38690

EMERGENCY ACTION PLAN

FOR

INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO

Prepared For:

U.S. Environmental Protection Agency
Region V
536 S. Clark Street
Chicago, Illinois

CONTRACT NO. 68-95-0017

TAT-05-F-00445

TDD# 5-8410-54

Prepared by:

WESTON-SPER
Technical Assistance Team
Region V

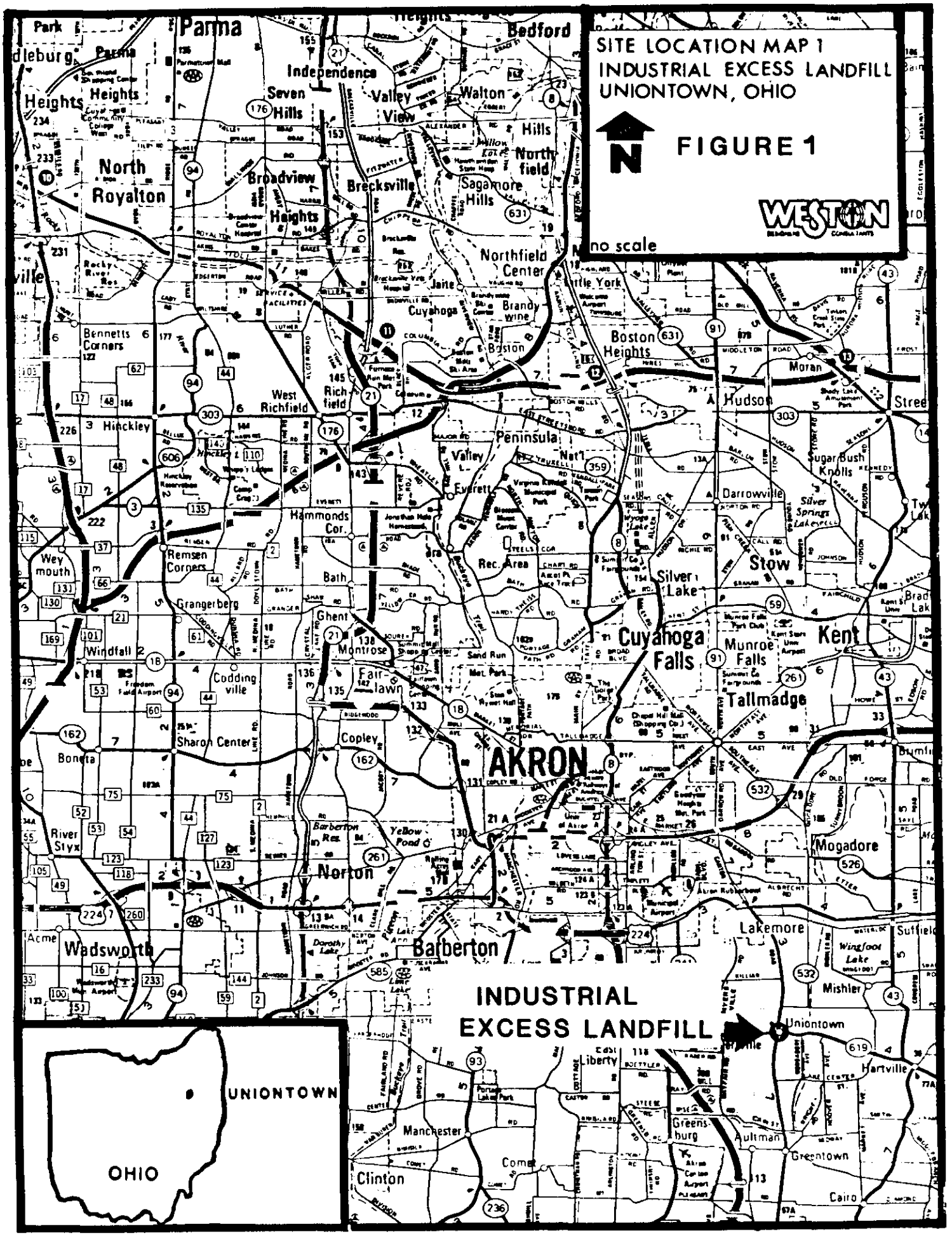
December 1984

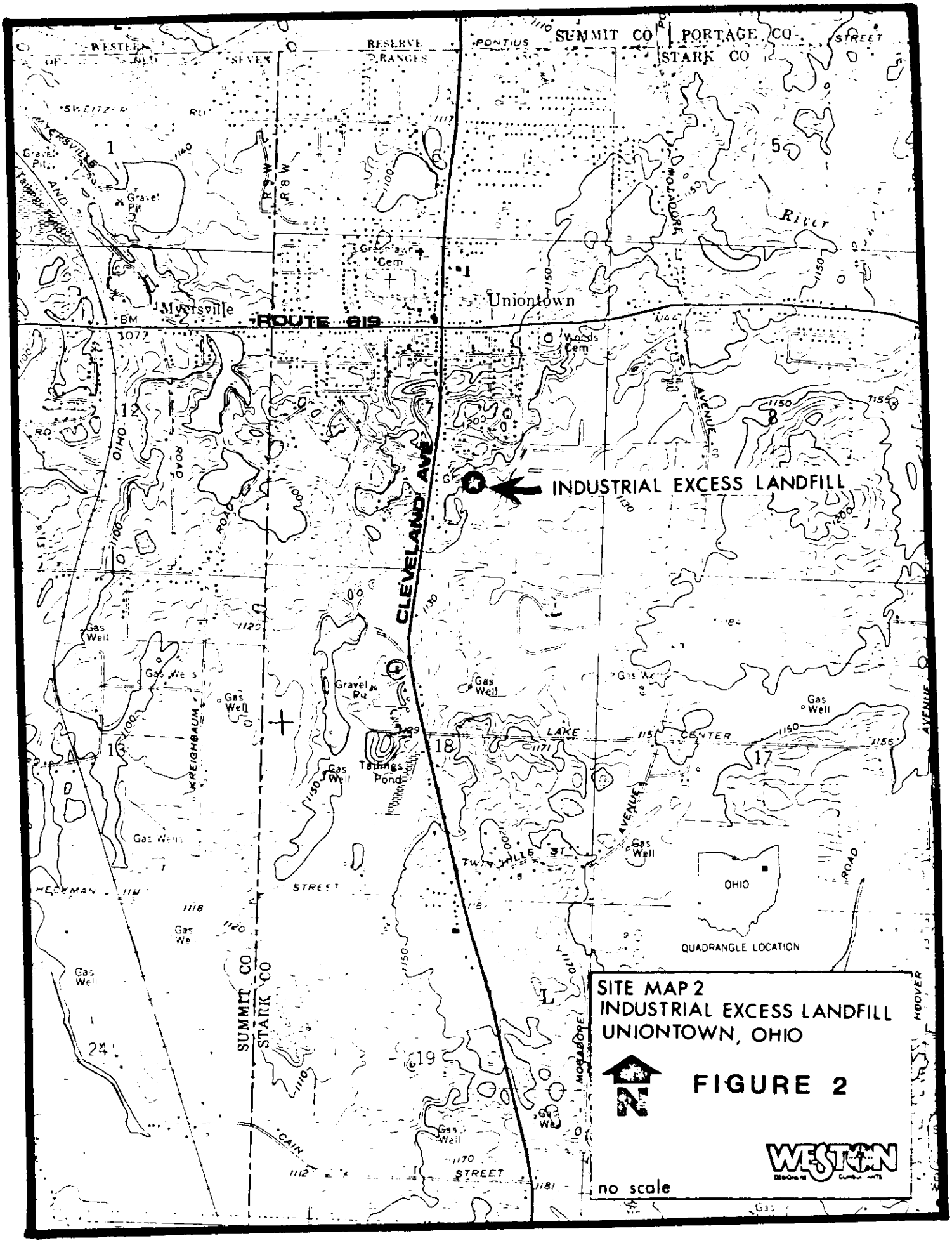
1.0 SITE HISTORY

The Industrial Excess Landfill is located southeast of Akron, Ohio, in Lake Township, Stark County (Figure 1). Situated at 12646 Cleveland Avenue, NW, Uniontown, Ohio, the landfill is approximately one-quarter of a mile southeast of the intersection of Cleveland Avenue and Ohio Route 619 (Figure 2). It is thought that in the early 1900s, the site was used to mine small regional coal beds. A vertical shaft may have been located in the central part near the western boundary leading into the landfill area. Subsequent to coal mining activities, the site was mined for its sand and gravel content using open pit techniques. Excavation was eventually terminated when the pit depth approached that of the water table.

On May 24, 1968, the sand and gravel operation was converted to a solid waste disposal facility under the ownership of Mr. Charles M. Kittinger. Mr. Kittinger acquired the title from Richard and Janet Sheets. In 1968, Lake Township zoning permits were issued allowing a variety of waste materials to be accepted. A solid waste disposal license was first issued in 1968 by the Stark County Board of Health (SCBH). In addition to site inspections conducted by the SCBH, the license was reviewed annually until 1972 by the Ohio Department of Public Health (ODPH). After responsibility for the state's solid waste program was transferred to the Ohio Environmental Protection Agency (OEPA) in 1972, the OEPA conducted the annual license reviews.

During the landfill's operating period, the operators accepted municipal, commercial, industrial and hazardous wastes of largely unknown composition. It is, however, thought by the OEPA that industrial waste generated by the rubber industry in the Akron, Ohio, area constitutes a major portion of the landfilled wastes. (A list of possible generators and haulers is presented in Attachment A.) Landfilling techniques varied considerably at the facility and included the application of liquid waste directly onto the working face of the fill. It has been reported that liquids were applied on the face either from 55-gallon drums or from tanker trucks. Two rather generic categories of waste were reportedly applied in this manner and included waste oil and rubber latex. According to Mr. Gary Gifford of the OEPA, the SCBH discouraged this practice when it became apparent that the quantities of liquid being disposed of--often exceeding 11,000 gallons per day--were saturating the working face of surrounding soils. Consequently, the landfill operation created a lagoon to contain liquid waste. The lagoon, which was situated on very porous sand and gravel without a liner, was backfilled January 24, 1972, by order of the SCBH.


SITE LOCATION MAP 1
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
N
FIGURE 1
WESTON
no scale
INDUSTRIAL
EXCESS LANDFILL
UNIONTOWN
OHIO
Parma
Bedford
Independence
Seven Hills
Valley View
Walton Hills
North Royalton
Broadview Heights
Brecksville
Sagamore Hills
Northfield
Northfield Center
Cuyahoga
Brandywine
Boston
Boston Heights
Bennetts Corners
West Richfield
Hinckley
Peninsula
Everett
Hammonds Cor.
Remsen Corners
Wey mouth
Bath
Rec. Area
Darrowville
Sugar Bush Knolls
Silver Springs
Stow
Silver Lake
Grangerberg
Ghent
Montrose
Windfall
Cuyahoga Falls
Munroe Falls
Kent
Tallmadge
Coddingville
Fairlawn
Sand Run
Met. Park
Sharon Center
Copley
AKRON
Bonetta
River Styx
Barberton Res.
Yellow Pond
Norton
Mogadore
Lakemore
Wingfoot Lake
Mishler
Acme
Wadsworth
Barberton
Uniontown
Hartville
Liberty
Manchester
Greensburg
Aultman
Greentown
Comet
Clinton
Cairo


SUMMIT CO
PORTAGE CO
STARK CO
Myersville
Uniontown
ROUTE 619
CLEVELAND AVE
INDUSTRIAL EXCESS LANDFILL
Gravel Pit
Cem
River
Gas Well
Tailings Pond
LAKE CENTER
AVENUE
STREET
ROAD
OHIO
QUADRANGLE LOCATION
SITE MAP 2
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
FIGURE 2
no scale
WESTON

According to Mr. Ken Catlette, a former heavy equipment operator at the Industrial Excess Landfill, drummed waste was also buried on site. (Attachment B contains a statement by Mr. Catlette taken on May 31, 1984.) As part of the daily routine, drums were opened, emptied of their contents and sent back to the appropriate generator. Mr. Catlette stated that if the drum contained solid material, the landfill personnel would ". . . just roll it down the hill and put it right in. . . ." Of the estimated 60,000 drums received at the facility during Mr. Catlette's tenure, he estimated that 400 or 500 drums were buried in the landfill. Photographs taken in 1969, 1971, and 1972 document the presence of a large number of drums on the landfill (Attachment C).

During the years from 1968 through 1972 under the management of Mr. Kittinger, the quantity of waste accepted by the facility rose from 200 to 375 tons per day. In the latter part of 1972, Mr. Hyman Budoff, Vice President of the landfill company, purchased the landfill from Mr. Kittinger. Mr. Budoff used the landfill primarily as a sanitary dump until 1979. In 1980, due to public pressure and the facility reaching its volumetric capacity, the SCBH ordered closure proceedings to start. On May 28, 1980, by order of the Stark County Court of Common Pleas (Case No. 80-365), closure of the landfill was arranged. The landfill was then covered with on-site material of sand and gravel and seeded.

Environmental sampling in the area of the landfill has been limited in both scope and frequency. Ground water testing was done by the OEPA in 1973 and 1980. Sampling by the U.S. Environmental Protection Agency (U.S. EPA) of landfill leachate, was conducted on December 4, 1980.

In the summer of 1983, area residents demonstrated a renewed interest in the Industrial Excess Landfill. Their main concerns focused on possible ground water contamination resulting from the landfill and an alleged elevated miscarriage rate in the area. These concerns were presented to the OEPA and the Stark County Board of Health. The SCBH conducted an informal survey of the miscarriage rate in the area and concluded that the local situation was not higher than the national norm given by the United Way. A review of the survey methodology suggests that the survey should not be used to characterize the miscarriage rate in the vicinity of the landfill.

Due to elevated levels of explosive gases adjacent to the landfill and in nearby homes, Mr. Gary Gifford of the OEPA requested assistance from the U.S. EPA in evaluating site

conditions. On September 19, 1984, the U.S. EPA tasked the Technical Assistance Team (TAT) to initiate site assessment activities. This report summarizes the findings of the assessment and presents recommended mitigative actions and the estimated cost of their implementation.

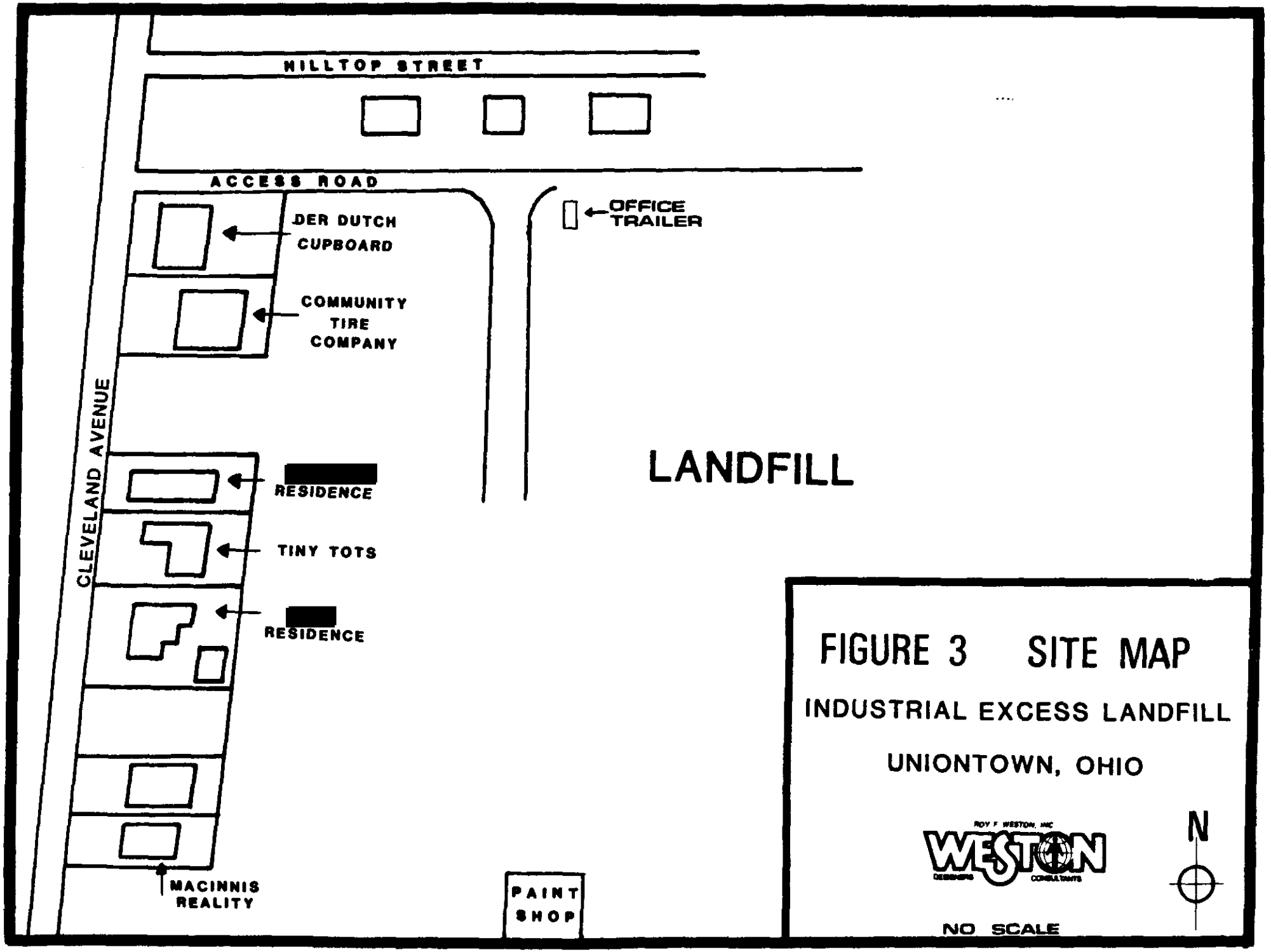
2.0 SITE ASSESSMENT

2.1 Site Description

The Industrial Excess Landfill is located at latitude 40° 58' 10" and longitude 81° 24' 30" in the City of Uniontown, Ohio. The landfill covers an area of approximately 30 acres of which an estimated 24 acres contain waste material. It is bordered on the west by residential homes, one restaurant (Der Dutch Cupboard) and a tire company (Community Tire Company). The homes, restaurant, and tire company are approximately 75-100 feet west of the site. To the south, the site is bordered by private property. The only structure on this property is a paint shop that is occupied approximately 40 hours per week. The site's eastern border is Metzger Ditch, a tributary of the Tuscarawas River. A sod farm is located directly to the east of the ditch. The north is bordered by vacant lots and private residences (Figure 3).

