CARL H. BRADLEY
SECRETARY

WALLACE G. WILKINSON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

27328

January 25, 1988

Ms. Betsy Shaver
U.S. Environmental
Protection Agency
345 Courtland Street, N.E.
Atlanta, Ga. 30365

RE: Site Screening Investigation Report
Campground Landfill
Jefferson County, Kentucky

Dear Ms. Shaver:

Please find enclosed the Site Screening Investigation Report for the Campground Landfill. The purpose of this report is to update the Preliminary Assessment and to determine if this site will rank high enough to be placed on the National Priority List (NPL). The preliminary HRS score sheets and EPA Form 2070-13 are found in Appendix A of this report. Based on this report the following conclusions are made:

1. Campground Landfill received hazardous waste during the early years of its operation.

2. Contaminants from the landfill are not migrating to ground or surface waters.

3. The preliminary HRS score for this site is 25.86. This score is based on the fact that no observed releases have been documented at this site. Therefore, the Campground Landfill will not score high enough to rank on the NPL.

Based on the results of this investigation, the Kentucky Division of Waste Management is recommending that no further action be taken under CERCLA at this time. The Division's Solid Waste Branch is continuing to receive quarterly groundwater monitoring analyses from Campground Landfill as part of their two (2) year post-closure period.

If you have any questions, please feel free to contact me at (502) 564-6716, Ext. 272.

Sincerely,

Caroline Patrick Haight

Caroline Patrick Haight, Manager
Uncontrolled Sites Section
Division of Waste Management

CPH:MT:cg

Enclosure

SITE SCREENING INVESTIGATION REPORT
CAMPGROUND LANDFILL
JEFFERSON COUNTY

BY
Mike Talley
Uncontrolled Sites Branch
December, 1987

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BACKGROUND

The Campground Landfill is located at 4501 Campground Road in Louisville, Jefferson County, Kentucky (Appendix B, Figure 2). This site was operated as a permitted solid waste landfill from February 1975 until the spring of 1986. During its operation, Campground Landfill had three (3) different owners/operators. The landfill was first opened by Mr. Jerry Blankenship and was subsequently acquired by SCA Services of Kentucky, Inc. and finally Waste Management of Kentucky, Inc. Campground Landfill is currently in a two year post-closure period which began February 10, 1987 (Appendix C). The Kentucky Division of Waste Management's Solid Waste Branch is currently receiving groundwater monitoring analyses from the site on a quarterly basis. To date, no groundwater contamination has been indicated.

According to the three (3) 103(c) "Notification of Hazardous Waste Site" forms found in Appendix D and various other sources from Kentucky Division of Waste Management (KDWM) files (Appendix E), Campground Landfill received hazardous waste during its operation. Some of the waste received included those listed under F001, F002 and F008 of RCRA.

ENVIRONMENTAL SETTING

Campground Landfill is located in the extreme western portion of the Outer Bluegrass Region within one (1) mile of the Ohio River (Appendix B, Figure 2). This area is characterized by its relative lack of relief.

The area is underlain by outwash deposits consisting of sand, gravel, silt and clay. The first consolidated material encountered underneath the site is the Holtsclaw Siltstone Member located at a depth of approximately 150 feet. Wells in the area commonly yield 200-500 gallons per minute when they penetrate the full thickness of the outwash deposits. Water quality is described as hard (U.S.G.S.-1960).

Surface water drainage from the site is to the north and the south. The northerly drainage route is to Paddys Run and then the Ohio River, approximately one and three-quarter stream miles from the landfill. The southerly route is to Cane Run, Mill Creek and the Ohio River, respectively. The Ohio River is approximately five (5) stream miles from the site along this southerly route (Appendix B, Figure 2).

Soils in the area are of the Sciotoville Series and are described as shallow, moderately well-drained silt loams with depths of about 18 inches. The permeability and available water capacity of these soils is moderate (U.S.D.A. - 1966).

The climate of this area is temperate and humid. Precipitation is well distributed throughout the year with a slight peak in the spring. Total annual precipitation averages 42 inches. The prevailing winds are from the south (U.S.D.A - 1966).

Consultation with the Kentucky Nature Preserves Commission reveals that Clonophis Kirtlandii (Kirtland's Water Snake) inhabits the area around Lake Dreamland, approximately one (1) mile from the site. Clonophis Kirtlandii is currently under consideration for inclusion on the "List of Federally Endangered Species."

WASTE CHARACTERISTICS

Kentucky Division of Waste Management CERCLA PA/SI personnel conducted sampling at Campground Landfill on August 11, 1987. The samples taken were:

CL-01, Upgradient Groundwater
CL-02, Downgradient Groundwater
CL-03, Downgradient Groundwater
CL-04, Background Soil
CL-05, Composite Soil from Northern Drainage Ditch
CL-06, Composite Soil from Southern Drainage Ditch
CL-07, Leachate from Northeastern Section of Landfill

Sample locations and photographs are found in Appendices B and F.

Sample analyses do not indicate that any contaminants from the landfill are migrating to ground or surface waters (Appendix G).

POPULATIONS ZONES

Population data and methodology are found in Appendix H of this report. The total population within a four (4) mile radius of this site is 129,948. There are 7,280 people living within a 0-1 mile zone, 17,491 within a 1-2 mile zone, 39,779 within a 2-3 mile zone and 65,398 within a 3-4 mile zone.

WATER USAGE

Municipal water service within a three (3) mile radius of this site is supplied by the Louisville Water Company and the Edwardsville Water Corporation. To determine the number of potential groundwater users within a three (3) mile radius, water distribution lines from the two (2) water companies were drawn onto U.S.G.S. 7.5 minute series topographic maps (Appendix I) and the houses counted in areas not having or adjacent to distribution lines. There are 47 households within three (3) miles of the site which do not have municipal water service. Multiplying 47 times 3.8 people per household results in 179 people who potentially use groundwater.

There are no surface water intakes within three (3) miles downstream of this site.

REFERENCES

U.S.D.A. - 1966. Soil Survey of Jefferson County, Kentucky.

U.S.G.S. - 1960. Availability of Groundwater in Bullitt, Jefferson and Oldham Counties, Kentucky.

U.S.G.S. - 1983. Louisville West Quadrangle, 7.5 Minute Series Topographic Map.

U.S.G.S. - 1982. Lanesville Quadrangle, 7.5 Minute Series Topographic Map.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	KYD098951262

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Campground Landfill	4501 Campground Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Louisville	KY	P.O. Box #19498	Jefferson	111	03

09 COORDINATES LATITUDE	LONGITUDE
38° 12' 25.0"	085° 50' 25.0"

10 TYPE OF OWNERSHIP (Check one)
☑ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
8, 11, 87 (MONTH DAY YEAR)	☐ ACTIVE ☑ INACTIVE	1976 (BEGINNING YEAR) | 1986 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☑ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Mike Talley	Environmental Specialist	KNREPC	(502) 564-6716

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Jim Childers	Geologist Senior	KNREPC	(502) 564-6716
Jon Maybriar	Environmental Specialist	KNREPC	(502) 564-6716
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Shird Robinson	Special Waste Manager	P.O. Box 19498 2678 Outer Loop Road	(502) 966-0272
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☑ PERMISSION ☐ WARRANT	9:00 am – 5:30 p.m.	Sunny, Low to Mid 80's

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
		( )

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Mike Talley	KNREPC	KDWM	(502) 564-6716	10, 2, 87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	KYD098951262

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☑ A. SOLID
- ☑ B. POWDER, FINES
- ☑ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☑ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☑ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☑ D. PERSISTENT
- ☑ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☑ G. FLAMMABLE
- ☑ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	103(c) notifications		list wastes under F001, F002,
SOL	SOLVENTS	F008 & D008.		
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

103(c) notifications from Hobart, Mobil Chemical and B.F. Goodrich Chemical Group. (Appendix)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☑ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~194 — 04 NARRATIVE DESCRIPTION

The shallow depth of groundwater + the permeability of the alluvial deposits make groundwater contamination likely. There are 51 residences in Kentucky + Indiana that are not served by municipal water service. 51 X 3.8 ≅ 194

01 ☑ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown — 04 NARRATIVE DESCRIPTION

Surface water drainage into the Ohio River could affect recreational users of the river. There are no surface water intakes within 3 miles downstream.

01 ☑ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~130,000 — 04 NARRATIVE DESCRIPTION

Any contaminants which might leach out of the landfill could become airborne and affect ~130,000 people within 4 miles. Leachate was found during the SSI site visit.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

None observed

01 ☑ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~7,280 — 04 NARRATIVE DESCRIPTION

This site is enclosed by a fence but there are no security guards after hours. ~7,280 people live within 1 mile of the site.

01 ☑ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) — ☑ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ~50 (Acres) — 04 NARRATIVE DESCRIPTION

The Campground Landfill covers ~50 acres.

01 ☑ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~194 — 04 NARRATIVE DESCRIPTION

Shallow groundwater + permeability of alluvial deposits make groundwater contamination likely. ~194 people within 3 miles are not served by municipal water service.

01 ☑ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: unknown — 04 NARRATIVE DESCRIPTION

This landfill is closed and capped. The gateworker + maintenance people could be exposed to contaminants from leachate.

01 ☑ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~130,000 — 04 NARRATIVE DESCRIPTION

~130,000 people within 4 miles could be affected by an air release of contaminants.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KY0098951262

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

None observed

01 ☑ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Fish could be contaminated from surface water release of contaminants.

01 ☑ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☑ OBSERVED (DATE: 8/11/87) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: unknown — 04 NARRATIVE DESCRIPTION

Leachate was observed & sampled on the northeast side of the landfill during the SSI site visit.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: ~30,000 if an air release occurs.

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

U.S.G.S. Maps, K.D.W.M. files, sample analyses

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	KY0098951262

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☑ G. STATE (Specify) Sanitary Landfill	056.27	Feb. 1975	10/1/87	
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☑ F. LANDFILL	unknown	
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

☑ A. BUILDINGS ON SITE

1

06 AREA OF SITE

~ 50 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☐ C. INADEQUATE, POOR ☑ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

The Campground Landfill originated from a large pit that was dug to obtain fill material for nearby road construction.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ☐ YES ☑ NO

02 COMMENTS

There is approximately 30" of cover over the site.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

K.D.W.M files, conversations with Campground employees

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	KYD099951262

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☐	B. ☐
NON-COMMUNITY	C. ☐	D. ☑

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☑

03 DISTANCE TO SITE

A. ~1 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☑ A. ONLY SOURCE FOR DRINKING
☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)
☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)
☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER ~194

03 DISTANCE TO NEAREST DRINKING WATER WELL ~1 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
~50 (ft)	WSW	~50 (ft)	200-500 gpm (gpd)	☐ YES ☑ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

Residents of Senn Road and Bramers Lane (West of the floodwall) utilize groundwater wells. Hershel Sallings, who lives at the west end of Senn Road, said that his well is about 85 feet deep.

10 RECHARGE AREA

☐ YES
☐ NO

COMMENTS

11 DISCHARGE AREA

☑ YES
☐ NO

COMMENTS except during extremely dry periods

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☑ A. RESERVOIR, RECREATION DRINKING WATER SOURCE
☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES
☐ C. COMMERCIAL, INDUSTRIAL
☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Ohio River	☐	~1 (mi)
Cane Run	☐	~½ (mi)
Lake Dreamland	☐	~1 (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 7,280 (NO. OF PERSONS)	B. 24,771 (NO. OF PERSONS)	C. 64,550 (NO. OF PERSONS)

02 DISTANCE TO NEAREST POPULATION

~100 feet (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

~6,000

04 DISTANCE TO NEAREST OFF-SITE BUILDING

~100 feet (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The Campground Landfill is located in a densely populated urban area (Louisville). Over 100,000 people live within 4 miles of the site.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☑ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one) N/A

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
N/A (ft)	unknown (ft)	unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
~11.0 (in)	3.0 (in)	~10 %		≤ 2 %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

* currently under consideration ~1 (mi)

ENDANGERED SPECIES: Clonophis Kirtlandii

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. ~100 feet ~~(mi)~~	B. ~100 feet ~~(mi)~~	C. _____ (mi)	D. _____ (mi)

N/A

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The Campground Landfill is located in the relatively flat area of the Ohio River Valley. The entire area around the Landfill is approximately 450 feet above MSL.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

U.S.G.S. Topographic, Geologic & Hydrologic Maps. U.S.D.A. Soil Survey

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	3	Kentucky Division of Environmental Services	
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL	3	" " " " "	
VEGETATION			
OTHER Leachate	1	" " " " "	

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Depth to water table at Groundwater monitoring wells	

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☑ GROUND ☐ AERIAL

02 IN CUSTODY OF K.D.W.M (Name of organization or individual)

03 MAPS ☑ YES ☐ NO

04 LOCATION OF MAPS K.D.W.M.

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

K.D.W.M. files, SSI site visit

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	KYD098951262

II. CURRENT OWNER(S) / **PARENT COMPANY** (if applicable)

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER
Waste Management of KY, Inc.			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE
P.O. Box 19498			

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
Louisville	KY	40231			

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first) / **IV. REALTY OWNER(S)** (if applicable, list most recent first)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
SCA Services of Kentucky, Inc.			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
Louisville	KY	40231			

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Jerry Blankenship			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1314 Medora Road			

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
Louisville	KY	40231			

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

K.D.W.M. files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

II. CURRENT OPERATOR (Provide if different from owner)			OPERATOR'S PARENT COMPANY (If applicable)		
01 NAME: Same as owner	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER				

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)			PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)		
01 NAME: Same as previous owners	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

K.D.W.M. Files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
B.F. Goodrich Company Chemical Group		Hobart Corporation	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
4100 Bells Lane		3401 Jewell Ave.	
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
Louisville / KY / 40232		Louisville / KY / 40212	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
Mobil Chemical Co.		Cissell Manufacturing	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
1630 W. Hill St.			
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
Louisville / KY / 40201		Louisville / KY /	

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

K.D.W.M. files.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ D. SPILLED MATERIAL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

II. PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☑ S. CAPPING/COVERING — 02 DATE Sept. 86 — 03 AGENCY K.D.W.M. (Solid Waste)
04 DESCRIPTION Approximately 30" of cover soil was placed over the landfill and was then revegetated in compliance with the closure plan.

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☑ W. GAS CONTROL — 02 DATE 1978 — 03 AGENCY K.D.W.M.
04 DESCRIPTION Gas control & collection system was installed to alleviate migrating methane gas problem

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☑ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
No record

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

K.D.W.M. files

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	KYD098951262

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☑ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

K.D.W.M. files

EPA FORM 2070-13 (7-81)

Facility Name: Campground Landfill

Location: Louisville, KY.

EPA Region: IV

Person(s) in Charge of the Facility: Waste Management of KY, Inc.

Name of Reviewer: Mike Talley Date: 10/5/87

General Description of the Facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

The Campground Landfill is located at 4501 Campground Road in Louisville, Jefferson County, Kentucky. Groundwater contamination is the major concern at this site.

Scores: S_M = 48.33 (S_{gw} = 51.02 S_{sw} = 14.55 S_a = 64.62) observed release

S_{FE} = 25.86 44.22 6.79 0 No observed release

S_{DC} =

Figure 1

HRS COVER SHEET

GROUND WATER ROUTE WORK SHEET

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score		Max. Score	Ref. (Section)
1 OBSERVED RELEASE	0 45	1	0	45	45	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.						
2 ROUTE CHARACTERISTICS						3.2
Depth to Aquifer of Concern	0 1 2 (3)	2	6		6	
Net Precipitation	0 1 (2) 3	1	2		3	
Permeability of the Unsaturated Zone	0 1 (2) 3	1	2		3	
Physical State	0 1 2 (3)	1	3		3	
Total Route Characteristics Score			13		15	
3 CONTAINMENT	0 1 2 (3)	1	3		3	3.3
4 WASTE CHARACTERISTICS						3.4
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	8	
Total Waste Characteristics Score			26	26	26	
5 TARGETS						3.5
Ground Water Use	0 1 2 (3)	3	9	9	9	
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 (16) 18 20 / 24 30 32 35 40	1	16	16	40	
Total Targets Score			25	25	49	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			25,350	29,250	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} =		44.22 / 51.02	No Observed Release / Observed Release

Figure 2

Ground Water Route Work Sheet

DRAFT

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score		Max. Score	Ref. (Section)
1 Observed Release	0 45	1	0	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.						
2 Route Characteristics						4.2
Facility Slope and Intervening Terrain	0 1 2 3	1	0		3	
1-yr. 24-hr. Rainfall	0 1 2 3	1	2		3	
Distance to Nearest Surface Water	0 1 2 3	2	2		6	
Physical State	0 1 2 3	1	3		3	
Total Route Characteristics Score			7		15	
3 Containment	0 1 2 3	1	3		3	4.3
4 Waste Characteristics						4.4
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	18	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	8	8	8	
Total Waste Characteristics Score			26	26	26	
5 Targets						4.5
Surface Water Use	0 1 2 3	3	6	6	9	
Distance to a Sensitive Environment	0 1 2 3	2	2	2	6	
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	0	40	
Total Targets Score			8	8	55	
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			4,368	9,360	64,350	
7 Divide line 6 by 64,350 and multiply by 100	S_{sw} = 6.79 / 14.55					

No Observed Release / Observed Release

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

DRAFT

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1	45	45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1	1	3	
Toxicity	0 1 2 3	3	9	9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	8	8	
	Total Waste Characteristics Score		18	20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 / 21 24 27 30	1	21	30	
Distance to Sensitive Environment	0 1 2 3	2	4	6	
Land Use	0 1 2 3	1	3	3	
	Total Targets Score		28	39	
4 Multiply 1 x 2 x 3			22,680	35,100	
5 Divide line 4 by 35,100 and multiply by 100		S_a = 64.62			

FIGURE 9
AIR ROUTE WORK SHEET

DRAFT

	S	S^2	observed release S	observed release S^2	No observed release S	No observed release S^2
Groundwater Route Score (S_{gw})	51.02	2,603.04	44.22	1955.41		
Surface Water Route Score (S_{sw})	14.55	211.70	6.79	46.10		
Air Route Score (S_a)	64.62	4,175.74	0	0		
$S_{gw}^2 + S_{sw}^2 + S_a^2$		6,990.48		2,001.51		
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		83.61		44.74		
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		48.33		25.86		

$S_M = 30.68$ w/o S_a

FIGURE 10
WORKSHEET FOR COMPUTING S_M

DRAFT
11-25-86

HRS SCORE SHEET

DATE: 10/5/87

SITE NAME: Campground Landfill

EPA ID #: KYD098951262 REVIEWER: Mike Talley

HRS FACTOR SCORES	Score	Default	Known	Estimate
1) Toxicity/persistence (TP)	18	none	✓	
2) Waste quantity (WQ)	8	(1)		✓
3) Containment (Groundwater) (C_{gw})	3	(3)	✓	
4) Depth to aquifer of concern (D_{ac})	6	(6)	✓	
5) Distance to nearest well/population (DP_g)	16	none		✓
6) Containment (Surface Water) (C_{sw})	3	(3)	✓	
7) Distance to surface water (D_{sw})	2	(6)		✓
8) Distance to surface intake/population (DP_s)	0	none		

S GROUNDWATER ROUTE SCORING:

a) If observed release: $S_{gw} = \frac{(TP + WQ)\ (DP_g + 9)}{12.74}$ = 51.02

b) If no observed release: $S_{gw} = \frac{(D_{ac} + 7)\ (TP + WQ)\ (DP_g + 9)(C_{gw})}{573.3}$ = 44.22

SURFACE WATER ROUTE SCORING

If observed release: $S_{sw} = \frac{(TP + WQ)\ (DP_s + 9)}{14.3}$ = 16.36

If no observed release: $S_{sw} = \frac{(D_{sw} + 5)\ (TP + WQ)\ (DP_s + 9)(C_{sw})}{643.5}$ = 7.64

MULTIMEDIA HRS SCORING

Do not score the air route unless an observed release is known to have occurred.

$$S_m = \sqrt{\frac{S_{gw}^2 + S_{sw}^2}{1.73}} = 30.67$$

The scoring in above steps is based on the following default scores:

1) the sum of the scores for net precipitation, permeability, and physical state is 7,
2) the groundwater use is for drinking and the score used is 9.
3) the sum of the scores for slope/terrain, rainfall and physical state is 5,
4) the sum of the scores for surface water use and distance to sensitive environments is 9.

If these assumptions are known to be substantially incorrect, complete an HRS scoring sheet.

DRAFT
11-25-86

SITE SCREENING SUMMARY

Site Name: Campground Landfill

EPA ID #: KYD098951262

Reviewer Name: Mike Talley Date: 10/5/87

I. INITIAL REVIEW: (Check where appropriate)

NPL ___ RCRA ___ Fed. Fac. ___ "Low Priority" Landfill ___

NFA ___ reason: ___

II. LEAD: Fund ___ Enforcement ___ Unknown ✓

III. REMOVAL: Needed ___ reason: ___

Completed ___ (score using preremoval conditions)

IV. HRS SCORE: 48.33 Confidence: high ___ medium ✓ low ___

V. LOCATION: Latitude: 38° 12' 25.0" Longitude: 085° 50' 25.0"

V. INFORMATION NEEDED: (Check information needed to determine disposition)

A. Preliminary Assessment (Notes/sources for future reference)

___ 1. RCRA Status Information
___ 2. Observed Release
___ 3. Target Information
___ 4. Distance to Surface Water
___ 5. Depth to aquifer of concern
___ 6. Waste identity
___ 7. Hazardous waste quantity
___ 8. Others (list)

B. Site Investigation

___ 1. Waste identity
___ 2. Distance to surface water
___ 3. Slope/intervening terrain
___ 4. Containment
✓ 5. Observed release (surface)
✓ 6. Observed release (ground)
___ 7. Hazardous waste quantity
___ 8. Others (list)

CRITICAL HRS FACTOR DOCUMENTATION FORM

DATE: 10/15/85

SITE NAME: Campground Landfill

EPA ID #: KYD098951262 REVIEWER: Mike Talley

1) Is an observed release documented (background and site samples are available and the site is shown to be the source of the contamination) or is one likely?

GROUNDWATER: Yes___ No___ Likely ✓ SURFACE WATER: Yes___ No___ Likely ✓
Groundwater info source: K.D.W.M. files
Surface water info source: K.D.W.M files

2) What is the depth at the site to the shallowest aquifer used locally for drinking water?

Depth: ~50 feet Known ___ Estimated ✓ Unknown ___
Source: U.S.G.S. Hydrologic Investigations, Groundwater wells on-site

3) What is the distance to surface water from the hazardous waste?

Distance: ~ 1 mile Known ___ Estimated ✓ Unknown ___
Source: U.S.G.S. Maps

4) What are the most toxic/persistent chemicals at the site: Unknown ✓

a)_____ b)_____ c)_____
Source: _____

5) What is the hazardous waste quantity?

Quantity: _____ Known ___ Estimated ___ Unknown ✓
Source: _____

6) What is the distance to the nearest public water supply well using the aquifer of concern and what is the population served?

Distance: _____ Known ___ Estimated ___ Unknown ✓
Population: _____ Known ___ Estimated ___ Unknown ✓
Source: _____

7) What is the distance to the nearest private water supply well using the aquifer of concern and what is the population served within 3 miles?

Distance: ~ 1/2 mile Known ___ Estimated ✓ Unknown ___
Population: ~194 Known ___ Estimated ✓ Unknown ___
Source: Groundwater Use Survey, U.S.G.S. Maps

3) What is the distance to the nearest downstream surface water intake and the population served?

Distance: _____ Known ___ Estimated ___ Unknown ✓
Population: _____ Known ___ Estimated ___ Unknown ✓
Source: _____

REGION IV RCRA/NPL POLICY QUESTIONNAIRE FOR INITIAL SCREENING

Site Name Campground Landfill

City Louisville State Kentucky

Facility I.D. Number KYD098951262

Type of Facility: Generator____ Transporter____ TSD____

I. RCRA APPLICABILITY

	yes	no
Does the facility have RCRA interim status?		✓
Does the facility have a final or post-closure permit? If so, date issued____		✓
Is the facility a non-notifier that has been identified by States or EPA?		✓
Is the facility a known or possible protective filer?		✓
Have RCRA wastes been stored onsite for longer than 90 days since November 19, 1980?		✓
Have RCRA wastes been disposed onsite since November 19, 1980?		

STOP HERE IF ALL ANSWERS TO QUESTIONS IN SECTION I ARE NO

II. FINANCIAL STATUS	yes	no
Is the facility owned by an entity that has filed for bankruptcy under federal laws (Chapter 7 or 11) or State laws?		

If yes, what has it filed under?

Chapter 7____ Chapter 11 ____ Other ____

III. ENFORCEMENT

RCRA Status	yes	no
Has the facility lost authorization to operate via LOIS, 3005(c) permit denial, 3008(h) IS termination, 3005(d) permit revocation?	_____	_____
Has the facilities interim status been terminated via another mechanism (i.e. administrative termination)?	_____	_____

IV. CERCLA STATUS

What CERCLA financed remedial or removal activities have been initiated at the site? (RI/FS, RD/RA, O&M, forward planning, and removal; does not include enforcement or PA/SI activities).

V. Enforcement Status

	yes	no
In general, would you characterize the facility as demonstrating an unwillingness to undertake corrective action based on prior State, CERCLA or RCRA actions?	_____	_____

If yes, please describe and cite the authorities exercised.

	yes	no
Is the owner/operator a party to any enforcement action at the site?	_____	_____

If not, why not?

Are any PRPs (including owner/operators) undertaking remedial studies or action in response to CERCLA enforcement authorities? What is the extent/ type of work that has been completed (RI/FS, etc.) and who (generators, owner/operator, etc.) is conducting the work?

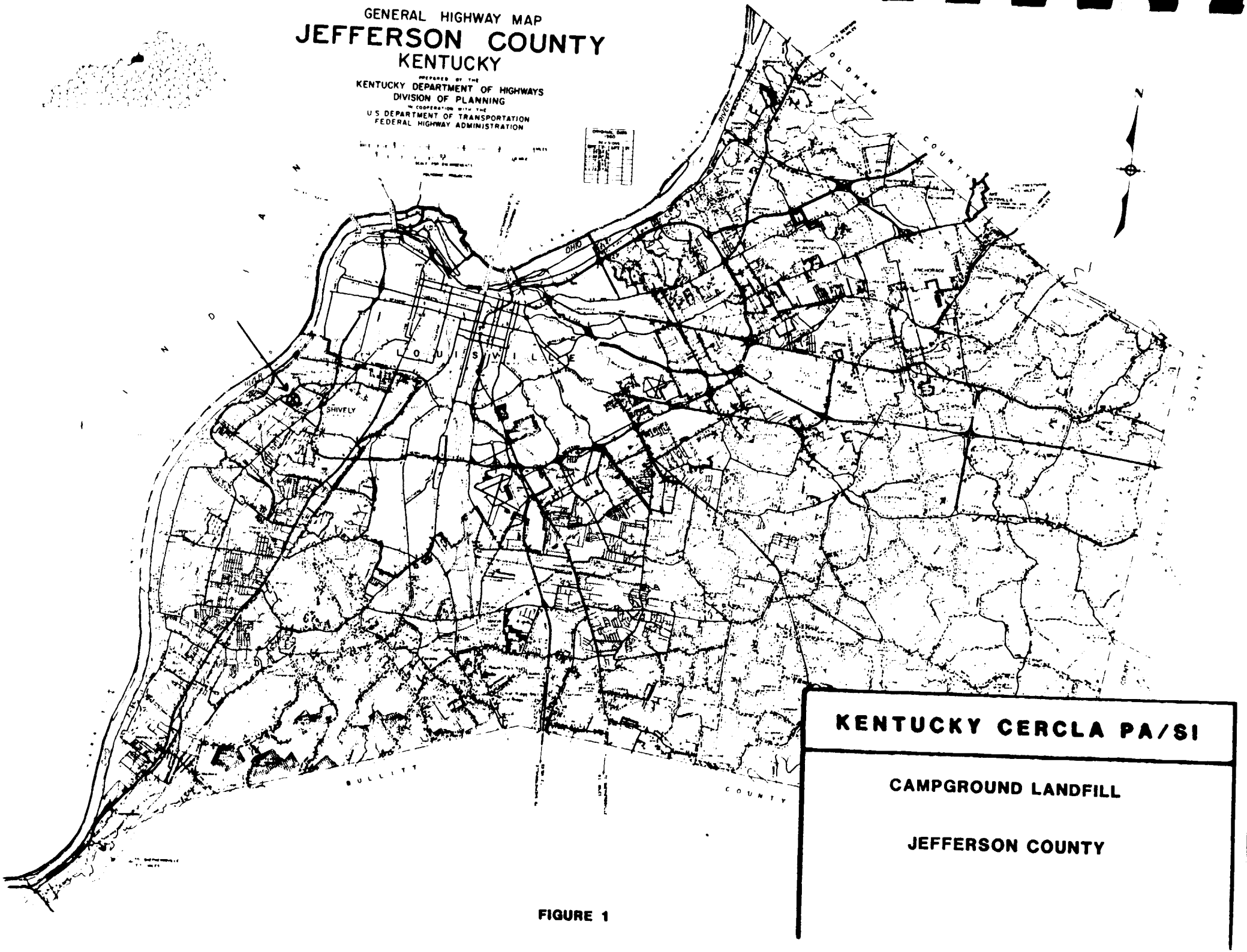

GENERAL HIGHWAY MAP
JEFFERSON COUNTY
KENTUCKY
PREPARED BY THE
KENTUCKY DEPARTMENT OF HIGHWAYS
DIVISION OF PLANNING
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
LOUISVILLE
SHIVELY
OHIO
RIVER
OLDHAM
COUNTY
BULLITT
COUNTY
KENTUCKY CERCLA PA/SI
CAMPGROUND LANDFILL
JEFFERSON COUNTY

FIGURE 1

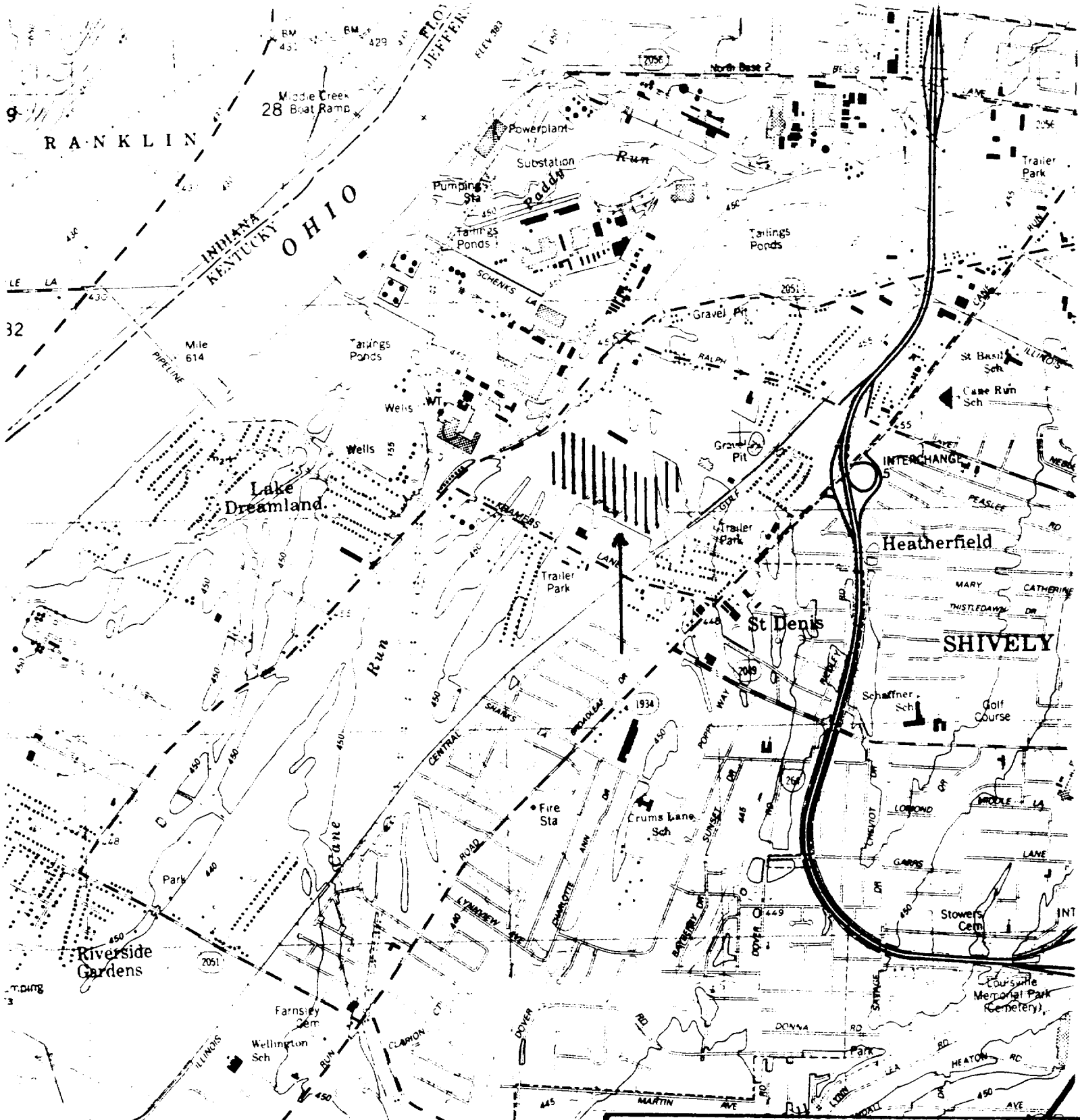


FIGURE 2

KENTUCKY CERCLA PA/SI

CAMPGROUND LANDFILL

JEFFERSON COUNTY

1:24000

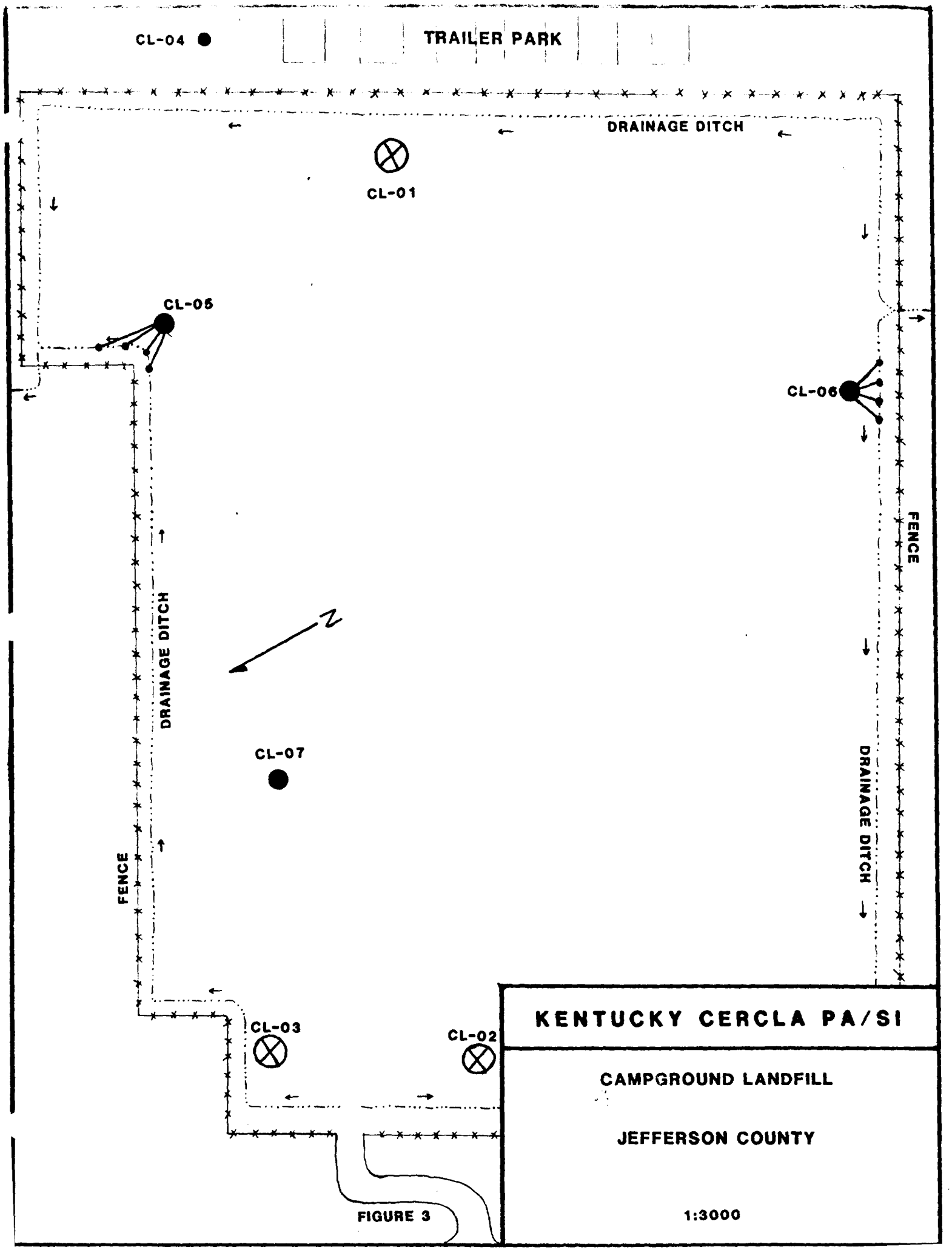
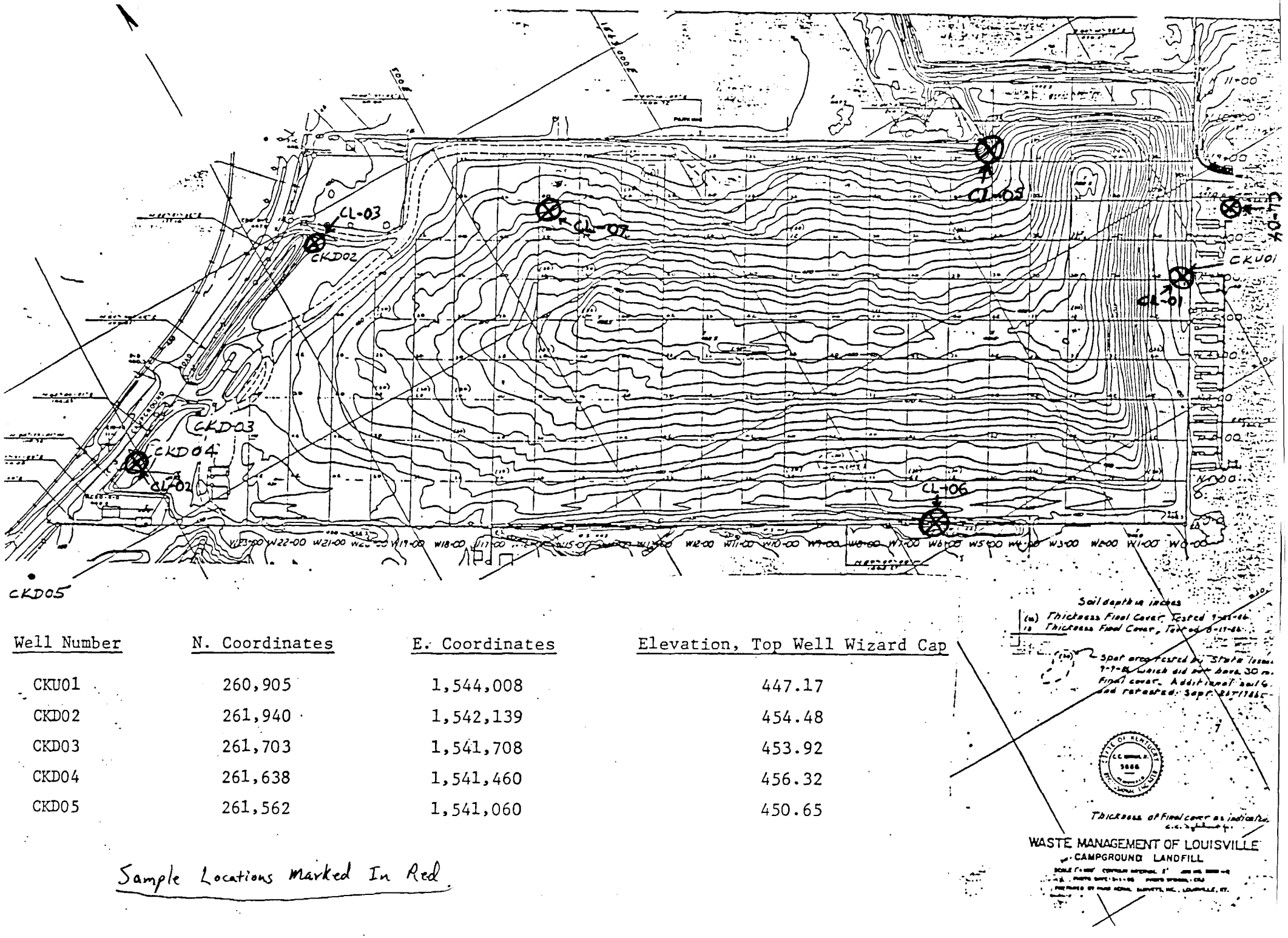

CL-04
TRAILER PARK
DRAINAGE DITCH
CL-01
CL-05
CL-06
FENCE
DRAINAGE DITCH
N
CL-07
DRAINAGE DITCH
FENCE
CL-03
CL-02
KENTUCKY CERCLA PA/SI
CAMPGROUND LANDFILL
JEFFERSON COUNTY
1:3000

FIGURE 3



Well Number	N. Coordinates	E. Coordinates	Elevation, Top Well Wizard Cap
CKU01	260,905	1,544,008	447.17
CKD02	261,940	1,542,139	454.48
CKD03	261,703	1,541,708	453.92
CKD04	261,638	1,541,460	456.32
CKD05	261,562	1,541,060	450.65

Sample Locations Marked In Red

056.27

February 10, 1987

Mr. Cecil Iglehart, P.E.
Waste Management of Kentucky, Inc.
P.O. Box 19498
Louisville, Kentucky 40219

Re: SCA Services of Kentucky, Inc. (Campground)
Jefferson County
File #056.27

Dear Mr. Iglehart:

Site inspections conducted September 9 and December 4, 1986, reveal that you have met the requirements for closure of the above referenced site. A two year post closure maintenance period starts effective the date of this letter. This performance period will continue until February 10, 1989. The performance period may be extended if site is not properly maintained to meet the environmental performance standards.

In order to receive complete release, you must provide a deed notice as recorded stating the location of the landfill and the time period the site was used for a landfill. The notice must state that potential leachate and gas migration problems must be examined prior to disturbance of the area. Further, the site must be maintained without adverse erosion and a viable vegetative cover must be maintained on site.

No additional waste is to be disposed of at this site. The methane gas vent and collection systems must be operated and maintained by others or the permittee.

A copy of the approved closure contour plan and amended permit are enclosed. Should you have any questions regarding this matter, please contact Shelby C. Jett, P.E., of this office, at (502) 564-6716.

Sincerely,

J. Alex Barber

J. Alex Barber, Director
Division of Waste Management

JAB:CWR:akw

cc: Louisville Field Office

U.S. ENVIRONMENTAL PROTECTION AGENCY
COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA)
SECTION 103(C): NOTIFICATION OF HAZARDOUS SUBSTANCE SITES
(NOTIFICATION DEADLINE DATE - JUNE 9, 1981)

SITE IDENTIFICATION:
CAMPGROUND LANDFILL
4501 CAMPGROUND RD
LOUISVILLE KY 40216
COUNTY: JEFFERSON
PERSON REQUIRED TO NOTIFY:
MOBIL CHEMICAL CO
1630 W. HILL ST
LOUISVILLE KY 40201
STATUS:

CONTACT:
BELT, R., PLANT MGR
502-774-4411

WASTE AMOUNT : 500 TONS FROM: 1973 TO: 1981 RELEASES:
FACILITY AREA: 0 TONS
FACILITY TYPE: LANDFILL
WASTE SOURCE : CHEMICAL(GENL)
WASTE TYPES : OTHER

SITE IDENTIFICATION:
CAMPGROUND LANDFILL
4501 CAMPGROUND RD
LOUISVILLE KY 40216
COUNTY: JEFFERSON
PERSON REQUIRED TO NOTIFY:
HOBART CORP
3401 JEWELL AVE
LOUISVILLE KY 40212
STATUS:

CONTACT:
CARLETON, JAMES, PROJ ENGR
513-335-7171

WASTE AMOUNT : 49980 CU FT FROM: 1950 TO: 1979 RELEASES: LIKELY
FACILITY AREA: 0 CU FT
FACILITY TYPE: LANDFILL
WASTE SOURCE : CHEMICAL(GENL)
WASTE TYPES : F001, F002, F008

SITE IDENTIFICATION:
CAMPGROUND LANDFILL
4501 CAMPGROUND RD
LOUISVILLE KY 40216
COUNTY: JEFFERSON
PERSON REQUIRED TO NOTIFY:
GOODRICH, B.F. CO CHEMICAL GROUP
P.O. BOX 32950
LOUSIVILLE KY 40232
STATUS: TRANSPORTER

CONTACT:
GIRARDI, FRANK, SR ENGR
502-778-6631

WASTE AMOUNT : 29200 TONS FROM: 1974 TO: 1979 RELEASES:
FACILITY AREA: 0 TONS
FACILITY TYPE: LANDFILL
WASTE SOURCE : CHEMICAL(GENL)
WASTE TYPES : ORGANICS, HEAVY METALS, UNKNOWN

[illegible] Notification of Hazardous [illegible]

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in the unshaded spaces. Use a separate page if indicated. Mark the box which applies.

Mail to:
[illegible]
[illegible]
[illegible]
[illegible] 20 20 1 30

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

[illegible]

B Site Location:

Enter the common name of the site and actual location of the site.

[illegible]

C Person to Contact:

Enter the name, title, and business telephone number of the person to contact regarding the person submitted on this form.

[illegible]

D Dates of Waste Handling:

Enter the month, day, and year waste treatment, storage, or disposal began and ended at the site.

[illegible]

Waste Type: Choose the option you prefer to complete

Option I: [illegible] you [illegible] encourage [illegible] Section I—Description of Site.

General [illegible]
Place an [illegible] boxes. [illegible] overlap [illegible] category.

1. ☐ Chemicals
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Flammables
6. ☐ Acids
7. ☐ Bases
8. ☐ PCB
9. ☐ Mixed Hazardous Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the one appropriate box.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Furniture
5. ☐ Paper Products
6. ☐ Leather Products
7. ☐ Lumber Products
8. ☐ Chemical Products
9. ☐ Petroleum Refining
10. ☐ Military Munitions
11. ☐ Electric Generation
12. ☐ Transportation
13. ☐ Rubber Products
14. ☐ Secondary Metals
15. ☐ Plastic Products
16. ☐ [illegible]
17. ☐ [illegible]
18. ☐ [illegible]

[illegible]

Specific Type of Waste:
[illegible]

[illegible]

Form Approved
OMB No. 2[illegible]
EPA Form 2[illegible]

Notification of Hazardous Waste Activity | Site Type:

F Waste Quantity:

Place an X in the appropriate boxes to indicate the form of the waste.

In the "total facility waste amount" space give the estimated amount and quantity (volume) of hazardous waste at the site using cubic feet or gallons.

In the "total facility area" space give the estimated area in square feet or acres occupied by the waste at the site.

Facility Type:

1. ☐ Pits
2. ☐ Land Treatment
3. ☐ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount:

_____

_____

Total Facility Area:

_____

_____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate box(s) to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, it is encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, major roads, rivers or other landmarks near the site. Place an X on the map to indicate the site location. Show the direction of the prevailing wind. You may use a blank or a published map or map overlay of the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant manager, superintendent, trustee, or attorney) or person authorized to notify on behalf of the owner provide a material statement of fact that is true in accordance with 40 CFR 270.10(d). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship of the person signing to the owner of the site. Required to notify under 40 CFR 270.10(d) to notify under 40 CFR 270.10(e).

Name _____ Signature _____

Date _____ Title _____

Phone _____ Area Code _____

Company _____

☐ Owner, Present
☐ Owner, Past
☐ Operator, Present
☐ Operator, Past
☐ Generator, Present
☐ Generator, Past
☐ Other

[illegible]

May 13, 1981

TO R. McAfee
Hazardous Waste Coordinator, [illegible]

FROM J. J. Carleton
Corporate Hazardous Waste Coordinator

SUBJECT Superfund Notification

Copies To
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
File

The EPA has been charged by Congress to compile information regarding past disposal of hazardous waste. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (commonly known as Superfund and or "CERCLA 1980") has we furnish EPA by June 9, 1981, certain information concerning our past disposal practices.

In order to comply with this request for information, I am requesting that each of you send to my attention by June 2, 1981, the below information in letter form. I will then fill in the Superfund notification form and will include with it a copy of your letter. Even though we are on the fringes of what Superfund is really after, namely abandoned sites, our compliance with the request is mandatory.

Since time is of the essence, EPA is not requiring that you painstakingly document the information omitted. This information may be based on your knowledge or reasonably available records. Your best estimates for being quantities will be satisfactory.

The following information is requested:

1. EPA ID Number
2. Waste generated at your facility by EPA Hazard Class Number. These [illegible] are found on the Notification filed in August, 1980.
3. Name and address of disposal site or sites used prior to disposal under RCRA in 19[illegible]. Indicate the type of landfill (e.g. Sanitary, Private industrial, etc.). If a recycling facility, so indicate.
4. Dates these sites were used.
5. Estimate of yearly quantities.

Please sign your letter to me, and be sure to use [illegible] envelope. In the event that you should have any questions, please contact either myself or Dick Lewis by [illegible].

A copy of this letter and a copy of your response will be part of the Superfund notification which will be filed by Facilities Engineering, and signed by J. J. Carleton.

Please be prompt in your information disclosure.

J.J.C.

[illegible]

[illegible]

May [illegible], [illegible]

TO [illegible]

FROM Bob [illegible]

SUBJECT Waste Disposal

COPIES TO

B. Wright
B. May
File

As requested in your letter dated May [illegible], [illegible], I am sending you the following information on waste disposal [illegible].

1. EPA - ID Number - KY[illegible]
2. Lucas Code Numbers - P-001 and P-002 [illegible], P-003 Mary Paint.
3. Prior disposal sites - Shoneymead [illegible], 4501 Campground Road, Louisville, Kentucky ([illegible] in [illegible])
4. [illegible] - 1980 to 1990*
5. Yearly quantities - [illegible] cubic Yards.

Robert B. [illegible]
Plant Engineer
Louisville, Ky.

*Total: A library of waste was made by [illegible] Disposal, Inc. This was the only landfill used to my knowledge.

No records were kept before 1980. These quantities are based on 1980 figures.

F-126

[illegible]

[illegible]

This initial notification information is required by Section 3010(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use a separate piece of paper. Indicate the letter of the item which applies.

A Person Required to Notify

Enter the name and address of the person or organization [illegible]

Name: [illegible]

Street: 4500 Dodge [illegible]

City: Louisville State: KY Zip: 4[illegible]

B Site Location

Enter the common name of the site and actual location of the site.

Name of Site: Camp Ground [illegible]

Street: 4502 Camp Ground [illegible]

City: Louisville State: KY Zip: 4[illegible]

C Person to Contact

Enter the name, title, address, and business telephone number of the person to contact regarding information submitted on this form.

Name and Title: [illegible]

Phone: 502/778-[illegible]

D Dates of Waste Handling

Enter the year that waste was first stored, treated, disposed, or transported at this site and ended at this site.

Started: [illegible] Ended: [illegible]

E Waste Type: Check the [illegible] you prefer to complete.

Option 1: Select one or more waste types and source categories. If you do not know the waste type or source, you are encouraged to describe it in the Additional Description of Site.

General Type of Waste
Place an X in the appropriate boxes. The categories are not over-lapping. Check appropriate categories.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metal
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Miscellaneous [illegible]
10. ☐ Explosives
11. ☐ Other Specify:

Source of Waste
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textile
4. ☐ Leather
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel foundry
8. ☐ Chemical/General
9. ☐ Plating/Coloring
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Tires/Cement
13. ☐ Other Chemicals
14. ☐ Sanitary/Refuse
15. ☐ Dry Cleaners
16. ☐ [illegible]
17. ☐ [illegible]
18. ☐ Other Specify:

Option 2: [illegible] Specific Type of Waste: [illegible]

Specific Type of Waste
EPA has [illegible] under [illegible] of RCRA. [illegible] Please [illegible]

Form [illegible]
OMB No. [illegible]
EPA Form [illegible]

Notification of Hazardous Waste S | Site Ins

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" area, give the estimated quantity and quantity (volume) of hazardous wastes at the site using English or metric units.

In the "total facility area" area, give the estimated area in which the facilities occupy, using square feet or acres.

Facility Type

1. [ ] Piles
2. [ ] Land Treatment
3. [X] Landfill
4. [ ] Tanks
5. [ ] Impoundment
6. [ ] Underground Injection
7. [ ] Drums, Above Ground
8. [ ] Drums, Below Ground
9. [ ] Other (Specify)

Total Facility Waste Amount

[illegible] 28,240 tons [illegible]

Total Facility Area

[illegible] Unknown

[illegible]

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

[ ] Known [ ] Suspected [ ] Likely [X] None All/Unknown

Note: [illegible] Hazardous Waste Site Inventory Questionnaire will assist EPA and state and local governments in locating and assessing hazardous waste sites. Although completing the form is not required, [illegible] helpful.

H Sketch Map of Site Location: (Optional)

Sketch a map showing the site, highways, roads, or other prominent landmarks near the site. Place an X on the map to indicate the site location. Show an arrow pointing the direction north. You may substitute a published map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or houses. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

*[illegible] Indicate the multiple portion of [illegible] facility waste - not all of [illegible]

which [illegible] hazardous per [illegible]

J Signature and Title:

The [illegible] (such as plant manager, superintendent, trustee, [illegible]) to notify [illegible] of any [illegible] in Item A. [illegible] notification [illegible] Check [illegible] relating [illegible] required [illegible] to notify [illegible]

[illegible] Owner, Present
[illegible] Owner, Past
[X] [illegible]
[illegible] Operator, Present
[illegible] Operator, Past
[X] Other (Specify)

EPA Notification of Hazardous Waste Site

United States
Environmental Protection
Agency
Washington, DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print. If [illegible] additional space, use separate [illegible] paper. Indicate the letter of the item which applies.

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name

Street

City State Zip Code

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site

Street

City County State Zip Code

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title)

Phone

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

Started & Ended

E Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating, Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary Refuse
15. ☐ Photofinishing
16. ☐ Auto Repair
17. ☐ Unknown
18. ☐ Other (Specify)

Option II: This option is available to persons subject to the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
[illegible] waste [illegible] the [illegible] by [illegible] the EPA Region serving the state in which the site is located.

F Waste Quantity

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "Total Facility Waste Amount" space, give the estimated total quantity (volume) of hazardous waste using cubic feet or gallons.

In the "Total Facility Area" space, give the estimated total area in which hazardous waste occupies, using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☐ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

Volume _____

Total Facility Area

Area _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of waste to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ None

Note: Items G and H are optional. Completing these items will assist EPA and state and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a published map showing the site location.

Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or streams. If you have information as to how waste was disposed and where the waste came from, please provide any other information or comments which may help describe the site conditions.

Signature and Title:

The person or persons [illegible] such as [illegible] trustees or [illegible] to notify [illegible] mailing [illegible] in item [illegible] notification [illegible] Check the [illegible] location [illegible]

[illegible]

[illegible]

Company Name: MOBIL OIL CORP.
Division/Facility: MOBIL CHEMICAL
Facility Name: MOBIL CHEMICAL [illegible]

Address: 1600 E. HILL ST.
No. Street

LOUISVILLE, KY 40271
City State Zip

Name of Person Completing Form: R. [illegible]

Position: PLANT MANAGER

Phone Number: (502) 776-4411

1. Year Facility Opened ..... 19 [illegible] (10-11)

2. Primary SIC Code ..... [illegible] (12-15)

3. Estimate the total amount of process waste (gal) [illegible] generated by this facility during [illegible] (the year 1 in 1979 were disposed of):

thousand gallons ..... [illegible] (16-24)

hundred tons ..... [illegible] (25-31)

thousand cubic yards ..... [illegible] (32-40)

4. Estimate (in whole percent) how these process wastes (item 3 in 1979 were disposed of:

in landfill ..... [illegible] (41-44)

in pit/pond/lagoon ..... [illegible] (45-47)

in deep well ..... [illegible] (48-50)

incinerated ..... [illegible] (51-53)

reprocessed/recycled ..... [illegible] (54-56)

evaporated ..... [illegible] (57-59)

unknown ..... [illegible] (60-62)

other (Specify_____) ..... [illegible] (63-65)

5. What is the total number of known sites (including [illegible]) on the property where this facility is located or one or more that have been used for the disposal of process wastes from this facility since 1960? ..... [illegible] (66-67)

[illegible]

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes-1; no-2) ..... [illegible] (68)

[illegible]

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1960? (Yes-1; no-2) ..... [illegible] (69)

[illegible]

8. Identify the number of your permanent employees (full time) [illegible] employed on this site [illegible] ..... [illegible] (70-72)

9. Identify the [illegible] your [illegible] employees [illegible] employed on this site [illegible] ..... [illegible] (73-75)

A

B

C

D

E

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. [illegible]
11. [illegible]

Page 2

Company Name: MOBIL OIL CORP.
Parent Corporation: MOBIL CHEMICAL
Facility Name: MOBIL CHEMICAL

Site Name: CAMPGROUND LANDFILL

A

B. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 3=don't know)

FILL IN EVERY BLOCK SPACE

B

Acid solutions, with pH<3	1	(10)
pickling liquor	1	(11)
metal plating waste	1	(12)
circuit etchings	1	(13)
inorganic acid manufacture	1	(14)
organic acid manufacture	1	(15)
Base solutions, with pH>11	1	(16)
caustic soda manufacture	1	(17)
nylon and similar polymer generation	1	(18)
scrubber residual	1	(19)
Heavy metals & trace metals (bonded organically or inorganically)	1	(20)
arsenic, selenium, antimony	1	(21)
mercury	1	(22)
iron, manganese, magnesium	1	(23)
zinc, cadmium, copper, chromium (trivalent)	1	(24)
chromium (hexavalent)	1	(25)
lead	1	(26)
Radioactive residues, >[illegible] curies/gram	1	(27)
uranium residuals & residuals for the recovery	1	(28)
lanthanide series elements and rare earths	1	(29)
phosphate slag	1	(30)
thorium	1	(31)
radium	1	(32)
other alpha, beta & gamma emitters	1	(33)
Organics	1	(34)
pesticides & intermediates	1	(35)
herbicides & intermediates	1	(36)
fungicides & intermediates	1	(37)
rodenticides & intermediates	1	(38)
halogenated aliphatics	1	(39)
halogenated aromatics	1	(40)
acrylates & latex emulsions	1	(41)
PCB's	1	(42)
amines, amides, imides	1	(43)
plasticizers	1	(44)
[illegible]	1	(45)
fillers	1	(46)
solvents polar (except water)	1	(47)
carbontetrachloride	1	(48)
trichlorethylene	1	(49)
other solvents nonpolar	1	(50)
solvents halogenated aliphatic	1	(51)
solvents halogenated aromatic	1	(52)
oils and oil sludges	1	(53)
esters and ethers	1	(54)
alcohols	1	(55)
ketones & aldehydes	1	(56)
alkanes	1	(57)
Inorganics	1	(58)
salts	1	(59)
mercaptans	1	(60)
Misc	1	(61)
pharmaceutical wastes	1	(62)
paints & pigments	1	(63)
catalysts (eg. vanadium, platinum, palladium)	1	(64)
[illegible]	1	(65)
shock sensitive wastes (eg. nitrates, [illegible])	1	(66)
air water reactive wastes (eg. Na, [illegible])	1	(67)
wastes with flash point below [illegible]	1	(68)

NOTE: This waste is General Trash (i.e., paper, [illegible] filters and rags). For organic solids, [illegible] quantities as to be [illegible] 1.

AUG 15 REC'D

M E M O R A N D U M

August 14, 1978

TO: JACK McCLURE, Chief
Hazardous Waste Management Section

CAROLINE P. HAIGHT, Chief
Non-Hazardous Waste Management Section

FROM: ROBERT L. SHOLAR, Environmental Specialist RLS
Hazardous Waste Management Section

SUBJECT: Drums of Unidentified Waste from Nalco Chemical Company Disposed of a Campground Landfill

On August 11, 1978, I spoke with Mr. Herb Beck of Nalco Chemical Company in Louisville, Kentucky. At my request, Mr. Beck has searched Nalco records to determine the contents of drums which this Division permitted to be buried at Campground Landfill on May 5, 1976.

According to Mr. Beck, a total of five (5) drums were disposed of. Three (3) of the drums were coded 7613 and contained a polyacrylomide organic dispersant. One (1) drum was coded 236 and contained only a small amount of a paper plant microbiocide. The active component of this material is a polyamine salt and its toxic characteristics last about 48 hours. The final drum was coded 7621 - methylene bis-thiocyanate - however, Nalco officials contend that the drum was actually partially filled with an oil sorbent material and not the original contents.

Please attach this memorandum to the original Campground investigation.

RLS/lrw

FILE - CAMPGROUND

M E M O R A N D U M

July 6, 1978

TO: JACK McCLURE, Chief
Hazardous Waste Management Section

FROM: ROBERT L. SHOLAR, Environmental Specialist RLS
Hazardous Waste Management Section

SUBJECT: Industrial Waste Disposal by B.F. Goodrich, Inc. at various Louisville Area Landfills Including Campground Landfill

On June 26, 1978, I met with Mr. Joe Robben and Mr. Joseph Fannen of B.F. Goodrich to discuss industrial waste disposal by that company.

According to Mr. Robben, Goodrich still operates within the framework submitted to the division in 1976 (see attachment). They landfill an assortment of sludges and resins at various Louisville area landfills. The bulk of their material goes to either Mobile Waste, Southern Materials, and/or Campground Landfill. Southern Materials is the primary recipient of an organic sludge containing a host of trace chemicals (ie. . . vinyl chloride monomer, chloroform, carbon tetrachloride, styrene, and acrylonitrile). Of the above, chloroform and VCM were identified as components of gas samples taken from Campground Landfill.

Goodrich's waste disposal program is complex (ie. . . they employ six (6) haulers, two (2) incineration outfits, and utilize four (4) disposal sites), therefore, it is impossible to determine if waste substances have been transported to the wrong landfill. It is possible that no mistakes have been made if one assumes that ground water contamination from Southern Materials Landfill lends to the gas constituents monitored at Campground Landfill. This assumption, if proven, might also explain the presence in gas samples of several un-traceable hydrocarbons and chlorinated hydrocarbons (ie. . . benzene, dichloropropane, methylene chloride, etc...).

Mr. Robben was instructed to reanalyze (on Department forms) each family of wastes to be disposed of so that a complete review of their waste situation might be possible.

Mr. Robben requested a thirty (30) day consideration period and on July 26, 1978, a meeting is planned to discuss B.F. Goodrich's intentions regarding changes in their waste disposal policies.

RLS/lrw

CLASSIFICATION	DESCRIPTION	DISPOSAL METHOD	ANNUAL ESTIMATE VOLUME
I. Waste Treatment Area			
A. Centrifuge Semi-Solids	a. 48-54% TS in H_2O b. Trace monomers including VCM. c. Trace calcium and iron. d. Non-flammable	Landfill to Mobil Waste, Inc.; also can go to Camp Ground Fill, Inc.	5.93 MM Total Wt
B. Skimmer Wastes	a. 13% in H_2O(1) b. Trace monomers including VCM. c. Trace calcium and iron. d. Non-flammable	Landfill to Mobil Waste; also can go to Camp Ground Fill, Inc.	2.13 MM Total Wt without adjustme for new procedur

(1) The method being used as of October 15, 1976, is to drain off excess liquid to industrial waste water treatment facility, therefore the liquid content of waste going to landfill will be reduced. Data is not available at this time as to the TS of remaining sediment.

II. Reactor Material Excluding Lugger and Compactor Material			
A. Geon	a. 20%-60% in H_2O b. Organics such as VCM, chloroform, carbon tetra-chloride may be present. c. Non-flammable	Landfill to Southern Materials Services	1.07 MM Total Wt
B. Abson	a. 30%-50% TS in H_2O b. Organics such as styrene, acrylonitrile may be present. c. Non-flammable	Landfill to Southern Materials Services	.037 MM Total Wt
III. Tanks Other Than Reactors and Interceptor Pits			
A. Geon	a. 20%-60% TS in H_2O b. Organics such as VCM may be present. c. Non-flammable	Landfill to: Southern Materials Services; Camp Ground Fill, Inc.	1.37 MM Total Wt

RECEIVED
1976
DIV. OF SOLID WASTE
LONG BEACH OFFICE

IT II (cont'd)

CLASSIFICATION	DESCRIPTION	DISPOSAL METHOD	ANNUAL ESTIMATI VOLUME
B. Hycar	a. 30%-60% TS in H_2O b. Organics such as acrylonitrile, styrene may be present. c. Non-flammable	Landfill to Southern Materials Services; Camp Ground Fill, Inc.	1.16 MM Total Wt
C. Abson	a. 20-60% TS in H_2O b. Organics such as acrylonitrile, styrene may be present. c. Non-flammable	Landfill to Southern Materials Services; Campground Fill, Inc.	1.38 MM Total Wt
IV. Compactor, Lugger and Drum Disposal			
A. Compactor	Paper, wood, scrap plastic, rubber and construction material.	Landfill to Mobil Waste Control, Inc.	2.3 MM I Total Wt
B. Lugger	Paper, wood, scrap PVC, plastic, rubber construction material, cafeteria wastes.	Landfill to Mobil Waste Control, Inc.	7.3 MM I Total Wt
C. Drum Disposal: Steel and Fiber	Paper, wood, coagulated latex solids, non-hazardous solid scrap raw materials.	Landfill to Camp Ground Fill, Inc.	3.3 MM I Total W
V. Boiler Fly Ash	Cinders	Landfill to Camp Ground Fill, Inc. and Landfill, Inc.	6.86 MM Total W

VI. Miscellaneous Materials

Flammable or hazardous materials. These materials are reviewed by the Environmental Department and disposed of in proper manner, i.e. incineration or chemical treatment.

RECEIVED
NOV 11 1976
DIV. OF SOLID WASTE
LOUISVILLE OFFICE

WASTE HAULERS	USERS	DISPOSAL SITES
1. Blankenship Construction Company 7500 Grade Lane Louisville, Kentucky 40219	1;3; 8	Camp Ground Fill, Inc. 4501 Camp Ground Road Louisville, Kentucky
2. Bramer Construction Company 4314 Cane Run Road Louisville, Kentucky 40216	2;7;4	Southern Materials Services Co., Inc. 3402 Vogt Avenue Louisville, Kentucky
3. B.F.Goodrich Chemical Company Bells Lane Louisville, Kentucky 40211		
4. C. H. Heist Corporation 3811 Cane Run Road Louisville, Kentucky 40211		
5. Industrial Liquid Waste Disposal Co. Rural Route 3 Columbus, Indiana 47201	5	Industrial Liquid Waste Disposal Co. Rural Route 3 Columbus, Indiana
6. Liquid Waste Disposal, Inc. 1292 Fern Valley Road Louisville, Kentucky	6	Liquid Waste Disposal, Inc. 1292 Fern Valley Road Louisville, Kentucky
7. Mid-East Sales Corporation P. O. Box 20161 4317 Taylorsville Road Louisville, Kentucky 40220		
8. Mobil Waste Control, Inc. 7100 Grade Lane Louisville, Kentucky 40219	8	Mobil Waste Control, Inc. I-65 & Outerloop Louisville, Kentucky
	2;	Landfill, Inc. 7510 Grade Lane Louisville, Kentucky 4021[illegible]

M E M O R A N D U M

June 22, 1978

TO: JACK McCLURE, Chief
Hazardous Waste Management Section

FROM: ROBERT L. SHOLAR, Environmental Specialist RLS
Hazardous Waste Management Section

SUBJECT: Industrial Waste Disposal by American Synthetic Rubber Corporation at Campground Landfill

On June 22, 1978, I met with Mr. Jim McGraw, Environmental Engineer, at American Synthetic Rubber Corporation in Louisville, Kentucky. American Synthetic generates two waste products of concern to this Division:

1) Calcium carbonate sludge
2) and rubber fines.

Both of these wastes are lagooned on site. The lagoons are pumped out periodically and the material is hauled to Campground Landfill by American Snythetic.

Item #1, Calcium carbonate sludge, results from lime treatment to soften river water for plant use. It is a pumpable liquid with approximately 20% solids content.

Item #2, the rubber fines, result from a seive process and consist of minute particles of rubber suspended in water. The rubber is non-vulcanized, therefore, biodegradable. Mr. McGraw did not have any information on breakdown products and could not discount the possibility that the decomposition process might release the solvent component of the material. American Synthetic uses Toluene as a primary solvent. (23 ppm in gas sample from Campground Landfill)

Mr. McGraw was informed that these waste materials would likely have to be dewatered or disposed of at another site, or both. Please advise me on this matter.

American Synthetic has on file a letter of permission granted by Mr. Jerry Hurst in 1972. The letter states that the water content of their wastes can be neglected because they utilize an industrial fill which does not accept putrescible or hazardous materials, and the leachate composition should be non-toxic. Since that time American Synthetic has ceased to operate their own landfill and contracts with Blankenship's Campground Landfill, a sanitary fill, into which their landfill property has been incorporated. Due to the altered circumstances the 1972 letter should be revoked and a review of American Synthetics disposal methods is warranted in order to provide a more protective solution to their waste problem.

RLS/lrw

M E M O R A N D U M

June 20, 1978

TO: JACK McCLURE, Chief
Hazardous Waste Management Section

FROM: ROBERT L. SHOLAR, Environmental Specialist RLS
Hazardous Waste Management Section

SUBJECT: Industrial Waste Disposal at Ford's Kentucky Truck Plant

On June 15, 1978, I met with Mr. Dave Madison, Environmental Engineer, at Ford Motor Company's Truck Plant. We discussed three waste by-products generated at this plant:

1) a process lagoon sludge,
2) a paint sludge,
3) and disposal of off-spec paint and solvents.

Item #1, the process lagoon sludge, is currently being treated and disposed of in Indiana by Industrial Liquid Waste Disposal. This is the same waste which the Division permitted for landfilling at Campground Landfill in 1974 as Chemfix material. According to Mr. Madison, Ford no longer utilizes this landfill and the permission may be withdrawn. Mr. Madison intends to analyze this sludge in case an emergency situation should ever require disposal in Kentucky.

Item #2, a paint sludge, is presently transported by lugar box to Mobile Waste Landfill for disposal. Mr. Madison agreed to analyze this sludge and apply for permission to dispose of the same.

Item #3, off-spec paint and solvent, is currently drummed and disposed of at Mobile Waste. Mr. Madison was informed that these materials are unacceptable for landfilling and he intends to contact local recyclers and scavengers as a possible solution to this problem.

Ford also recycles waste oil and their oil wastewater is hauled to Indiana by I.L.W.D.

RLS/lrw

UNSCANNABLE

MEDIA

(PHOTOGRAPHS)

MARY HELEN MILLER
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director *BJ for WEP*
Division of Environmental Services

DATE: September 25, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1600

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-04 Soil Sample

Sample Matrix: Soil **Collection Method:** Grab

REPORT OF ANALYSIS

Report No: B14-0001 **SA No:** 87-3336

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.787 mg/kg
Arsenic	0.047 mg/kg
Barium	101 mg/kg
Cadmium	0.056 mg/kg
Chromium	183 mg/kg
Lead	36.8 mg/kg
Mercury	0.059 mg/kg
Selenium	0.615 mg/kg
Silver	0.163 mg/kg
Methylene Chloride	< 25.0 mg/kg
1,2-Dichloroethene	< 5.0 mg/kg
Chloroform	< 5.0 mg/kg
1,2-Dichloroethane	< 5.0 mg/kg
1,1,1-Trichloroethane	< 5.0 mg/kg
Carbon Tetrachloride	< 5.0 mg/kg

Bromodichloromethane	< 5.0 mg/kg
Trichloroethene	< 5.0 mg/kg
1,2-Dichloropropane	< 5.0 mg/kg
Dibromochloromethane	< 5.0 mg/kg
Chloroethylvinylether	< 5.0 mg/kg
Bromoform	< 5.0 mg/kg
Tetrachloroethene	< 5.0 mg/kg
Chlorobenzene	< 5.0 mg/kg
Benzene	< 5.0 mg/kg
Toluene	< 5.0 mg/kg
Ethylbenzene	< 5.0 mg/kg
o-Xylene	< 5.0 mg/kg
m-Xylene	< 5.0 mg/kg
p-Xylene	< 5.0 mg/kg
Total Xylenes	< 5.0 mg/kg
Styrene	< 5.0 mg/kg
o-Chlorotoluene	< 5.0 mg/kg
Hexachlorobenzene	< 5.0 mg/kg
Hexachlorocyclohexane, alpha isomer	< 0.01 mg/kg
Hexachlorocyclohexane, beta isomer	< 0.01 mg/kg
Hexachlorocyclohexane, gamma isomer	< 0.01 mg/kg
Hexachlorocyclohexane, delta isomer	< 0.01 mg/kg
Heptachlor	< 0.01 mg/kg
Aldrin	< 0.01 mg/kg
Heptachlor Epoxide	< 0.01 mg/kg
Oxychlordane	< 0.01 mg/kg
t-Chlordane	< 0.01 mg/kg
c-Chlordane	< 0.01 mg/kg
t-Nonachlor	< 0.01 mg/kg
alpha-Chlordene	< 0.01 mg/kg
Chlordene	< 0.01 mg/kg
gamma-Chlordene	< 0.01 mg/kg
cis-Nonachlor	< 0.01 mg/kg
O, P' - DDE	< 0.01 mg/kg
P, P' - DDE	< 0.01 mg/kg
Dieldrin	< 0.01 mg/kg
Endrin	< 0.01 mg/kg
O, P' - DDD	< 0.01 mg/kg
P, P' - DDD	< 0.01 mg/kg
O, P' - DDT	< 0.01 mg/kg
P, P' - DDT	< 0.01 mg/kg
Total DDT	< 0.01 mg/kg
Methoxychlor	< 0.01 mg/kg
Mirex	< 0.01 mg/kg
Endosulfan I	< 0.01 mg/kg
Endosulfan II	< 0.01 mg/kg
Endosulfan Sulfate	< 0.01 mg/kg
Endrin Aldehyde	< 0.01 mg/kg
Endrin Ketone	< 0.01 mg/kg
Toxaphene	< 0.01 mg/kg
Dicamba	< 0.1 mg/kg
	< 0.010 mg/kg

2,4-Dichlorophenoxyacetic Acid	< 0.010 mg/kg
2,4,5-Trichlorophenoxyacetic Acid	< 0.010 mg/kg
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.010 mg/kg
Picloram	< 0.010 mg/kg
Aroclor 1016	< 0.1 mg/kg
Aroclor 1221	< 0.1 mg/kg
Aroclor 1232	< 0.1 mg/kg
Aroclor 1242	< 0.1 mg/kg
Aroclor 1248	< 0.1 mg/kg
Aroclor 1254	< 0.1 mg/kg
Aroclor 1260	< 0.1 mg/kg
Aroclor 1262	< 0.1 mg/kg
Aroclor 1268	< 0.1 mg/kg
Phenol	< 2.0 mg/kg
Aniline	< 2.0 mg/kg
Bis-(2-Chloroethyl) ether	< 2.0 mg/kg
2-Chlorophenol	< 2.0 mg/kg
1,3-Dichlorobenzene	< 2.0 mg/kg
1,4-Dichlorobenzene	< 2.0 mg/kg
Benzyl Alcohol	< 2.0 mg/kg
1,2-Dichlorobenzene	< 2.0 mg/kg
2-Methylphenol	< 2.0 mg/kg
Bis-(2-Chloroisopropyl) ether	< 2.0 mg/kg
4-Methylphenol	< 2.0 mg/kg
N-Nitroso-di-n-propylamine	< 2.0 mg/kg
Hexachloroethane	< 2.0 mg/kg
Nitrobenzene	< 2.0 mg/kg
Isophorone	< 2.0 mg/kg
2-Nitrophenol	< 2.0 mg/kg
2,4-Dimethyphenol	< 2.0 mg/kg
Bis-(2-Chloroethoxy)methane	< 2.0 mg/kg
Benzoic Acid	< 8.0 mg/kg
2,4-Dichlorophenol	< 2.0 mg/kg
1,2,4-Trichlorobenzene	< 2.0 mg/kg
Naphthalene	< 2.0 mg/kg
4-Chloroaniline	< 2.0 mg/kg
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 2.0 mg/kg
4-Chloro-3-methylphenol	< 2.0 mg/kg
2-Methylnaphthalene	< 2.0 mg/kg
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 2.0 mg/kg
2,4,6-Trichlorophenol	< 2.0 mg/kg
2,4,5-Trichlorophenol	< 2.0 mg/kg
2-Chloronaphthalene	< 2.0 mg/kg
2-Nitroaniline	< 2.0 mg/kg
Dimethyl Phthalate	< 2.0 mg/kg
Acenaphthylene	< 2.0 mg/kg
2,6-Dinitrotoluene	< 2.0 mg/kg
3-Nitroaniline	< 2.0 mg/kg
Acenaphthene	< 2.0 mg/kg
2,4-Dinitrophenol	< 8.0 mg/kg
4-Nitrophenol	< 2.0 mg/kg

Report No: B14-0001
SA No: 87-3336

Dibenzofuran	< 2.0 mg/kg
2,4-Dinitrotoluene	< 2.0 mg/kg
Diethyl Phthalate	< 2.0 mg/kg
Fluorene	< 2.0 mg/kg
4-Chlorophenyl phenyl ether	< 2.0 mg/kg
4-Nitroaniline	< 2.0 mg/kg
2-Methyl-4,6-Dinitrophenol	< 2.0 mg/kg
N-Nitrosodiphenylamine	< 2.0 mg/kg
1,2-Diphenylhydrazine	< 2.0 mg/kg
4-Bromophenylphenylether	< 2.0 mg/kg
Hexachlorobenzene	< 2.0 mg/kg
Pentachlorophenol	< 2.0 mg/kg
Phenanthrene	< 2.0 mg/kg
Anthracene	< 2.0 mg/kg
Dibutyl Phthalate	< 2.0 mg/kg
Fluoranthene	< 2.0 mg/kg
Benzidine	< 2.0 mg/kg
Pyrene	< 2.0 mg/kg
Butyl Benzyl Phthalate	< 2.0 mg/kg
3,3'-Dichlorobenzidine	< 2.0 mg/kg
Benzo(A)Anthracene	< 2.0 mg/kg
Chrysene	< 2.0 mg/kg
Bis(2-Ethylhexyl)Phthlate	< 2.0 mg/kg
Dioctylphthalate	< 2.0 mg/kg *
Benzo(B)Fluoranthene	< 2.0 mg/kg
Benzo(K)Fluoranthene	< 2.0 mg/kg
Benzo(A)Pyrene	< 2.0 mg/kg
Indeno(1,2,3-C,D)Pyrene	< 2.0 mg/kg
Dibenzo(A,H)Anthracene	< 2.0 mg/kg
Benzo(G,H,I)Perylene	< 2.0 mg/kg

*Compound detected below quantification limits.

MARY HELEN MILLER
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director SA for WED
Division of Environmental Services

DATE: September 28, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1630

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-05 Sediment Sample

Sample Matrix: Sediment **Collection Method:** Composite

REPORT OF ANALYSIS

Report No: B14-0002 **SA No:** 87-3337

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.887 mg/kg
Arsenic	2.98 mg/kg
Barium	98.1 mg/kg
Cadmium	0.036 mg/kg
Chromium	74.5 mg/kg
Lead	16.3 mg/kg
Mercury	0.041 mg/kg
Selenium	0.144 mg/kg
Silver	0.154 mg/kg
Methylene Chloride	< 25.0 mg/kg
1,2-Dichloroethene	< 5.0 mg/kg
Chloroform	< 5.0 mg/kg
1,2-Dichloroethane	< 5.0 mg/kg
1,1,1-Trichloroethane	< 5.0 mg/kg
Carbon Tetrachloride	< 5.0 mg/kg

Bromodichloromethane	< 5.0 mg/kg
Trichloroethene	< 5.0 mg/kg
1,2-Dichloropropane	< 5.0 mg/kg
Dibromochloromethane	< 5.0 mg/kg
Chloroethylvinylether	< 5.0 mg/kg
Bromoform	< 5.0 mg/kg
Tetrachloroethene	< 5.0 mg/kg
Chlorobenzene	< 5.0 mg/kg
Benzene	< 5.0 mg/kg
Toluene	< 5.0 mg/kg
Ethylbenzene	< 5.0 mg/kg
o-Xylene	< 5.0 mg/kg
m-Xylene	< 5.0 mg/kg
p-Xylene	< 5.0 mg/kg
Total Xylenes	< 5.0 mg/kg
Styrene	< 5.0 mg/kg
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Hexachlorobenzene	< 5.0 mg/kg
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Hexachlorocyclohexane, gamma isomer	< 0.01 mg/kg
Hexachlorocyclohexane, delta isomer	< 0.01 mg/kg
Heptachlor	< 0.01 mg/kg
Aldrin	< 0.01 mg/kg
Heptachlor Epoxide	< 0.01 mg/kg
Oxychlordane	< 0.01 mg/kg
t-Chlordane	< 0.01 mg/kg
c-Chlordane	< 0.01 mg/kg
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Chlordene	< 0.01 mg/kg
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cis-Nonachlor	< 0.01 mg/kg
O, P' - DDE	< 0.01 mg/kg
P, P' - DDE	< 0.01 mg/kg
Dieldrin	< 0.01 mg/kg
Endrin	< 0.01 mg/kg
O, P' - DDD	< 0.01 mg/kg
P, P' - DDD	< 0.01 mg/kg
O, P' - DDT	< 0.01 mg/kg
P, P' - DDT	< 0.01 mg/kg
Total DDT	< 0.01 mg/kg
Methoxychlor	< 0.01 mg/kg
Mirex	< 0.01 mg/kg
Endosulfan I	< 0.01 mg/kg
Endosulfan II	< 0.01 mg/kg
Endosulfan Sulfate	< 0.01 mg/kg
Endrin Aldehyde	< 0.01 mg/kg
Endrin Ketone	< 0.01 mg/kg
Toxaphene	< 0.01 mg/kg
Dicamba	< 0.1 mg/kg
	< 0.010 mg/kg

2,4-Dichlorophenoxyacetic Acid	< 0.010 mg/kg
2,4,5-Trichlorophenoxyacetic Acid	< 0.010 mg/kg
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.010 mg/kg
Picloram	< 0.010 mg/kg
Aroclor 1016	< 0.1 mg/kg
Aroclor 1221	< 0.1 mg/kg
Aroclor 1232	< 0.1 mg/kg
Aroclor 1242	< 0.1 mg/kg
Aroclor 1248	< 0.1 mg/kg
Aroclor 1284	< 0.1 mg/kg
Aroclor 1260	< 0.1 mg/kg
Aroclor 1262	< 0.1 mg/kg
Aroclor 1268	< 0.1 mg/kg
Phenol	< 2.0 mg/kg
Aniline	< 2.0 mg/kg
Bis-(2-Chloroethyl) ether	< 2.0 mg/kg
2-Chlorophenol	< 2.0 mg/kg
1,3-Dichlorobenzene	< 2.0 mg/kg
1,4-Dichlorobenzene	< 2.0 mg/kg
Benzyl Alcohol	< 2.0 mg/kg
1,2-Dichlorobenzene	< 2.0 mg/kg
2-Methylphenol	< 2.0 mg/kg
Bis-(2-Chloroisopropyl) ether	< 2.0 mg/kg
4-Methylphenol	< 2.0 mg/kg
N-Nitroso-di-n-propylamine	< 2.0 mg/kg
Hexachloroethane	< 2.0 mg/kg
Nitrobenzene	< 2.0 mg/kg
Isophorone	< 2.0 mg/kg
2-Nitrophenol	< 2.0 mg/kg
2,4-Dimethyphenol	< 2.0 mg/kg
Bis-(2-Chloroethoxy)methane	< 2.0 mg/kg
Benzoic Acid	< 8.0 mg/kg
2,4-Dichlorophenol	< 2.0 mg/kg
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Naphthalene	< 2.0 mg/kg
4-Chloroaniline	< 2.0 mg/kg
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 2.0 mg/kg
4-Chloro-3-methylphenol	< 2.0 mg/kg
2-Methylnaphthalene	< 2.0 mg/kg
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 2.0 mg/kg
2,4,6-Trichlorophenol	< 2.0 mg/kg
2,4,5-Trichlorophenol	< 2.0 mg/kg
2-Chloronaphthalene	< 2.0 mg/kg
2-Nitroaniline	< 2.0 mg/kg
Dimethyl Phthalate	< 2.0 mg/kg
Acenaphthylene	< 2.0 mg/kg
2,6-Dinitrotoluene	< 2.0 mg/kg
3-Nitroaniline	< 2.0 mg/kg
Acenaphthene	< 2.0 mg/kg
2,4-Dinitrophenol	< 8.0 mg/kg
4-Nitrophenol	< 2.0 mg/kg

Dibenzofuran	< 2.0 mg/kg
2,4-Dinitrotoluene	< 2.0 mg/kg
Diethyl Phthalate	< 2.0 mg/kg
Fluorene	< 2.0 mg/kg
4-Chlorophenyl phenyl ether	< 2.0 mg/kg
4-Nitroaniline	< 2.0 mg/kg
2-Methyl-4,6-Dinitrophenol	< 2.0 mg/kg
N-Nitrosodiphenylamine	< 2.0 mg/kg
1,2-Diphenylhydrazine	< 2.0 mg/kg
4-Bromophenylphenylether	< 2.0 mg/kg
Hexachlorobenzene	< 2.0 mg/kg
Pentachlorophenol	< 2.0 mg/kg
Phenanthrene	< 2.0 mg/kg
Anthracene	< 2.0 mg/kg
Dibutyl Phthalate	< 2.0 mg/kg
Fluoranthene	< 2.0 mg/kg
Benzidine	< 2.0 mg/kg
Pyrene	< 2.0 mg/kg
Butyl Benzyl Phthalate	< 2.0 mg/kg
3,3'-Dichlorobenzidine	< 2.0 mg/kg
Benzo(A)Anthracene	< 2.0 mg/kg
Chrysene	< 2.0 mg/kg
Bis(2-Ethylhexyl)Phthlate	< 2.0 mg/kg
Dioctylphthalate	< 2.0 mg/kg
Benzo(B)Fluoranthene	< 2.0 mg/kg
Benzo(K)Fluoranthene	< 2.0 mg/kg
Benzo(A)Pyrene	< 2.0 mg/kg
Indeno(1,2,3-C,D)Pyrene	< 2.0 mg/kg
Dibenzo(A,H)Anthracene	< 2.0 mg/kg
Benzo(G,H,I)Perylene	< 2.0 mg/kg

MARY HELEN MILLER
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director SS for WED
Division of Environmental Services

DATE: September 28, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1635

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-06 Sediment Sample

Sample Matrix: Sediment **Collection Method:** Composite

REPORT OF ANALYSIS

Report No: B14-0003 **SA No:** 87-3338

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.971 mg/kg
Arsenic	2.84 mg/kg
Barium	89.3 mg/kg
Cadmium	0.010 mg/kg
Chromium	30.8 mg/kg
Lead	11.9 mg/kg
Mercury	0.027 mg/kg
Selenium	0.291 mg/kg
Silver	0.078 mg/kg
Methylene Chloride	< 25.0 mg/kg
1,2-Dichloroethene	< 5.0 mg/kg
Chloroform	< 5.0 mg/kg
1,2-Dichloroethane	< 5.0 mg/kg
1,1,1-Trichloroethane	< 5.0 mg/kg
Carbon Tetrachloride	< 5.0 mg/kg

Bromodichloromethane	< 5.0 mg/kg
Trichloroethene	< 5.0 mg/kg
1,2-Dichloropropane	< 5.0 mg/kg
Dibromochloromethane	< 5.0 mg/kg
Chloroethylvinylether	< 5.0 mg/kg
Bromoform	< 5.0 mg/kg
Tetrachloroethene	< 5.0 mg/kg
Chlorobenzene	< 5.0 mg/kg
Benzene	< 5.0 mg/kg
Toluene	< 5.0 mg/kg
Ethylbenzene	< 5.0 mg/kg
o-Xylene	< 5.0 mg/kg
m-Xylene	< 5.0 mg/kg
p-Xylene	< 5.0 mg/kg
Total Xylenes	< 5.0 mg/kg
Styrene	< 5.0 mg/kg
o-Chlorotoluene	< 5.0 mg/kg
Hexachlorobenzene	< 5.0 mg/kg
Hexachlorocyclohexane, alpha isomer	< 0.01 mg/kg
Hexachlorocyclohexane, beta isomer	< 0.01 mg/kg
Hexachlorocyclohexane, gamma isomer	< 0.01 mg/kg
Hexachlorocyclohexane, delta isomer	< 0.01 mg/kg
Heptachlor	< 0.01 mg/kg
Aldrin	< 0.01 mg/kg
Heptachlor Epoxide	< 0.01 mg/kg
Oxychlordane	< 0.01 mg/kg
t-Chlordane	< 0.01 mg/kg
c-Chlordane	< 0.01 mg/kg
t-Nonachlor	< 0.01 mg/kg
alpha-Chlordene	< 0.01 mg/kg
Chlordene	< 0.01 mg/kg
gamma-Chlordene	< 0.01 mg/kg
cis-Nonachlor	< 0.01 mg/kg
O, P' - DDE	< 0.01 mg/kg
P, P' - DDE	< 0.01 mg/kg
Dieldrin	< 0.01 mg/kg
Endrin	< 0.01 mg/kg
O, P' - DDD	< 0.01 mg/kg
P, P' - DDD	< 0.01 mg/kg
O, P' - DDT	< 0.01 mg/kg
P, P' - DDT	< 0.01 mg/kg
Total DDT	< 0.01 mg/kg
Methoxychlor	< 0.01 mg/kg
Mirex	< 0.01 mg/kg
Endosulfan I	< 0.01 mg/kg
Endosulfan II	< 0.01 mg/kg
Endosulfan Sulfate	< 0.01 mg/kg
Endrin Aldehyde	< 0.01 mg/kg
Endrin Ketone	< 0.01 mg/kg
Toxaphene	< 0.01 mg/kg
Dicamba	< 0.1 mg/kg
	< 0.010 mg/kg

2,4-Dichlorophenoxyacetic Acid	< 0.010 mg/kg
2,4,5-Trichlorophenoxyacetic Acid	< 0.010 mg/kg
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.010 mg/kg
Picloram	< 0.010 mg/kg
Aroclor 1016	< 0.1 mg/kg
Aroclor 1221	< 0.1 mg/kg
Aroclor 1232	< 0.1 mg/kg
Aroclor 1242	< 0.1 mg/kg
Aroclor 1248	< 0.1 mg/kg
Aroclor 1284	< 0.1 mg/kg
Aroclor 1260	< 0.1 mg/kg
Aroclor 1262	< 0.1 mg/kg
Aroclor 1268	< 0.1 mg/kg
Phenol	< 1.5 mg/kg
Aniline	< 1.5 mg/kg
Bis-(2-Chloroethyl) ether	< 1.5 mg/kg
2-Chlorophenol	< 1.5 mg/kg
1,3-Dichlorobenzene	< 1.5 mg/kg
1,4-Dichlorobenzene	< 1.5 mg/kg
Benzyl Alcohol	< 1.5 mg/kg
1,2-Dichlorobenzene	< 1.5 mg/kg
2-Methylphenol	< 1.5 mg/kg
Bis-(2-Chloroisopropyl) ether	< 1.5 mg/kg
4-Methylphenol	< 1.5 mg/kg
N-Nitroso-di-n-propylamine	< 1.5 mg/kg
Hexachloroethane	< 1.5 mg/kg
Nitrobenzene	< 1.5 mg/kg
Isophorone	< 1.5 mg/kg
2-Nitrophenol	< 1.5 mg/kg
2,4-Dimethyphenol	< 1.5 mg/kg
Bis-(2-Chloroethoxy)methane	< 1.5 mg/kg
Benzoic Acid	< 6.0 mg/kg
2,4-Dichlorophenol	< 1.5 mg/kg
1,2,4-Trichlorobenzene	< 1.5 mg/kg
Naphthalene	< 1.5 mg/kg
4-Chloroaniline	< 1.5 mg/kg
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 1.5 mg/kg
4-Chloro-3-methylphenol	< 1.5 mg/kg
2-Methylnaphthalene	< 1.5 mg/kg
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 1.5 mg/kg
2,4,6-Trichlorophenol	< 1.5 mg/kg
2,4,5-Trichlorophenol	< 1.5 mg/kg
2-Chloronaphthalene	< 1.5 mg/kg
2-Nitroaniline	< 1.5 mg/kg
Dimethyl Phthalate	< 1.5 mg/kg
Acenaphthylene	< 1.5 mg/kg
2,6-Dinitrotoluene	< 1.5 mg/kg
3-Nitroaniline	< 1.5 mg/kg
Acenaphthene	< 1.5 mg/kg
2,4-Dinitrophenol	< 6.0 mg/kg
4-Nitrophenol	< 1.5 mg/kg

Dibenzofuran	< 1.5 mg/kg
2,4-Dinitrotoluene	< 1.5 mg/kg
Diethyl Phthalate	< 1.5 mg/kg
Fluorene	< 1.5 mg/kg
4-Chlorophenyl phenyl ether	< 1.5 mg/kg
4-Nitroaniline	< 1.5 mg/kg
2-Methyl-4,6-Dinitrophenol	< 1.5 mg/kg
N-Nitrosodiphenylamine	< 1.5 mg/kg
1,2-Diphenylhydrazine	< 1.5 mg/kg
4-Bromophenylphenylether	< 1.5 mg/kg
Hexachlorobenzene	< 1.5 mg/kg
Pentachlorophenol	< 1.5 mg/kg
Phenanthrene	< 1.5 mg/kg
Anthracene	< 1.5 mg/kg
Dibutyl Phthalate	< 1.5 mg/kg
Fluoranthene	< 1.5 mg/kg
Benzidine	< 1.5 mg/kg
Pyrene	< 1.5 mg/kg
Butyl Benzyl Phthalate	< 1.5 mg/kg
3,3'-Dichlorobenzidine	< 1.5 mg/kg
Benzo(A)Anthracene	< 1.5 mg/kg
Chrysene	< 1.5 mg/kg
Bis(2-Ethylhexyl)Phthlate	< 1.5 mg/kg
Dioctylphthalate	< 1.5 mg/kg
Benzo(B)Fluoranthene	< 1.5 mg/kg
Benzo(K)Fluoranthene	< 1.5 mg/kg
Benzo(A)Pyrene	< 1.5 mg/kg
Indeno(1,2,3-C,D)Pyrene	< 1.5 mg/kg
Dibenzo(A,H)Anthracene	< 1.5 mg/kg
Benzo(G,H,I)Perylene	< 1.5 mg/kg

MARY HELEN MILLER
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MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director *BS for WED*
Division of Environmental Services

DATE: September 28, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1710

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-07 Leachate Sediment

Sample Matrix: Sediment **Collection Method:** Grab

REPORT OF ANALYSIS

Report No: B14-0004 **SA No:** 87-3339

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.848 mg/kg
Arsenic	2.28 mg/kg
Barium	122 mg/kg
Cadmium	0.009 mg/kg
Chromium	11.9 mg/kg
Lead	14.2 mg/kg
Mercury	0.024 mg/kg
Selenium	< 0.139 mg/kg
Silver	0.120 mg/kg
Methylene Chloride	< 25.0 mg/kg
1,2-Dichloroethene	< 5.0 mg/kg
Chloroform	< 5.0 mg/kg
1,2-Dichloroethane	< 5.0 mg/kg
1,1,1-Trichloroethane	< 5.0 mg/kg
Carbon Tetrachloride	< 5.0 mg/kg

Bromodichloromethane	< 5.0 mg/kg
Trichloroethene	< 5.0 mg/kg
1,2-Dichloropropane	< 5.0 mg/kg
Dibromochloromethane	< 5.0 mg/kg
Chloroethylvinylether	< 5.0 mg/kg
Bromoform	< 5.0 mg/kg
Tetrachloroethene	< 5.0 mg/kg
Chlorobenzene	< 5.0 mg/kg
Benzene	< 5.0 mg/kg
Toluene	< 5.0 mg/kg
Ethylbenzene	< 5.0 mg/kg
o-Xylene	< 5.0 mg/kg
m-Xylene	< 5.0 mg/kg
p-Xylene	< 5.0 mg/kg
Total Xylenes	< 5.0 mg/kg
Styrene	< 5.0 mg/kg
o-Chlorotoluene	< 5.0 mg/kg
Hexachlorobenzene	< 0.01 mg/kg
Hexachlorocyclohexane, alpha isomer	< 0.01 mg/kg
Hexachlorocyclohexane, beta isomer	< 0.01 mg/kg
Hexachlorocyclohexane, gamma isomer	< 0.01 mg/kg
Hexachlorocyclohexane, delta isomer	< 0.01 mg/kg
Heptachlor	< 0.01 mg/kg
Aldrin	< 0.01 mg/kg
Heptachlor Epoxide	< 0.01 mg/kg
Oxychlordane	< 0.01 mg/kg
t-Chlordane	< 0.01 mg/kg
c-Chlordane	< 0.01 mg/kg
t-Nonachlor	< 0.01 mg/kg
alpha-Chlordene	< 0.01 mg/kg
Chlordene	< 0.01 mg/kg
gamma-Chlordene	< 0.01 mg/kg
cis-Nonachlor	< 0.01 mg/kg
O, P' - DDE	< 0.01 mg/kg
P, P' - DDE	< 0.01 mg/kg
Dieldrin	< 0.01 mg/kg
Endrin	< 0.01 mg/kg
O, P' - DDD	< 0.01 mg/kg
P, P' - DDD	< 0.01 mg/kg
O, P' - DDT	< 0.01 mg/kg
P, P' - DDT	< 0.01 mg/kg
Total DDT	< 0.01 mg/kg
Methoxychlor	< 0.01 mg/kg
Mirex	< 0.01 mg/kg
Endosulfan I	< 0.01 mg/kg
Endosulfan II	< 0.01 mg/kg
Endosulfan Sulfate	< 0.01 mg/kg
Endrin Aldehyde	< 0.01 mg/kg
Endrin Ketone	< 0.01 mg/kg
Toxaphene	< 0.1 mg/kg
Dicamba	< 0.010 mg/kg

2,4-Dichlorophenoxyacetic Acid	< 0.010 mg/kg
2,4,5-Trichlorophenoxyacetic Acid	< 0.010 mg/kg
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.010 mg/kg
Picloram	< 0.010 mg/kg
Aroclor 1016	< 0.1 mg/kg
Aroclor 1221	< 0.1 mg/kg
Aroclor 1232	< 0.1 mg/kg
Aroclor 1242	< 0.1 mg/kg
Aroclor 1248	< 0.1 mg/kg
Aroclor 1284	< 0.1 mg/kg
Aroclor 1260	< 0.1 mg/kg
Aroclor 1262	< 0.1 mg/kg
Aroclor 1268	< 0.1 mg/kg
Phenol	< 2.5 mg/kg
Aniline	< 2.5 mg/kg
Bis-(2-Chloroethyl) ether	< 2.5 mg/kg
2-Chlorophenol	< 2.5 mg/kg
1,3-Dichlorobenzene	< 2.5 mg/kg
1,4-Dichlorobenzene	< 2.5 mg/kg
Benzyl Alcohol	< 2.5 mg/kg
1,2-Dichlorobenzene	< 2.5 mg/kg
2-Methylphenol	< 2.5 mg/kg
Bis-(2-Chloroisopropyl) ether	< 2.5 mg/kg
4-Methylphenol	< 2.5 mg/kg
N-Nitroso-di-n-propylamine	< 2.5 mg/kg
Hexachloroethane	< 2.5 mg/kg
Nitrobenzene	< 2.5 mg/kg
Isophorone	< 2.5 mg/kg
2-Nitrophenol	< 2.5 mg/kg
2,4-Dimethyphenol	< 2.5 mg/kg
Bis-(2-Chloroethoxy)methane	< 2.5 mg/kg
Benzoic Acid	< 10.0 mg/kg
2,4-Dichlorophenol	< 2.5 mg/kg
1,2,4-Trichlorobenzene	< 2.5 mg/kg
Naphthalene	< 2.5 mg/kg
4-Chloroaniline	< 2.5 mg/kg
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 2.5 mg/kg
4-Chloro-3-methylphenol	< 2.5 mg/kg
2-Methylnaphthalene	< 2.5 mg/kg
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 2.5 mg/kg
2,4,6-Trichlorophenol	< 2.5 mg/kg
2,4,5-Trichlorophenol	< 2.5 mg/kg
2-Chloronaphthalene	< 2.5 mg/kg
2-Nitroaniline	< 2.5 mg/kg
Dimethyl Phthalate	< 2.5 mg/kg
Acenaphthylene	< 2.5 mg/kg
2,6-Dinitrotoluene	< 2.5 mg/kg
3-Nitroaniline	< 2.5 mg/kg
Acenaphthene	< 2.5 mg/kg
2,4-Dinitrophenol	< 10.0 mg/kg
4-Nitrophenol	< 2.5 mg/kg

Dibenzofuran	< 2.5 mg/kg
2,4-Dinitrotoluene	< 2.5 mg/kg
Diethyl Phthalate	< 2.5 mg/kg
Fluorene	< 2.5 mg/kg
4-Chlorophenyl phenyl ether	< 2.5 mg/kg
4-Nitroaniline	< 2.5 mg/kg
2-Methyl-4,6-Dinitrophenol	< 2.5 mg/kg
N-Nitrosodiphenylamine	< 2.5 mg/kg
1,2-Diphenylhydrazine	< 2.5 mg/kg
4-Bromophenylphenylether	< 2.5 mg/kg
Hexachlorobenzene	< 2.5 mg/kg
Pentachlorophenol	< 2.5 mg/kg
Phenanthrene	< 2.5 mg/kg
Anthracene	< 2.5 mg/kg
Dibutyl Phthalate	< 2.5 mg/kg
Fluoranthene	< 2.5 mg/kg
Benzidine	< 2.5 mg/kg
Pyrene	< 2.5 mg/kg
Butyl Benzyl Phthalate	< 2.5 mg/kg
3,3'-Dichlorobenzidine	< 2.5 mg/kg
Benzo(A)Anthracene	< 2.5 mg/kg
Chrysene	< 2.5 mg/kg
Bis(2-Ethylhexyl)Phthlate	< 2.5 mg/kg
Dioctylphthalate	< 2.5 mg/kg
Benzo(B)Fluoranthene	< 2.5 mg/kg
Benzo(K)Fluoranthene	< 2.5 mg/kg
Benzo(A)Pyrene	< 2.5 mg/kg
Indeno(1,2,3-C,D)Pyrene	< 2.5 mg/kg
Dibenzo(A,H)Anthracene	< 2.5 mg/kg
Benzo(G,H,I)Perylene	< 2.5 mg/kg

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COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director
Division of Environmental Services

DATE: September 28, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1100

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-01 Ground water monitoring well

Sample Matrix: Water **Collection Method:** Grab

REPORT OF ANALYSIS

Report No: B14-0005 **SA No: 87-3340**

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.010 mg/l
Arsenic	< 0.002 mg/l
Barium	0.030 mg/l
Cadmium	< 0.001 mg/l
Chromium	< 0.001 mg/l
Lead	< 0.002 mg/l
Mercury	< 0.0001 mg/l
Selenium	< 0.002 mg/l
Silver	< 0.001 mg/l
Methylene Chloride	< 0.005 mg/l
1,2-Dichloroethene	< 0.001 mg/l
Chloroform	< 0.001 mg/l
1,2-Dichloroethane	< 0.001 mg/l
1,1,1-Trichloroethane	< 0.001 mg/l
Carbon Tetrachloride	< 0.001 mg/l

Bromodichloromethane	< 0.001 mg/l
Trichloroethene	< 0.001 mg/l
1,2-Dichloropropane	< 0.001 mg/l
Dibromochloromethane	< 0.001 mg/l
Chloroethylvinylether	< 0.001 mg/l
Bromoform	< 0.001 mg/l
Tetrachloroethene	< 0.001 mg/l
Chlorobenzene	< 0.001 mg/l
Benzene	< 0.001 mg/l
Toluene	< 0.001 mg/l
Ethylbenzene	< 0.001 mg/l
o-Xylene	< 0.001 mg/l
m-Xylene	< 0.001 mg/l
p-Xylene	< 0.001 mg/l
Total Xylenes	< 0.001 mg/l
Styrene	< 0.001 mg/l
o-Chlorotoluene	< 0.001 mg/l
Hexachlorobenzene	< 0.0001 mg/l
Hexachlorocyclohexane, alpha isomer	< 0.0001 mg/l
Hexachlorocyclohexane, beta isomer	< 0.0001 mg/l
Hexachlorocyclohexane, gamma isomer	< 0.0001 mg/l
Hexachlorocyclohexane, delta isomer	< 0.0001 mg/l
Heptachlor	< 0.0001 mg/l
Aldrin	< 0.0001 mg/l
Heptachlor Epoxide	< 0.0001 mg/l
Oxychlordane	< 0.0001 mg/l
t-Chlordane	< 0.0001 mg/l
c-Chlordane	< 0.0001 mg/l
t-Nonachlor	< 0.0001 mg/l
alpha-Chlordene	< 0.0001 mg/l
Chlordene	< 0.0001 mg/l
gamma-Chlordene	< 0.0001 mg/l
cis-Nonachlor	< 0.0001 mg/l
O, P' - DDE	< 0.0001 mg/l
P, P' - DDE	< 0.0001 mg/l
Dieldrin	< 0.0001 mg/l
Endrin	< 0.0001 mg/l
O, P' - DDD	< 0.0001 mg/l
P, P' - DDD	< 0.0001 mg/l
O, P' - DDT	< 0.0001 mg/l
P, P' - DDT	< 0.0001 mg/l
Total DDT	< 0.0001 mg/l
Methoxychlor	< 0.0001 mg/l
Mirex	< 0.0001 mg/l
Endosulfan I	< 0.0001 mg/l
Endosulfan II	< 0.0001 mg/l
Endosulfan Sulfate	< 0.0001 mg/l
Endrin Aldehyde	< 0.0001 mg/l
Endrin Ketone	< 0.0001 mg/l
Toxaphene	< 0.001 mg/l
Dicamba	< 0.001 mg/l

2,4-Dichlorophenoxyacetic Acid	< 0.001 mg/l	
2,4,5-Trichlorophenoxyacetic Acid	< 0.001 mg/l	
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.001 mg/l	
Picloram	< 0.001 mg/l	
Aroclor 1016	< 0.001 mg/l	
Aroclor 1221	< 0.001 mg/l	
Aroclor 1232	< 0.001 mg/l	
Aroclor 1242	< 0.001 mg/l	
Aroclor 1248	< 0.001 mg/l	
Aroclor 1284	< 0.001 mg/l	
Aroclor 1260	< 0.001 mg/l	
Aroclor 1262	< 0.001 mg/l	
Aroclor 1268	< 0.001 mg/l	
Phenol	< 0.021 mg/l	
Aniline	< 0.021 mg/l	
Bis-(2-Chloroethyl) ether	< 0.021 mg/l	
2-Chlorophenol	< 0.021 mg/l	*
1,3-Dichlorobenzene	< 0.021 mg/l	
1,4-Dichlorobenzene	< 0.021 mg/l	
Benzyl Alcohol	< 0.021 mg/l	
1,2-Dichlorobenzene	< 0.021 mg/l	
2-Methylphenol	< 0.021 mg/l	*
4-Methylphenol	< 0.021 mg/l	*
Bis-(2-Chloroisopropyl) ether	< 0.021 mg/l	
N-Nitroso-di-n-propylamine	< 0.021 mg/l	
Hexachloroethane	< 0.021 mg/l	
Nitrobenzene	< 0.021 mg/l	
Isophorone	< 0.021 mg/l	
2-Nitrophenol	< 0.021 mg/l	*
2,4-Dimethyphenol	< 0.021 mg/l	*
Bis-(2-Chloroethoxy)methane	< 0.021 mg/l	
Benzoic Acid	< 0.084 mg/l	
2,4-Dichlorophenol	< 0.021 mg/l	*
1,2,4-Trichlorobenzene	< 0.021 mg/l	
Naphthalene	< 0.021 mg/l	
4-Chloroaniline	< 0.021 mg/l	
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 0.021 mg/l	
4-Chloro-3-methylphenol	< 0.021 mg/l	*
2-Methylnaphthalene	< 0.021 mg/l	
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 0.021 mg/l	
2,4,6-Trichlorophenol	< 0.021 mg/l	*
2,4,5-Trichlorophenol	< 0.021 mg/l	*
2-Chloronaphthalene	< 0.021 mg/l	
2-Nitroaniline	< 0.021 mg/l	
Dimethyl Phthalate	< 0.021 mg/l	
Acenaphthylene	< 0.021 mg/l	
2,6-Dinitrotoluene	< 0.021 mg/l	
3-Nitroaniline	< 0.021 mg/l	
Acenaphthene	< 0.021 mg/l	
2,4-Dinitrophenol	< 0.084 mg/l	*
4-Nitrophenol	< 0.021 mg/l	*

Dibenzofuran	< 0.021 mg/l
2,4-Dinitrotoluene	< 0.021 mg/l
Diethyl Phthalate	< 0.021 mg/l
Fluorene	< 0.021 mg/l
4-Chlorophenyl phenyl ether	< 0.021 mg/l
4-Nitroaniline	< 0.021 mg/l
2-Methyl-4,6-Dinitrophenol	< 0.021 mg/l *
N-Nitrosodiphenylamine	< 0.021 mg/l
1,2-Diphenylhydrazine	< 0.021 mg/l
4-Bromophenylphenylether	< 0.021 mg/l
Hexachlorobenzene	< 0.021 mg/l
Pentachlorophenol	< 0.021 mg/l *
Phenanthrene	< 0.021 mg/l
Anthracene	< 0.021 mg/l
Dibutyl Phthalate	< 0.021 mg/l
Fluoranthene	< 0.021 mg/l
Benzidine	< 0.021 mg/l
Pyrene	< 0.021 mg/l
Butyl Benzyl Phthalate	< 0.021 mg/l
3,3'-Dichlorobenzidine	< 0.021 mg/l
Benzo(A)Anthracene	< 0.021 mg/l
Chrysene	< 0.021 mg/l
Bis(2-Ethylhexyl)Phthlate	< 0.021 mg/l
Dioctylphthalate	< 0.021 mg/l
Benzo(B)Fluoranthene	< 0.021 mg/l
Benzo(K)Fluoranthene	< 0.021 mg/l
Benzo(A)Pyrene	< 0.021 mg/l
Indeno(1,2,3-C,D)Pyrene	< 0.021 mg/l
Dibenzo(A,H)Anthracene	< 0.021 mg/l
Benzo(G,H,I)Perylene	< 0.021 mg/l

*Analytical results are suspect as the quality control criteria were exceeded on this sample.

MARY HELEN MILLER
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director *sfwrd*
Division of Environmental Services

DATE: September 28, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1250

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-02 Ground water monitoring well

Sample Matrix: Water **Collection Method:** Grab

REPORT OF ANALYSIS

Report No: B14-0006 **SA No:** 87-3341

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.010 mg/l
Arsenic	< 0.002 mg/l
Barium	0.010 mg/l
Cadmium	< 0.001 mg/l
Chromium	< 0.001 mg/l
Lead	< 0.002 mg/l
Mercury	< 0.0001 mg/l
Selenium	< 0.002 mg/l
Silver	0.001 mg/l
Methylene Chloride	< 0.005 mg/l
1,2-Dichloroethene	< 0.001 mg/l
Chloroform	< 0.001 mg/l
1,2-Dichloroethane	< 0.001 mg/l
1,1,1-Trichloroethane	< 0.001 mg/l
Carbon Tetrachloride	< 0.001 mg/l

Bromodichloromethane	< 0.001 mg/l
Trichloroethene	< 0.001 mg/l
1,2-Dichloropropane	< 0.001 mg/l
Dibromochloromethane	< 0.001 mg/l
Chloroethylvinylether	< 0.001 mg/l
Bromoform	< 0.001 mg/l
Tetrachloroethene	< 0.001 mg/l
Chlorobenzene	< 0.001 mg/l
Benzene	< 0.001 mg/l
Toluene	< 0.001 mg/l
Ethylbenzene	< 0.001 mg/l
o-Xylene	< 0.001 mg/l
m-Xylene	< 0.001 mg/l
p-Xylene	< 0.001 mg/l
Total Xylenes	< 0.001 mg/l
Styrene	< 0.001 mg/l
o-Chlorotoluene	< 0.001 mg/l
Hexachlorobenzene	< 0.0001 mg/l
Hexachlorocyclohexane, alpha isomer	< 0.0001 mg/l
Hexachlorocyclohexane, beta isomer	< 0.0001 mg/l
Hexachlorocyclohexane, gamma isomer	< 0.0001 mg/l
Hexachlorocyclohexane, delta isomer	< 0.0001 mg/l
Heptachlor	< 0.0001 mg/l
Aldrin	< 0.0001 mg/l
Heptachlor Epoxide	< 0.0001 mg/l
Oxychlordane	< 0.0001 mg/l
t-Chlordane	< 0.0001 mg/l
c-Chlordane	< 0.0001 mg/l
t-Nonachlor	< 0.0001 mg/l
alpha-Chlordene	< 0.0001 mg/l
Chlordene	< 0.0001 mg/l
gamma-Chlordene	< 0.0001 mg/l
cis-Nonachlor	< 0.0001 mg/l
O, P' - DDE	< 0.0001 mg/l
P, P' - DDE	< 0.0001 mg/l
Dieldrin	< 0.0001 mg/l
Endrin	< 0.0001 mg/l
O, P' - DDD	< 0.0001 mg/l
P, P' - DDD	< 0.0001 mg/l
O, P' - DDT	< 0.0001 mg/l
P, P' - DDT	< 0.0001 mg/l
Total DDT	< 0.0001 mg/l
Methoxychlor	< 0.0001 mg/l
Mirex	< 0.0001 mg/l
Endosulfan I	< 0.0001 mg/l
Endosulfan II	< 0.0001 mg/l
Endosulfan Sulfate	< 0.0001 mg/l
Endrin Aldehyde	< 0.0001 mg/l
Endrin Ketone	< 0.0001 mg/l
Toxaphene	< 0.001 mg/l
Dicamba	< 0.001 mg/l

2,4-Dichlorophenoxyacetic Acid	< 0.001 mg/l
2,4,5-Trichlorophenoxyacetic Acid	< 0.001 mg/l
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.001 mg/l
Picloram	< 0.001 mg/l
Aroclor 1016	< 0.001 mg/l
Aroclor 1221	< 0.001 mg/l
Aroclor 1232	< 0.001 mg/l
Aroclor 1242	< 0.001 mg/l
Aroclor 1248	< 0.001 mg/l
Aroclor 1284	< 0.001 mg/l
Aroclor 1260	< 0.001 mg/l
Aroclor 1262	< 0.001 mg/l
Aroclor 1268	< 0.001 mg/l
Phenol	< 0.022 mg/l
Aniline	< 0.022 mg/l
Bis-(2-Chloroethyl) ether	< 0.022 mg/l
2-Chlorophenol	< 0.022 mg/l
1,3-Dichlorobenzene	< 0.022 mg/l
1,4-Dichlorobenzene	< 0.022 mg/l
Benzyl Alcohol	< 0.022 mg/l
1,2-Dichlorobenzene	< 0.022 mg/l
2-Methylphenol	< 0.022 mg/l
4-Methylphenol	< 0.022 mg/l
Bis-(2-Chloroisopropyl) ether	< 0.022 mg/l
N-Nitroso-di-n-propylamine	< 0.022 mg/l
Hexachloroethane	< 0.022 mg/l
Nitrobenzene	< 0.022 mg/l
Isophorone	< 0.022 mg/l
2-Nitrophenol	< 0.022 mg/l
2,4-Dimethyphenol	< 0.022 mg/l
Bis-(2-Chloroethoxy)methane	< 0.022 mg/l
Benzoic Acid	< 0.088 mg/l
2,4-Dichlorophenol	< 0.022 mg/l
1,2,4-Trichlorobenzene	< 0.022 mg/l
Naphthalene	< 0.022 mg/l
4-Chloroaniline	< 0.022 mg/l
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 0.022 mg/l
4-Chloro-3-methylphenol	< 0.022 mg/l
2-Methylnaphthalene	< 0.022 mg/l
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 0.022 mg/l
2,4,6-Trichlorophenol	< 0.022 mg/l
2,4,5-Trichlorophenol	< 0.022 mg/l
2-Chloronaphthalene	< 0.022 mg/l
2-Nitroaniline	< 0.022 mg/l
Dimethyl Phthalate	< 0.022 mg/l
Acenaphthylene	< 0.022 mg/l
2,6-Dinitrotoluene	< 0.022 mg/l
3-Nitroaniline	< 0.022 mg/l
Acenaphthene	< 0.022 mg/l
2,4-Dinitrophenol	< 0.088 mg/l
4-Nitrophenol	< 0.022 mg/l

Dibenzofuran	< 0.022 mg/l
2,4-Dinitrotoluene	< 0.022 mg/l
Diethyl Phthalate	< 0.022 mg/l
Fluorene	< 0.022 mg/l
4-Chlorophenyl phenyl ether	< 0.022 mg/l
4-Nitroaniline	< 0.022 mg/l
2-Methyl-4,6-Dinitrophenol	< 0.022 mg/l
N-Nitrosodiphenylamine	< 0.022 mg/l
1,2-Diphenylhydrazine	< 0.022 mg/l
4-Bromophenylphenylether	< 0.022 mg/l
Hexachlorobenzene	< 0.022 mg/l
Pentachlorophenol	< 0.022 mg/l
Phenanthrene	< 0.022 mg/l
Anthracene	< 0.022 mg/l
Dibutyl Phthalate	< 0.022 mg/l
Fluoranthene	< 0.022 mg/l
Benzidine	< 0.022 mg/l
Pyrene	< 0.022 mg/l
Butyl Benzyl Phthalate	< 0.022 mg/l
3,3'-Dichlorobenzidine	< 0.022 mg/l
Benzo(A)Anthracene	< 0.022 mg/l
Chrysene	< 0.022 mg/l
Bis(2-Ethylhexyl)Phthlate	< 0.022 mg/l *
Dioctylphthalate	< 0.022 mg/l
Benzo(B)Fluoranthene	< 0.022 mg/l
Benzo(K)Fluoranthene	< 0.022 mg/l
Benzo(A)Pyrene	< 0.022 mg/l
Indeno(1,2,3-C,D)Pyrene	< 0.022 mg/l
Dibenzo(A,H)Anthracene	< 0.022 mg/l
Benzo(G,H,I)Perylene	< 0.022 mg/l

*Compound detected below quantification limits.

MARY HELEN MILLER
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director *for WCP*
Division of Environmental Services

DATE: September 28, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1345

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-03 Ground water monitoring well

Sample Matrix: Water **Collection Method:** Grab

REPORT OF ANALYSIS

Report No: B14-0007 **SA No:** 87-3342

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.010 mg/l
Arsenic	0.003 mg/l
Barium	0.030 mg/l
Cadmium	< 0.001 mg/l
Chromium	< 0.001 mg/l
Lead	0.002 mg/l
Mercury	< 0.0001 mg/l
Selenium	< 0.002 mg/l
Silver	0.001 mg/l
Methylene Chloride	< 0.005 mg/l
1,2-Dichloroethene	< 0.001 mg/l
Chloroform	< 0.001 mg/l
1,2-Dichloroethane	< 0.001 mg/l
1,1,1-Trichloroethane	< 0.001 mg/l
Carbon Tetrachloride	< 0.001 mg/l

Bromodichloromethane	< 0.001 mg/l
Trichloroethene	< 0.001 mg/l
1,2-Dichloropropane	< 0.001 mg/l
Dibromochloromethane	< 0.001 mg/l
Chloroethylvinylether	< 0.001 mg/l
Bromoform	< 0.001 mg/l
Tetrachloroethene	< 0.001 mg/l
Chlorobenzene	< 0.001 mg/l
Benzene	< 0.001 mg/l
Toluene	< 0.001 mg/l
Ethylbenzene	< 0.001 mg/l
o-Xylene	< 0.001 mg/l
m-Xylene	< 0.001 mg/l
p-Xylene	< 0.001 mg/l
Total Xylenes	< 0.001 mg/l
Styrene	< 0.001 mg/l
o-Chlorotoluene	< 0.001 mg/l
Hexachlorobenzene	< 0.0001 mg/l
Hexachlorocyclohexane, alpha isomer	< 0.0001 mg/l
Hexachlorocyclohexane, beta isomer	< 0.0001 mg/l
Hexachlorocyclohexane, gamma isomer	< 0.0001 mg/l
Hexachlorocyclohexane, delta isomer	< 0.0001 mg/l
Heptachlor	< 0.0001 mg/l
Aldrin	< 0.0001 mg/l
Heptachlor Epoxide	< 0.0001 mg/l
Oxychlordane	< 0.0001 mg/l
t-Chlordane	< 0.0001 mg/l
c-Chlordane	< 0.0001 mg/l
t-Nonachlor	< 0.0001 mg/l
alpha-Chlordene	< 0.0001 mg/l
Chlordene	< 0.0001 mg/l
gamma-Chlordene	< 0.0001 mg/l
cis-Nonachlor	< 0.0001 mg/l
O, P' - DDE	< 0.0001 mg/l
P, P' - DDE	< 0.0001 mg/l
Dieldrin	< 0.0001 mg/l
Endrin	< 0.0001 mg/l
O, P' - DDD	< 0.0001 mg/l
P, P' - DDD	< 0.0001 mg/l
O, P' - DDT	< 0.0001 mg/l
P, P' - DDT	< 0.0001 mg/l
Total DDT	< 0.0001 mg/l
Methoxychlor	< 0.0001 mg/l
Mirex	< 0.0001 mg/l
Endosulfan I	< 0.0001 mg/l
Endosulfan II	< 0.0001 mg/l
Endosulfan Sulfate	< 0.0001 mg/l
Endrin Aldehyde	< 0.0001 mg/l
Endrin Ketone	< 0.0001 mg/l
Toxaphene	< 0.001 mg/l
Dicamba	< 0.001 mg/l

2,4-Dichlorophenoxyacetic Acid	< 0.001 mg/l
2,4,5-Trichlorophenoxyacetic Acid	< 0.001 mg/l
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.001 mg/l
Picloram	< 0.001 mg/l
Aroclor 1016	< 0.001 mg/l
Aroclor 1221	< 0.001 mg/l
Aroclor 1232	< 0.001 mg/l
Aroclor 1242	< 0.001 mg/l
Aroclor 1248	< 0.001 mg/l
Aroclor 1284	< 0.001 mg/l
Aroclor 1260	< 0.001 mg/l
Aroclor 1262	< 0.001 mg/l
Aroclor 1268	< 0.001 mg/l
Phenol	< 0.022 mg/l
Aniline	< 0.022 mg/l
Bis-(2-Chloroethyl) ether	< 0.022 mg/l
2-Chlorophenol	< 0.022 mg/l *
1,3-Dichlorobenzene	< 0.022 mg/l
1,4-Dichlorobenzene	< 0.022 mg/l
Benzyl Alcohol	< 0.022 mg/l
1,2-Dichlorobenzene	< 0.022 mg/l
2-Methylphenol	< 0.022 mg/l *
4-Methylphenol	< 0.022 mg/l *
Bis-(2-Chloroisopropyl) ether	< 0.022 mg/l
N-Nitroso-di-n-propylamine	< 0.022 mg/l
Hexachloroethane	< 0.022 mg/l
Nitrobenzene	< 0.022 mg/l
Isophorone	< 0.022 mg/l
2-Nitrophenol	< 0.022 mg/l *
2,4-Dimethyphenol	< 0.022 mg/l *
Bis-(2-Chloroethoxy)methane	< 0.022 mg/l
Benzoic Acid	< 0.088 mg/l *
2,4-Dichlorophenol	< 0.022 mg/l *
1,2,4-Trichlorobenzene	< 0.022 mg/l
Naphthalene	< 0.022 mg/l
4-Chloroaniline	< 0.022 mg/l
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 0.022 mg/l
4-Chloro-3-methylphenol	< 0.022 mg/l *
2-Methylnaphthalene	< 0.022 mg/l
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 0.022 mg/l
2,4,6-Trichlorophenol	< 0.022 mg/l *
2,4,5-Trichlorophenol	< 0.022 mg/l *
2-Chloronaphthalene	< 0.022 mg/l
2-Nitroaniline	< 0.022 mg/l
Dimethyl Phthalate	< 0.022 mg/l
Acenaphthylene	< 0.022 mg/l
2,6-Dinitrotoluene	< 0.022 mg/l
3-Nitroaniline	< 0.022 mg/l
Acenaphthene	< 0.022 mg/l
2,4-Dinitrophenol	< 0.088 mg/l
4-Nitrophenol	< 0.022 mg/l

Dibenzofuran	< 0.022 mg/l
2,4-Dinitrotoluene	< 0.022 mg/l
Diethyl Phthalate	< 0.022 mg/l
Fluorene	< 0.022 mg/l
4-Chlorophenyl phenyl ether	< 0.022 mg/l
4-Nitroaniline	< 0.022 mg/l
2-Methyl-4,6-Dinitrophenol	< 0.022 mg/l *
N-Nitrosodiphenylamine	< 0.022 mg/l
1,2-Diphenylhydrazine	< 0.022 mg/l
4-Bromophenylphenylether	< 0.022 mg/l
Hexachlorobenzene	< 0.022 mg/l
Pentachlorophenol	< 0.022 mg/l *
Phenanthrene	< 0.022 mg/l
Anthracene	< 0.022 mg/l
Dibutyl Phthalate	< 0.022 mg/l
Fluoranthene	< 0.022 mg/l
Benzidine	< 0.022 mg/l
Pyrene	< 0.022 mg/l
Butyl Benzyl Phthalate	< 0.022 mg/l
3,3'-Dichlorobenzidine	< 0.022 mg/l
Benzo(A)Anthracene	< 0.022 mg/l
Chrysene	< 0.022 mg/l
Bis(2-Ethylhexyl)Phthlate	< 0.022 mg/l **
Dioctylphthalate	< 0.022 mg/l
Benzo(B)Fluoranthene	< 0.022 mg/l
Benzo(K)Fluoranthene	< 0.022 mg/l
Benzo(A)Pyrene	< 0.022 mg/l
Indeno(1,2,3-C,D)Pyrene	< 0.022 mg/l
Dibenzo(A,H)Anthracene	< 0.022 mg/l
Benzo(G,H,I)Perylene	< 0.022 mg/l

*Analytical results are suspect as the quality control criteria were exceeded on this sample.

**Compound detected below quantification limits.

MARY HELEN MILLER
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director
Division of Environmental Services

DATE: September 30, 1987

Collected by: Mike Talley **Date:** 08/11/87 **Time:** 1710

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: CL-07 Leachate sample

Sample Matrix: Water **Collection Method:** Grab

REPORT OF ANALYSIS

Report No: B14-0008 **SA No: 87-3343**

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Cyanide	< 0.010 mg/l
Arsenic	0.013 mg/l
Barium	0.865 mg/l
Cadmium	< 0.001 mg/l
Chromium	0.036 mg/l
Lead	0.039 mg/l
Mercury	0.00002 mg/l
Selenium	< 0.002 mg/l
Silver	< 0.001 mg/l
Methylene Chloride	< 0.005 mg/l *
1,2-Dichloroethene	< 0.001 mg/l *
Chloroform	< 0.001 mg/l *
1,2-Dichloroethane	< 0.001 mg/l *
1,1,1-Trichloroethane	< 0.001 mg/l *
Carbon Tetrachloride	< 0.001 mg/l *

Bromodichloromethane	< 0.001 mg/l *
Trichloroethene	< 0.001 mg/l *
1,2-Dichloropropane	< 0.001 mg/l *
Dibromochloromethane	< 0.001 mg/l *
Chloroethylvinylether	< 0.001 mg/l *
Bromoform	< 0.001 mg/l *
Tetrachloroethene	< 0.001 mg/l *
Chlorobenzene	< 0.001 mg/l *
Benzene	< 0.001 mg/l *
Toluene	< 0.001 mg/l *
Ethylbenzene	< 0.001 mg/l *
m-Xylene	0.002 mg/l *
o & p-Xylenes	0.002 mg/l *
Total Xylenes	0.004 mg/l *
Styrene	< 0.001 mg/l *
o-Chlorotoluene	< 0.001 mg/l *
Hexachlorobenzene	< 0.0001 mg/l
Hexachlorocyclohexane, alpha isomer	< 0.0001 mg/l
Hexachlorocyclohexane, beta isomer	< 0.0001 mg/l
Hexachlorocyclohexane, gamma isomer	< 0.0001 mg/l
Hexachlorocyclohexane, delta isomer	< 0.0001 mg/l
Heptachlor	< 0.0001 mg/l
Aldrin	< 0.0001 mg/l
Heptachlor Epoxide	< 0.0001 mg/l
Oxychlordane	< 0.0001 mg/l
t-Chlordane	< 0.0001 mg/l
c-Chlordane	< 0.0001 mg/l
t-Nonachlor	< 0.0001 mg/l
alpha-Chlordene	< 0.0001 mg/l
Chlordene	< 0.0001 mg/l
gamma-Chlordene	< 0.0001 mg/l
cis-Nonachlor	< 0.0001 mg/l
O, P' - DDE	< 0.0001 mg/l
P, P' - DDE	< 0.0001 mg/l
Dieldrin	< 0.0001 mg/l
Endrin	< 0.0001 mg/l
O, P' - DDD	< 0.0001 mg/l
P, P' - DDD	< 0.0001 mg/l
O, P' - DDT	< 0.0001 mg/l
P, P' - DDT	< 0.0001 mg/l
Total DDT	< 0.0001 mg/l
Methoxychlor	< 0.0001 mg/l
Mirex	< 0.0001 mg/l
Endosulfan I	< 0.0001 mg/l
Endosulfan II	< 0.0001 mg/l
Endosulfan Sulfate	< 0.0001 mg/l
Endrin Aldehyde	< 0.0001 mg/l
Endrin Ketone	< 0.0001 mg/l
Toxaphene	< 0.001 mg/l
Dicamba	< 0.001 mg/l

2,4-Dichlorophenoxyacetic Acid	< 0.001 mg/l
2,4,5-Trichlorophenoxyacetic Acid	< 0.001 mg/l
2-(2,4,5-Trichlorophenoxy)Propionic Acid	< 0.001 mg/l
Picloram	< 0.001 mg/l
Aroclor 1016	< 0.001 mg/l
Aroclor 1221	< 0.001 mg/l
Aroclor 1232	< 0.001 mg/l
Aroclor 1242	< 0.001 mg/l
Aroclor 1248	< 0.001 mg/l
Aroclor 1284	< 0.001 mg/l
Aroclor 1260	< 0.001 mg/l
Aroclor 1262	< 0.001 mg/l
Aroclor 1268	< 0.001 mg/l
Phenol	< 0.025 mg/l
Aniline	< 0.025 mg/l
Bis-(2-Chloroethyl) ether	< 0.025 mg/l
2-Chlorophenol	< 0.025 mg/l *
1,3-Dichlorobenzene	< 0.025 mg/l
1,4-Dichlorobenzene	< 0.025 mg/l
Benzyl Alcohol	< 0.025 mg/l
1,2-Dichlorobenzene	< 0.025 mg/l
2-Methylphenol	< 0.025 mg/l *
4-Methylphenol	< 0.025 mg/l *
Bis-(2-Chloroisopropyl) ether	< 0.025 mg/l
N-Nitroso-di-n-propylamine	< 0.025 mg/l
Hexachloroethane	< 0.025 mg/l
Nitrobenzene	< 0.025 mg/l
Isophorone	< 0.025 mg/l
2-Nitrophenol	< 0.025 mg/l *
2,4-Dimethyphenol	< 0.025 mg/l *
Bis-(2-Chloroethoxy)methane	< 0.025 mg/l
Benzoic Acid	< 0.100 mg/l *
2,4-Dichlorophenol	< 0.025 mg/l *
1,2,4-Trichlorobenzene	< 0.025 mg/l
Naphthalene	< 0.025 mg/l
4-Chloroaniline	< 0.025 mg/l
1,1,2,3,4,4-Hexachloro-1,3-butadiene	< 0.025 mg/l
4-Chloro-3-methylphenol	< 0.025 mg/l *
2-Methylnaphthalene	< 0.025 mg/l
1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene	< 0.025 mg/l
2,4,6-Trichlorophenol	< 0.025 mg/l *
2,4,5-Trichlorophenol	< 0.025 mg/l *
2-Chloronaphthalene	< 0.025 mg/l
2-Nitroaniline	< 0.025 mg/l
Dimethyl Phthalate	< 0.025 mg/l
Acenaphthylene	< 0.025 mg/l
2,6-Dinitrotoluene	< 0.025 mg/l
3-Nitroaniline	< 0.025 mg/l
Acenaphthene	< 0.025 mg/l
2,4-Dinitrophenol	< 0.100 mg/l
4-Nitrophenol	< 0.025 mg/l

Dibenzofuran	< 0.025 mg/l
2,4-Dinitrotoluene	< 0.025 mg/l
Diethyl Phthalate	< 0.025 mg/l
Fluorene	< 0.025 mg/l
4-Chlorophenyl phenyl ether	< 0.025 mg/l
4-Nitroaniline	< 0.025 mg/l
2-Methyl-4,6-Dinitrophenol	< 0.025 mg/l *
N-Nitrosodiphenylamine	< 0.025 mg/l
1,2-Diphenylhydrazine	< 0.025 mg/l
4-Bromophenylphenylether	< 0.025 mg/l
Hexachlorobenzene	< 0.025 mg/l
Pentachlorophenol	< 0.025 mg/l *
Phenanthrene	< 0.025 mg/l
Anthracene	< 0.025 mg/l
Dibutyl Phthalate	< 0.025 mg/l
Fluoranthene	< 0.025 mg/l
Benzidine	< 0.025 mg/l
Pyrene	< 0.025 mg/l
Butyl Benzyl Phthalate	< 0.025 mg/l
3,3'-Dichlorobenzidine	< 0.025 mg/l
Benzo(A)Anthracene	< 0.025 mg/l
Chrysene	< 0.025 mg/l
Bis(2-Ethylhexyl)Phthlate	< 0.025 mg/l **
Dioctylphthalate	< 0.025 mg/l
Benzo(B)Fluoranthene	< 0.025 mg/l
Benzo(K)Fluoranthene	< 0.025 mg/l
Benzo(A)Pyrene	< 0.025 mg/l
Indeno(1,2,3-C,D)Pyrene	< 0.025 mg/l
Dibenzo(A,H)Anthracene	< 0.025 mg/l
Benzo(G,H,I)Perylene	< 0.025 mg/l

*Analytical results are suspect as the quality control criteria were exceeded on this sample.

**Compound detected below quantification limits.

MARY HELEN MILLER
SECRETARY

MARTHA LAYNE COLLINS
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

TO: Division of Waste Management
Frankfort Office Park, 18 Reilly Road
Frankfort, Kentucky 40601

Re: Campground Landfill
Jefferson County
ID #KYD098951262

ATTN: Barry Burrus

FROM: William E. Davis, Director B for WEP
Division of Environmental Services

DATE: September 28, 1987

Collected by: James Smith **Date:** 08/10/87 **Time:** 1350

Delivered by: Mike Talley **Date:** 08/12/87 **Time:** 0950

Received by: Polly Ellis **Date:** 08/12/87 **Time:** 0950

Sample Identification: Field blank

Sample Matrix: Water **Collection Method:** Grab

REPORT OF ANALYSIS

Report No: B14-0009 **SA No:** 87-3344

Finished: 09/24/87 **Approved:** 09/24/87

TOTAL CONSTITUENTS	CONCENTRATION
Methylene Chloride	0.006 mg/l
1,2-Dichloroethene	< 0.001 mg/l
Chloroform	< 0.001 mg/l
1,2-Dichloroethane	< 0.001 mg/l
1,1,1-Trichloroethane	< 0.001 mg/l
Carbon Tetrachloride	< 0.001 mg/l
Bromodichloromethane	< 0.001 mg/l
Trichloroethene	< 0.001 mg/l
1,2-Dichloropropane	< 0.001 mg/l
Dibromochloromethane	< 0.001 mg/l
Chloroethylvinylether	< 0.001 mg/l
Bromoform	< 0.001 mg/l
Tetrachloroethene	< 0.001 mg/l
Chlorobenzene	< 0.001 mg/l
Benzene	< 0.001 mg/l

Toluene	< 0.001 mg/l
Ethylbenzene	< 0.001 mg/l
o-Xylene	< 0.001 mg/l
m-Xylene	< 0.001 mg/l
p-Xylene	< 0.001 mg/l
Total Xylenes	< 0.001 mg/l
Styrene	< 0.001 mg/l
o-Chlorotoluene	< 0.001 mg/l

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

CHAIN OF CUSTODY RECORD

TYPE OF INSPECTION: ☐ COMPLAINT ☐ COMPLIANCE ☐ EMERGENCY ☐ ENFORCEMENT ☒ UNCONTROLLED SITE

SAMPLING LOCATION: Campground Landfill Jefferson County

I.D. NUMBER: EPA ID # KYD09895/262 DATE: 8/11/87

SAMPLE NUMBER	DATE TIME	STATION DESCRIPTION	METHOD	TYPE	SIZE	TYPE OF PRESERVATION	ANALYSIS REQUESTED
	8/11/87 11:00 a.m.	CL-01 G.W. Monitoring Well	Grab	G ☒ M S	(1) liter	HNO_3 + Ice	Metals (Total)
	"	"	"	G ☒ M S	"	NaOH + Ice	Cyanide
3340	"	"	"	G ☒ M S	"	Ice	Herbicides
	"	"	"	G ☒ M S	"	"	Pesticides / PCBs
	"	"	"	G ☒ M S	"	"	Base - Neutral - Acid
	"	"	"	G ☒ M S	(2) VOA		Volatile Chlorinated - Aromatics

B14-0005

SAMPLERS (SIGNATURES) [signature]

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
[signature]	8/12/87	9:50 a.m.	Polly Ellis	8/12/87	950
Representing KDWM			Representing DES		
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Representing			Representing		

White Copy - CENTRAL OFFICE Canary Copy - LABORATORY
Pink Copy - SHIPPER Goldenrod Copy - INSPECTOR

DEP5005

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

CHAIN OF CUSTODY RECORD

TYPE OF INSPECTION: ☐ COMPLAINT ☐ COMPLIANCE ☐ EMERGENCY ☐ ENFORCEMENT ☒ UNCONTROLLED SITE

SAMPLING LOCATION: Campground Landfill Jefferson County

I.D. NUMBER: EPA ID# KYD098951262 DATE: 8/11/87

SAMPLE NUMBER	DATE TIME	STATION DESCRIPTION	METHOD	TYPE	SIZE	TYPE OF PRESERVATION	ANALYSIS REQUESTED
	8/11/87 12:50 p.m.	CL-02 G.W. Monitoring Well	Grab	G ☒ M S	(1) liter	HNO_3 + Ice	Metals (Total)
	"	"	"	G ☒ M S	"	NaOH + Ice	Cyanide
3341	"	"	"	G ☒ M S	"	Ice	Herbicides
	"	"	"	G ☒ M S	"	"	Pesticides / PCBs
	"	"	"	G ☒ M S	"	"	Base - Neutral - Acid
	"	"	"	G ☒ M S	(2) VOA	"	Volatile Chlorinated - Aromatics

B14-0000

SAMPLERS (SIGNATURES) mh Tally

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
mh Tally	8/12/87	9:50 a.m.	Polly Ellis	8/12/87	9:50
Representing KDWM			Representing DES		
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Representing			Representing		

White Copy - CENTRAL OFFICE Canary Copy - LABORATORY
Pink Copy - SHIPPER Goldenrod Copy - INSPECTOR

DEP5005

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

CHAIN OF CUSTODY RECORD

TYPE OF INSPECTION: ☐ COMPLAINT ☐ COMPLIANCE ☐ EMERGENCY ☐ ENFORCEMENT ☒ UNCONTROLLED SITE

SAMPLING LOCATION: Campground Landfill Jefferson County

I.D. NUMBER: EPA I.D. # KYD098951262 DATE: 8/11/87

SAMPLE NUMBER	DATE TIME	STATION DESCRIPTION	METHOD	TYPE	SIZE	TYPE OF PRESERVATION	ANALYSIS REQUESTED
	8/11/87 1:45 pm.	CL-03 G.W. Monitoring Well	Grab	G ☒ M S	(1) liter	HNO_3 + Ice	Metals (Total)
	"	"	"	G ☒ M S	"	NaOH + Ice	Cyanide
3342	"	"	"	G ☒ M S	"	Ice	Herbicides
3342	"	"	"	G ☒ M S	"	"	Pesticides / PCBs
	"	"	"	G ☒ M S	"	"	Base - Neutral - Acid
	"	"	"	G ☒ M S	(2) VOA	"	Volatile Chlorinated - Aromatics

B14 00007

SAMPLERS (SIGNATURES) M. Tally

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
M. Tally	8/12/87	9:50 a.m.	Riley Ellis	8/12/87	950
Representing KPWM			Representing DES		
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Representing			Representing		

White Copy - CENTRAL OFFICE Canary Copy - LABORATORY
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DEP5005

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

CHAIN OF CUSTODY RECORD

TYPE OF INSPECTION: ☐ COMPLAINT ☐ COMPLIANCE ☐ EMERGENCY ☐ ENFORCEMENT ☒ UNCONTROLLED SITE

SAMPLING LOCATION: Campground Landfill Jefferson County

I.D. NUMBER: EPA I.D.# KYD098951262 DATE: 8/11/87

SAMPLE NUMBER	DATE TIME	STATION DESCRIPTION	METHOD	TYPE	SIZE	TYPE OF PRESERVATION	ANALYSIS REQUESTED
3336	8/11/87 4:00 p.m.	CL-04 Soil	Grab	G L M ☒	(1) 500-ml	Ice	Total Metals, Cyanide, Herbicides, Pesticides/PCBs, Base-Neutral-Acid
	"	"	"	G L M ☒	(1) VOA	B14-00001	Volatile Chlorinated-Aromatics
3337	8/11/87 4:30 p.m.	CL-05 Sediment	Comp.	G L M ☒	(1) 500-ml	"	Total Metals, Cyanide, Herbicides, Pesticides/PCBs, Base-Neutral-Acid
	"	"	"	G L M ☒	(1) VOA	B14-00002	Volatile Chlorinated-Aromatics
3338	8/11/87 4:35 p.m.	CL-06 Sediment	"	G L M ☒	(1) 500 ml	"	Total Metals, Cyanide, Herbicides, Pesticides/PCBs, Base-Neutral-Acid
	"	"	"	G L M ☒	(1) VOA	B14-00003	Volatile Chlorinated-Aromatics

SAMPLERS (SIGNATURES) Mil Tilly

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Mil Tilly	8/12/87	9.50 a.m.	Patty Ellis	8/12/87	0950
Representing KDWM			Representing DES		
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Representing			Representing		

White Copy - CENTRAL OFFICE Canary Copy - LABORATORY
Pink Copy - SHIPPER Goldenrod Copy - INSPECTOR

DEP5005

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

CHAIN OF CUSTODY RECORD

TYPE OF INSPECTION: ☐ COMPLAINT ☐ COMPLIANCE ☐ EMERGENCY ☐ ENFORCEMENT ☒ UNCONTROLLED SITE

SAMPLING LOCATION: Campground Landfill Jefferson County

I.D. NUMBER: EPA ID# KYD098951262 DATE: 8/11/87

SAMPLE NUMBER	DATE TIME	STATION DESCRIPTION	METHOD	TYPE	SIZE	TYPE OF PRESERVATION	ANALYSIS REQUESTED
	8/11/87 5:10 p.m.	CL-07 Leachate	Grab	G ☒ M S	(1) liter	HNO_3 + Ice	Metals (Total)
	"	"	"	G ☒ M S	"	NaOH + Ice	Cyanide
3343	"	"	"	G ☒ M S	"	Ice	Herbicides
	"	"	"	G ☒ M S	"	"	Pesticides / PCBs
	"	"	"	G ☒ M S	"	"	Base - Neutral - Acid
	"	"	"	G ☒ M S	(2) VOA	"	Volatile Chlorinated - Aromatics

814-0008

SAMPLERS (SIGNATURES) Nels Talley

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Nels Talley	8/12/87	9:50 a.m	Polly Ellis	8/12/87	0950
Representing KDWM			Representing DES		
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Representing			Representing		

White Copy - CENTRAL OFFICE Canary Copy - LABORATORY
Pink Copy - SHIPPER Goldenrod Copy - INSPECTOR

DEP5005

ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

CHAIN OF CUSTODY RECORD

TYPE OF INSPECTION: ☐ COMPLAINT ☐ COMPLIANCE ☐ EMERGENCY ☐ ENFORCEMENT ☒ UNCONTROLLED SITE

SAMPLING LOCATION: Campground Landfill Jefferson County

I.D. NUMBER: EPA ID# KYD098951262 DATE: 8/11/87

SAMPLE NUMBER	DATE TIME	STATION DESCRIPTION	METHOD	TYPE	SIZE	TYPE OF PRESERVATION	ANALYSIS REQUESTED
3339	8/11/87 5:10 p.m.	CL-07 Leachate Sediment	Grab	G L ~~M~~ S	(1) 500 ml	Ice	Total Metals, Cyanide, Herbicides Pesticides/PCBs, Base-Neutral-Acid
	"	"	"	G L ~~M~~ S	(1) VOA	"	Volatile Chlorinated-Aromatics
				G L M S			B14-00004
				G L M S			
3344	8-10-1350	Field Blank	Grab	G (L) M S	VOA		B14-00009 VC-11-1A#
				G L M S			

SAMPLERS (SIGNATURES) Mike Selby

RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Mike Selby	8/12/87	9:50 a.m.	Polly Ellis	8/12/87	0950
Representing KDWM			Representing DES		
RELINQUISHED BY (Signature)	DATE	TIME	RECEIVED BY (Signature)	DATE	TIME
Representing			Representing		

White Copy - CENTRAL OFFICE Canary Copy - LABORATORY
Pink Copy - SHIPPER Goldenrod Copy - INSPECTOR

DEP5005

White Copy - CENTRAL OFFICE
Pink Copy - SHIPPER Goldenrod Copy

DIVISION OF WASTE MANAGEMENT

RECEIPT FOR SAMPLES

GENERAL INFORMATION

INSTALLATION TYPE: ☐ GENERATOR ☐ INCINERATOR ☐ TREATMENT FACILITY
☒ LANDFILL ☐ STORAGE FACILITY ☐ SURFACE IMPOUNDMENT ☐ WASTE PILE

INSTALLATION NAME: Campground Landfill EPA ID NO.: KYD098951262

INSTALLATION ADDRESS: 4501 Campground Road Louisville, KY

COUNTY: Jefferson

DESCRIPTION OF SAMPLES

SAMPLE NUMBERS: CL-01

STATION DESCRIPTION/SAMPLING LOCATION: Upgradient Groundwater Monitoring Well (Campground Designation CKU-01) Next to trailer park

SAMPLE METHOD: ☒ GRAB ☐ COMPOSITE

SAMPLE TYPE: ☐ GAS ☒ LIQUID ☐ SEMI-SOLID ☐ SOLID

SAMPLE SIZE: ☐ PINT ☐ QUART ☐ GALLON ☒ OTHER 5 1-liter containers, 2 VOA's

SAMPLES IN SERIES: ☐ NO ☒ YES, TOTAL SAMPLES IN SEQUENCE 7

DUPLICATE SAMPLES ☒ NOT REQUESTED ☐ REQUESTED AND PROVIDED

COMMENTS:

Mike Talley — NAME OF DEPARTMENTAL REPRESENTATIVE

Environmental Specialist — TITLE

[signature] — SIGNATURE

8/11/87 — DATE

The undersigned acknowledges that the sample(s) described above were obtained at the location and under the circumstances described above.

SHIRD ROBINSON — NAME

SPECIAL WASTE MGR. — TITLE

Shird Robinson — SIGNATURE

8-11-87 — DATE

DWM-6 1/81

DIVISION OF WASTE MANAGEMENT

RECEIPT FOR SAMPLES

GENERAL INFORMATION

INSTALLATION TYPE: ☐ GENERATOR ☐ INCINERATOR ☐ TREATMENT FACILITY
☒ LANDFILL ☐ STORAGE FACILITY ☐ SURFACE IMPOUNDMENT ☐ WASTE PILE

INSTALLATION NAME: Campground Landfill EPA ID NO.: KYD098951262

INSTALLATION ADDRESS: 4501 Campground Road Louisville, KY

COUNTY: Jefferson

DESCRIPTION OF SAMPLES

SAMPLE NUMBERS: CL-02

STATION DESCRIPTION/SAMPLING LOCATION: Downgradient Groundwater Monitoring Well (Campground Designation CKD-04)

SAMPLE METHOD: ☒ GRAB ☐ COMPOSITE

SAMPLE TYPE: ☐ GAS ☒ LIQUID ☐ SEMI-SOLID ☐ SOLID

SAMPLE SIZE: ☐ PINT ☐ QUART ☐ GALLON ☒ OTHER 5 1-liter containers 2 VOAs

SAMPLES IN SERIES: ☐ NO ☒ YES, TOTAL SAMPLES IN SEQUENCE 7

DUPLICATE SAMPLES ☒ NOT REQUESTED ☐ REQUESTED AND PROVIDED

COMMENTS:

Mike Talley — Environmental Specialist

NAME OF DEPARTMENTAL REPRESENTATIVE — TITLE

Mike Talley — 8/11/87

SIGNATURE — DATE

The undersigned acknowledges that the sample(s) described above were obtained at the location and under the circumstances described above.

SHIRD ROBINSON — SPECIAL WASTE MGR.

NAME — TITLE

Shird Robinson — 8-11-87

SIGNATURE — DATE

DWM-6 3/83

DIVISION OF WASTE MANAGEMENT

RECEIPT FOR SAMPLES

GENERAL INFORMATION

INSTALLATION TYPE: ☐ GENERATOR ☐ INCINERATOR ☐ TREATMENT FACILITY
☒ LANDFILL ☐ STORAGE FACILITY ☐ SURFACE IMPOUNDMENT ☐ WASTE PILE

INSTALLATION NAME: Campground Landfill EPA ID NO.: KYD098951262

INSTALLATION ADDRESS: 4501 Campground Road Louisville, KY

COUNTY: Jefferson

DESCRIPTION OF SAMPLES

SAMPLE NUMBERS: CL-03

STATION DESCRIPTION/SAMPLING LOCATION: Downgradient Groundwater Monitoring Well (Campground Designation CKD-02)

SAMPLE METHOD: ☒ GRAB ☐ COMPOSITE

SAMPLE TYPE: ☐ GAS ☒ LIQUID ☐ SEMI-SOLID ☐ SOLID

SAMPLE SIZE: ☐ PINT ☐ QUART ☐ GALLON ☒ OTHER 5 1-liter containers 2 VOAs

SAMPLES IN SERIES: ☐ NO ☒ YES, TOTAL SAMPLES IN SEQUENCE 7

DUPLICATE SAMPLES ☒ NOT REQUESTED ☐ REQUESTED AND PROVIDED

COMMENTS:

Mike Talley — Environmental Specialist

NAME OF DEPARTMENTAL REPRESENTATIVE — TITLE

Mike Talley — 8/11/87

SIGNATURE — DATE

The undersigned acknowledges that the sample(s) described above were obtained at the location and under the circumstances described above.

SHIRD ROBINSON — SPECIAL WASTE MGR.