The Industrial Excess Landfill is immediately adjacent to the City of Uniontown with the outlying area being generally rural. The population of Uniontown is 19,400 with approximately 3,600 people potentially affected by drinking water contamination from the landfill. The only potable water is supplied by private wells. The depth to ground water varies from 5 to 55 feet. Average depth to the main aquifer is 40 feet (approximately 1120 MSL). The yield of the aquifer is unknown. The individual wells are developed in either saturated overburden or sandstone bedrock at the bottom of the overburden. Ground water movement has not been positively identified due to the geologic complexity of the area, but is generally thought to travel in a west to northwest direction. Unlike the flow of the ground water, surface water drainage is to the southeast into the adjacent tributary of the Tuscarawas River. It then flows south to the Tuscarawas River which bends and flows north. The main surface drainage system in the area is into the Tuscarawas River to the north.

The landfill is in an area formed by the processes of glaciation. Overlapping of glacial fronts left large deposits of sand and gravel. The permeability of this material is 10^{-4} -10^{-3} cm/sec. Located within the sand and gravel are small discontinuous clay beds with an east to southeast slope. Local area bedrock is made up of sandstone. The


HILLTOP STREET
ACCESS ROAD
DER DUTCH CUPBOARD
OFFICE TRAILER
COMMUNITY TIRE COMPANY
CLEVELAND AVENUE
LANDFILL
RESIDENCE
TINY TOTS
RESIDENCE
MACINNIS REALITY
PAINT SHOP
FIGURE 3 SITE MAP
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
ROY F. WESTON, INC
WESTON
DESIGNERS CONSULTANTS
N
NO SCALE

site is an upland area surrounded by stepped marsh areas. Elevation of the landfill ranges from 1178.5' at the highest point near the northwest corner, to 1117.3' to the low spot in the southeast corner (Figure 4). The site slope is 11° to the southeast.

According to estimates supplied by local officials, the landfill approaches a depth of 60 feet in areas where excavation of the sand and gravel pit was greatest. The area in the southwest corner was the first to be utilized for industrial waste disposal. The northwest corner is thought to contain drums with unknown contents. The exact location of the lagoon, backfilled in 1972, has not been determined. Office trailers and heavy excavation machinery (e.g., a caterpillar) have been left on site and are deteriorating. The landfill, at present, is completely covered with material consisting of sand and gravel. Stressed vegetation is present and odors can be detected coming from the landfill.

2.2 Summary of Existing Analytical Data

2.2.1 Sampling of Residential Well Water Supplies

In January, February and March 1984, 24 ground water samples from domestic and commercial wells were collected from the general area around the landfill by the OEPA. Each of the 24 samples of ground water were analyzed for organic and inorganic constituents. Figure 5 presents the location of the sampled wells.

All samples were analyzed for and were reported to be within the EPA Primary Drinking Water Standards. Several samples, however, exceeded the Secondary Drinking Water Standards for Total Dissolved Solids (TDS). A total of six sampling locations (#8, 12, 13, 14, 15 and 21) exceeded the TSD standard of 500 mg/l. The maximum level suggested for chlorides (250 mg/l) was also exceeded at one sample location (#14). Of particular concern to local residents was the detection of phenols in 5 of the 23 samples (#13, 14, 15, 18 and 21), with the highest reported concentration being 13 ug/l. OEPA recommends a maximum allowable level of 150 ug/l of phenol in drinking water supplies while New York State Ground Water Standards (New York State Classification and Quality Standards Official Codes, Rules and Regulations of the State of New York, Chapter X, Division of Water Resources, Article 2, Part 703.5) limit phenolic compounds to a maximum of 1 ug/l.

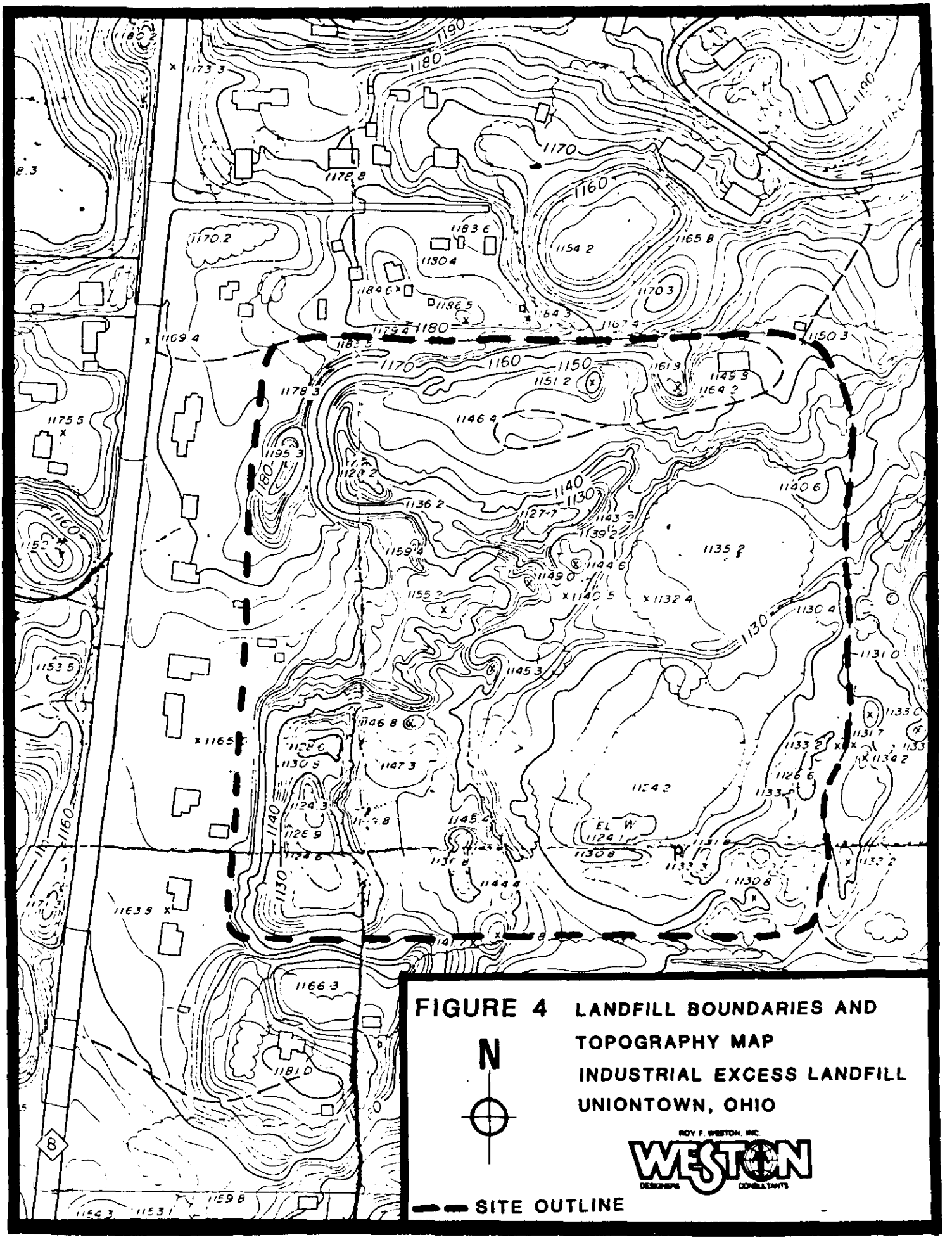


FIGURE 4
LANDFILL BOUNDARIES AND TOPOGRAPHY MAP
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
N
ROY F. WESTON, INC.
WESTON
DESIGNERS CONSULTANTS
SITE OUTLINE

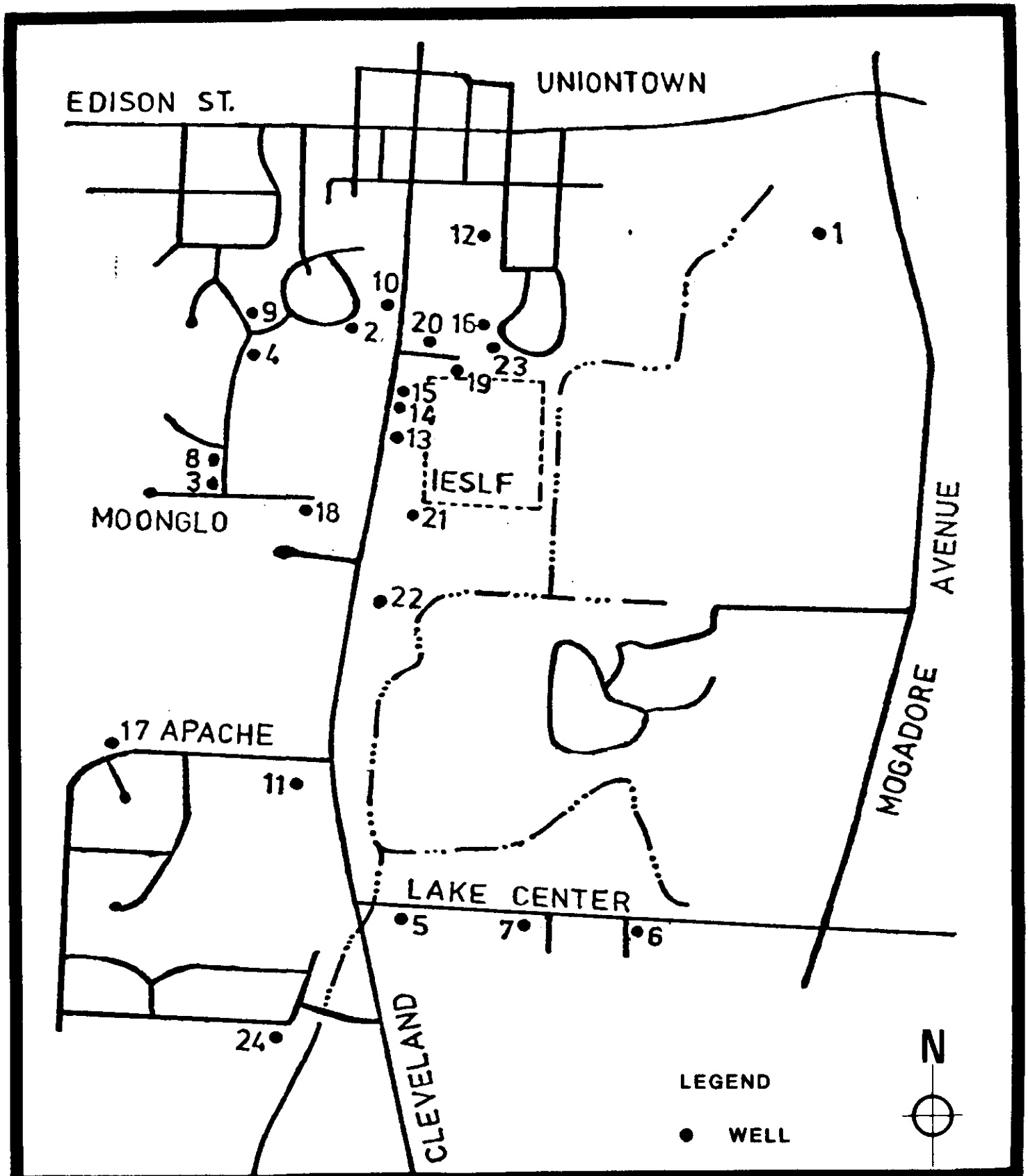


FIGURE 5 SAMPLE LOCATION MAP

MUNICIPAL AND RESIDENTIAL WELLS

UNIONTOWN, OHIO

ROY F. WESTON INC
WESTON
DESIGNERS CONSULTANTS

MAP COURTISY OF OHIO EPA

It was the opinion of the OEPA that the majority of the tested wells had excellent water quality; however, the OEPA concluded its report by stating: "In consideration of known factors, it is probable that the landfill is the principal source of the observed TDS elevations and trace levels of phenols. Additional well sampling and hydrogeological analysis will be necessary prior to final determination regarding the source(s) of TDS and phenol."

2.2.2 Gas Sampling Performed by the East Ohio Gas Company on April 27, 1984, and September 25-26, 1984

On April 27, 1984, the East Ohio Gas Company sampled ambient air at three locations in the vicinity of the Industrial Excess Landfill and manifold gas at one location. The objective of the survey was to determine if the presence of methane gas in the ground was caused by a gas pipeline leak.

Figure 6 illustrates the sample locations (1-4) and Table 1 displays the survey results. (Detailed information regarding this and other sampling activities conducted at the landfill is presented in Attachment D.) It should be noted that the manifold gas (sample 3) is for commercial use and should contain a high volume percentage of methane (i.e., greater than 90 percent). The remaining gas samples analyzed by the East Ohio Gas Company were collected from bore holes and contained elevated levels of methane gas (11.6 to 67.5 percent).

The East Ohio Gas Company conducted additional sampling activities in the vicinity of Industrial Excess Landfill on September 25-26, 1984. In-ground gas sampling was carried out at three locations (Figure 6, samples 5, 7, 8). In addition, a sample was gathered at an East Ohio Gas manifold (sample 6). The results of the chromatographic analysis (Table 1) revealed elevated percentages of methane present in the atmospheres of sample bore holes.

Explosivity readings were also taken at three residences located on Cleveland Avenue, Uniontown, Ohio. In total, ten sample points were surveyed. Figure 7 illustrates the percent lower explosive limit observed at each sample location (see Attachment D for sample location and description).

Samples locations 1, 6 and 8 produced LELs in excess of 100 percent. This environment could ignite or explode in the presence of an ignition source. Samples 4, 10, 9 and 3 yielded LELs of 80, 20, 10 and 5 percent, respectively.

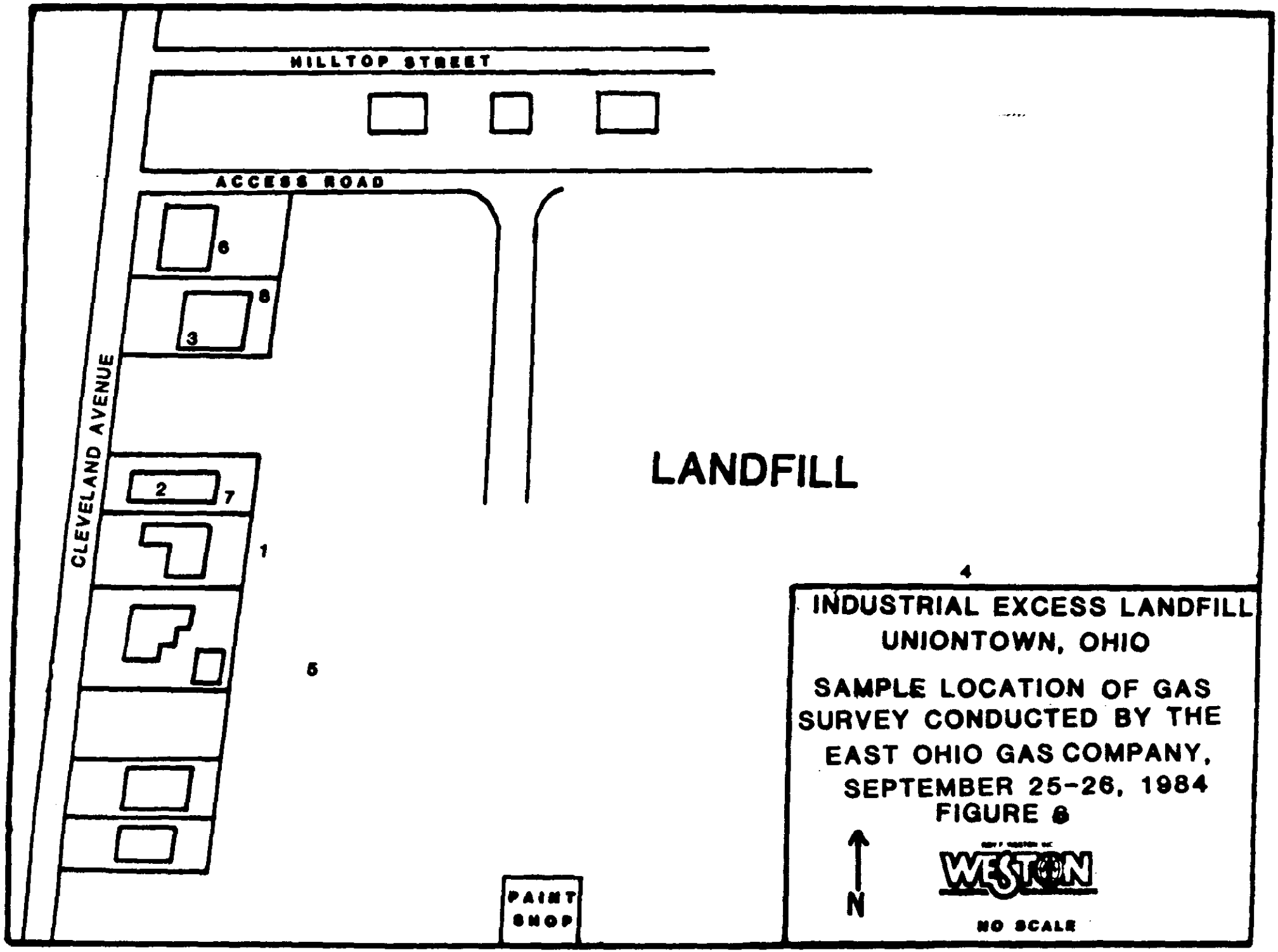
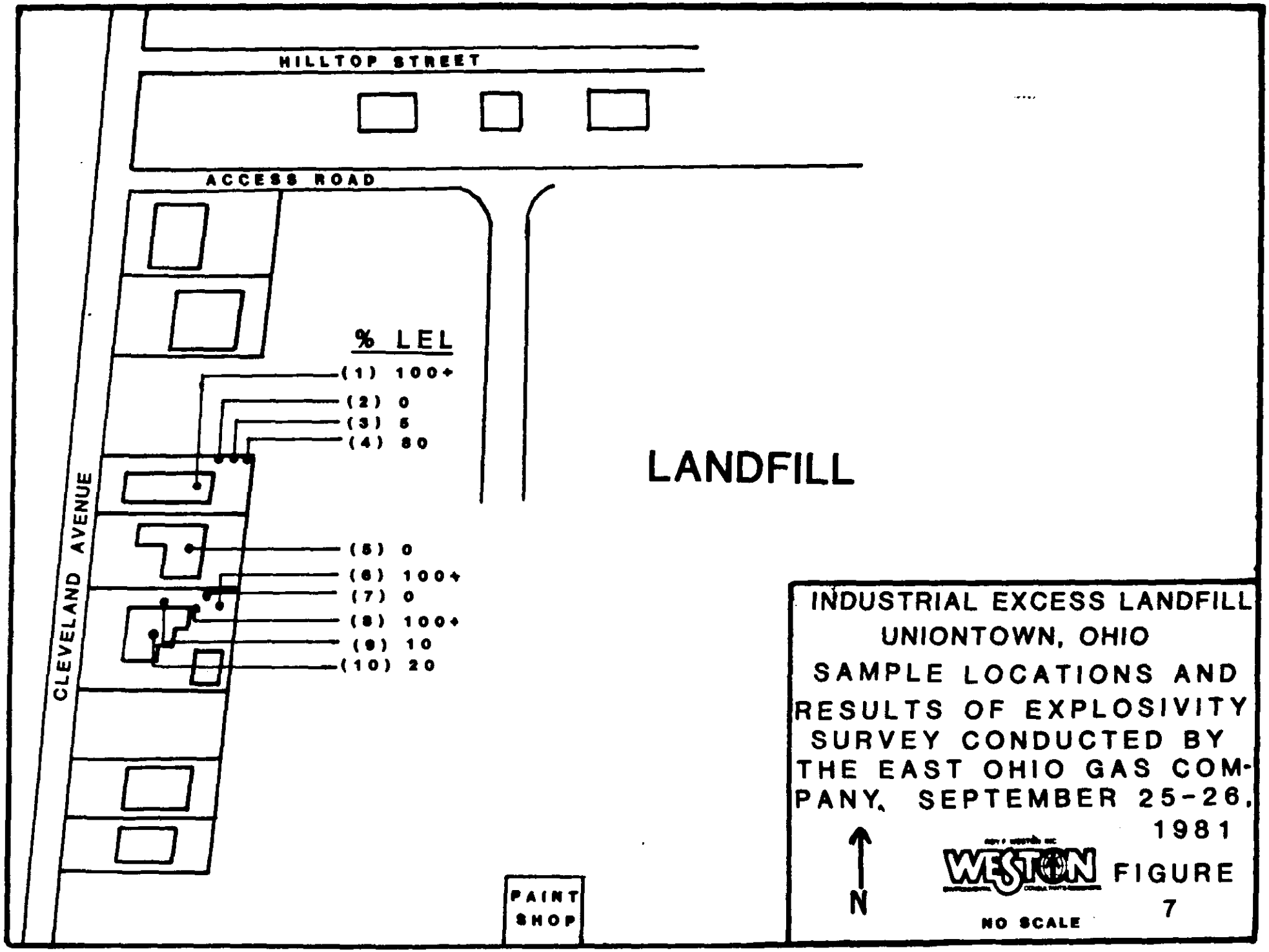

HILLTOP STREET
ACCESS ROAD
CLEVELAND AVENUE
LANDFILL
6
8
3
2
7
1
4
5
PAINT SHOP
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
SAMPLE LOCATION OF GAS SURVEY CONDUCTED BY THE EAST OHIO GAS COMPANY, SEPTEMBER 25-26, 1984
FIGURE 6
N
WESTON
NO SCALE

TABLE 1

RESULTS OF CHROMATOGRAPHIC ANALYSIS OF AIR SAMPLES COLLECTED BY THE EAST OHIO GAS COMPANY ON APRIL 27, 1984, AND SEPTEMBER 25-26, 1984, INDUSTRIAL EXCESS LANDFILL, UNIONTOWN, OHIO

Component	Volume Percent of Gases by Sample							
	1	2	3	4	5	6	7	8
Helium	-	-	-	-	-	-	-	-
Hydrogen	-	-	trace	-	0.0	0.00	-	0.00
Oxygen and Argon	-	-	-	-	-	0.19	-	-
Nitrogen	-	-	-	-	-	4.45	-	-
Methane	45.7	11.60	91.60	67.5	16.40	88.91	2.53	0.18
Ethane	0.0	0.00	1.10	0.0	0.00	4.04	0.00	0.00
Carbon dioxide	13.2	1.16	0.03	22.4	0.17	0.44	2.12	0.45
Propane	0.0	0.00	0.42	-	0.00	1.21	0.00	0.00
Iso-butane	trace	0.00	0.04	trace	0.00	0.17	0.00	0.00
N-butane	0.0	0.00	0.07	0.0	0.00	0.34	0.00	0.00
Neo-pentane	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00
Iso-pentane	0.0	0.00	0.01	0.0	0.00	0.07	0.00	0.00
N-pentane	0.0	0.00	0.01	0.0	0.00	0.08	0.00	0.00
Hexane	0.0	0.00	trace	0.0	0.00	0.10	0.00	0.00

NOTE: Sample locations 1, 2, 3 and 4 were collected on April 27, 1984.
Sample locations 5, 6, 7 and 8 were collected on September 25-26, 1984.



INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
SAMPLE LOCATIONS AND RESULTS OF EXPLOSIVITY SURVEY CONDUCTED BY THE EAST OHIO GAS COMPANY, SEPTEMBER 25-26, 1981

WESTON

FIGURE 7

2.2.3 Explosivity Survey Performed by the Uniontown Volunteer Fire Department

The Uniontown Volunteer Fire Department has conducted numerous explosivity surveys of the residential area adjacent to Industrial Excess Landfill. The sample locations and their descriptions are presented in Attachment D. The results of the surveys are presented in Figure 8. The graph illustrates that several locations yield concentrations of a flammable mixture that may ignite or explode if an ignition source was present. The findings of the most recent sampling (October 16, 1984) denote that sample locations 1, 2, 4, 5 and 6 possessed explosive mixtures.

2.3 Summary of Air Sampling Conducted by TAT

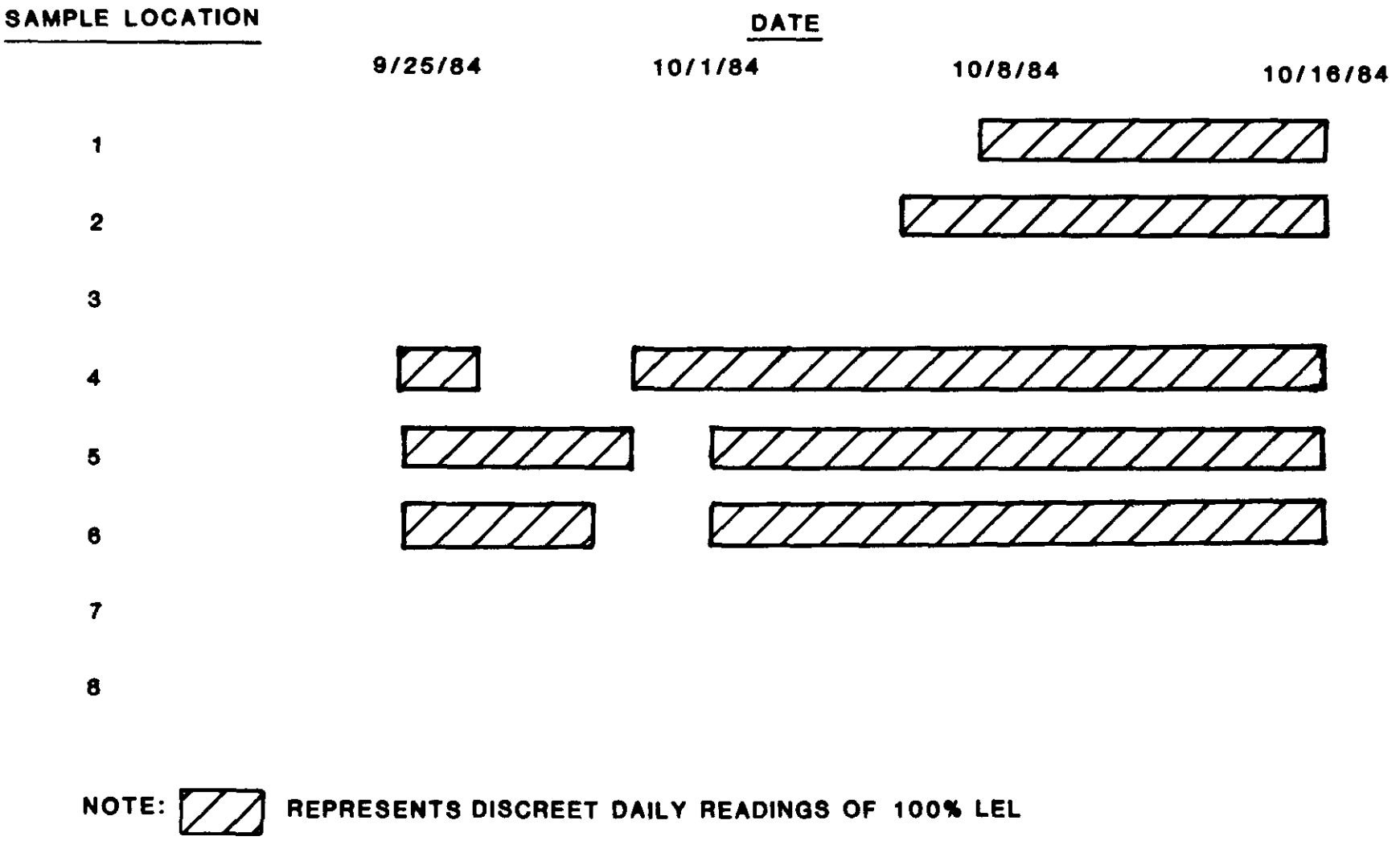
The TAT conducted air sampling in Uniontown, Ohio, on October 4-5, 1984, and on October 11, 1984. The initial surveys (October 4-5, 1984) were performed utilizing the combustible gas indicator (CGI) and the organic vapor analyzer (OVA). In addition, coconut-based charcoal tubes were used to sample bore hole atmospheres for those volatile organic compounds designated as priority pollutants. Figure 9 represents the locations sampled by the TAT. The sample description and location, as well as the observed readings of both the CGI and the OVA can be found in Attachment D. The data obtained from the CGI provides confirmation that several locations adjacent to the Industrial Excess Landfill site contain explosive mixtures (#1, 3, 4, 5 and 8). The OVA revealed high concentrations of organic vapors present at sample locations #1, 3, 4, 5, 6 and 8.

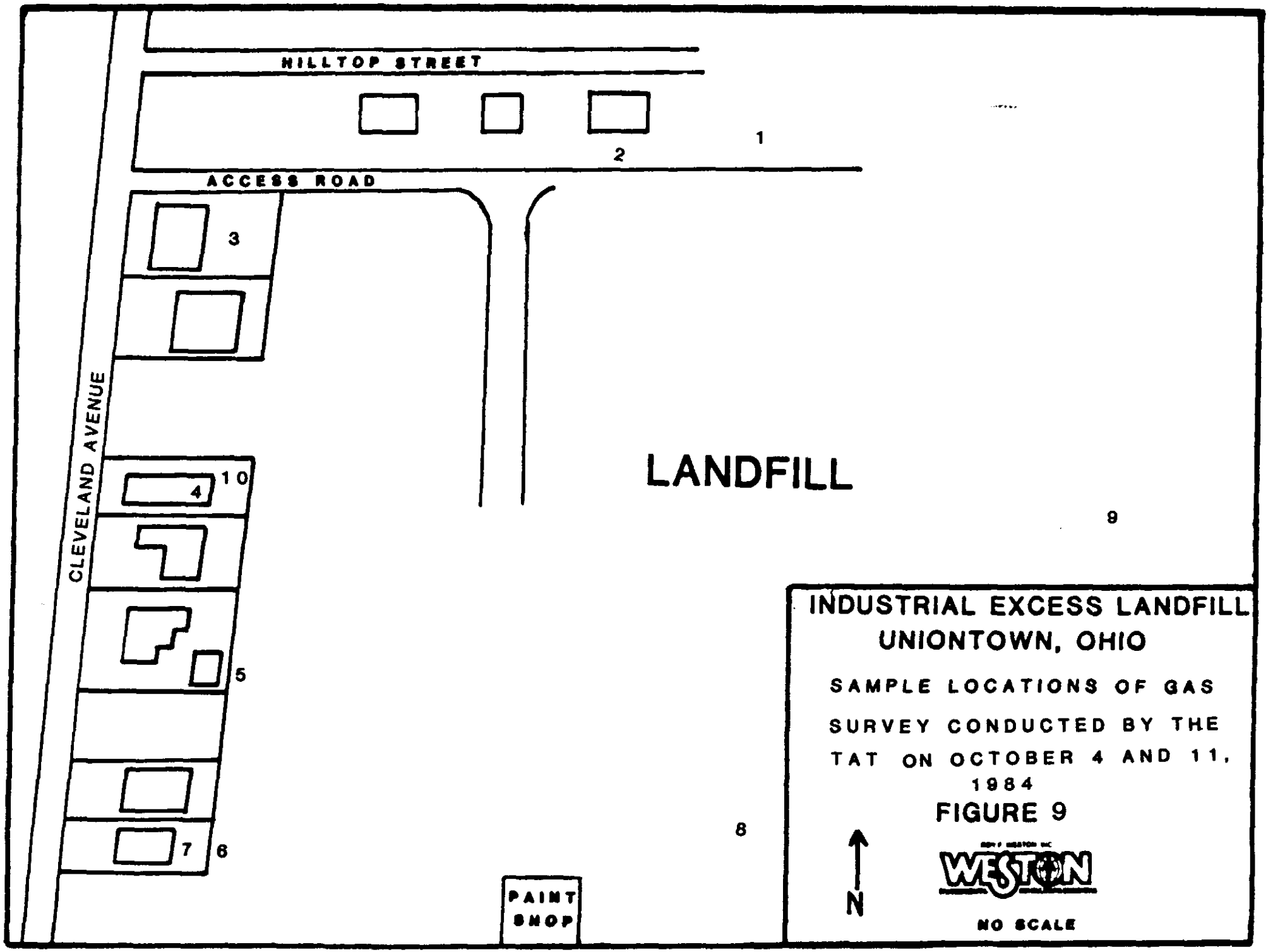
The results of the analysis for volatile compounds are presented in Table 2. In all cases, there were no volatile priority pollutants present (detectable limit 0.1 mg/m^3). However, the GC/MS scan determined that the primary organic constituents of the gas were C_4, C_5, C_6, and C_9 hydrocarbons. Total hydrocarbon concentrations ranged from <0.1 to >130 mg/m^3 (Table 3). Due to a break-through of the hydrocarbons onto the back section of several of the charcoal tubes, it was decided that resampling would occur at sample locations 3, 5, 6 and 10.

The TAT returned to the Industrial Excess Landfill on October 11, 1984, to resample locations 3, 5, 6, and 10 for the purpose of refining the previously discussed air sampling data. Samples were collected employing decreased sampling periods and flow rates thus ensuring that break-through would not occur. The charcoal tubes were analyzed for total

FIGURE 8

RESULTS OF EXPLOSIVITY SURVEY CONDUCTED BY UNIONTOWN VOLUNTEER FIRE DEPARTMENT INDUSTRIAL EXCESS LANDFILL, UNIONTOWN, OHIO




HILLTOP STREET
ACCESS ROAD
CLEVELAND AVENUE
LANDFILL
PAINT SHOP
1
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7
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9
10
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
SAMPLE LOCATIONS OF GAS SURVEY CONDUCTED BY THE TAT ON OCTOBER 4 AND 11, 1984
FIGURE 9
N
NO SCALE

TABLE 2

RESULTS OF GC/MS SCAN CONDUCTED 10/4/84 BY THE TAT
FOR VOLATILE ORGANIC COMPOUNDS DESIGNATED AS PRIORITY POLLUTANTS
INDUSTRIAL EXCESS LANDFILL, UNIONTOWN, OHIO

	Sampling Locations[1]								
Volatile Compounds	1	2	3	4	5	6	7	8	9
Acrolein	ND[2]	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trans-1-3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND

[1] A sample was not collected at location #10.

[2] None detected, lower detection limit 0.1 mg/m^3.

TABLE 3

RESULTS OF HYDROCARBON ANALYSIS ON SAMPLES COLLECTED
BY THE TECHNICAL ASSISTANCE TEAM ON OCTOBER 4 AND 11, 1984
INDUSTRIAL EXCESS LANDFILL, UNIONTOWN, OHIO

Sample Location	Total Hydrocarbons (mg/m^3) 10/4/84[1]	Total Hydrocarbons (mg/m^3) 10/11/84[2]
1	5.6	
2	<0.1	
3	>0.6+*	44
4	0.4	
5	>130+*	530
6	>1.1*	<0.2
7	>0.4*	
8	0.3	
9	<0.1	
10	Sample not collected	1.1
11 (blank)		<50 ug

[1] Lower detectable limit = 0.1 mg/m^3.

[2] Lower detectable limit = 50 ug.

+ Noticeable amount of liquid inside tube.

* Break-through occurred.

hydrocarbons (Table 3). Calculated hydrocarbon air concentrations ranged from <0.2 to 530 mg/m^3. Further, all detectable hydrocarbons were identified and quantified using GC/MS analysis. Table 4 lists the compounds and their respective relative concentrations. Due to rounding, the sum of the hydrocarbon concentrations (mg/m^3) at each location may not equal the respective value reported in Table 3.

It is important to note that benzene is considered to be a common contaminant of charcoal tubes. Attachment E contains a letter from ALERT Analytical Laboratories stating that th presence of benzene, in this case at levels <0.1 mg/m^3, most probably reflects pre-sampling contamination rather than evidence of benzene in bore hole atmospheres. This opinion is supported by results from the previous sampling effort on October 4, 1984 (Table 2). These data reveal that benzene was not detectable in nine sample locations at a lower detection limit of 0.1 mg/m^3. The hydrocarbon compounds identified at the Industrial Excess Landfill are similar to those found in gases at other municipal landfills. Table 5 presents the components of raw landfill gas collected at the Mountain View Gas Collection Project in Mountain View, California. Compounds in the C_4 through C_{12} range were identified and included aromatic, halogenated and oxygenated hydrocarbons. Ion chromatography of the raw gas identified the presence of 125 compounds. Gases were also analyzed from stations in the natural gas pipeline before and after addition of the landfill gas (Table 6). Of particular note is the presence of alkyl benzenes and benzene in the natural gas prior to the introduction of the landfill gas. Alkylbenzenes ranging from ethylbenzene to tetra methyl benzene were identified and ranged from 63 to 360 mg/m^3. The concentration of benzene ranged from 28 to 81 mg/m^3 compared to a recommended exposure limit of 30 mg/m^3. The presence of these compounds, however, does not necessarily indicate an exposure to the end users.