NAME — TITLE

Shird Robinson — 8-11-87

SIGNATURE — DATE

DIVISION OF WASTE MANAGEMENT

RECEIPT FOR SAMPLES

GENERAL INFORMATION

INSTALLATION TYPE: ☐ GENERATOR ☐ INCINERATOR ☐ TREATMENT FACILITY
☒ LANDFILL ☐ STORAGE FACILITY ☐ SURFACE IMPOUNDMENT ☐ WASTE PILE

INSTALLATION NAME: Campground Landfill EPA ID NO.: KYD093951262

INSTALLATION ADDRESS: 4501 Campground Road Louisville, KY

COUNTY: Jefferson

DESCRIPTION OF SAMPLES

SAMPLE NUMBERS: CL-04

STATION DESCRIPTION/SAMPLING LOCATION: Background Soil

SAMPLE METHOD: ☐ GRAB ☒ COMPOSITE

SAMPLE TYPE: ☐ GAS ☐ LIQUID ☐ SEMI-SOLID ☒ SOLID

SAMPLE SIZE: ☐ PINT ☐ QUART ☐ GALLON ☒ OTHER 1 1-liter container, 1 VOA

SAMPLES IN SERIES: ☐ NO ☒ YES, TOTAL SAMPLES IN SEQUENCE 7

DUPLICATE SAMPLES ☒ NOT REQUESTED ☐ REQUESTED AND PROVIDED

COMMENTS:

Mike Talley — NAME OF DEPARTMENTAL REPRESENTATIVE

Environmental Specialist — TITLE

Mike Talley — SIGNATURE

8/4/87 — DATE

The undersigned acknowledges that the sample(s) described above were obtained at the location and under the circumstances described above.

SHIRO ROBINSON — NAME

SPECIAL WASTE MGR — TITLE

Shiro Robinson — SIGNATURE

8-11-87 — DATE

DIVISION OF WASTE MANAGEMENT

RECEIPT FOR SAMPLES

GENERAL INFORMATION

INSTALLATION TYPE: ☐ GENERATOR ☐ INCINERATOR ☐ TREATMENT FACILITY
☒ LANDFILL ☐ STORAGE FACILITY ☐ SURFACE IMPOUNDMENT ☐ WASTE PILE

INSTALLATION NAME: Campground Landfill EPA ID NO.: KYD098951262

INSTALLATION ADDRESS: 4501 Campground Road

COUNTY: Jefferson

DESCRIPTION OF SAMPLES

SAMPLE NUMBERS: CL-05

STATION DESCRIPTION/SAMPLING LOCATION: Sediments from drainage ditch. Next to American Concrete Pipe Co.

SAMPLE METHOD: ☐ GRAB ☒ COMPOSITE

SAMPLE TYPE: ☐ GAS ☐ LIQUID ☐ SEMI-SOLID ☒ SOLID

SAMPLE SIZE: ☐ PINT ☐ QUART ☐ GALLON ☐ OTHER 1 1-liter container / 1 VOA

SAMPLES IN SERIES: ☐ NO ☐ YES, TOTAL SAMPLES IN SEQUENCE

DUPLICATE SAMPLES ☒ NOT REQUESTED ☐ REQUESTED AND PROVIDED

COMMENTS:

Mike Talley — NAME OF DEPARTMENTAL REPRESENTATIVE

Environmental Specialist — TITLE

Mike Talley — SIGNATURE

8/11/87 — DATE

The undersigned acknowledges that the sample(s) described above were obtained at the location and under the circumstances described above.

SHIRO ROBINSON — NAME

SPECIAL WASTE M&R — TITLE

Shiro Robinson — SIGNATURE

8-11-87 — DATE

DIVISION OF WASTE MANAGEMENT

RECEIPT FOR SAMPLES

GENERAL INFORMATION

INSTALLATION TYPE: ☐ GENERATOR ☐ INCINERATOR ☐ TREATMENT FACILITY
☒ LANDFILL ☐ STORAGE FACILITY ☐ SURFACE IMPOUNDMENT ☐ WASTE PILE

INSTALLATION NAME: Campground Landfill EPA ID NO.: KYD093951262

INSTALLATION ADDRESS: 4501 Campground Road Louisville, KY

COUNTY: Jefferson

DESCRIPTION OF SAMPLES

SAMPLE NUMBERS: CL-06

STATION DESCRIPTION/SAMPLING LOCATION: Sediments from drainage ditch where drainage leaves site on northernmost edge of site.

SAMPLE METHOD: ☐ GRAB ☒ COMPOSITE

SAMPLE TYPE: ☐ GAS ☐ LIQUID ☐ SEMI-SOLID ☒ SOLID m.T.

SAMPLE SIZE: ☐ PINT ☐ QUART ☐ GALLON ☐ OTHER 1 1-liter container / 1 VOA

SAMPLES IN SERIES: ☐ NO ☒ YES, TOTAL SAMPLES IN SEQUENCE 7

DUPLICATE SAMPLES ☒ NOT REQUESTED ☐ REQUESTED AND PROVIDED

COMMENTS:

Mike Talley — Environmental Specialist
NAME OF DEPARTMENTAL REPRESENTATIVE — TITLE

Mike Talley — 8/11/87
SIGNATURE — DATE

The undersigned acknowledges that the sample(s) described above were obtained at the location and under the circumstances described above.

Shirl Robinson — SPECIAL WASTE MGR.
NAME — TITLE

Shirl Robinson — 8-11-87
SIGNATURE — DATE

DWM-6 1/81

DIVISION OF WASTE MANAGEMENT

RECEIPT FOR SAMPLES

GENERAL INFORMATION

INSTALLATION TYPE: ☐ GENERATOR ☐ INCINERATOR ☐ TREATMENT FACILITY
☒ LANDFILL ☐ STORAGE FACILITY ☐ SURFACE IMPOUNDMENT ☐ WASTE PILE

INSTALLATION NAME: Campground Landfill EPA ID NO.: KY0098951262

INSTALLATION ADDRESS: 454 Campground Road Louisville, KY

COUNTY: Jefferson

DESCRIPTION OF SAMPLES

SAMPLE NUMBERS: CL-07

STATION DESCRIPTION/SAMPLING LOCATION: Leachate Stream?

SAMPLE METHOD: ☒ GRAB ☐ COMPOSITE

SAMPLE TYPE: ☐ GAS ☒ LIQUID ☒ SEMI-SOLID ☐ SOLID

SAMPLE SIZE: ☐ PINT ☐ QUART ☐ GALLON ☒ OTHER 5 1-liter containers 3 VOAs 1 500-ml

SAMPLES IN SERIES: ☐ NO ☒ YES, TOTAL SAMPLES IN SEQUENCE 7

DUPLICATE SAMPLES ☒ NOT REQUESTED ☐ REQUESTED AND PROVIDED

COMMENTS:

Mike Talley — NAME OF DEPARTMENTAL REPRESENTATIVE

Environmental Specialist — TITLE

Mike Talley — SIGNATURE

8/11/87 — DATE

The undersigned acknowledges that the sample(s) described above were obtained at the location and under the circumstances described above.

SHIRD ROBINSON — NAME

SPECIAL WASTE MGR — TITLE

Shird Robinson — SIGNATURE

8-11-87 — DATE

POPULATION DATA DOCUMENTATION

NAME OF SITE: Campground Landfill

COUNTY: Jefferson

RADIUS	HOUSE/BUILDING COUNT	POPULATION
0 TO 1/4 Mile	10	38
1/4 TO 1/2 Mile		2,901
1/2 TO 1 Mile		4,341
1 TO 2 Miles		17,491
2 TO 3 Miles		39,779
3 TO 4 Miles		65,398

129,948 = Total Population within 4 miles.

METHODOLOGY: House and building counts are taken from U.S.G.S Topographic map(s). These numbers are then multiplied by the conversion factor of 3.8 persons per household, as suggested in EPA's Uncontrolled Hazardous Waste Site Ranking System Users Manual, to obtain populations.

REFERENCES: KY. State Data Center, Louisville, KY. (502) 588-7990 (Sam Samnick)
U.S.G.S. - 1978, Louisville West Quadrangle, 7.5 Minute Series Topographic Map.

COMMENTS: Data presented here are taken from the attached data sheet. This data is computer-generated at the KY. State Data Center in Louisville, KY., and is based on the 1980 Census. House counts are impossible in the urban Louisville area.

(C) COPYRIGHT 1983 UNIVERSITY OF NEBRASKA-LINCOLN. ALL RIGHTS RESERVED
Suggested citation: Love, Douglas O. and Jerome A. Deichert, 'Site Evaluation and Location System', Bureau of Business Research, University of Nebraska-Lincoln, 1983.
SELS is tabulating the value of characteristic
. - POPULATION TOTAL
between 0 and .25 mile(s) of each block group center
(Equal weight)

Block Group Tabulation

1180
SELS is tabulating the value of characteristic
1 - POPULATION TOTAL
between 0 and .5 mile(s) of each block group center
(Equal weight)

Block Group Tabulation

1180 2939.
SELS is tabulating the value of characteristic
1 - POPULATION TOTAL
between 0 and 1 mile(s) of each block group center
(Equal weight)

Block Group Tabulation

1180 7280.
SELS is tabulating the value of characteristic
1 - POPULATION TOTAL
between 0 and 2 mile(s) of each block group center
(Equal weight)

Block Group Tabulation

1180 24771.
SELS is tabulating the value of characteristic
1 - POPULATION TOTAL
between 0 and 3 mile(s) of each block group center
(Equal weight)

Block Group Tabulation

1180 64550.
SELS is tabulating the value of characteristic
1 - POPULATION TOTAL
between 0 and 4 mile(s) of each block group center
(Equal weight)

Block Group Tabulation

1180 129948.

Record of Communication

☑ PHONE CALL ☐ DISCUSSION ☐ ON-SITE
☐ CONFERENCE ☐ OTHER ☐ ON-CALL

TO: Becky Carter (812) 951-3845
Edwardsville Water Corporation

FROM: Mike Talley
KDWM CERCLA PA/SI

DATE: 10/5/87
TIME: 9:00 a.m.

SUBJECT: Location of intake wells & water distribution of Edwardsville Water Corporation.

SUMMARY OF COMMUNICATION:

Ms. Edwards stated that their intake wells are located at the end of Sevenmile Lane on the Ohio River. Ms. Edwards said that they service the Highway 111, Twomile Lane, Fivemile Lane, Gap Hollow Road, and Daily Road areas.

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES:

Record of Communication

☐ PHONE CALL ☑ DISCUSSION ☐ ON-SITE
☐ CONFERENCE ☐ OTHER ☐ ON-CALL

TO: Hershel W Sallings
Senn Road (Resident)

FROM: Mike Talley
KDWM CERCLA PA/SI

DATE: 9/24/87
TIME: 2:00 p.m.

SUBJECT: Groundwater use in the Lake Dreamland area at Louisville, KY.

SUMMARY OF COMMUNICATION:

Mr Sallings stated that all of the residents on Senn Road used wells. He was rather upset that the Louisville Water Company would not run water to them unless ~~they~~ the residents paid the several thousand dollar installation fee. Mr. Sallings told me that the well he used was ~ 85 feet deep but that he was unsure about the water level in the well.

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES TO:

Record of Communication

☐ PHONE CALL ☑ DISCUSSION ☐ ON-SITE
☐ CONFERENCE ☐ OTHER ☐ ON-CALL

TO: Mrs. Edith Duvall
4409 Bramer's Lane

FROM: Mike Talley
KDWM CERCLA PA/SI

DATE: 9/24/87
TIME: 2:30 p.m.

SUBJECT: Groundwater use in the Lake Dreamland area of Louisville, KY.

SUMMARY OF COMMUNICATION:

Mrs. Duvall stated that all the residences on the west side of the floodwall (Bramer's Lane) used groundwater. Mrs. Duvall said that the Louisville Water Company claims it cannot aquire easement rights to run water lines to the residences on Bramer's Lane west of the floodwall. Mrs. Duvall was unsure about the depth of her well and the depth to the water table.

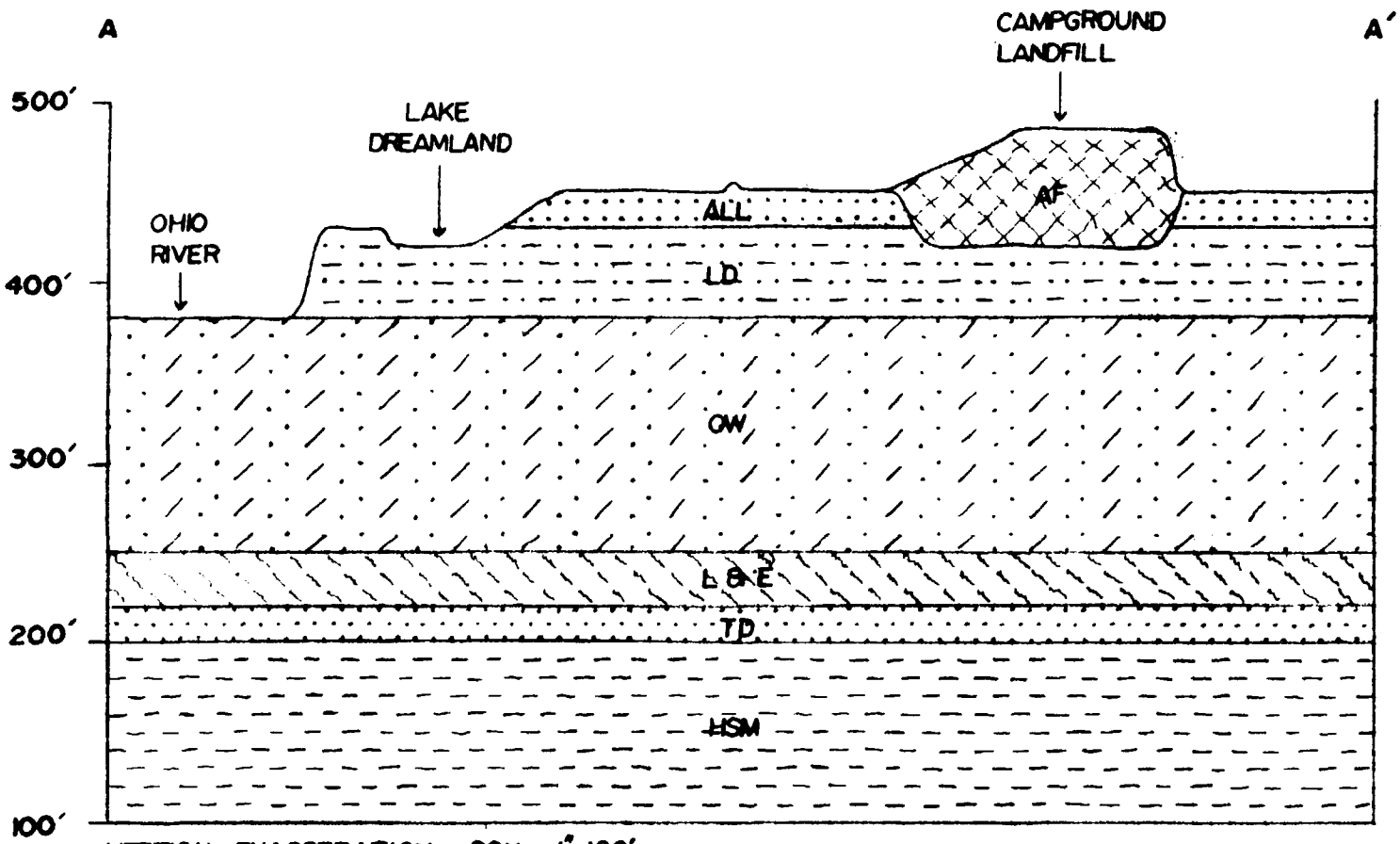
CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES TO:

OVERSIZED

DOCUMENT

GENERALIZED CROSS-SECTION OF THE LOUISVILLE WEST QUADRANGLE



VERTICAL EXAGGERATION 20X 1"=100′
HORIZONTAL SCALE 1"=2000′

AF, ARTIFICIAL FILL
ALL, ALLUVIUM
LD, LACUSTRINE DEPOSITS
OW, OUTWASH
L&E, LOESS & EOLIAN SAND
TD, TERRACE DEPOSITS
HSM, HOLTSCLAW SILTSTONE MEMBER

Campground Landfill SSI Sampling

8/11/87 Sunny, Low to Mid 80's

KDWM personnel

Mike Talley OSC
Jim Childers
John Maybrier

Waste Management of Louisville personnel

Shird Robinson

- Arrived on-site at 9:30 a.m.

CL-01 ~~37.~~ or CKU-01 2" ID
Upgradient Groundwater Monitoring Well
Locked cap on well
Depth of well = 73.67 feet
Depth to water = 37.75 feet

Purged 19 gallons
CL-01 taken at 11:00 a.m.
5 1-liter containers
2 VOAs

CL-02 or CKQ-04 2" I.D. PVC.

Downgradient Monitoring Well
Locked cap on well
Depth of Well = 95.00 feet
Depth to Water = 53.00 feet

purged 21 gallons

CL-02 taken at 1250
5 1-liter containers
2 VOAs

CL-03 or CKD-02 2" I.D. PVC.
Downgradient Monitoring Well
Locked cap on well
Depth of Well = 74.00 feet
Depth to Water 50.55 feet

purged 12 gallons

CL-03 taken at 1:45 p.m.
5 1-liter containers
2 VOAs

CL-04 - Background Soil
collected at rear of trailer on
Lot 15 on Wagon Trail in Pioneer
Mobilhome Trailer Park off Cane
Run Road behind Campground Landfill.
(Northernmost corner)
3 Photos taken - Facing East,
West & South

Time: 4:00 PM.
Grab Sample collected

Sample location ≈ 150' from landfill
property line at rear of above de-
scribed trailer

1 500-ml soil
1 VOA soil

CL-05 - On Site Sediment
Collected from drainage ditch located
on south side of landfill next
to Concrete Company culvert
Two photos taken facing ≈ West to
southwest
Composite sample 1-500ml
Time 4:30 PM 1-VOA

CL-06 - On site sediment collected from drainage ditch on North side of landfill next to & upgradient from Rohm & Haas's treatment pond

Two photos taken facing ≈ NE and N.

Composite collected
Time 4:35 PM
1 - 500 ml
1 - VOA

CL-07 - on site leachate & sediment sample collected from outbreak on north side of landfill approximately 1000' from the methane gas pumping station - (Easterly Direction from station)

Three photos taken facing ≈ south & southwest

Grab collected (H_2O)	(sed) Grab collected
3 - 1 Liter glass	1 - 500 ml
2 - 1 Liter plastic	1 - VOA
2 - VOA	

Time 5:10 PM.

M.2 - SITE MAINTENANCE FORM

* ACTION: _ *

EPA ID : KYD098951262

SITE NAME: CAMPGROUND LANDFILL SOURCE: N * _____ _ *

STREET : 4501 CAMPGROUND RD CONG DIST: 03 * _____ __ *

CITY : LOUISVILLE ZIP: 40216 * _____ _____-____ *

CNTY NAME: JEFFERSON CNTY CODE : 111 * _____ ___ *

LATITUDE : 38/11/36.0 LONGITUDE : 085/48/30.0 * __/__/__._ ___/__/__._ *

LL-SOURCE: R LL-ACCURACY: * _ _ *

SMSA : 4520 HYDRO UNIT: 05140101 * ____ _____ *

INVENTORY IND: Y REMEDIAL IND: Y REMOVAL IND: N FED FAC IND: N * _ _ _ _ *

NPL IND: N NPL LISTING DATE: NPL DELISTING DATE: * _ __/__ __/__ *

SITE/SPILL IDS: * __ __ __ __ __ *

RPM NAME: RPM PHONE: - - * _____ ___-___-____ *

SITE CLASSIFICATION: SITE APPROACH: * __ ___ *

DIOXIN TIER: REG FLD1: REG FLD2: * ____ _____ _ *

RESP TERM: PENDING ( ) NO FURTHER ACTION ( ) * PENDING (_) NO FURTHER ACTION (_) *

ENF DISP: NO VIABLE RESP PARTY ( ) VOLUNTARY RESPONSE ( ) * _ _ *
ENFORCED RESPONSE ( ) COST RECOVERY ( ) * _ _ *

SITE DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

M.2 - PROGRAM MAINTENANCE FORM

* ACTION: _ *

SITE: CAMPGROUND LANDFILL

EPA ID: KYD098951262 PROGRAM CODE: H01 PROGRAM TYPE: * _ *

PROGRAM QUALIFIER: ALIAS LINK : * *

PROGRAM NAME: SITE EVALUATION * *

DESCRIPTION:

* *

* *

* *

* *

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: CAMPGROUND LANDFILL
PROGRAM: SITE EVALUATION

EPA ID: KYD098951262 PROGRAM CODE: H01 EVENT TYPE: DS1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: E * _ ___ _ *

EVENT NAME: DISCOVERY STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START:	__/__/__	__/__/__	__/__/__
COMP :	COMP :	COMP : 11/01/79	__/__/__	__/__/__	__/__/__

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %				
			0	_____	_____	__	___

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: CAMPGROUND LANDFILL
PROGRAM: SITE EVALUATION

EPA ID: KYD098951262 PROGRAM CODE: H01 EVENT TYPE: PA1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: S * _ ___ _ *

EVENT NAME: PRELIMINARY ASSESSMENT STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START:	__/__/__	__/__/__	__/__/__
COMP :	COMP :	COMP : 12/01/79	__/__/__	__/__/__	__/__/__

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

COOP AGR #	AMENDMENT #	STATUS	STATE %
			0

M.2 - COMMENT MAINTENANCE FORM

SITE: CAMPGROUND LANDFILL

EPA ID: KYD098951262

COM NO	COMMENT	ACTION
001	KYS000001079, KYS000001080, KYS0000	_
	01089 (103 C) NOTIFICATIONS.	

SITE SCREENING SUMMARY 11-25-86

(4)

Site Name: Campground Landfill

EPA ID #: KYD098951262

Reviewer Name: Beverly Oliver Date: 1-26-87

I. INITIAL REVIEW: (Check where appropriate)

NPL ___ RCRA ___ Fed. Fac. ___ "Low Priority" Landfill ___

NFA ___ reason: ___

II. LEAD: Fund ___ Enforcement 4 Unknown ___

III. REMOVAL: Needed ___ reason: ___

Completed ___ (score using preremoval conditions)

IV. HRS SCORE: Not Scorable (Waste Identity) Confidence: high ___ medium ___ low ___

V. LOCATION: Latitude: 38° 10' 30.00" Longitude: 85° 50' 40.00"

V. INFORMATION NEEDED: (Check information needed to determine disposition)

A. Preliminary Assessment (Notes/sources for future reference)

PA 12/1/79

___ 1. RCRA Status Information
X 2. Observed Release
X 3. Target Information
X 4. Distance to Surface Water
X 5. Depth to aquifer of concern
X 6. Waste identity
X 7. Hazardous waste quantity
X 8. Others (list)

B. Site Investigation

X 1. Waste identity
X 2. Distance to surface water
X 3. Slope/intervening terrain
X 4. Containment
X 5. Observed release (surface)
X 6. Observed release (ground)
X 7. Hazardous waste quantity
___ 8. Others (list)

This site is located in an industrial section of Louisville known as Rubbertown. There is a strong possibility that this site contains hazardous waste but no specific wastes are documented in the files.

CRITICAL HRS FACTOR DOCUMENTATION FORM DATE: 1-22-86

:TE NAME: Campground Landfill

:A ID #: KYD098951262 REVIEWER: Beverly Oliver

.) Is an observed release documented (background and site samples are available and the site is shown to be the source of the contamination) or is one likely?

GROUNDWATER: Yes___ No X Likely ___ SURFACE WATER: Yes___ No X Likely___
Groundwater info source: ___
Surface water info source: ___

2) What is the depth at the site to the shallowest aquifer used locally for drinking water?

Depth: 100 ft Known ___ Estimated X Unknown ___
Source: USGS Hydrologic Atlas

3) What is the distance to surface water from the hazardous waste?

Distance: .75 mi Known ___ Estimated X Unknown ___
Source: USGS Topo Louisville West Quadrangle

4) What are the most toxic/persistent chemicals at the site: Unknown X

a)___ b)___ c)___
Source: ___

5) What is the hazardous waste quantity?

Quantity: ___ Known ___ Estimated ___ Unknown X
Source: ___

6) What is the distance to the nearest public water supply well using the aquifer of concern and what is the population served?

Distance: >3 mi Known ___ Estimated ___ Unknown ___
Population: ___ Known ___ Estimated ___ Unknown ___
Source: Ky Active D.

7) What is the distance to the nearest private water supply well using the aquifer of concern and what is the population served within 3 miles?

Distance: 3000 ft. Known ___ Estimated ___ Unknown ___
Population: 50 Known ___ Estimated ___ Unknown ___
Source: USGS Topo & SI Report on Triangle Refinery

3) What is the distance to the nearest downstream surface water intake and the population served?

Distance: > 3 mi Known ___ Estimated ___ Unknown ___
Population: ___ Known ___ Estimated ___ Unknown ___
Source: ___

11-25-86

HRS SCORE SHEET

DATE: 1-27-87

SITE NAME: Campground Landfill

EPA ID #: KYD098951262 REVIEWER: Beverly Oliver

HRS FACTOR SCORES Not Scorable

	Score	Default	Known	Estimate
1) Toxicity/persistence (TP)		none		
2) Waste quantity (WQ)		(1)		
3) Containment (Groundwater) (C_{gw})		(3)		
4) Depth to aquifer of concern (D_{ac})		(6)		
5) Distance to nearest well/population (DP_g)		none		
6) Containment (Surface Water) (C_{sw})		(3)		
7) Distance to surface water (D_{sw})		(6)		
8) Distance to surface intake/population (DP_s)		none		

S GROUNDWATER ROUTE SCORING:

a) If observed release: $S_{gw} = \frac{(TP + WQ)\ (DP_g + 9)}{12.74} =$ _____

) If no observed release: $S_{gw} = \frac{(D_{ac} + 7)\ (TP + WQ)\ (DP_g + 9)(C_{gw})}{573.3} =$ _____

SURFACE WATER ROUTE SCORING

If observed release: $S_{sw} = \frac{(TP + WQ)\ (DP_s + 9)}{14.3} =$ _____

If no observed release: $S_{sw} = \frac{(D_{sw} + 5)\ (TP + WQ)\ (DP_s + 9)(C_{sw})}{643.5} =$ _____

IMEDIA HRS SCORING

D. not score the air route unless an observed release is known to have occurred.

$$S_m = \sqrt{\frac{S_{gw}^2 + S_{sw}^2}{1.73}} = \text{\_\_\_\_\_}$$

The scoring in above steps is based on the following default scores:

1) the sum of the scores for net precipitation, permeability, and physical state is 7,
2) the groundwater use is for drinking and the score used is 9.
3) the sum of the scores for slope/terrain, rainfall and physical state is 5,
4) the sum of the scores for surface water use and distance to sensitive environments is 9.

If these assumptions are known to be substantially incorrect, complete an HRS scoring sheet.

RCRA/NPL POLICY QUESTIONNAIRE FOR INITIAL SCREENING

Site Name Campground Landfill

City Louisville State Ky

Facility I.D. Number KYD078951262

Type of Facility: Generator____ Transporter____ TSD____

I. RCRA APPLICABILITY

	yes	no
Does the facility have RCRA interim status?	___	X
Did the facility ever have RCRA interim status?	___	X
Does the facility have a final or post-closure permit? If so, date issued _____	___	X
Is the facility a non-notifier that has been identified by States or EPA?	___	X
Is the facility a known or possible protective filer?	___	X

STOP HERE IF ALL ANSWERS TO QUESTIONS IN SECTION I ARE NO

II. FINANCIAL STATUS

Is the facility owned by an entity that has filed for bankruptcy under federal laws (Chapter 7 or 11) or State laws?	___	___

If yes, what has it filed under?
Chapter 7___ Chapter 11___ Other___

III. ENFORCEMENT

RCRA Status

Has the facility lost authorization to operate via LOIS, 3005(c) permit denial, 3008(h) IS termination, 3005(d) permit revocation?	___	___
Has the facility's Interim Status been terminated via another mechanism (i.e. administrative termination)?		

CERCLA Status

What CERCLA financed remedial or removal activities have been initiated at the site? (RI/FS, RD/RA, O&M, forward planning, and removal; does not include enforcement or PA/SI activities)

Enforcement Status

YES

In general, would you characterize the facility as demonstrating an unwillingness to undertake corrective action based on prior State, CERCLA or RCRA actions? ____

If yes, please describe and cite the authorities exercised.

Is the owner/operator a party to any enforcement action at the site? ____

If not, why not?

Are any PRPs (including owner/operators) undertaking remedial studies or action in response to CERCLA enforcement authorities? What is the extent/type of work that has been completed (RI/FS, etc.) and who (generators, owner/opera etc.) is conducting the work?

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

Warren County

DATE: 7/20/88

SUBJECT: "New" Kentucky Sites

FROM: Robert Morris R. Morris

KYD985066414
705 Pearl St.
Bowling Green, Ky 42101

TO: File

On 7/20/88 Mary MacDonald of NUS contacted me and said that during her review of the Rad Chemicals Inc. site in Warren Co., Ky. (KYD096544234) she found this site was actually two (2) sites (the plant and a non-contiguous warehouse). I told her to do a PAR on the Plant site and a PA on the Warehouse site (which I entered into WasteLAN as Rad Chemicals Warehouse, Warren Co., Ref# 4940)). Upon further review of the file I found two (2) other sites on which Rad Chemical disposed of wastes which were not on WasteLAN. I entered them into WasteLAN and had FIT schedule PAs on them. They were: Caldwell Property, Warren Co., Ref # 4942; and Bradmar Property, Butler Co., Ref# 4941.

cc: Betsy Shaver
site files

MEMORANDUM

TO: Barry Burrus, Chief BB
Uncontrolled Site Section

FROM: Bob Burns, Environmentalist RB
Uncontrolled Site Section

SUBJECT: Preliminary Assessment Report for the Campground Landfill
Jefferson County
EPA ID: KYD098951262

DATE: September 18, 1984

This active landfill has disposed of wastewater treatment sludges from paint manufacturing, tank tar sludge from coking operations, spent potliners from primary aluminum production, dust/sludge from ferrochromium-silicon production, dust/sludge from ferrochromium production, dust/sludge from ferromanganese production, and asbestos. This facility has had a history of leachate outbreaks.

Conversations with field personnel indicate that this facility probably disposed of hazardous wastes in the past.

After the completion of a preliminary assessment and conversations with field personnel it is recommended that this facility be inspected on a medium priority.

BB/las

c John Brooks
U.S. EPA
File

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	D098951261

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Campground Landfill	4501 Campground Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Louisville	KY	40216	Jefferson	56	

09 COORDINATES LATITUDE	LONGITUDE
38° 11' 29.5"	085° 50' 40."

10 DIRECTIONS TO SITE (Starting from nearest public road)
I-264 W to Campground Rd. exit. Landfill is on the left of the road.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
Campground Landfill	7500 Grade Lane

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Louisville	KY	40219	(502) 361-8125

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Shird Robinson	7500 Grade Lane

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Louisville	KY	40219	(502) 361-8125

13 TYPE OF OWNERSHIP (Check one)
☑ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☑ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☑ YES DATE ___/___/___ (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☑ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
_____ BEGINNING YEAR | _____ ENDING YEAR ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Waste water treatment sludges from paint manufacturing, decanter tank tar sludge from coking operations, spent potliners from primary aluminum production, dust/sludge from ferrochromium-silicon production, dust/sludge from ferrochromium production dust/sludge from ferromanganese, asbestos

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☑ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
John Brooks	KYNREPC, Louisville Field Office	(502) 588-4254

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Robert Burns	KYNREPC	Waste Mgt	(502) 564-6716	4 9 84 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	D098951261

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES *(Check all that apply)*

- ☑ A. SOLID
- ☑ B. POWDER, FINES
- ☑ C. SLUDGE
- ☐ D. OTHER _____ *(Specify)*
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE *(Measures of waste quantities must be independent)*

TONS _____

CUBIC YARDS Unknown

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS *(Check all that apply)*

- ☑ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	Unknown		
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES *(See Appendix for most frequently cited CAS Numbers)*

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Unknown				

V. FEEDSTOCKS *(See Appendix for CAS Numbers)*

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

KYNREPC files

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	D098951261

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

If hazardous substances are on-site, direct contact is possible

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

If hazardous substances are on-site, worker exposure is possible

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☑ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	D098951261

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
No mention in files

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*
No mention in files

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES *(Spills/runoff/standing liquids/leaking drums)* — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☑ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
Several leachate outbreaks have been observed during past inspections

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

There were no types of analyses concerning this site in our files.

V. SOURCES OF INFORMATION *(Cite specific references, e. g., state files, sample analysis, reports)*

KYNREPC files

SEP 30 '83

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION	SITE NUMBER (to be assigned by Hq)

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete S ... n II (*Preliminary Assessment*). File this form in the Regi ... mental Protection Agency; Site Tracking System; Hazardou ... gton, DC 20460.

KYD098951262 JEFFERSON
CAMPGROUND LANDFILL
4501 CAMPGROUND RD
LOUISVILLE KY 40216
CARLETON, JAMES, PROJ MGR* 5133357171

KYD098951262 JEFFERSON
CAMPGROUND LANDFILL
4501 CAMPGROUND RD
LOUISVILLE KY 40216
BELT, R., PLANT MGR 5027744411

KYD098951262 JEFFERSON
CAMPGROUND LANDFILL
4501 CAMPGROUND RD
LOUISVILLE KY 40216
GIRARDI, FRANK, SR ENGR 5027786031

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. M X

I. SITE DESCRIPTION

"103-C NOTIFICATION" DATE: 810609
CARL SCHRUEDER
PHONE: 502-564-6716

J. HOW IDENTIFIED (i.e., ci

K. DATE IDENTIFIED (mo., day, & yr.)

L. PRINCIPAL STATE CONT
1. NAME
2. TELEPHONE NUMBER

II. PRELIMINARY ASSESSMENT (complete this section last)

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED (*no hazard*)

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☒ 4. SITE INSPECTION NEEDED (*low priority*)

C. PREPARER INFORMATION

1. NAME
2. TELEPHONE NUMBER
3. DATE (mo., day, & yr.) 10/1/82

WS 12/10/82

III. SITE INFORMATION

A. SITE STATUS

☐ 1. ACTIVE (*Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if intrequently.*)

☐ 2. INACTIVE (*Those sites which no longer receive wastes.*)

☐ 3. OTHER (*specify*): (*Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.*)

B. IS GENERATOR ON SITE?

☐ 1. NO ☐ 2. YES (*specify generator's four-digit SIC Code*):

C. AREA OF SITE (*in acres*)

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE (*deg.—min.—sec.*)
2. LONGITUDE (*deg.—min.—sec.*)

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☐ 2. YES (*specify*):

Continued From Front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER *(specify)*:		6. OTHER *(specify)*:		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER *(specify)*:
					9. OTHER *(specify)*:		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

V. WASTE RELATED INFORMATION

A. WASTE TYPE

☐ 1 UNKNOWN ☐ 2. LIQUID ☐ 3. SOLID ☐ 4. SLUDGE ☐ 5. GAS

B. WASTE CHARACTERISTICS

☐ 1 UNKNOWN ☐ 2. CORROSIVE ☐ 3. IGNITABLE ☐ 4 RADIOACTIVE ☐ 5 HIGHLY VOLATILE
☐ 6. TOXIC ☐ 7 REACTIVE ☐ 8 INERT ☐ 9 FLAMMABLE

☐ 10. OTHER *(specify)*: _____

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

2. Estimate the amount *(specify unit of measure)* of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
'X' (1) PAINT, PIGMENTS	'X' (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER *(specify)*:	(2) NON-HALOGNTD SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER *(specify)*	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER *(specify)*:			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER *(specify)*:
			(6) CYANIDE	(6) OTHER *(specify)*:	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER *(specify)*		

V. WASTE RELATED INFORMATION *(continued)*

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER				
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

☐ 1. NPDES PERMIT ☐ 2. SPCC PLAN ☐ 3. STATE PERMIT *(specify)*: _____

☐ 4. AIR PERMITS ☐ 5. LOCAL PERMIT ☐ 6. RCRA TRANSPORTER

☐ 7. RCRA STORER ☐ 8. RCRA TREATER ☐ 9. RCRA DISPOSER

☐ 10. OTHER *(specify)*: _____

B. IN COMPLIANCE?

☐ 1. YES ☐ 2. NO ☐ 3. UNKNOWN

4. WITH RESPECT TO *(list regulation name & number)*: _____

VIII. PAST REGULATORY ACTIONS

☐ A. NONE ☐ B. YES *(summarize below)*

IX. INSPECTION ACTIVITY *(past or on-going)*

☐ A. NONE ☐ B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

X. REMEDIAL ACTIVITY *(past or on-going)*

☐ A. NONE ☐ B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

LOW-S-11

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION	SITE NUMBER (to be assigned by Hq)
IV	

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

LOW-S-11

I. SITE IDENTIFICATION

A. SITE NAME: Campground Landfill

B. STREET *(or other identifier)*: 4501 Campground Road

C. CITY: Louisville

D. STATE: KY

E. ZIP CODE:

F. COUNTY NAME: Jefferson

G. OWNER/~~OPERATOR~~ *(if known)*

1. NAME: Jerry Blankenship (office 7500 Grade Lane)

2. TELEPHONE NUMBER: (502) 361-8125

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION: State inspected Landfill and defunct asphalt plant

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*: EPIC (1979) Site visit

K. DATE IDENTIFIED *(mo., day, & yr.)*: 10/21/80

L. PRINCIPAL STATE CONTACT

1. NAME: Ms. PAT HAIGHT

2. TELEPHONE NUMBER: (502) 564-6716

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☒ 2. MEDIUM ~~☐ 3. LOW~~ ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED *(no hazard)*

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☒ 4. SITE INSPECTION NEEDED *(low priority)*

C. PREPARER INFORMATION

1. NAME: Will Stringfellow

2. TELEPHONE NUMBER: 404-288-7711

3. DATE *(mo., day, & yr.)*: 10/28/80

III. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*

☐ 2. INACTIVE *(Those sites which no longer receive wastes.)*

☐ 3. OTHER *(specify)*: *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

☒ 1. NO

☐ 2. YES *(specify generator's four-digit SIC Code)*:

C. AREA OF SITE *(in acres)*: ~7

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE *(deg.-min.-sec.)*:

2. LONGITUDE *(deg.-min.-sec.)*:

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☒ 2. YES *(specify)*: Trailer at asphalt plant and landfill

Continued From Front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(*ies*) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (*specify*):		6. OTHER (*specify*):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (*specify*):
					9. OTHER (*specify*):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Sanitary landfill, state inspected
owner says they receive no hazwaste

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. UNKNOWN [ ] 2. LIQUID [X] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[X] 1. UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4. RADIOACTIVE [ ] 5. HIGHLY VOLATILE
[ ] 6. TOXIC [ ] 7. REACTIVE [X] 8. INERT [ ] 9. FLAMMABLE

[ ] 10. OTHER (*specify*): Municipal landfill + industrial dump

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

unknown, Eckhardt Report

2. Estimate the amount(*specify unit of measure*) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
'X' (1) PAINT, PIGMENTS	'X' (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER(*specify*):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER(*specify*):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER(*specify*):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER(*specify*):
			(6) CYANIDE	X (6) OTHER(*specify*): Municipal waste	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER(*specify*)		

 Continue On Page 3

Continued From Page 2

V. WASTE RELATED INFORMATION *(continued)*

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

roads are stabilized w/ waste oil
industrial waste unknown

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

asphalt plant no longer in operation, ponds will be filled
water flows from landfill to low spot (on property) where sand pit is.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS	X			landfill odors
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS	X			Runoff prob. does not leave property
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES	X			
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

 Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

☐ 1. NPDES PERMIT ☐ 2. SPCC PLAN ☐ 3. STATE PERMIT *(specify)*: _____

☐ 4. AIR PERMITS ☐ 5. LOCAL PERMIT ☐ 6. RCRA TRANSPORTER

☐ 7. RCRA STORER ☐ 8. RCRA TREATER ☐ 9. RCRA DISPOSER

☐ 10. OTHER *(specify)*: _____

B. IN COMPLIANCE?

☐ 1. YES ☐ 2. NO ☐ 3. UNKNOWN

4. WITH RESPECT TO *(list regulation name & number)*: _____

VIII. PAST REGULATORY ACTIONS

☐ A. NONE ☐ B. YES *(summarize below)*

IX. INSPECTION ACTIVITY *(past or on-going)*

☐ A. NONE ☐ B. YES *(complete items 1,2,3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

X. REMEDIAL ACTIVITY *(past or on-going)*

☐ A. NONE ☐ B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 4

SITE NUMBER (to be assigned by HQ): 35

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Campground Fill Company

B. STREET *(or other identifier)*: 7500 Grade Lane (business office)

C. CITY: Louisville

D. STATE: Ky.

E. ZIP CODE: 40219

F. COUNTY NAME: Jefferson

G. OWNER/OPERATOR *(if known)*
1. NAME: Jerry Blankenship
2. TELEPHONE NUMBER: (502) 361-9477

H. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION
50 acre sanitary landfill-Entrance 4501 Campground Road

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*
Eckhardt Report

K. DATE IDENTIFIED *(mo., day, & yr.)*

L. PRINCIPAL STATE CONTACT
1. NAME: Pat Haight
2. TELEPHONE NUMBER: (502) 564-6716

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM
☐ 1. HIGH ☒ 2. MEDIUM ☐ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION
☐ 1. NO ACTION NEEDED *(no hazard)*
☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 4. SITE INSPECTION NEEDED *(low priority)*
xx 5. Possible ground water monitoring would be advantagous

C. PREPARER INFORMATION
1. NAME: John Brooks
2. TELEPHONE NUMBER: (502) 564-6716
3. DATE *(mo., day, & yr.)*: 12-13-79

III. SITE INFORMATION

A. SITE STATUS
☒ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*
☐ 2. INACTIVE *(Those sites which no longer receive wastes.)*
☐ 3. OTHER *(specify)*: *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?
☒ 1. NO ☐ 2. YES *(specify generator's four-digit SIC Code)*:

C. AREA OF SITE *(in acres)*: 50

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE *(deg.—min.—sec.)*
2. LONGITUDE *(deg.—min.—sec.)*

E. ARE THERE BUILDINGS ON THE SITE?
☐ 1. NO ☒ 2. YES *(specify)*: Scale House & Pump House for methane gas system

T2070-2 (10-79)

Continue On Reverse

Continued from front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
X	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Company does small percentage of own hauling
Sanitary Landfill with only a few non-hazardous Industrial wastes allowed at present time.

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1 UNKNOWN [ ] 2. LIQUID [ ] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[ ] 1. UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4 RADIOACTIVE [ ] 5 HIGHLY VOLATILE
[X] 6. TOXIC [ ] 7 REACTIVE [ ] 8 INERT [ ] 9 FLAMMABLE

[ ] 10. OTHER (specify): _____

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes-some Records (data) submitted by company

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
'X' (1) PAINT, PIGMENTS	'X' (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	X (2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	X (2) ASBESTOS	(2) HOSPITAL
(3) PCTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	(6) OTHER (specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			X (10) METALS		
			(11) OTHER (specify)		

 Continue On Page 3

Continued From Page 2

V. WASTE RELATED INFORMATION *(continued)*

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

Mercury
CCl_4
Methanol
Acetone
Chloroform

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

Non-hazardous indistrial wastes from--Hillerich Bradsby (sludge) and Mid-East Sales Corp. (urea fertilizergel) now accepted-Also drummed asbestos from American Synthetic Rubber

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

 Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [X] 3. STATE PERMIT *(specify)*: Sanitary landfill #056.27
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER *(specify)*:

B. IN COMPLIANCE?

- [X] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN

4. WITH RESPECT TO *(list regulation name & number)*: KRS 224

VIII. PAST REGULATORY ACTIONS

- [X] A. NONE
- [ ] B. YES *(summarize below)*

IX. INSPECTION ACTIVITY *(past or on-going)*

- [ ] A. NONE
- [X] B. YES *(complete items 1,2,3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION
Routine Inspection	Fall '79	State	Site satisfactory

X. REMEDIAL ACTIVITY *(past or on-going)*

- [ ] A. NONE
- [X] B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION
Methane gas extraction	1979	Landfill	Stopped migration of gas--installed evacuation system

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 4

SITE NUMBER (to be assigned by HQ): KYD 098951202

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II (*Preliminary Assessment*). File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (*EN-335*); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Campground Fill Company

B. STREET (*for other identifier*): 7500 Grade Lane (business office)

C. CITY: Louisville

D. STATE: Ky

E. ZIP CODE: 40219

F. COUNTY NAME: Jefferson

G. OWNER/OPERATOR (*if known*)
1. NAME: Jerry Blankenship
2. TELEPHONE NUMBER: (502) 361-9477

H. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION
50 acre sanitary landfill-Entrance 4501 Campground Road

J. HOW IDENTIFIED (*i.e., citizen's complaints, OSHA citations, etc.*)
Eckhardt Report

K. DATE IDENTIFIED (*mo., day, & yr.*)

L. PRINCIPAL STATE CONTACT
1. NAME: Pat Haight
2. TELEPHONE NUMBER: (502) 564-6716

II. PRELIMINARY ASSESSMENT (*complete this section last*)

A. APPARENT SERIOUSNESS OF PROBLEM
☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION
☐ 1. NO ACTION NEEDED (*no hazard*)
☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 4. SITE INSPECTION NEEDED (*low priority*)
xx 5. Possible ground water monitoring would be advantagous

C. PREPARER INFORMATION
1. NAME: John Brooks
2. TELEPHONE NUMBER: (502) 564-6716
3. DATE (*mo., day, & yr.*): 12-13-79

III. SITE INFORMATION

A. SITE STATUS
☒ 1. ACTIVE (*Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.*)
☐ 2. INACTIVE (*Those sites which no longer receive wastes.*)
☐ 3. OTHER (*specify*): (*Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.*)

B. IS GENERATOR ON SITE?
☒ 1. NO
☐ 2. YES (*specify generator's four-digit SIC Code*):

C. AREA OF SITE (*in acres*): 50

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE (*deg.—min.—sec.*)
2. LONGITUDE (*deg.—min.—sec.*)

E. ARE THERE BUILDINGS ON THE SITE?
☐ 1. NO ☒ 2. YES (*specify*): Scale House & Pump House for methane gas system

T2070-2 (10-79)

Continue On Reverse

Continued from front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
X	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Company does small percentage of own hauling
Sanitary Landfill with only a few non-hazardous Industrial wastes allowed at present time.

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. UNKNOWN [ ] 2. LIQUID [ ] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[ ] 1. UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4. RADIOACTIVE [ ] 5. HIGHLY VOLATILE
[X] 6. TOXIC [ ] 7. REACTIVE [ ] 8. INERT [ ] 9. FLAMMABLE

[ ] 10. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes-some Records (data) submitted by company

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
X (1) PAINT, PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	X (2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	X (2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	(6) OTHER (specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			X (10) METALS		
			(11) OTHER (specify)		

 Continue On Page 3

Continued From Page 2

V. WASTE RELATED INFORMATION *(continued)*

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

Mercury
CCl_4
Methanol
Acetone
Chloroform

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

Non-hazardous indistrial wastes from--Hillerich Bradsby (sludge) and Mid-East Sales Corp. (urea fertilizergel) now accepted-Also drummed asbestos from American Synthetic Rubber

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [X] 3. STATE PERMIT (specify): Sanitary landfill #056.27
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER (specify):

B. IN COMPLIANCE?

- [X] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN

4. WITH RESPECT TO (list regulation name & number): KRS 224

VIII. PAST REGULATORY ACTIONS

- [X] A. NONE
- [ ] B. YES (summarize below)

IX. INSPECTION ACTIVITY (past or on-going)

- [ ] A. NONE
- [X] B. YES (complete items 1,2,3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Routine Inspection	Fall '79	State	Site satisfactory

X. REMEDIAL ACTIVITY (past or on-going)

- [ ] A. NONE
- [X] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Methane gas extraction	1979	Landfill	Stopped migration of gas--installed evacuation system

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.

Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*. List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo, day, & yr)	3. ACTION END DATE (mo, day, & yr)	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo, day, & yr)	3. ACTION END DATE (mo, day, & yr)	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA

POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System, Hazardous Waste Enforcement Task Force (*EN-335*); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
C. CITY	D. STATE	E. ZIP CODE

II. FINAL DETERMINATION

Indicate the recommended action(*s*) and agency(*ies*) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

Continue On Reverse

HOBART CORPORATION

WORLD HEADQUARTERS TROY, OHIO 45374 513 335-7171

May 13, 1981

TO R. McAfee
Hazardous Waste Coordinator, Louisville Plant

FROM J. J. Carleton
Corporate Hazardous Waste Coordinator

SUBJECT Superfund Notification

Copies To
F. Bazler
J. Delaney
W. E. Henson
R. Lenox
R. D. Leytze
D. Riley
File

The EPA has been charged by Congress to compile information regarding past disposal of hazardous waste. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (commonly known as Superfund) mandates in Section 103(c) that we furnish EPA by June 9, 1981, certain information concerning our past disposal practices.

In order to comply with this request for information, I am requesting that each of you send to my attention by June 3, 1981, the below information in letter form. I will then fill in the Superfund notification form and will include with it a copy of your letter. Even though we are on the fringes of what Superfund is really after, namely abandoned sites, our compliance with the request is mandatory.

Since time is of the essence, EPA is not requiring that you painstakingly document the information submitted. This information may be based on your knowledge or reasonably available records. Your best estimates involving quantities will be satisfactory.

The following information is requested:

1. EPA ID Number
2. Waste generated at your facility be EPA Hazard Code Number. These items are found on the Notification filed in August, 1980.
3. Name and address of disposal site or sites used prior to disposal under RCRA in 1980. Indicate the type of landfill (eg. County Sanitary, Private Industrial, etc.). If a recycling facility, so indicate.
4. Dates these sites were used.
5. Estimate of yearly quantities.

Please sign your letter to me, and be sure to use company stationary. In the event that you should have any questions, please contact either myself or Dick Lenox in Troy.

A copy of this letter and a copy of your response will be part of the Superfund notification which will be filed by Facilities Engineering and signed by J. J. Carleton.

Please be prompt in your information dispatch.

J. J. Carleton/smc

JJC/smc

EQUIPMENT, SYSTEMS AND SERVICES FOR THE WORLD'S FOOD INDUSTRY... KITCHENAID APPLIANCES FOR THE HOME... IN OVER 100 COUNTRIES

EPA Notification of Hazardous Waste Site

R

United States Environmental Protection Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810608

Form 8 of 12

KYS000001089

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: The BFGoodrich Company Chemical Group

Street: 4100 Bells Lane - P.O. Box 32950

City: Louisville State: KY Zip Code: 40232

B Site Location:

Enter the common name (if known) and actual location of the site.

KYD098 951262

Name of Site: Camp Ground Landfill

Street: 4501 Camp Ground Road

City: Louisville County: Jefferson State: KY Zip Code: 40219

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Mosser, Ms. Paige, Senior Engineer, Environmental Services Group

Phone: 502/778-6631, Ext. 2490

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site

From (Year): 1974 To (Year): 1979

E Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☒ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☒ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☒ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☒ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

		0 0 0 2 7

RECEIVED EPA/REGION IV JUN 3 0 02 PM '81 ENVIRONMENTAL DIVISION

Form Approved
OMB No. 2000-0138
EPA Form 8900-1

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☒ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount*

~~cubic feet~~ _____

~~gallons~~ *29,200 tons (est.)*

Total Facility Area

square feet *Unknown*

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ None
☒ *Unknown*

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

**BFGoodrich Louisville Facility's portion of the total facility waste - not all of which may have been hazardous per RCRA Regulations.*

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name *Mr. E. L. Beeler, Facility Manager*

Street *The BFGoodrich Company Chemical Group*
P.O. Box 32950

City *Louisville* State *KY* Zip Code *40232*

Signature *E. L. Beeler* Date *6/5/81*

☐ Owner, Present
☐ Owner, Past
☒ Transporter
☐ Operator, Present
☐ Operator, Past
☒ Other *(Generator*

HOBAR CORPORATION

WORLD HEADQUARTERS TROY, OHIO 45374

May 22, 1981

TO James Carleton

FROM Bob McAfee

SUBJECT **Waste Disposal**

COPIES TO
B. Wright
B. May
File

As requested in your letter dated May 13, 1981, I am sending you the following information on waste disposal before 1980.

1. EPA - ID Number - KYD006372205
2. Hazard Code Numbers - F-001 and F-002 Degreasers, D-008 Waste Paint.
3. Prior disposal site - Compground Landfill, 4501 Campground Road, Louisville, Kentucky (Private Industrial)
4. Dates Used - 1950 to 1979*
5. Yearly Quantities - 60 Cubic Yards.

Robert E. McAfee
Plant Engineer
Louisville Plant

*Actual delivery of waste was made by Industrial Disposal, Inc. This was the only landfill used to my knowledge.

No records were kept before 1980. These quantities are based on 1980 figures.

F-126

EPA Notification of Hazardous Waste Site

United States Environmental Protection Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810609

KY5000001079

A Person Required to Notify:
Enter the name and address of the person or organization required to notify.

Name: Mobil Chemical Co
Street: 1630 W. Hill St
City: Louisville State: KY Zip Code: 40201

B Site Location:
Enter the common name (if known) and actual location of the site.

KYD 098 951262

Name of Site: Campground Landfill
Street: 4501 Campground R
City: Louisville County: ~~KY~~ State: KY Zip Code: 40204

C Person to Contact:
Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Belt, R, Plant Mgr
Phone: 502-774-4411

D Dates of Waste Handling:
Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1973 To (Year): 1981

E Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☑ Other (Specify) Oil fill

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☑ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet _____

gallons 500 tons

Total Facility Area

square feet _____

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required

Name _____

Street _____

City _____ State _____ Zip Code _____

Signature _____ Date _____

☐ Owner, Present
☐ Owner, Past
☐ Transporter
☐ Operator, Present
☐ Operator, Past
☐ Other

EPA Notification of Hazardous Waste Si

United States Environmental Protection Agency Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810609

KY5000001080

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: Hobart Corporation

Street: 3401 Jewell Avenue

City: Louisville State: KY Zip Code: 40212

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site: ~~Please~~ see attached letter Campground Landfill

Street: 4501 Campground Rd

City: Louisville County: State: KY Zip Code: 40204

KYD098951262

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Carleton, James J., Project Engineer

Phone: 513/335-7171 Hobart Corporation, Troy, OH 45374

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1950 To (Year): 1979 See Attached Letter

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

F001	F002	F003
F005	F006	F007
F008	F009	F017
F018		

RECEIVED EPA/REGION IV JUN 9 12 40 PM '81 ENVIRONMENT DIVISION

00177

Form Approved
OMB No. 2000-0138

EPA Form 8900-1

Notification of Hazardous Waste Site **Side Two**

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☒ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☒ Other (Specify) See Attached letter.

Total Facility Waste Amount

cubic feet 46980

gallons

Total Facility Area

square feet

acres

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☒ Likely ☐ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name James J. Carleton, Project Engineer

Street World Headquarters

City Troy State OH Zip Code 45374

Signature James J. Carleton Date 6/8/81

☐ Owner, Present
☐ Owner, Past
☐ Transporter
☐ Operator, Present
☐ Operator, Past
☒ Other

EPA

POTENTIAL HAZARDOUS WASTE SITE
TENTATIVE DISPOSITION

REGION	SITE NUMBER
IV	KY0000000790

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Campground Fill Company	4501 Campground Rd.	
C. CITY	**D. STATE**	**E. ZIP CODE**
Louisville	KY	

II. TENTATIVE DISPOSITION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED -- NO HAZARD					
B. INVESTIGATIVE ACTION(S) NEEDED *(If yes, complete Section III.)*					
C. REMEDIAL ACTION NEEDED *(If yes, complete Section IV.)*	X				X
D. ENFORCEMENT ACTION NEEDED *(if yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR DISPOSITION

F. INDICATE THE ESTIMATED DATE OF FINAL DISPOSITION *(mo., day, & yr.)*	G. IF A CASE DEVELOPMENT PLAN IS NECESSARY, INDICATE THE ESTIMATED DATE ON WHICH THE PLAN WILL BE DEVELOPED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*
R. Shane Pitchock	404/881-2234	10/8/80

III. INVESTIGATIVE ACTIVITY NEEDED

A. IDENTIFY ADDITIONAL INFORMATION NEEDED TO ACHIEVE A FINAL DISPOSITION.

B. PROPOSED INVESTIGATIVE ACTIVITY *(Detailed Information)*

1. METHOD FOR OBTAINING NEEDED ADDITIONAL INFO.	2. SCHEDULED DATE OF ACTION *(mo, day, & yr)*	3. TO BE PERFORMED BY *(EPA, Contractor, State, etc.)*	4. ESTIMATED MANHOURS	5. REMARKS
a. TYPE OF SITE INSPECTION				
(1)				
(2)				
(3)				
b. TYPE OF MONITORING				
(1)				
(2)				
c. TYPE OF SAMPLING				
(1)				
(2)				

Continue On Reverse

Continued From Front

III. INVESTIGATIVE ACTIVITY NEEDED and PART B - PROPOSED INVESTIGATIVE ACTIVITY *(Continued)*

d. TYPE OF LAB ANALYSIS (1)				
(2)				
e. OTHER *(specify)* (1)				
(2)				

C. ELABORATE ON ANY OF THE INFORMATION PROVIDED IN PART B *(on front & above)* AS NEEDED TO IDENTIFY ADDITIONAL INVESTIGATIVE WORK.

D. ESTIMATED MANHOURS BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL ESTIMATED MANHOURS FOR INVESTIGATIVE ACTIVITIES	1. ACTION AGENCY	2. TOTAL ESTIMATED MANHOURS FOR INVESTIGATIVE ACTIVITIES
a. EPA		b. STATE	
c. EPA CONTRACTOR		d. OTHER *(specify)*	

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY STRATEGY *(On Site & Off-Site)*: List all emergency actions needed to bring site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the space below.

1. ACTION	2. EST. START DATE *(mo,day,& yr)*	3. EST. END DATE *(mo,day,& yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. ESTIMATED COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site & Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. EST. START DATE *(mo,day,& yr)*	3. EST. END DATE *(mo,day,& yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. ESTIMATED COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED
Monitoring Wells			Private	$	
				$	
				$	
				$	
				$	
				$	

C. ESTIMATED MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL EST. MANHOURS FOR REMEDIAL ACTIVITIES	3. TOTAL EST. COST FOR REMEDIAL ACTIVITIES	1. ACTION AGENCY	2. TOTAL EST. MANHOURS FOR REMEDIAL ACTIVITIES	3. TOTAL EST. COST FOR REMEDIAL ACTIVITIES
a. EPA			b. STATE		
c. PRIVATE PARTIES			d. OTHER *(specify)*		

EPA

POTENTIAL HAZARDOUS WASTE SITE
TENTATIVE DISPOSITION

REGION	SITE NUMBER
IV	

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Campground Landfill	Campground Rd	
C. CITY	**D. STATE**	**E. ZIP CODE**
Louisville	KY	

II. TENTATIVE DISPOSITION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED -- NO HAZARD	X	X			
B. INVESTIGATIVE ACTION(S) NEEDED *(If yes, complete Section III.)*					
C. REMEDIAL ACTION NEEDED *(If yes, complete Section IV.)*	X				X
D. ENFORCEMENT ACTION NEEDED *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*	X				X

E. RATIONALE FOR DISPOSITION

F. INDICATE THE ESTIMATED DATE OF FINAL DISPOSITION *(mo., day, & yr.)*	G. IF A CASE DEVELOPMENT PLAN IS NECESSARY, INDICATE THE ESTIMATED DATE ON WHICH THE PLAN WILL BE DEVELOPED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*
R. Shane Hitchcock	404/881-2234	6/26/80

III. INVESTIGATIVE ACTIVITY NEEDED

A. IDENTIFY ADDITIONAL INFORMATION NEEDED TO ACHIEVE A FINAL DISPOSITION.

B. PROPOSED INVESTIGATIVE ACTIVITY *(Detailed Information)*

1. METHOD FOR OBTAINING NEEDED ADDITIONAL INFO.	2. SCHEDULED DATE OF ACTION *(mo, day, & yr)*	3. TO BE PERFORMED BY *(EPA, Contractor, State, etc.)*	4. ESTIMATED MANHOURS	5. REMARKS
a. TYPE OF SITE INSPECTION				
(1)				
(2)				
(3)				
b. TYPE OF MONITORING				
(1)				
(2)				
c. TYPE OF SAMPLING				
(1)				
(2)				

Continue On Reverse

Continued From Front

III. INVESTIGATIVE ACTIVITY NEEDED and PART B - PROPOSED INVESTIGATIVE ACTIVITY *(Continued)*

d. TYPE OF LAB ANALYSIS (1)				
(2)				
e. OTHER *(specify)* (1)				
(2)				

C. ELABORATE ON ANY OF THE INFORMATION PROVIDED IN PART B *(on front & above)* AS NEEDED TO IDENTIFY ADDITIONAL INVESTIGATIVE WORK.

D. ESTIMATED MANHOURS BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL ESTIMATED MANHOURS FOR INVESTIGATIVE ACTIVITIES	1. ACTION AGENCY	2. TOTAL ESTIMATED MANHOURS FOR INVESTIGATIVE ACTIVITIES
a. EPA		b. STATE	
c. EPA CONTRACTOR		d. OTHER *(specify)*	

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY STRATEGY *(On Site & Off-Site)*: List all emergency actions needed to bring site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the space below.

1. ACTION	2. EST. START DATE *(mo,day,&yr)*	3. EST. END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. ESTIMATED COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site & Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. EST. START DATE *(mo,day,&yr)*	3. EST. END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. ESTIMATED COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED
Gas venting system	1978	1978	Private	$	
				$	
				$	
				$	
				$	
				$	

C. ESTIMATED MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL EST. MANHOURS FOR REMEDIAL ACTIVITIES	3. TOTAL EST. COST FOR REMEDIAL ACTIVITIES	1. ACTION AGENCY	2. TOTAL EST. MANHOURS FOR REMEDIAL ACTIVITIES	3. TOTAL EST. COST FOR REMEDIAL ACTIVITIES
a. EPA			b. STATE		
c. PRIVATE PARTIES			d. OTHER *(specify)*		

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION	SITE NUMBER (to be assigned by Hq)
IV	

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition *(Section II)*. File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Tack Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Campground Landfill

B. STREET *(or other identifier)*: Campground Rd.

C. CITY: Louisville

D. STATE: KY

E. ZIP CODE:

F. COUNTY NAME: Jefferson

G. SITE OPERATOR INFORMATION

1. NAME: Campground Fill Company

2. TELEPHONE NUMBER:

3. STREET:

4. CITY: Louisville

5. STATE: KY

6. ZIP CODE:

H. REALTY OWNER INFORMATION *(if different from operator of site)*

1. NAME:

2. TELEPHONE NUMBER:

3. CITY:

4. STATE:

5. ZIP CODE:

I. SITE DESCRIPTION: Sanitary Landfill w/ some industrial wastes - methane gas migration problem

J. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION *(complete this section last)*

A. ESTIMATE DATE OF TENTATIVE DISPOSITION *(mo., day, & yr.)*: 7/20/79

B. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE

C. PREPARER INFORMATION

1. NAME: Ashane Hitchcock

2. TELEPHONE NUMBER: 404/881-2234

3. DATE *(mo., day, & yr.)*: 6/26/80

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME: John E. Dickinson

2. TITLE: Chemical Engineer

3. ORGANIZATION: EPA

4. TELEPHONE NO. *(area code & no.)*: 404/881-3016

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
	KY-DWREP	502/564-6716

C. SITE REPRESENTATIVES INTERVIEWED *(corporate officials, workers, residents)*

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS

Continued From Front

III. INSPECTION INFORMATION *(continued)*

D. GENERATOR INFORMATION *(sources of waste)*

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS

G. DATE OF INSPECTION *(mo., day, & yr.)* 6/13/78	H. TIME OF INSPECTION	I. ACCESS GAINED BY: *(credentials must be shown in all cases)* ☒ 1. PERMISSION ☐ 2. WARRANT

J. WEATHER *(describe)*

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN *(mark 'X')*	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER *(specify)*			

B. FIELD MEASUREMENTS TAKEN *(e.g., radioactivity, explosivity, PH, etc.)*

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS

 Continue On Page 3

Continued From Page 2

IV. SAMPLING INFORMATION *(continued)*

C. PHOTOS

1. TYPE OF PHOTOS

[X] a. GROUND [ ] b. AERIAL

2. PHOTOS IN CUSTODY OF:

D. SITE MAPPED?

[ ] YES. SPECIFY LOCATION OF MAPS:

E. COORDINATES

1. LATITUDE *(deg.-min.-sec.)*

2. LONGITUDE *(deg.-min.-sec.)*

V. SITE INFORMATION

A. SITE STATUS

[X] 1. ACTIVE *(Those inductrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*

[ ] 2. INACTIVE *(Those sites which no longer receive wastes.)*

[ ] 3. OTHER *(specify)*: _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

[X] 1. NO [ ] 2. YES *(specify generator's four-digit SIC Code)*: _____

C. AREA OF SITE *(in acres)*

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [ ] 2. YES *(specify)*:

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity*(ies)* and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER *(specify)*:		6. OTHER *(specify)*:		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER *(specify)*:
					9. OTHER *(specify)*:		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[X] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [X] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [X] 7. INERT [X] 8. FLAMMABLE

[ ] 9. OTHER *(specify)*:

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

 Continue On Reverse

Continued From Front

VII. WASTE RELATED INFORMATION *(continued)*

2. Estimate the amount *(specify unit of measure)* of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
'X' (1) PAINT, PIGMENTS	'X' (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER *(specify)*:	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER *(specify)*:	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER *(specify)*:			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER *(specify)*:
			(6) CYANIDE	(6) OTHER *(specify)*:	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER *(specify)*:		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE *(place in descending order of hazard)*

1. SUBSTANCE	2. FORM *(mark 'X')*			3. TOXICITY *(mark 'X')*				4. CAS NUMBER	5. AMOUNT	6. UNIT
	a. SOLID	b. LIQ.	c. VAPOR	a. HIGH	b. MED.	c. LOW	d. NONE			
Methane Gas			X							

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

☒ A. HUMAN HEALTH HAZARDS

Methane gas in the past has migrated into the septic systems of a nearby trailer park and into the Kentucky Concrete Pipe Company. A gas evacuation system has been installed, however.

 Continue On Page 5

Continued From Page 4

VIII. HAZARD DESCRIPTION *(continued)*

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☐ E. CONTAMINATION OF FOOD CHAIN

☐ F. CONTAMINATION OF GROUND WATER

☐ G. CONTAMINATION OF SURFACE WATER

 Continue On Reverse

Continued From Front

VIII. HAZARD DESCRIPTION *(continued)*

☐ H. DAMAGE TO FLORA/FAUNA

☐ I. FISH KILL

☑ J. CONTAMINATION OF AIR

Methane and other gases

☐ K. NOTICEABLE ODORS

☐ L. CONTAMINATION OF SOIL

☐ M. PROPERTY DAMAGE

 Continue On Page 7

Continued From Page 6

VIII. HAZARD DESCRIPTION *(continued)*

☐ N. FIRE OR EXPLOSION

In trailer park & concrete company the potential for explosion exists.

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☐ Q. EROSION PROBLEMS

☐ R. INADEQUATE SECURITY

☐ S. INCOMPATIBLE WASTES

VIII. HAZARD DESCRIPTION *(continued)*

☐ T. MIDNIGHT DUMPING

☐ U. OTHER *(specify)*:

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE *(specify units)*
1. IN RESIDENTIAL AREAS	unk			unk
2. IN COMMERCIAL OR INDUSTRIAL AREAS	unk			unk
3. IN PUBLICLY TRAVELLED AREAS				
4. PUBLIC USE AREAS *(parks, schools, etc.)*				

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER *(specify unit)*	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
D. POTENTIAL YIELD OF AQUIFER	E. DISTANCE TO DRINKING WATER SUPPLY *(specify unit of measure)*	F. DIRECTION TO DRINKING WATER SUPPLY

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY < 15 CONNECTIONS* ☐ 2. COMMUNITY *(specify town)*: > 15 CONNECTIONS _____

☐ 3. SURFACE WATER ☐ 4. WELL

Continue On Page 9

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (*e.g., RCRA, State, NPDES, etc.*)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (*mo., day, & yr.*)	E. EXPIRATION DATE (*mo., day, & yr.*)	F. IN COMPLIANCE (*mark 'X'*)		
					1. YES	2. NO	3. UNKNOWN

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☐ NONE ☐ YES (*summarize in this space*)

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition (*Section II*) information on the first page of this form.

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA *(continued)*

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH *(specify unit)*	3. LOCATION *(proximity to population/buildings)*	4. NON-COMMUNITY *(mark 'X')*	5. COMMUNITY *(mark 'X')*

I. RECEIVING WATER

1. NAME

☐ 2. SEWERS ☐ 3. STREAMS/RIVERS

☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER *(specify)*:

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☐ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND

☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK *(specify below)*	'X'	C. OTHER *(specify below)*
	1. SAND				
	2. CLAY				
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH *(100,000 to 1000 cm/sec.)* ☐ C. HIGH *(1000 to 10 cm/sec.)*

☐ D. MODERATE *(10 to .1 cm/sec.)* ☐ E. LOW *(.1 to .001 cm/sec.)* ☐ F. VERY LOW *(.001 to .00001 cm/sec.)*

G. RECHARGE AREA

☐ 1. YES ☐ 2. NO 3. COMMENTS:

H. DISCHARGE AREA

☐ 1. YES ☐ 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.

J. OTHER GEOLOGICAL DATA

Continue On Reverse

AUG 30 1978

Mr. Norman Schell, Director
Division of Hazardous Materials &
Waste Management
State Department for Natural Resources
& Environmental Protection
Capital Plaza Tower
Frankfort, Kentucky 40601

Dear Mr. Schell:

In reference to the Campground Landfill gas migration problem, we have contacted Mr. Bobby Carroll of our Athens laboratory regarding the purchase of a pyrolyzer-gas chromatograph unit. The laboratory does not have funds to purchase this unit. We have learned that Murray State University has a pyrolyzer-GC unit. Mr. Paul Goodley of the Chemistry Department said you could contact him at 502/762-2534 to arrange for analysis of the landfill gas samples.

A literature search on gas migration control has shown that some type of convective flow must be used if pipe vents are to be effective. A list of EPA publications on controlling landfill gas migration is attached.

Other EPA regions have found that induced convection is necessary for venting landfill gas. Some larger landfills are using the gas as a fuel source.

The cost of installing a flaring system would range from $10,000 to $100,000. Several options are available. Flares could be installed at each of the wells or, if a header is installed, one flare could be used. The size and price of the flare would depend on the amount of gas generated. I have included the names of two companies that provide flaring and venting systems.

Also enclosed is a summary of hazards for the components analyzed by EPA, Athens on June 8, 1978. The concentrations of benzene, vinyl chloride, and tetrachloroethane exceed inhalation threshold limit values.

If you have any questions, please call me or John Dickinson.

Sincerely,

James H. Scarbrough, P.E.
Chief
Residuals Management Branch

Enclosures

cc: Mr. Bruce K. Lane
Mr. Robert T. Offutt
Mr. James H. Finger

JHS
8/29/78

4ATS:RDavenport:cj:X3016:8/28/78
Davenport 8/29

AUG 30 1978

Methane Gas Migration

Ben Glover

FILE

REGION I, BOSTON, MA

Talked to Dennis Gagne.

Part of University of Massachusetts was built over an old landfill. A combination of an impervious membrane, gravel barriers and a computer-based methane detection system prevent gas accumulation in the building area.

REGION II, NEW YORK, NY

No report.

REGION III, PHILADELPHIA, PA

Talked to Charlie Howard.

Harleyville, PA - CO migration, explosion in 1975, no damage. Old quarry was made into a landfill. Gas migrated from fissures into an artesian (deep-bored) well. Solution: Vented the well and later vented the land area.

Richmond, VA - Methane migration. Hills on which Richmond built were filled with refuse. After landfilling, city cemented whole area. An abandoned well was still open. (Well was about 10 yards from landfill.) Cement slabs over the well formed cracks. Gas seeped through crack and exploded. Solution: Forced venting with pump. (Regular venting failed.) Mr. Howard recommended test boring with monitor well meter hookups to establish how much gas is there.

REGION V, CHICAGO, IL

Rita Davenport talked to Ken Berkchant

Hopkins, MI	- Sandra Forrest	FTS 776-7288
Illinois	- Tom Kavinole	FTS 956-6760
Michigan	- B.P. Shaw	FTS 253-6620

Check with State of Arkansas; they have strict closure procedures. Get State contact: Chief of Solid Waste Division in Little Rock, 501/371-1701.

REGION VI, DALLAS, TX

Talked to Bill Hathaway, FTS 729-2645.

Landfills are shallow. Have had minor problems to date.

REGION VII, KANSAS CITY, MO.

Talked to Chet McLoughlin, FTS 758-3307.

Have had few problems. NRG have a 10 year contract to tie up to methane gas rights. They plan to collect gas for use. City has development rights.

Weber Quarry (near St. Louis, MO) - Fred Weber of Asphalt Batch Company has a 14-acre landfill that is 240 feet deep. He plans to use gas for fuel (500 gal/day).

Kansas City, KS - Has a landfill that is 120 feet deep and shaped like a bowl. Monitored closely. When ice cap covers the landfill, gas flows laterally.

Omaha, NB - Gas found when a sewer system was being constructed. Gas was found in the trenches. Filled trenches with gravel for venting system.

REGION VIII, DENVER, CO

Talked to More Johnson.

He mentioned that there is a task force in Denver working on the problem. He mentioned some people that I should talk to:

1. Don Kennerson, Fire Chief
   South Adams Fire Dept.
   Commerce City (Denver)
   303/288-0835 and 4179

2. Consultant: Russ Herman
   Denver Associates
   303/234-1971

3. John Pacey (deals with big landfills)
   San Jose', CA
   408/275-1444, FTS 463-7011

REGION IX, SAN FRANCISCO, CA

Talked to Jim Schalor. Region IX has few problems.

REGION X, SEATTLE, WA

Vent the area. Maybe flare the gas.

NOTES: Talked to Don Kennerson, Fire Chief of South Adams Fire Dept. 303/288-4179. Three general methods of eliminating migrating gas:

1. Passive bent system - use of gravel fill trenches around landfill. Gas flow into grave and up to the air.

2. Barrier - gas hits barrier and goes up.

3. Vacuum extraction - system of wells over landfill. Pump sucks air from wells; flare the gas.

Method No. 3 is the best method. Two of 100 landfills used method No. 3 (sanitary landfills). The landfill which uses an extraction well system covers 100 acres.

Talked to:

Sandra Forrest
MN Pollution Control Agency
Hopkins, MN
FTS 776-7288

She told me to contact:

Mr. Beecher
Hopkin Sanitary Landfill
612/935-8474

Anoka Municipal Landfill
612/421-0540

BGl

4ATS:BGlover:cj:X3016:8/28/78

TOXIC LEVELS[1/]

Sequence No.	Name of Compound	TLV[2/] (PPM)	TWA[3/] (PPM)
CY14000	Benzene	25	10
FS91000	Chloroform	25	50
TX96250	Dichloropropane	75	75
PA80500	Methylene Chloride	200	500
KI84000	Tetrachloroethane	5	-
XS52500	Toluene	100	200
KJ31500	Trichloroethane	10	10
KX45500	Trichloroethylene	100	100
KU96250	Vinyl Chloride	200	1
KY93600	1, 2-Dichloroethylene	200	200
PA82000	Dichlorodifluoromethane	1000	1000
KI05250	1, 2-Dichloroethane	50	50

1/Registry of Toxic Effects of Chemical Substances, 1977 Edition.

2/Threshold Limit Values (TLV) which are recommended limits proposed by the American Conference of Governmental Industrial Hygienists based on a consensus. The TLV is the recommended upper limit (ceiling) concentration of a substance to which most workers can be exposed without adverse effect.

3/TWA refers to the time-weighted average standard set by OSHA.

FLARING AND VENTING SYSTEMS

Mr. John F. Straitz, III
Pollution Control Division
National AirOil Burner Company, Inc.
1284 East Sedgley Avenue
Philadelphia, PA 19134
215/743-5300

Mr. Roger Noble
Flare Department
John Zink Company
Post Office Box 5388
Tulsa, OK 74105
918/747-1371

REFERENCES FOR GAS MIGRATION CONTROL

OSW PUBLICATIONS

287. Sanitary landfill design and operation. D. R. Brunner and D. J. Keller, Environmental Protection Publication SW-65ts. Washington, U.S. Government Printing Office, 1972. 59 p.