Comparison of the component gases at the Mountain View Project and the Industrial Excess Landfill reveals the following:

- The concentrations of total hydrocarbons were greater in gases at the Mountain View project than at the Industrial Excess Landfill; and,
- Halogenated hydrocarbons were present in relatively high concentrations in gases at the Mountain View Project but were absent in gases at the Industrial Excess Landfill.

TABLE 4

RESULTS OF GC/MS SCAN FOR HYDROCARBONS IN SAMPLES
COLLECTED BY THE TECHNICAL ASSISTANCE TEAM ON OCTOBER 11, 1984

Location	Identified Compounds and Respective Concentrations (mg/m^3)			
3	Cyclohexane	0.5	Heptane	1.0
	Methylcyclopentane	0.6	4-Ethenylcyclohexene	11
	3-Methylpentane	1.4	1-Methylethyl benzene	0.5
	Benzene	<0.1	1-Ethenyl-3-Methylenecyclopentane	19
	Hexane	7.3	2,3-Dimethylbutane	0.1
	3-Methylhexane	0.7	2-Methylpentane	1.1
5	Cyclohexane	8	Noane	12
	Methylcyclopentane	11	5-Methyl-1-heptene	9
	2,3-Dimethylbutane	2	2,3,5-Trimethylhexane	1
	3-Methylpentane	12	2,4-Dimethylheptane	3
	Hexane	39	1-Ethyl-2-Propylcyclohexane	4
	Methylcyclohexane	58	Heptane	58
	2,4-Dimethylpentane	7	3,5,5-Trimethyl-1-hexene	19
	2,3-Dimethylpentane	20	3,4-Dimethylhexane	33
	3-Ethylpentane	7	4-Methyl-1-hexene	4
	3-Methylhexane	51	2,2,3,3-Tetramethylbutane	2
	2-Methylhexane	38	1,5-Hexadiyne	47
	3,3-Dimethylhexane	9	2,5-Dimethylheptane	33
	1,3-Dimethylcyclohexane	20	1,4-Dimethylbenzene	20
	2,2-Dimethylheptane	7		
6	--			
10	Benzene	<0.1		
	3-Methylhexane	0.4		
	2-Methylhexane	0.2		
	Heptane	0.1		
	Methylcyclohexane	0.2		
	2,3-Dimethylpentane	0.2		

TABLE 5

COMPONENTS OF RAW LANDFILL GAS COLLECTED
FROM THE MOUNTAIN VIEW GAS COLLECTION PROJECT[1]

Compound	Concentration (mg/m^3)
Carbon #4	65
5	9.0
6	5.5
7	191
8	402
9	970
10	1600
11	49
12	73
Total Aromatic Hydrocarbons	587
Total Halogenated Hydrocarbons	472
Total Oxygenated Hydrocarbons	731
Total Chromatographable Volatile Organics	5155

[1] "Landfill Methane Recovery Part I: Environmental Impacts--Final Report," Gas Research Institute Report - GRI-80/0084.

TABLE 6

CONCENTRATIONS OF COMPOUNDS IN NATURAL GAS
PIPELINE L-101 UPSTREAM AND DOWNSTREAM OF THE
MOUNTAIN VIEW PROJECT GAS INJECTION POINT (mg/m^3)[1]

Compound	Upstream	Downstream		
	Stierlin Rd. Station	Embarcadero Road Station	Rengstorff Station	Sierra Vista
Carbon No. 6	375	92	226	235
7	743	1247	1005	817
8	612	614	645	762
9	448	486	552	604
10	166	205	212	115
Total Aromatics	128	440	103	253
Total Oxygenated Hydrocarbons	390	475	220	440
Alkyl Benzenes	63	360	112	115
Benzene	50	79	28	81
Trichloroethene	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND

[1] "Landfill Methane Recovery Part I: Environmental Impacts--Final Report," Gas Research Institute Report - GRI-80/0084.

From this comparison, based on data gathered as of November 21, 1984, it appears as if the gases at the Industrial Excess Landfill contain relatively few contaminants at low concentrations.

3.0 THREAT TO HUMAN HEALTH AND THE ENVIRONMENT

This section addresses how the substances detected by the previously-discussed sampling efforts, combined with other factors, such as weather patterns and the site's proximity to residential and commercial areas, present a significant risk of harm to human life or health and the environment. The major threats posed by the Industrial Excess Landfill, in order of magnitude, include the potential for fire and explosion in nearby structures and the potential for direct contact (i.e., inhalation) with hazardous vapors.

The most dangerous potential threat presented by the landfill is that posed by volatile gases migrating to adjacent homes and businesses and accumulating, in the atmosphere, to explosive levels. The probability of an explosion in these homes may be estimated by examining the three requisite elements necessary for an explosion to occur--fuel, air and an ignition source.

The presence of fuel, in this case gaseous hydrocarbons, has been documented by past sampling efforts. Air monitoring was conducted routinely from September 25, 1984, through October 16, 1984, by Mr. Algood (Uniontown Fire Department). Of the eight bore holes sampled regularly, five have had explosive atmospheres present since October 7, 1984. Further, of these five, three have had explosive atmospheres daily dating back to September 25, 1984. Although these data reflect levels in the ground rather than ambient air, it is possible for the gases to accumulate in the buildings adjacent to the sampled bore holes. This was vividly demonstrated on September 26, 1984, as residences on Cleveland Avenue were evacuated when an atmosphere approaching 25% of the LEL of the gas mixture was detected in the basement crawl space at the [redacted] residence ([redacted]). Although the levels of explosive gases decreased within two days, thus allowing reoccupation, it is possible that the gas levels will increase again. Discussion with knowledgeable U.S. EPA, OEPA and TAT personnel suggest that the potential for increased lateral migration of gases from the landfill will increase during the winter months when the surface soils freeze, thus forming a barrier to vertical gas migration. This, in turn, would enhance the potential for greater gas levels in the homes adjacent to the landfill.

The second element necessary for an explosion to occur is the presence of air or, more specifically, oxygen. This requirement was illustrated when monitoring the oxygen deficient atmospheres in the bore holes. On several occasions, explosive gas mixtures were detectd in concentrations above the upper explosive limit or UEL. In these situations, the migrating gases displaced oxygen to the point where ignition would not occur. The presence of air in the nearby residences, however, is not in short supply and would be sufficient to sustain a reaction.

The third and last necessary element of an explosion is an ignition source or heat. Such sources are common in households and may include hot water heaters, clothes dryers, ranges, ovens and light fixtures. During the winter months, the number of sources will increase with the use of furnaces, space heaters and fireplaces or wood stoves.

The previous discussion presents evidence that an explosion could occur in several of the homes adjacent to the Industrial Excess Landfill. The proper fuel-to-oxygen ratio in the presence of an ignition source would result in a very rapid, violent release of energy. When the gases cannot freely dissipate and are confined as they are in a building, they enter the combustion reaction more rapidly which enhances the explosive process. The primary hazards associated with an explosion include:

- Physical destruction due to shock waves, heat and flying objects;
- Initiation of secondary fires or the creation of flammable conditions; and,
- Release of toxic and corrosive compounds into the surrounding environment.

An example of this type of explosion occurred on March 21, 1984, in a home adjacent to the Hardy Road Landfill in Akron, Ohio. Flammable/explosive landfill gases had migrated into the structure, an ignition source--in this case a match--was supplied and the home exploded and burst into flames. It was only through the fast reactions of the residents that lives were not lost. A similar explosion, if it were to occur in a home near the Industrial Excess Landfill, would present significant and substantial threats of harm to human life or health.

The second major threat presented by the landfill is that posed by the potential for direct contact with hazardous vapors. The many gaseous constituents of the vapors migrating from the landfill can, at elevated concentrations, adversely impact human health through two mechanisms--asphyxiation and physiological dysfunction. Methane, the major component of the raw landfill gas, is classified as a simple asphyxiant.[1,2] A simple asphyxiant has no specific toxicity effect, but acts by excluding oxygen from the lungs. The effect of simple asphyxiant gases is proportional to the extent to which they displace oxygen in the air. Examples of such effects include rapid respiration, air hunger and a decrease in alertness and muscular coordination. In severe cases, where the concentration of the simple asphyxiant exceeds 75% in the mixture of air and gas, there may be nausea and vomiting, prostration and loss of consciousness, and finally, convulsions, deep coma and death.

As discussed in Section 2.0 of this report, methane concentrations in landfill gas were determined by chromatographic analysis by the East Ohio Gas Company. The in-ground gases were collected at several locations both on, and adjacent to, the landfill. Methane concentrations ranged from a minimum of 0.18% to a maximum of 67.5%. The most significant in-ground readings to date were taken in the basement of the [redacted] residence ([redacted]) and approximately 150 feet behind the Tiny Tots Nursery School (12534 Cleveland Avenue) where methane levels were 11.6% and 45.7%, respectively. This information demonstrates that methane has migrated to the homes in significant concentrations and that the levels can reach, at least near the houses at this time, the point where appreciable symptoms of asphyxiation would develop. The threat of asphyxiation is likely to increase during the winter months when windows and doors are closed and the lateral migration of gases is thought to increase.

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1 "Dangerous Properties of Industrial Materials - Fifth Edition," N.J. Sax. Van Nostrand Reinhold Co. 1979.

2 "TLVs, Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment and Biological Exposure Indices with Intended Changes for 1984-85." Copyright 1984 by American Conference of Governmental Industrial Hygienists. ISBN: 0-936712-54-6.

Many of the minor constituents of the raw landfill gas pose threats to human health through the second mechanism--physiologic effects. Table 7 lists the hydrocarbons detected in the TAT sampling effort, the respective concentrations of the substances found in the air, and information about each substance describing its physiologic effect.

The majority of the compounds listed are respiratory irritants and are narcotic in high concentrations. Exposure to some of the detected hydrocarbons can have extreme adverse effects such as: methylcyclohexane, which has no odor or other warning signs, can cause narcosis, anethesia and death by tetanic spasm; heptane, when inhaled causes marked vertigo, uncoordination and hilarity; hexane, dermal exposure can cause blister formation, itching, erythema and pigmentation and may also cause motor neuropathy, marked vertigo, fatigue, parathesia in distal extremities, blurred vision, anorexia and the onset of polyneuropathy; and, benzene, a recognized leukemogen, a known mutagen and a suspected teratogen, can be absorbed through the skin causing erthyma, edema, narcosis, coma and death through respiratory or cardiac failure.

Of the 32 compounds identified as a result of the TAT sampling effort, only 6 have been assigned Threshold Limit Values (TLVs) by the American Conference of Governmental and Industrial Hygienists (ACGIH). Upon comparison of the sample concentrations and the TLVs, it is apparent that the six compounds are well below the established limits recommended by the ACGIH. Further, these data were based on in-ground atmospheres rather than ambient air in the homes adjacent to the Industrial Excess Landfill.

There are, however, two factors that increase the potential for physiological harm from the landfill gases. First, as stated previously, the lateral migration of gas may increase during the winter months and thus cause gas levels, including the trace hydrocarbons, to increase in the ambient air within the homes. Secondly, the TLVs established by the ACGIH are based on time-weighted average concentrations for eight hours per day, five days per week rather than the longer exposure periods that would be experienced by residents adjacent to the landfill. It is important to note that some of the residents are retired and spend a great majority of their time within their homes. Hence, because the long-term, chronic effects of the hydrocarbon compounds at levels below their respective TLV are unknown, and because of the amount of time spent at home by some of the local residents, it is believed that if the landfill gases increase to equilibrium levels in the atmospheres of the adjacent homes, a significant and

TABLE 7

SUMMARY OF HYDROCARBONS IDENTIFIED AND SOME ASSOCIATED CRITICAL TOXICITY CHARACTERISTICS
INDUSTRIAL EXCESS LANDFILL, UNIONTOWN, OHIO

Substance	Sample Concentration (mg/m^3)	Threshold Limit Value[a]	IDLH[b]	Comments
Benzene	<0.1	1 ppm (skin) (5 ppm ccil.)	2000 ppm	o Recognized leukemogen, with symptoms toms including anemia, leucopenia, macrocytosis, reticulocytosis, thromocytopenia, high color index and prolonged bleeding. Known mutagen. Suspected teratogen. o Absorbed through skin. o Exposure symptoms include erythema, edema, narcosis, menorrhagia, petechiae, purpura, coma and death through respiratory or cardiac failure. o Dangerous fire hazard when explosed to heat or flame. Very flammable.
Cyclohexane	0.5-8.0	300 ppm	3500 ppm	o Tissue irr via inhal and oral routes, irr to skin. o Fire hazard when exposed to heat or flame, can react with oxidizers. o Narcotic, may cause death through respiratory paralysis.
1,4-Dimethylbenzene	20.0			
2,3 Dimethylbutane	0.1-2.0			o Irr and narcotic in high concentrations. o Fire hazard when exposed to heat or flam, can react with oxidizers. o Explosive.

TABLE 7 (Continued)

Substance	Sample Concentration (mg/m^3)	Threshold Limit Value[a]	IDLH[b]	Comments
1,3 Dimethylcyclohexane	20.0			o Irr and narcotic in high concentration. o Fire hazard.
2,2-Dimethylheptane	7.0			o Irr and narcotic in high concentration. o Fire hazard.
2,4-Dimethylheptane	3.0			o Irr and narcotic in high concentration. o Fire hazard.
2,5-Dimethylheptane	33.0			o Irr and narcotic in high concentration. o Fire hazard.
3,3-Dimethylhexane	9.0			o Irr and narcotic in high concentration. o Fire hazard.
3,4-Dimethylhexane	33.0			o Irr and narcotic in high concentration. o Fire hazard.
2,3-Dimethylpentane	0.2-20.0			o Irr and narcotic in high concentration. o Fire hazard.
2,4-Dimethylpentane	7.0			o Irr and narcotic in high concentration. o Fire hazard.
4-Ethenylcyclohexane	11.0			
1-Ethyl-3-Methylenecyclopentane	19.0			
3-Ethylpentane	7.0			
1-Ethyl-2-Propylcyclohexane	19.0			

TABLE 7 (Continued)

Substance	Sample Concentration (mg/m^3)	Threshold Limit Value[a]	IDLH[b]	Comments
Heptane	0.1-58.0	400 ppm	4250 ppm	o Irr to respiratory tract, narcotic in high concentration. o Toxic data: Inhal-marked vertigo, *incoordination and hilarity.* o Fire hazard.
1,5-Hexadiyne	47.0			
Hexane	7.3-39.0	50 ppm	5000 ppm	o May cause motor neuropathy. o Marked vertigo, drowsiness, fatigue, loss of appetite, paresthesia in distal extremities, muscle weakness, blurred vision, headache, anorexia and onset of polyneuropathy. o Dermal exposure--no anestheia, *blister formation, itching, erythema,* pigmentation and pain. o Fire and explosion hazard when exposed to heat or flame. o Reacts with oxidizers.
Methylcyclohexane	0.2-58.0	400 ppm	3500 ppm	o Has no warning signs. o Caused death in rbbits. o 3 times as toxic as hexane--cause death by tetanic spasm. o Causes narcosis and anesthesia. o Dangerous when exposed to heat, flame and oxidizers.

TABLE 7 (Continued)

Substance	Sample Concentration (mg/m^3)	Threshold Limit Value[a]	IDLH[b]	Comments
Methylcyclopentane	0.6-11.0			o Irr and narcotic in high concentration. o Dangerous when exposed to heat flame or oxidizers.
1-Methylethyl benzene	0.5			
5-Methyl-1-Heptene	9.0			
2-Methylhexane	0.2-39.0			o Irr via inhal and oral routes. o Fire hazard--keep from sparks and flame.
3-Methylhexane	0.4-51.0			o Same as 2-Methylhexane.
4-Methyl-1-Hexene	4.0			
2-Methyl pentane	1.1			o May have narcotic or anesthetic properties. o Dangerous when exposed to heat, flame or oxidizers.
3-Methyl pentane	1.4-12			o Same as 2-Methylpentane.
Nonane	12	200 ppm		o Irr to respiratory tract. Narcotic in high concentration. o Fire hazard when exposed to heat or flame. o May react with oxidizers. o Explosion; in form of gas when exposed to flame.

TABLE 7 (Continued)

Substance	Sample Concentration (mg/m^3)	Threshold Limit Value[a]	IDLH[b]	Comments
2,2,3,3 Tetramethylbutane	2.0			
2,3,5-Trimethylhexane	1.0			
3,5,5-Trimethyl-1-Hexene	19.0			

[a] Threshold limit values are reported as time-weighted averages (TWA) with the exception of benzene, which is reported as the ceiling limit.
"Skin" notation refers to the potential contribution to the overall exposure by the cutaneous route including mucous membranes and eye, either by air borne, or more particularly, by direct contact with the substance. Vehicles can alter skin adsorption.

[b] IDLH = Immediately Dangerous to Life and Health.

References include: 1. "TLVs, Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment and Biological Exposure Indices with Intended Changes for 1984-85," Copyright 1984 by American Conference of Governmental Industrial Hygienists, ISBN: 0-936712-54-6. 2. "NIOSH/OSHA Pocket Guide to Chemical Hazards," Eds. F.W. Mackison, R.S. Stricoll and L.J. Partridge, Jr., NIOSH Publication No. 78210, GP Stock No. 017-033-00342-4. 1981 Printing. 3. "Dangerous Properties of Industrial Materials - Fifth Edition," N.J. Sax. Van Nostrand Reinhold Co., 1979.

substantial threat would be posed to human health through the direct contact route of exposure.

4.0 RECOMMENDED ACTION

The proposed Emergency Action measures prescribed in this plan are designed to remove or lessen the threat to human health and the environment from gases being generated and released by the Industrial Excess Landfill. Alternative technologies for controlling gas migration will be summarized followed by a detailed description of the system best suited to eliminate threats posed by the landfill. Figure 10 lists the specific elements of the proposed Emergency Action with their corresponding period of performance. It is estimated that this action will require 14 weeks to complete at a cost of approximately $560,000.