391. Disposal of sewage sludge into a sanitary landfill. R. Stone, comp. Environmental Protection Publication SW-71d. Washington, U.S. Environmental Protection Agency, 1975, 418 p.

458. Anaerobic digestion of solid waste and sewage sludge to methane. S. J. Hitte. Environmental Protection Publication SW-159. (Washington), U.S. Environmental Protection Agency, July 1975. 13 p.

497. Waste Management Technology and Resource and Energy Recovery: Proceedings; 4th National Congress, Atlanta, Nov. 12-14, 1975. National Solid Wastes Management Association and U.S. Environmental Protection Agency. Environmental Protection Publication SW-8p. Washington, U.S. Government Printing Office, 1976. 382 p.

583. Treatment and utilization of landfill gas; Mountain View project feasibility study. M.J. Blanchet (Pacific Gas and Electric Company, San Francisco). (Washington), U.S. Environmental Protection Agency. 17 p.

587. Recovery of landfill gas at Mountain View; engineering site study. J.A. Carlson (City of Mountain View, Calif.). Environmental Protection Publication SW-587d. (Washington), U.S. Environmental Protection Agency, 1977. 63 p.

600. Resource recovery and waste reduction; fourth report to Congress. U.S. Environmental Protection Agency, Office of Solid Waste. Environmental Protection Publication SW-600. Washington, U.S. Government Printing Office, 1977. 142 p.

620. Resource recovery implementations; a status report. L. McEwen and S. Levy. Resource Recovery & Energy Review, 4(1): 21-25, Jan.-Feb. 1977.

NTIS REPORTS

PB-213 487. Landfill decomposition gases; an annotated bibliography. J.A. Geyer. U. S. Environmental Protection Agency, 1972. 28 p.

PB-218 672 Development of construction and use criteria for sanitary landfills; final report on a solid waste management demonstration grant. County of Los Angeles, Department of County Engineer, and Engineering-Science, Inc. Environmental Protection Agency, 1973. (511 p.)

PB-230 379 Sonoma County solid waste stabilization study. EMCON Associates. Environmental Protection Publication SW-65d. U.S. Environmental Protection Agency, 1974. 224 p.

PB-239 778 Sonoma County solid waste stabilization study. EMCON Associates. Environmental Protection Publication SW-65d.1. U.S. Environmental Protection Agency, 1975. 283 p.

PB 254 550 Twelve-month extension Sonoma County solid waste stabilization study. EMCON Associates. Environmental Protection Publication SW-120c. U.S. Environmental Protection Agency, 1976. (54 p.)

PB-272 595 Management of gas and leachate in landfills; proceedings of third annual municipal solid waste research symposium. 1977. 297 p.

JHS
↓
Rita (file)

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

MEMORANDUM

Aug 3, 1978

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill - Migrating Gas

On Monday, July 31, 1978, a second meeting was held at the Louisville and Jefferson County Health Department Building to discuss the migrating gas problem at the Campground Landfill. The following persons were present: John Brooks and J. E. McClure, Jr., Kentucky Department for Natural Resources, Division of Hazardous Materials & Waste Management; Jerry Blankenship; Philip A. Emery and Robert W. Davis, U.S. Geological Survey; David Ross Stevens, County Judge's Office; Harley Blankenship, attorney for Campground Landfill; Joe Pavoni, TenEch Environmental Consultants; H. VanArsdale, Attorney for Kentucky Concrete Pipe Company; Robert Hockensmith, Kentucky Concrete Pipe Company, and the writer.

The writer called the meeting to order at approximately 10:30 A.M., and presented the following update. Mr. Blankenship has installed 36 wells 50' on center along the south side of his property. Gas readings in those wells varied from 0% to 70%. He has also installed four (4) wells 100' on center along the east boundry of the landfill, and the gas readings range from 7% to 25%. One (1) well has been installed on the north side of the landfill and the gas readings there were 0%. One (1) well has been constructed by the U.S.G.S. on the west side across Campground Road, and the gas readings were 65%. Eight (8) monitoring wells have been installed on Kentucky Concrete Property and gas readings in those wells varied from 0% to 65%. The new house located on Kentucky Concrete Company's property has been equipped with a lateral field and disconnected from the seepage pit and gas readings from the roof vent were 0%.

From work that has been done as mentioned above, it has been determined that gas has not been eliminated from the Kentucky Concrete Company property. Therefore, the wells installed along the south side of the landfill will not be adequate to solve the problem. The reading in the well constructed by the U.S.G.S. indicates gas is also migrating in the westerly direction away from the fill. There are also several wells constructed on Kentucky Concrete Company property and along the boundry of the landfill which need to be capped and/or valved so gas readings may be taken.

The Health Department recommendations at this time, are as follows:

(1) Reduce the monitoring to three (3) days a week;

(2) Explore the possibility of the installation of a lateral field to service the plant production building and disconnect the seepage pit which now serves said building;

(3) Install a gas monitoring system within the plant production building so the doors may be closed before imlement weather arrives.

(4) Request Air Pollution Control to collect at least two (2) additional air samples for analysis, one from the new wells installed on the Blankenship Property and one from the pit cap in the trailer park area which abutts the landfill on the east;

(5) Request Mr. Blankenship to submit, in writing, by August 11, 1978, a schedule for testing, analyzing, designing and constructing a positive evacuation system.

The following are comments from the meeting participants:

Mr. VanArsdale

(1) He objected to the Health Department reduction of monitoring.

(2) He agreed with the installation of an alarm system.

(3) He requested information from the Kentucky Department for Natural Resources and Environmental Protection about illegal dumping of toxic materials and what effect these toxic chemicals in the atmosphere would have on workers and visitors to the Kentucky Concrete Pipe Company site.

(4) He agreed that the lateral field on the new house appears to have eliminated an immediate gas problem, however, questions the installation of an additional lateral field to service the plant production building.

(5) He indicated the Kentucky Concrete Pipe Company has been prohibited from constructing a new building because of the gas problem and the old house where the initial gas problem was detected has been rendered useless to the company due to the migrating gas. Therefore, Mr. VanArsdale requests the Health Department to direct a letter to Mr. Hockensmith stating that construction of a new building would be prohibited and recommending that the old dwelling not be occupied.

(6) He reiterated his concern to the State concerning possible illegal dumping of industrial waste into the landfill and requested the State to initiate steps to put an immediate stop to said dumping.

(7) Two (2) of the monitoring wells installed on the Kentucky Concrete Pipe Company property were left uncapped and he requested the capping of said wells as soon as possible.

Mr. Robert Hockensmith

(1) He endorsed Mr. VanArsdale's comments and added that something must be done before the winter months set in because they cannot continue to operate as they have with the doors wide open to provide for proper ventilation.

Dr. Joseph Pavoni

(1) TenEch Environmental Consultants, Inc., obtained gas readings from the eight (8) monitoring wells installed on the Kentucky Concrete Pipe Company property and their results coincided with the Health Department's findings.

(2) TenEch is also in the process of checking with the soils engineer who initially worked on the Kentucky Concrete Company's design to determine exactly what the soil conditions are on the property.

(3) Dr. Pavoni requested that two (2) additional monitoring wells be located on the other side of Kramers Lane from Kentucky Concrete Pipe Company's property to determine the full extent of the range of the migrating gas.

(4) Dr. Pavoni agreed with the installation of the lateral field, along with an automatic alarm system, for the Kentucky Concrete Pipe Company's production plant.

(5) He also feels a positive evacuation system is going to be mandatory to eliminate the gas problem from the Kentucky Concrete Pipe Company property.

(6) He also suggested the monitoring wells be checked for gas volume production and suggested that one (1) monitoring well be evacuated with a pump and monitored to determine the well's recharge capabilities.

Mr. J.E. McClure,Jr.

(1) Mr. McClure indicated that the Kentucky Department for Natural Resources and Environmental Protection is reviewing existing permits with the Campground Landfill by industrial customers and is requiring the industries to resubmit new chemical analysis for each waste presently being deposited in the landfill.

(2) The State is also investigating other landfills in the area and their wastes, both sanitary and industrial, being deposited in said landfills.

(3) The State recently took aerial photos and found a large number of surface ponds to exist in the area, which will be investigated.

(4) Mr. McClure also indicated the State was preparing to take enforcement action in the area.

(5) The State is instituting a manifest system which will require all producers to keep accurate records of quantities and analyses of waste being deposited. The industries should start receiving notices of the institution of the manifest system within the next three (3) months, in the Jefferson County area.

Mr. Jerry Blankenship

(1) Mr. Blankenship agreed with the installation of the new lateral field for the production building on the Kentucky Concrete Pipe Company property, along with the installation of an automatic gas monitoring system.

(2) Mr. Blankenship stated, at the present he had no costs figures of what a positive evacuation system would run and that he felt the wells recently installed had not been in long enough to give a true indication of whether or not additional gas reduction would occur off the landfill site.

(3) Mr. Blankenship indicated he would like to install another type of well, 3' in diameter with a 6" perforated pipe down the center, surrounded by crushed rock, to determine if this type well may be more efficient than what has presently been installed.

In summary, it was agreed that the wells installed by Mr. Blankenship have not solved the gas migration problem.

(1) It was felt by the Health Department that a positive evacuation system will be required to sufficiently prevent migrating gas from leaving the Campground Landfill site.

(2) The Health Department will request Air Pollution Control to collect two more air samples for analysis, one from the wells constructed on the landfill site and one from the trailer park pit.

(3) Health Department established the date of August 11, 1978, as a deadline for Jerry Blankenship to submit a schedule detailing the time frame necessary for monitoring and analysis, construction plans and specifications, and actual construction and start-up.

(4) A new lateral field system is to be installed to serve the Kentucky Concrete Pipe Company production building along with an automatic alarm system.

Upon submittal of Mr. Blankenship's proposed schedule the Health Department along with the Kentucky Department for Natural Resources and Environmental Protection will decide upon its acceptability. All interested parties will be kept abreast of any action taken.

cc: T. S. Wallace, Jr., M.D.
Bruce K. Lane
Larry Woods
Jay Gordon
Randy Hockensmith
Harley N. Blankenship
Jerry P. Blankenship
John Dickinson
John Brooks
Ross Singleton
Jack McClure
Harold Davis
Larry Schumer
Pat Haight
Richard Wellinghurst
Joseph L. Pavoni
Bert VanArsdale
Thomas J. Nortof
David Ross Stevens
Thomas Coomes
Phillip A. Emery
Robert W. Davis

National AirOil Burner

National AirOil Burner Company, Inc., 1284 East Sedgley Avenue, Philadelphia, Pa 19134

Telephone (215) 743-5300 Telex 84-5403 Branch Offices: Houston, London, Milan and Tokyo

July 25, 1978

R. Davenport, Chemist
US Environmental Protection
Agency
345 Courtland Street NE
Atlanta, GA 30308

RECEIVED
JUL 27 1978
SOLID WASTE MANAGEMENT BRANCH

Dear Mr. Davenport:

Thank you for your interest in NAO products.

Since we cannot pinpoint your specific areas of interest, we have enclosed a copy of our Catalog N-30. This general catalog contains information about products for:

> *PROCESS COMBUSTION EQUIPMENT: gas, oil and combination-fuel-fired burners, atomizing oil guns, low-noise integrated-shroud burners, low NO_x burners, and accessories for reliable combustion.*
>
> *ONSHORE AND OFFSHORE FLARING / VENTING SYSTEMS: elevated and ground flares, populated area combustors, smokeless flaring, pilot-ignition systems, efficient flare-system-components, and vent / fire suppression systems.*
>
> *INCINERATION AND COMBUSTION SYSTEMS: vapor-disposal units for gasoline / benzene loading terminals, incineration equipment for liquids or gases with heat recovery, steam generation and / or scrubbers . . . also inert gas generators and direct fired air heaters.*

For detailed information about NAO's reliable flaring, venting and incineration systems, please call / write: John F. Straitz, III, director of our pollution control division. . . . For additional information about NAO's burners, accessories, and dependable combustion systems, please call / write me.

NAO has been dedicated to solving combustion problems . . . heat generation, its application, and problems arising from its use . . . since 1912. We would like to offer our expertise and our "engineered solutions" for your combustion- and / or pollution-control applications.

Looking forward to hearing from you, I am

Very truly yours,

Paul J. Binker

Paul J. Binker
Vice President — Sales

PJB / nas
ATTACHMENTS
Cat. plus reply card

Flares on Parade

DEPARTMENT OF PUBLIC HEALTH

LOUISVILLE AND JEFFERSON COUNTY

400 EAST GRAY STREET

P.O. BOX 1704
LOUISVILLE, KY. 40201

T. S. WALLACE, JR., M. D.
DIRECTOR OF HEALTH

July 24, 1978

Mr. Jerry Blankenship
Campground Landfill
7500 Grade Lane
Louisville, Kentucky 40219

Re: Migrating Gas Problem

Dear Mr. Blankenship:

As per our conversation on Friday, July 21, 1978, this will confirm the meeting set for Monday, July 31, 1978, at 10:00 A.M., at the Louisville and Jefferson County Department of Public Health Building, Room #202, to discuss the effectiveness of the system installed to correct the gas migrating problem at the Campground Landfill. By copy of this letter, all persons present at the June 13, 1978, meeting are invited to attend the above mentioned meeting.

Very truly yours,

Charles E. Weiter

Charles E. Weiter, Assistant Director
Division of Environmental Health

CEW/mlr

Rec'd 8/1/78 JHS

Rec'd 8/2/78 RD

John Dickinson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30308

JUN 19 1978

Mr. Norman Schell, Director
Division of Hazardous Materials &
Waste Management
State Department for Natural Resources
& Environmental Protection
Capital Plaza Tower
Frankfort, Kentucky 40601

Dear Mr. Schell:

In reference to the Campground landfill gas migration problem, enclosed is a copy of Mr. John Dickinson's field report. The report covers the inspection of the Campground landfill and the Southern Materials landfill, and the meeting at the Louisville-Jefferson County Health Department.

Based on this report and my own experience with a similar problem at Lee's Lane landfill in Louisville, we recommend that your Division require all landfills located in similar geologic formations to install gas control facilities as a permit condition.

Attached is a partial list of references my staff has compiled on controlling landfill gas migration. We can get you a copy of some of these if you do not already have them in your files. Reports from NTIS must be ordered by your office. We plan to contact the other EPA Regional offices to determine what the best management practice, in their judgment and experience, is for landfill gas control. In addition, we are calculating the amount of gas that the landfill site will produce as a function of time.

We have contacted Mr. Bobby Carroll of our Athens laboratory about the feasibility of simulating flaring conditions and determining combustion products. He informed us that there is a device called a pyrolyzer in which gas can be heated prior to passing into the GC/mass spec unit. Athens does not have one now but may be able to purchase one. Mr. Carroll is investigating the temperature and dwell time for these units and the price of the unit. The pyrolyzer will not exactly simulate a flare but

the data would give an idea of what decomposition products might be formed if flaring becomes necessary. My staff is investigating the types and costs of installing a conventional industrial flare system.

We will supply you and the Louisville-Jefferson County Health Department with any additional information we get. If you have any questions, please call me or John Dickinson.

Sincerely,

James H. Scarbrough

James H. Scarbrough, P.E.
Chief
Residuals Management Branch

Enclosures

cc: Mr. Bruce K. Lane, Director
Division of Environmental Health
Louisville, Kentucky

Mr. James H. Finger, Director
Surveillance and Analysis Division
EPA Region IV

Mr. Robert T. Offutt
Secretary-Treasurer
Jefferson County Air Pollution Control District
Louisville, Kentucky 40204

Evaluation of Landfill Gas Migration and a Prototype Gas Migration Barrier, PB-239, 357/7BA

Gas and Leachate from Landfills: Formation Collection and Treatment, PB-251, 161/6BA, EPA-600/9-76/004

Sanitary Landfill. A Bibliography, PB-215, 904/BA

Landfill Decomposition Gases. An Annotated Bibliography, PB-213, 487/2BA, 34 pp., EPA-SW-72-1-1

Rita ← John A.
JHS

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

6-15-78

M E M O R A N D U M

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Road Landfill Migrating Gas Problem

On Tuesday, June 13, 1978, a meeting was held at the Louisville and Jefferson County Department of Public Health to discuss the migrating gas problem at the Campground Road Landfill. The following persons were in attendance: Jay Gordon, Kentucky Concrete Pipe Company; Randy Hockensmith, Kentucky Concrete Pipe Company; Harley Blankenship, Attorney for Campground Landfill; John Dickinson, Federal EPA; John Brooks, Ky. Division of Hazardous Material & Waste Management; Ross Singleton, Ky. Division of Hazardous Material and Waste Management; Jack McClure, Ky. Division of Hazardous Material and Waste Management; Harold Davis, Air Pollution Control; Larry Schumer, Air Pollution Control; Pat Haight, Division of Hazardous Materials and Waste Management; Richard Wellinghurst, Louisville & Jefferson County Department of Health; Dr. Joseph L. Pavoni, TenEch Environmental Consultants; Bert VanArsdale, Attorney for Kentucky Concrete Pipe Company; Thomas J. Nortof, Louisville & Jefferson County Civil Prepardness; David Ross Stevens, Jefferson County Government; Thomas Coomes, Charles E. Weiter and Bruce K. Lane, Louisville and Jefferson County Department of Public Health; Henry L. Stephens, Attorney for the Board of Health; Jerry Blankenship.

The meeting was called to order at approximately 11:15 A.M., and Jerry Blankenship presented the following as his recommendations for prohibiting the gas from migrating beyond the Campground Road property:

(1) He proposed to install a natural venting system composed of drilled wells with perforated pipe to extend 30' below ground surface with 30' above ground stacks. He proposed to place these wells every 100' along the east and south property lines of the landfill.

(2) He proposed to apply for an Air Pollution Permit to vent the gases to the atmosphere simultaneous with the installation of the wells.

(3) He would establish a sampling program.

(4) He would submit to the Kentucky Division of Hazardous Materials and Waste Management and the Louisville and Jefferson County Department of Health, "As Built" plans upon completion of the above mentioned installation.

Dr. Pavoni representing Kentucky Concrete Pipe Company suggested the following:

(1) The wells installed adjacent to Kentucky Concrete Pipe Company's property line be placed 50' on centers instead of 100'.

(2) An additional eight (8) monitoring wells be placed on the Kentucky Concrete Pipe Company property. By monitoring these wells the efficiency of the venting system could be determined, in respect to Kentucky Concrete Pipe Company's property.

(3) Dr. Pavoni suggested that a system of flaring off the gases be investigated and possibly be made mandatory at a later date.

John Dickinson from the Federal Environmental Protection Agency agreed to investigate and obtain answers to the following questions:

(1) Will the Environmental Protection Agency Laboratory in Athens Georgia analyze additional samples?

(2) What is the standard practice at other industrial fill sites around the country for eliminating migrating gas (a natural venting system or flaring off of the gases)?

(3) Would Environmental Protection Agency Laboratory at Athens, Georgia conduct tests of burning the gases and then analyzing the conbusted gases?

Mr. Dickinson suggested that at least one (1) well be sunk to ground water so as to afford the opportunity to obtain ground water samples for analysis. He also suggested that Air Pollution try to establish the flow rate of the gases that are presently being emitted by the fill.

The Kentucky Division of Hazardous Materials and Waste Management agreed to review and check out previous letters of permission granted to industries for liquid waste disposal at the Campground Fill. This will be performed to try and determine the source of exotic chemicals present in the migrating gas. The State also will analyze ground water samples and investigate other systems in the area such as fly ash ponds, industrial waste lagoon systems, etc., as a possible source.

In summary it was agreed upon by all present, the following items would be performed:

(1) Mr. Blankenship would install wells on the east and south side property lines of the landfill 100' on centers and 50' on centers where the landfill property abutts Kentucky Concrete Pipe Company's property.

(2) At least one (1) well will be sunk to ground water so as to afford the opportunity to obtain ground water samples for analysis. Eight (8) additional sampling wells to be located on Kentucky Concrete Pipe Company's property at locations suggested by Dr. Pavoni.

(3) Simultaneous to the installation of the wells Mr. Blankenship would apply for an Air Pollution Permit to vent the gases to the atmosphere.

(4) Mr. Blankenship will submit "As Built" plans and specifications to the Kentucky Division of Hazardous Materials and Waste Management and the Louisville and Jefferson County Department of Health.

(5) Mr. Blankenship will establish a sampling program on a twice a day, once in the morning and once in the afternoon, for thirty (30) days following the installation to determine venting efficiency.

(6) All wells, weather permitting, are to be installed by the week of July 10, 1978.

(7) The Louisville and Jefferson County Health Department will continue to monitor the entire area surrounding the fill site for migrating gas.

(8) Air Pollution will work with the Federal Environmental Protection Agency on collecting additional samples for analysis.

(9) The Kentucky Division of Hazardous Materials and Waste Management will review previous permission letters for industries to discharge liquid waste in the landfill, will check out ground water quality and investigate other above ground sources of possible pollution such as fly ash ponds, industrial waste lagoon systems, etc.

At the end of July all analyses shall be reviewed by the Kentucky Division of Hazardous Materials and Waste Management, Air Pollution and the Louisville and Jefferson County Department of Public Health, to determine the efficiency of the venting system and a decision will be made at that time, whether or not additional preventive measures will be necessary.

JUNE 15, 1978

cc: T. S. Wallace, Jr., M.D.
Bruce K. Lane
Henry L. Stephens
Jay Gordon
Randy Hockensmith
Harley N. Blankenship
Jerry P. Blankenship
John Dickinson
John Brooks
Ross Singleton
Jack McClure
Harold Davis
Larry Schumer
Pat Haight
Richard Wellinghurst
Joseph L. Pavoni
Bert VanArsdale
Thomas J. Nortof
David Ross Stevens
Thomas Coomes

TenEch
Environmental Consultants, Inc.
Mark W. Tenney, Sc.D., P.E.
Joseph L. Pavoni, Ph.D., P.E.

January 12, 1979
Louisville, Kentucky

Mr. Charles E. Weiter, Assistant Director
Division of Environmental Health
Louisville and Jefferson County Department
of Public Health
400 East Gray Street
Louisville, Kentucky 40202

Dear Mr. Weiter:

In accordance with your memorandum of December 21, 1978, I have reviewed with my staff the efficiency of the gas evacuation system at the Campground Landfill. We recommend that the following conditions be met immediately with regard to this system:

- A backup blower system of sufficient capacity including standby electrical power capabilities be installed in conjunction with the gas evacuation system to insure that a vacuum will be maintained at all times on all wells.

- All necessary explosive gas sensors are installed in Kentucky Concrete Pipe Company's plant. To date one sensor has been installed in each of the two restrooms and a third sensor has been installed in the main manufacturing building. A fourth sensor still has to be installed in the main manufacturing building.

- All explosive gas sensors installed in Kentucky Concrete Pipe Company's plant and the blower system should be tied into telephones of representatives of both Campground Landfill and Kentucky Concrete to insure that such representatives would be notified if the gas alarm activated or the blower was not functioning.

- All monitoring wells on Kentucky Concrete Pipe Company's property should be protected against accidental breakage by installing mutually agreed upon devices.

- A daily log of operation of the gas evacuation system be maintained.

744 W. Washington Street
South Bend, Indiana 46601
219/234-1166

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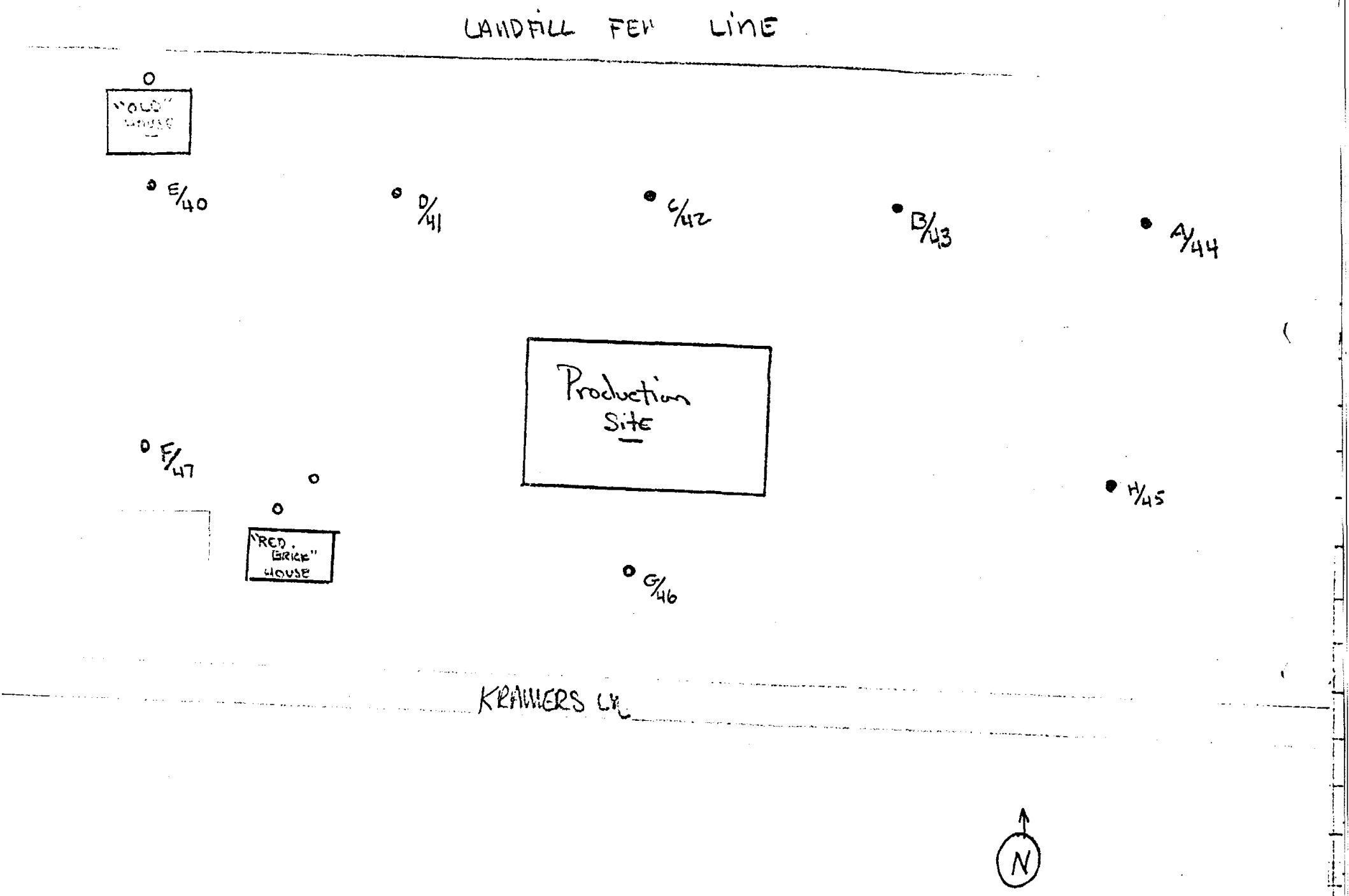
Chicago, Illinois 60606
312/454-0021

515 Park Avenue
Louisville, Kentucky 40208
502/636-3565

LOCATION	DATE 12/18	12/19	12/20	12/21	12/22	12/26	12/27	12/28	12/29	1/2	1/3	1/4	1/5	1/12	1/10	1/28
CAP																
D HOUSE																
PIT CAP	0	0	0	0	0	0	0	0	0	0		0		0	0	0
D BERKE HOUSE																
SEPTIC TANK	0	0	0	0	0	0	0	0	0	0		0		0	0	0
PIT CAP	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT		NT	NT	NT
Site																
PIT CAP	0	0	0	0	0	0	0	0	0	FROZEN		FROZEN		0	0	0
MONITORING WELL A/44	25	10	40	0	0	0	0	0	0	0		0		0	0	0
B/43	7	0	15	0	0	0	0	0	0	0		0		0	0	0
C/42	0	0	0	0	0	0	0	0	0	0		0		0	0	0
D/41	0	0	0	0	0	0	0	0	0	0		0		0	0	0
E/40	0	0	0	0	0	0	0	0	0	0		0		0	0	0
F/47	0	0	0	0	0	0	0	0	0	0		0		0	0	0
G/46	0	0	0	0	0	0	0	0	0	0		0		0	0	0
H/45	5	12	WELL 30	20	10	20	0+	0	0+	0		0		4	0	0
SGS Well Upgradient	12	62	65	0	62	0	30	25	35	0		65		80	0	40

Readings Taken


LANDFILL FEN LINE
"OLD" HOUSE
E/40
D/41
C/42
B/43
A/44
Production Site
F/47
H/45
"RED BRICK" HOUSE
G/46
KRAMERS LN
N

~~JHS~~ JHS 1/2/79
Rita file

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

MEMORANDUM

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill

On Tuesday, December 19, 1978, a fourth meeting was held at the Louisville and Jefferson County Department of Health Building to discuss the progress of the migrating gas problem at the Campground Landfill. The following persons were in attendance: P. Clark Bledsoe, Engineer, Louisville and Jefferson County Department of Health; Harold Davis, Air Pollution Control District; John Brooks, Kentucky Division of Hazardous Material and Waste Management; Jerry Blankenship, Campground Fill Company; Randy Hockensmith, Kentucky Concrete Pipe Company; Marshell Eldred, Jr., Attorney for Kentucky Concrete Pipe Company; Ellen Ruch, Training Officer, Health Department; Jay Gordon, Jr., Kentucky Concrete Pipe Company; Thomas L. Coomes, Supervisor, Health Department; Richard Wellinghurst, Sanitarian, Health Department; and the writer.

The meeting was called to order at approximately 10:00 A.M., and the writer presented the following information:

(1) A chart listing the methane gas readings from November 27, 1978, through December 18, 1978, was presented. (see attachment) The majority of the readings were zero until December 18, 1978, when several readings appeared that were at or above the explosive level for methane gas. It was theorized that these readings appeared because Mr. Blankenship had turned the evacuation system down on December 14, 1978.

(2) The Health Department requested Mr. Blankenship to install an all-weather road that would allow Health Department personnel access to the evacuation system at all times.

(3) The Health Department will continue to sample the monitoring wells on Kentucky Concrete property daily until December 23, 1978. If gas readings disapate to zero the monitoring will be placed on a twice a week basis until January 23, 1979, when a decision will be made as to future monitoring of the wells. If gas does not disapate to zero by December 23, 1978, the Health Department will contact Mr. Blankenship and Kentucky Concrete Company to discuss future sampling procedures.

(4) If gas disapates to zero the Health Department will be agreeable to releasing Kentucky Concrete Pipe Company's construction plans for their proposed future building.

(5) The Health Department had received no comments from Dr. Pavoni and requested that if additional information was necessary for his office to make a decision upon the efficiency of the system that he please contact this office prior to January 23, 1979.

(6) The flooding of the three (3) wells adjacent to Kentucky Concrete's property by surface runoff was discussed. It is the understanding of the Health Department this situation is being coordinated with David Daugherty's office and Joe Ballard of Miller, Wihry & Lee, and the Health Department requested a copy of the final plans that are approved by Mr. Daugherty's office, for handling of the surface water.

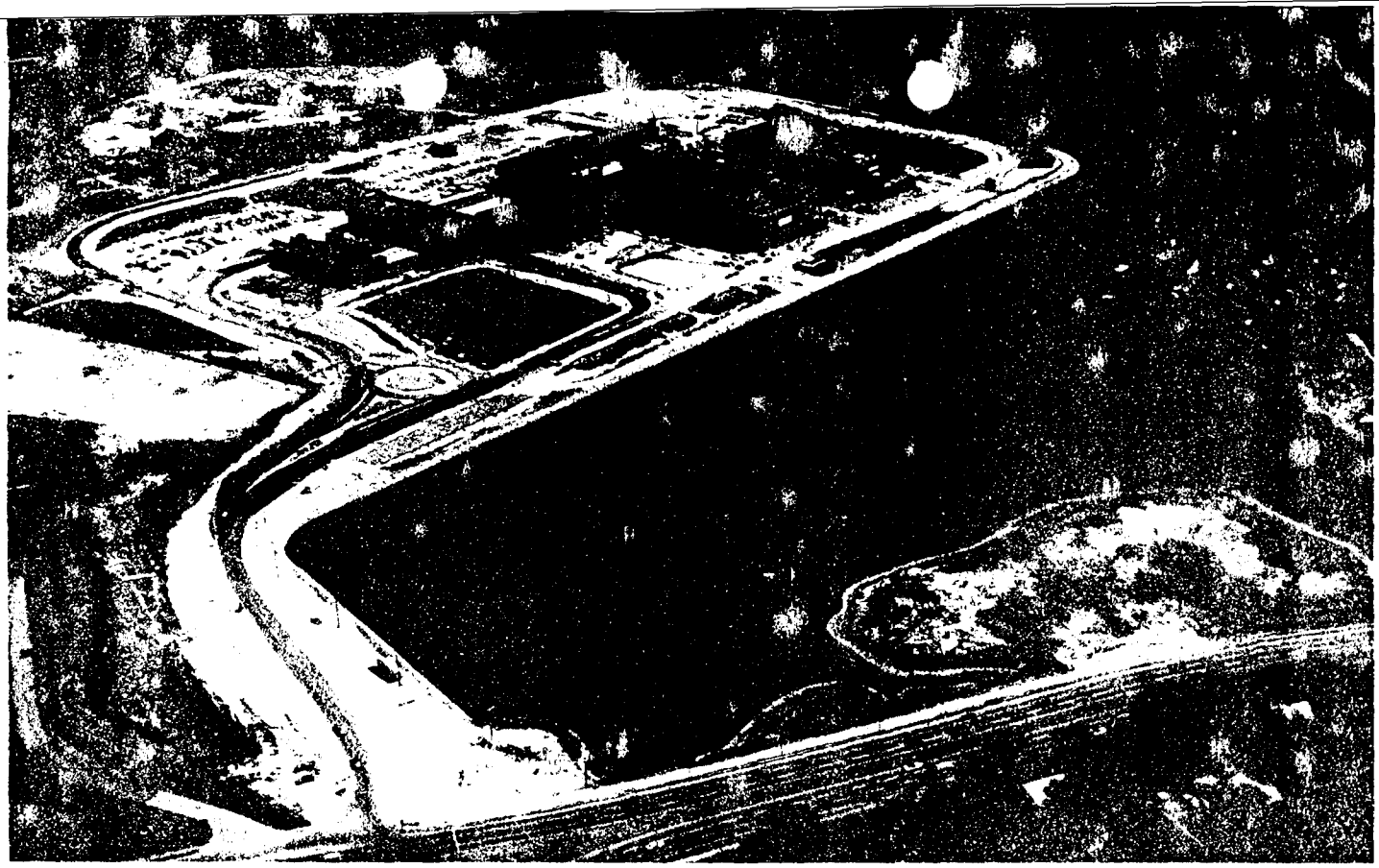
The following comments were made by Mr. Harold Davis of the Air Pollution Control:

(1) The Air Pollution Control District collected samples on December 5, 1978, from the vent stack and also an ambient air sample downwind from the vent stack. The results indicated the system is venting 38% methane, one part per billion benzene, .2 parts per million toluene. The sample collected downwind revealed results well within acceptable limits for the three (3) compounds mentioned above.

UNSCANNABLE

MEDIA

(PHOTOGRAPHS)



VIEW FROM THE BRIDGE. The property jutting into south Boston Harbor was a sanitary landfill until the University of Massachusetts built its Harbor Campus on the site. Methane from 30 years worth of packed refuse is watched by alarm system with computer-controlled infrared analyzers which also actuate fresh air purging system before gas buildup reaches danger level.

in Boston Harbor

Methane monitoring, purging system keeps university classes in session

Above ground, the University of Massachusetts' new Harbor Campus in Boston looks like many other colleges. Beneath the turf and concrete, however, lies the difference.

The university, completed in 1974, is built atop a sanitary landfill jutting into southern Boston Harbor. The landfill facility had been used by the city for over 30 years until it reached its maximum capacity.

Building a campus on a unique site also provided some unique problems. From previous construction on the landfill, project architects knew that natural methane gas released from decomposition was a potential hazard. The university retained Engineering-Science, Inc. of Arcadia, California to perform an analysis at the building site and make recommendations on handling methane leakage into building areas.

The recommended and adopted safety system is a combination of an impervious membrane, gravel barriers and a computer-based methane detection system that continuously samples for methane build-up, records concentrations and triggers alarms when it reaches the danger level and automatically actuates a fresh air purging system. Heart of the monitoring, alarm and control system are infrared gas analyzers supplied by Mine Safety Appliances Company.

Four times an hour, a pump draws air samples from probes installed through the cement slab below each building and starts a complex chain of testing. Eight above-ground sampling probes are also located in stairwells and other occupied space in basements.

Six of the seven buildings on the campus are equipped with the active monitoring, alarm and purging system involving 16 test points and a separate infrared analyzer. The seventh structure has a monitoring and alarm system only, relying on physical barriers and passive venting to prevent methane buildup.

If methane build-up is detected, a report is quickly transmitted from the instrument to a central computer in the supervisory data control center. Instru-

FRESH AIR FIEND. Infrared methane analyzers and oxygen detectors keep electronic eye on methane buildup under and in college buildings. Exhaust valves and fresh air inlets are automatically actuated.

If you need more info contact

ment alarms are triggered when methane levels under or in a building reach 50 percent of the Lower Explosive Limit (the LEL for methane is 5 percent by volume.)

In addition to triggering a red alarm light at the central computer, the system automatically actuates purge pumps located on the top floor of each building. The pumps can also be started by the central computer operator who can override analyzer control.

The pumps draw methane out of a rock blanket below the building and vent the gas through riser pipes extending 10 feet above the roof. At the same time, an inlet valve opens, drawing fresh air into the rock blanket to dilute the methane concentration.

According to Myron Nosanov of Engineering-Science, there were several reasons why complete reliance on a passive venting system (no purging) was not feasible: 1) building areas were large and the system would have to depend to an unreliable degree on the integrity of an impervious membrane; 2) frozen ground during winter and the need for protecting against frost have precluded venting with a gravel blanket at the sides of the buildings; and 3) the buildings were to be constructed on pilings because of extremely poor bearing conditions.

Continuous 24-hour-a-day monitoring is necessary at the Harbor Campus Complex because build-up of methane can occur rather rapidly, according to Peter Verrochi, chief engineer of the Physical Plant Department of the university.

"In some 'hot spots' we can get enough methane to set off the alarm in 30 minutes time," says Verrochi.

To keep the system functioning with minimum downtime, routine inspection is conducted daily by a technician responsible for maintaining the methane/oxygen detection system.

During these inspections, fresh air inlet valves are checked and the analyzers recalibrated if necessary. A combination of a training school at MSA's headquarters and on-the-job training enables university personnel to handle maintenance problems.

NOT A RE-RUN. System continuously monitors methane levels, displays gas concentrations on CRT in central control room. Data can also be printed out for permanent record.

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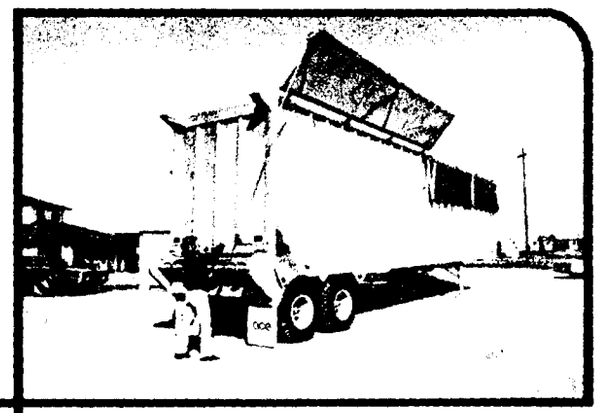

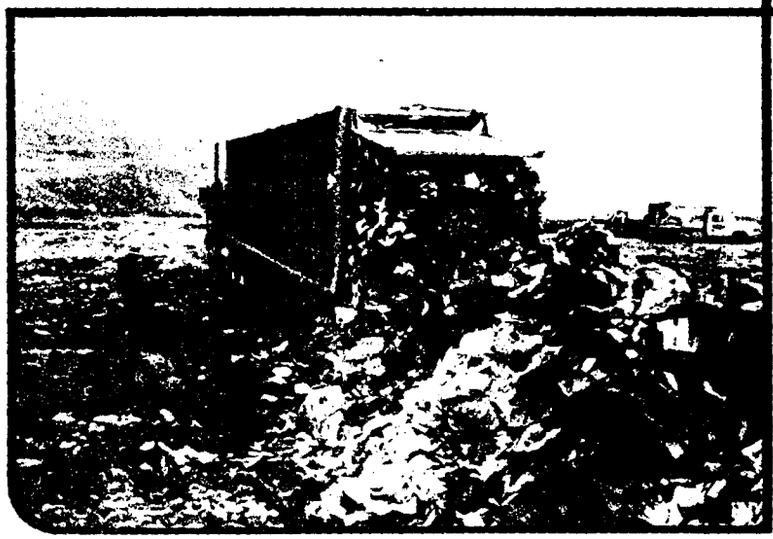

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FOR MORE DATA CIRCLE #2 ON REPLY COUPON

Gas Control Safeguards Development of a Landfill Site

M. E. NOSANOV
Manager
Special Projects Department
and
ROBERT L. WHITE
President
Engineering-Science, Inc.
Arcadia, California

NESTLED into the City of Los Angeles' Santa Monica Mountains, south of Mulholland Drive and west of the San DiegoFreeway, is the MountainGate Country Club and an adjacent associated townhouse development. The country club presently includes an 18-hole tournament size golf course along with tennis courts and club house facilities. The townhouses are now under development.

These developments would not necessarily be of interest if it were not for several unique circumstances concerning the site. The golf course is atop a completed sanitary landfill, in what was once one of many unusable, inaccessible canyons. The townhouses are to be constructed on the ridges of the mountains which partially encircle the golf course. The ridges were cut and graded to provide daily and final cover for the landfill and to prepare for final tract grading.

The sanitary landfill was operated under lease to the Los Angeles County Sanitation District. Landfilling operation began in 1964, and in February, 1971, after the controlled placement of six million tons of compacted refuse, the fill was covered and contoured with from 20 to 40 feet of soils graded from the ridges. The landfill was operated as a Class II Waste disposal site (State of California designation) accepting wastes consisting primarily of nontoxic chemically or biologically decomposable material in addition to nonwater soluble, nondecomposable inert solids.

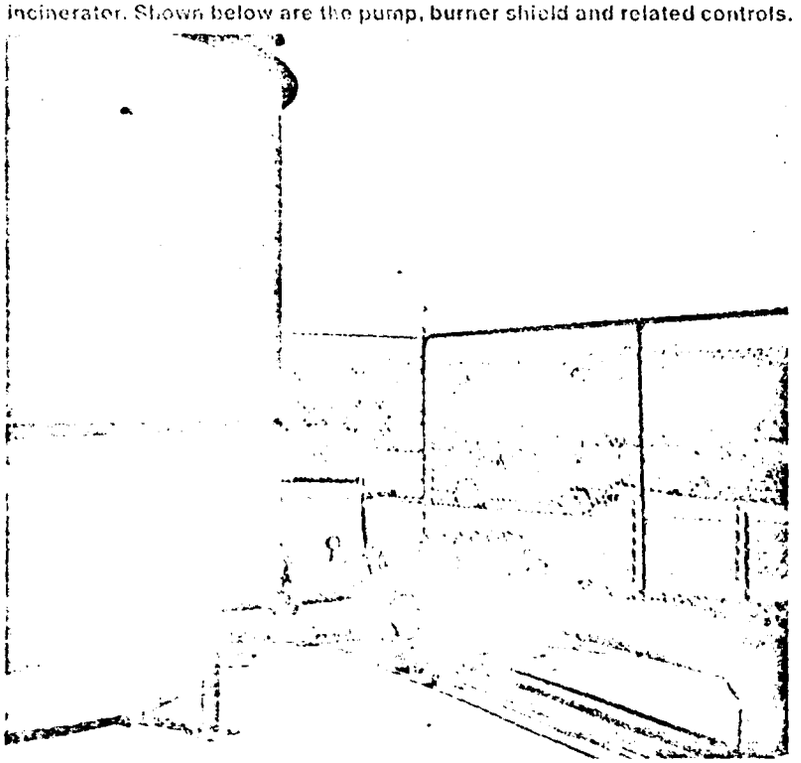
Conditions within most landfills generally favor the formation of gases of which the principal components are methane, carbon dioxide and nitrogen. Other gases which may be found, usually in lesser quantities, include hydrogen sulfide, other acid gases, organic gases, and argon.

At MountainGate, a study of the presence of and potential for gas generation and migration was performed by Engineering-Science, Inc. (ES) in 1971. At that time, the need for the study was recognized by the developer, Barclay Hollander Corporation, because of the possibility of migrating methane gas collecting in buildings, underground structures, and piping ways. In concentrations within 5 to 15 percent (by volume, in air) and in the presence of a spark or glowing heat source exceeding 1100°F, with adequate oxygen, methane will explode. Explosions from landfill gas, although rare, have been well documented throughout the United States and Canada.

The 1971 investigation revealed a potential for the generation of large quantities of gas within the landfill but the absence of measurable quantities of methane at the proposed building sites. The existing geology did not appear sufficiently permeable to permit methane migration. However, it was determined that although the soil would prevent migration of gases to adjacent developable sites, the continued integrity of boundary soils could not be assured and further, migration of gases through utility lines and/or bedding materials could occur. Hence, precautionary gas control measures were judged necessary for the proposed development and made part of the conditions of approval by the City of Los Angeles.

Criteria and design details were developed by ES for a landfill gas venting system, and gas control criteria were also prepared for buildings and hardware subsystems. The gas venting system was later constructed and placed in operation in January, 1976. A proposed gas monitoring program and building plans incorporating gas barrier hardware are being completed.

A VACUUM pump draws gas from the venting system and delivers it to the incinerator. Shown below are the pump, burner shield and related controls.



Gas Venting System

The vent wells and interceptor trench system consist of a series of slotted vertical and horizontal pipe which are connected to a collector system of solid exhaust header pipes. An outfall pipe connects to a vacuum pump. When the vacuum pump is operating, negative pressure is induced within the soils surrounding the slotted pipe, causing gases within the area of influence to flow towards and into the venting system. The collected gases are then incinerated in a gas burner.

All piping is underground except at the pump and incinerator station which is located on a reinforced concrete slab and surrounded by a chain link fence. In each interceptor trench are both the slotted trench pipe which is connected to the vertical well pipe, and the solid collector pipes. The trenches and wells are backfilled with crushed rock and

PERFORATED vent well pipe is placed in a boring, prior to placing rock and connecting pipes. For protection, workmen on the job used respirators. Outfall pipe was assembled at grade and eased into the trench with the aid of a loader.

covered with a layer of PVC sheeting and concrete. Each collector pipe connects to a pipe outfall which runs in a smaller trench covered with native soils to the pumping station. Butterfly valves control the amount of vacuum supplied to each segment of the venting system. All pipes and valves are of PVC to reduce the danger of sparking.

The gas venting system includes 20 wells installed along the periphery of the landfill adjacent to the proposed townhouse locations. These wells vary from 30 to 50 feet deep. Four special wells were installed within the landfill, three to vent high gas concentrations and one to function as a pilot methane mining extraction well. There are 2,670 feet of interceptor piping and 3,445 feet of outfall and special vent well piping.

Pump and Incinerator

The pump at the incinerator station provides subatmospheric pressures throughout the vent wells and interceptor lines and forces the collected gases through a waste gas incinerator. The vacuum pump has aluminum impellers and a fiberglass housing; a flame check and automatic shutoff are built into the burner instrumentation controls.

The pump, a belt-driven centrifugal turboblower, is powered by a 20 hp electric motor. Immediately downstream from the blower discharge are two 6-inch valves. The first valve is a manual latch-operated reset safety shut-off valve. This valve is open only when the ultraviolet sensing unit on the incinerator detects the flame, or when a pressure sensing switch detects a predetermined reduction in pressure in the line between the pump and the incinerator. The second valve is a gear-operated flow control butterfly valve and is the system's primary flow controller. Flow is indicated by the measure of pressure drop through a venturi tube located adjacent to the flow control valve. A flame arrestor has been installed to prevent back burn from the incinerator.

The incinerator unit has 288 burner tubes inside a 6-foot diameter, 2-foot high ceramic shield, which in turn is surrounded by an 8-foot diameter, 14-foot high shell. A propane gas line feeds a pilot light within the incinerator to initiate combustion. The pilot flame goes out approximately one minute after incinerator start-up and must be electronically re-ignited during the start-up procedure.

The pump and incinerator unit has a maximum flow capacity of approximately 1,134 cfm. The landfill gas has a BTU rating of between 250 to 500 per cubic foot. The pilot gas propane tank has a 500 gallon capacity with 40 SCFH capacity to the pilot flame.

Under minimum flow conditions gusty winds were occasionally found to extinguish the incinerator, causing the ultraviolet sensor to shut down the pump. A wind brake added to the open cyclone-type fencing surrounding the station subsequently prevented recurrence of windcaused flameout.

Tests of the system operation indicate that the turboblower is capable of displacing the design volume of gas. The flow controlling and gauging devices work accurately and the incinerator is capable of sustained combustion under design flows.

Safety Criteria and Procedures

During excavation in soils above the landfill and drilling through the cover to the fill material, significant concentrations of combustible and obnoxious gases were measured. Provisions were made for the protection of men and equipment working in the proximity of these potentially hazardous excavations.

The contractor and ES' engineers were equipped with combustible gas indicators, acid gas and organic vapor respirators, and safety goggles. Protective skin cream was also available for any persons with sensitive skin problems. When gas was detected within a trench or in proximity to a drill hole, the workmen wore respirators and goggles. Trenches and drill holes were wetted during excavation to reduce the hazards of sparking. Operating equipment was equipped with high exhaust stacks and foam type fire extinguishers. During construction of the underground portion of the system the golf course was closed.

Methane Mining Possibilities

The existing outfall and pump and incinerator station have been recently utilized as one of several mechanisms to investigate the feasibility of collecting methane gas from the landfill and converting it to useful purposes. A specially designed pilot extraction well has been constructed and valved into the system and a report on the feasibility of commercial methane mining is scheduled for publication in the near future.

CONCEPTUAL DESIGNS
FOR
GAS MIGRATION CONTROL SYSTEMS
FOR
CITY OF HOPKINS LANDFILL

by

Charles A. Moore

Ronald M. McOmber

DRAFT REPORT

September 1977

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SECTION 1

BACKGROUND

The city of Hopkins, Minnesota, sanitary landfill (Wefald, E., 1975) constitutes a potential hazard to adjacent townhouses when organic refuse decomposes generating methane gas. The sanitary landfill comprises 37.2 acres and is located in the NW 1/4 of the SW 1/4, section 25, Township 117 North, Range 22 West in the city of Hopkins, Hennepin County, Minnesota (Figure 1). The study by Wefald was limited to an area adjacent to the Westbrook Patio Homes. Figure 2 shows the landfill venting cross-section as proposed by Wefald.

The first author was made aware of this problem on April 3, 1975. As a part of an on-going EPA contract, computer simulations were performed based on limited site data which indicated that methane could be expected to migrate to the subject townhouses at levels within the potential explosion range of 5 to 15 percent methane in air. In a letter report, dated May 14, 1975 the feasibility of using trench type vents to control methane migration was investigated in a preliminary manner. The investigation was preliminary in that adequate computer models for design of methane migration control facilities were in an embryonic state. Only unpumped trench vents could be treated, and then only in terms of a trench efficiency factor which could not be readily related to specific and measurable site conditions.

In March 1976, the US EPA contracted with the Ohio State University Research Foundation to develop computer models to simulate a variety of practical gas migration control systems for sanitary landfills. A contract modification in early 1977 resulted in the development of conceptual designs for gas migration control devices for the Hopkins landfill. This report presents the results of that investigation.

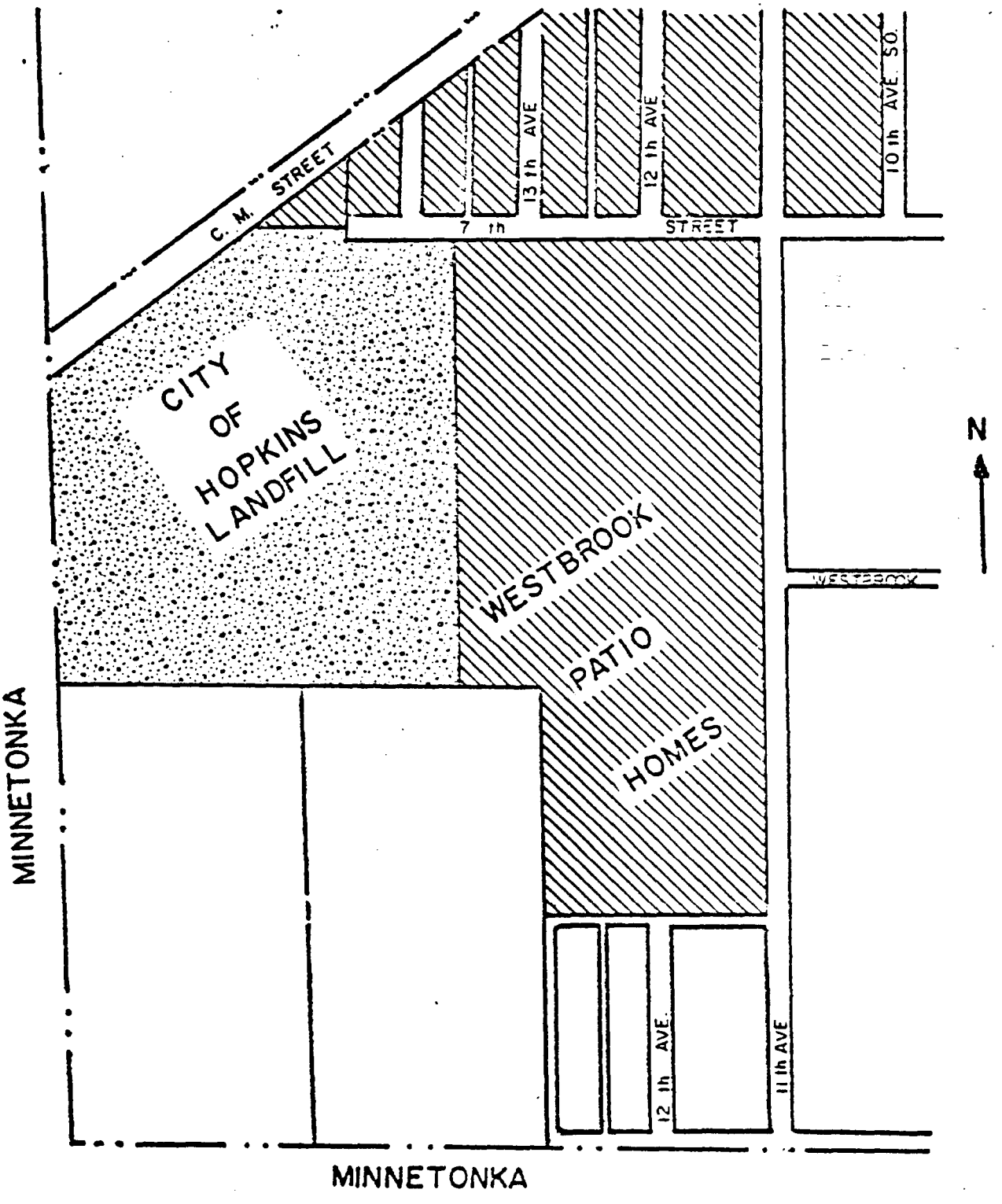


FIGURE 1 Location Map, City of Hopkins Landfill (after Wefald, 1975)

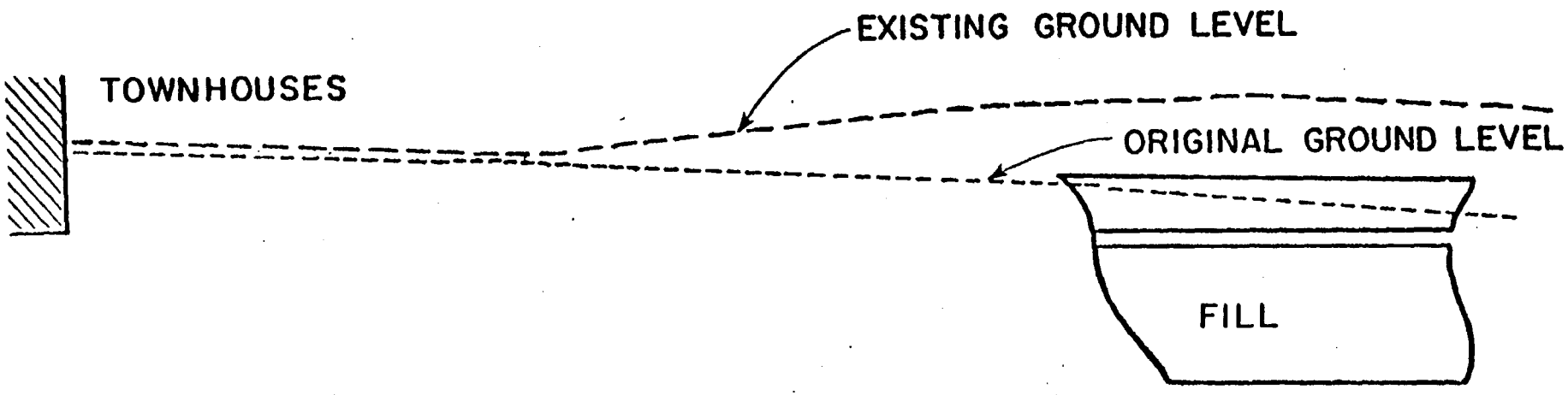


FIGURE 2 Cross-section at Landfill Site

SECTION 2

SITE INFORMATION

Data on site conditions were provided in the form of boring logs and site plans by Hennepin county officials. These data were analysed by project personnel and field geometry and material properties which adequately represented the site conditions within the constraints imposed by the computer program capabilities were developed. The existing soil at the site is a mixture of gravel, sand, clay and organics. Soil conditions were reported in two separate sets of boring logs and differences were noted in the descriptions of materials, presumably because different engineers described the soil. For purposes of this study the soil was approximated as a material having a mean pore radius of 12,000 Å.

The ground water table was relatively consistently encountered at a depth of 7.5 meters (24.6 feet) and this was taken as the depth to an impervious layer in the computer simulation. The landfill itself extended to a depth somewhat below the ground water table.

The distance from the landfill to the townhouses varied; however, 30 meters (98 feet) was taken as an average distance. The venting at the ground surface was taken to be that which would occur with an average five mile per hour wind and no account was made for ground surface freezing. The methane generation rate within the fill was taken to be 9.5×10^{-2} continuously with an initial methane concentration of 70 percent within the fill and zero percent in the surrounding soil.

SECTION 3

GAS MIGRATION WITHOUT CONTROLS

The computer code was initially run without any gas migration control devices. The methane concentrations as a function of position at five years (after steady state had been reached) are shown in Figure 3. It may be noted that the 5 percent methane contour extends to the townhouse. An attempt was made to correlate the predicted methane concentrations with those measured in the field during the winter of 1975-1976. Reasonable agreement was found; however, the field data showed considerable erratic fluctuation and the meter employed could not resolve methane concentration above the lower explosive limit (5 percent).

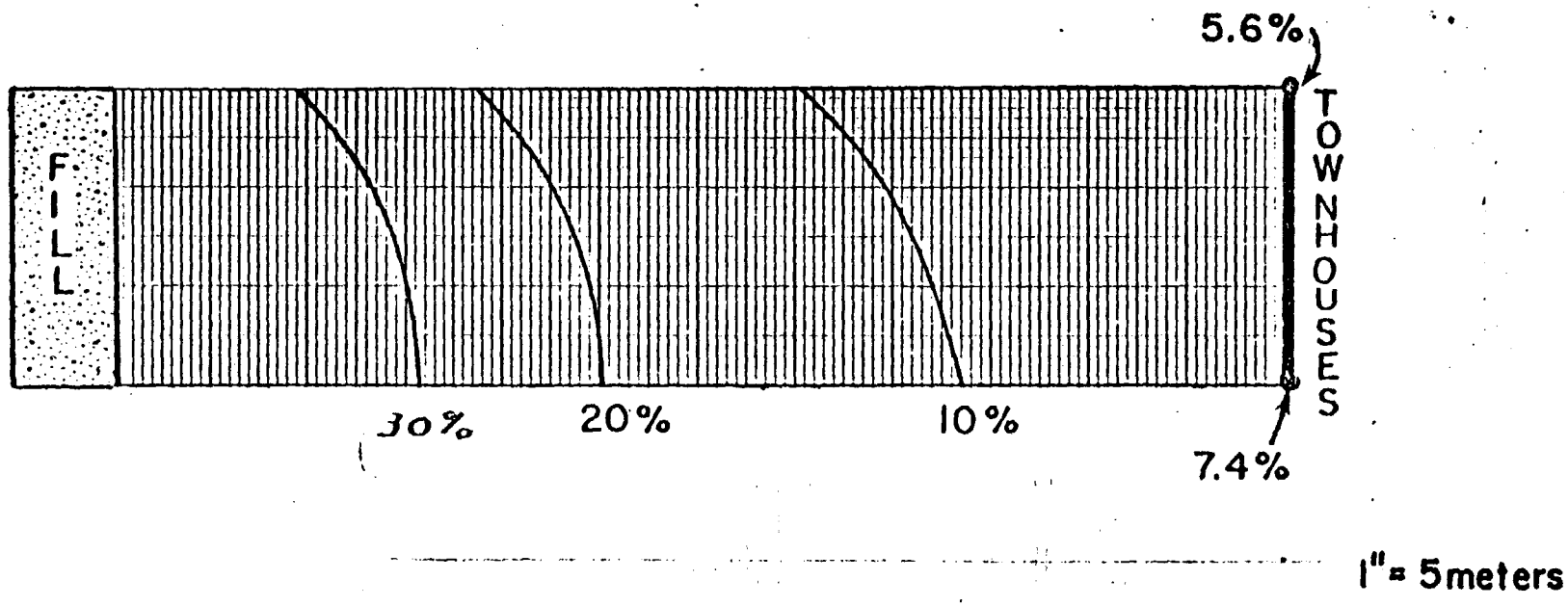


FIGURE 3 Methane Mole Fraction Contours Without Controls

SECTION 4

CONTROL DEVICES CONSIDERED

After consultation with Hennepin County engineers, it was determined that gas migration control facilities could best be installed approximately 5 meters (16.4 feet) from the edge of the landfill. This location was chosen to avoid interfering with utilities adjacent to the townhouses. The approach to analysis was to evaluate a variety of possible control facilities in a preliminary manner and to more carefully investigate the type of facility which appeared to offer the optimum solution.

Previous experience with similar installations has shown that trenches filled with gravel and employing no pumping are of limited effectiveness. Thus, this alternative was not considered.

The systems considered were pumped trenches employing both exhaust pumping and recharge pumping, and impermeable barriers. Two depths, one-third and two-thirds penetration to the ground water table, were treated. Figure 4a presents the results for penetration two-thirds of the way to bedrock while figure 4b presents the results for penetration one-third of the way to bedrock.

It may be seen from figure 4a that a barrier alone retards the methane migration noticeably, the 5 percent level having receded at steady state some 7.5 meters (25 feet) in from the townhouse. While this approach might be considered to alleviate the problem, the authors prefer to employ gas migration control facilities that retract the 5 percent methane contour back to the landfill side of the installation. Reference to figure 4a shows that recharge pumping systems employing 1 or 2 cubic feet per minute per linear foot of trench are effective in restricting the 5 percent methane contour to within the region between the landfill and the installation. Exhaust pumping at 2 cubic feet per minute is somewhat less effective. In order to test the feasibility of using a shallower trench, the data shown in figure 4b were obtained. Here it is noted that a recharge pumping system involving 2 cubic feet per minute per linear foot of trench was also effective in controlling methane migration.

It was concluded that an effective methane migration control installation would involve recharge pumping at a rate of 2 or more cubic feet per minute per linear foot of trench into a sealed top clay gravel filled trench penetrating 2.5 meters (8.2 feet) into the ground (one-third of the depth to the ground water table). The trench should be installed beyond the edge of the landfill. If any landfill material extends beyond the installation, the recharge pumping system would force the methane generated therein towards the townhouses.

Sealing the trench top increases the effectiveness of the system. Compacted soil may be used to effect the seal and turf may be developed on the soil if desired.

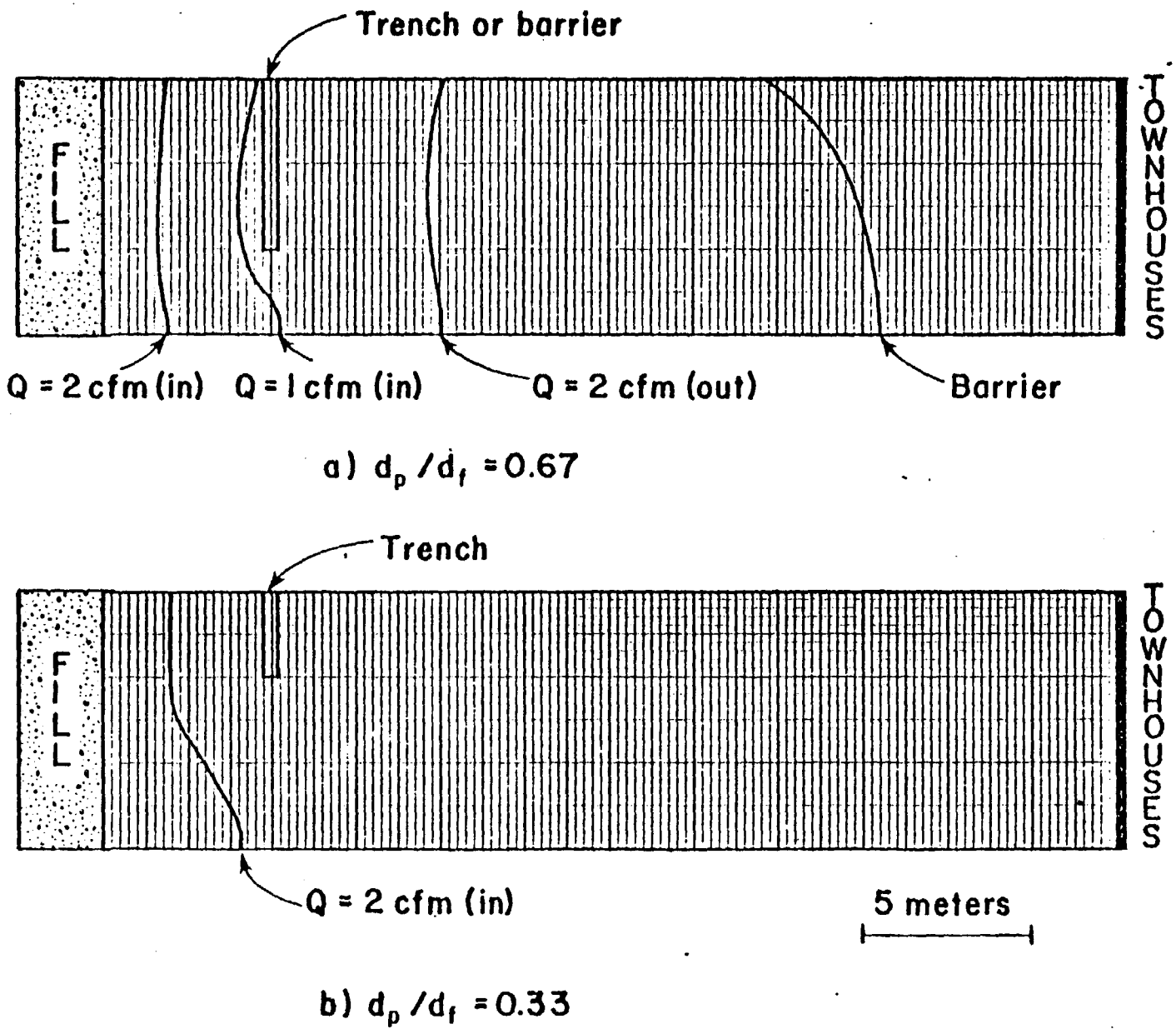


FIGURE 4 Comparison of Effectiveness of Methane Migration Control Devices Showing Steady State 5% Methane Contours

SECTION 5

TIME CONSIDERATIONS AFTER INSTALLATION

Studies were performed to determine the time required for the recommended system to become effective. Initially the system was allowed to come to steady state and, as shown in figure 5a, the 5 percent methane level was exceeded in all areas between the landfill and the townhouses. The control device was then activated and figure 5b through f shows the effectiveness as a function of time. Note that the steady state is reached after 250 days. Beginning at about 100 days, the region within which methane concentrations exceed 5 percent bifurcates with a high methane pocket being forced back toward the townhouses. During this period, careful monitoring should be undertaken to insure that excessively high methane concentrations are not encountered near the townhouses.

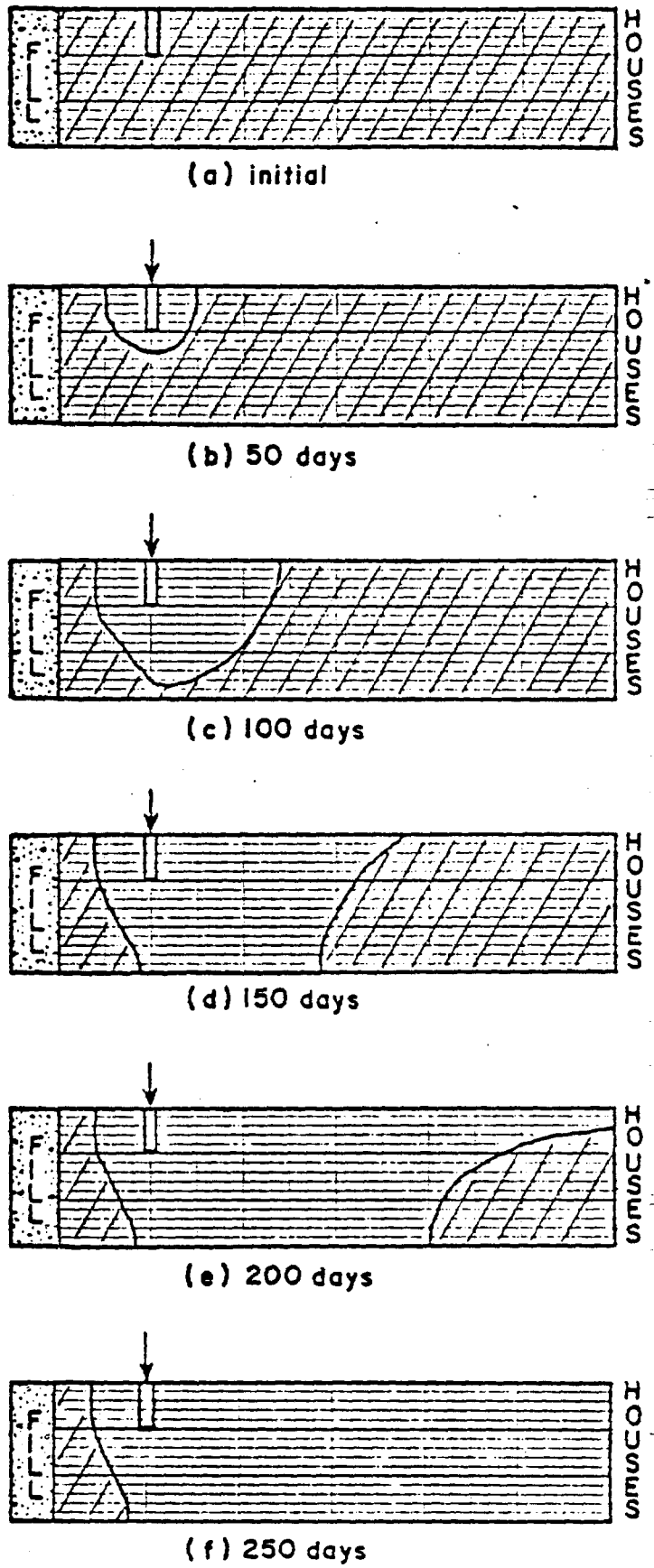


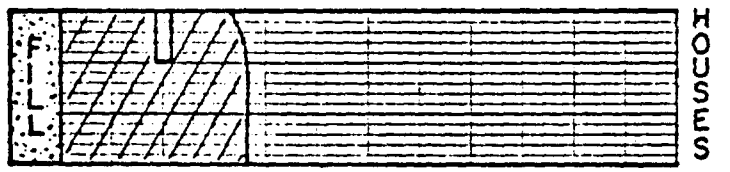
FIGURE 5 Regions Where Methane Exceeds 5% (shaded) at Various Times After Initiating Control Device

SECTION 6

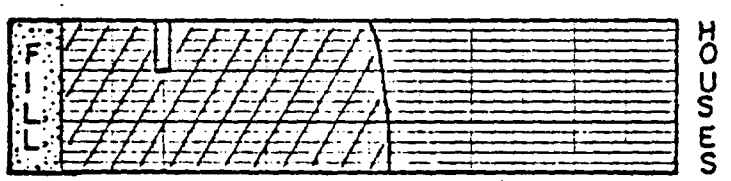
AFFECTS OF SYSTEM BREAKDOWN

Computer simulations were performed to determine the rate at which methane recharge would occur in the event that the recharge pumps ceased to function. The results are shown in figure 6. It may be seen that it would require in excess of one year for the 5 percent methane level to again reach the townhouses. It should be pointed out, however, that after the pumping is reinitiated, a plug of methane will be forced outward toward the townhouses in a manner similar to that shown in figure 5c through f. The longer the pumping system is inoperable, the more methane will be contained in this plug. Reference to figure 6b shows that even after 50 days, the 5 percent methane contour has moved out far enough to initiate a plug flow upon system reactivation.

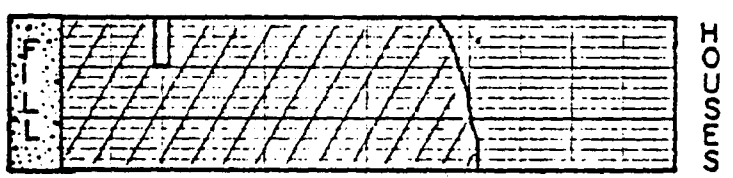
(a) initial



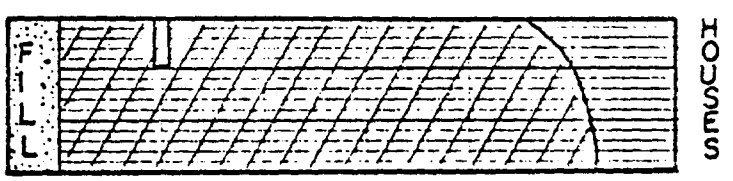
(b) 50 days



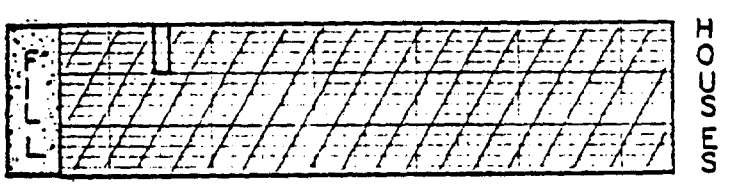
(c) 150 days



(d) 250 days



(e) 400 days



(f) 600 days

FIGURE 6 Extent of Readvance of 5% Methane Level (shaded) as a Function of Time After System Shut Down

SECTION 7

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that it is possible to develop a system to alleviate methane migration to the subject townhouses. A conceptual design consisting of a pumped recharge trench should provide adequate protection. However, it is important that monitoring be employed particularly during system startup.

SECTION 8

REFERENCE

Wefald, E. (1975), Report on Investigation of Sanitary Landfill, City of Hopkins, Minnesota.

DESIGN CHARTS

FOR

GAS MOVEMENT

AROUND

SANITARY LANDFILLS

by

Charles A. Moore

Katherine L. Jayko

DRAFT REPORT

September 1977

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2 Cross section through Figure 1.

3 Effect of varying decomposition time on maximum excursion of 5% methane level in granular soil.

4 Effect of varying soil porosity on maximum excursion of 5% methane level in granular soil.

5 Effect of varying temperature on maximum excursion of 5% methane level in granular soil.

6 Effect of varying ground surface perviousness on maximum excursion of 5% methane level in granular soil.

A.1 Design chart for granular soil (pervious ground surface and radial boundary).

A.2 Design chart for granular soil (impervious ground surface and pervious radial boundary).

A.3 Design chart for granular soil (pervious ground surface and impervious radial boundary).

A.4 Design chart for fine grained soil (pervious ground surface and radial boundary).

A.5 Design chart for fine grained soil (impervious ground surface and pervious radial boundary).

B.1 Time overlay for design chart for granular soil (pervious ground surface and radial boundary).

B.2 Time overlay for design chart for granular soil (impervious ground surface and pervious radial boundary).

B.3 Time overlay for design chart for granular soil (pervious ground surface and impervious radial boundary).

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LIST OF SYMBOLS

C_i	concentration of gas i
d_f	depth of landfill
d_s	depth to impervious layer
$\overline{D}_{AB}$	diffusion coefficient for gas A in gas B
$f_v(r)$	volume fraction having pore radius, r
K_i	Knudsen diffusion coefficient for gas i
M_i	molecular weight of gas i
n	soil porosity
N_i	flux of gas i relative to fixed coordinates
r	pore radius
r_{min}, r_{max}	limits on pore size distribution approximation
r_f	radius of landfill
r_s	radius to surrounding soil boundary
r_t	radius to maximum excursion of 5% methane level
R	gas constant
t	time
T	temperature
z	spatial distance
τ	tortuosity
Å	angstrom = 1×10^{-10} meters
∞	infinity

SECTION 1

INTRODUCTION

In order to predict gas concentrations around sanitary landfills, appropriate mathematical analogues have been developed (Moore and Alzaydi, 1977) and solved (Moore and Rai, 1977). The computer codes developed in these reports can be used to predict time dependent concentrations of gases at any position around sanitary landfills. Complicated geometries and boundary conditions can be treated and the effects of carbon dioxide on ground water quality can be determined.

The techniques for application of these computer codes to field problems are documented in Moore and Rai, 1977. While these codes are user oriented, they nevertheless require access to a relatively large computer and presume that the user is familiar with standard Fortran IV programming.

The purpose of this report is to provide design charts for methane distribution based on relatively simple landfill site geometry and flow boundary conditions. These charts can be used by designers to assess potential gas hazards. If use of these charts indicates that a particular field situation may be problematical, it is recommended that site-specific studies be performed using the computer codes.

SECTION 2

SUMMARY OF THEORETICAL APPROACH

Moore and Alzaydi (1977) have developed equations to describe flow of gases around sanitary landfills. A flux equation must be written for each component:

$$-N_A = \frac{1}{\tau} \sum_{r_{min}}^{r_{max}} f_v(r) \left| \frac{\frac{\bar{D}_{AB}}{RT} \cdot \frac{\partial C_A}{\partial Z}}{\left(1 - \sqrt{\frac{M_A}{M_B}}\right) C_A + \frac{\bar{D}_{AB}}{RTK_A \tau}} \right. .$$

where N_A = diffusional flux of gas A relative to fixed coordinates

τ = tortuosity factor

r = pore radius

r_{min}, r_{max} = limits on pore size distribution approximation

$f_v(r)$ = volume fraction having pore radius, r

$\bar{D}_{AB}$ = diffusion coefficient for gas A in gas B

R = gas constant

T = temperature

C_i = concentration of gas i

Z = spatial distance

M_i = molecular weight of gas i

K_i = Knudsen diffusion coefficient for gas i.

In addition, conservation of matter must be reflected in a continuity equation:

$$\frac{\partial C_A}{\partial t} = -\frac{\partial N_A}{\partial z}$$

where t = time.

Note that in these equations the properties of the gases and of the porous medium are decoupled:

gas properties: $\bar{D}_{AB}$, M_A, M_B, K_A

porous medium properties: r, r_{min}, r_{max}, $f_v(r)$, τ.

SECTION 3

APPLICATIONS TO SANITARY LANDFILLS

3.1 GEOMETRICS OF LANDFILL AND SURROUNDING SOIL

Simplified geometric conditions (see Figure 1) are assumed in developing the design charts for sanitary landfills. The landfill itself is assumed cylindrical in shape and of radius, r_f, and depth, d_f. The soil surrounding the landfill is assumed to have a horizontal soil-atmosphere interface varying in perviousness from completely pervious to completely impervious. At some depth, d_s, an impervious stratum (bedrock or groundwater table) is assumed to be encountered. At some radial distance, r_s, another soil stratum which is either pervious or impervious is assumed to be encountered. The mathematical model does not extend beyond r_s.

3.2 TIME DEPENDENT MOVEMENT OF METHANE

Figure 2 shows a cross-section through Figure 1. Typically refuse decomposes, generating methane in the landfill. Through time, methane migrates out through the soil surrounding the landfill. Methane is explosive in concentrations between 5% and 15% in air. Thus, the contour line of 5% methane can be used to delineate areas in which there is an explosion hazard from safe areas. (Note that this presumes that methane concentration greater than 15% still present a hazard; the rationale being that in such high concentration areas oxygen to cause explosions could be available in building basements, etc.) Figure 2 shows that the 5% methane contour progresses outward from the landfill as decomposition proceeds. However, at the end of a certain period of time, the decomposition ceases. Subsequently, the 5% methane contours begin to retreat back toward the landfill. Thus, it is possible to delineate the maximum outward excursion of methane and to predict the time required for this maximum excursion to occur. In the hypothetical example of Figure 2, the maximum excursion is r_t and occurs in 10 years.

3.3 ASSUMPTIONS ON WHICH DESIGN CHARTS ARE BASED

A set of design charts has been prepared for the conditions described in sections 3.1 and 3.2. These charts were developed to allow the designer to predict the maximum distance of excursion, r_t, of the 5% methane level. In addition, the time required for maximum excursion can be determined. Because equations (1) and (2) are nonlinear, it is difficult to present normalized solutions in the form of charts. The approach used to circumvent these difficulties was to assume typical average values for landfill dimensions (d_f = 16 meters, r_f = 160 meters), for gas compositions and decomposition times (70% methane, 30% carbon dioxide; decomposition time = 5 years), and for soil properties (see Table 1). A pressure of one atmosphere and a temperature of 25° C were used. Charts were prepared for two soil types (granular and fine grained) and for three sets of boundary conditions (permeable ground surface-permeable radial boundary, impermeable ground surface-permeable radial boundary and permeable ground surface-impermeable radial boundary). Additional charts were then prepared to allow for correction of nonidealized conditions.

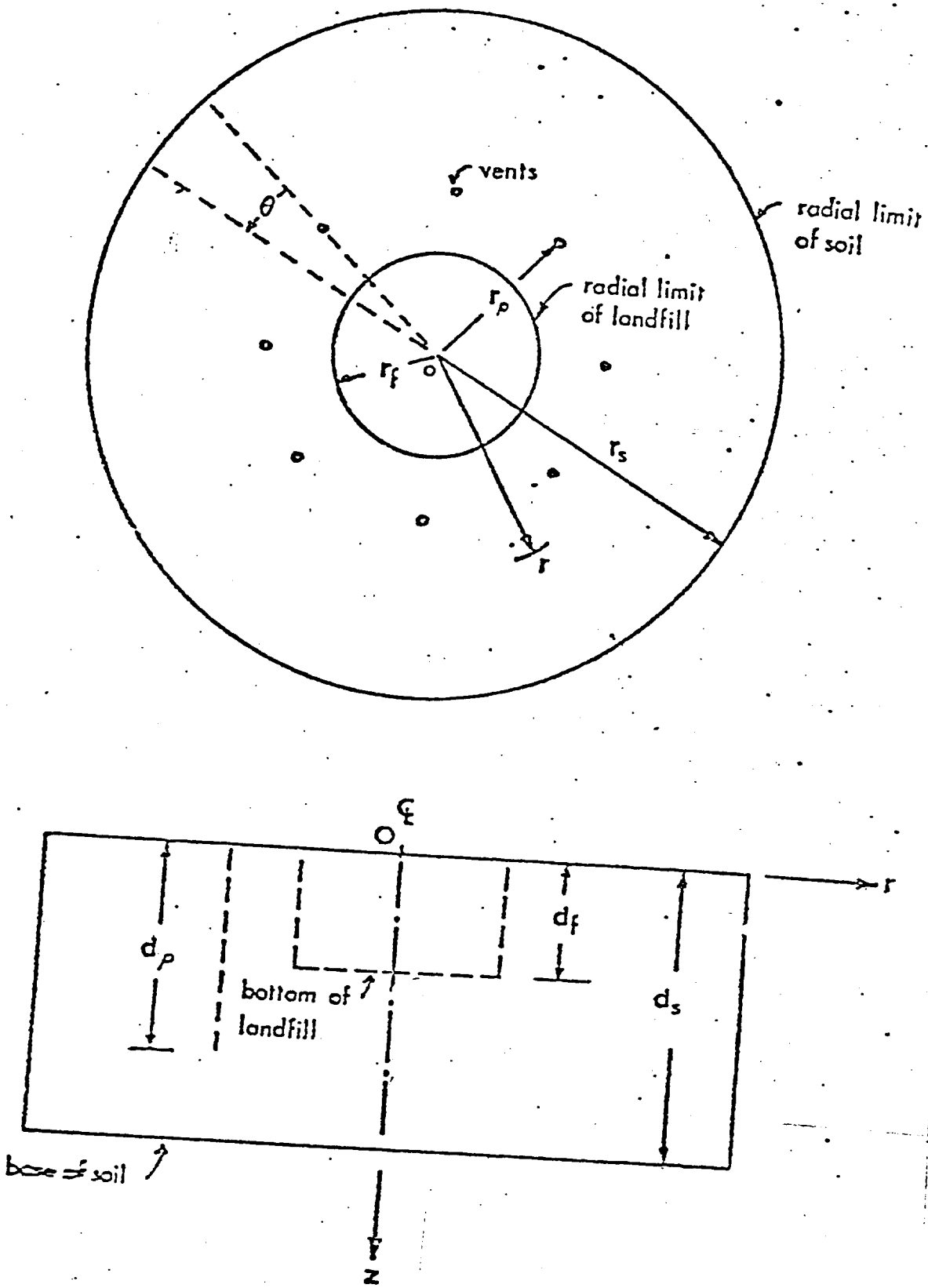

Figure 1 - Simplified landfill geometry.

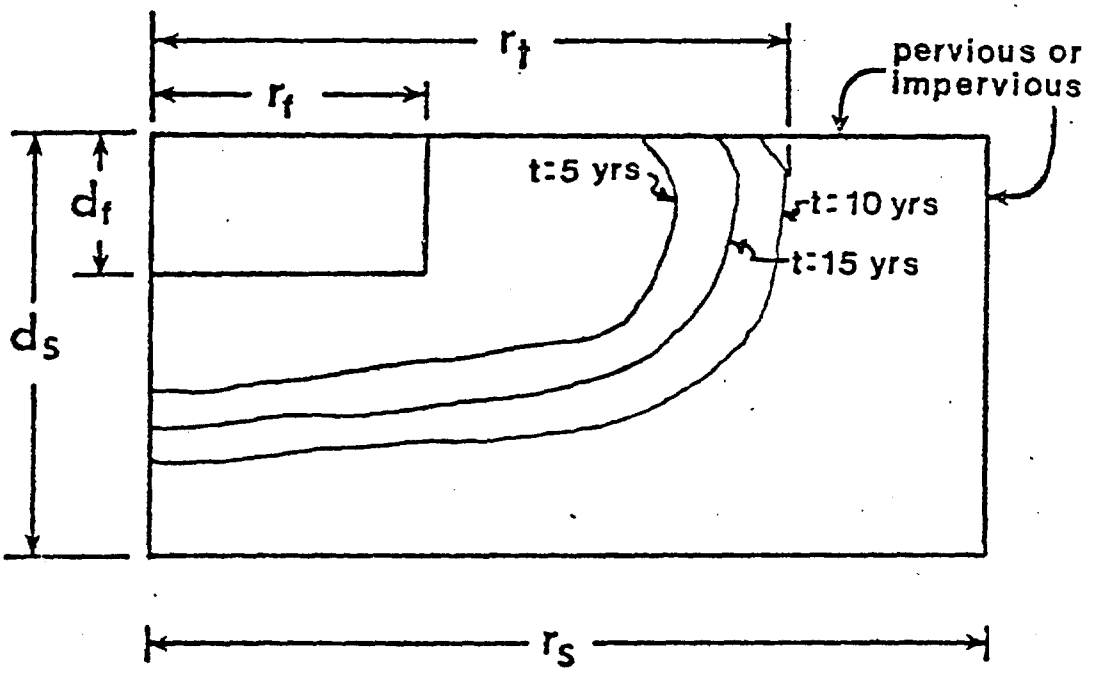

Figure 2 Cross - section through Figure 1.

additional samples if "new information" would be obtained but they would not run the same types of samples over again.

o EPA was requested to supply information on best technology available for disposing of landfill gas.

o EPA was requested to explore the feasibility of running a gas sample through a furnace and then into the GC/mass spee unit to determine combustion products. The Air Pollution District was concerned that phosgene could be formed by incomplete combustion of the chlorinated hydrocarbons.

o Eight 2" gas monitoring wells will be installed on Kentucky Concrete Pipe property to determine if the venting is lowering methane concentrations. If substantial progress is not achieved within 2-3 weeks, a flare system or forced air blower system may be required. Other gas monitoring wells will be installed on the site perimeter.

o Water monitoring wells (3) will be installed per Kentucky Division of Hazardous Materials and Waste Management geologists to determine if groundwater is source of exotic chemicals that are found in the gas.

o The industrial facilities in the area will be inspected by the State to determine if on-site dumps are polluting the groundwater.

o All industrial permitted wastes going to Campground will be re-examined by the State.

o The site operator should not fill all the way to the sand banks on the existing working face to provide an air gap between the site and adjoining structures.

o The site operator said he had not knowingly taken any wastes containing the "exotic" compounds found in the landfill gas. However, he does not check each waste load nor does the State.

o Mr. Weiter said that this gas problem was confined to the Concrete Pipe Company property primarily.

o Elevated o/o explosive limits readings have been obtained in the septic pits of the trailer park north of the fill but this could be from aneorobic decomposition of household sewage.

o The house labeled "New House" on Mr. Davis' sketch was occupied by the Kentucky Concrete Pipe Company plant superintendent, but he has vacated the house because the septic pit gas is in the 35-40% combustible range. There was some discussion about installing a conventional tile field so he can move back in.

o No gas was found in the "old house" basement.

TECHNICAL ASSISTANCE INQUIRY

1. REQUEST FROM: Jim Scarbrough / John Dickinson DATE: 6/15/78

2. REQUEST:
   - ✓ Contact EPA Regions for best management practices, in their experience
   - Calculate the amount of gas site will produce as a function of time
   - Determine form & duration of flare
   - Types & costs of installing conventional industrial flaring
   - Determine combustion products.

3. BACKGROUND:
   Compacted
   Lined
   Leachate

4. KEY PROPERTIES OF MATERIAL:
   3.9 ft^3 methane / 5 to 25 year period

5. DISPOSAL ALTERNATIVES:

6. RECOMMENDED DISPOSAL:

7. ACTUAL DISPOSAL:

8. REFERENCES:

1-23-79

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

MEMORANDUM

Rita file

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill

On Tuesday, January 23, 1979, a fifth meeting was held at the Louisville and Jefferson County Department of Public Health Building to discuss the progress of the migrating gas problem at the Campground Landfill. The following persons were in attendance: William J. Manby, Louisville & Jefferson County Civil Preparedness; Harley N. Blankenship, Attorney, Campground Landfill; S. Jay Gordon, Kentucky Concrete Pipe Company; Jerry Blankenship and Sherod Robinson, Campground Landfill; Marty Tittlebaum, TenEch Environmental Consultants; Harold Davis, Air Pollution Control; John G. Brooks, Kentucky Department for Natural Resources and Environmental Protection; P. Clark Bledsoe, Richard Wellinghurst, and the writer, from this office. Also in attendance was Marshall Eldred, Attorney for Kentucky Concrete Pipe. The meeting was called to order at approximately 10:00 A.M., and the writer presented the following information:

(1) A chart listing the methane gas readings from December 18, 1978, through January 22, 1979, was presented. (See Attachment). All readings from December 21, 1978 through January 22, 1979, were "zero" except for monitoring well "H". (See Attachment) It is the feeling of the Health Department the system was now functioning as designed and effectively preventing the migrating of methane gas from the Campground Property to the Kentucky Concrete Pipe Company Property.

(2) Surface water conditions were discussed concerning three (3) wells in the evacuation system and this is presently being investigated by an engineering firm employed by Jerry Blankenship and soon will be presented to David Daugherty, Water Management Engineer, for his approval.

(3) Mr. Blankenship stated he has one smaller back-up system onsite. If existing blower system would fail this smaller system could be installed and operational within several hours. An additional larger standby blower system is on order and should be available for installation within the very near future.

(4) Mr. Blankenship indicated he is in the process of investigating the use of the methane gas that is being produced by his landfill and upon completion of his feasibility study another evacuation system will be installed on the fill site itself to collect the methane gas for re-use.

(5) Additional wells are yet to be constructed to the front of the fill paralleling Campground Road.

(6) A standby generator to supply power in case of emergency outages is being investigated by Mr. Blankenship, with the Wayne Supply Company. The intention here is for the Wayne Supply Company to provide a standby generator, when necessary, by contract with Mr. Blankenship.

(7) Mr. Blankenship indicated American Synthetic Rubber Company has now been made aware of the migrating gas problems that exist at the fill site and that he is working up a written proposal for perpetual maintenance of the system which must be submitted to the Kentucky Department for Natural Resources and Environmental Protection and the Health Department by March 1, 1979.

(8) Mr. Blankenship is also working on the installation of an all-weather access road that would provide ingress and egress for Health Department inspectors, to the blower house location.

Marshall Eldred

(1) Mr. Eldred questioned the gas readings that were being produced by well "H". (See Health Department response #3)

(2) Mr. Eldred requested more frequent monitoring by the Health Department than once every thirty (30) days. (See Health Department response #5)

12-30-78

~~John~~

JIM S.
Might help
for Lees Lane

~~JOHN~~
Rita - file
Campground

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

MEMORANDUM

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill
Migrating Gas

On Wednesday, November 29, 1978, a third meeting was held at the Louisville and Jefferson County Department of Health Building to update all involved parties on the migrating gas problems at the Campground Landfill. The following persons were in attendance: Ms. P. Haight, Kentucky Division of Hazardous Materials & Waste Management; Randy Hockensmith, Robert Hockensmith and S. Jay Gordon, Kentucky Concrete Pipe Company; Marshall Eldred, Jr. and H. VanArsdale, Attorneys for Kentucky Concrete Pipe Company; Dr. Joseph Pavoni; TenEch Environmental Consultants; Bill Manby, Louisville & Jefferson County Civil Preparedness; Harley Blankenship, Attorney for Campground Fill, Inc.; Jerry Blankenship, owner of Campground Fill, Inc.; Harold L. Davis, Air Pollution Control District; P. Clark Bledsoe, Thomas Coomes, Bruce K. Lane, Charles E. Weiter, and Richard Wellinghurst representing the Louisville and Jefferson County Department of Health.

The meeting was called to order at approximately 10:30 A.M., and the writer presented the following information:

(1) A chart was presented listing the methane gas readings in the monitoring wells from October 24, 1978, to November 28, 1978. The preliminary findings indicate the evacuation system is removing the gas from under Kentucky Concrete Pipe Company's property and preventing additional gas from migrating under said property.

(2) The Health Department, at the present time, will process construction plans for future expansion of the Kentucky Concrete Pipe Company or modifications to existing structures provided special design features are incorporated in the construction plans that will provide for a gas monitoring alarm system, a water trap between the septic tank and pit, and possibly an air exhaust system.

(3) The Health Department will require Jerry Blankenship to maintain a monthly log of operation for the gas evacuation system. This log will record the times of operation of the system along with the times of inoperation and any repairs or maintenance necessary to keep the system in proper operating condition. A copy of this log is to be kept on the premises and a copy is to be submitted to this office within ten (10) days following the preceding month.

(4) Mr. Blankenship is to provide immediate notification to the Health Department, Kentucky Division of Hazardous Materials & Waste Management and all surrounding property owners of any breakdown of the system. An alarm system is to be installed that will provide immediate notification of any breakdown.

(5) A design is to be worked out for capping and lowering to grade level, the monitoring wells on Kentucky Concrete Company's property.

(6) Jerry Blankenship is to submit, in writing, by March 1, 1979, to this office, a method for perpetual maintenance of the evacuation system. This method will be reviewed by Health Department and Kentucky Division of Hazardous Materials & Waste Management prior to the renewal of the landfill operation permit for 1979.

The following comments were mady by participants attending the subject meeting:

Mr. VanArdsale

(1) He was interested as to when the evacuation system was first started up. (October 28, 1978)

(2) He requested a definition of manometer readings. (indicator of whether well is breathing in or out)

(3) He asked for the number of wells presently hooked to the evacuation system. (21 wells)

(4) He requested the number of wells adjacent to the Kentucky Concrete Pipe Company's property. (25 wells)

(5) He asked how many times the present system has been down since start-up. (twice; once because of breakdown; second time to replace existing equipment with a larger pump)

(6) He questioned whether all 21 wells were hooked up at the same time. (yes)

(7) He questioned how the gas being collected by the evacuation system is being disposed of. (venting to the atmosphere)

(8) He asked how many venting systems will be installed to completely service the landfill. (If possible all wells will be connected to one (1) pump house and vented at the same location.)

(9) He questioned whether a generator was available if power was lost. (no)

(10) He requested the Health Department continue checking the monitoring wells until the efficiency of the evacuation system has been established. (Health Department, Dr. Pavoni, Mr. Blankenship, Air Pollution Control District

will meet and sample to determine the system's efficiency within the next two (2) weeks)

Marshall Eldred

(1) He questioned whether or not the Health Department will allow permits to be issued for new construction until the evacuation system's efficiency has been established. (The Health Department will process plans but not issue permits until the system's efficiency has been established as mentioned in Mr. VanArsdale's comment #10.)

Dr. Pavoni

(1) He stated the data to date makes the system appear to be working but he would like the following data collected before agreeing to the system's efficiency:
   (a) Check the venting system to determine if methane is truly being vented;
   (b) Analyze what is leaving the venting system;
   (c) Confirm the landfill is still producing methane gas and that it has not dissipated due to the change in temperature, or by increased rainfall.

Air Pollution

(1) Air Pollution will meet with the Health Department, Dr. Pavoni and Jerry Blankenship and monitor ambient air samples.

(2) Air Pollution will collect samples from the venting system and analyze for methane and two (2) other tracer compounds.

Kentucky Division of Hazardous Materials and Waste Management

(1) Ms. Haight indicated that the Kentucky Department for Natural Recources and Environmental Protection had requested resubmittals by all industrial customers of the Campground Landfill for new chemical analyses of any industrial waste that is being deposited in the landfill. She indicated that the State had not received all information requested as of this date.

(2) Ms. Haight also indicated the State was collecting information from all industries in the area to complete their industrial inventory and that all of this information had not been collected and reviewed as of this date.

(3) Ms. Haight indicated the State has a hearing set for Southern Materials within the next month and that Environmental Protection Agency may be taking enforcement action against the Lees Lane Landfill but no other enforcement action is comtemplated by the Kentucky Department for Natural Resources and Environmental Protection in the rubbertown area.

(4) Ms. Haight also indicated the manifest system which Mr. McClure alluded to at the August meeting was still in the process of being prepared and regulations still being drawn up, therefore, no industries in the area have yet received notifications of that future program.

NOVEMBER 30, 1978

cc: T.S. Wallace Jr., M.D.
Jay Gordon
Jerry Blankenship
Ross Singleton
Larry Schumer
Joseph Pavoni
David Ross Stevens
Robert Davis
Bruce K. Lane
Randy Hockensmith
John Dickinson
Jack McClure
Pat Haight
Bert VanArsdale
Thomas Coomes
Larry Wood
Harley Blankenship
John Brooks
Harold Davis
Richard Wellinghurst
Thomas Mortof
Phillip Emery

(2) The methane present in the ambient air presented no explosion problems at this time. The Air Pollution Control District will collect additional ambient air samples some time in the future during inversion conditions, to check the amounts of the three (3) compounds in the ambient air during adverse conditions.

(3) The Air Pollution Control District had no objections to the venting systen now in existence, as long as no elevated readings are obtained in the ambient air. If, however, flaring of the gases is initiated there would be some concern over the inability to control the complete combustion of the gases.

Jerry Blankenship

(1) Mr. Blankenship stated three (3) wells adjacent to Kentucky Concrete Pipe Company property are being inundated with surface water and on December 15, 1978, he reconstructed his header system on the wells to go around the ponding water, and also reduced the flow of air from the evacuation system and speculates this is the reason for the positive gas readings on December 18, 1978.

(2) Mr. Blankenship indicated he would be willing to meet with Kentucky Concrete Pipe Company and develop a system for protection of the monitoring wells on their property.

(3) Mr. Blankenship also agreed to install an all-weather access road to the control house.

(4) Mr. Blankenship indicated a total of 33 wells are now connected to the evacuation system. He also estimated normal down time for maintenace of the system would be approximately one (1) hour.

Kentucky Concrete Pipe Company

(1) It was requested of the Health Department to continue daily monitoring of the wells on Kentucky Concrete Pipe Company property until the evacuation system has been accepted as an efficient method of preventing migrating gas. (See Health Department comment #3)

(2) It was also requested that Mr. Blankenship meet with them and provide protection for the monitoring wells located on Kentucky Concrete Pipe Company property. (See Mr. Blankenship's comment #2)

(3) Does the venting of these gases pose any threat to Kentucky Concrete Pipe Company employees during times of inversion? (See Air Pollution Control comment #2)

(4) It was questioned whether or not a flaring system would be more efficient than just the evacuation and venting. (See Air Pollution Control's response #3)

CEW/mlr

cc: T.S. Wallace, Jr., M.D.
Jay Gordon
Jerry Blankenship
Ross Singleton
Larry Schumer
Joseph Pavoni
David Ross Stevens
Robert Davis
Bruce K. Lane
Randy Hockensmith
David Daugherty
John Dickinson
Jack McClure
Pat Haight
Bert VanArsdale
Thomas Coomes
Larry Wood
Harley Blankenship
John Brooks
Harold Davis
Richard Wellinghurst
Thomas Mortof
Phillip Emery

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

August 14, 1978

Mr. Ben Glover
EPA
Solid Waste Department
345 Courtland Street, N.E.
Atlanta, GA 30308

Dear Mr. Glover:

As you requested, I am enclosing a list of users of the Pyroprobe Solids Pyrolyzer. We are sorry for the delay in getting this information to you.

Also enclosed is our Pyroprobe 100 Solids Pyrolyzer product bulletin, as well as a few reprints on the Pyroprobe.

If you have any questions or would like additional information, please feel free to contact us or our representative for your area, Mr. James Sasser of Sci-Con, Inc.

Sincerely,

Elaine V. Baccino

Elaine V. Baccino
Office Marketing Manager

EVTB:ckh
Encl.
CC: Sci-Con, Inc.
1268 Carrollwood Way
Stone Mountain, GA 30083
(404) 294-6181

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PYROPROBE USERS LIST

ALABAMA

Mr. Richard Carter
State of Alabama
P. O. Box 119
Enterprise, AL 36330

Mr. William Landon
P. O. Box 231
Auburn, AL 36830

Mr. Brent Wheeler - 5 ordered 9/30/76
State of Alabama
Dept. of Toxicology & Criminal Investigation
P. O. Box 128
Huntsville, AL 36830
205-539-1401

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PYROPROBE USERS LIST

FLORIDA

Dr. Bill McGee & Mr. Rodger Morrison
Forensic Science Department
Florida Technical University
P. O. Box 25000
Orlando, FL 32816
305-275-2788

J. Pulco
Air Force Eastern Test Range
Planetary Quarantine Lab
Building 49635
Cape Canaveral, FL 32920

Norman T. Lee, Criminalist
Monroe County Sheriff's Department
Crime Lab
P. O. Box 1269
Key West, FL 33040
305-296-2424 X36

Pratt & Whitney Aircraft
State Road 710
United, FL 33402
205-844-7311

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PYROPROBE USERS LIST

GEORGIA

Dr. Eugene Reiner
Center for Disease Control
U.S.P.H.S.
Atlanta, GA 30333
404-633-3563

Mr. Joseph L. Glajch
University of Georgia
Department of Chemistry
Athens, GA 30602
404-542-2626 X80

Ms. Elizabeth B. Higman
U.S.D.A., ARS, Richard B. Russell
Agric. Research Center
P. O. Box 5677
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PYROPROBE USERS LIST

KENTUCKY

R. F. Vance
General Electric Company
Building 35, Room 1101
Appliance Park
Louisville, KY 40225
502-452-4642

Mr. Bill Lloyd
University of Kentucky
131 Anderson Hall
Lexington, KY 40506
606-257-2866

Mr. Edward Dance
Chem. Section Supv.
Kentucky State Police Lab
1250 Louisville Road
Frankfort, KY 40601
502-564-3876

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PYROPROBE USERS LIST

MISSISSIPPI

Dr. Arthur Hume
Crime Lab
Miss. Highway Safety Patrol
P. O. Box 958
Jackson, MS 39200
601-362-1664

W. S. Kelly
Miss. Crime Lab
P. O. Box 5008
Jackson, MS 39216
601-354-7693

Miss. State University
Forest Product Lab
P. O. Box FP
Miss. State, MS 39762
601-325-2116

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PYROPROBE USERS LIST

NORTH CAROLINA

Dr. Thomas A. Perfetti
Research Chemist
R. J. Reynolds Tobacco Co.
Research Center - Main Street
Winston-Salem, NC 27102
919-748-2773

Mr. Tom McSwain
North Carolina State Bureau of Investigation
109 E. North Street
Raleigh, NC 27603

Mr. Bryon Stembal
Law Enforcement Center
825 E. 4th Street
Charlotte, NC 28202
704-374-2316

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PYROPROBE USERS LIST

SOUTH CAROLINA

Dr. Stephen L. Morgan
University of South Carolina
Chemistry Department
Columbia, SC 29208
803-777-8064 or 7414

Dr. Peter Hauser
Deering Milliken Research Corp.
P. O. Box 1926
Spartanburg, SC 29304
803-573-2223

Celanese Fibers Company
Cherry Road Station
Rock Hill, SC 29730
803-366-4121

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PYROPROBE USERS LIST

TENNESSEE

Mr. William Darby, Director
Tenn. Bureau of Investigation
State Crime Lab
3021 Lebanon Road
Donelson, TX 37214
615-741-4476

Ms. Linda Hales
Tenn. Valley Authority
Laboratory Branch - 150-401 Bldg.
Chattanooga, TN 37401
615-755-3135

Mr. John Crockett
Ownes Corning Fiberglas
1167 Lower Brownsville Road
Jackson, TN 38301
901-424-5330

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel. 215 932 [illegible]
Telex: 83 5[illegible]

SUMMARY SHEET

The CDS 820WP Organic Water Pollution Analysis System makes possible in a single system, the analysis of trace organics in water at the PPB level, the analysis of total organic carbons (TOC) in water, and the analysis of total organics in sludge. When the 820WP is combined with the CDS 1200 Elemental Analyzer/Peak Identifier System, not only total organic analysis but specific organic compound identification in water pollutants and sludge becomes practical.

The CDS Model 1200 Elemental Analyzer/Peak Identifier is a unique instrument which provides an empirical formula or elemental analysis for each peak eluting from a gas chromatograph as well as a vapor phase controlled thermolytic dissociation pattern (CTD). This CTD pattern makes possible a direct molecular structural identification as well as a functional group analysis with sensitivities limited only by the detector used. The CTD pattern is in many ways the thermal equivalent of a mass spectrum, with a simpler interpretation because of the lower energies involved.

The 1200 is extremely simple to operate using only gas chromatographic technique. The results are very straightforward in interpretation and provide positive identification at the submicrogram level.

We feel the Pyroprobe 100 Solids Pyrolyzer represents a new concept in solids pyrolysis, and that it will replace the Curie Point units as they have replaced the old filament pyrolyzers. The Pyroprobe has the fastest heating rate of any commercial pyrolyzer - 75°C/msec to 600°C reached in 8 msec, as compared to 100-300 msec for commercial Curie Point devices.

Now, for the first time, you can specify complete control of the entire heating profile, resulting in added reproducibility and specificity. Also, almost any type of sample can be handled, due to the interchangeability of probes.

The Pyroprobe 120 is the 1400° version of the Model 100 and is equipped with a three position function selector switch which enables the operator to flash off solvent at 100°C, pyrolyze the sample at the selected final temperature and clean the probe at 1000°C.

The CDS 0100-381 Extended Interval Option permits the ribbon or coil probe to maintain any desired temperature up to 1400°C for a switch selectable interval of 1, 2, 4, 8, 15, 30, 60, 120, or 240 minutes. This extended interval is needed whenever there is a requirement to maintain a sample at an elevated temperature for more than 20 seconds. Examples include the stepwise heating of a sample to simulate the precombustion and combustion phenomenon useful in flame retardant studies.

The CDS 0100-382 Extended Temperature Programming Option enables the ribbon or coil probe to be temperature programmed at a switch selectable rate of 5°, 10°, 20°, 30°, 40°/min. followed by a variable isothermal final temperature interval. This control of temperature profile can be useful in studying coal gasification, rock shale oil recoveries, precombustion and combustion phenomenon and catalyst regeneration studies.

Both the Extended Interval Option and Extended Temperature Programming Option are invaluable for thermal evolution of organics from an inorganic matrix.

The Model 820 Controlled Atmosphere Pyrolysis System is extremely useful for simulating the thermal reaction of polymers in controlled atmosphere. It can be used for testing the formation of noxious vapors and smoke formation during the heating of a polymer in air, during processing or use. It provides organic content in shale, coal gasification data, and organic contaminates in air or water. It provides the means of converting from the reaction gas to helium so that successful gas chromatography or mass spectrometry analysis can be carried out.

Our Model 800 Reaction Systems are particularly valuable for catalyst evaluation and carrying out small scale reactions, both in the continuous and pulse mode at temperatures to $1000^{o}C$ and pressures up to 1500 PSI.

The CDS Series 700 Micro-Organism Identification System provides for characterization of anaerobic bacteria by examination of their metabolic products by gas chromatography, as well as by pyrolysis gas chromatographic pattern of the micro-organism itself. The pyrolysis GC of the micro-organism has been shown to provide strain, as well as species differentiation. The CDS 700 System is extremely simple to operate and can provide a micro-organism identification from a single culture in minutes.

PYROPROBE™ 100 SOLIDS PYROLYZER

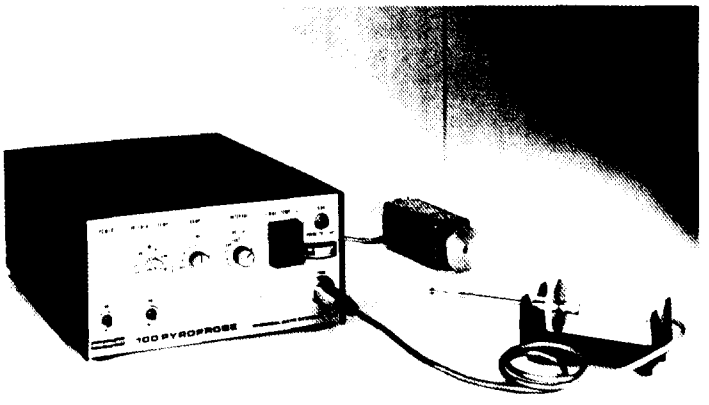
. . . . .CONTINUOUSLY SELECTABLE PYROLYSIS TEMPERATURE TO 1000°C
. . . . .EIGHT LINEAR TEMPERATURE HEATING RATES TO 20,000°C/SECOND
. . . . .FASTEST HEATING RATE AVAILABLE – TO 600°C IN 8 MILLISECONDS
. . . . .TEN PYROLYSIS INTERVALS – 20 MSEC TO 20 SEC.
. . . . .DUAL PROBES FOR ALL SOLID SAMPLES
. . . . .FITS ANY GAS CHROMATOGRAPH

INTRODUCTION

Pyrolysis gas chromatography has established itself as a convenient and effective technique for the identification of polymers, paints, resins, rubbers and micro-organisms. In addition to identification, the technique can be used to determine the microstructure of polymers, the chemical composition of unknown compounds and end-use suitability of products such as brake linings and ablative materials.

The PYROPROBE represents the third generation in solids rolyzers. It is expected that it will replace the Curie Point units ..s they replaced the old filament pyrolyzers.

The PYROPROBE has the fastest heating rate of any commercial pyrolyzer – 75°C/msec to 600°C reached in 8 msec, as compared to 100-300 msec for commercial Curie Point devices.



NEW CONCEPT

The new concept is based on a precision platinum element that serves as a temperature sensor, heater and sample holder nultaneously. This element forms one leg of a conventional .heatstone bridge circuit and the temperature setting control forms a balancing leg. This permits extremely rapid and precise response. By electronically programming the balancing leg, controlled linear heating rates are obtained.

COMPLETE CONTROL

The PYROPROBE enables the entire heating profile to be defined. The final pyrolysis temperature can be varied to 1000°C and can be set to within 1°C. Additionally, the pyrolysis interval (the time during which power is supplied to the element) can be varied from twenty msec to twenty sec, in a choice of ten intervals. The heating rate of the ribbon element can be controlled from 0.1°C/msec to 20°msec (that is 100°C/second to 20,000°C/sec.) in a choice of eight rates. This "ramp" control can be bypassed so that the maximum available power is applied to the element until the final pyrolysis temperature is reached. This heats the ribbon element to 600°C in approximately 8 msec and to 1000°C in 17 msec. The coil element holding a quartz tube takes 600 msec to heat to 600°C since its higher mass causes it to heat more slowly.

INTERCHANGEABLE PROBES

The PYROPROBE is supplied with two different probes – ribbon and coil types. The ribbon probe is used for samples that can be dissolved or melted and deposited on the ribbon. The coil probe is used for material such as granular or fiber samples. It is generally used in conjunction with a replaceable quartz tube which acts as a sample holder.

Thus, the PYROPROBE can accept any type of sample due to the availability of two different probes and is therefore more versatile than either of the two types of conventional devices.

OPTIONAL PYROLYSIS INTERFACE

For those gas chromatographs into which the probes will not fit, a pyrolysis interface must be used. This fits onto the gas chromatograph and acts as an extension of the injection port or connects directly to the column. The temperature of the interface is sensed by a platinum resistance thermometer controlled by a zero crossing, fully proportional temperature controller in the PYROPROBE electronic module. Carrier gas preheated to the interface temperature sweeps the vaporized pyrolysis products from the interface as if the probe were actually in the gas chromatograph injection port.

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5303

PYROPROBE 100/120 SOLIDS PYROLYZER

HOW TO ORDER

Part Number	Description	Price
CDS 100-371	Pyroprobe 100 (1) Solids Pyrolyzer, including interchangeable coil and ribbon probes.	$ 1595.00
CDS 120	Pyroprobe 120 (1) Solids Pyrolyzer, including interchangeable coil and ribbon probes (1400° version) with CDS 100-401 Three Position Function Selector Switch which enables operator to flash off solvent at 100°C, pyrolyze the sample at the selected final temperature and clean the probe at 1000°C.	2035.00

OPTIONS

CDS 100-372	Pyrolysis Interface with temperature controller (2,3)	429.00
CDS 100-375	Additional Pyrolysis Interface without temperature controller(2). Cannot be used without 100-372.	337.00
CDS 100-376	Quartz Lined Option for above(3)	151.00
CDS 100-401	Function Switch(3,4)	225.00
CDS 100-402	1400° Option(3)	215.00
CDS 0100-381	Extended Interval Option -1,2,4,8,15,30,60,120 or 240 minutes	1154.00
CDS 0100-382	Extended Temperature Programming Option -5°,10°, 20°,30°,40°,60°,120°,180°,240°,300°C/Minute. This option includes 0100-381.	1820.00
CDS 0100-1020-1	Ribbon Probe (Standard diameter 1/4")	215.00
CDS 0100-1020-2	Coil Probe (Standard diameter 1/4")	215.00
CDS 0100-1021-1	Direct Insertion Ribbon Probe for DuPont Series 490 Mass Spec (Other Mass Spec Probes on request)	1032.00
CDS 0100-1021-2	Direct Insertion Coil Probe for DuPont Series 490 Mass Spec (Other Mass Spec Probes on request)	1032.00
CDS 0100-1060	20 Quartz Tubes for Coil Probe	48.50/pk.
CDS 0100-1062-3	Quartz Boat for Large Probe	23.00
CDS 0100-1076-1	25 Probe Seals	39.45/pk.
CDS 0100-1076-5	25 Large Probe Seals	46.00/pk.
CDS 1620-0059	20 Viton O-Rings for Interface	19.50/pk.
CDS 1620-0089	10 Graphite Ferrules for Interface	43.00/pk.
CDS 1640-0002	Quartz Wool	14.00/pk.
	Standard Probe Refurbishing	37.00
CDS 100-373	Large Probe Interface with temperature controller (2,3)	550.00
CDS 100-377	Large Probe Interface without temperature controller(2,3)	462.00

5/1/78

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215 932 [illegible]
Telex: 83-5308

ORDERING INFORMATION CONT'D

Part Number	Description	Price
CDS 0100-378-2	Programmed Pyrolysis Interface with rapid cool-down capability to go to 800°C, limited to 400°C when used with probes.	$ [illegible].00
	NOTE: The Model 210 Temperature Programmer is required to program above interface - CDS 0210-674 $1803.00	
CDS 0100-1020-3	Large Coil Probe (Diameter 5/16")	360.00
CDS 0100-1060-2	Quartz Boat for Standard Coil Probe	20.00
CDS 0100-1060-3	Alumina Tubes for Standard Coil Probe (4/pack)	121.00/pk.
CDS 0100-1062-2	Bulk Quartz Tube for Large Coil Probe - Unslotted	19.00/ea.
	Large Probe Refurbishing	43.50

(1) Includes PYROPROBE electronics module, one calibrated ribbon probe, one calibrated coil probe and probe stand.
(2) State chromatograph make and model number.
(3) These options cannot be field installed.
(4) This three position switch enables the operator to flash off solvent at 100°C, pyrolyze the sample at the selected final temperature and to clean the probe at 1000°C.

STATE OF ILLINOIS

ROUTING AND TRANSMITTAL SLIP

Date 8/9/78

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. ~~Jim Scarbrough~~		
2. ~~Region IV~~		
3. ~~John D~~ Rita		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate	✓	For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Illinois EPA gas sample analyses from sanitary landfill with lateral migration into adjacent residences.

\ores

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Wanda Szigalowski	Phone No.

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

EPA-4 (Rev. 7/15/75)

LPC/NPC Samples from Chicago Heights

9042 (B-1) (Abandoned Well in Vacant lot No. of Site)

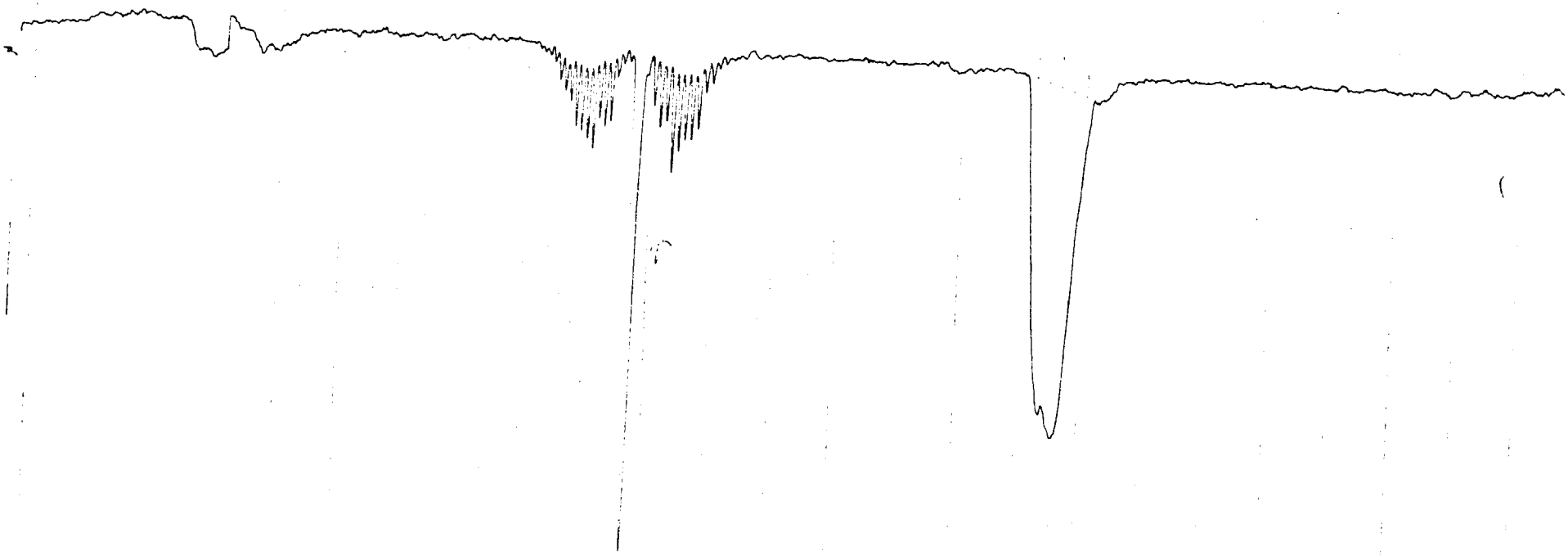
Methane 20.25%
CO_2 14.66%

9043 (B-2) (Soil probe just south of ℄ of 26th St.)

Methane 31.50%
CO_2 18.38%

9044 (B-3) (shower drain in basement of 355 E. 26th St)