4.1 Alternative Gas Control Technologies

Several different technologies exist for controlling landfill gas migration. Such collection systems include:

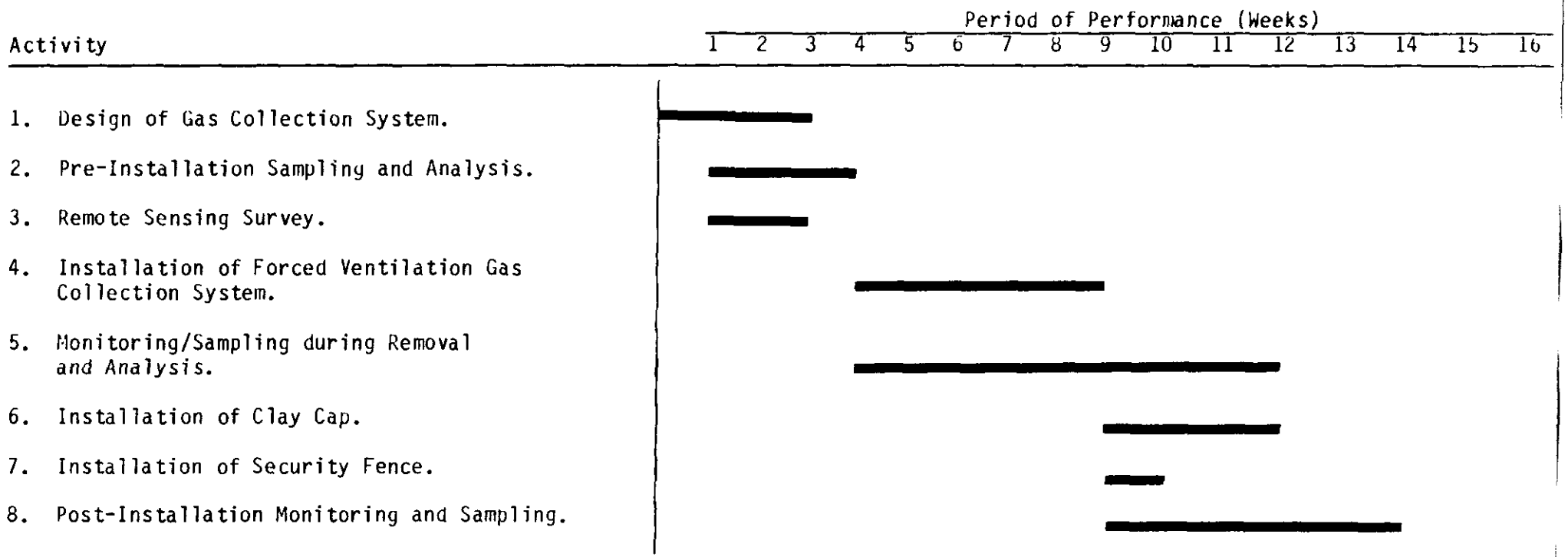
- o Trench vents;
- o Gas barriers; and,
- o Pipe venting systems.

A combination of these systems, when used along with other gas control techniques, such as surface capping and water control, have been used effectively to control landfill gas migration (U.S. EPA 1983). The type of system used depends on many variables including: soil composition, topography, climate, depth of landfill, and the types and concentrations of gases present. Field measurements to determine gas concentrations, positive or negative pressures, and soil permeability are also valuable for designing and installing a gas ventilation system. A brief description of several types of collection system follows.

Trench vents are rock- or gravel-filled ditches where gases flow into a central collection point or are released directly into the atmosphere. Trench vents would not be effective at the Industrial Excess Landfill because the depth of the landfill is 50-60 feet below the surface. Typical trench depths of 20 feet would not prevent migrating gas from flowing under the trenches. Also, because the liner materials often used in trench designs are not compatible with some of the organic gases identified in the gas analyses, the effectiveness of this technique is severely limited.

FIGURE 10

PROJECTED SCHEDULE FOR THE REMOVAL ACTION IN
UNIONTOWN, OHIO



Gas barriers of compacted clay, concrete, or nonpermeable liners are usually used in conjunction with collection systems to channel gas flow toward collection points. Use of flexible synthetic liners as gas barriers would not be effective at the Industrial Excess Landfill due to the incompatibility problem discussed above. Further, the use of other types of gas barriers, such as slurry walls and compacted clay, are not recommended due to their unproven effectiveness.

Pipe vents are perforated pipes installed vertically or horizontally to collect gases or vapors. Venting systems for landfill gas control are of two types: atmospheric or forced air ventilation. The use of atmopsheric pipe venting requires placement in areas of high gas concentrations, usually directly on the landfill, and are not considered to be effective in controlling lateral migration of gases.

The major elements of a forced-ventilation system include collection wells, a manifold (optional) and a system to provide suction to the wells. Because the forced ventilation system has been shown to be an effective means of controlling both vertical and lateral gas migration from landfills, it is recommended that this type of system be installed at the Industrial Excess Landfill. Section 4.3 discusses, in detail, the components of the gas collection and treatment system proposed for use at the Uniontown site. The following section (4.2) outlines the need for a limited remote sensing survey that would define the limits of the fill area.

4.2 Remote Sensing Survey

As noted in Section 1.0 of the report, it is believed that several hundred drums of solid waste material were buried intact within the Industrial Excess Landfill. The location of these drums and other industrial and/or commercial waste is an extremely important consideration in collection well placement. Because of the lack of both landfill operation records, and sequential photographs or topographic maps, the exact boundary of the fill and origin soils is unknown.

To establish the boundary and to ensure that collection wells would not be drilled into a pocket of drummed waste, it is recommended that a limited, remote-sensing survey be conducted on the western side of the landfill. Using such instruments as ground-penetrating radar and magnetometers, a trained geologist could define areas of disturbed versus undisturbed strata. This would, in turn, assist in the selection of areas where there is a high probability that drums are not present. Ground-penetrating radar may be the most suitable instrument for use at the Industrial Excess Landfill because

of the locally sandy soils (sandy soils are more likely to increase the maximum profile depth) and because it is particularly useful in delineating refilled depressions.

4.3 Gas Collection and Treatment System

As noted previously, landfill gases are collected from the ground by collection wells. Figure 11 illustrates the construction of a well that is specifically designed to be used as part of a forced ventilation system. The four inch diameter wells extend to just above the water table and are screened to within ten feet of final grade. Clogging of the well can be prevented with gravel packing around the well and bentonite cement grout in the annulus near the top of the well.

Figure 12 displays the recommended well placement at the Industrial Excess Landfill. Assuming a radius of influence of 100 feet and a well placement 150 feet apart, the system should create an effective barrier to migrating gases. In addition to well placement, a second initial factor affecting collection efficiencies is the rate at which air is drawn through the system. The flow rate must be high enough to collect the majority of gases that are generated by the landfill and to maximize the radius of influence thereby minimizing the number of wells required. (Existing collection systems typically use a pumping rate of 50 cubic feet per minute [cfm] and can achieve a drawn-down with a radius of influence of 100-250 feet.) It is, however, equally important that the flow rate is not so high that excess air is drawn into the system with the landfill gases. This could inhibit the generation of methane by causing the landfill waste decomposition process to become aerobic, and possibly result in spontaneous combustion due to the introduction of oxygen. Another factor taken into account when designing this system was the cyclical pattern of gas generation in the landfill. Because methane generation is influenced by temperature and moisture patterns, the total volume of generated gas varied considerably from season to season. After evaluating this and other variables, it was determined that the system be designed for a maximum flow rate of 100 cfm. The incorporation of a variable speed blower and throttle valves on each well will allow an operator to adjust the flow rate according to the amount of gas being generated by the landfill.

The manifold is the second element of the forced ventilation system to be installed at the Industrial Excess Landfill. The manifold is a horizontal pipe connecting all or a portion

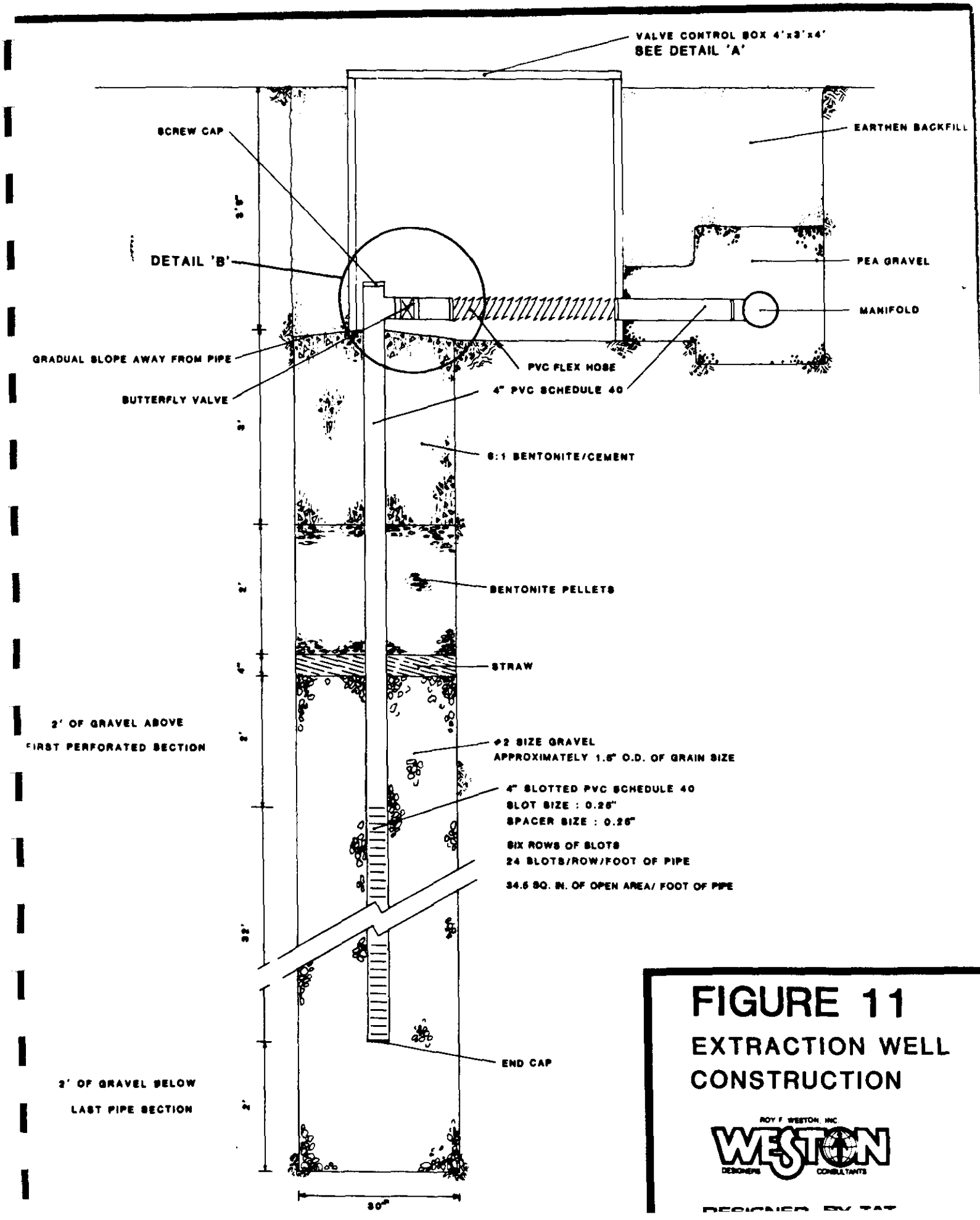
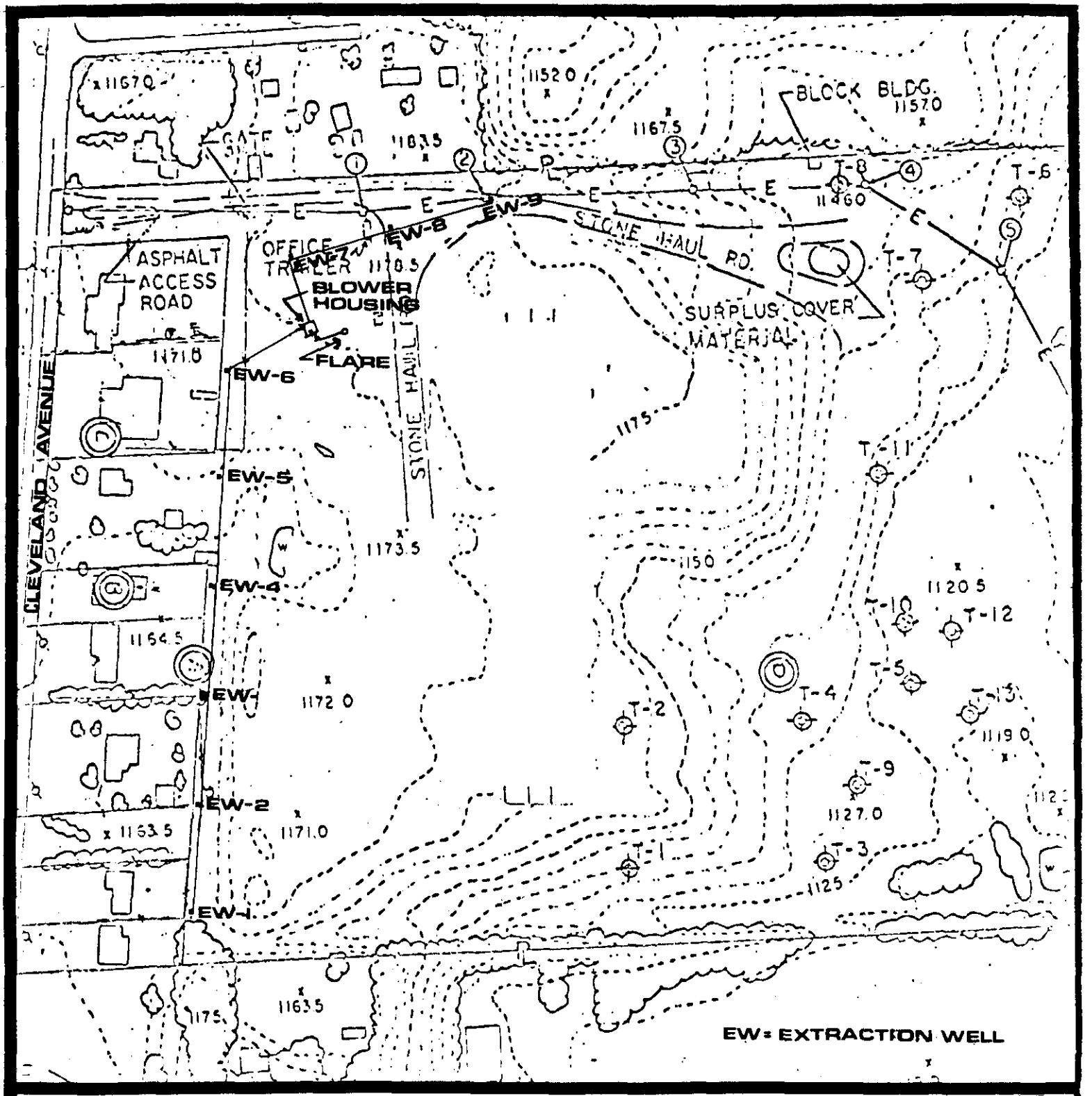


FIGURE 11

EXTRACTION WELL CONSTRUCTION

ROY F. WESTON, INC.
WESTON
DESIGNERS CONSULTANTS



NO SCALE

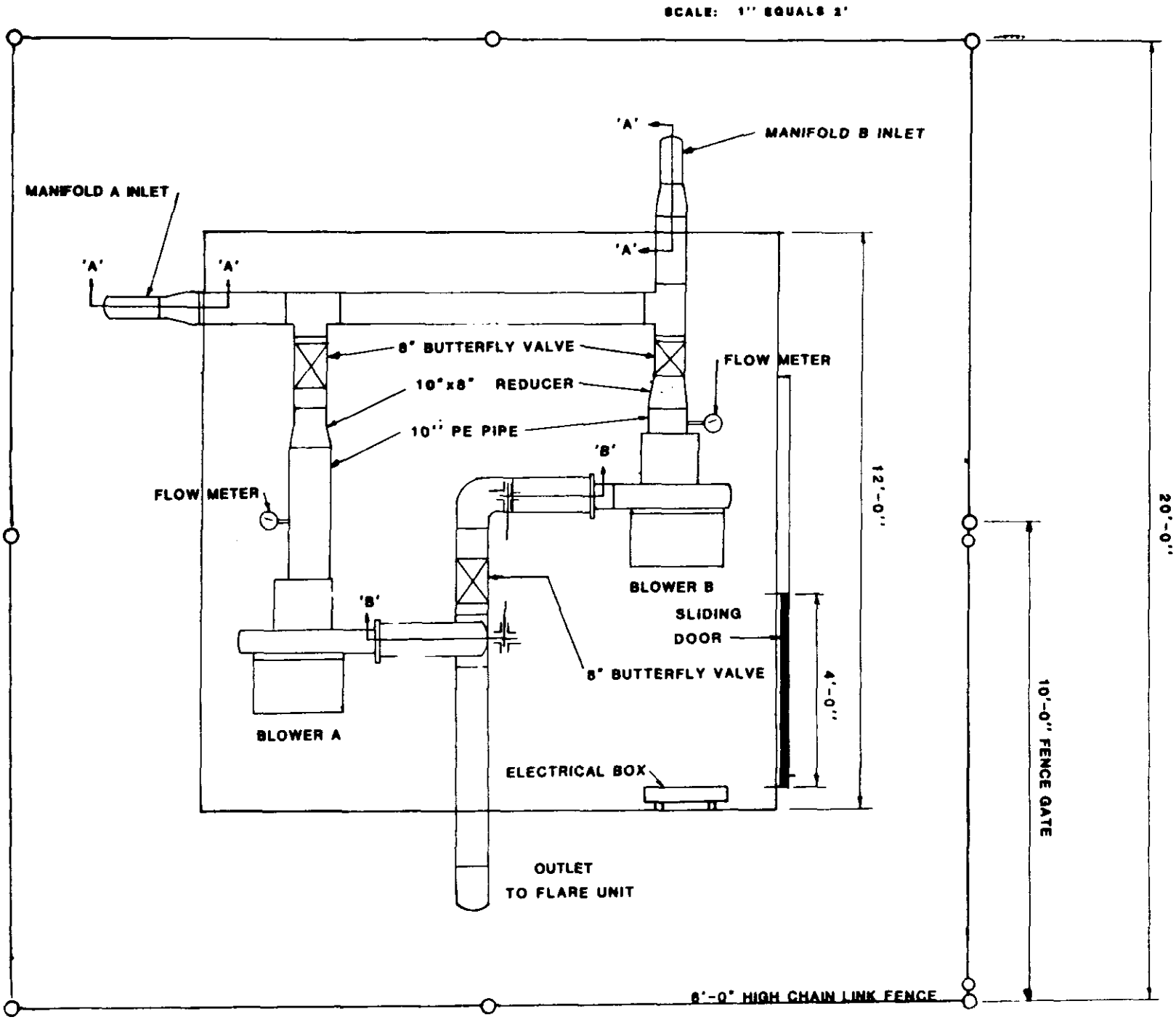
FIGURE 12

INDUSTRIAL EXCESS LANDFILL SITE MAP
PROPOSED METHANE RECOVERY SYSTEM
UNIONTOWN, OHIO

N

WESTON
DESIGNERS CONSULTANTS

FIGURE 13 BLOWER HOUSE AND PIPING LAYOUT



of the collection wells to a central suction unit (Figure 12). The manifold may be placed either above or below ground. The determination of placement is based upon several factors such as climatic conditions, potential for site settling, site topography and proximate land uses. For purposes of the Emergency Action Plan, it is assumed that underground placement would be a more cost-effective method because an above-ground manifold would have to be fenced to protect it against vandalism. (Discussion with several gas collection system operators has revealed that vandalism is frequent at unprotected facilities.)