Methane	ND	20.54
CO_2	ND	10.17



9043
B-2

— 4cc of Sample

Air

9043

903104

```
>T
MULT.MOT.? S

FILE :903105
TITLE:LIM SAMPLE 3040
MASS RANGE :10-150
INTEG. TIME:3
SCANS PER SCAN :0
THRESHOLD:0
MAX. RUN TIME:30
INST. RANGE SETTING:H

PS
T

PS
T
UNABLE TO QUANTITATE-SAMPLE IS SATURATED
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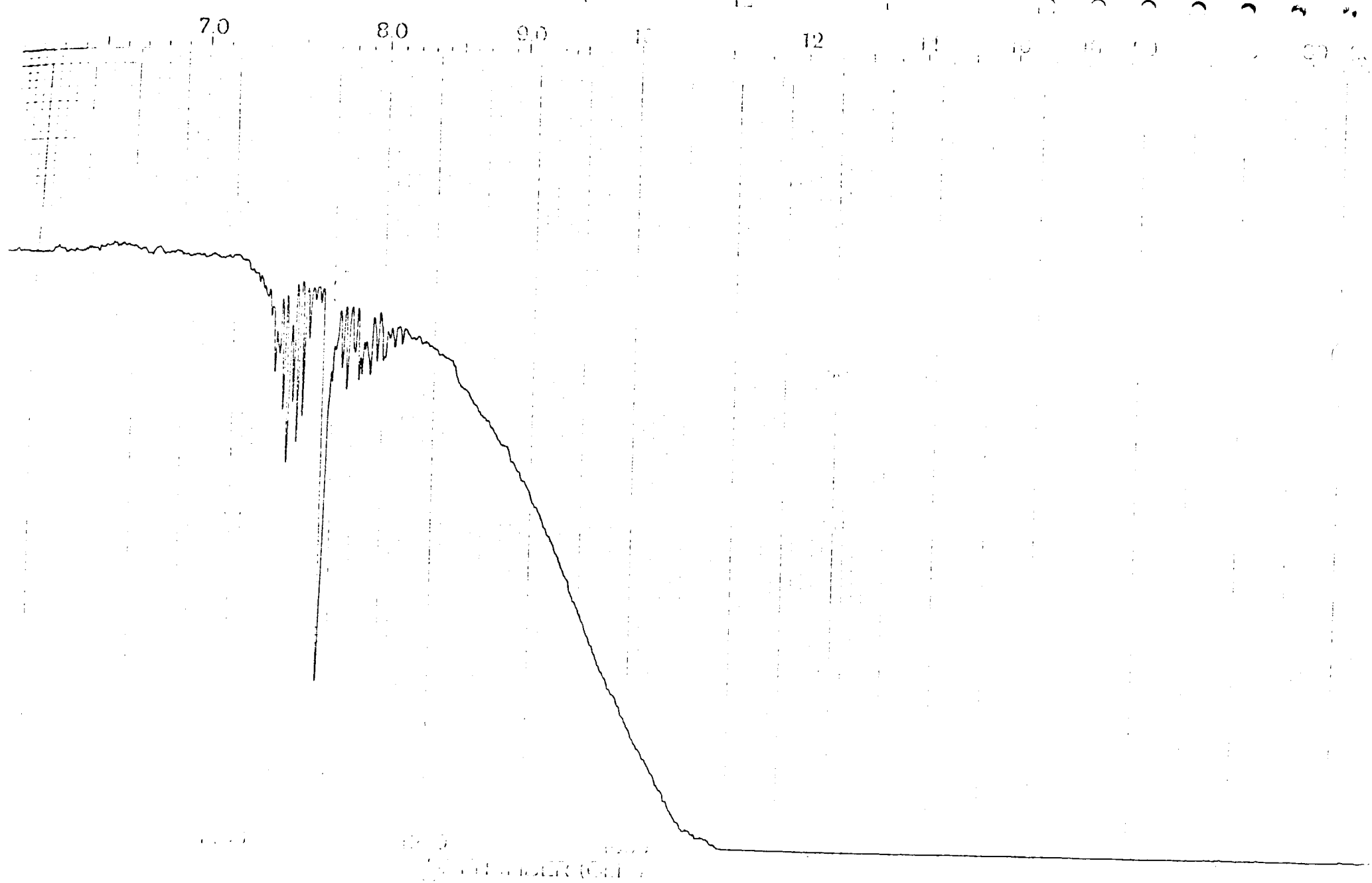
0.8

0.2cc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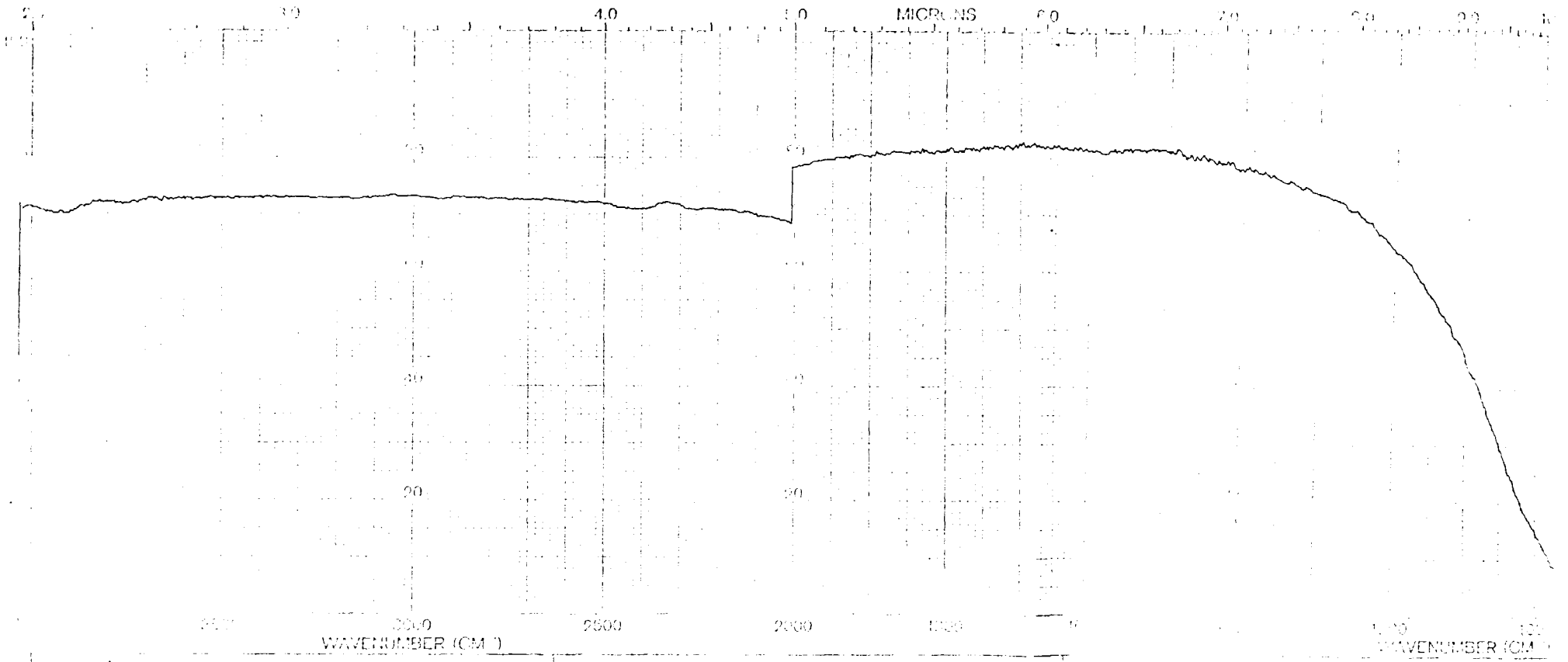
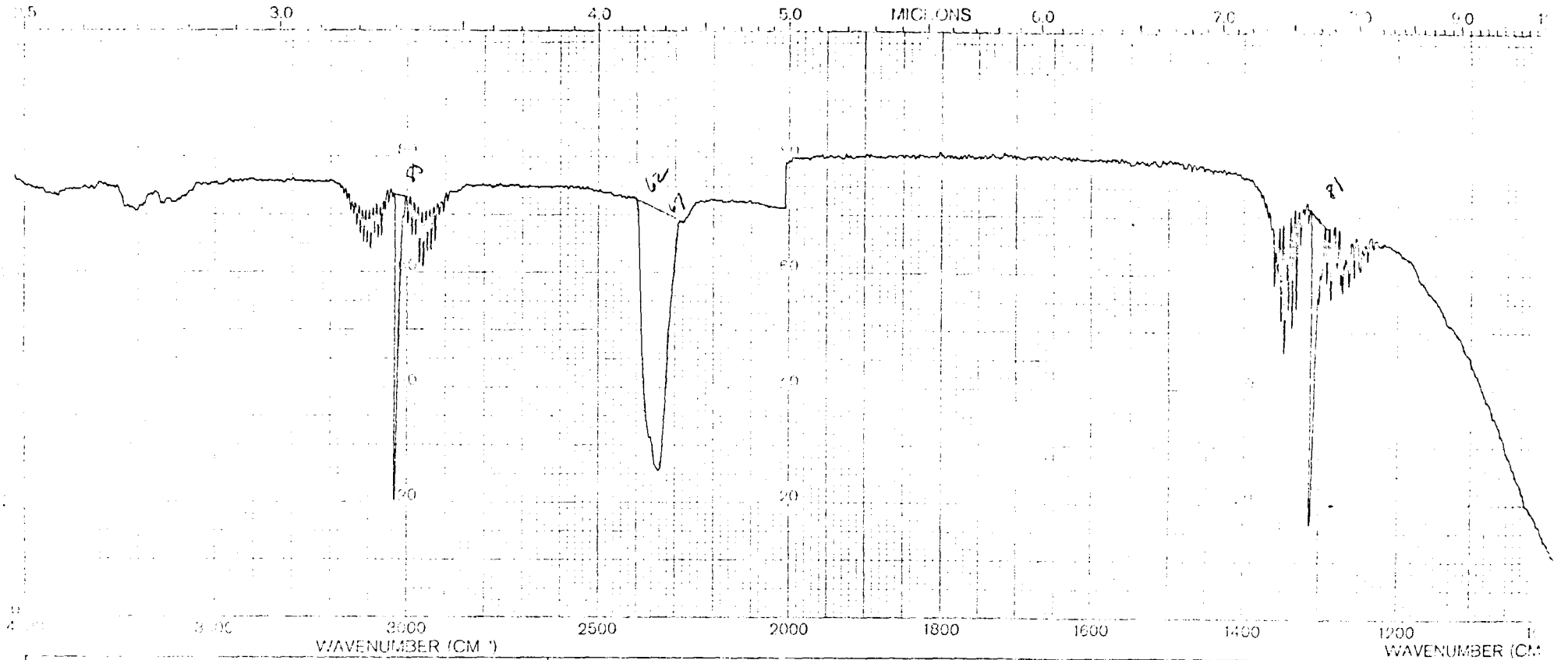
8/29/77
IR 8 - 8/29/77



Air

SOLVENT
CONCENTRATION
CELL PATH
REFERENCE Air

REMARKS



SAMPLE 9044 B-3 10cc

OPTICS

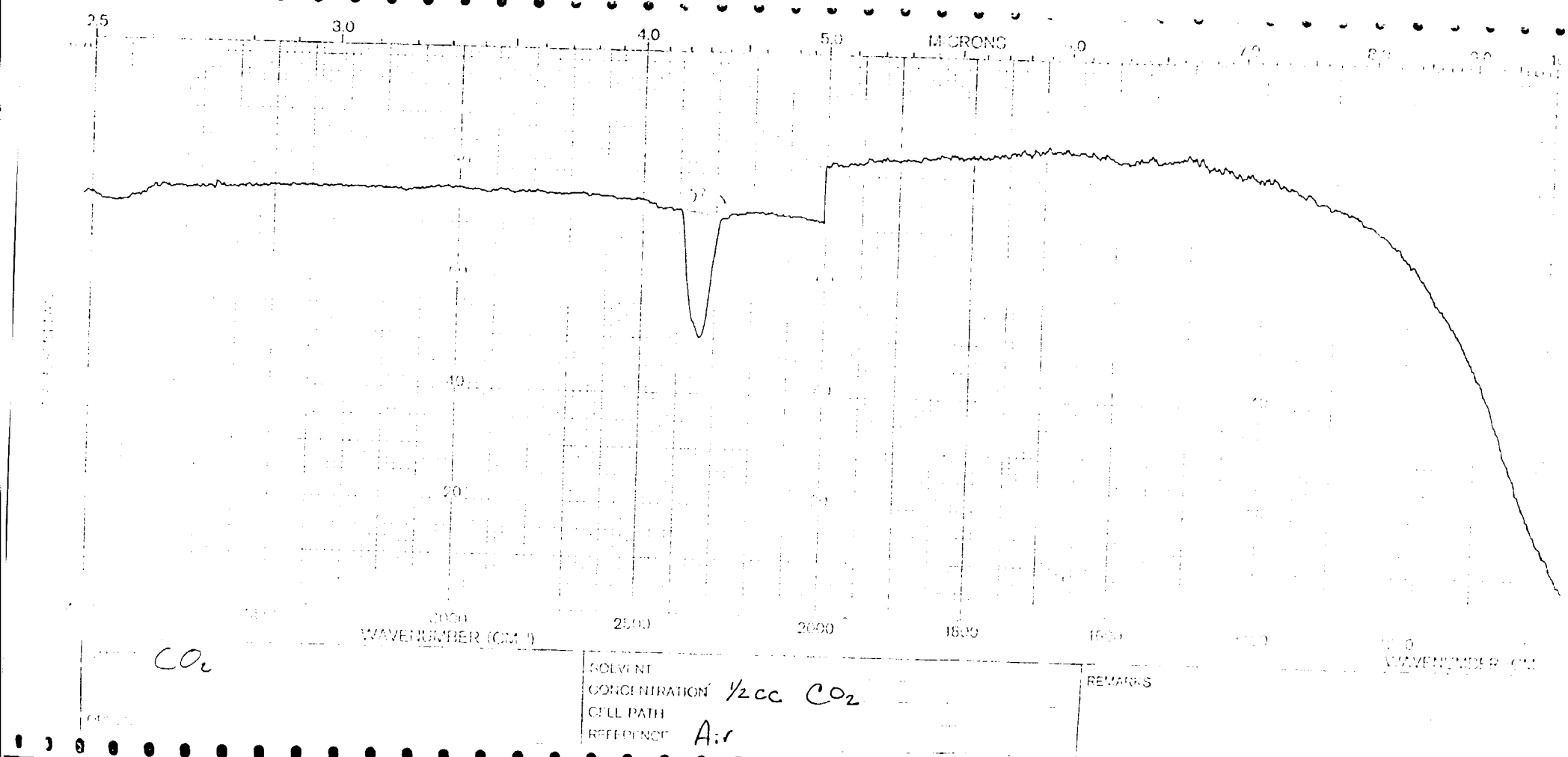
SOLVENT

CONCENTRATION

CELL PATH

REFERENCE

REMARKS


3.0
4.0
5.0
MICRONS
40
20
2500
2000
1500
WAVENUMBER (CM⁻¹)
CO_2
SOLVENT
CONCENTRATION ½cc CO_2
CELL PATH
REFERENCE Air
REMARKS

TILE :[illegible]
TITLE:[illegible] SINGLE [illegible]
MASS RANGE :10-150
INTEG. TIME:3
SCANNING [illegible] COUNT :6
[illegible]
INT. [illegible] TIME:30
INT. [illegible]

10^{-8}

0.2cc

9044

AIR	[illegible]	=	[illegible]	[illegible]	=	[illegible]	[illegible]	=	[illegible]
CH4	[illegible]	=	1[illegible]	[illegible]	=	[illegible]	[illegible]	=	[illegible]
CO2	[illegible]	=	1[illegible]	[illegible]	=	[illegible]	[illegible]	=	[illegible]

MAY NOT BE [illegible], [illegible] SOLD.

MIL SAMPLE 3044

SPEC.# 41

0	.00		.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.77	1.70	2.40
14	3.10	30.33	100.00	.70	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00				

SPEC.? 73

0	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	1.70	.47	.00
14	.00	.00	?.65	.00	.00	.00	.?0
21	.00	.30	.00	.00	.00	.10	.00
28	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.0?	.00	.00	.00	.00
42	.00	.57	100.00	1.43	.44	.00	.00
49	.00	.00					

Ben Glover
8-1-79

Dr. Eugene Lelli
ph. (215) 932-3636
FTS Op. 597-3311
Chemical Data Systems
OXford, Pa.

Spoke with Dr. Lelli and Greg Gagus

[redacted] Gave me Crime Labs
Univ. of Ga. → Nancy Moon
CDC → Eugene Wilder

Mr. Gagus gave a [redacted] retailer:
P.J. Colbert Co.
Phil Colbert, St. Louis, Mo
(314) 423-8388

Henry Durichion

[redacted]

Mr. Colbert gave me:
Murray State Univ.
Paul Goodley.

Louisville
FTS 0.:352-5011

Info. 9-1-502-555-1212

Univ of [redacted] Louisville
Chem. Lab → 588-6798

Switch Board 588-5555

Pyrolyzer ⇒ GC

Dr. Zaté

Dr. Taylor → 2hrs.

Mr. Weiter
(502) 587-3885

UK [redacted]
Lexington

606

[illegible] · O and Environ

1

— Coal amines
Goodrich Resins + Rubber
Amer. — Lime slurry
SYNT.

Thursday, May 11 (continued)

3:30 - 3:15	Break
3:15 - 4:15 State RA agreements, consolidated grants, etc. continued	Paul DeFalco, et. al.
4:15 - 5:15 Management Task Force Update	Bill Carter
5:15 - 5:30 Joint U.S./Canadian C&M Study	George Alexander
5:30 - 7:30 Transportation to dinner and back to hotel	Dinner Lab Staff
8:00 Informal Discussions (Hotel)	

Friday, May 12

Breakfast -- Restaurant opens at 7:00 AM
Check out (bring luggage with you to lobby)

8:15 Transportation to Lab	Lab Staff
8:30 - 10:00 Inflation, economy and EPA	Doug Costle/Bill Drayton
10:00 - 10:15	Break
10:15 - 11:00 Minority Business Enterprise	Beth Sullivan
11:00 - 12:00 Steel Strategy	Jodie Bernstein
12:00 - 1:30	Lunch (at Lab)
1:30 - 3:00 Policy Guidance Feedback	Douglas Costle
Summary	Barbara Blum
Transportation to Airport	Lab Staff

June 15, 1978

Campground Landfill Gas Migration Problem

John E. Dickinson, PE
Hazardous Waste Management Coordinator

James H. Scarbrough, Chief
Residuals Management Branch

Kentucky Hazardous Materials and Waste Management personnel accompanied me to the Campground landfill site 6/13/78. Pictures of the site are attached with a sketch prepared by Mr. Davis. The landfill was being operated satisfactorily. Waste is being deposited in the northeast area of the area that is "to be filled." There is an open space between the working face and the sides of the pit; this will minimize migration of the gas into the Mobile Home Park area in the northeast corner of the site. The Campground site accepts about 1000 tons/day municipal waste per Pat Haight; the site has 2-3 years life expectancy. Some industrial wastes are accepted by the site by special permission only.

We next inspected the Southern Materials landfill north of the Campground landfill. The Southern Materials landfill is permitted as an inert site but accepts putrescible and other wastes quite frequently. Kentucky is in the process of revoking the permit. The State suspects the Southern Materials landfill has taken industrial wastes in the past.

We next met with representatives of the Louisville and Jefferson County Health Department, representatives of the Jefferson County Air Pollution Control District, Mr. Blankenship, the operator of the site and

his attorney, representatives of Kentucky Concrete Pipe Company and their attorney and consulting engineer.

The meeting was chaired by Mr. Charles Weiter, Public Health Engineer. The main points of the meeting are summarized below:

o Mr. Blankenship will immediately start installing vent pipes on the east and south ends of the landfill. Vent pipes will be 4" diameter perforated plastic pipe in 6" diameter hole on 50 foot centers on the Kentucky Concrete Pipe property line and 100 foot centers elsewhere. The pipes will extend 30' below grade and 30' above grade. Construction can be completed within three weeks. "As built" drawings will be supplied to the Air Pollution Control District for approval. Mr. Davis of the Air District originally suggested a 2-week approval time but agreed to the as built approval.

o Kentucky Concrete Pipe wanted the gas to be flared to increase gas excavation flow (chimney effect) and to prevent an explosive mixture from being formed on their property. It was pointed out that the methane should rise quickly and not form an explosive mixture but this should be monitored in the field.

o EPA was requested by Mr. Weiter to provide lab assistance on running air samples on the vent gas and ambient air after the pipes are installed. Mr. Dickinson of EPA reported that Athens had agreed to run

additional samples if "new information" would be obtained but they would not run the same types of samples over again.

o EPA was requested to supply information on best technology available for disposing of landfill gas.

o EPA was requested to explore the feasibility of running a gas sample through a furnace and then into the GC/mass spee unit to determine combustion products. The Air Pollution District was concerned that phosgene could be formed by incomplete combustion of the chlorinated hydrocarbons.

o Eight 2" gas monitoring wells will be installed on Kentucky Concrete Pipe property to determine if the venting is lowering methane concentrations. If substantial progress is not achieved within 2-3 weeks, a flare system or forced air blower system may be required. Other gas monitoring wells will be installed on the site perimeter.

o Water monitoring wells (3) will be installed per Kentucky Division of Hazardous Materials and Waste Management geologists to determine if groundwater is source of exotic chemicals that are found in the gas.

o The industrial facilities in the area will be inspected by the State to determine if on-site dumps are polluting the groundwater.

o All industrial permitted wastes going to Campground will be re-examined by the State.

o The site operator should not fill all the way to the sand banks on the existing working face to provide an air gap between the site and adjoining structures.

o The site operator said he had not knowingly taken any wastes containing the "exotic" compounds found in the landfill gas. However, he does not check each waste load nor does the State.

o Mr. Weiter said that this gas problem was confined to the Concrete Pipe Company property primarily.

o Elevated o/o explosive limits readings have been obtained in the septic pits of the trailer park north of the fill but this could be from aneorobic decomposition of household sewage.

o The house labeled "New House" on Mr. Davis' sketch was occupied by the Kentucky Concrete Pipe Company plant superintendent, but he has vacated the house because the septic pit gas is in the 35-40% combustible range. There was some discussion about installing a conventional tile field so he can move back in.

o No gas was found in the "old house" basement.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: June 15, 1978

CT: Campground Landfill Gas Migration Problem

FROM: John E. Dickinson, PE
Hazardous Waste Management Coordinator

TO: James H. Scarbrough, Chief
Residuals Management Branch

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Table 1 Soil Properties Assumed for Design Charts

soil type	porosity, n	tortuosity, τ	pore size distribution	
			pore radius (Å)	volume fraction
granular	.4	2.25	4×10^5	0.4
fine grained	.4	2.25	6.35×10^1	.022
			1.385×10^2	.038
			3.0×10^2	.044
			6.55×10^2	.048
			1.45×10^3	.0456
			3.15×10^3	.0464
			6.85×10^3	.048
			1.52×10^4	.048
			3.30×10^4	.038
			2.25×10^4	.022
				$\Sigma = .40$

3.4 CONFIGURATION OF DESIGN CHARTS

The design charts, included in Appendix A, plot r_t/r_f versus d_s/d_f for several values of r_s/r_f. It is presumed that for a given landfill r_f, d_f, r_s and d_f will be known. Thus, d_s/d_f and r_s/r_f can be calculated. The charts are entered at the value of d_s/d_f. The value of d_s/d_f is projected vertically until the proper curve for r_s/r_f is intersected. The value of r_t/r_f may then be read. This value is multiplied by r_f to obtain r_t.

The time for maximum excursion can also be determined if the time overlay charts of Appendix B are used.

3.4.1 Example Problem I

A sanitary landfill is approximately circular in shape with a radius of 200 meters. The depth of the landfill is 15 meters. The soil surrounding the landfill is a sand (granular) and the groundwater table is encountered at a depth of 20 meters. Because of frequent rainfall, it is assumed that the ground surface is saturated and, therefore, impervious. It is presumed that decomposition will be complete in 5 years. Compute the maximum excursion of the 5% methane level. Compute the time after beginning of filling when the maximum excursion is reached.

Solution: From the description given above:

$$r_f = 200 \text{ m}, \; d_f = 15 \text{ m}, \; d_s = 20 \text{ m},$$

The soil is granular, and the ground surface is impermeable. Because no limit to the horizontal extent of the soil is mentioned, it is presumed that $r_s = \infty$.

Thus:

$$\frac{d_s}{d_f} = \frac{20}{15} = 1.33; \qquad \frac{r_s}{r_f} = \frac{\infty}{200} = \infty \geq 5.$$

Figure A.2 is appropriate for granular soils with impervious surface boundaries and pervious radial boundaries. Entering for d_s/d_f = 1.33 and proceeding upward to the curve for $r_s/r_f \geq 5$ we find $r_t/r_f = 2.04$. Because $r_f = 200$ m, $r_t = 2.04 \; (r_f) = 2.04 \; (200) =$ 408 meters. From Figure B.2, the time required for maximum excursion is slightly over 100 years.

3.4.2 Example Problem II

The situation is the same as in Example Problem I except that the ground surface is dry (pervious).

Solution: Same as Example Problem I except use Chart A.1 to get $r_t/r_f = 1.234$.

$\therefore r_t = 1.234 \; (200) = 250$ meters.
From B.1 the time required for maximum excursion is a little over 5 years.

3.5 EFFECT OF VARYING ASSUMED VALUES FOR DECOMPOSITION TIME, SOIL POROSITY, AND TEMPERATURE

A study was made of the effects of varying the typical values assumed for decomposition time, soil porosity and temperature on r_t.

The effects of varying decomposition time are shown in Figure 3. For short decomposition times, corrections of as much as -12% were required. However, decomposition times of up to 15 years required corrections of only +7%.

3.5.1 Example Problem III

The situation is the same as Example Problem I except that the decomposition time is 7 years rather than 5 years.

Solution: From Problem I, $r_t/r_f = 2.04$ for a 5 year decomposition time.

$$\frac{t_o}{5} = \frac{10}{5} = 2.0$$

From Figure 3, factor = 1.044.

Thus

$$\left.\frac{r_t}{r_f}\right|_{t_o} = \left.\frac{r_t}{r_f}\right|_{5} \times \text{factor} = 2.04(1.044) = 2.13$$

Therefore $r_t = 2.13 \quad r_f = 2.13 \quad (200) = 426$ m.

Figure 4 shows the effects of varying porosity. Here correction factors are quite small, with factors of -10% being required for porosities of 0.1.

3.5.2 Example Problem IV

The situation is the same as Example Problem I except that the soil porosity is 0.3 instead of 0.4.

Solution: From Problem I, $r_t/r_f = 2.04$ for a porosity of 0.4.

$$\frac{n}{.4} = \frac{.3}{.4} = .75$$

From Figure 4 for n/.4 = .75, factor = .982.

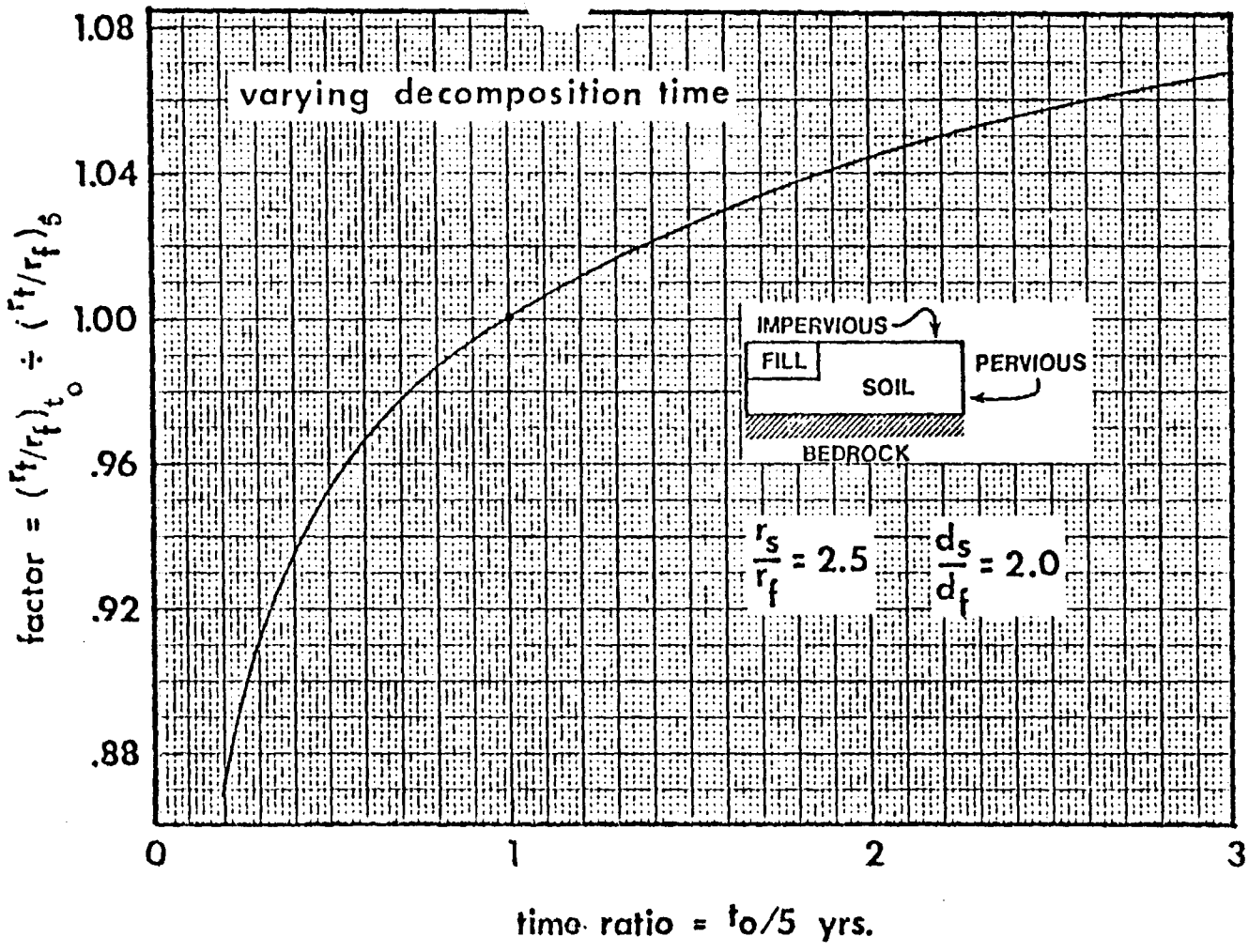

Figure 3 Effect of varying decomposition time on maximum excursion of 5% methane level in granular soil.

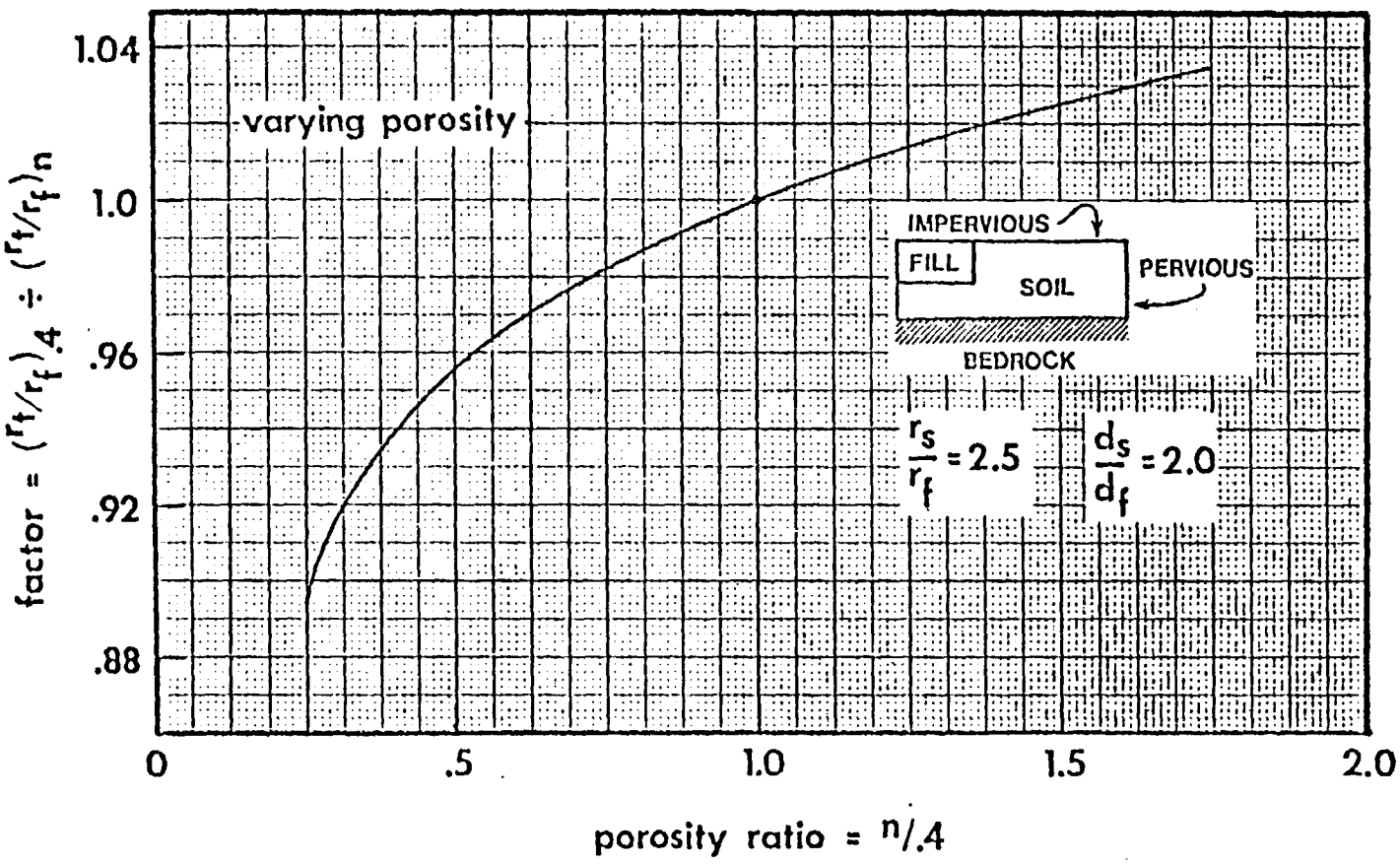

Figure 4 Effect of varying soil porosity on maximum excursion of 5% methane level in granular soil.

Thus

$$\left.\frac{r_t}{r_f}\right|_n = \left.\frac{r_t}{r_f}\right|_{.4} \quad \text{x factor} = 2.04\ (.982) = 2.00$$

Finally, the effect of temperature variation is shown in Figure 5. The effect is negligibly small.

3.6 EFFECT OF VARYING PERVIOUSNESS OF GROUND SURFACE

Factors such as rainfall infiltration, frost, vegetation, paving, etc., can result in the ground surface having perviousness varying between completely pervious and completely impervious. The effect of relative perviousness of the ground surface boundary is shown in Figure 6. The variation can be seen to be nonlinear with a high degree of imperviousness being required to approach the totally impervious permeation limits.

3.6.1 Example Problem V

The situation is the same as in Example Problem I except that the ground surface is not saturated by rain. Instead, 75% of the ground surface is impervious due to buildings with flat slab foundations. Thus, 25% of the ground surface is pervious.

Solution: From Problem I for a completely impervious ground surface r_t = 408 m. From Problem II for a completely pervious ground surface r_t = 250. From Figure 6 for 25% perviousness r_t/r_f = 1.43.

Thus $r_t = 1.43\ \ r_f = 1.43\ \ (200) = 286$ m.

3.7 EFFECT OF RADIAL BOUNDARY CONDITIONS

The concept of a radial soil boundary at r_s was introduced to allow for finite grid sizes in the computer codes. In practice, if the radial soil boundary is large relative to r_f, then the existence of the boundary has little effect on the solution. This is bourne out by noting that on all of the design charts, one curve holds for all r_s/r_f greater than some particular value (1.5 on A.1, A.3, A.4; and 5 on A.2 and A.5). Moreover, if the soil boundary is far away from the landfill, it is unimportant whether the boundary is taken as pervious or impervious. Thus, the curves for r_s/r_f = 1.5 are identical on Chart A.1 (pervious radial boundary) and A.3 (impervious radial boundary).

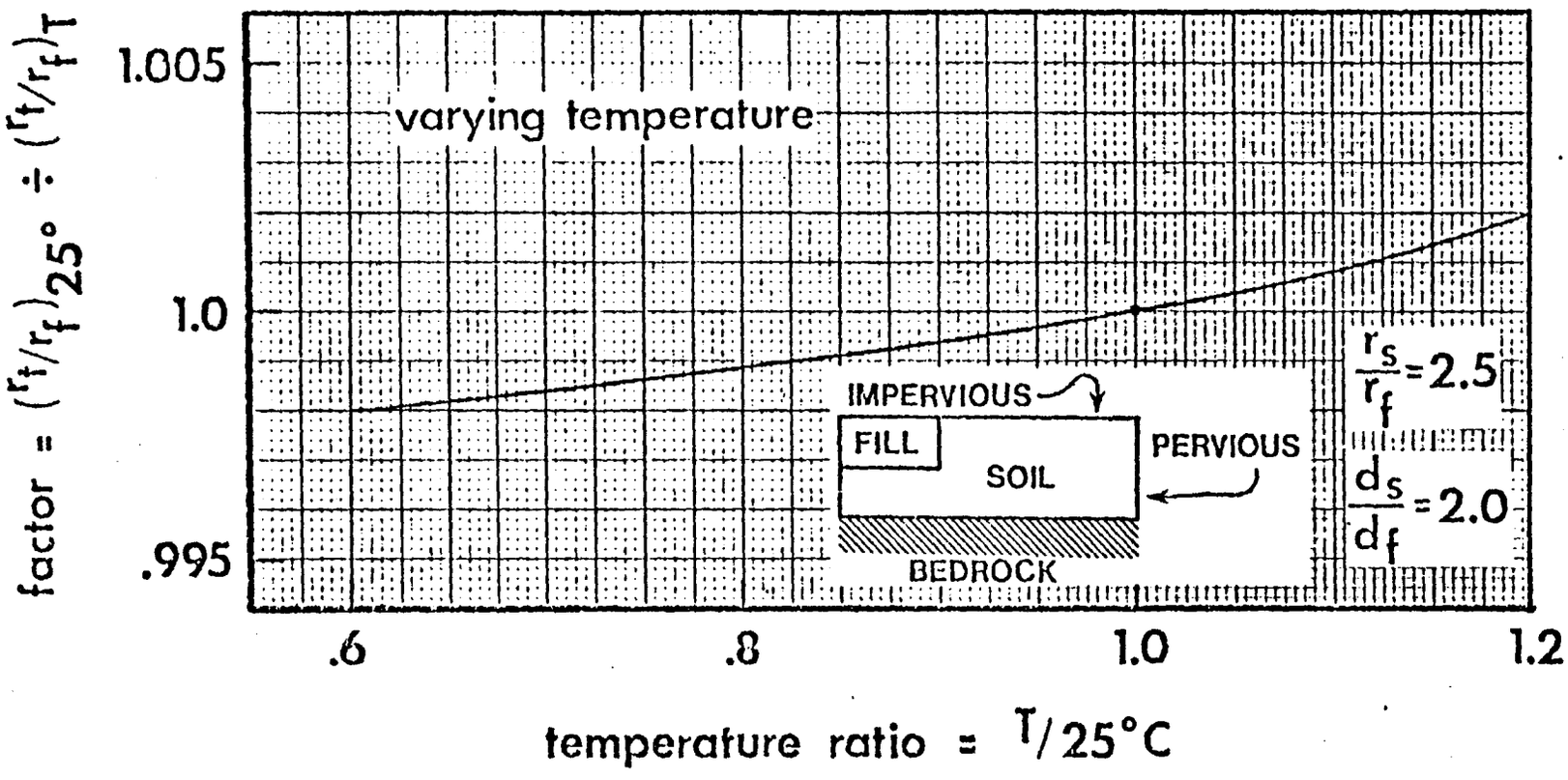

Figure 5 Effect of varying temperature on maximum excursion of 5% methane level in granular soil.

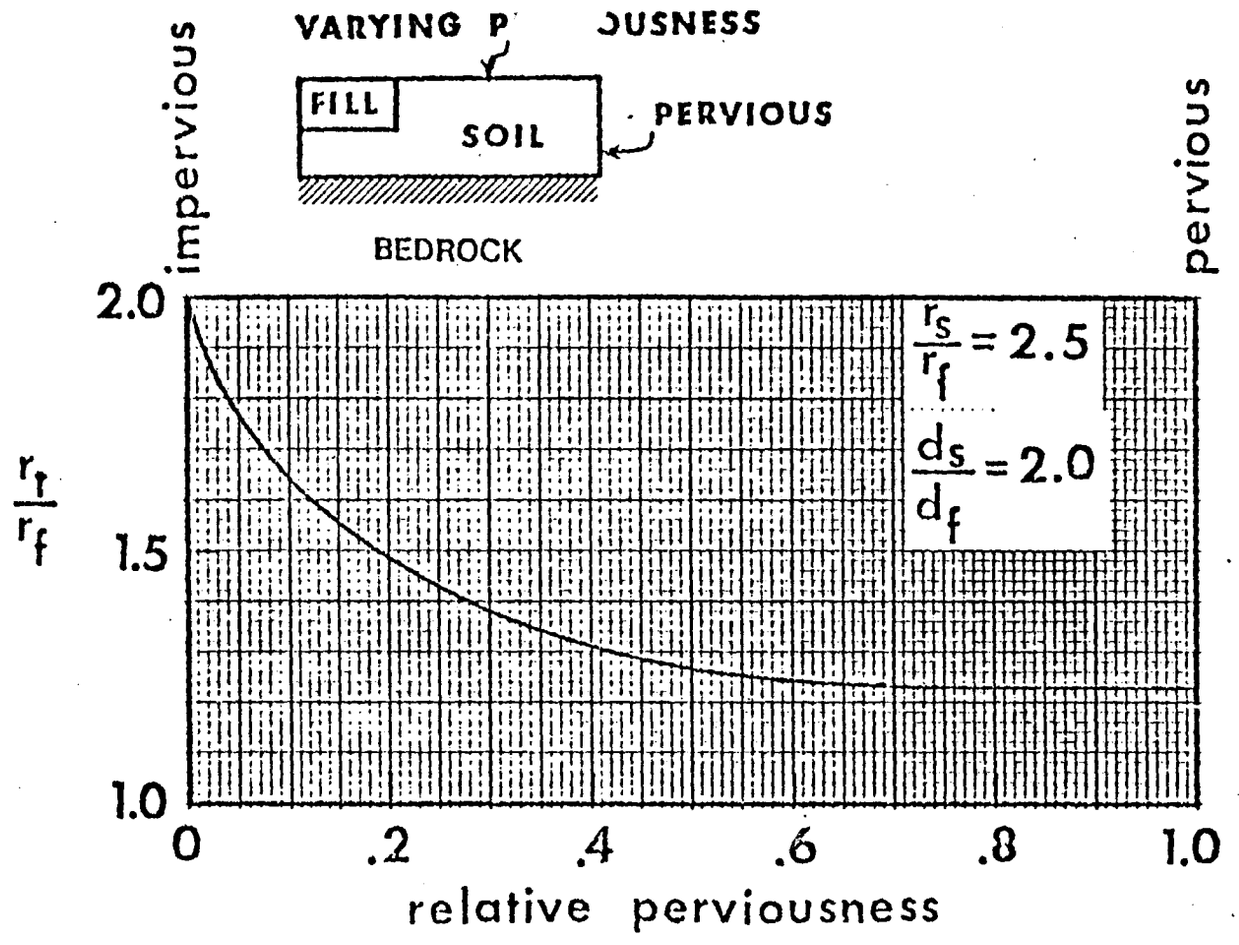

Figure 6 Effect of varying ground surface perviousness on maximum excursion of 5% methane level in granular soil.

SECTION 4

REFERENCES

1. Moore, Charles A., and Alzaydi, Ayad A., "Development of Predictive Models for Landfill Gas Movement - Theoretical Considerations," US EPA, in press (1977).

2. Moore, Charles A., and Rai, Iqbal S., "Development of Predictive Models for Landfill Gas Movement - Computer Program Development," US EPA, in press (1977).

APPENDIX A

DESIGN CHARTS FOR METHANE

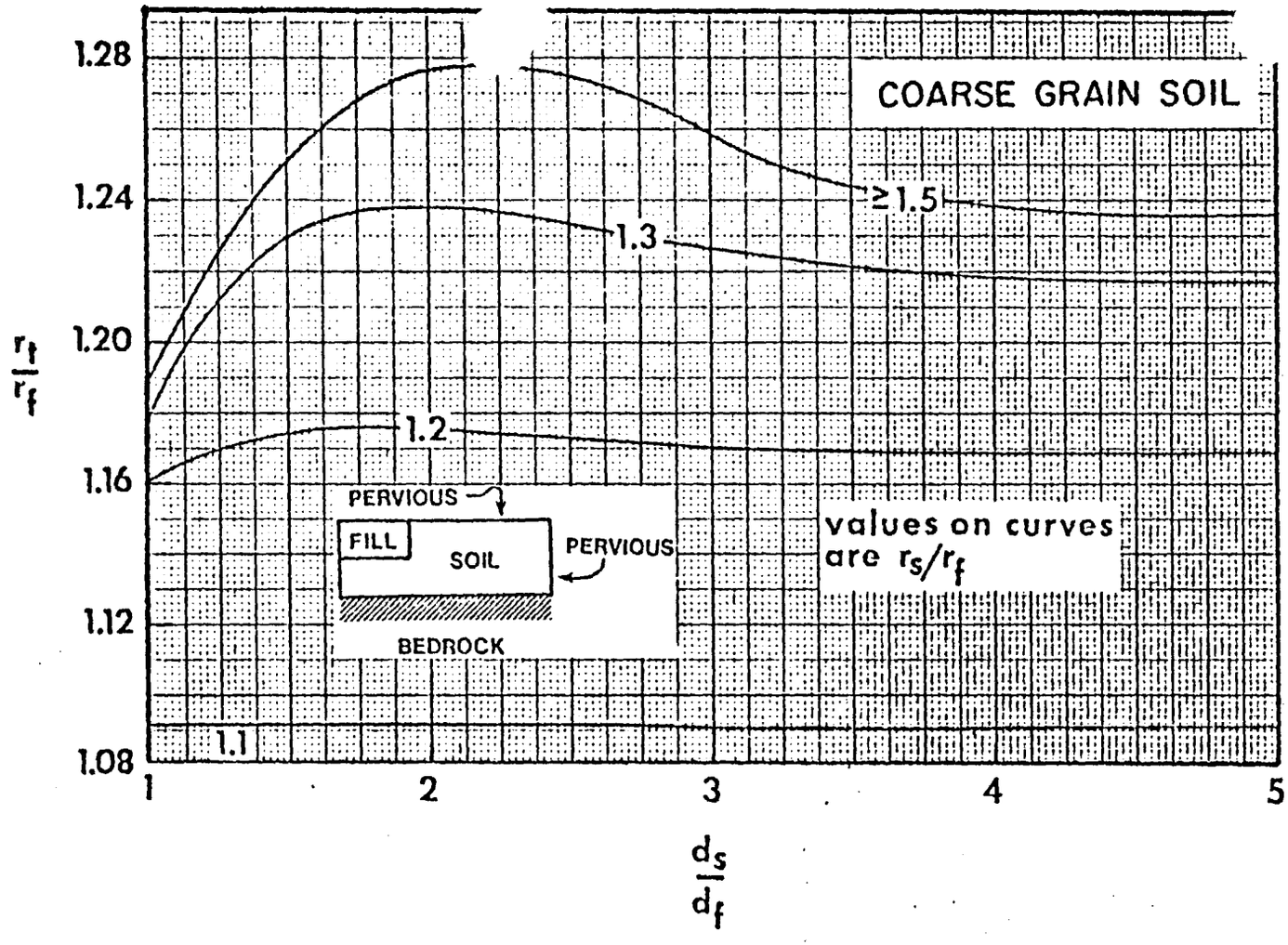

Figure A.1 Design chart for granular soil (previous ground surface and radial boundary).

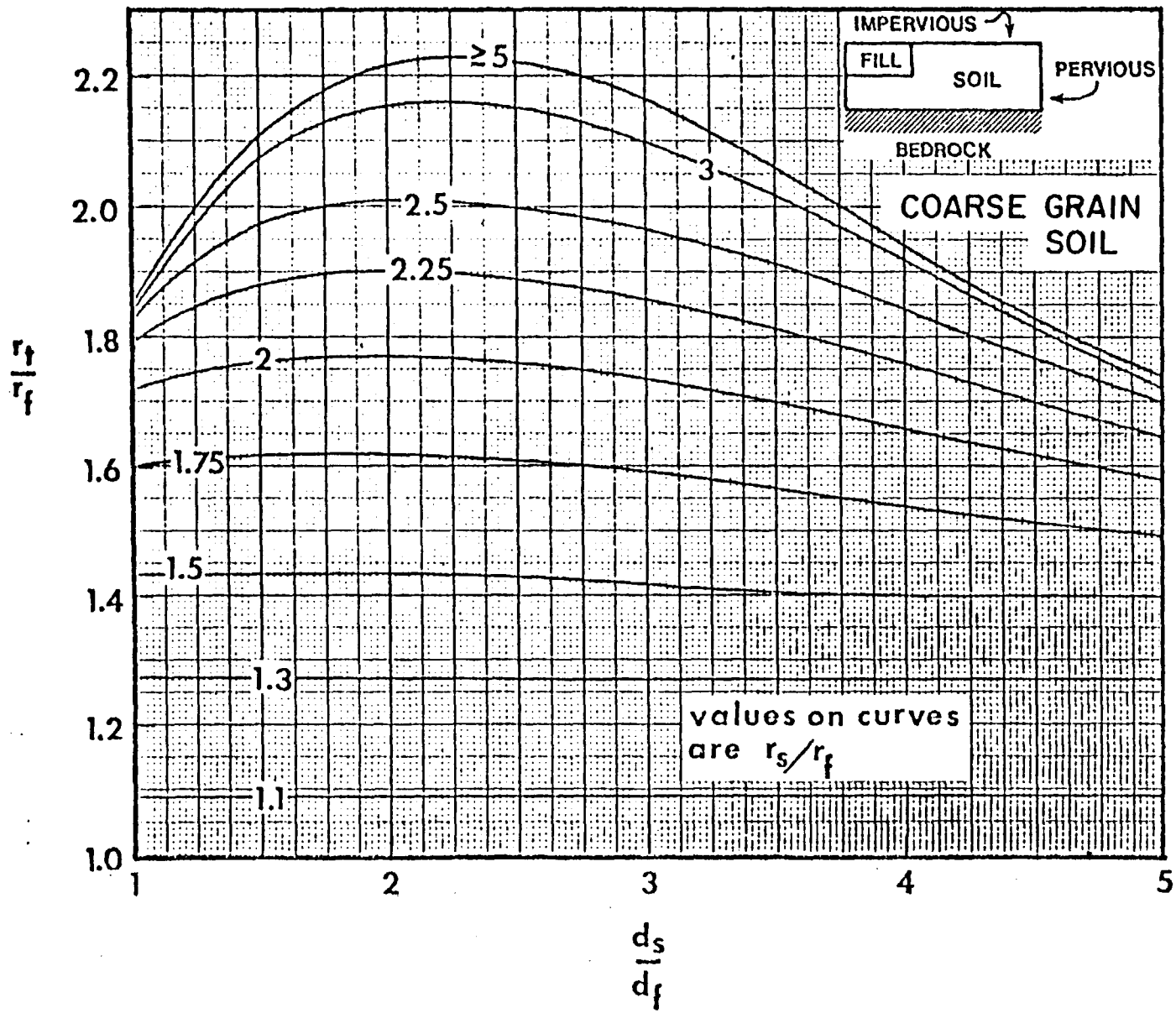

Figure A.2 Design chart for granular soil (impervious ground surface and pervious radial boundary).

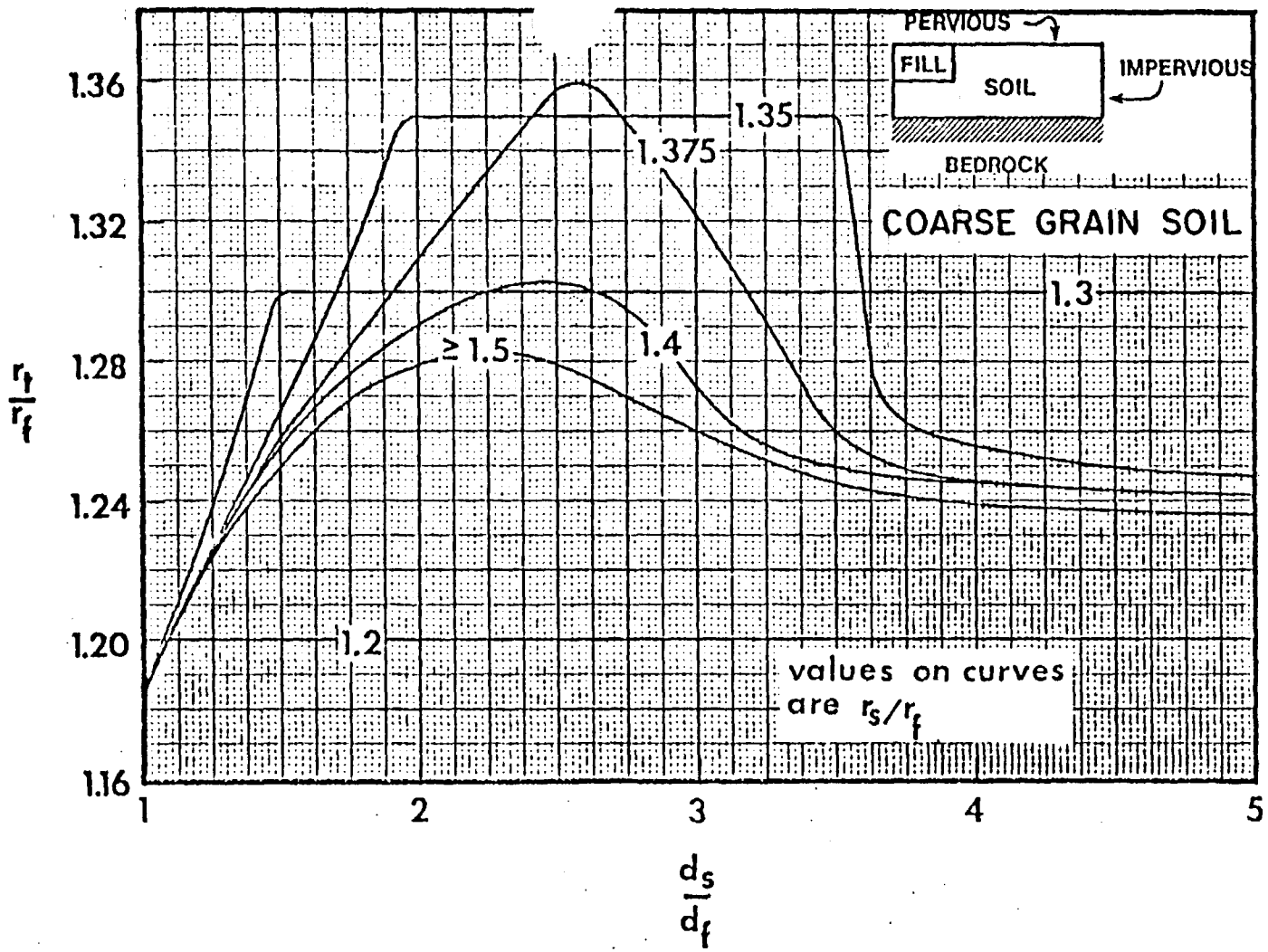

Figure A.3 Design chart for granular soil (previous ground surface and impervious radial boundary).

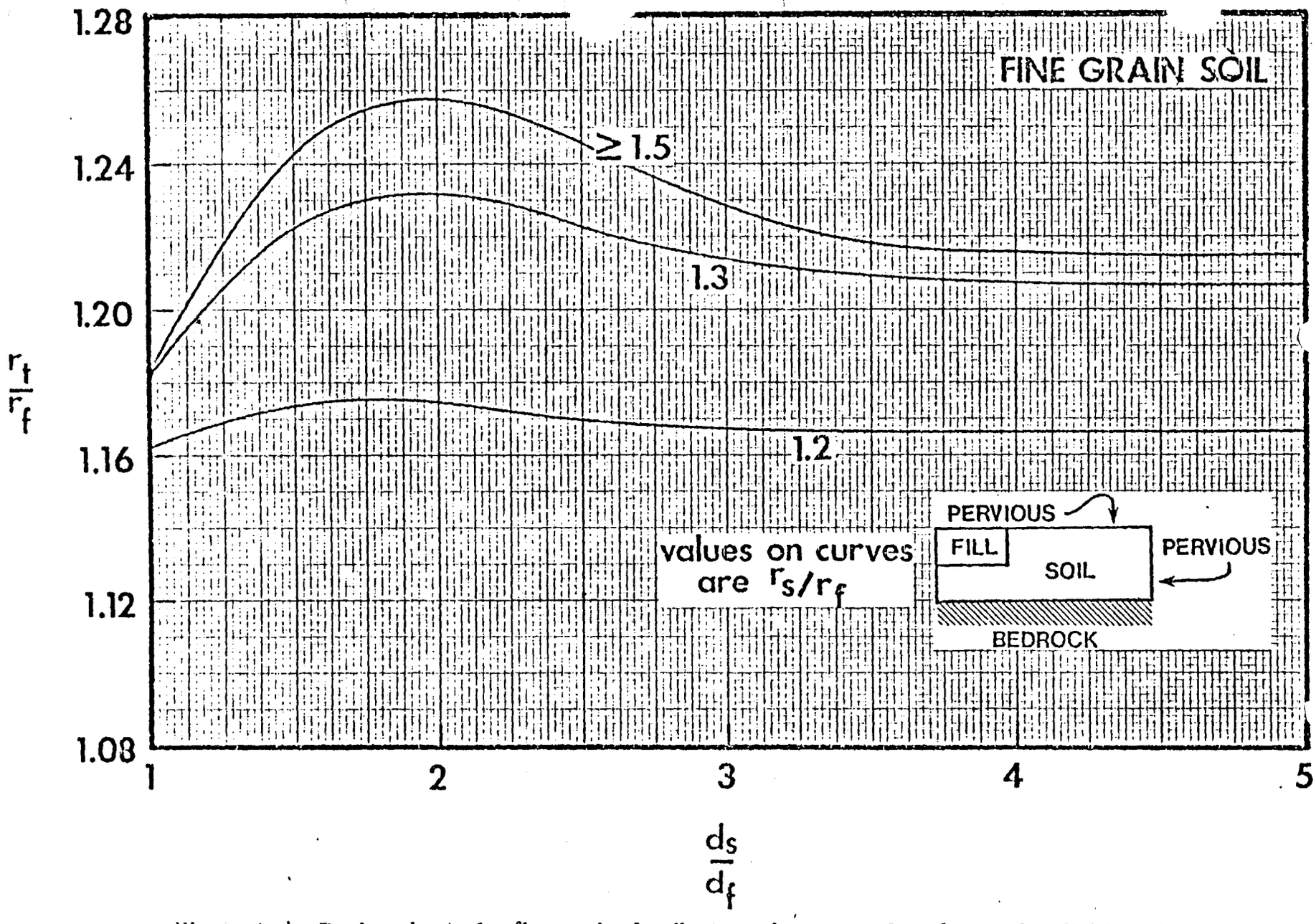

Figure A. 4 - Design charts for fine grained soils (pervious ground surface and radial boundary).

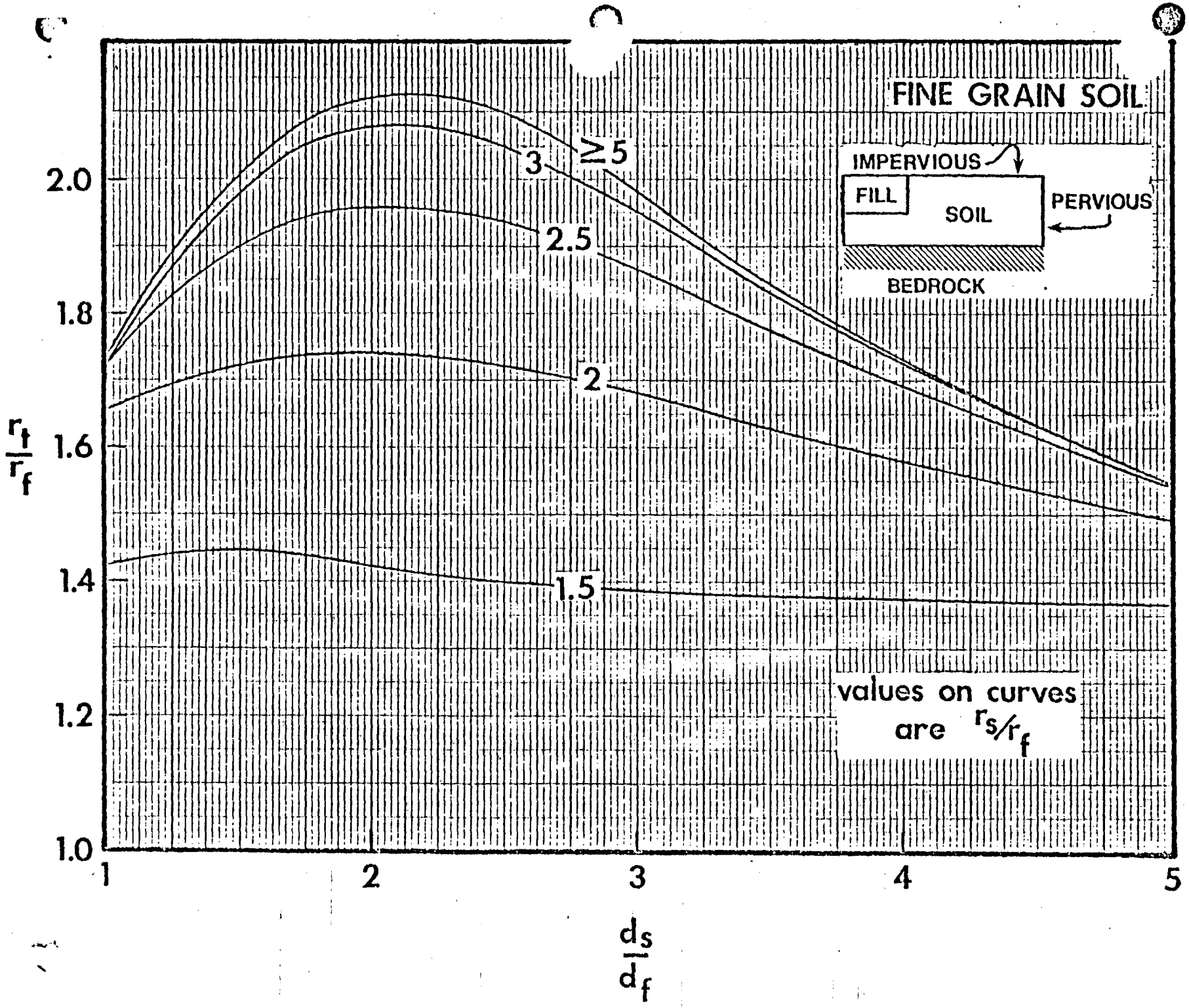

Figure A.5-Design chart for methane in fine grained soil (impervious ground surface and pervious radial boundary):

APPENDIX B

DESIGN CHARTS FOR METHANE WITH TIME OVERLAYS

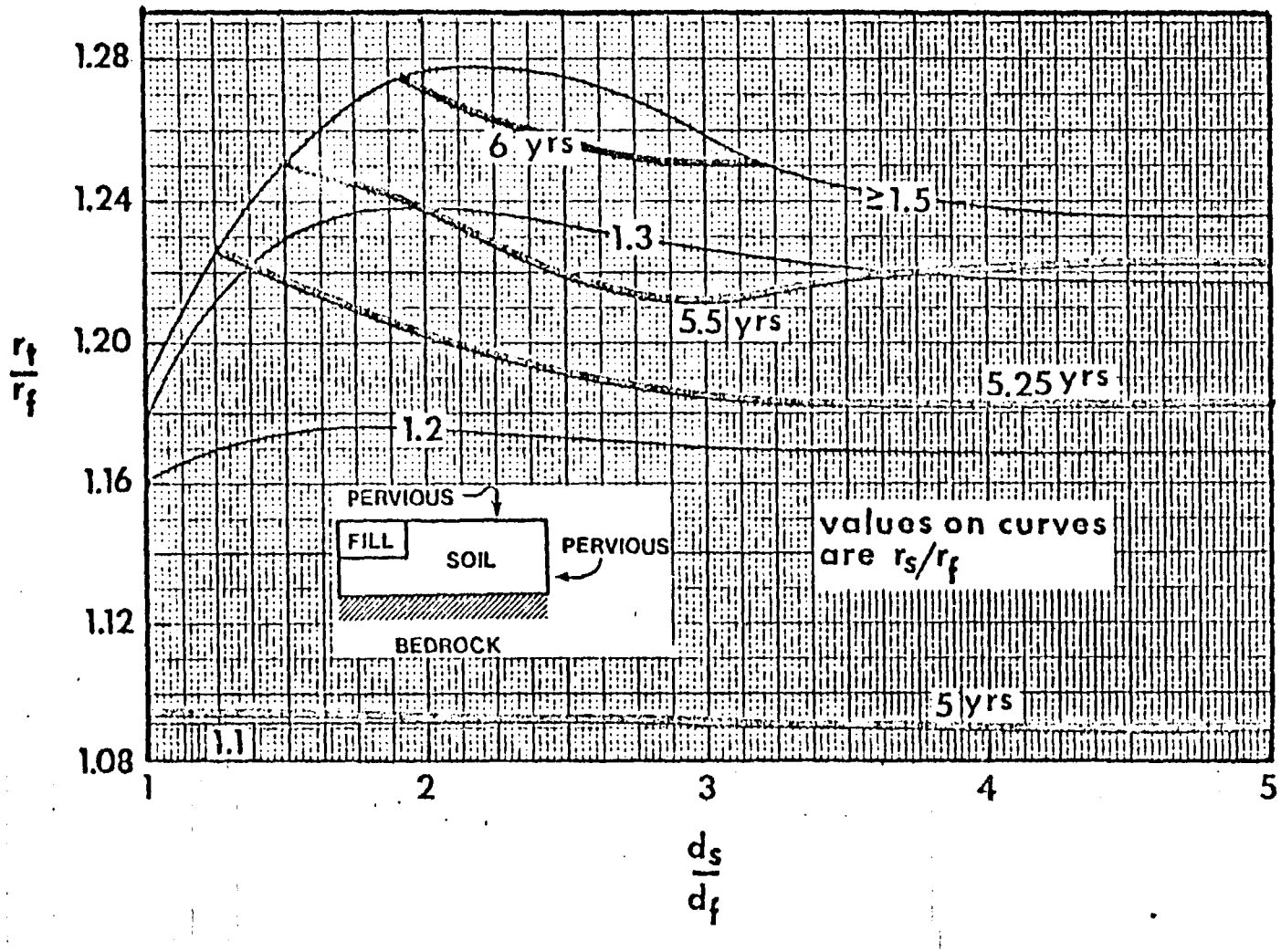

Figure B. 1 Time overlay for design chart for granular soil (pervious ground surface and radial boundary).

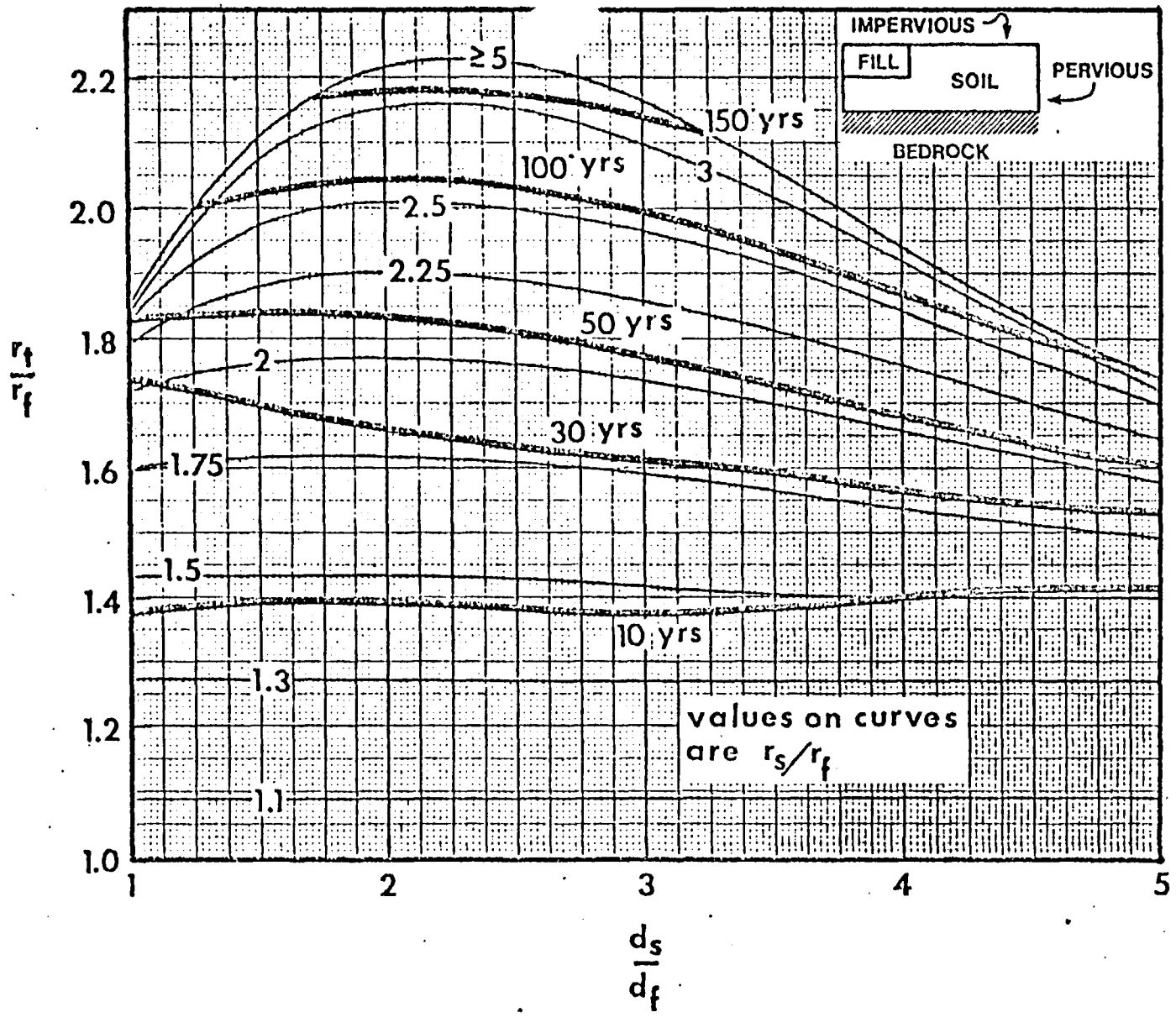

Figure B.2 Time overlay for design chart in granular soil (impervious ground surface and pervious radial boundary).

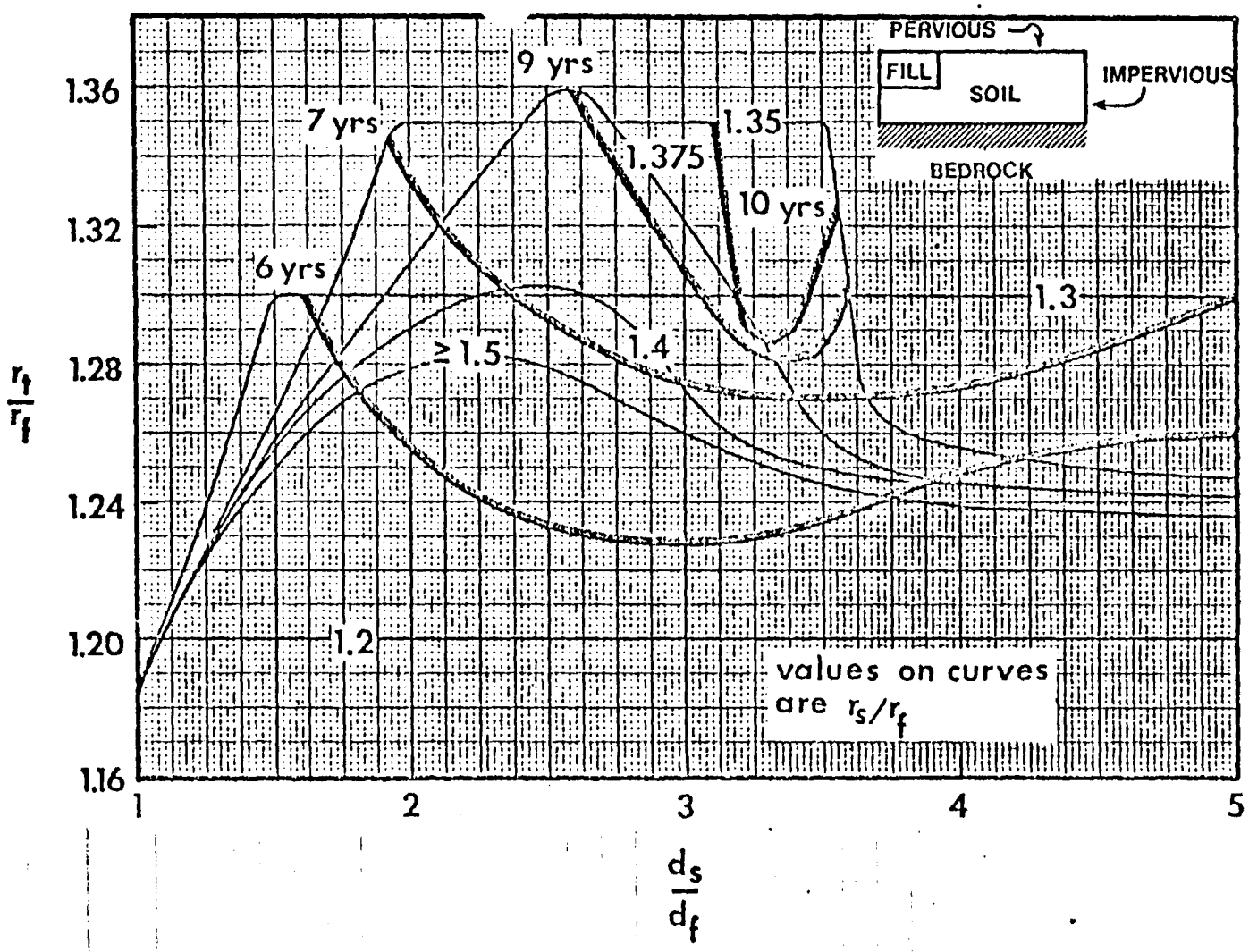

Figure B.3 Time overlay for design chart for granular soil (pervious ground surface and impervious radial boundary).

DESIGN CRITERIA

FOR

LANDFILL GAS MIGRATION CONTROL DEVICES

by

Charles A. Moore

John E. Lynch

DRAFT REPORT

September 1977

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3.2	ASSUMPTIONS OF WHICH DESIGN CRITERIA ARE BASED	
4	STUDY OF MIGRATION CONTROL FACILITIES	
4.1	TRENCH VENTS WITH NATURAL CONVECTION TO THE ATMOSPHERE	
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FINAL

| | | | | | | | | (1-8)
(DO NOT USE)

FORM B: DISPOSAL SITE INFORMATION

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: MOBIL OIL CORP Division/Subsidiary: MOBIL CHEMICAL
Facility Name: MOBIL CHEMICAL - Louisville Plant
Name of Site: CAMPGROUND LANDFILL EPA ID# KYD006388441
Address of Site: _____
no. street

LOUISVILLE, KY 40204
city state zip code

Name of Owner (while used by facility): UNKNOWN
Address: _____
no. street

_____
city state zip code

Current Owner (if different from above): _____
Address: _____
no. street

_____
city state zip code

1. Location (1= the property on which facility is located; 2= off-site) 2 (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership 9=don't know) 2 (11)
3. Current status (1= closed; 2= still in use; 9=don't know) 2 (12)
   IF CLOSED, specify year closed 19 (13-14)
4. Year first used for process waste from this facility 1973 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 1979 (17-18)
6. Total amount of process waste from this facility disposed at site:
   USE TONS ONLY IF POSSIBLE: thousand gallons ..... (19-26)
   Right justify response hundred tons 5 (27-33)
   thousand cubic yards ..... (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   - landfill, mono industrial waste 9 (42)
   - landfill, mixed industrial waste 1 (43)
   - landfill, drummed waste 9 (44)
   - landfill, municipal refuse co-disposed ... 9 (45)
   - pits/ponds/lagoons 9 (46)
   - deep well injection 9 (47)
   - land farming 9 (48)
   - incineration 9 (49)
   - treatment (eg. neutralizing) 9 (50)
   - reprocessing/recycling 9 (51)
   - other (specify) _____ 9 (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) 9 (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

FIGURES

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Eugene F. Mooney
xmxmxmxmxmxm
SECRETARY

JULIAN M. CARROLL
GOVERNOR

COMMONWEALTH OF KENTUCKY
DEPARTMENT FOR NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL PROTECTION
JOHN A. ROTH
COMMISSIONER
FRANKFORT, KENTUCKY 40601

August 17, 1978

Mr. Tom Bennett
U.S. Environmental
Protection Agency
Surveillance and Analysis Section
College Street Road
Athens, Georgia 30605

Dear Mr. Bennett:

As we discussed yesterday, three (3) syringe wells had samples of gas from the Campground Landfill in Louisville, Kentucky. They are being forwarded under separate cover by the Jefferson County Air Quality Group.

If possible, please analyze these three (3) samples as one, that is by mixing them. If this is not feasible, please analyze the syringe that is indicated in the package.

What I am interested in is the amount of exotic hydrocarbons in trace and larger amounts.

Thank your for your cooperation.

Sincerely,

John E. McClure, Jr., Acting Chief
Hazardous Material Management Section
Division of Hazardous Material and
Waste Management
(502) 564-2424

JEM:cjg

cc: John Dickinson
Charles Weiter
Bob Sholar
Air Quality

SECTION 1

INTRODUCTION

The objective of this study was to provide guidelines for design of gas migration control facilities for sanitary landfills. Computer codes developed under a previous study (c.f. Moore and Alzaydi, 1977; and Moore and Rai, 1977) were modified to incorporate pressure flow as well as diffusional flow. In addition, the codes were modified to incorporate the more realistic case of constant gas generation rates within the landfill as opposed to the constant concentrations used in the previous studies. It should be noted, however, that additional research is required on gas generation within the landfill before entirely satisfactory modeling can be undertaken.

The migration control devices studied included trenches venting under natural convection, trenches with exhaust pumping, trenches with recharge pumping, barriers, hybrid systems consisting of a barrier with a pumped (exhaust or recharge) or unpumped trench on the landfill side, and pumped (exhaust or recharge) pipe vents.

SECTION 2

SUMMARY OF THEORETICAL APPROACH

The Fundamental equation governing combined transition region flow of multicomponent gases in porous media is given by Rai and Moore (1977) as:

$$\sum_{\substack{i=1 \\ i \neq j}}^{m} \frac{x_j N_i^o - x_i N_j^o}{c \, \overline{D}_{ij}} - \frac{N_j^o}{\overline{K}_j} = \frac{1}{RT} \quad P_j \tag{1}$$

where N_i^o = diffusive flux vector of component i (g mole/cm^2-s)

P_i = partial pressure of component i (atmos)

x_i = mole fraction of component i (dimensionless)

$\overline{D}_{ij}$ = molecular diffusion coefficient of component i diffusing in components j (cm^2/s)

T = temperature (K)

R = gas constant (dyne - cm/g-mole-K)

$c = \sum_{r_{min}}^{r_{max}} \frac{f_r(r)}{\tau}$

$f_v(r)$ = volume fraction of pores of radius r

τ = tortuosity

$\overline{K}_j = c \, D_{kj}$

D_{kj} = Knudsen diffusion coefficient

$= k_j r$

r = pore radius

$k_j = 9.7 \times 10^{-5} \sqrt{T/M_j}$

M_j = molecular weight of components j (g)

In these equations the properties of the gases and of the porus medium are decoupled:

gas properties: $\overline{D}_{ij}$, k_j, M_j,

porous medium properties: r, $f_v(r)$, τ.

SECTION 3

APPLICATIONS TO SANITARY LANDFILLS

3.1 GEOMETRICS OF LANDFILL AND SURROUNDING SOIL

Simplified geometric conditions (figure 1) are assumed in applying the model to sanitary landfills. The landfill itself is assumed cylindrical in shape and of radius, r_f, and depth, d_f. The soil surrounding the landfill is assumed to have a horizontal soil-atmosphere interface with interchange between the soil gas and the atmospheric gas being related to concentration differences and wind velocity.

At some depth, d_s, an impervious stratum (bedrock or groundwater table) is assumed to be encountered. At some radial distance, r_s, a region of prescribed gas concentration is assumed to be encountered in order to limit the areal extent for modeling.

Gas migration control facilities are installed at radius, r_p, and penetrate to depth, d_p. In the case of a hybrid system, a twin node scheme is employed with one node at r_p representing the vent and a twin node at r_p representing the barrier. In the case of pipe vents, the pipes must be equally spaced around the circumference generated by r_p.

3.2 ASSUMPTIONS ON WHICH DESIGN CRITERIA ARE BASED

Several types of gas migration control facilities were studied for a typical landfill. The specific geometry is:

radius of landfill, $r_f = 160$ m

depth of landfill, $d_f = 16$ m

radius to limit of study, $r_s = 400$ m

depth to impervious layer, $d_s = 32$ m

radius out to control facility, $r_p = 192$ m

depth of control facility, $d_p = 16$ m.

Thus,

$$r_s/r_f = 2.5;\ d_s/d_f = 2.0;\ r_p/r_f = 1.2;\ \text{and}\ d_p/d_f = 1.0.$$

The spatial mesh size was 16 m.

The venting at the ground surface was that which would be expected for a uniform 5 mph wind; however, at the vent itself varying degrees of sealing were investigated.

Two soil types were studied; a fine grained soil having a mean pore radius of 1450Å and a coarse grained soil having a pore radius of 20,000Å. Both soil

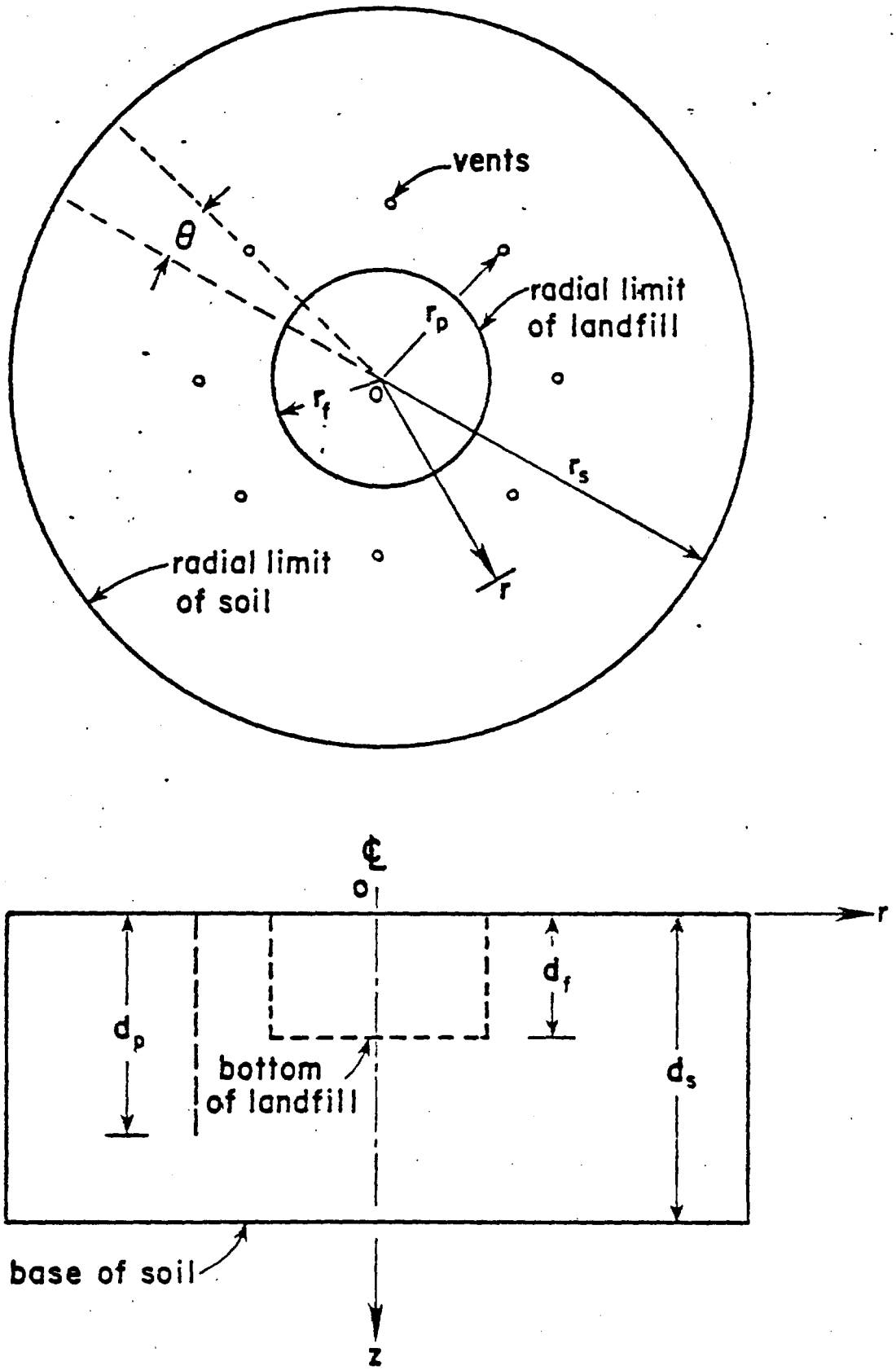


FIGURE 1 Simplified Landfill Geometry

types had a porosity of 0.40 and a degree of saturation of zero. The fine grained soil had a tortuosity, $\tau = 1.55$ and the coarse grained soil had $\tau = 2.71$.

A two component gas system composed of methane and air was used to limit computing costs. Within the landfill methane was initially present at a mole fraction of 70 percent and was continuously generated at a constant rate. Pressure within the fill was initially atmospheric, but increased to a few inches of water due to gas generation.

Total pressure at the soil-atmosphere interface was maintained at 1 atmosphere. The mole fraction of methane was held at zero; while the mole fraction of air was held at 100 percent.

A datum case was examined with no control device installed to serve as a basis for comparing the effectiveness of the various methods. Figures 2a and b show methane mole fraction contours for the two soil types studied. The extent of migration of the 5 percent methane level is of the order of 3 times the radius of the landfill. Based upon these data, it was decided that an appropriate location for the gas migration control facility would be 1.2 times the radius of the landfill or at a radial distance of 192 m. The exact location, of course, was dictated by the grid used to model the problem.

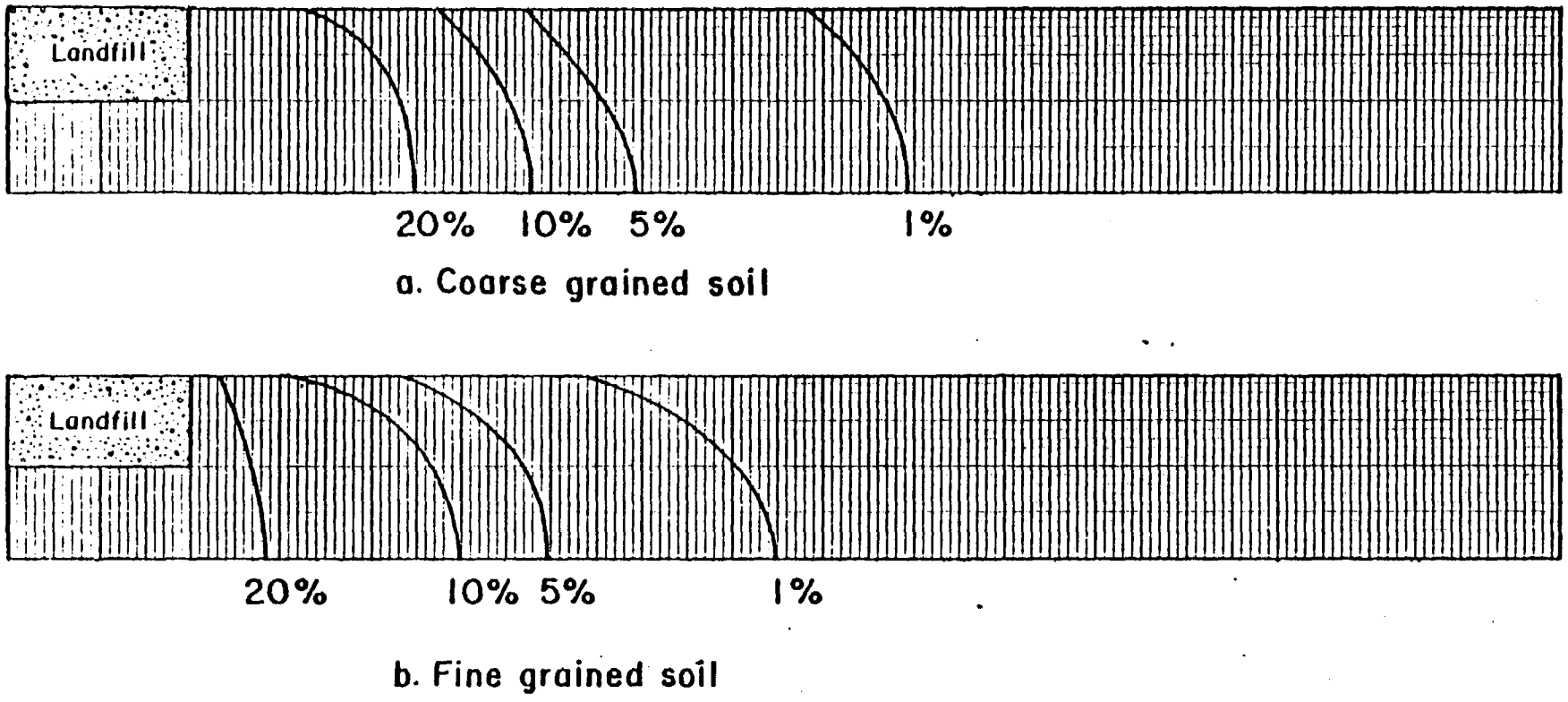


FIGURE 2 Methane Mole Fraction Contours for Datum Runs without Gas Migration Control Devices

SECTION 4

STUDY OF MIGRATION CONTROL FACILITIES

4.1 TRENCH VENTS WITH NATURAL CONVECTION TO THE ATMOSHPERE

Previous experience (c.f. Moore and Rai, 1977) with natural convection trenches indicated that they would be only marginally effective. In some cases, covered trenches actually increase the distance of gas migration by providing a horizontal path of higher perviousness than the natural soil. These conclusions were substantiated in the present study. For the coarse grained soil the results for the natural convection trench could not be distinquished from the datum; whereas, for the fine grained soil, as shown in figure 3, there was a measurable but small effectivenss. Such control facilities might be useful in situations where high total pressures build up in the vicinity of the control device. However, this migration control approach cannot be generally recommended.

4.2 TRENCH VENTS EMPLOYING FORCED CONVECTION (PUMPING)

A trench was introduced at $r_p/r_f = 1.2$ having a depth ratio, $d_p/d_f = 1.0$. For each of the two soil types, the trenches were evaluated for various pumping rates both into and out of the trench, and for both a sealed and an unsealed trench top. Typical methane mole fraction contours are shown in figure 4 for exhaust pumping and in figure 5 for recharge pumping at 5 cubic feet per minute per linear foot of trench (CFM, hereafter). Reference to these figures shows that there is a measurable effectiveness in each case. In order to study the effectiveness in more detail a variety of different pumping rates was employed. Figure 6 plots the steady state extent of travel of the 5 percent methane contour for both exhaust and recharge pumping in coarse grained soils. Figure 7 plots the same relationships for fine grained soils. Reference to these figures shows that recharge pumping systems are consistently more effective than exhaust systems. In only one case (Q = 8, fine grained) was an exhaust system capable of retracting the 5 percent contour back to the landfill side of the trench. The effectiveness of recharge pumping systems lies in their providing a positive pressure barrier driving methane bck into the landfill. Conversely, exhaust pumping systems attract methane away from the landfill toward the trench.

However, it is important to point out one potentially detrimental aspect of recharge pumping systems. If such a system is installed where methane has already migrated beyond the proposed installation point, imposing the recharge system will result in the bifurcation of methane forcing one plug back toward the landfill and a second plug out from the trench. This second effect may results in a high methane plug travelling to areas beyond the trench. Thus, in practice, careful monitoring must be employed.

Studies were performed varying the conditions of the seal at the trench top. It was found that there was little effect on the extent of methane migration. Of course, all studies presume that the trench remains free of water.

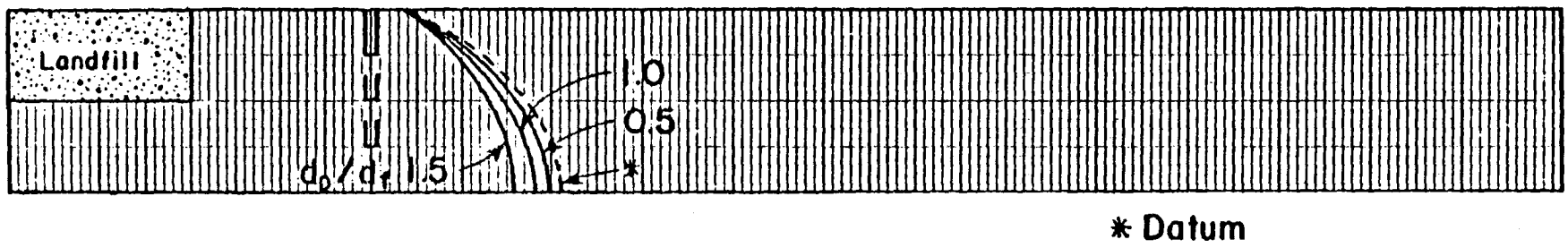


FIGURE 3 Methane 5% Mole Fraction Contours for Various Depths of Penetration for Natural Convection Trenches in Fine Grained Soils

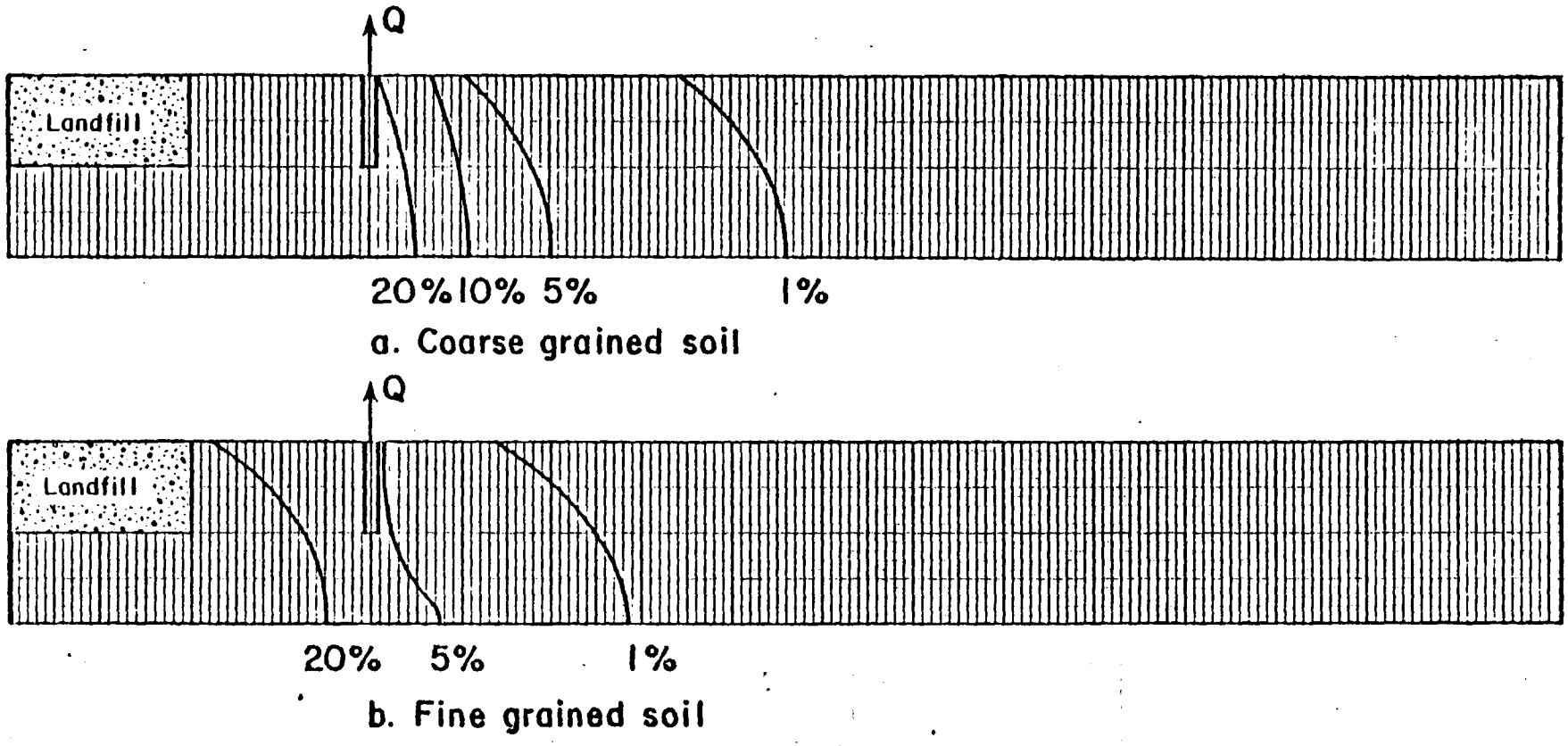


FIGURE 4 Methane Mole Fraction Contours for Trench Vents Exhaust Pumped at Q = 5 CFM

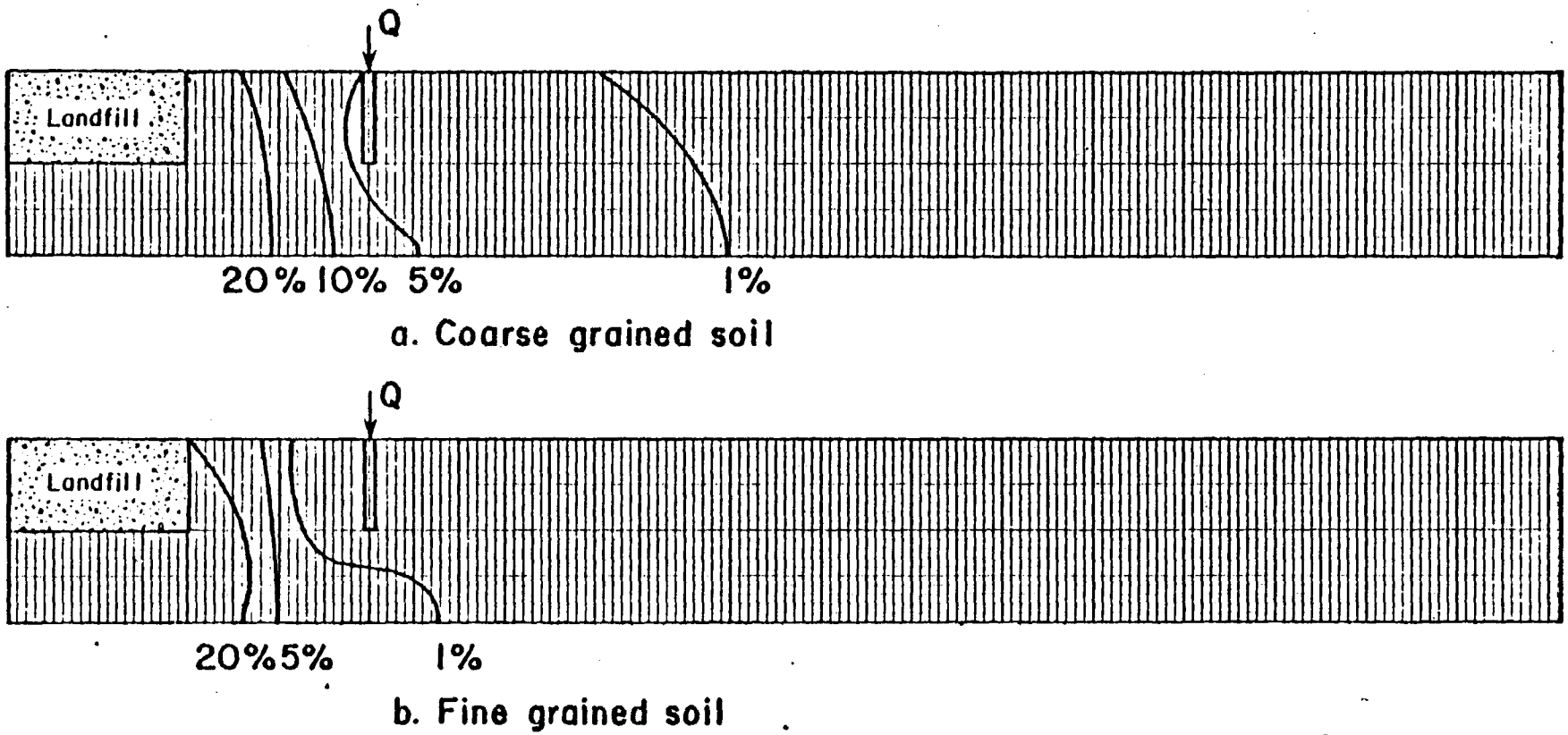


FIGURE 5 Methane Mole Fraction Contours for Trench Vents Recharge Pumped at Q = 5 CFM

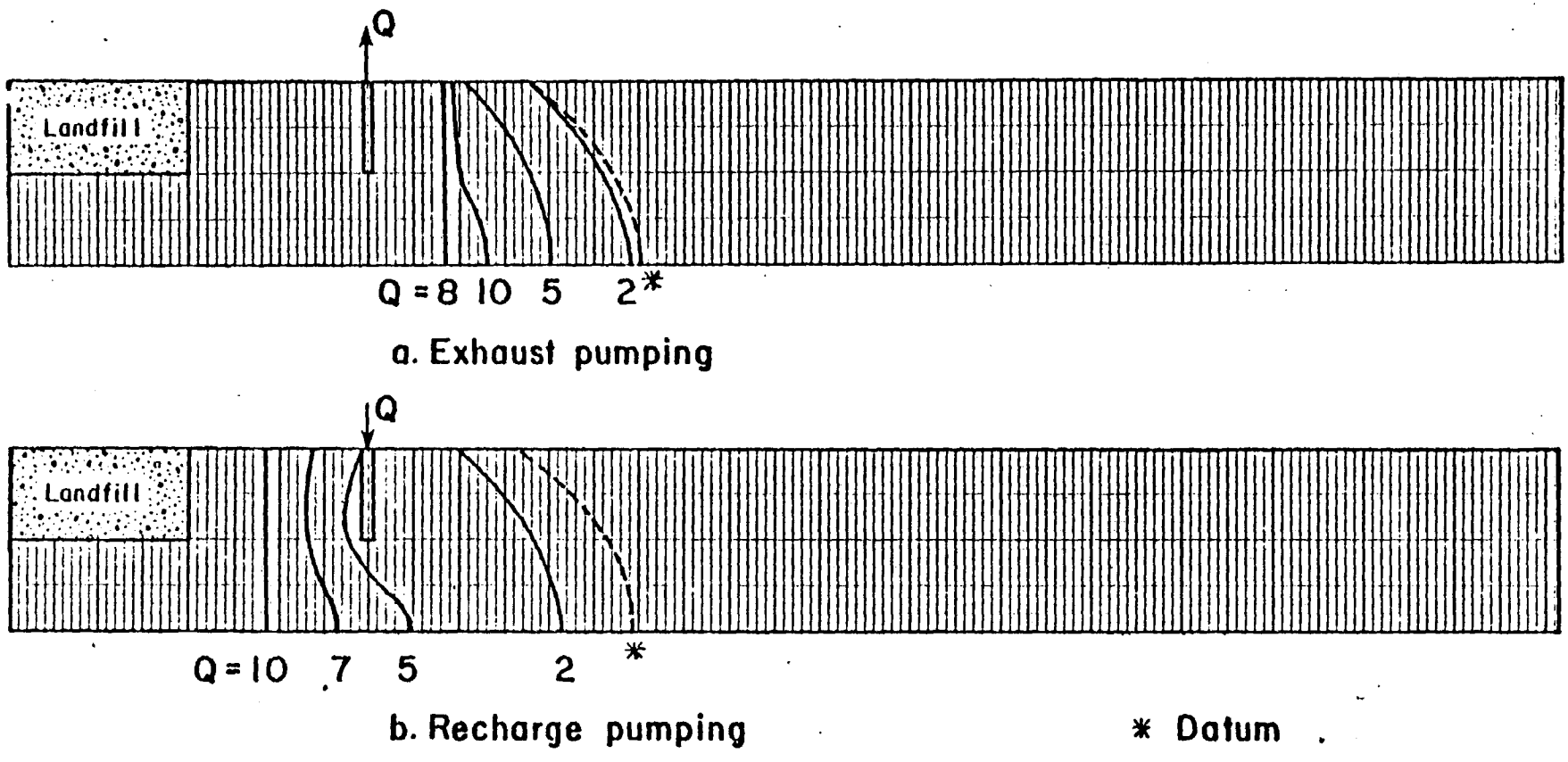


FIGURE 6 Methane 5% Mole Fraction Contours for Various Pumping Rates, Q(CFM), for Exhaust and Recharge Pumping in Coarse Grained Soils

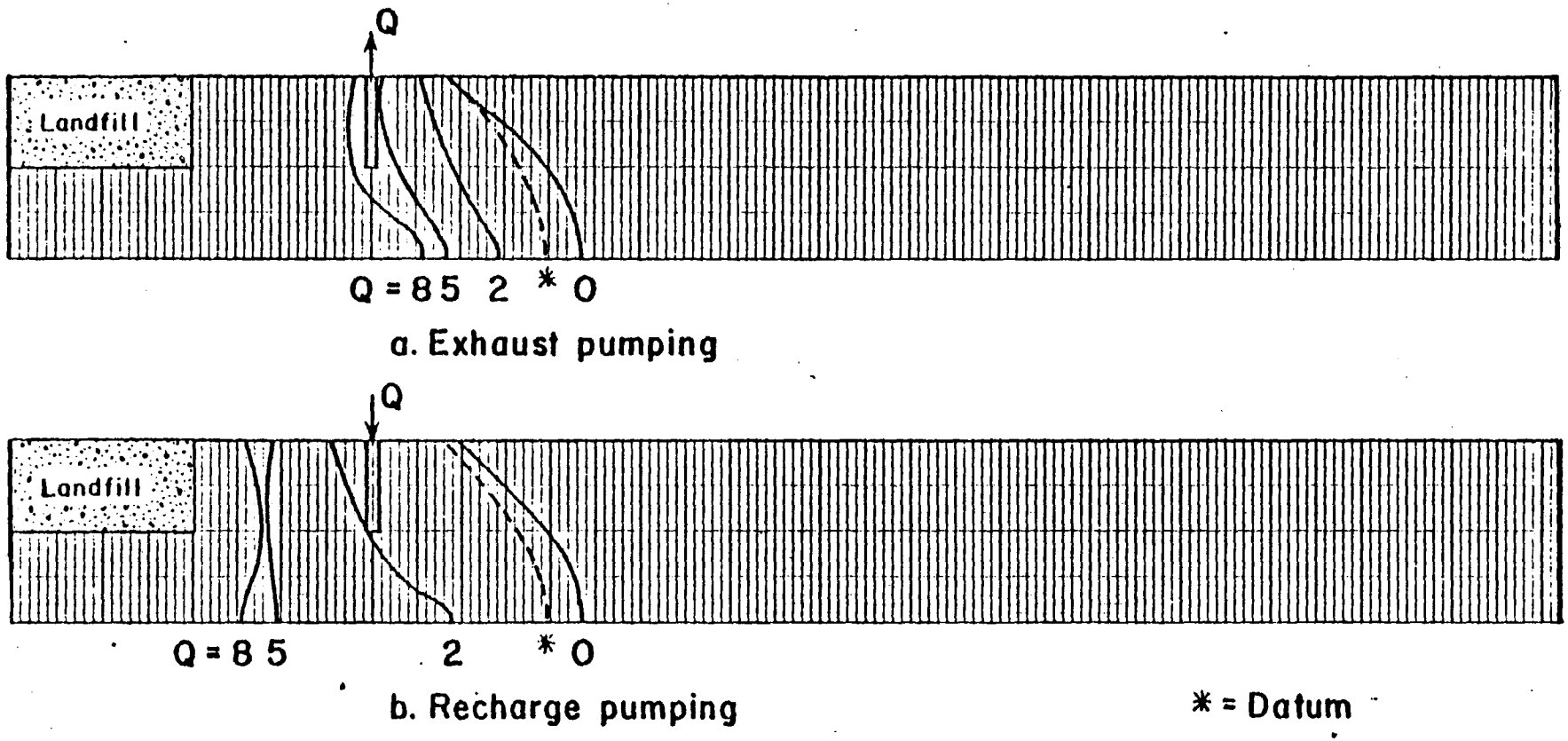


FIGURE 7 Methane 5% Mole Fraction Contours for Various Pumping Rates, Q(CFM), for Exhaust and Recharge Pumping in Fine Grained Soils

Studies were also performed to determine the effect of approximating a fine grained soil by a single mean pore radius. Results showed that for practical purposes, a single mean pore radius gave essentially the same result as a more accurate approximation using ten pore radii.

In order to summarize the results of the pumped trench studies, figure 8 was prepared. In this figure, the steady state maximum 5 percent migration distance with a control device active divided by the maximum 5 percent migration distance without a control device is plotted versus pumping rate. The relationships differed somewhat depending upon soil type and degree of trench top seal; however, a representative curve has been constructed.

4.3 IMPERVIOUS TRENCH BARRIERS

A barrier type control facility is perhaps the most economical to construct and maintain. Either an impervious synthetic liner or saturated soil can be used. It should be pointed out, however, that whereas compacted, partially saturated clay is relatively impermeable to water, it is not impervious to gas. Reference to figures 2a and b shows that the fine grained soil allows only slightly less extensive methane migration than the coarse grained soil at the same porosity and degree of saturation.

Computer simulation showed that partially penetrating barriers are disappointingly ineffective. Figure 9 compares to data with barriers penetrating 16 m (d_p/d_f = 1.0) and 24 m (d_p/d_f = 1.5) in coarse soil. Of course, an impervious barrier penetrating down to the impervious base at d_s would be effective in restricting methane to the landfill side of the barrier.

Thus it is recommended that impervious barriers be used only when they can penetrate to the groundwater table or to another impervious soil or rock stratum.

4.4 HYBRID TRENCH SYSTEMS

Hybrid systems consist of a trench, which can be either pumped or unpumped, having a barrier placed on the side away from the landfill. Computer simulations of unpumped hybrid systems (figure 10) showed them to be marginally effective. This is expected since neither an umpumped trench (figure 3) nor a partially penetrating barrier (figure 9) was particularly effective. Figure 10 also shows the results for various pumping rates both into and out of the trench. The effectiveness of the system is apparent, with recharge pumping again being the most effective.

However, reference to figure 7 shows that, for the same non-zero pumping rate, the pumped trench alone is more effective than the corresponding hybrid system for both recharge and exhaust pumping. The rationale behind this is not immediately apparent; however, the following reasoning appears logical. As shown in figure 9 a barrier with d_p/d_f = 1.0 is almost imperceptibly effective in retarding migration when employed alone. Thus its principal role in the hybrid system would be to modify the effect of the pumping. Whereas the pump remains effective (in fact, more effective for a given Q)

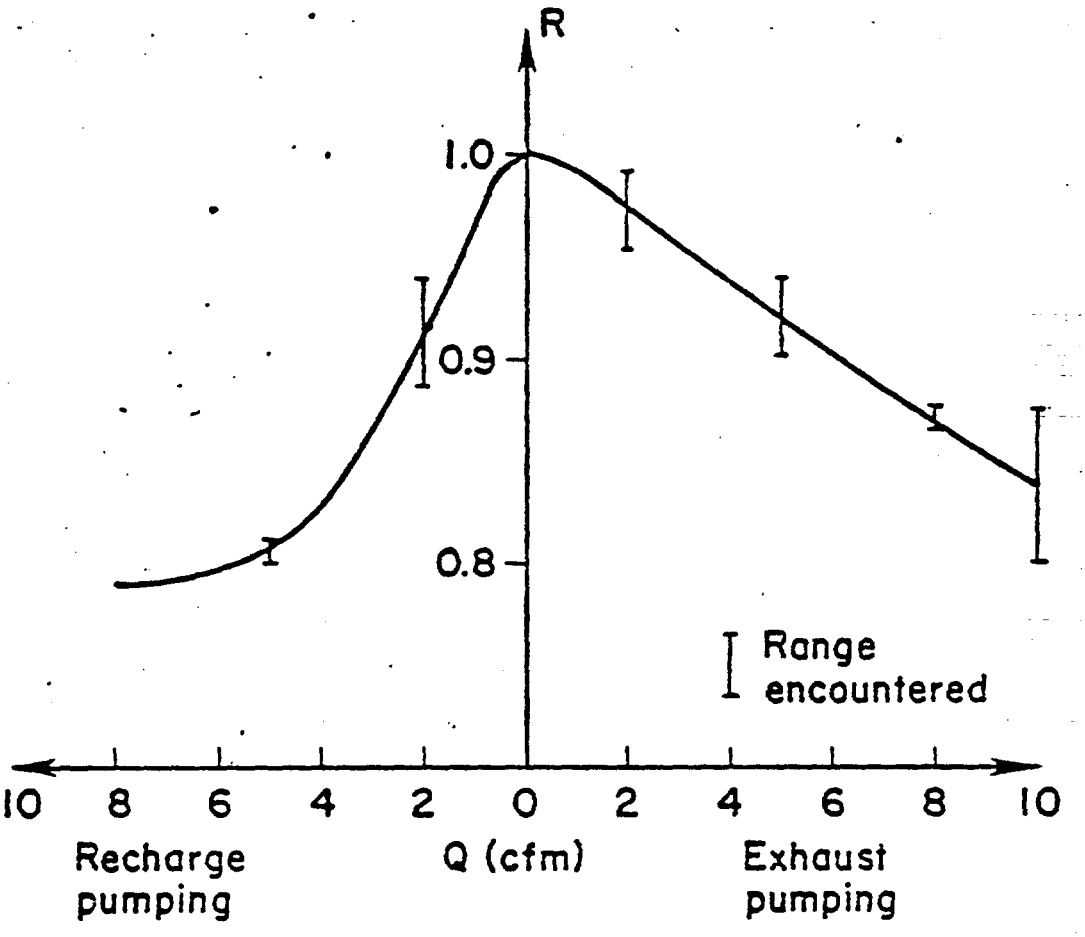


FIGURE 8 Ratio of Maximum 5% Methane Migration Distance with Control Device to Distance without Control Device for Trenches with Exhaust and Recharge Pumping

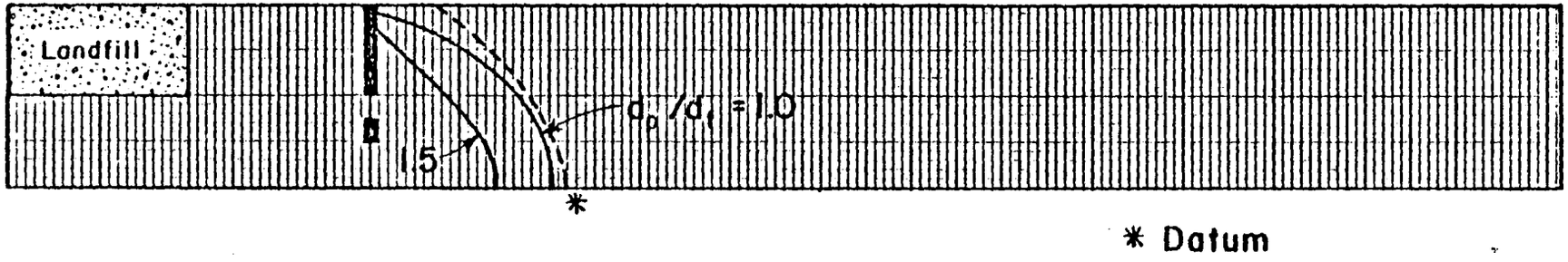


FIGURE 9 Methane 5% Mole Fraction Contours for Trench Barriers Penetrating to Different Depths in Coarse Grained Soils

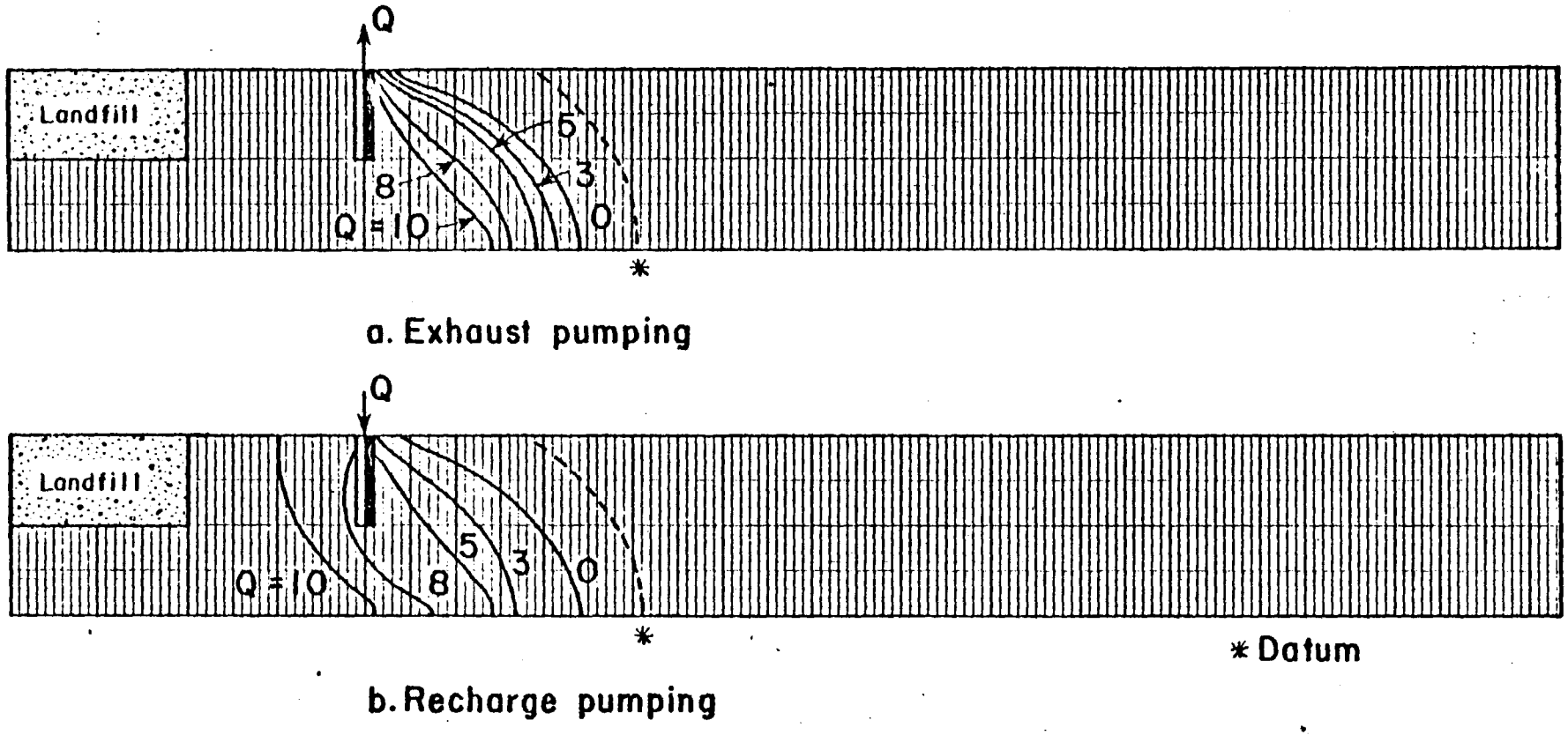


FIGURE 10 Methane 5% Mole Fraction Contours for Various Pumping Rates, Q(CFM), for Exhaust and Recharge Pumped Hybrid Systems in Fine Grained Soils

on the landfill side of the installation, its effectiveness on the side ɔosite to the landfill is severly reduced. Thus it appears that hybrid tems may offer a decrement in effectiveness at an increment in cost.

Figure 11 presents data in the form of figure 8 showing the effectivenss of hybrid systems as a function of pumping rate.

4.5 PIPE VENT SYSTEMS

Three dimensional computer codes were used to simulate partially penetrating pumped pipe vents. The configuration chosen consisted of six pipes spaced equally at 60° around the circumference of a circle of radius 192 m (r_p/r_f = 1.2). Three cases were studied:

1. recharge pumping at 5 CFM into pipes penetrating to d_p/d_f = 1.0,
2. recharge pumping at 5 CFM into pipes penetrating to d_p/d_f = 2.0 (i.e. to the impervious lower stratum), and
3. exhaust pumping at 10 CFM from pipes penetrating to d_p/d_f = 1.0.

Figure 12 plots 5 percent methane contours for these cases for values of θ as defined in figure 1. It may be seen that in all cases a retraction occurs for θ = 0° (i.e. along a radial line passing through the vent); however, there is actually an increase in migration distance for intermediate values of . Thus it appears that the pumped vents set up a circulation pattern that decreases migration distances directly behind the ent at the expense of increased migration distances along planes within e area between vents. Figure 13 shows the plan view for 5 percent migration at the elevation of the bottom of the landfill (i.e. d/d_f = 1.0).

It may be concluded that pumped pipe vents are not particularly effective for the cases studied; however, closer spaced vents might be more effective. Of course, in the limit of an infinite number of pipe vents along a circumference, the results are identical to those obtained for a trench.

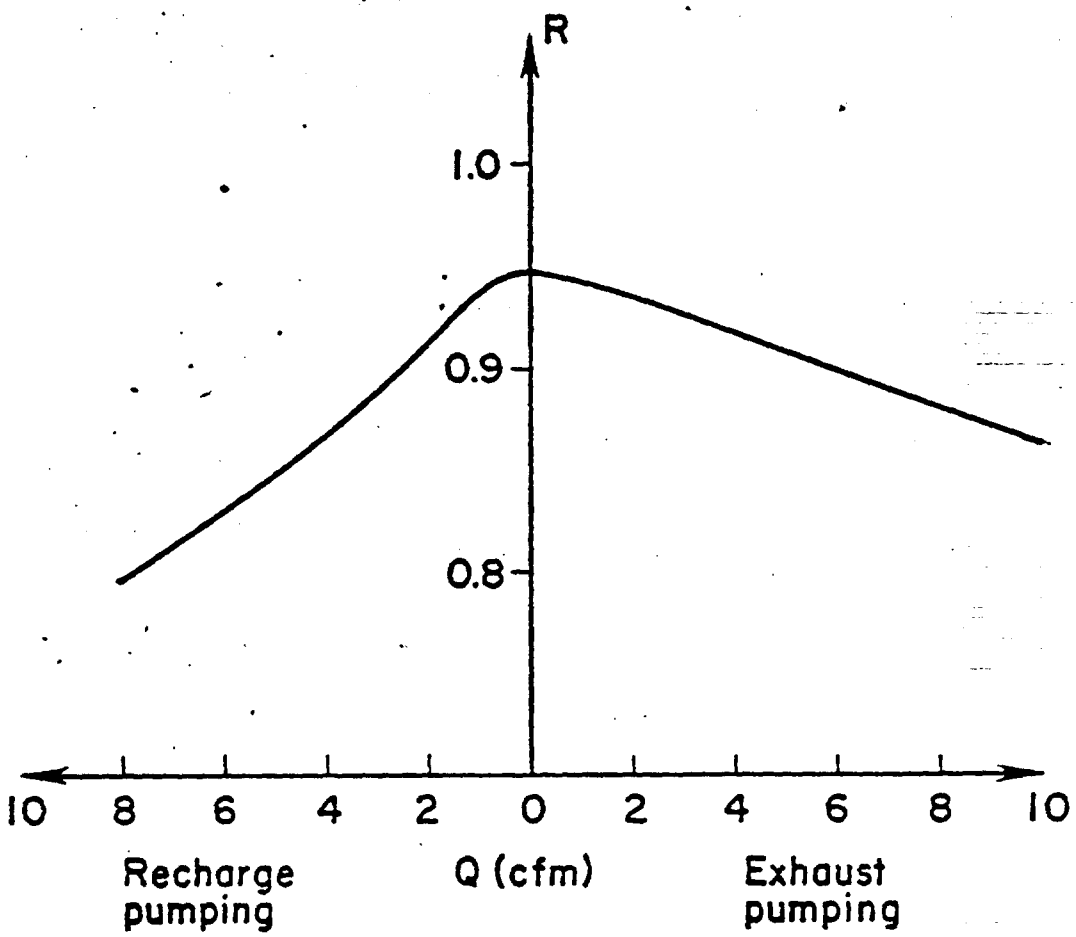
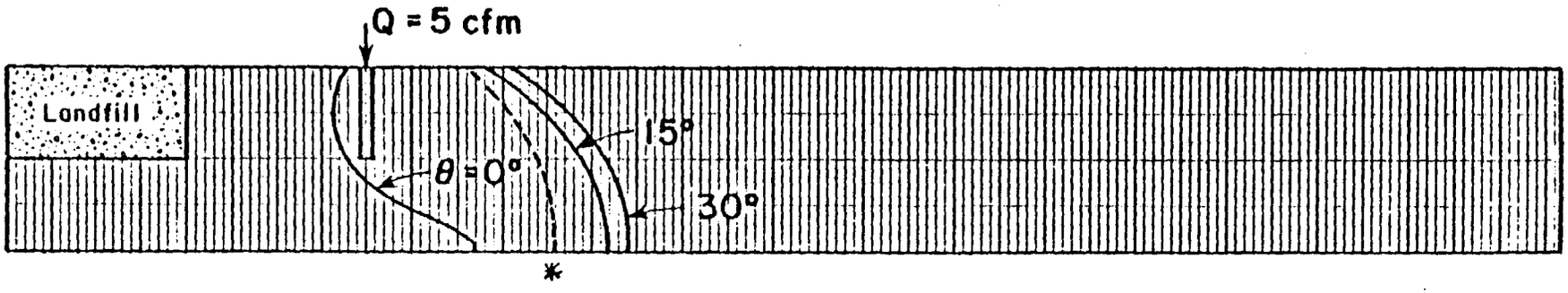
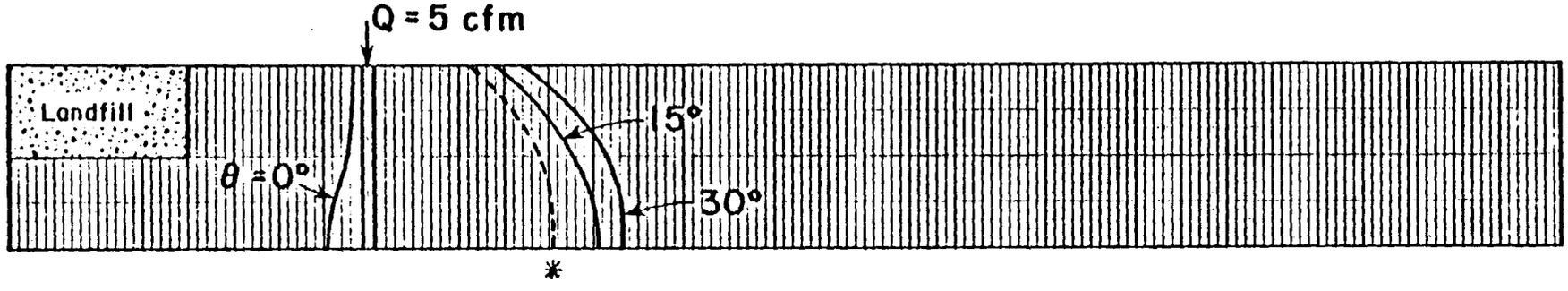


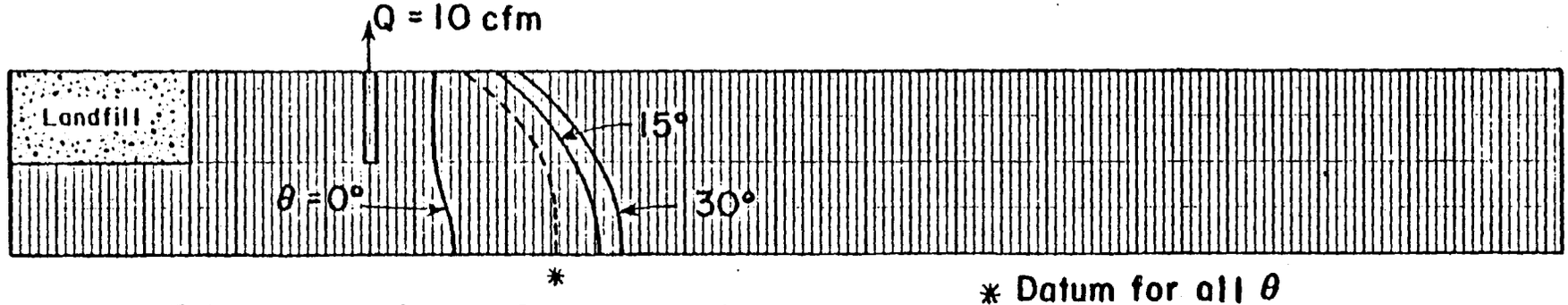
FIGURE 11 Ratio of Maximum 5% Methane Migration Distance with Control Device to Distance without Control Device for Hybrid Trench Systems with Exhaust and Recharge Pumping



a. Recharge pumping at Q = 5 cfm with $d_p/d_f = 1.0$



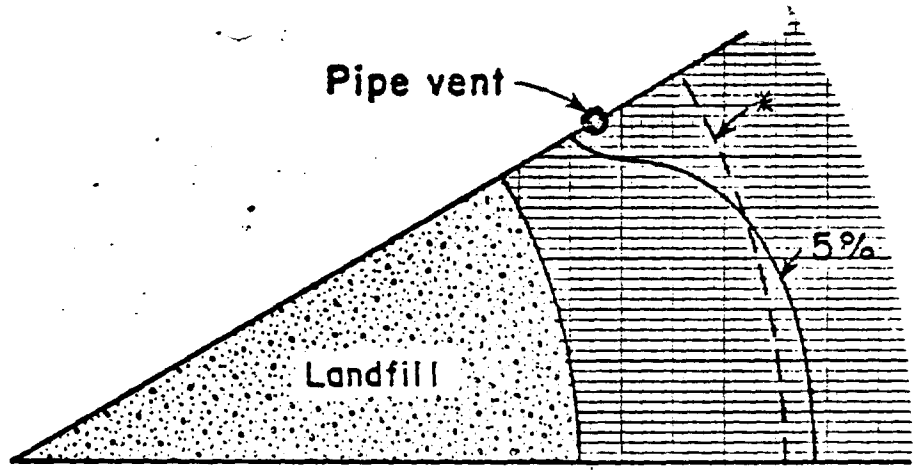
b. Recharge pumping at Q = 5 cfm with $d_p/d_f = 2.0$



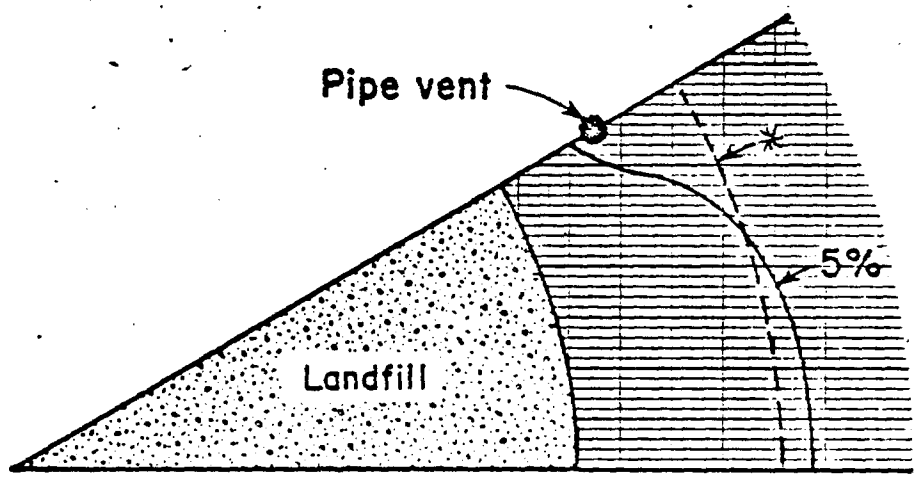
c. Exhaust pumping at Q = 10 cfm with $d_p/d_f = 1.0$

* Datum for all θ

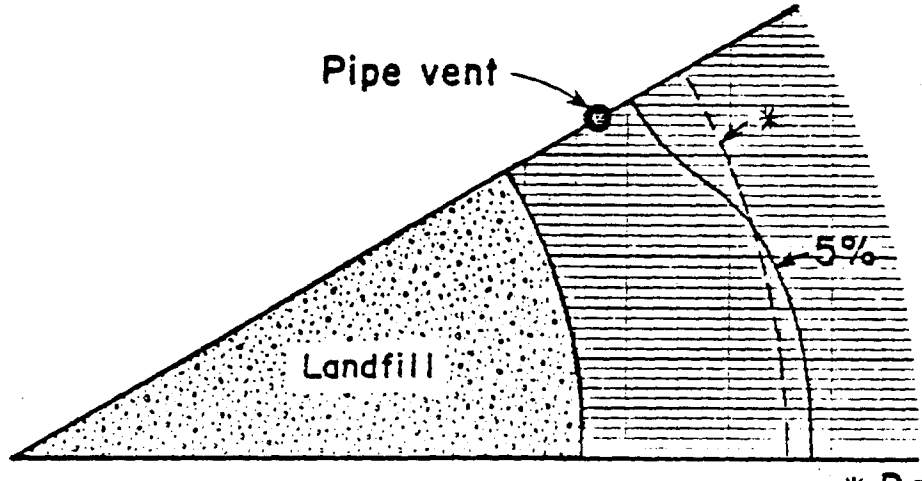
FIGURE 12 Methane 5% Mole Fraction Contours for Various Values of Q for Pumped Pipe Systems for Coarse Grained Soils



a) Recharge pumping at Q = 5 cfm with d_p/d_f = 1.0



b) Recharge pumping at Q = 5 cfm with d_p/d_f = 2.0



* Datum

c) Recharge pumping at Q = 10 cfm with d_p/d_f = 1.0

FIGURE 13 Methane 5% Mole Fraction Contours for Pumped Pipe Systems in Coarse Grained Soils

SECTION 5

RECOMMENDED CONFIGURATIONS

While the typical landfill conditions used for this study are reasonable average conditions, the reader should be cautioned that the conditions at each particular site are unique. It is in recognition of this that the user oriented computer codes described by Moore and Rai (1977) and Rai and Moore (1977) were developed. Thus, it is recommended that for design purposes the appropriate computer simulations be performed using site specific input.

Nevertheless, it is appropriate to make some summary comments based on the data presented in this work and upon the authors' experience with simulations for other landfill configurations (c.f. Moore and McOmber, 1977) which may serve to guide designers in selecting appropriate gas migration control device configurations.

In drawing these conclusions, two terms will be defined:

1. A system which alleviates migration will be defined as one which is capable of reducing methane concentrations, but which will probably not be effective in retracting the 5 percent methane contour back to the landfill side of the installation.

2. A system which controls migration will be defined as one which is capable of retracting the 5 percent methane contour back to the landfill side of the installation.

Of the systems considered:

1. Unpumped pipe vents placed around the landfill are not effective. Their sole effect is to relieve excess pressures which, in general, are not found very far from the landfill. This does not mean, however, that such vents placed within the landfill would not be beneficial. Such vents do relieve excess total pressures and thereby reduce migration.

2. Natural convection trench vents are not effective control devices. Such devices will be effective in relieving excess total pressures; however, as in the case of unpumped pipe vents, such excess pressures rarely occur at reasonable distances from the landfill.

3. Pumped trenches are capable of alleviating and controlling methane migration. Either recharge pumping or exhaust pumping is effective with recharge pumping being the most effective. Whether the trench top is sealed or open appears to make little difference.

A recharge pumping system has the disadvantage that when it is put into operation in an area which is already charged with methane, a plug of methane may be forced outward by increased total pressures.

An exhaust pumping system has the disadvantage that it actually attracts additional methane from the landfill out toward the control installation. If a system breakdown occurs, this accumulated methane can readily migrate outward.

4. Trench type barrier systems alleviate migration but do not serve as control devices unless they extend downward to an impervious stratum.

5. Hybrid systems consisting of a pumped trench backed up by an impervious trench can alleviate migration and can control migration if high recharge pumping is employed. However, such systems are usually less effective than pumped trenches alone and are probably not cost effective.

6. Pumped pipe vents alleviate migration along a radial line extending through the vent, but aggravate migration between vents. Clearly, because infinitely closely spaced vents are equivalent to a trench, in the limit their effectiveness is the same as the effectiveness of pumped trenches - that is, they could alleviate and control migration. However, the present studies do not allow conclusions to be drawn on the closeness of spacing required for an effective system to result.

SECTION 6

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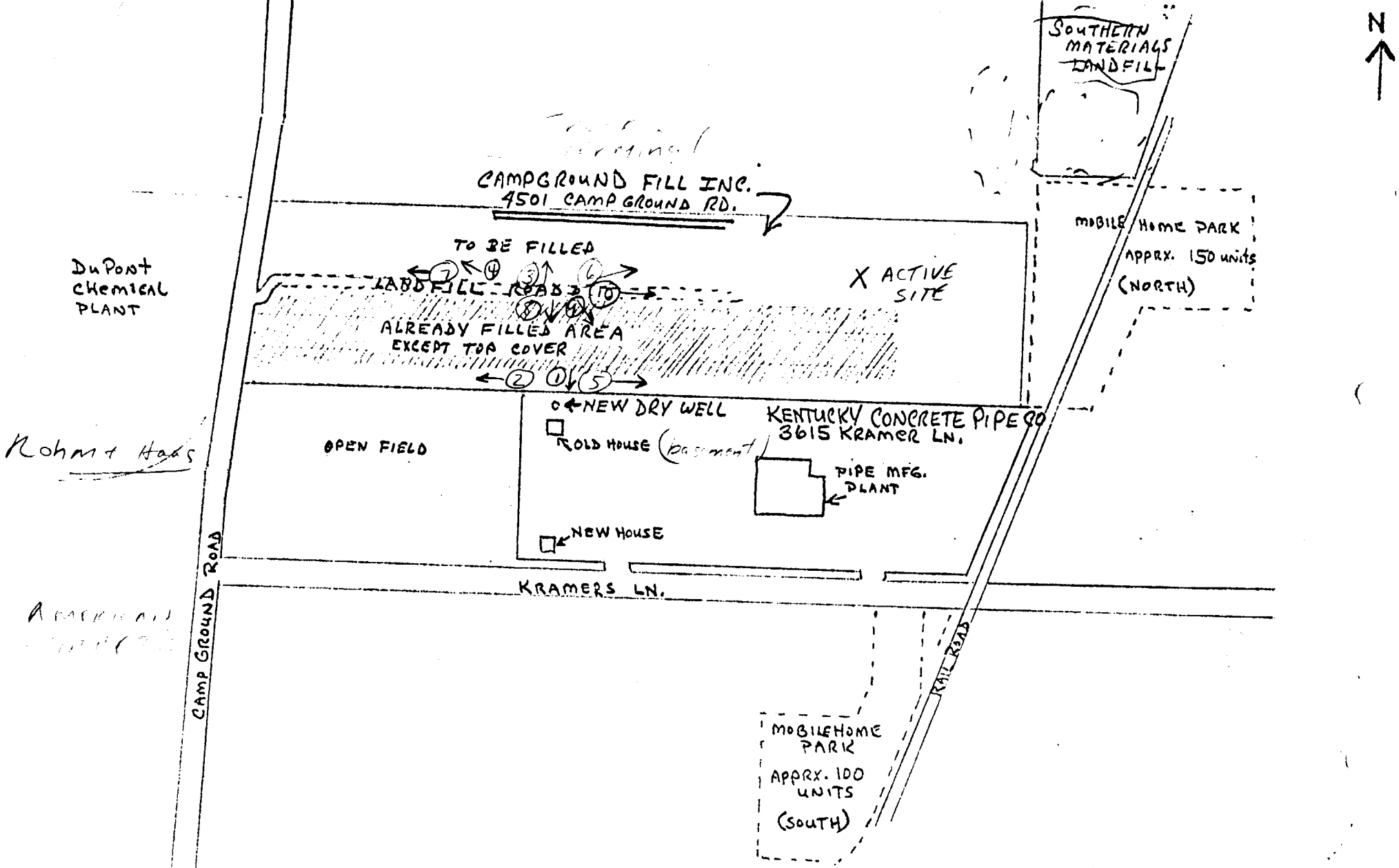
2. Moore, Charles A., and McOmber, Ronald M., "Conceptual Designs for Gas Migration Control Systems for City of Hopkins Landfill," US EPA, in press (1977).

3. Moores, Charles A., and Rai, Iqbal S., "Development of Predictive Models for Landfill Gas Movement - Computer Program Development," US EPA, in press (1977).

4. Rai, Iqbal S., and Moore, Charles A., "Development of Predictive Models for Landfill Gas Migration Control Devices - Computer Program Development and User's Manual," US EPA, in press (1977).



DRAWING PRODUCED 6/5/78
By HAROLD DAVIS, Air Pollution Control District
Jefferson County Kentucky - 502/587-3327

SCALE: 1" approximately 100 yards

SUSPECTED LANDFILL GAS MIGRATION

CAMPGROUND FILL INC.
4501 Campground Rd.
Louisville Kentucky

- JERRY BLANKENSHIP, OPCTR -

EPA (Complete)

Sample taken 6/5/78
by Harold Da
Analyzed 6/8/78 @ ~ 18
by EPA, Athens
Results Received 6/8/78 @ 22

Benzene	25. ppm
Chloroform	.67 ppm
Dichloropropane	5.9 ppm
Methane	59. %
Methylene Chloride	.4 ppm
Tetrachloroethene	5.8 ppm
Toluene	23. ppm
Trichloroethane	5.4 ppm
Trichloroethene	1.3 ppm
Vinyl Chloride	1.38 ppm

OTHER EXOTICS TO FOLLOW:

2-Dichloroethane 1.6 ppm
1-2 Dichloroethene 2.9 ppm
Dichlorodifluoromethane 2.7 ppm

6/9/78

"The primary function of a flare is to convert flammable, toxic or corrosive vapors to less objectionable compounds by means of combustion."

NAO presents FLARES ON PARADE

SPECIFY

HANDLING COMBUSTION PROBLEMS THE RIGHT WAY SINCE 1912.

National AirOil Burner

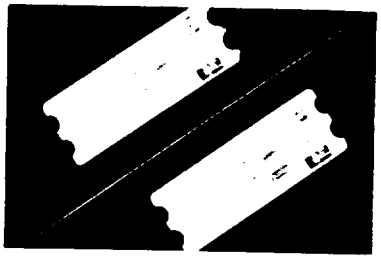
National AirOil Burner Company, Inc.

1284 East Sedgley Avenue, Philadelphia, PA 19134
Telephone (215) 743-5300 Telex 845403

Branch Offices: Houston, London, Milan and Tokyo
Authorized Agents and Representatives in Major Cities of the World.

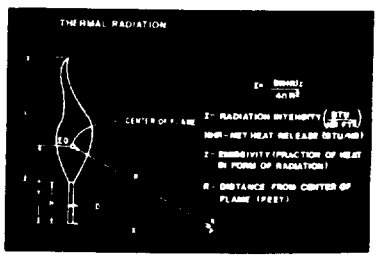
$3.00

"New flaring and venting systems must be capable of doing a better job than their predecessors."



NAO's slide rule and the basic equations and conversion values listed on the NAO pocket guide will allow you to determine flare-tip diameter and overall stack height for preliminary evaluations.

NAO's extensive work in accurate sizing for optimum flaring — with minimal thermal radiation — has been programmed into a minicomputer. (For this critical application in the Arctic Circle, a thin layer of gravel shields the permafrost.)

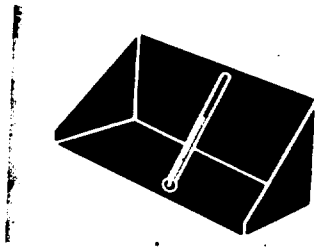


This is the basic thermal radiation equation with applicable geometry for no wind. Access to NAO's extensive and complete minicomputer programs is as near as your telephone.

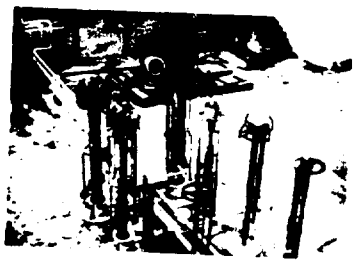
PROBLEMS WITH FIELD MEASUREMENTS

- WHAT IS FLARE FLOW RATE
- WHAT IS FLARE GAS COMPOSITION
- ACCURATE INSTRUMENTATION
- WIND SPEED
- SOLAR RADIATION

Common problems with field measurements include inaccurate data for flow rate, gas composition, wind speed and solar-radiation measurements.



Black box with thermometer has been used as a quick, crude, inaccurate instrument for radiation measurements.



This test facility in NAO court yard includes eight different flares, with tip diameters ranging from 2" to 10".

"Economy-conscious companies are emphasizing energy conservation and overall efficiency."

For decades, flaring and venting have been as uncomplicated as igniting waste gases or venting hydrocarbon vapors to the atmosphere unburned.

But things have changed. And they are continuing to change — drastically.

This booklet contains basic information, extracted from NAO's educational slide series. . . information designed to create a better understanding of the problems involved in engineering safe, efficient flaring or venting systems.

SPECIFY

NAO

Flaring innovators with field-proven systems around the globe . . . pioneering new technology for onshore and offshore flaring

National AirOil Burner

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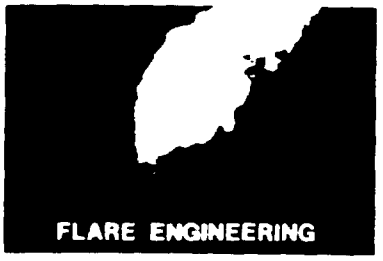
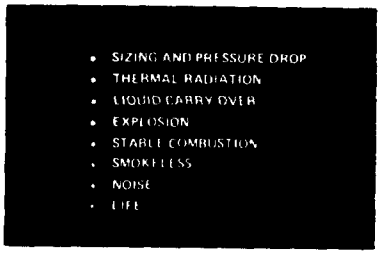
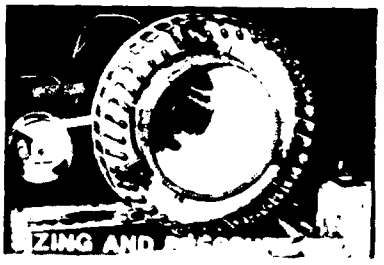


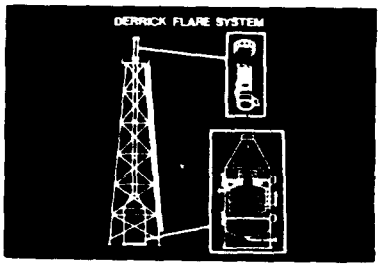
A flare is not just a glorified pipe in the sky.



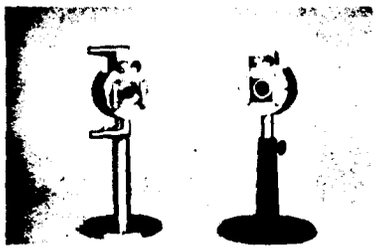
There are many factors involved in the proper — and safe — design of an efficient flaring system.



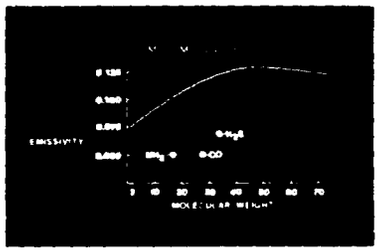
The most efficient-size flare tip is dictated by: the temperature and molecular weight of the waste gas; the available pressure drop; and the gas-flow rate.



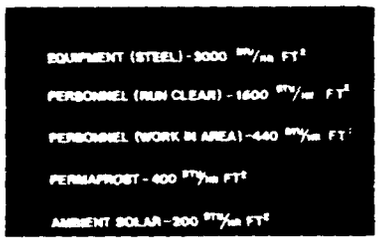
For a complete flare system, including knockout drum, the pressure drop for the flare tip will be approximately 45% of the total pressure drop.



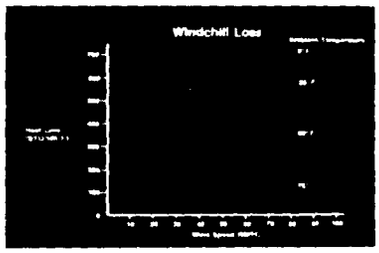
Eppley meters are examples of top-quality instrumentation. But if you use the wrong window (quartz or glass), you could have a 50% error in your readings.



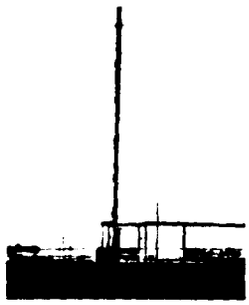
Flame emissivity is partially dependent upon molecular weight. A few strange-behavior gases (ammonia, CO_2, H_2S), however, fall under the emissivity curve.



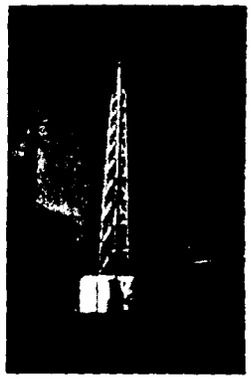
All of these figures are very conservative with no provision for wind, temperature or clothing. The "run-clear" figure, for example, is for bare skin. Most people now use 2000 BTU/hr ft² instead of 1500.



Heat loss is a direct result of wind and ambient temperatures. At 25°F, there is about five times as much heat dissipation as at 75°F.



How do you handle the thermal radiation problem? One way is to elevate the stack. This is a 250-ft tall guyed stack for a 36" diameter flare tip.

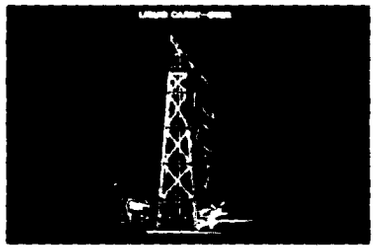


Where space is limited, one way to handle the thermal radiation problem is with an elevated derrick flare system. This one is 225-ft tall; and this complete flaring system includes a combination water seal and knock-out drum.

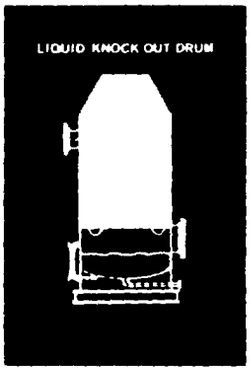
Flares for offshore platforms are usually tipped over for two reasons: (1) If there is ever any liquid carry-over, it will be thrown out and away from the platform; and (2) the unit is hinged so it can be lowered to a barge at sea level.

"Safety and environmental regulations now exert a decided influence on the design aspects involved in the flaring or venting of waste gases, onshore or offshore."

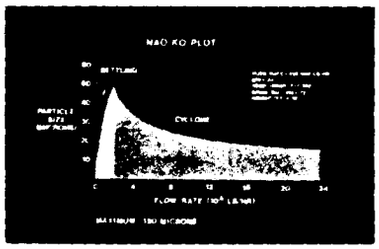
Ground-flare pit in Puerto Rico has air-blower flare in center of a series of emergency Jet-Mix® vortex flares. Center flare comes on first for low-flow rates, followed by emergency flares in rows of four for complete combustion at higher rates.



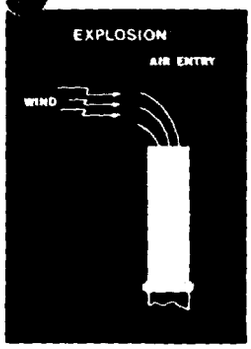
Too small a knockout drum will allow liquid to reach the top of the flare, where it is thrown down as burning rain.



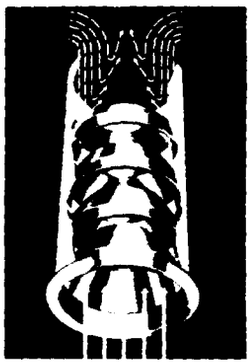
Properly designed knock-out drum combines cyclone and settling effects to prevent liquid carry-over.



Knockout plot for a particular drum shows how the settling and cyclone effects can work together for an efficient overall design.

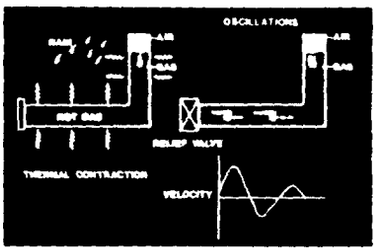


Air penetration into a stack, due to (1) a low-molecular-weight exhaust gas or (2) a high-temperature gas which tends to float out of the stack, can cause explosions or burn-back in the flare tip and stack.

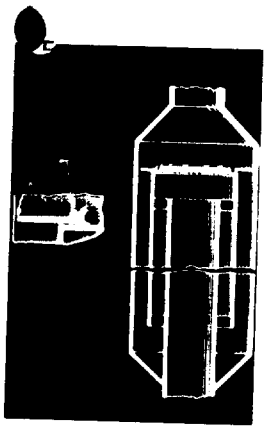


NAO's patented Fluidic Seal® — the most efficient and least expensive reverse-flow kinetic seal — prevents air penetration at flare tips and stacks. No moving parts. No complex bends or baffles. Nothing to wear out, jam or clog.

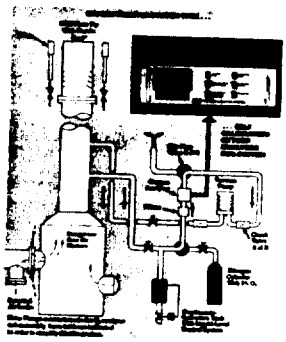
Full-size carbon-steel mockup of NAO 54" flare tip, under construction in Japan, is tested with purge gas to obtain oxygen-level readings above and below Fluidic Seal®. Before any new-size Fluidic Seal® is manufactured, complete tests are conducted with various wind conditions and purge rates.



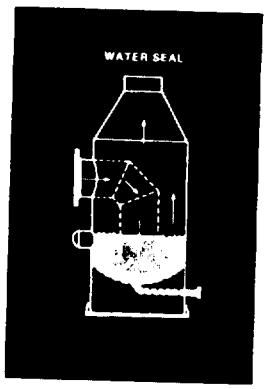
Oxygen also may enter a flare stack due to thermal contraction or oscillations in the stack. Since any significant air intrusion can create dangerous conditions, NAO developed an automatic O_2 monitor system (patent pending) for safe flaring of combustible gases.



This molecular-type seal has flapper valves which can be jammed by small pieces of refractory. NAO's no-moving-parts Fluidic Seal® offers a straight-open, venturi-type flow path for waste gases. Refractory material and other foreign matter can drop right through a Fluidic Seal®, with no possibility of plugging.



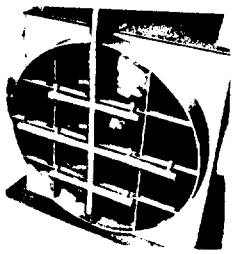
During low flows, negative pressures can be developed at the base of a stack. Any leak can then cause air infiltration. This creates extremely hazardous conditions. NAO's continuous O_2 monitor system used in conjunction with NAO's patented fire-suppression/explosion-prevention systems will prevent catastrophic explosions.



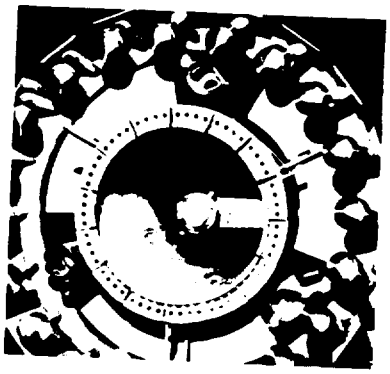
A water seal, properly designed to eliminate pulsations and to break all bubbles into many, many small ones is one of the best ways to prevent flame flashback from a flare stack into the flame header. It also can be used for back-pressure control.

"Primary factors in flare engineering are safety and economy. The ideal flaring system can provide both; but components must be carefully considered."

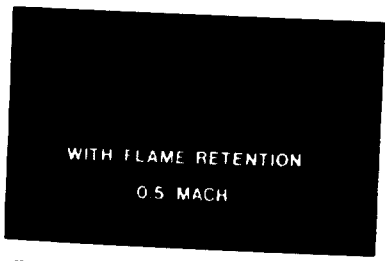
"Ecology-conscious companies are more concerned than ever about emissions."



Too often, flame arrestors are just big, bulky and expensive. . . and they don't really work! Every NAO MetaGrid® flame-arrestor system is custom-engineered and tested to satisfy the requirements of a particular application and a particular gas or mixture of gases.



A flame-retention ring on a flare tip helps to assure stable and complete combustion. An older style flame-retention ring is illustrated.



Without a flame-retention ring, maximum exit velocity for an open-ended pipe is approximately 2/10s of sonic or 220 ft/second. A flame-retention ring allows higher exit velocities and hence: a smaller flare tip with less flame tilt, lower radiation, longer tip life.

SMOKELESS OPERATION

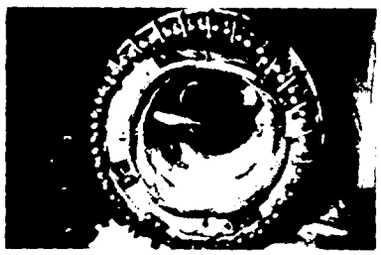
- STEAM
- GAS ASSIST
- COMPRESSED AIR
- WATER SPRAY
- AIR BLOWER
- JET MIX

Methods of obtaining smokeless operation include injection of steam — with ring and center-steam injection for large-diameter flares — assist gas, compressed air, water spray, air blower, and NAO's patented Jet-Mix® system.

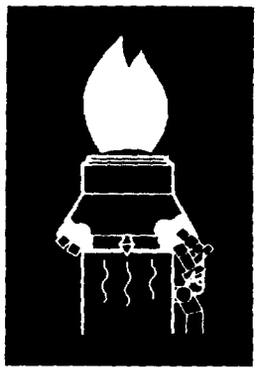
Here's an example of a very smoky gas, with no steam injection.

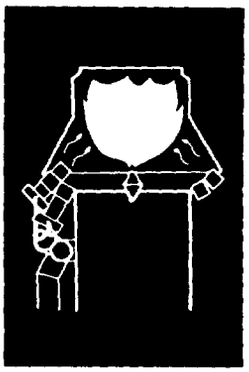
And here's the same propylene flaring operation . . . with NAO Jet-Mix® ring and center-steam injection.

"Smokeless flares are required for clean disposal of hydrocarbons in the paraffin group above methane and for other groups such as olefins and aromatics."

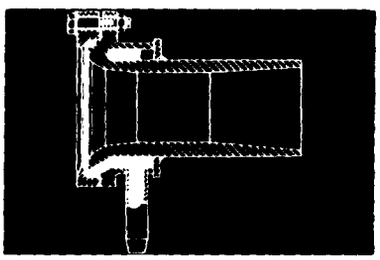


Too much steam with too small a waste-gas flow will cause a gas-steam/air mixture to be drawn into the flare tip, causing burn back inside the tip. This is an example of too much of a good thing!

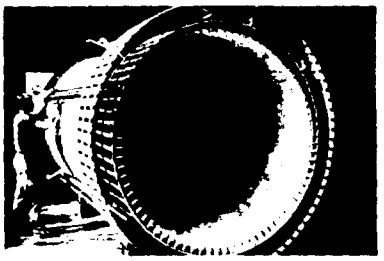




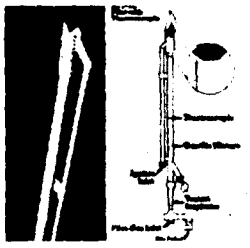
Injecting steam and air inside the flare tip can cause problems. With normal or emergency gas flows, the flame is outside and above the flare tip (left). But for low rates, where control of the steam/air injection is critical and difficult, burn back inside the flare will occur to rapidly destroy the flare.



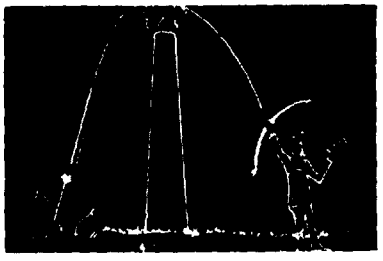
A Coanda inspirator is sometimes used to achieve smokeless flaring. But the gap (white area) is less than 1/4 mm — and is subject to severe plugging problems, making it impractical for use on flares.



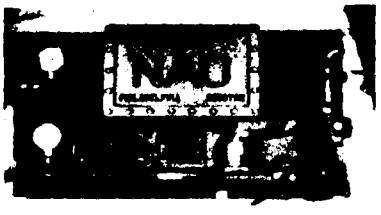
Swirling action, created by NAO's new VorTuSwirl® vanes, acts like a gyroscope to hold the flame erect. These vortex vanes insure lower pressure drops with smoother flows and less noise.



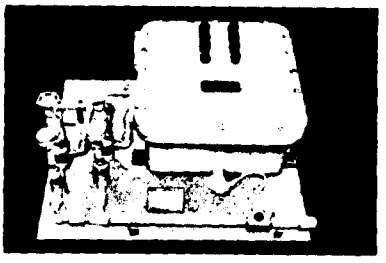
NAO flare pilots, available with or without thermocouples for continuous monitoring of flame, have special windshields. Each pilot windshield protects the lower 8" of the pilot flame to insure dependable performance regardless of wind conditions.



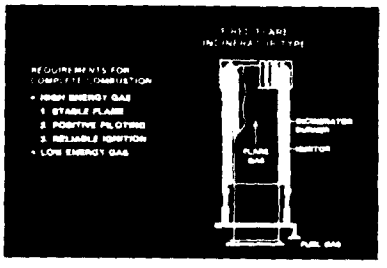
An old method of igniting a flare — and the surrounding grass — was the flaming arrow.



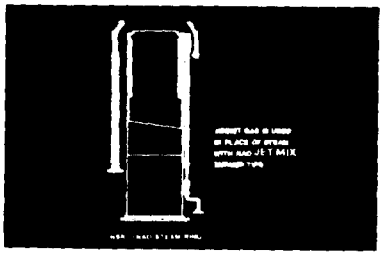
This basic NAO ignitor panel is capable of shooting a flame front through a one-mile equivalent length of one-inch pipe to light several pilots sequentially.



NAO automatic ignitor panel, with explosion-proof housing, simultaneously ignites several pilots. Special NAO panel configurations are in operation all over the world, from the extreme cold of Alaska's North Slope to the hot deserts of Iraq.

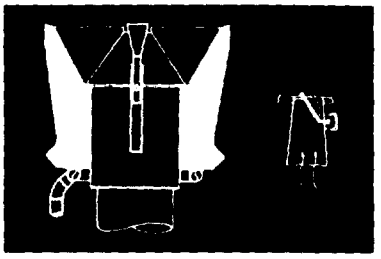


Incinerator-type fired flares are required for low BTU gases that won't burn by themselves. Examples: acid or sour gas below 115 BTU/ft³; ammonia at 365 BTU/ft³; and waste coke-oven gas below 90 BTU/ft³.

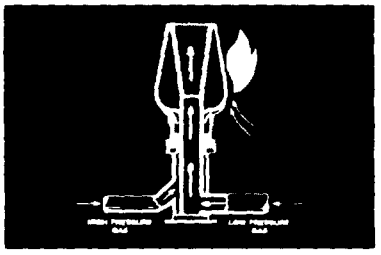


By using an oversize Jet-Mix® ring, similar to the NAO steam ring, to inject assist gas at the top of a stack, we can combine the chemical energy of the assist gas with its kinetic energy. . . to pull in air, generate turbulence, and assure optimum mixing of the fuel/air mixture with the waste stream.

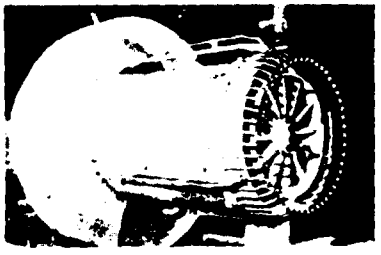
"The primary objective of NAO is to provide proven solutions to combustion, pollution, energy or process-control problems."



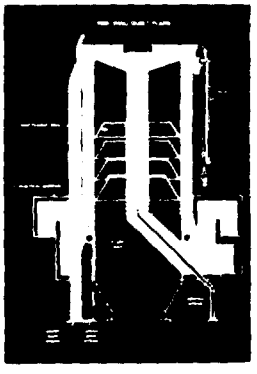
This is one example of how not to design a smokeless flare. The moving parts at the very top of the flare can be plugged by snow, ice or freezing rain. When the flare must be activated, it won't work.



Here's another design with moving parts. It has the same inherent problems.

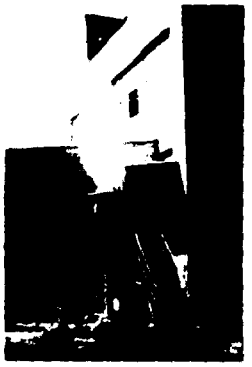


NAO's Quiet Flare has no moving parts. It also has large air passages which can't be clogged, plus effective acoustical shrouding. This efficient flare tip combines reliable smokeless operation with very low noise.

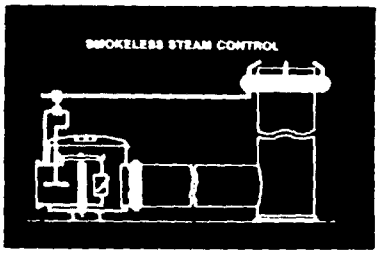


Cutaway of Quiet Flare shows acoustical shrouding and positions of upper and lower steam rings, center steam injector, and Fluidic Seal®.

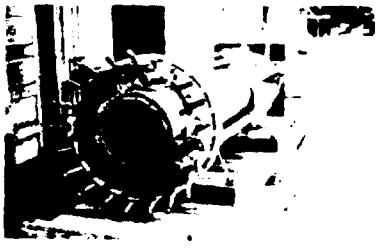
Here's the smoky propylene flare again. This time without water spray and without steam.



When we added the water spray, we obtained a very clear flame. With no wind, this flame rises straight up from the flare tip.



Before we look at the NAO water-spray flare, here's a far-from-satisfactory design for smokeless steam control. It incorporates a flapper valve and butterfly: Parts which tend to jam when the chips are down!



And here's the water-spray design that turned the smoky propylene into a clear flame. Note: The nozzles on this NAO water-spray ring are tipped out. . . so the flame can't move out of the smokeless pattern.

Pyrolysis GLC For the Rapid Identification of Organic Polymers*

by **Norbert Iglauer**** and **Freeman F. Bentley,***** Air Force Materials Laboratory (AFML/LPH), Wright-Patterson AFB, OH 45433

Abstract

A pyrolysis gas chromatography method for the rapid identification of organic polymers is described. Previous pyrolysis GLC studies have involved single flow systems, and the identity of the small and large components of the pyrolyzate could not be determined simultaneously. The method described here makes use of a Chemical Data Systems Pyrochrom which separates the pyrolyzate into a dual flow system equipped with thermal conductivity and flame ionization detectors. This arrangement permits the determination of both the small and large components present under optimum conditions. A linear temperature program is used to resolve the higher boiling components of the pyrolyzate in a reasonable time. The pyrograms obtained not only offer a "fingerprint" of the polymer, but also enable a detailed qualitative and quantitative analysis of the fragments of the pyrolyzate. The results of studies on some classes of elastomers, thermoplasts and fabrics are reported here. The polymer classes investigated include polyolefins, polyesters, polyurethanes, polyethers, polyamides, phenolics, polycarbohydrates, epoxy resins and polycarbonates.

Introduction

Pyrolysis gas chromatography as a means for the identification of polymers has been known for several years, but previous pyrolysis GLC studies have involved single flow systems and the identity of the small and large components of the pyrolyzate could not be determined simultaneously (1-6). The method described here makes use of a Chemical Data Systems Pyrochrom with thermal conductivity and flame ionization detectors (7-10). This arrangement permits the determination of both the small and large components present under optimum conditions. The technique offers many advantages over other analytical methods; e.g., infrared spectroscopy and NMR (11,12). Some are listed below:

(1) Only small samples in the mg range are required;

(2) A previous preparation, necessary in infrared spectroscopy, is not necessary;

(3) A pyrogram (*pyro*lysis-chromato*gram*), including sample preparation, can be run in less than 30 minutes;

(4) The equipment is less expensive than many other types of instrumentation and is easy to operate.

The pyrograms obtained not only offer a "fingerprint" but also enable a detailed qualitative and quantitative analysis of fragments.

This report does not represent a complete study of all kinds of polymers, rather, it is a summary of results on the investigation of some classes of elastomers, thermoplasts and fabrics (fibers). These polymers were selected to determine the potential of the new pyrolysis-GLC technique in determining the structure and stability of materials with improved properties. The intent of the overall program is to extend the study to obtain data on all polymers of interest to the Air Force. Such a comprehensive summary will provide a convenient reference base for future characterization of these materials both through interpretative and pattern recognition approaches.

Principle of Thermolytic Degradation

Pyrolysis is the subjection of organic material to elevated temperatures in the absence of oxygen. This leads to the thermal decomposition of the molecules into several preferential fragments. The nature and the quantity of such fragments reflect the elemental and structural character of the parent material. Through identification of such fragments, either by known elution times of the individual fragments or by the fingerprint method of the whole pyrogram, the

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****Address correspondence or request for reprints to Freeman F. Bentley, Air Force Materials Laboratory (LPH), Wright-Patterson AFB, OH 45433.*

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2. Fanter, D. L., Walker, J. W., and Wolf, C. J., Anal. Chem., **40**, 2168 (1968).
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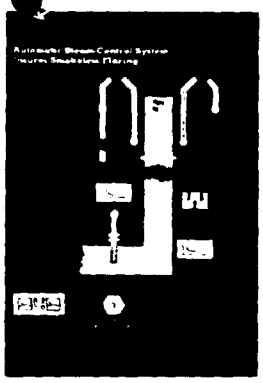
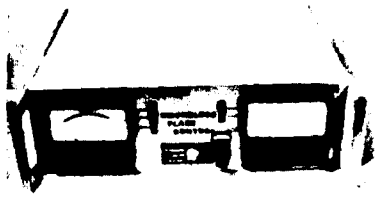
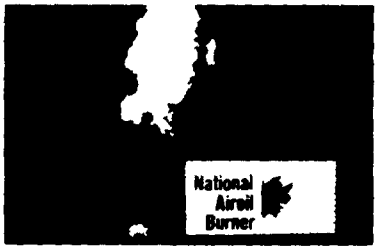


NAO's fully automatic control system for smokeless flaring insures optimum combustion of flare-stack effluents, regardless of the flow rate and the composition of the waste gas.



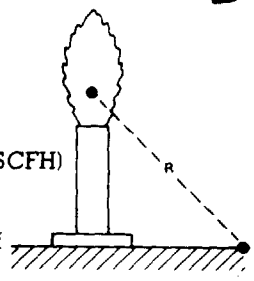
Electronic signals, generated by separate flow and radiation-intensity sensors, are individually linearized — then combined electronically to dictate efficient steam-flow control.



A reminder: "The primary function of a flare is to convert flammable, toxic or corrosive vapors to less objectionable compounds by means of combustion."

"The flaring process involves the release of tremendous amounts of energy, up to tens of billions of BTUs, in the form of thermal radiation."

[illegible]IC RADIATION EQUATION:



$$I = \frac{(FR)(NHV)\epsilon}{4\pi R^2}$$

I = Radiation Intensity (BTU/HR FT²)
FR = Flow Rate (LB/HR or SCFH)
NHV = Net Heating Value (BTU/LB or BTU/SCF)
ϵ = Emissivity (fraction of heat in form of radiation)
R = Distance From Center of Flame to Observation/Measurement Point (FT)

FLAME LENGTH:

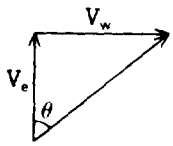
$$L = 10 \times D\sqrt{\frac{\Delta P}{55}}$$

L = Flame Length (FT)
D = Tip Diameter From Slide Rule (INCHES)
ΔP = Pressure Drop of Tip From Slide Rule (" W.C.)

CENTER OF FLAME:

$L_c = L/3$

WIND EFFECT:



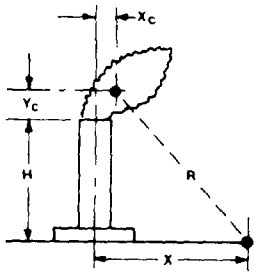
$$\theta = \text{ARC TAN } \frac{V_w}{V_e}$$

V_w = Wind Speed (FPS)

APPROXIMATE EXIT VELOCITY:

$$V_e = 550\sqrt{\frac{\Delta P}{55}} \text{ (FPS)}$$

FLAME-CENTER COORDINATES:



$X_c = L_c \text{ SIN } \theta$
$Y_c = L_c \text{ COS } \theta$

GEOMETRY:

$$R = \sqrt{(X - X_c)^2 + (H + Y_c)^2}$$

GENERAL CONVERSIONS:

FLOW RATE:
1 Kg/HR = 2.205 LB/HR
1 Nm³/HR = 37.32 SCFH

TEMPERATURE:
°F = 1.8 × °C + 32°

PRESSURE:
1 kPa = 0.145 PSI
1 bar = 14.50 PSI
1 kg/cm² = 14.22 PSI
1 PSI = 27.7" W.C.

HEATING VALUE:
1 K cal/Nm³ = 0.106 BTU/SCF
1 K cal/kg = 1.80 BTU/LB
1 KJ/Nm³ = 0.025 BTU/SCF
1 KJ/kg = 0.430 BTU/LB

RADIATION INTENSITY:
1 K cal/HR M² = 0.369 BTU/HR FT²
1 KJ/HR M² = 0.088 BTU/HR FT²
1 Watt/M² = 0.317 BTU/HR FT²
1 Langley/HR = 3.687 BTU/HR FT²

DIMENSIONS:
1 Km/HR = 0.6214 MPH
1 MPH = 1.467 FPS
1 INCH = 25.4 MM
1 FOOT = 0.3048 METERS

National AirOil Burner

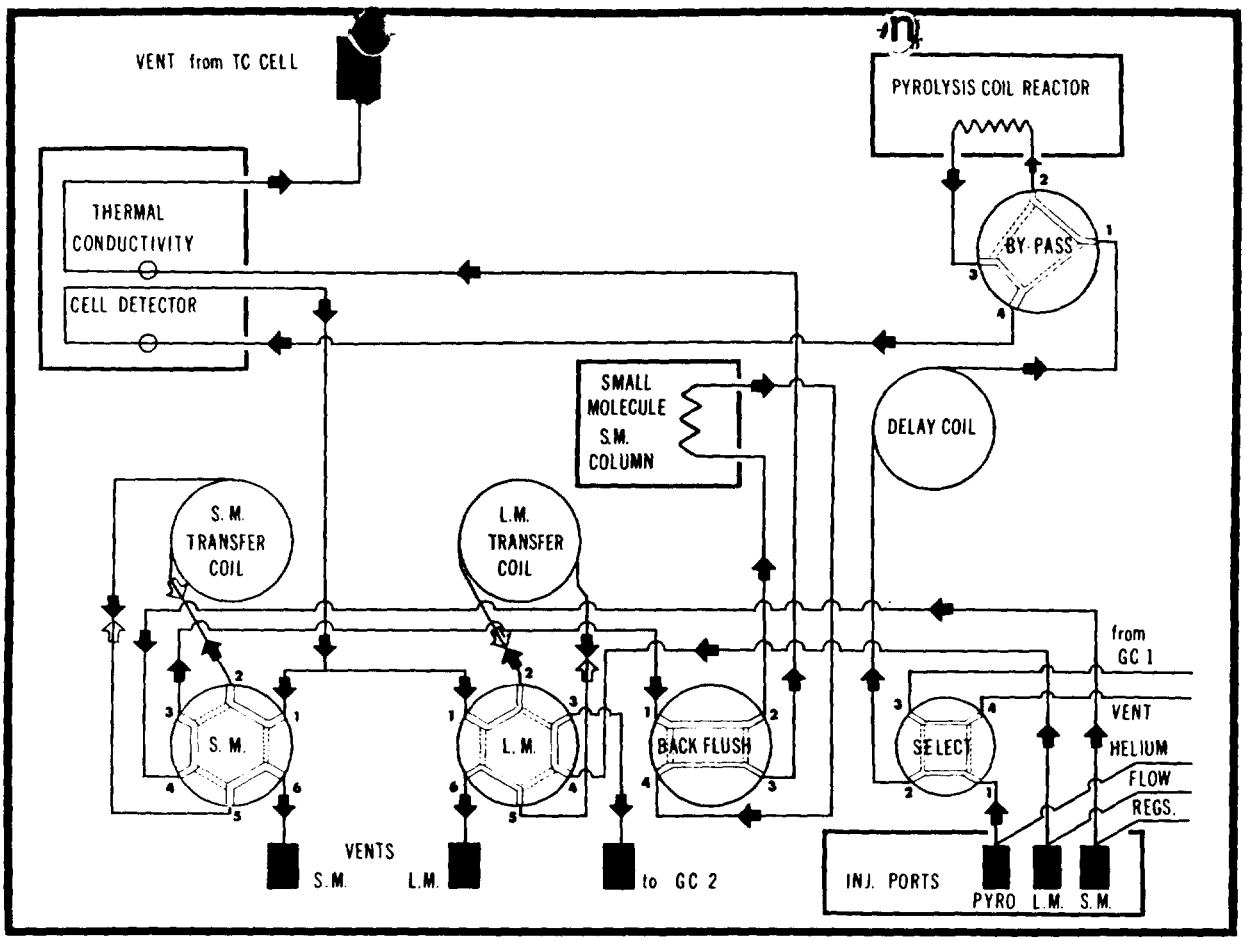


Figure 3. Pyrochrom Flow Diagram

For the analysis of smaller fragments such as CO, CO_2, H_2O, CH_4, etc. a self-contained gas chromatograph (FGA for Functional Group Analyzer) provided in the Pyrochrom is used. This unit consists of a chromatographic column and a thermal conductivity detector, and is provided with a backflushing arrangement so that the larger fragments can be driven back off the column after the analysis of the smaller fragments is complete. The column is packed with a combination 4 ft Chromosorb (a mixed porous polymer 104) and 8 ft Porapak Q. The analysis of the small molecules requires approximately 15 minutes.

The Hewlett-Packard 5750 GC serves as an external gas chromatograph (GC2) whose helium flow for the analytical column has been diverted so as to be available to backflush the second transfer coil and which is connected to the Pyrochrom by a heated transfer line. Through the use of the GC2, the larger fragments can be separated and analyzed. The GC2 is equipped with two flame ionization and a dual thermal conductivity detector, and is operated under dual column conditions.

The two analytical columns employed in GC2 are 20 ft x ⅛ in. o.d., s.s. tubes packed with 10% SE-30 on 80/100 Chromosorb W. The column oven is operated with linear temperature programming from 50 to 250°C with a heating rate of 10°C/min.

The operating conditions for the Model 100 Pyroprobe, GC1, Model 1100 Pyrochrom, FGA and GC2 chromatographs are given as follows:

100 Pyroprobe

Pyrolysis temperature	1000°C
Pyrolysis chamber temperature	150°C
Ramp (temperature rise)	20°C/msec
Interval (pyrolysis time)	10 sec

GC1

Injector temperature	245°C
Column oven temperature	220°C
TC-detector cell temperature	205°C
Flow rate He	40 ml/min (100 psi)
TC-bridge current	150 mA
Recorder speed	2/3 in./min

1100 Pyrochrom

Transfer line to GC1 temperature	220°C (STD)
Valve oven temperature	235°C (STD)
Injector temperature	235°C (STD)
Transfer line to GC2 temperature	235°C (STD)
Flow rate reactor He	25 ml/min (meter 1.0) (100 psi)
Flow rate FGA coil He	12.5 ml/min
Flow rate SD coil He	13 ml/min

nature of the parent material be deduced (13,14).

In the process of pyrolytic fragmentation, thermal energy applied to the organic molecule exceeds the energy of specific molecular bonds, and fractures the molecule into smaller molecules. At high temperatures of pyrolysis, organic compounds will fragment mainly into simple molecules; e.g., methane, hydrogen, carbon monoxide, water, etc. When the pyrolysis is conducted at lower temperatures, short-chained organic fragments are obtained.

Pyrolytic fragmentation is not a random phenomenon, but a process which can be statistically predicted. Under a given set of conditions for a thermal energy input, fracturing of specific molecular bonds is favored.

Experimental

A functional diagram of the equipment used in this investigation is shown in Figure 1. It consists of a 100 Solids Pyrolyzer (Figure 2) by Chemical Data Systems (15) attached to a Varian Aerograph 200 with a thermoconductivity detector (GC1), an 1100 Pyrochrom Pyrolyzer by Chemical Data Systems, which is described by S. F. Sarner, G. D. Pruder and E. J. Levy (8), (Figure 3), and a Hewlett-Packard 5750 dual column gas chromatograph (GC2) with 2 flame ionization (FID) and a dual thermal conductivity detector.

In a typical operation a sample is inserted in a thin walled quartz tube of approximately 25 mm length and 2 mm i.d. and then placed in the platinum coil of the pyrolysis probe.

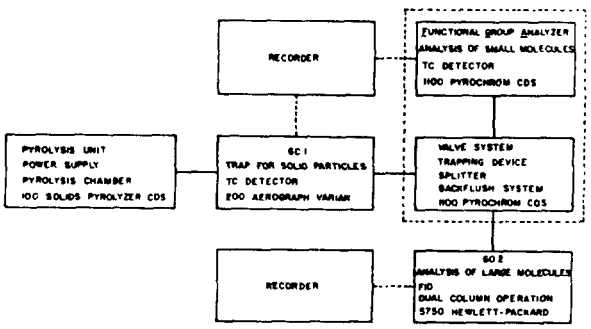


Figure 1. A functional diagram of the pyrolysis system.

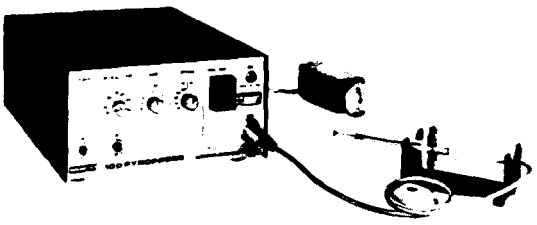


Figure 2. Pyroprobe 100 Solids Pyrolyzer

This pyrolyzer uses a platinum filament which serves as both a heater and a sensor and allows a high wattage to be applied to the coil, producing a rapid rise in temperature. The platinum ribbon probe has a rise time of less than 10 msec to 600°C, while the platinum coil probe has a rise time with quartz tubes in place of 600 msec to 600°C. When the filament reaches the preset temperature, variable continuously to 1000°C, a control circuit will cut back the power to keep the temperature constant for a time interval of 20 msec to 20 sec. As a recent study by Georges Guiochon (16) indicated, the important reproducibility parameter is not, in fact, the final temperature controllability, but is the control and rate of temperature rise. This instrument seems to meet the requirements for high reproducible thermal degradation. Because the pyrolysis probe does not fit directly into the injection port, a temperature controller is provided on the control module to maintain the pyrolysis chamber at any desired temperature from 50-500°C. This variable temperature pyrolysis probe is attached to the injection port of GC1.

The Varian 200 GC (GC1) is equipped with a 6 in. x 1/8 in. o.d. stainless steel column, fitted with either glass beads or 10% SE-30 on Chromosorb W. This column is used as a trap to hold back all solid and nonvolatile particles from the flow system. The trap has to be changed after 20 or 30 runs, depending on the nature of the polymer to be pyrolyzed.

The pyrolyzate is transferred through the thermoconductivity detector of GC1 and a heated line (3 ft. x 0.027 in. i.d., s.s., 50-300°C) to the 1100 Pyrochrom analyzer. This instrument normally is employed to use vapor phase pyrolysis for the identification of gas chromatographic effluents from GC1. However, when solids are pyrolyzed, the built-in gold reactor of the 1100 Pyrochrom is bypassed, since no further degradation of the fragments is desired.

By means of a selector valve a certain fraction of the GC1 effluent can be diverted into the Pyrochrom flow system (Figure 3). After bypassing the reactor, the sample flows through a thermal conductivity detector, the function of which is to provide a timing peak indicating that the sample has proceeded to this point. Next the sample is split into two segments, allowing for two simultaneous analyses. In each segment the sample is passed into a transfer coil by means of a transfer valve. At this time the valves are turned. This causes a separate helium flow, provided in each segment, to backflush the transfer coils into the analytical units. This arrangement allows the helium flow in the Pyrochrom to be independent of those required by analyses.

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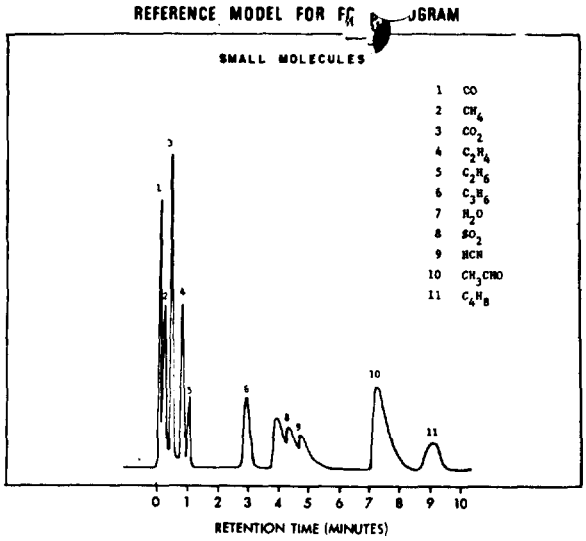


Figure 4. Reference model for the FGA pyrogram (small molecules).

C_2H_6, C_3H_6, H_2O, SO_2, HCN, CH_3CHO, C_4H_8. The nonpolar fragments, such as CO, CH_4, CO_2, C_2H_4, C_2H_6, etc., give sharp, well defined peaks. On the other hand, the polar fragments, such as H_2O, SO_2, HCN, CH_3CHO, NH_3, etc. show tailing peaks. The peak maximums of the polar fragments shift to lower retention times with increasing concentrations. However, the tailing sections of the peaks overlap independent of the concentrations used.