The manifold network leads to a central blower system. Gas in the manifold, pumped from the collection wells, will flow through an exhaust header into a large centrifugal fan. As seen in Figure 13, the manifold system is connected to two blower units. This design aspect is recommended so that the ventilation system can be powered by one blower, thus keeping the second blower on standby for emergency use. The blowers should be enclosed in a protective structure to minimize malfunctions caused by moisture, reduce the noise levels, and to maximize the system operators's ability to maintain and/or repair the units.

Gas being discharged from the blower can either be vented directly into the atmosphere, treated, recovered as fuel, or flared. Direct ventilation of the gas at the Industrial Excess Landfill was not considered because of the volume of gas and the proximity to residential areas. The use of a carbon adsorption system is not justified based upon the analytical results of the gas. The questionable gas-producing life-span of the landfill makes recovery and resale of the gas unattractive. Therefore, thermal oxidation is recommended for the gas collected at the Industrial Excess Landfill.

Because the amount of gas generated by the landfill may not require continuous flaring, a timer or sensor can be installed to determine when enough gas has been collected. Smokeless flares can be designed that convert unburned heavy hydrocarbons to hydrogen and carbon dioxide. After-burners can also be used to decompose gases before releasing them into the environment. This is done in specially designed incinerators maintained at temperatures up to 1600°F. A well-designed afterburner can achieve 98% destruction of pollutants. At high flow rates, afterburners are a cost-effective form of gas treatment.

4.4 Installation of a Clay Cap (Optional)

A clay cap measuring 500' x 1100' will be installed on the

western section of the landfill including the area surrounding the collection wells. The clay will be deposited in an eight inch layer and compacted to six inches by first using a sheepsfoot roller and then a rubber tire roller. The clay will be purchased from a local supplier. In order to stabilize the clay cap, it will be covered by four inches of top soil which, in turn, will be seeded to prevent erosion and to retain moisture.

The clay cap will be multifunctional. It will prevent water from draining into the venting wells, reduce the introduction of air into the landfill, and reduce infiltration of water into the landfill. Minimizing water drainage into the venting wells is critical as excess water introduced into the ventilation system decreases gas collection efficiency and increases maintenance costs. By reducing the amount of air introduced into the landfill, the volume of raw landfill gas collected is maximized while avoiding disturbance of the anaerobic conditions. Also, air drawn into the collection system contributes to corrosion of the system. It can also increase the explosion potential of the collected gas mixture. The third purpose of the clay cap will be to reduce the amount of water introducted into the landfill. Since the anaerobic processes within the landfill require water to generate methane gas, the clay cap will indirectly reduce the amount of methane being produced.

4.5 Sampling and Air Monitoring Activities

For purposes of determining the effectiveness of the forced ventilation system, sampling should be conducted both before and after its installation. A grid system will be established to determine sample locations and thus assure accurate comparison of pre- and post-action samples. Volatile organic and gas composition analyses will be performed using the Region V portable gas chromatography unit. The utilization of the Photo Vac Unit would be cost effective and would enable rapid sample identification. In addition to pre- and post-action sampling, ambient atmosphere monitoring should be conducted to ensure on-site personnel safety during the installation of the ventilation system.

4.5.2 Pre-Installation Sampling

Both soil and landfill gas samples will be analyzed prior to installation of the ventilation system or the site cap. Soils will be analyzed to characterize and document the materials being capped. Landfill gases will be collected and analyzed to provide data for developing ventilation system operating parameters. Perimeter and on-site soil borings of approximately ten feet in depth are to be analyzed by GC/MS for volatile organic compounds. Air grab samples will be collected from the borings to determine the relative concentrations of hydrocarbons in the landfill gas. Analysis of

these grab samples will be performed with a portabel gas chromatography unit by TAT personnel. In addition, all borings are to be surveyed for explosivity, and percent methane utilizing the Combustible Gas Indicator, Organic Vapor Analyzer, and Methane Monitor, respectively. The TAT will also conduct these measurements.

4.5.2 Sampling During Installation

Sampling during installation activities should be instituted to ensure a safe environment for on-site personnel. Sample activities implemented during installation should consist of surveying explosivity, O_2 levels, organic vapors, and methane levels. The explosivity of the ambient atmosphere will constantly be monitored to detect the likelihood of an explosive mixture. Furthermore, O_2 levels and organic vapors should be monitored to assure that proper respiratory protection is utilized.

4.5.3 Post-Installation Sampling

Post-installation sampling should be conducted to determine the efficiency of the venting system. This activity will consist of sampling air from the established perimeter borings, raw landfill gas, flue gas and condensate. The bore hole air samples should be analyzed for relative concentrations of hydrocarbons. The raw landfill gas is to be sampled at the well head and blower inlets and analyzed for volatile organic compounds and percent methane. The flue gas should be collected above the flare and should also be analyzed for volatile organic compounds. All of the above-mentioned post-removal samples should be analyzed utilizing a portable gas chromatography unit. Condensate will be analyzed through GC/MS screenings to identify and quantify all constituents.

Initial monitoring of the system after start-up will be required daily for two to three weeks for balancing and flow adjustments. Regular monitoring will be needed at least twice a month to maintain proper flow rates based on the amount of landfill gas being generated. An operating manual containing instructions for system operation and maintenance as well as a sampling schedule will be provided by the TAT and U.S. EPA and reviewed with the system operator.

4.6 Installation of a Security Fence

The installation of a six foot chain link security fence augmented with three strands of barbed wire around the blower/compressor and flaring equipment will be one of the last actions to take place. Warning placards will be placed on the fence to further inform the area residents of the potential dangers of coming into contact with the blower system or

flare unit. The main purpose of the fence will be that of safety. The fence will keep unauthorized people away from potentially dangerous equipment. Its second purpose will be to prevent vandalism. There have been reports of vandals damaging expensive machinery of gas recovery systems at different locations around the country. A fence will help to prevent any such incidents.

5.0 IMMEDIATE REMOVAL

5.1 *Develop Site Safety and Contingency Plan*

Personnel	Days	Amount
1 Response Manager @ $52.50/hr	1	$ 420.00
1 Foreman, Level 3 @ $33.60/hr	1	270.00
2 Per Diems @ $60/day	1	$ 120.00
	Subtotal Section 5.1	$ 810.00

5.2 Restrict Property Access

Personnel	Days	Amount
1 Response Manager @ $52.50/hr	1/2	$ 210.00
1 Foreman, Level 2 @ $30.50/hr	1/2	122.00
2 Cleanup Technicians, Level 1, @ $21.00/hr	1/2	170.00
1 Security guard, Level 1 12 hrs/day and weekends	7 weeks	8,540.00
4 Per diems @ $60/day	1/2	120.00
Materials		**Amount**
10 Warning signs @ $20/ea		$ 200.00
	Section 5.2 Subtotal	$9,362.00

5.3 *Development and Design of Collection System*

Consultants (obtained by competitive bid)		$25,000.00
	Section 5.3 Subtotal	$25,000.00

5.4 Sampling and Air Monitoring Activities

5.4.1 Pre-Installation Sampling

Personnel	Days	Amount
1 Response Manager @ $52.50/hr	1/2	$ 210.00
1 Foreman, Level 2 @ $32.50/hr	1/2	122.00
2 Cleanup Technicians, Level 2, @ $23.10/hr	1/2	184.80
4 Per Diems @ $60/day	2	120.00
Equipment	**Days**	**Amount**
Sampling tools @ $11/day	1	$ 11.00
3 Level C protection @ $58/day	1	174.00
Materials		
Sample jars, decon equipment and other expendables		50.00
Analysis		
20 Soil samples for complete priority pollutants @ $566/ sample (Organic and inorganic by National Contract Labs)		11,320.00
	Section 5.4 Subtotal	$17,216.80

Samples utilizing a portable gas chromatography unit will be conducted by the TAT. Costs included under the TAT costs (Section 5.8).

5.4.2 Sampling during Installation

Air monitoring to be conducted by the TAT. Costs included under the TAT costs (Section 5.8).

5.4.3 Post-Installation Sampling

Air monitoring and samples utilizing a portable gas chromatography unit will be conducted by the TAT. Costs included under the TAT costs (Section 5.8).

Materials

Sample jars, decon equipment and other expendables		$ 25.00

Analysis

5 Condensate samples for full GC/MS screen @ $1000/sample		5,000.00

5.5 Remote Sensing Survey

Personnel	Days	Amount
1 Geologist @ $300/day	6	$1,800.00
1 Cleanup Technician Level 2 @ $23.10/hr	2	369.60
8 Per diems @ $60/day		48.00

Equipment

Ground-penetrating radar @ $300/day	2	$ 600.00
Proton magnetometer @ $40/day	2	80.00
Shipping and standby time		150.00
	Section 5.5 Subtotal	$3,479.60

5.6 Installation of Forced Ventilation Gas Collection System

Recovery Points	Amount
9 Gas wells, installed @ $45/ft, 60 ft ea	$24,300.00
6 Monitor wells, installed @ $45/ft, 60 ft ea	16,200.00

Ventilation System* (all costs include installation)	Amount
6" PVC pipe @ $36/ft (1350 ft)	$48,600.00
12 Elbows @ $84/ea	1,008.00
12 Tees @ $134/ea	3,216.00
9 6" Butterfly valves @ $468/ea	4,212.00
4 8" Butterfly valves @ $640/ea	2,560.00
3 Moisture traps @ $830/ea	2,490.00
4 Flow meters @ $2,140/ea	8,560.00
2 Blowers (10 hp, 500-1500 cfm) installed	15,000.00
Flare with shielded flame	15,000.00
Security fence (200 ft) @ $10/ft, installed, 6 ft mesh fence with 3 strands barbed wire	2,000.00
System Monitoring	**Amount**
Periodic system optimization by contractor Twice/month for 6 months	1,215.00
Power (based on 25,000 kwh/yr x .05 kwh) for 6 months	625.00
Operating costs (parts, equipment, maintenance, flare pilot, etc.) based on 1 year	10,000.00
Subtotal	$154,986.00
Overhead allowance 25%	38,746.50
Section 5.6 Subtotal	$193,732.50

5.7 Installation of Clay Cap

Personnel	Days	Amount
1 Response Manager @ $52.50/hr	10	$4,200.00
1 Foreman, Level 3 @ $33.60/hr	10	2,688.00

*Costs are based on "Handbook for Evaluating Remedial Action Technology Plans"; actual quantities and costs of items will be determined by design.

Personnel (Continued)	Days	Amount
4 Equipment operators, Level 1, @ $22.10/hr	10	7,072.00
2 Cleanup technicians, Level 2, @ $23.10/hr	10	3,696.00
8 Per diems @ $60/day	10	4,800.00
Equipment	**Days**	**Amount**
2 Front-end loaders @ $368/day	10	$7,360.00
1 Compactor @ $400/day	10	4,000.00
1 Dozer @ $385/day	10	3,850.00
Materials		**Amount**
Clay cap (13,600 cu yd estimated) @ $9/yd delivered		122,400.00
Top soil 9100 cu yd, $10 delivered		91,000.00
Seed		500.00
	Section 5.6 Subtotal	$251,566.00

5.8 Operations Support

Item	Months	Amount
1 Office trailer @ $945/mo	2	$1,890.00
1 Equipment trailer @ $450/mo	2	900.00
1 Passenger sedan @ $695/mo	2	1,390.00
1 Personnel van @ $800/mo	2	1,600.00
1 Maintenance vehicle @ $1100/mo	2	2,200.00
Mobilization/Demobilization	2	1,150.00
2 Portable toilets @ $85/mo ea	2	340.00
Phone and electrical utilities		800.00
TAT and EPA		30,000.00
	Section 5.8 Subtotal	$40,270.00

6.0 SUMMARY OF ESTIMATED COSTS FOR RECOMMENDED ACTIONS

Section	Action	Amount
5.1	Develop Site Safety & Conting. Plan	$ 810.00
5.2	Restrict Property Access	9,362.00
5.3	Develop. and Design of Collec. Syst.	25,000.00
5.4	Sampling and Air Monitoring Activities	17,216.80
5.5	Remote Sensing Survey	3,479.60
5.6	Installation of Gas Collec. Sys.	193,732.50
5.7	Site Capping and Cover	251,666.00
5.8	Operations Support	40,270.00
	Total	$541,536.90
		or say
		$545,000.00

ATTACHMENT A

LIST OF POSSIBLE GENERATORS
AND HAULERS OF HAZARDOUS WASTE
INDUSTRIAL EXCESS LANDFILL, UNIONTOWN, OHIO

POSSIBLE GENERATORS

1. Firestone Tire and Rubber Co.
   1200 Firestone Parkway
   Akron, Ohio 44317

2. General Tire and Rubber Co.
   One General Street
   Akron, Ohio 44329

3. B.F. Goodrich Co.
   500 S. Main St.
   Akron, Ohio 44316

5. Goodyear Aerospace Corp.
   1210 Massillon Rd.
   Akron, Ohio 44315

6. Morgan Adhesives Co.
   4560 Darrow Rd.
   Stow, Ohio 44224

7. Killian Latex Co.
   2064 Killian Rd.
   Akron, Ohio 44312

8. Hoover Co.
   101 E. Maple St.
   North Canton, Ohio 44720

9. Timken Co.
   1835 Dueber Ave. S.W.
   Canton, Ohio 44706

10. Teledyne-Monarch Co.
    10 Lincoln Park
    Hartville, Ohio 44632

11. Monsanto Corp.
    2689 Wingate Ave.
    Akron, Ohio 44314

12. Akron City Hospital
    525 E. Market St.
    Akron, Ohio 44304

13. Akron General Hospital
    400 Wabash Ave.
    Akron, Ohio 44307

14. Timken-Mercy Hospital
    1320 Timken-Mercy Dr.,NW
    Canton, Ohio 44701

POSSIBLE HAULERS

1. Akron Central Transfer (Hybrid Corp.)
   556 Becon St.
   Akron, Ohio 44311

2. Brotsky Barrel
   950 Rhodes Ave.
   Akron, Ohio 44307

3. Young's Septic Tank Cleaning
   P.O. Box 128
   Uniontown, Ohio 44685

4. Dynamic Drain
   - out of business, no known address

5. Texecot
   - firm from Georgia, no known address

6. Kittinger Trucking
   2224 Myersville Rd.
   Akron, Ohio 44312

7. Akwell

8. SCA

ATTACHMENT B

STATEMENT UNDER OATH OF KENNY CATLETTE
TAKEN ON MAY 31, 1984

STATEMENT UNDER OATH OF

KENNY CATLETTE

May 31, 1984

7:20PM

Location: Lake Township Government Offices

Present: David Herbert, Chris Borello, Mr. Kenny Catlette

Mr. Catlette was put under oath as required by law, by David L. Herbert, Esquire, Notary Public. Mr. Herbert did the questioning.

Q. Where do you live Mr. Catlette?

A. In Akron, [redacted].

Q. What is your phone number?

A. [redacted]

Q. How long have you lived there?

A. 18 years.

Q. Where are you employed?

A. Independent Lift Truck.

Q. What do you do for them?

A. Mechanic.

Q. How long have you been employed by them?

A. I just started there a month ago.

Q. Prior to that where were you employed?

A. Tow Lift, Inc.

Q. What did you do for them?

A. Service Manager.

Q. How long were you there?

A. 5½ years.

Q. Prior to that where were you employed?

EXHIBIT "H"

A. Ohio Lift Truck.

Q. How long were you there?

A. 5 years.

Q. Prior to that where were you employed?

A. Industrial Excess Landfill.

Q. Inc.?

A. Yeah.

Q. How long were you employed by them?

A. It was about 5½, 6 years.

Q. Alright, from previous comments you have told me that you were employed by them for approximately, from the period of 1971 through 1977.

A. That's approximately, yeah.

Q. What did you do for them? What were your duties?

A. Heavy Equipment Mechanic and Heavy Equipment Operator.

Q. Describe a typical day as to what you would do for them.

A. On the days that I was operating, uh, we'd open at 7, get the equipment ready to go, and, immediately we'd start taking in waste.

Q. O.K.

A. And we'd take waste till 5, 5:30, then we would close and then put on the final cover.

Q. Who did you report to? Who was your immediate supervisor?

A. Gene Laston.

Q. L-a-s-t-o-n?

A. Yes.

Q. Do you know where he is located now?

A. In New Jersey.

Q. OK. Who was his Supervisor?

A. Hyman Budoff.

Q. Was Hyman Budoff the owner-operator of the Industrial Excess Landfill at that time?

A. Yes, at that time.

Q. He was also at that time, was he not, an owner of Hybud Corporation?

A. Yes. Prior to that, it was a...I worked there for Charlie Kittinger too, in this period of time, uh Kittinger had it, it was Kittinger Trucking.

Q. What was Kittinger's relationship with this particular dump?

A. Charlie owned it at one time.

Q. Do you know what time he owned it? Approximately.

A. I would say 74? I'm just guessing at that.

Q. Are you saying that's when he sold it or that's when he bought it?

A. That's when Charlie sold it to Hybud.

Q. So prior to '74 he owned it and operated it?

A. Yes.

Q. Was there any change in the operation at all from what you were able to observe as a worker there between Kittinger's operation and Budoff's operation?

A. Well, we took about the same thing. We had a problem with tires,...

Q. At what point in time?

A. After Hybud took over, we quit taking tires.

Q. Why?

A. Uh, they kept cropping out, ;you couldn't bury them.

Q. You mean popping out of the fill?

A. Yes. No matter how deep you buried them, after you ran over that area with the heavy equipment, they would work theirselves right out again.

Q. Why don't you give us an idea, if you can, as to who, in terms of what companies, what entities, originated the waste that wound up in the Landfill, if you know? Who produced the waste that wound up there?

A. Uh, well there was a lot of the rubber shops.

Q. Which ones?

A. Uh, Goodyear, I know for sure, and Firestone.

Q. How about Goodrich?

A. Yes, I think Goodrich, I've seen their trucks in there, they hauled their own waste, Goodrich did.

Q. OK, who else?

A. Morgan Adhesive was one of them.

Q. Who else?

A. I can't think of anyone else, any of the big companies, right off.

Q. Alright. Any little companies that you can think of?

A. Yeah, I think, uh, what's the one in Hartville, uh....

Q. Teledyne?

A. Yeah, Monarch.

Q. Alright, Monarch Rubber?

A. Yeah, they hauled their own stuff in there though, I remember seeing their truck in there.

Q. Alright, who else?

A. There was that little rubber shop on Killian Road. Killian Rubber. But I don't know what that name was. Akwell? Yeah, Akwell hauled in there.

Q. How do you spell that?

A. A-c-k-w-e-l-l, I imagine

Q. Alright, who else?

A. There was a lot of independent haulers.

Q. Who would pick up from other sources?

A. Yes.

Q. What were those independent haulers that you recall?

A. I don't, I can't tell you, I just don't remember.

Q. Was Hybud Corporation one of them?

A. Oh yeah, they were the major hauler in there.

Q. Anybody else that you can recall?

A. Uh, what was the big trash hauler? I keep thinking M&M but I think it was a corporate name.

Q. SCA?

A. I think.

Q. SCA.

A. SCA, yeah.

Q. OK.

A. But they had some small subsidiaries before they mergered.

Q. Anybody else that you can think of?

A. Well Charlie hauled in there, Charlie Kittinger.

Q. Kittinger?

A. After Hybud took over, Charlie kept hauling in there.

Q. What was his company called?

A. Kittinger Trucking.

Q. And that was after Hybud or it was before Hybud?

A. Before and after, yes.

Q. Did you ever see any Dow Chemical Trucks in there?

A. I can't honestly say. I....

Q. Are you familiar with the symbol of Dow Chemical?

A. Yes.

Q. It's like a triangle.

A. Yes.

Q. Do you recall seeing,...I've seen a picture from some years ago that seems to depict a Dow Chemical logo.

A. Well, you know, we used to, I wasn't involved in it, but they used to wash out some tankers in there.

Q. Who used to wash out?

A. Uh, Charlie did.

Q. What kind of tankers?

A. They would haul into, I think into the Rubber shops, and then before they would leave whatever they had hauled in they had to have flushed out.

Q. With water or with some other chemical?

A. Yeah, I think with water.

Q. Was there water available at this site?

A. Yes.

Q. Alright. So they would wash them out?

A. Yes.

Q. Do you know or have any idea what was contained in those?

A. No, I have no idea.

Q. Were you ever told or did you have any suspicions as to what was contained in them?

A. No.

Q. Do you know the reason why they had to be washed out?

A. The only reason that I know is to have the tanker clean for whenever they went to the next.,...wherever they were going.

Q. OK, and this would have been some kind of a liquid that was delivered to rubber companies?

A. I, I'm assuming that, yes...because I don't really know, you know, because I wasn't involved in it.

Q. Do you recall any of the carriers who hauled it? You know, the name of the company?

A. No, I don't.

Q. The name of the individuals?

A. I don't know.

Q. Who would be more intimate, or more familiar with this washing out process of the tankers other than yourself?

A. Charlie Kittinger, he was ...

Q. Alright, besides Kittinger, any other employees whose names you recall?

A. There was, he had a lot of employees that just came and went and I didn't really get to know.

Q. OK.

A. Wedidn't really get settled down until Hybud took over and we had a crew that was pretty much the same all the time.

Q. You were paid in terms of your payroll and your paychecks by check, were you not?

A. Yes.

Q. OK. Were the other employees paid the same way?

A. I think so.

Q. So, supposedly, we should be able to find records.

A. Oh, sure.

Q. OK. It's my understanding that from time to time various government officials would come out to the site and do "on-site" inspections, whatever that means.

A. Yeah.

Q. Do you recall seeing those inspections?

A. I seen different people, the only one that I seen that I recognized was Doppler.

Q. How do you know him?

A. Well, at that time I just...Gene told me who he was.

Q. Gene?

A. Laston.

Q. Alright.

A. So, after the first time...He came like once a month or whatever for inspection.

Q. Who would he talk with while he was there?

A. Gene. Gene Laston.

Q. Did you ever hear any of their conversations?

A. No.

Q. Did Gene ever tell you anything about the conversations that he had with Doppler or what Mr. Doppler was doing there?

A. No, Gene never discussed that part of the business with me.

Q. How thorough were Mr. Doppler's inspections?

A. Uh, they didn't seem to be too thorough.

Q. Describe for me what he would do.

A. He would, uh, I don't know if he ever wrote anything up because I wasn't involved in that, you know...

Q. Alright. But you were able to see.

A. Yeah. Sometimes after he would leave we would have to cover a certain area, uh, an area that maybe the rain had washed the cover off of.

Q. OK.

A. And Gene would have us, in our spare time, cover a certain area that got uncovered from the weather.

Q. OK, anything else? That you observed, you know, from his inspections?

A. That was about the only thing that I ever knew of.

Q. Anyone else whose name or agency you would recall that came out to do inspections?

A. No.

Q. OK. Did you ever observe barrells being dumped at this location?

A. Oh, sure.

Q. OK. Where did the barrells come from? Who brought them in?

A. Charlie hauled a lot of them in. Charlie Kittinger.

Q. What period of time would we be talking about?

A. Well, this was prior to Hybud. Uh, Charlie still owned it then.

Q. Alright. How many barrells are we talking about, a day.

A. 100.

Q. One hundred barrells a day?

A. That's an estimate.

Q. For what period of time?

A. Probably two years.

Q. What Years? Prior to '74?

A. Prior to '74, yeah.

Q. Where, principally, if you can describe an area, would these barrells be put? Within the dump.

A. At the time, I remember, when we just pulled into the drive at the top of the hill, the area north, I guess...

Q. It would be to the right as you drive in?

A. As you pulled in...yeah to the right, looking right, just right over, there was a hill there, we had covered that out...

Q. Alright.

A. The bottom was still empty, in fact the lake was still in there. At that time.

Q. Alright, would you place these barrells near that lake?

A. Well, uh, we were at the top where the slope went down to the lake.

Q. OK, and that's where the barrells were placed?

A. Yes.

Q. So it would be the right hand side.

A. At the right hand side at the top of the fill.

Q. How many yards northeast, you're talking about the northeast direction from where the entrance is into the dump...How many yards, approximately, were the barrells placed...

A. From the gate?

Q. From the gate.

A. 200 yards.

Q. So, it would be 200 yards northeast?

A. Of the gate. Coming in the gate.

Q. Of the gate, so that's almost straight ahead, practically.

A. It would be just to the right. If you went straight ahead you would hit....

Q. If I'm driving in, you know where the Dutch Cupboard is, and the driveway is there...

A. Yeah.

Q. And if I'm going Northeast I would be going to my left, would I not?

A. Let me tell you how it is then you tell me the direction.

Q. OK.

A. Pulling in the drive, uh, you would go slightly to the right about 200 yards.

Q. Alright, slightly to the right about 200 yards. So you are saying that for this two year period, perhaps a hundred barrells a day, five days a week, or more? Six days a week, were placed in that general area?

A. It would have been more. Well, that area would only take so much, but that was...a majority of it was dumped there, but what they did, some of those barrells they dumped out and took back to the rubber shops.

Q. What kind of liquid would be dumped out of them?

A. It was a liquid.

Q. Describe it.

A. Uh, it was just uh, some of it was white, some of it was black, some of it was clear, uh.

Chris Borello - Was there an odor?

A. Oh yeah, it had a strong odor. You could smell the latex, of course.

Q. Sometimes or all the time?

A. When they were dumping.

Q. OK, but are you able to say that you smelled latex in all of the barrells?

A. No.

Q. OK. So you smelled different kinds of smells, then, from some of the barrells that were dumped.

A. Oh sure, some of it was so strong you couldn't inhale it. It was so strong it would burn your nose if you happened to be in that area and ran over it or something with the dozer; ran through it and stirred it up. It was a real...it was a toxic odor sometimes.

Q. Sharp odor?

A. Yes.

Q. Did you ever touch any of that substance? Get it on your clothing, anthing like that?

A. Nope, not me.

Q. Do you have any health problems? Today? Respiratory or otherwise?

A. No. I didn't really know what it was but I just knew I didn't want any part of it.

Q. OK.

A. We had an explosion out there one time.

Q. When was this?

A. I don't know if you knew about it or not, where the kid got killed?

Q. A kid got killed?

A. I think he did. I think he got.....he would get these guys from Manpower, because nobody wanted to do this job, it was so nasty, and he would hire these guys from Manpower. Charlie did.

Q. What year was this?

A. This was right towards the end before Charlie sold out. Maybe a year before.

Q. So near 1974?

A. Yeah. And these two guys were dumping these barrells and the guy had a can of a clear liquid and he brought it over to me and he says "What is this stuff?" and I said "I don't know man", you know, "I don't know what it is". He says it takes the, ...it takes the...they get that latex and stuff on their skin, you know, from that splashing, "it takes this off". I said "I don't know, maybe it's gas or something, I don't know." So they went down.

Q. Did it have a smell to it that you could observe?

A. No. I didn't get off my machine. I was on the dozer.

Q. OK. Go ahead.

A. And they, at the end of their shift, they went to the garage. We had a garage down in the bottom. The garage is since gone. And there was a shower in there. these guys was in there putting this stuff on their skin, and evidently the hot water tank, the fumes got into the hot water tank and blew the back wall out of the garage, and both of them got burned very bad, and I heard later that one of them had died.

Q. Do you know their names?

A. No. these guys were from, they were temporary help from Manpower.

Q. Would they have been covered by Workmen's Comp., would you know?

A. I have no idea. I...and I'm not sure. I know they were burned very bad.

Q. What hospital did they go to?

A. The Uniontown Fire Department would probably have a record because they were the one that transported them.

Q. Did they go North or South?

A. They probably went into Akron. But I'm guessing.

Q. And you have no idea of their names. Do you have any idea who might know them other than Kittinger?

A. Uh, well, there was a woman, Bongrant,...Bonifant? Yeah, Bonifant. You know her first name?

Chris Borello - That's the one I told you about.

Q. How do you spell it?

Chris Borello - Bruce's mother.

A. Bruce's mother, yeah.

Q. OK, we'll get that later.

A. She might have known because she kind of handled the books and that.

Q. For Kittinger?

A. Yeah. And she was there the day of that explosion cause we had a little office down there by the garage, a scale house, and she was in there.

Q. OK. Where did this substance, this clear liquid, come from?

A. It came in on one of the trucks.

Q. On one of the trucks?

A. Uhuh.

Q. And these guys, not knowing what it was, began to clean themselves with it?

A. Yeah, they were using it as a cleaning fluid.

Q. Did you have any idea which company brought that in?

A. I think it came in on Charlie's trucks.

Q. OK. Which company did it originate from?

A. Probably Goodyear, and I'm guessing.

Q. Why do you say that?

A. He hauled mostly for Goodyear.

Q. Were most of the barrells from Goodyear?

A. What Charlie hauled.

Q. And that's the majority of the barrells, is it not? What Kittinger hauled.

A. Yes.

Q. So most of what Kittinger hauled were from Kittinger's companies, and most of the barrells were from Kittinger's hauls.

A. Yeah, I would say the majority.

Q. So we're talking about over a two year period, perhaps... an awful lot of barrells.

A. An awful lot. Well, see the barrells...

Q. 60,000? Barrells?

A. Yeah, see, the barrells didn't stay there. Some of the barrells were dumped out and taken back and they would refill them and Charlie picked them up like every other day, bring them out and dump them out, the ones that would dump out. You know, if it was solid, if it got solid in the bottom or something, well then we just rolled it down the hill and put it right in the...we'd cover right over it. But if they could be dumped out, they they were dumped out. that's what we hired these guys for, to dump out the barrells.

Q. By hand?

A. Yeah, and then they would load them back up and Charlie would take them back to Goodyear.

Q. Did any of those guys that you know of develop any kind of health problems?

A. No, not to my knowledge.

Q. When you first started working there, did you notice any kind of deep mine shafts in the area. Deep pockets, depressions, anything like that?

A. Well, the whole thing was deep.

Q. OK, I know, but below that.

A. Just the lake.

Q. Alright, and the lake was over to the right hand side or straight ahead in the back, near the entrances.

A. When you came in, through the drive, it would be,...it would be to the right, but it was about 1/4 of a mile.

Q. That was that good side. It was a pretty good sized lake, right?

A. It was, at one time.

Q. Were any of these barrells...

A. Well, I said lake, it was a pond.

Q. OK.

A. Yeah.

Q. Were any of these barrells marked in any way that you could see? Such as with a poison label?

A. I don't remember, cause I..I didn't really get...I stayed away from it. I didn't know that it was hazardous at the time but I knew that I didn't want no part of it.

Q. OK.

A. So I stayed away from it as much as I could.

Q. At the end of the day, I take it from what you're saying, your practice would be normally to put the final cover, as you said.

A. Yes.

Q. Did you ever come back to work the next day and see things that were there on top of the final cover that weren't there the day before? Which would, of course, indicate that someone was dumping at night.

A. Well, I think...I think Hybud used to come in there occassionally at night, after the gates were closed. And that's just occassionally. I don't...I don't believe it was a steady practice.

Q. What kinds of things would you notice the next day?

A. Mostly trash.

Q. any chemicals of any kind? Not knowing what they were, but any chemicals or liquids of any kind?

A. No.

Q. Any barrells?

A. There might be some, but not a large quantity.

Q. How were people charged for coming and dumping?

A. They were charged by the size of the load.

Q. OK. Was there any particular charge, like per barrell?

A. That I don't know.

Q. Who kept those records?

A. Well, Mrs. Bonifant. Was her name Bonifant? Yeah, I think she kept the daily records then she turned them over to Hybud. You know, weekly or whatever.

Q. Have you ever observed tanker trucks coming in and dumping liquid out in quantity other than in barrells?

A. Not in quantity.

Q. Well, tell me what you observed.

A. Well, just them washing out, when they were in there washed out.

Q. OK. Did you ever see them come in there and just dump "liquid latex", I don't know if it is or not, but in the ponds?

A. I can't answer that.

Q. Let me re-phrase that. When you first come in, and you drive in and you would go straight back and a little bit to the right, towards that ditch in the back, before you start going down the hill, there were two lagoons, were there not? Or maybe at that time one lagoon.

A. There was one.

Q. Did you ever observe dumping in that lagoon? Liquid dumping?

A. That lagoon was contaminated.

Q. By what?

A. A runoff from whatever was on the hill.

Q. Describe the lagoon.

A. It was just murky, um, stagnate...

Q. See anything growing in it?

A. Cattails. That was about the only thing that would grow in it.

Q. OK.

A. Around it.

Q. Not in it?

A. No.

Q. What else did you observe about that lagoon?

A. Well, that was about it.

Q. Did you observe any of these tankers dumping directly into that lagoon?

A. No, I never observed that.

Q. OK. Are you aware, at some point, supposedly, the barrells and liquids were stopped?

A. Yes, I....

Q. Do you know when that was?

A. That might have been about the time that Hybud took over, and that's...I'm not sure about the dates because it didn't matter to me, you know, there was no reason for me to even remember it.

Q. Do you recall whether or not you saw any barrells or liquids after that supposed cut-off date?

A. I can't honestly answer, I don't know.

Q. Going back and trying to remember this thing, and I'm sure you've talked about this because you talked to Mrs. Borello prior to your coming tonight, have you had a chance to think about any of the unique characteristics of this liquid or the barrells, truck labels or labels on the barrells that may help us in identification of who or what was being dumped?

A. I just...I didn't...I had so much work to do and I was so busy at the time, and it was just normal, it was routine, and I, I didn't pay any attention to it, really, because, I just knew I didn't want to be involved with it and...

Q. OK. How often would you see Mr. Budoff? At the location during the time that he owned this dump, or he operated the dump?

A. I...He never had a regular schedule, uh, he would stop out maybe once or twice a week.

Q. How about Mr. Kittinger when he ran it?

A. Well, he was there all the time.

Q. Alright, so he obviously had an opportunity to see what was there?

A. Yeah, yeah Charlie was there. When he ran it, he was there almost all of the time.

Q. Did you ever have any incident where you were able to observe, other than the explosion, the effect of any of these chemicals in terms of contact with the skin, anything like that?

A. We had another fire.

Q. When was this?

A. Uh, I think that was after the explosion, uh, that would be the Uniontown Fire Department responded to it.

Q. OK. How did that happen?

A. At the time, Bob Deprado was on the Landfill. He was running the fill that day and Gene and I was in the garage.

Q. How do you spell his name? DePrado? Is that a capital P?

A. Yeah. Don't ask me how.....

Q. Go ahead.

A. He was related to Gene. He's Gene's nephew, and we heard this explosion. We were filling at that time over behind the houses the cut was pretty deep then, it was probably 70' deep.

Q. OK.

A. But we were in behind those houses, we had cut a...we had a cliff wall behind those houses right up to the property line. We had to excavate all the dirt out of there we could get.

Q. How was the bottom of that cliff line, by the way? Pretty muddy and wet?

A. Not in that area, because we didn't really get down too low up in there.

Q. What was the content of the soil?

A. Uh, sandy.

Q. OK. Gravelly?

A. Yeah.

Q. OK. Go ahead.

A. And, uh, we heard this explosion, we got over there as quick as we could and, uh, the fill was on fire, and later Bob told me that he had ran over some barrells and one of them had exploded, but that's what he said, I don't really know.

Q. OK. Any other incidents?

A. But it didn't take us too long to get the fire out. I think we had it out in a couple hours.

Q. Alright. Anything else?

A. There was another fire there but I wasn't working there at the time. I had left for a period of time; went someplace else. That was prior to this even.

Q. Were you aware of all of the adverse publicity; citizen reaction?

A. Oh yeah, I knew that the people around the area didn't like the landfill.

Q. Did you have any conversations with Mr. Kittinger or this Gene regarding that?

A. No.

Q. Now, I talk to people, I assume the guys that worked out there talked to people too, about what was going on, what they thought, that type of thing.

A. We didn't really talk, I didn't, Bob might of because Bob was close, he was family, but usually when my days work was done I left because I had something else I wanted to do, you know, so I didn't really hang around and talk shop because I had other things to do.

Q. OK. Were there ever any meetings with the employees to discuss, you know, what to say in public, what to say to members of the press or citizens or.....

A. Not with me.

Q. OK.

Off the record at 7:50pm.

Back on record at 7:53pm.

Q. We've asked a few questions off the tape and I want to get it on the record. Now, it's my understanding from what we just had to say, or what you just had to say, that on occasion when these barrells were dumped, they were dumped if the substance contained in them was liquid.

A. True

Q. Now, it's our understanding, and we've been told, that a lot of latex was dumped there and that supposedly solidifies or becomes hard after it is exposed to the air. Of the barrells that were dumped that you saw, in other words the contents poured out, how many of those in percentages turned hard or solidified?

A. I think out of 40 barrells, 10 barrells.

Q. You're talking about 25% of the barrells turned hard or solidified.

A. That's just an estimate.

Q. And that's based upon your observations over a two year period, perhaps 100 barrells a day.

A. Yeah.

Q. It's also our understanding that they received and you used as cover on occassion a substance called fly ash.

A. Yeah, we used a great deal of fly ash.

Q. What is fly ash?

A. It's a....it's what's left after they burn the coal. We were getting the fly ash out of Firestone. And they had a special grade of coal for the boilers to make their steam and this was a by-product, this was what was left, it was like soot. A little granular but there was nothing to it.

Q. After you spread that, how did that react? Or how did that stay?

A. Well, it stayed, about like dirt, wind would blow it and blow it away.

Q. It was that fine?

A. It was fine, yeah.

Q. Was it interspersed with bigger particles?

A. Uh, well, we mixed dirt with it.

Q. OK. Did it solidify or become like concrete?

A. No.

Q. For sure?

A. No. I never did see any of it turn into concrete.

Q. Well, not concrete, but concrete like in terms of hardness.

A. No.

Q. You're sure of that.

A. It always stayed powdery.

Q. Alright.

Q. Now, it's also our understanding that you had began installing trenches from where the ponds and lagoons were back to the ditch.

A. To the creek.

Q. Tell us about that. Who told you to do that and why? If you know.

A. Hybud probably told Gene Laston to do it. But to my knowledge they never made it to the creek.

Q. Did they start doing ditches from the Lake or the pond back to the creek?

A. They started, yes.

Q. Is that where most of the drain, the topography of the area seems to be that the drains surface, perhaps the underground water flows that way too. Is that what you were able to observe?

A. Yeah.

Q. Is that the way the liquids flowed when they were dumped there

A. Yeah, they were dumped up on top and ran to the pond.

Q. In terms of the barrells, the number of barrells that were left there, where their contents were not opened and dumped, but just the barrell was left, over the two year period that you observed, these hundred barrells a day, how many would have been left...approximately.

A. A two year period?

Q. Yes.

A. I have no idea to know for sure, probably 4 or 5 hundred.

Q. OK. You understand that when you're saying 4 or 5 hundred over the whole period?

A. That was left.

Q. That was left.

Q. OK. We're back on the tape again; I had to flip the tape. You understand that when you're talking about perhaps 100 barrells a day over a two year period, and you say 300 days a year, you're talking about 60,000 barrells.

A. That's a lot of barrells. I don't know, I ...

Q. I'm talking about barrells being either dumped or left.

A. It's possible.

Q. So you're talking about a very small percentage, is what you're saying, that were actually left in tact?

A. Yeah, I think there was. I don't really remember burying that many. Bob would probably know. Bob worked at fill more than I did cause I did mostly mechanical work. Bob would probably have a pretty good idea of what ...

Q. Do you know where he lives?

Chris Borello - He saw the barrells and everything?

A. Yeah, he was on the fill almost every day.

Q. Do you know where he lives?

A. No, I don't.

Q. Do we know where he lives?

Chris Borello - No.

A. He would have better...

Q. Is there anybody else besides Mr. Kittinger on Mr. DePrado, Mr. Budoff or Mr. Gene Laston whose name you can give us who worked either as an employee...

A. Well Bruce, you've got Bruce's name.

Chris Borello - You've got Russell, too.

Q. Wait a minute; Bruce who?

A. Bonifant? Is that his name, Bonifant?

Q. Alright, Bonifant. Mrs. Bonifant...

A. That was his Mom, yeah.

Q. Alright, and who was the other kid?

A. Russ Kidd.

Q. Russ Kidd?

A. Russ, he kind of just hung around at the landfill and scavaged aluminum and metals that he could resell. Batteries and that type of thing. I don't think he actually worked there; was on the payroll. But Russ might have washed out some tankers.

Q. Do you know where he lives?

A. I have no idea.

Q. Do we know?

Chris Borello - Well, I talked to his brother. He's gone all the time, he just checks in once in awhile.

Q. Have you had any recent conversations with Mr. Kittinger or Mr. Budoff or anybody connected with them? Anybody contacted you about this other than Chris? I don't know where this is going to lead ultimately. Are you willing to continue to cooperate with us about your information?

A. I'll tell you what I know...I've no reason to lie about it or anything.

Chris Borello - You said the barrells ended around '73 or '74?

A. When Budoff took over, it seems to me like that's when they ended. If you could talk to Bob, Bob could probably tell you a lot more than I can becuase he was on the fill every day.

Chris Borello - So the barrells were coming in when Bob was on the fill, at that time.

A. I think.....

Q. And certainly when Kittinger was there?

A. Yes.

Q. Do I have your permission to transcribe this statement as it's been taken today? In other words, to type it, and, if you want, you could come in and look at it, read it and then sign it.

A. Sure, everything I told you is the truth to the best of my knowledge.

Q. What I'm going to do then, I'm going to have the secretary type it and have her call you and ask you to come in at your convenience and sign it. What I'm going to do, with your permission now, is turn this tape recorder off. It's approximately 8:00pm. Do I have your permission to do so?

A. Sure.

Q. Thank you.

APPENDIX C

PHOTOGRAPHS OF INDUSTRIAL EXCESS LANDFILL,
UNIONTOWN, OHIO FROM 1968 TO PRESENT
(Courtesy of Lake Township Zoning Board)

UNSCANNABLE IMAGERY INSERT

SUPERFUND DOCUMENT MANAGEMENT SYSTEM (SDMS)

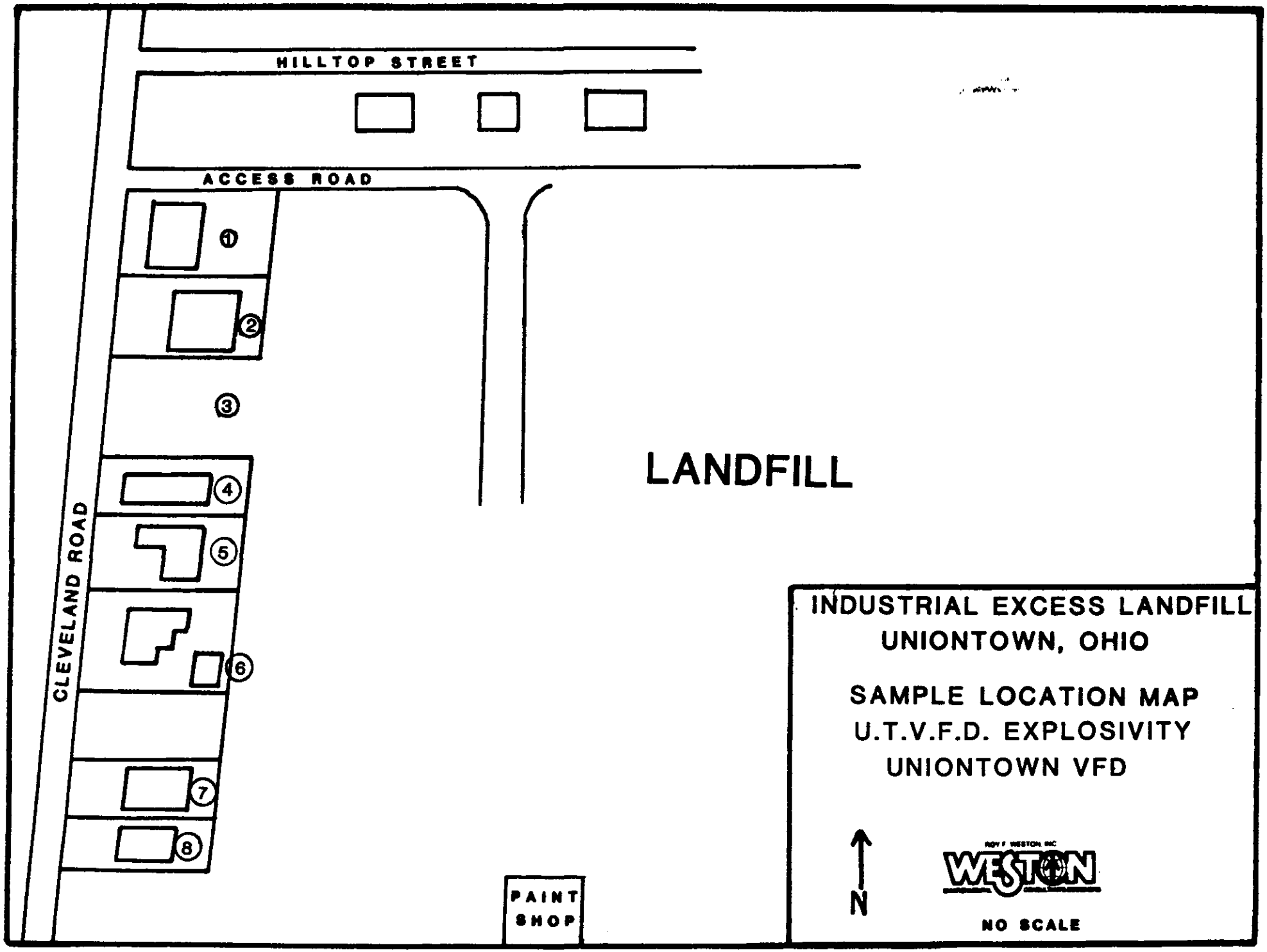
This document is an unscannable item in SDMS.
Please contact the EPA Region V Superfund Records Center to view this document.

SITE NAME	**INDUSTRIAL EXCESS LANDFILL INC**		
EPA ID NUMBER	**OHD 000377911**		
PHASE / ACTIVITY	**EMERGENCY RESPONSE REMOVAL ACTION**		
PRP AFFILIATION	**NONE**		
REASON WHY UNSCANNABLE	**__ILLEGIBLE**	**OR**	**_X_ FORMAT: PHOTOGRAPHS**
UNSCANNABLE DESCRIPTION / CONTENT	**16 LANDFILL OPERATION PHOTOS**		
DATE(S) OF UNSCANNABLE(S)	**4/4/69-2/7/72**		

ATTACHMENT D

Sampling Site Descriptions
For the East Ohio Gas Company's Survey (Chromatographic)
of Industrial Excess Landfill
April 27, 1984 and September 25-26, 1984

Sample Location	Description
1	Atmosphere sample, taken approximately 150 feet behind Tiny Tots Nursery, 12534 Cleveland Avenue, Uniontown, Ohio, 17:52, 4/27/84
2	Atmospheric sample, taken in basement of 12550 Cleveland Avenue, Uniontown, Ohio, 17:43, 4/27/84
3	Sample taken from manifold gas outlet at 12600 Cleveland Avenue, Uniontown, Ohio, 18:13, 4/27/84
4	Atmospheric sample, taken on eastern side of landfill, Uniontown, Ohio, 18:33, 4/27/84
5	In-ground reading atop Industrial Excess Landfill approximately 80 feet due east of 12506Cleveland Avenue, N.W., 9/25/84-9/26/84
6	East Ohio Gas manifold sample at 12622 Cleveland Avenue, N.W., 9/25/84-9/26/84
7	In-ground crawl space at 12550 Cleveland Avenue, N.W., 9/25/84-9/26/84
8	Septic tank located behind building at 12600 Cleveland Avenue, N.W., 9/25/84-9/26/84


HILLTOP STREET
ACCESS ROAD
CLEVELAND ROAD
1
2
3
4
5
6
7
8
LANDFILL
PAINT SHOP
INDUSTRIAL EXCESS LANDFILL
UNIONTOWN, OHIO
SAMPLE LOCATION MAP
U.T.V.F.D. EXPLOSIVITY
UNIONTOWN VFD
N
WESTON
NO SCALE

Sample Location of Explosivity Survey
Uniontown, Ohio
Conducted by the East Ohio Gas Company
September 25-26, 1984

Sample Location	Description
1	In-ground crawl space at 12550 Cleveland Avenue, N.W.
2	Four feet due east of southeast corner of house at 12550 Cleveland Avenue, N.W.
3	Sixty-three feet west of property line at 12550 Cleveland Avenue, N.W.
4	Existing monitor point along east property line at 12550 Cleveland Avenue, N.W.
5	Attic reading at 12506 Cleveland Avenue, N.W.
6	Fourty-two feet due east of floor drain at 12506 Cleveland Avenue, N.W.
7	Twenty-one feet due east of floor drain at 12506 Cleveland Avenue, N.W.
8	Fourteen feet due east of floor drain at 12506 Cleveland Avenue, N.W.
9	Floor drain reading at 12506 Cleveland Avenue, N.W.
10	Cracks in basement foundation wall at 12506 Cleveland Avenue, N.W.

Explosivity Testing Conducting by
Uniontown Volunteer Fire Department

Sample Location	Description
1	12622 Cleveland Ave., Uniontown, Ohio
2	12600 Cleveland Ave., Uniontown, Ohio
3	Abandoned lot situated between 12600 and 12550 Cleveland Avenue, Uniontown, Ohio
4	12550 Cleveland Ave., Uniontown, Ohio
5	12534 Cleveland Ave., Uniontown, Ohio
6	12506 Cleveland Ave., Uniontown, Ohio
7	Residential lot situated between MacInnis Realty and 12506 Cleveland Avenue, Uniontown, Ohio
8	MacInnis Realty, Uniontown, Ohio

SAMPLE LOCATION DESCRIPTIONS OF
THE COMBUSTABLE GAS, ORGANIC VAPOR AND
CHARCOAL TUBE SURVEYS CONDUCTED BY TAT

SAMPLE LOCATION	DESCRIPTION
1	Vacant lot 4½' from the north side of the landfill fence, 50' east of the fence of [redacted] Street residence.
2	Backyard at [redacted]. 3'10" from north side of landfill fence. 10' from fence bordering the west side of the yard.
3	Behind the parking lot of Der Deutch Cupboard on Cleveland Road. 82' east and 58½' north of the NE corner of the adjacent tire company building.
4	In the crawl space of the [redacted]'s residence on Cleveland Road.
5	On Cleveland Road behind the garage of the [redacted] residence. 15' south and 26½' east of the NE corner of the garage.
6	Behind MacInnis Reality on Cleveland Road. 7'2" south and 1'10" west of the SE corner of the neighboring fence.
7	Behind MacInnis Reality on Cleveland Road. 10'6" west and 7'7" south of the SE corner of the neighboring fence. Taped on a tree.
8	Behind the Paint Shop off of Cleveland Road. 149' east of the access road and 27½' north of the tree line.
9	On the Sod Farm which borders the east side of the landfill. 15'9" east of the east side of the ditch and 12' north of the center of the access road.
10	Backyard of [redacted] residence. 77' east and 8'6" south of the northeast corner of the [redacted] home.

Combustible Gas and Organic Vapor Survey
Conducted by the Technical Assistance Team
October 4-5, 1984

Sample Location	% LEL Explosivity	PPM Organic Vapors
1	100+	1000
2	Background	Background
3	100+	300
4	100+	500
5	100+	1000
6	0	300
7	Not sampled	Not sampled
8	100+	1000
9	Background	Background
10	50	20

Explosivity and Organic Vapor Survey
Conducted by the Technical Assistance Team
October 11, 1984

Sample Location	% LEL Explosivity	PPM Organic Vapors
3	100+	>1000
5	100+	>1000
6	0	60
10	40	100

ATTACHMENT E

LETTER FROM ALERT ANALYTICAL LABORATORIES
REGARDING PRESENCE OF BENZENE IN CHARCOAL TUBES

ALERT
ANALYTICAL LABORATORIES AND ENVIRONMENTAL RESPONSE TEAM
P.O. Box 208 CANTON, OHIO 44701 □ 24-Hour ALERT LINE (216) 454-8304

December 6, 1984

Roy F. Weston, Inc.
Suite 107
Suburban West Bldg.
20800 Center Ridge Rd.
Rocky River, Ohio 44116

Attention: Mr. Scott Springer

As per your phone request this letter will give a brief explanation of the presence of benzene as a contaminant in the charcoal tube sampling/carbon disulfide desorption method and how this effects the results given for the air sampling done on October 11, 1984, at the Industrial Excess Landfill.

There is a background benzene contamination in the charcoal tube/carbon disulfide method as stipulated in NIOSH P&CAM 127. This method was used to analyze the Industrial Excess Landfill charcoal tubes. This contamination is not significant when sampling benzene at levels above 0.1 mg/m^3 for a 240 L air sample. A 240 L air volume was used in sampling the Industrial Excess Landfill charcoal tubes. However, if the benzene concentration is less than 0.1 mg/m^3 for a 240 L air sample then the benzene contamination becomes significant. The reason for the significance of the contamination at this level is that the amount of benzene present due to the method's background contamination exceeds the amount of benzene present due to an actual benene concentration in the air. Therefore, the minimum detectable level for benzene in a 240 L air sample is 0.1 mg/m^3 since benzene concentrations below this level are insignificant when compared to the method's background benzene contamination.

For the air samples taken at the Industrial Excess Landfill on October 11, 1984, tubes 10 and 03 were reported as having an identifiable amount of benzene present on the charcoal tube at a level less than 0.1 mg/m^3. Since the benzene concentrations for these two air samples were below the minimum detectable level it can be concluded that the amount of benzene present on the tubes was high enough to be identified. However, this amount was mainly due to the method's background benzene contamination and any amount due to an actual benzene air concentration was insignificant when compared to the background amount.

I hope this adequately explains the presence of benzene on the charcoal tubes used for air sampling at the Industrial Excess Landfill. As stated previously most of the benzene present on the tubes in question was due to background contamination. In light of this I would like to conclude by saying that even though a background benzene contamination was present it can still be stated with certainity that if benzene was present in the air at the time of sampling the air concentration would be less than 0.1 mg/m^3.

Sincerely,

ALERT, INC.

Timothy Lavey

Timothy Lavey
Senior Environmental Chemist