Whereas the FGA pyrogram gives more information concerning the functionality of a polymer, the GC2 pyrogram may be useful for the identification of monomers and molecular components of the parent material. However, in many instances the GC2 pyrogram can be used only as a "fingerprint." Assuming that the operating conditions remain constant, especially temperatures and flow rates, the pyrograms show good reproducibility. Therefore, the pattern recognition method can be used to compare different samples for their identity. Figure 5 shows a reference model of larger molecules (GC2 pyrogram). This summarized pyrogram depicts 15 characteristic fragments of olefins and aromatic compounds.

Several classes of polymer compounds have been investigated in this study. The various classes of compounds are listed in Table I. In this table also the characteristic small molecule fragments can be seen which are formed on pyrolysis of the parent polymer.

It should be mentioned that CH_4, C_2H_4, C_2H_6 are present in almost all cases, except where noted; C_3H_6 and C_4H_8 can be found according to the structure of the polymer.

Polyolefins do not give CO, CO_2, H_2O or only small amounts from impurities or treatments such as surfactants or plasticizers.

Polystyrene gives only traces of small molecules.

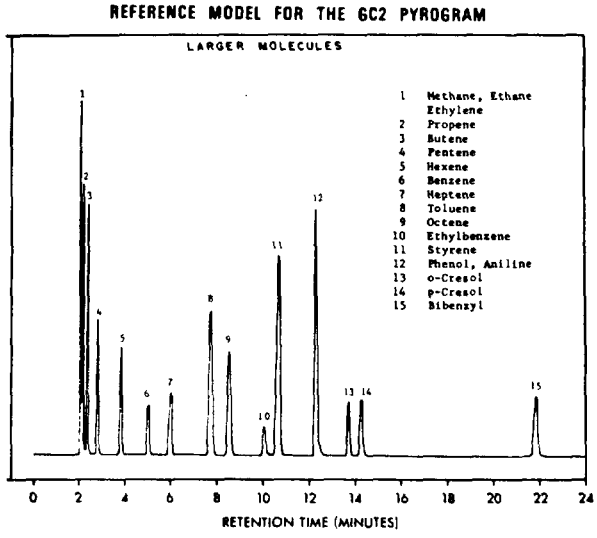


Figure 5. Reference model for the GC2 pyrogram (larger molecules).

Table I. Chemical Class Characterization from Small Molecule Patterns*

Class of Polymer	Characteristic Small Molecule Fragments
Polyolefins	No CO, CO_2, H_2O, etc. or only in small amounts from impurities or treatments (surfactants, plasticizers)
Polyester	CO, CO_2, H_2O, CH_3CHO—ratio $CO/CO_2 < 1$
Polyurethane	CO, CO_2, H_2O, CH_3CHO, unidentified fragment—ratio $CO/CO_2 < 1$
Polyether	CO, CO_2, H_2O, CH_3CHO—ratio $CO/CO_2 > 1$
Polyacrylonitrile	CO, CO_2, H_2O, HCN—$CO/CO_2 < 1$
Aliphatic Polyamide	CO, CO_2, NH_3, H_2O—$CO/CO_2 < 1$, NH_3 very weak
Aromatic Polyamide	CO, CO_2, H_2O—$CO/CO_2 < 1$, CH_4, C_2H_4, etc. often absent or only traces, depending on structure
Phenolics	CO, CO_2, H_2O—$CO/CO_2 > 1$, only CH_4
Polycarbohydrate	CO, CO_2, H_2O, CH_3CHO—$CO/CO_2 > 1$
Epoxy Resin	CO, CO_2, H_2O, CH_3CHO—$CO/CO_2 > 1$
Polycarbonate	CO, CO_2, only CH_4—$CO/CO_2 < 1$

*CH_4, C_2H_4, C_2H_6 present in all cases except where noted, C_3H_6 and C_4H_8 present according to structure.

FGA

Column oven temperature	130°C (130)
TC-detector cell temperature	280°C (STD)
TC-bridge current	180 mA
Flow rate FGA He	40 ml/min (meter 0.9) (100 psi)
Recorder speed	2/3 in./min

GC2

Injector temperature	80°C (5.5)
FID cell temperature	205°C (6)
TC-detector cell temperature	190°C (4)
Column oven temperature	50-250°C (recycle)
Temperature program	10°C/min linear
Post injection interval	2 min
Upper circuit interval	0
Column oven temperature overnight	200°C (isotherm)
Flow rate He column A	100 ml/min (100 psi)
Flow rate He column B	100 ml/min (100 psi)
Flow rate H_2 columns A+B	30 ml/min (12 psi)
Flow rate O_2 columns A+B	130 ml/min (14 psi)
Recorder speed	½ in./min

General Pyrolysis Procedure

For the pyrolysis of polymers a sample from 2-5 mg is inserted into a quartz tube which is then placed into the platinum coil, positioning it approximately in the middle of the coil. Then the probe is inserted into the chamber interface by holding the probe level in one hand and tightening the nut with the other. After the nut is tightened, a short wait period is recommended (ca. 1 min) before the pyrolysis is started. This procedure permits the air to be flushed out of the system. The temperature of the pyrolysis chamber should be kept at 150°C in order to remove all adsorbed water from the sample. The relative high temperature of 1000°C was chosen to obtain a good yield of both small and larger fragments.

After all air has been flushed out of the system, the bridge current of the thermal conductivity detector of GC1 is turned on and set to 150 mA. The "run" button on the Chemical Data Systems Pyroprobe 100 is pressed to start the pyrolysis, which is indicated by a deflection of a milliampmeter on the unit. The deflection results from a burst of current through the pyroprobe filament to produce the pyrolysis. When the peak of the pyrolyzate appears on the recorder trace, after 1 sec delay time, the selector valve is turned clockwise to GC1 position and is returned to "reactor" position after 5-7 sec. One should attempt to trap the whole peak within this time interval, otherwise the sample size analyzed could be increased or decreased, accordingly. It is more important to trap the peak within 5-7 sec than to be guided by the recorder trace. Longer trapping times are not recommended because the small fragments are not separated optimally in this case. In case of a wide peak either the peak maximum has to be trapped or the sample size decreased. The delay time is necessary to take into account the length of the transfer line and the flow rate (GC1) being used, since the appearance of the peak at the detector of GC1 will not coincide with the appearance of the peak at the selector valve. Delays will vary with transfer line size and flow rate (GC1), and therefore must be reestimated when changing operating conditions.

The sample fragments flow through a delay coil and bypass the reactor of the 1100 Pyrochrom and then flow through one side of the TC cell, causing an indication of the FGA recorder channel which is attenuated 64 times in addition to the attenuation selected. After this negative sample peak passes and the pen returns to the baseline, the transfer valves must be turned from "fill" to "run" position and the "inject start" button of GC2 pressed.

The temperature program starts with a 2 minute post injection interval and then continues with a heating rate of 10°C/min up to 250°C. The starting temperature should be kept at 50°C in order to get reproducible chromatograms.

By means of the built-in FGA, the small molecules are separated. Initially a pressure peak will be generated followed by a square wave disturbance peak. The pressure pulse is created by valve action in the 1100 Pyrochrom. The first product peak (CO) does not appear until the pressure peak has decayed and the early product peaks (CO, CH_4, CO_2) will appear on top of the square wave which has a flat displacement.

The GC column of the interval FGA is not designed to pass all products and is normally backflushed after the appearance of the butene peak (about 10 minutes after the CO peak) so as to clear the column for the next analysis. This is accomplished by turning the extreme left valve to the "backflush" position, and the FGA transfer valve from "run" to "fill" position.

The GC2 is employed for the analysis of the larger fragments. The C_1- and C_2- compounds are not separated under the operating conditions of this gas chromatograph. It should also be noted that CO, CO_2, H_2O, NH_3 are not detected by the flame ionization detector. The linear temperature program is used to resolve the higher boiling components in a reasonable time.

It is not necessary to turn both the FGA and the SD transfer valves unless both analyses are desired. The operations are independent, and if only one part of the analysis is to be conducted, only the corresponding transfer valve needs to be turned.

Results and Discussion

General

As was pointed out earlier, organic molecules decompose into several preferential fragments on pyrolysis. The nature and the quantity of the fragments reflect the elemental and structural character of the compound. The fragments consist of small (FGA pyrogram) and large (GC2 pyrogram) molecules, both of which contribute to the identity of the original material.

Separation and identification of the small molecules by the functional group analyzer gives valuable information to deduce the chemical class of polymer (7). Figure 4 shows a reference model for the FGA pyrogram indicating the positions (retention times) of all major small molecules; i.e., CO, CH_4, CO_2, C_2H_4,

Polyesters give CO, CO_2, [illegible] er and acetaldehyde, the ratio CO/CO_2 is smaller [illegible] h 1.

Polyurethanes give an additional fragment, which has not been identified, but is supposed to be isocyanic acid. Polyethers give the same fragments as polyesters, but the ratio CO/CO_2 is reversed. The characteristic fragment of polyacrylonitrile is hydrogen cyanide.

Aliphatic polyamides give ammonia as a characteristic fragment, but very often the amount is very small. Ammonia could not be found in the pyrolysis of aromatic polyamides.

Phenolic resins give CO, CO_2, water and methane; the ratio CO/CO_2 is greater than 1.

Polycarbohydrates such as cotton and epoxy resins also give acetaldehyde. On the pyrolysis of polycarbonates only CO, CO_2 and CH_4 could be found.

As in the case of the small molecules, certain general conclusions about the structure of polymeric systems can be drawn from the pyrograms of the larger molecules. Polyolefins can be recognized very easily by the sequence of olefinic and saturated hydrocarbon fragments. All materials containing aromatic components such as polystyrene, aromatic polyamides, esters, carbonates, phenolics, epoxy resins, etc. show benzene, toluene, ethylbenzene, styrene, etc. in a characteristic sequence.

Interpretation of Pyrolysis Products for Individual Polymers

The polymer compounds included in this study, together with their proposed structure and source, are listed in Table II. These were selected from a more comprehensive list of fibers, elastomers, thermoplasts, etc. under investigation in the laboratory to demonstrate the potential of the pyrolysis-GLC technique described in characterizing polymeric materials (17). Many of these polymers exist in an intractable physical state. Detailed interpretations of the pyrolysis products are given as follows. The interpretations for individual polymers include a discussion of the small molecules, resulting from the FGA, and the larger molecules from the GC2.

(1) *Polyethylene*

The material pyrolyzed in this study was previously used as a packing material to cushion analytical instruments. Its c[illegible]ical structure was unknown at that time. Pyroly[illegible] of this material resulted in a very rapid identification of its structure as polyethylene. Compared to pyrograms of high density polyethylene, only insignificant discrepancies can be observed. The FGA pyrogram depicts the presence of CH_4, C_2H_4, C_2H_6, C_3H_6, C_3H_8, C_4H_8 and C_4H_{10}. Ethylene is the main small molecule fragment as expected; furthermore, a rather large amount of C_3H_6 and C_3H_8 can be found (18). Almost all fragments could be identified in the GC2 pyrogram. The middle peak of the characteristic triple combination is the 1-olefin, the last peak is the saturated hydrocarbon with the same carbon number (Figures 6,7).

(2) *Polypropylene*

The small molecules produced when polypropylene is pyrolyzed are: CH_4, C_2H_4, C_2H_6, C_3H_6 and C_4H_8. Propylene is by far the most abundant product. The GC2 pyrogram is complex and completely different

FGA PYROGRAM FOR POLYETHYLENE

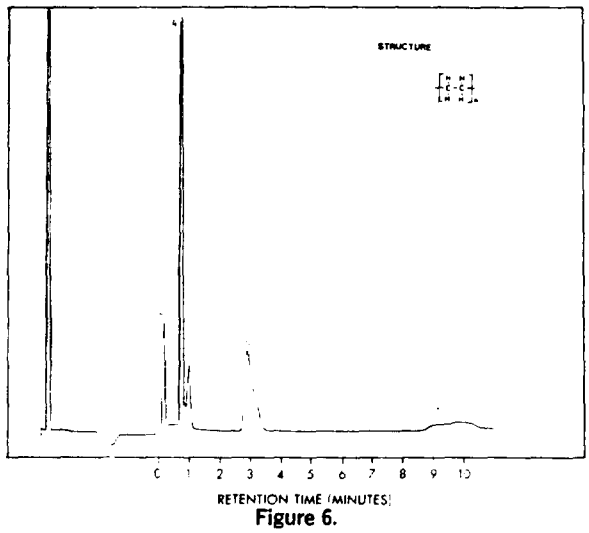


Figure 6.

17. Iglauer, N., Technical Report AFML-TR-72-274, AFML/TUA, Wright-Patterson Air Force Base, OH 45433.
18. Deur-Siftar, D., J. Gas Chromatog., 5, 81 (1967).

Table II. List of Polymers Investigated in this Study

Name	Structure	Source	Figure
1. Polyethylene	Polyethylene		6,7
2. Polypropylene	High density		8,9
3. Styrofoam	Polystyrene		10,11
4. VIB 5003	Polyester	Uniroyal	12,13
5. Genthane "S"	Polyurethane	General Tire	14,15
6. Polyvinylbutyral			16,17
7. TEKLAN	Modified acrylic		18,19
8. Cotton	Polycarbohydrate		20,21
9. Epoxy resin			22,23
10. Polycarbonate glass			24,25

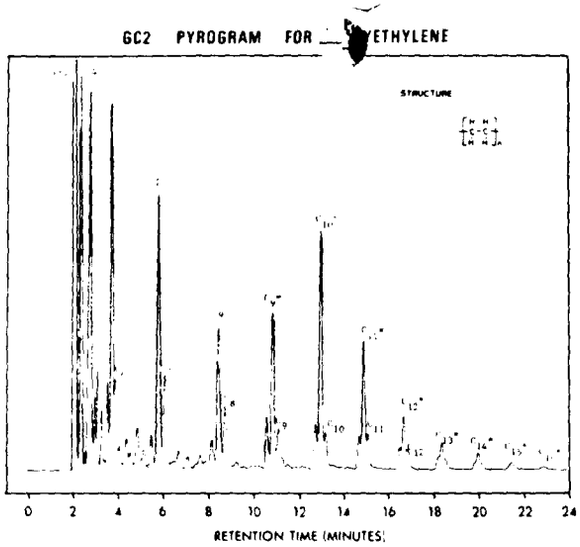


Figure 7.

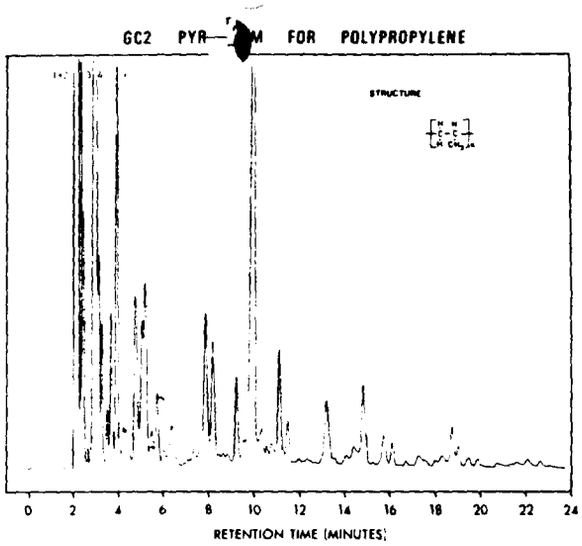


Figure 9.

from that of polyethylene. No attempt has been made to identify the individual fragments (Figures 8,9).

(3) *Polystyrene*

Styrofoam was used as the sample in this study. On pyrolysis of this material only traces of small molecules (CH_4, CO_2) were found. The GC2 pyrogram gave all the information needed to identify this polymer. Toluene, styrene and α-methylstyrene are the main pyrolysis products. Furthermore, benzene, ethylbenzene, isopropylbenzene, allylbenzene, β-methylstyrene, methallylbenzene, 1-phenyl-3-butene and dibenzyl are indicated in the pyrogram (19). Only the components listed in Figure 5 are labeled in the GC2 pyrogram (Figures 10,11).

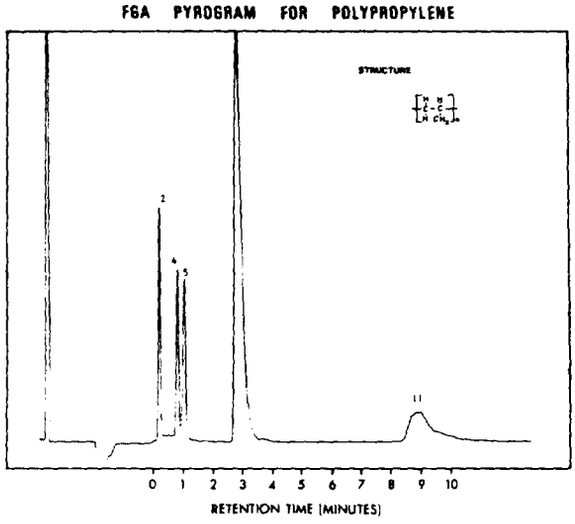


Figure 8.

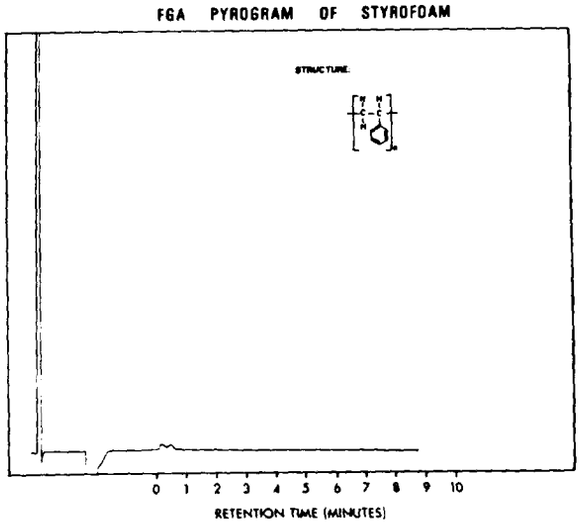


Figure 10.

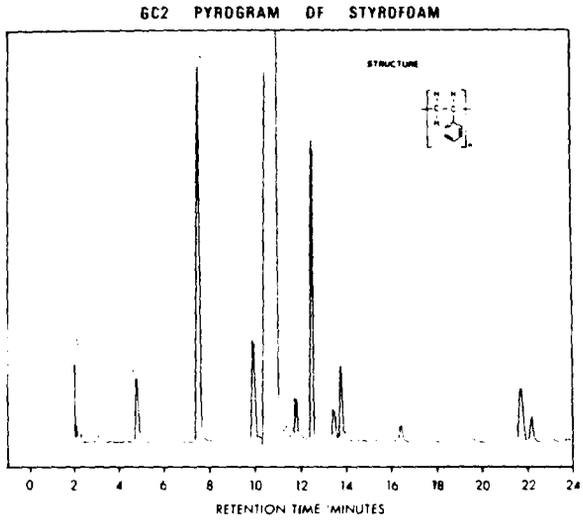


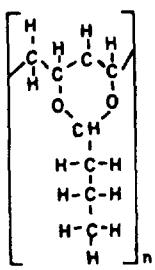
Figure 11.

19. Iglauer, N., and Bentley, F. F., Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, March 5, 1973, paper 58.

(4,5) *Polyester and Polyurethane*

A polyester produced CO, CH_4, CO_2, C_2H_4, C_2H_6, C_3H_6, H_2O and acetaldehyde on pyrolysis. A polyurethane polymer yields the same small molecule fragments and in addition a fragment supposed to be isocyanic acid. The small molecule products present a very characteristic fragmentation pattern for these types of polymers. Acetaldehyde, CO and CO_2, are the main fragments. A large CO_2 peak appears in the FGA pyrogram to indicate the presence of a carbonyl group. The GC2 pyrograms of the polyester and polyurethane samples studied are very similar, pointing out that one component, probably the alcoholic, must be the same in both polymers (Figures 12,13,14,15). The peak at 3 minute region in polyester absent from polyurethane pattern indicates the presence of $C_{=5}$. Based on the reference model for the GC2 pyrogram (Figure 5) the weak peaks at 5 and 10 minutes respectively appear to agree with retention times for benzene and ethylbenzene.

As an example for a compound with ether groups, polyvinylbutyral was used. The most characteristic fact on the pyrolysis of an ether is the large amount of CO compared to CO_2. Acetaldehyde is observed also as a significant fragment. The appearance of relatively large amounts of C_2H_4 and C_3H_6 indicate that C_2 and C_3 molecular groups have to be part of the compound. The structure of the polymer is given below:



The GC2 pyrogram is not of much help in deducing the structure of this polymer (Figures 16,17).

FGA PYROGRAM FOR VIB 5003; UNIROYAL

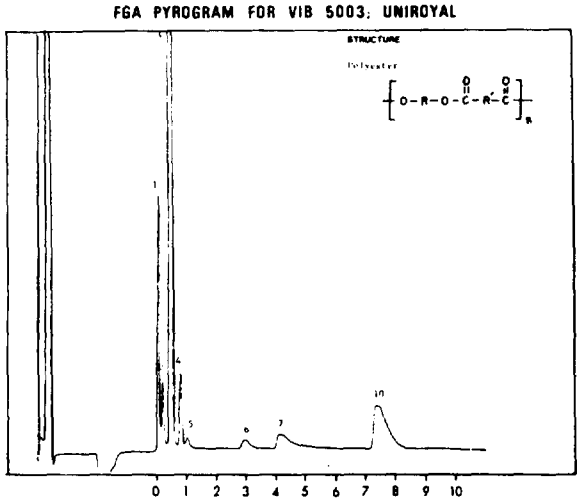


Figure 12.

GC2 PYROGRAM FOR VIB 5003; UNIROYAL

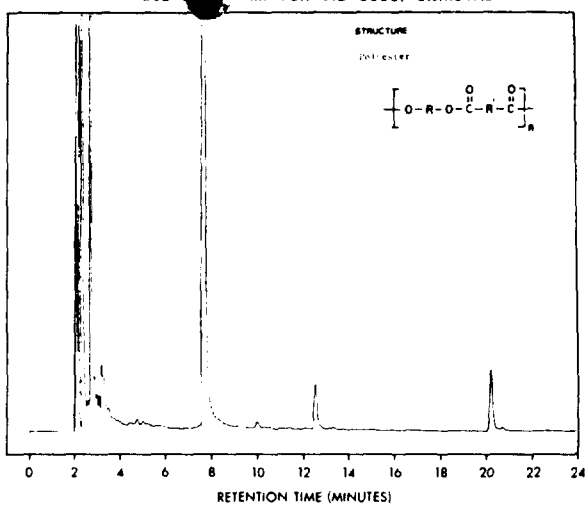


Figure 13.

FGA PYROGRAM FOR GENTHANE "S"; GENERAL TIRE

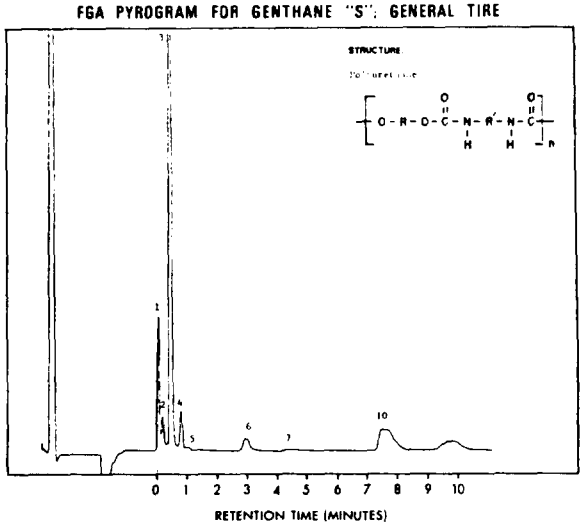


Figure 14.

GC2 PYROGRAM FOR GENTHANE "S"; GENERAL TIRE

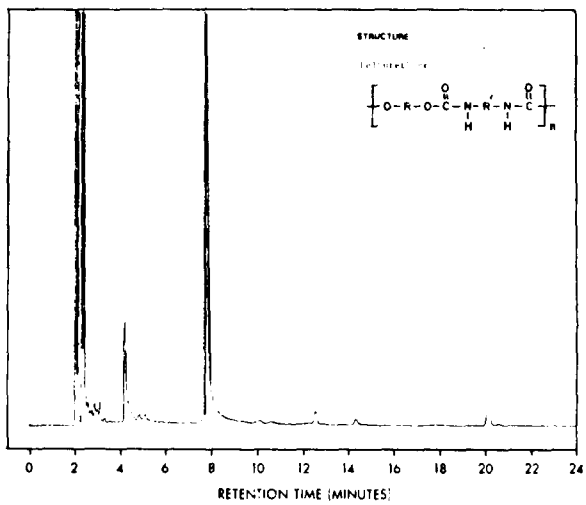


Figure 15.

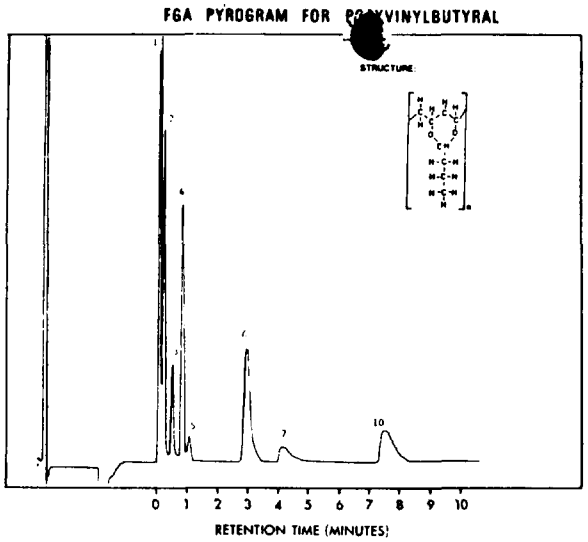


Figure 16.

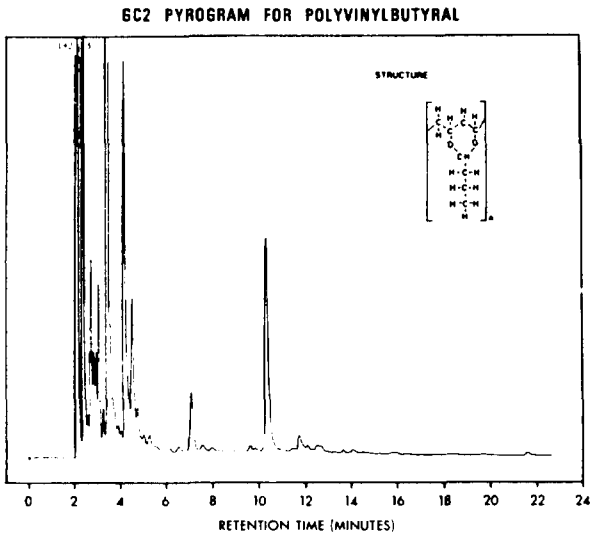


Figure 17.

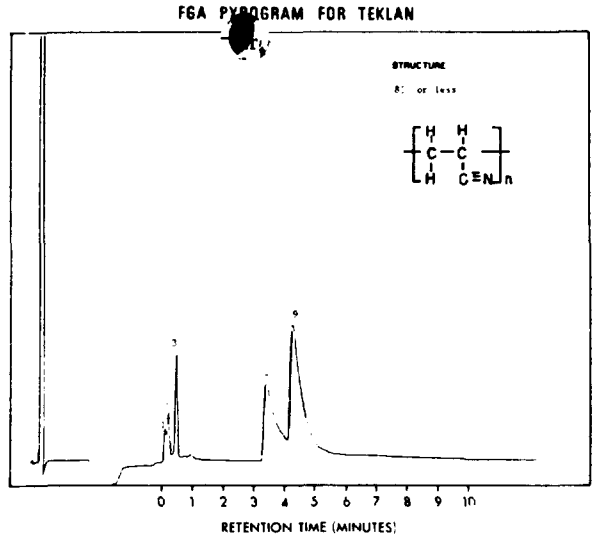


Figure 18.

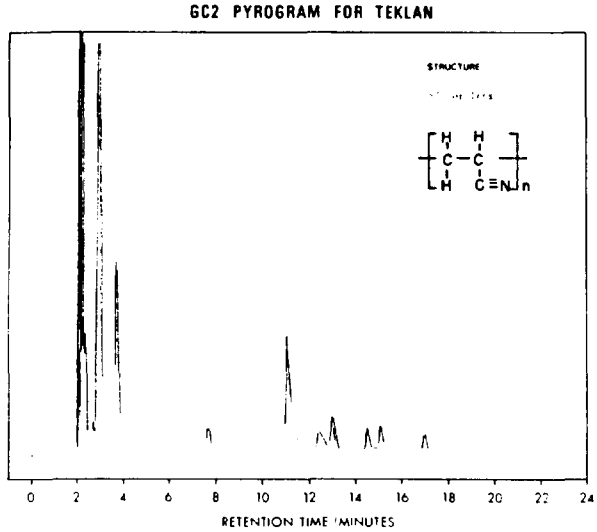


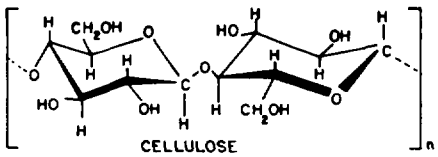
Figure 19.

(7) *Polyacrylonitrile*

On pyrolysis TEKLAN, a modified acrylic fiber (made from 85% or less acrylonitrile) gives HCN as a significant fragment, beside that CO, CH_4, CO_2, C_2H_4, C_3H_6 and water can be found in the small molecule pyrogram. The GC2 pyrogram indicates the presence of $C_1 + C_2$, and some C_3 and C_4 hydrocarbons as pyrolysis products (20) (Figures 18,19).

(8) *Cotton*

Cotton consists of almost pure cellulose, which consists of 1'-4 β-linked cellobiose units:



The main fragmentation products are CO, CO_2 and H_2O; smaller amounts of CH_4, C_2H_4 and CH_3CHO can be found in the FGA pyrogram. The GC2 pyrogram does not yield useful information; it can be used as "fingerprint" only (Figures 20,21).

(9) *Epoxy Resin*

The FGA pyrogram shows a significant pattern for this type of compound. The main fragments are CO, CO_2 and H_2O. The most characteristic degradation product is acetaldehyde beside CH_4, C_2H_4, C_2H_6, C_3H_6 and C_4H_8.

The GC2 pyrogram gives evidence of the presence

20. Lehrle, R. S., Robb, J. C., J. Gas Chromatog., 5, 89 (1967).

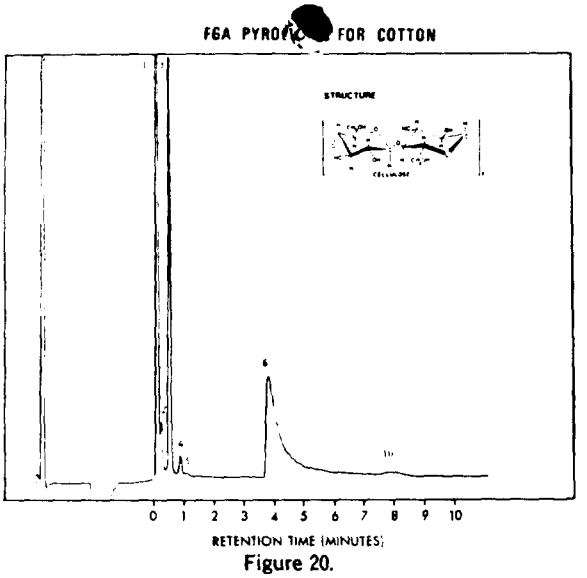


Figure 20.

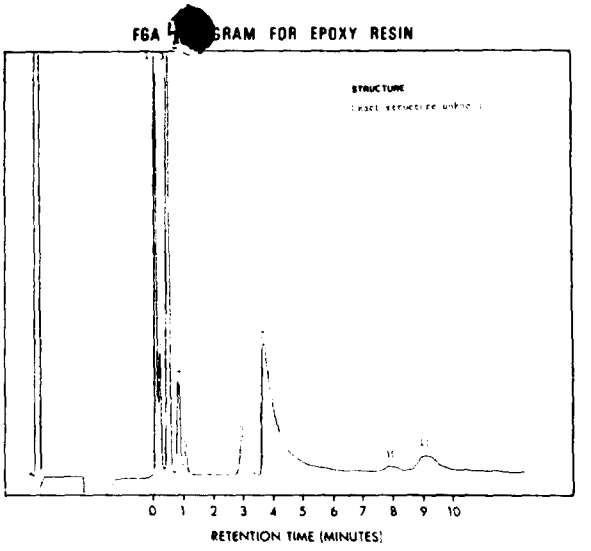


Figure 22.

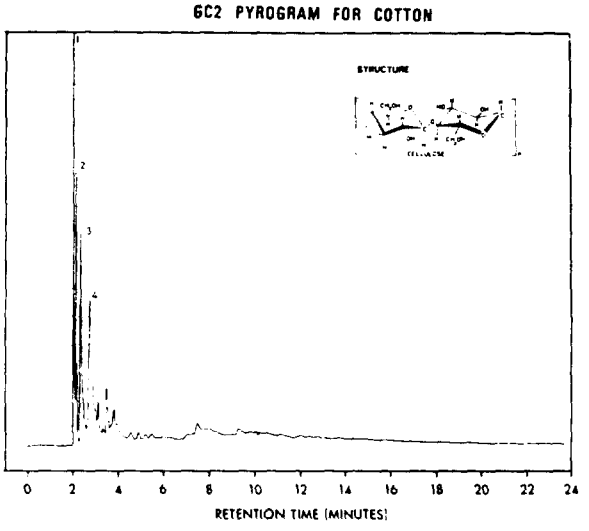


Figure 21.

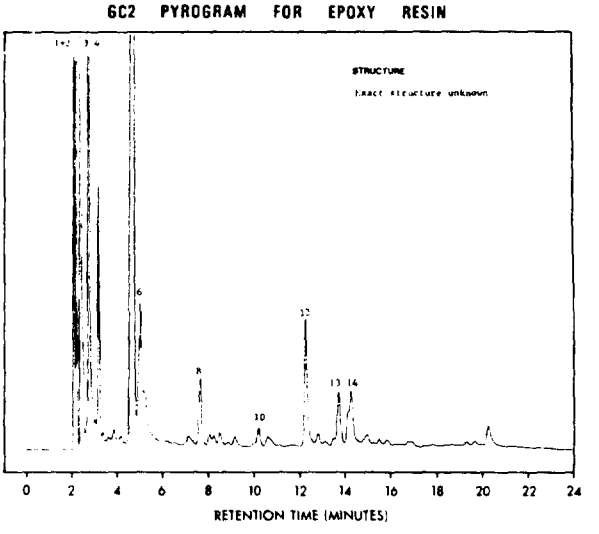


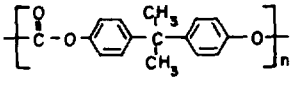
Figure 23.

of aromatic components within the molecule. Benzene, toluene, ethylbenzene, styrene, phenol, o- and p-cresol can be found here (Figures 22,23).

(10) *Polycarbonate Glass*

The last compound selected to illustrate the potential of the pyrolysis-GLC technique in determining the molecular structure of polymers was a polycarbonate glass.

The structure of this polymer is:



It was not surprising that CO, CH_4 and CO_2 were for the most part the only small molecules observed when this material was pyrolyzed. In the GC2 pyrogram also a small amount of C_3 appears. The other identified fragments were benzene, toluene, ethylbenzene, styrene, isopropylbenzene, phenol, α-methylstyrene, o-cresol and p-cresol (21) (Figures 24,25).

Conclusions

The pyrolysis gas chromatography method described herein appears to offer considerable promise as a technique to identify the structure of polymeric materials from their pyrolysis products. The experi-

21. Davis, A., Golden, J. H., J. Gas Chromatog., 5, 81 (1967).

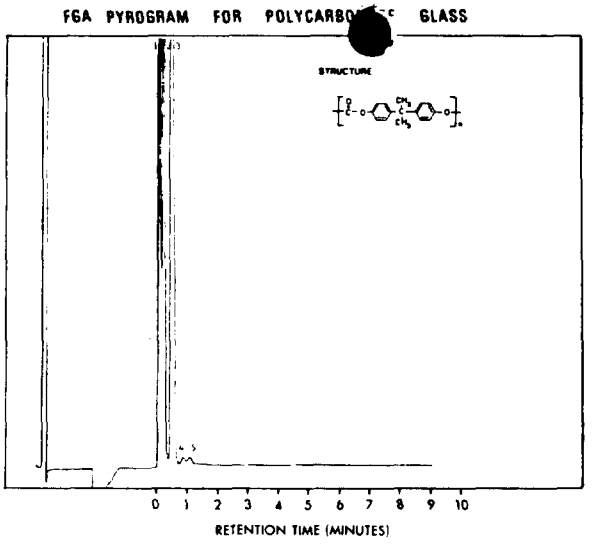


Figure 24.

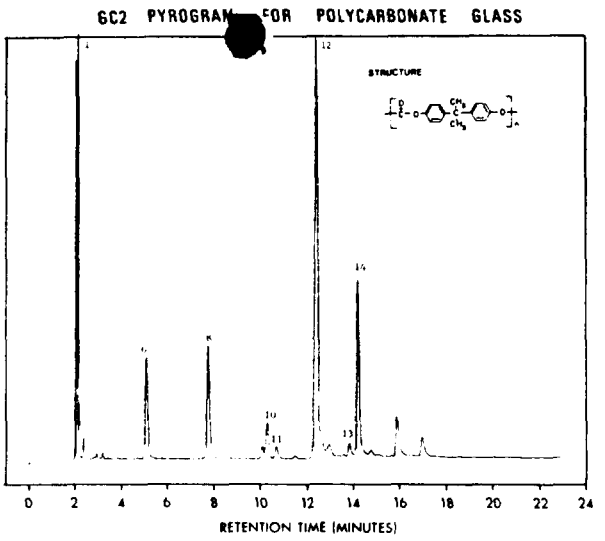


Figure 25.

mental set-up permits the determination of both small and large components present under optimum conditions in a reasonable time. Separation and identification of the small molecules provides information on the functionality of the polymer while the identity of the large molecules gives specific information on the molecular components of the parent material. The pyrograms obtained not only serve as "fingerprints" of polymers, but also permit a detailed qualitative and quantitative analysis of the fragments of the pyrolyzate. The rapid and reliable analysis of intractable polymers in the mg sample range appears to offer some advantages over other analytical methods such as infrared and NMR spectroscopy.

Acknowledgment

We are indebted to Dr. E. J. Levy for the use of the photographs of the Chemical Data Systems Pyroprobe 100 Solid Analyzer and the Pyrochrom 1100 Flow Diagram. ■

Manuscript received March 28, 1973

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Rita,

As promised I am enclosing a copy of Dr. Moore's gas migration report. If other questions or need for other printed material arise, please let me know.

Chris Phyne

P.S. Please keep me posted on the status of the Louisville gas problem.

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CONCLUSIONS AND RECOMMENDATIONS

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CONCEPTUAL DESIGNS
FOR
GAS MIGRATION CONTROL SYSTEMS
FOR
CITY OF HOPKINS LANDFILL

by

Charles A. Moore

Ronald M. McOmber

DRAFT REPORT

September 1977

SECTION 1

BACKGROUND

The city of Hopkins, Minnesota, sanitary landfill (Wefald, E., 1975) constitutes a potential hazard to adjacent townhouses when organic refuse decomposes generating methane gas. The sanitary landfill comprises 37.2 acres and is located in the NW 1/4 of the SW 1/4, section 25, Township 117 North, Range 22 West in the city of Hopkins, Hennepin County, Minnesota (Figure 1). The study by Wefald was limited to an area adjacent to the Westbrook Patio Homes. Figure 2 shows the landfill venting cross-section as proposed by Wefald.

The first author was made aware of this problem on April 3, 1975. As a part of an on-going EPA contract, computer simulations were performed based on limited site data which indicated that methane could be expected to migrate to the subject townhouses at levels within the potential explosion range of 5 to 15 percent methane in air. In a letter report, dated May 14, 1975 the feasibility of using trench type vents to control methane migration was investigated in a preliminary manner. The investigation was preliminary in that adequate computer models for design of methane migration control facilities were in an embryonic state. Only unpumped trench vents could be treated, and then only in terms of a trench efficiency factor which could not be readily related to specific and measurable site conditions.

In March 1976, the US EPA contracted with the Ohio State University Research Foundation to develop computer models to simulate a variety of practical gas migration control systems for sanitary landfills. A contract modification in early 1977 resulted in the development of conceptual designs for gas migration control devices for the Hopkins landfill. This report presents the results of that investigation.

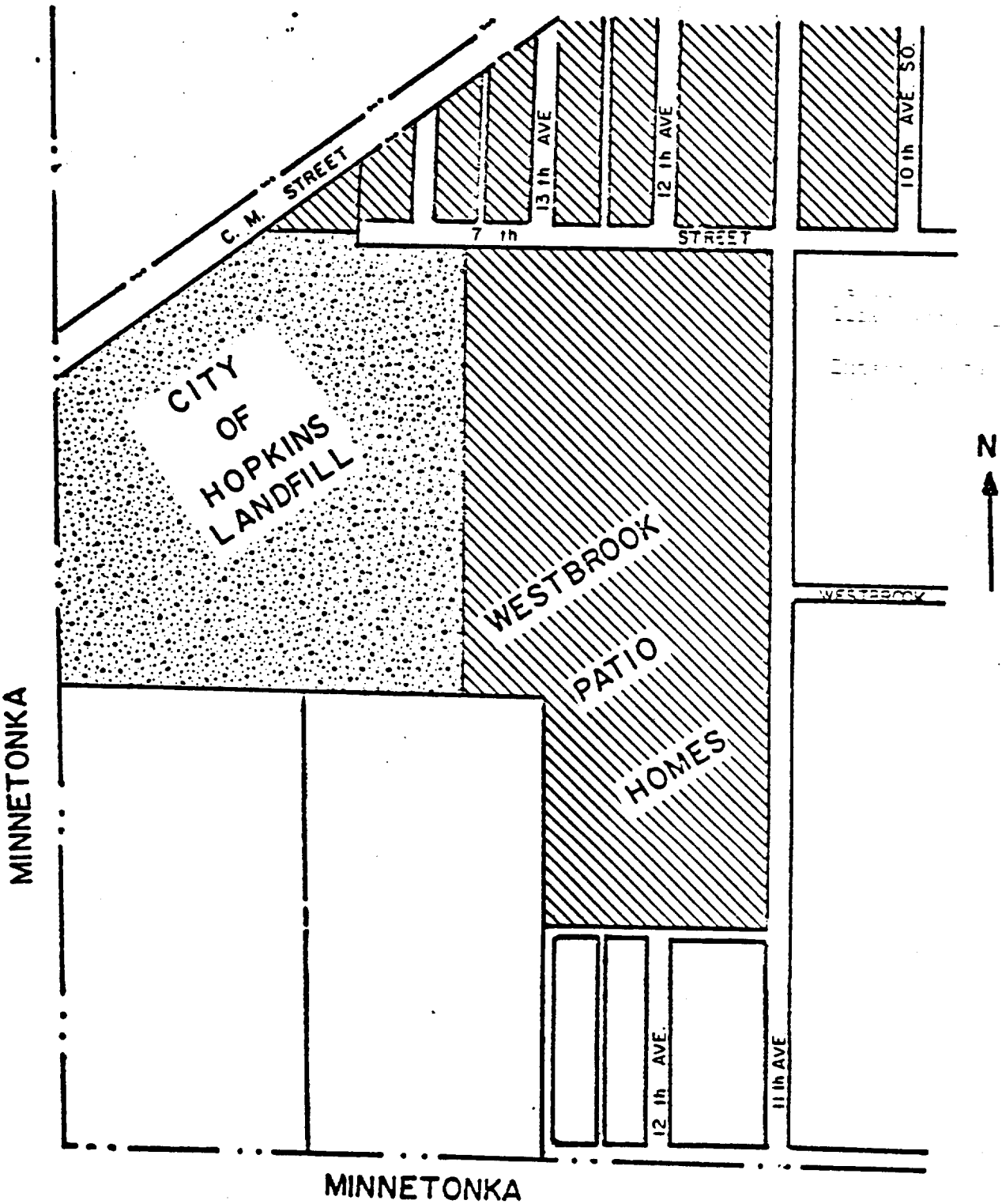

FIGURE 1 Location Map, City of Hopkins Landfill (after Wefald, 1975)

FIGURES

No.		Page
1	Location Map, City of Hopkins Landfill (after Wefald, 1975)	
2	Cross-section at Landfill Site	
3	Methane Mole Fraction Contours Without Controls	
4	Comparison of Effectiveness of Methane Migration Control Devices Showing Steady State 5% Methane Contours	
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6	Extent of Readvance of 5% Methane Level (shaded) as a Function of Time After System Shut Down	

SECTION 2

SITE INFORMATION

Data on site conditions were provided in the form of boring logs and site plans by Hennepin county officials. These data were analysed by project personnel and field geometry and material properties which adequately represented the site conditions within the constraints imposed by the computer program capabilities were developed. The existing soil at the site is a mixture of gravel, sand, clay and organics. Soil conditions were reported in two separate sets of boring logs and differences were noted in the descriptions of materials, presumably because different engineers described the soil. For purposes of this study the soil was approximated as a material having a mean pore radius of 12,000 Å.

The ground water table was relatively consistently encountered at a depth of 7.5 meters (24.6 feet) and this was taken as the depth to an impervious layer in the computer simulation. The landfill itself extended to a depth somewhat below the ground water table.

The distance from the landfill to the townhouses varied; however, 30 meters (98 feet) was taken as an average distance. The venting at the ground surface was taken to be that which would occur with an average five mile per hour wind and no account was made for ground surface freezing. The methane generation rate within the fill was taken to be 9.5×10^{-2} continuously with an initial methane concentration of 70 percent within the fill and zero percent in the surrounding soil.

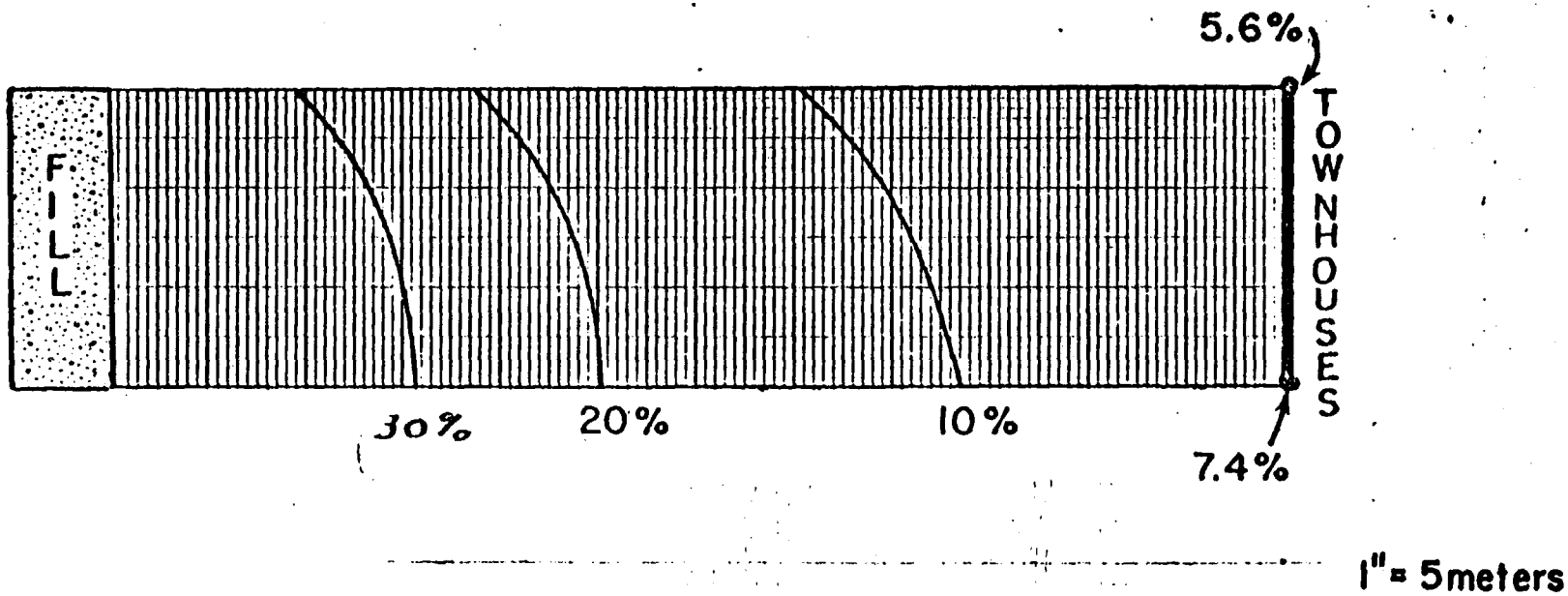


FIGURE 3 Methane Mole Fraction Contours Without Controls

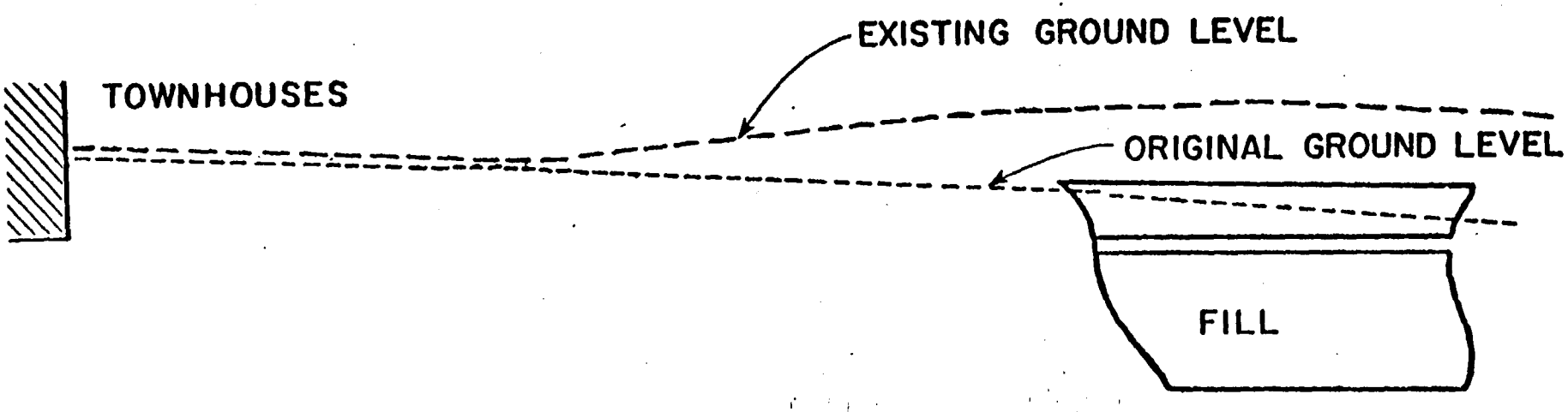


FIGURE 2 Cross-section at Landfill Site

SECTION 3

GAS MIGRATION WITHOUT CONTROLS

The computer code was initially run without any gas migration control devices. The methane concentrations as a function of position at five years (after steady state had been reached) are shown in Figure 3. It may be noted that the 5 percent methane contour extends to the townhouse. An attempt was made to correlate the predicted methane concentrations with those measured in the field during the winter of 1975-1976. Reasonable agreement was found; however, the field data showed considerable erratic fluctuation and the meter employed could not resolve methane concentration above the lower explosive limit (5 percent).

SECTION 4

CONTROL DEVICES CONSIDERED

After consultation with Hennepin County engineers, it was determined that gas migration control facilities could best be installed approximately 5 meters (16.4 feet) from the edge of the landfill. This location was chosen to avoid interfering with utilities adjacent to the townhouses. The approach to analysis was to evaluate a variety of possible control facilities in a preliminary manner and to more carefully investigate the type of facility which appeared to offer the optimum solution.

Previous experience with similar installations has shown that trenches filled with gravel and employing no pumping are of limited effectiveness. Thus, this alternative was not considered.

The systems considered were pumped trenches employing both exhaust pumping and recharge pumping, and impermeable barriers. Two depths, one-third and two-thirds penetration to the ground water table, were treated. Figure 4a presents the results for penetration two-thirds of the way to bedrock while figure 4b presents the results for penetration one-third of the way to bedrock.

It may be seen from figure 4a that a barrier alone retards the methane migration noticeably, the 5 percent level having receded at steady state some 7.5 meters (25 feet) in from the townhouse. While this approach might be considered to alleviate the problem, the authors prefer to employ gas migration control facilities that retract the 5 percent methane contour back to the landfill side of the installation. Reference to figure 4a shows that recharge pumping systems employing 1 or 2 cubic feet per minute per linear foot of trench are effective in restricting the 5 percent methane contour to within the region between the landfill and the installation. Exhaust pumping at 2 cubic feet per minute is somewhat less effective. In order to test the feasibility of using a shallower trench, the data shown in figure 4b were obtained. Here it is noted that a recharge pumping system involving 2 cubic feet per minute per linear foot of trench was also effective in controlling methane migration.

It was concluded that an effective methane migration control installation would involve recharge pumping at a rate of 2 or more cubic feet per minute per linear foot of trench into a sealed top clay gravel filled trench penetrating 2.5 meters (8.2 feet) into the ground (one-third of the depth to the ground water table). The trench should be installed beyond the edge of the landfill. If any landfill material extends beyond the installation, the recharge pumping system would force the methane generated therein towards the townhouses.

Sealing the trench top increases the effectiveness of the system. Compacted soil may be used to effect the seal and turf may be developed on the soil if desired.

SMOKELESS FLARING

of Hydrocarbon Vapors, Onshore or Offshore

■ In refineries and petrochemical plants, smokeless flaring operations are necessary to insure complete combustion of the heavy and unsaturated hydrocarbon vapors. Steam injection can be employed in most refineries and petroleum or petrochemical processing facilities to produce smokeless operation and efficient flaring of the hydrocarbon vapors.

With drilling platforms and other energy-production operations, the hydrocarbon streams are of low molecular weight. Generally speaking, these hydrocarbon vapors produce little or no smoke. But when smoking presents problems, we cannot use steam injection for efficient, smokeless flaring of the hydrocarbon vapors.

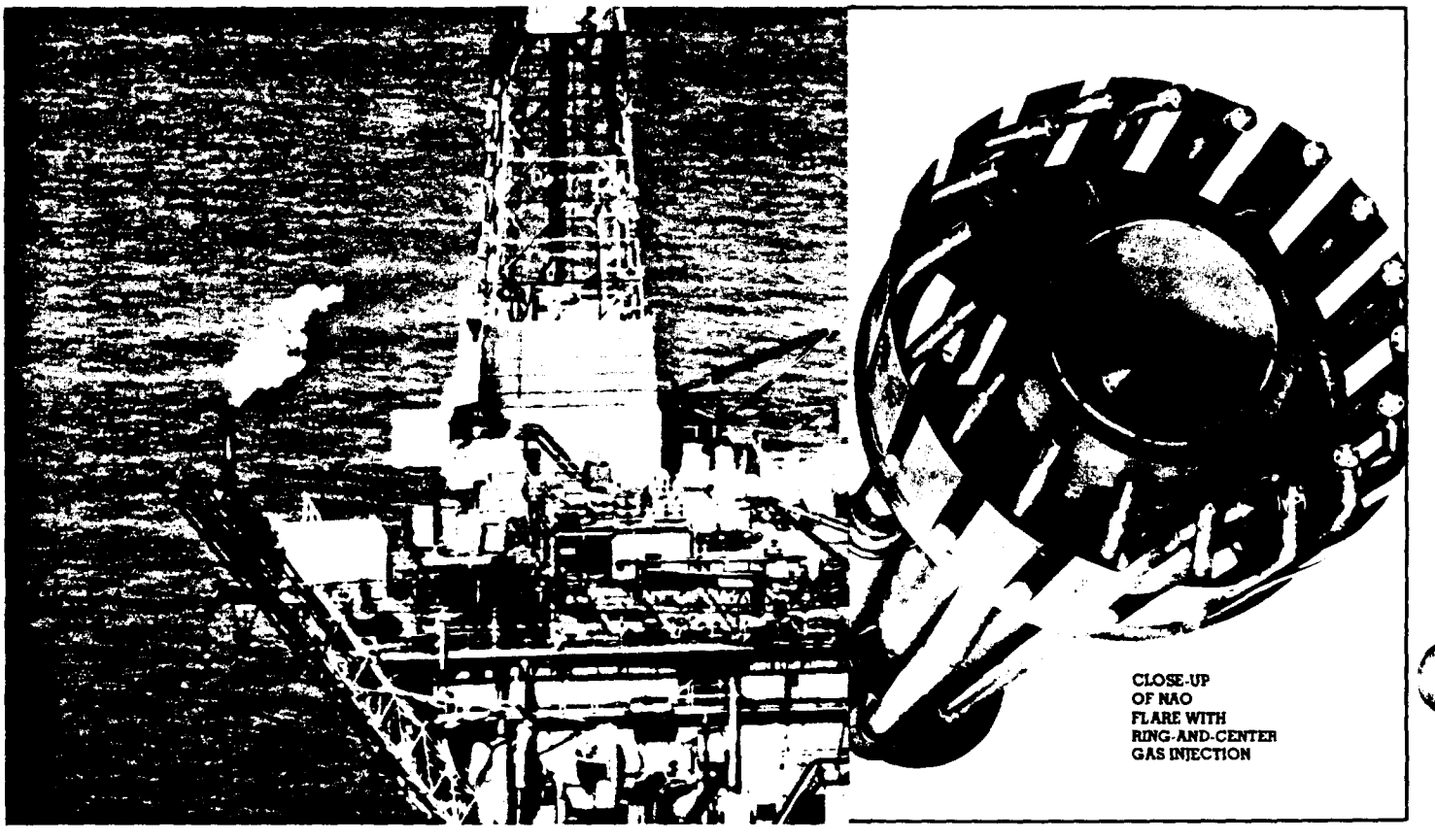
Onshore or Offshore: Steam is not usually available around a drilling rig, especially an offshore platform. Other methods must, therefore, be employed to achieve smokeless flaring. These alternate methods include: injection of high-pressure gas to provide turbulence and efficient mixing of the fuel/air combustible mixture; high-velocity Jet-Mix® action flares; water-spray systems; or the use of forced-air blowers.

The use of a high-pressure assist gas will produce smokeless operation, but it has several drawbacks: increased thermal radiation due to the addition of the heating value of the high-pressure gas; waste of energy; and costly operation. Gas-assist flares require approximately 0.15 to 0.30 lb of high-pressure gas per pound of waste-flare gas from a production platform.

For an offshore platform, where a high-pressure assist gas is readily available, the gas-assist method may offer distinct advantages.

Direct injection of water, sprayed into the flare, also will eliminate

Smokeless flaring for offshore platform is achieved with an NAO ring-and-center gas-injection flare system.



SPECIAL GROUND FLARE

HANDLES EIGHT DIFFERENT WASTE GASES PLUS A SOUR-WATER STREAM

Recently installed at Shin-Nittetsu (Nippon Steel) Chemical Co., Ltd. in Oita City, Japan, is a very special NAO ground flare.

Chamber Within a Chamber: Designed as a chamber within a chamber* to provide high turndown ratios — to efficiently dispose of eight different waste gases with widely varying flows, temperatures and pressures — this 65-ft ground flare also oxidizes a sour-waste-water stream.

Six nozzles, located around the periphery of the inner combustion chamber, vaporize the sour liquid waste for ultra-efficient disposal of up to 55 gpm of dirty, contaminated water.

The eight waste gases range from hydrogen-rich compounds (89% H_2) to extremely heavy gases. Examples include: hydrogen-rich vapors, with trace amounts of ill-smelling hydrogen sulfide to heavy paraffins, olefins, diolefins, B.T.X. (benzene, toluene, xylene), all the way to cyclopentadiene, a very heavy, difficult-to-burn gas used in the manufacture of plastics and insecticides.

Molecular weights vary from approximately 4.4 to 68.3. Available pressures range from a low of about 4 psig for a heavy C_5 absorber-vent gas to approximately 28 psig for the hydrogen-rich streams.

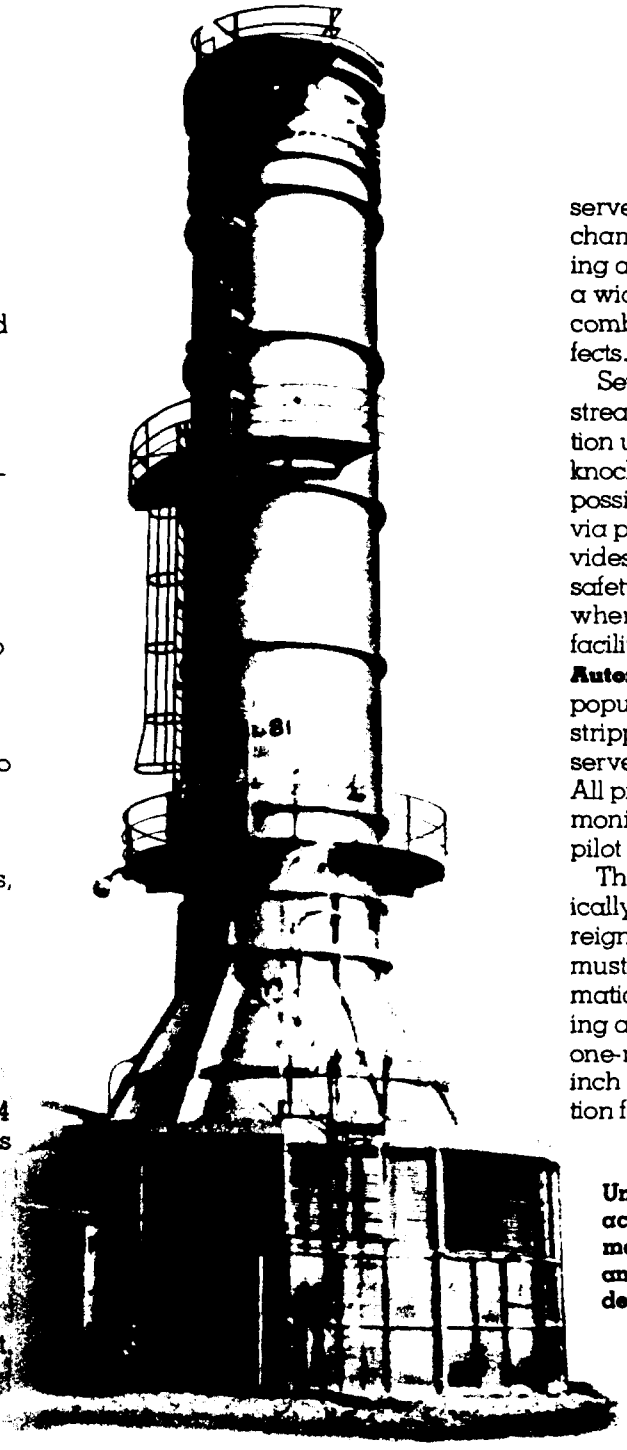
Densely Populated Area: This unique ground flare is installed in a densely populated area of Japan, where safety, pollution and noise-control requirements are especially stringent. To satisfy these tight control requirements, NAO engineered this chamber-within-a-chamber flaring system for smokeless combustion of all waste gases and the sour-liquid-waste stream . . . without steam . . . with no thermal radiation . . . and with no visible light.

To meet Shin-Nittetsu's very tight noise-level specifications, a ceramic-blanket-lined combustion chamber absorbs most reverberations and combustion noises. NAO's "acoustical fence" — with special soft, absorbent lining and perforated cover plate — serves as a very effective anechoic chamber because of its high dampening and noise absorption actions over a wide frequency range. This is due to combined dissipative and reactive effects.

Seven of the eight waste-gas streams are isolated from the combustion units by a water seal and a knockout drum. This protection from possible flashback or liquid carryover, via proven NAO components, provides the important extra margin of safety in this densely populated area where the petrochemical processing facility is located.

Automatic Ignition: For this special populated area ground flare, an H_2S stripper gas (one of the waste gases) serves as the pilot and assist gas. All pilots include individual flame monitors for continuous monitoring of pilot operation.

These NAO flare pilots are automatically and simultaneously ignited or reignited whenever a waste-gas flow must be disposed of. An NAO automatic ignitor panel, capable of shooting a 60-mph flame front through a one-mile equivalent length of one-inch pipe, insures dependable operation for this unique ground flare.



Unique NAO ground flare system, actually a chamber within a chamber, meets stringent safety, pollution and noise-level requirements for a densely populated area in Japan.

*patent pending

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smoke. The amount of water requi will depend upon the degree of atomization of the water stream and the particle size. With NAO's fine-atomizing nozzles, approximately 1 to 2 lb of water will be required for each pound of hydrocarbon vapor. (If the molecular weight of the flare gas increases, then the amount of water must be increased.)

Poor Design: With a coarse water spray, the amount of water required will increase as much as tenfold. And most of the water will fall through the flame without being utilized!

For offshore-platform operations where sufficient waste gas pressure is available, NAO's Jet-Mix® flaring systems provide smokeless operation. These unique flare tips employ a vortex action to insure flame retention and stability. They are capable of achieving high velocities, well in excess of 5/10s of sonic. This exit velocity is significantly higher than the maximum flame-stability velocity of a conventional flare tip.

With Jet-Mix® flaring systems, typical operating pressures range from 5 to 50 psig, with the higher pressures offering better turndown and improved mixing.

For applications requiring very wide flow-rate changes, staging systems — with multiple Jet-Mix® flare tips — should be considered.

Versatile, Flexible System: The most versatile and flexible smokeless flaring system is the forced-air blower with its coaxial gas and air ducts. With this versatile NAO system, primary air is mixed with the flare gas as the waste gas leaves the flare tip. Since the air stream has a velocity of 60 mph, it creates its own artificial wind.

The artificial wind holds the flame erect, regardless of ambient wind conditions. And the ultra-stable flame pattern reduces the possibility of flame tilt and thermal radiation in the work area.

Automatic controls and reliable pilots, with individual windshields, prevent hazardous or environmentally offensive discharges to the atmosphere.

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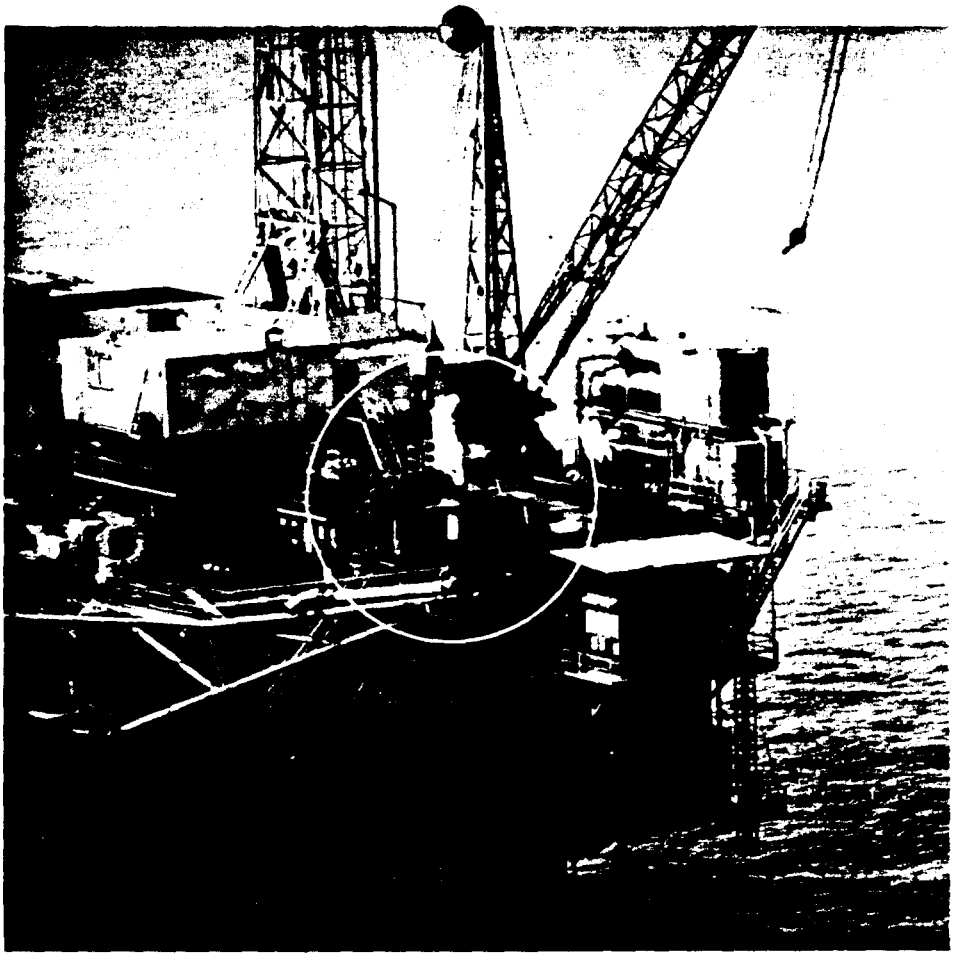
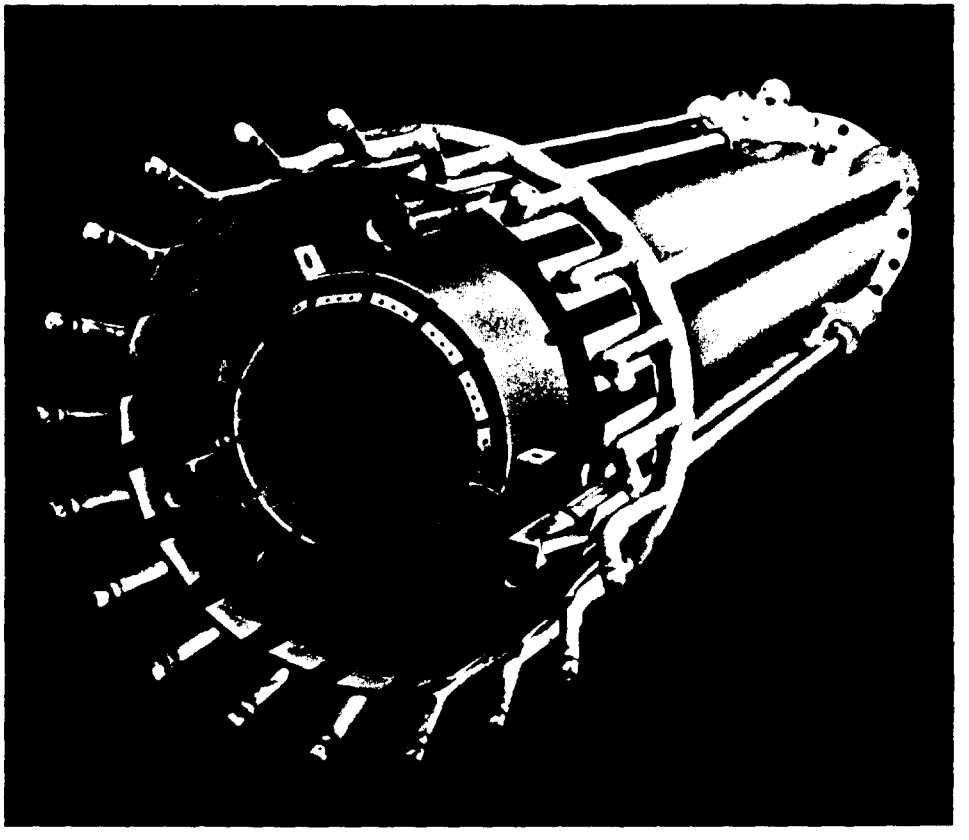


NAO smokeless air-blower flare is mounted on a boom for this offshore drilling platform in Cook Inlet, Alaska.

Direct injection of water, sprayed into the flare, will eliminate smoke. With NAO's fine-atomizing nozzles, approximately 1 to 2 lb of water will be required for each pound of hydrocarbon vapor. Nozzles are tipped out so flame can't move out of spray pattern.



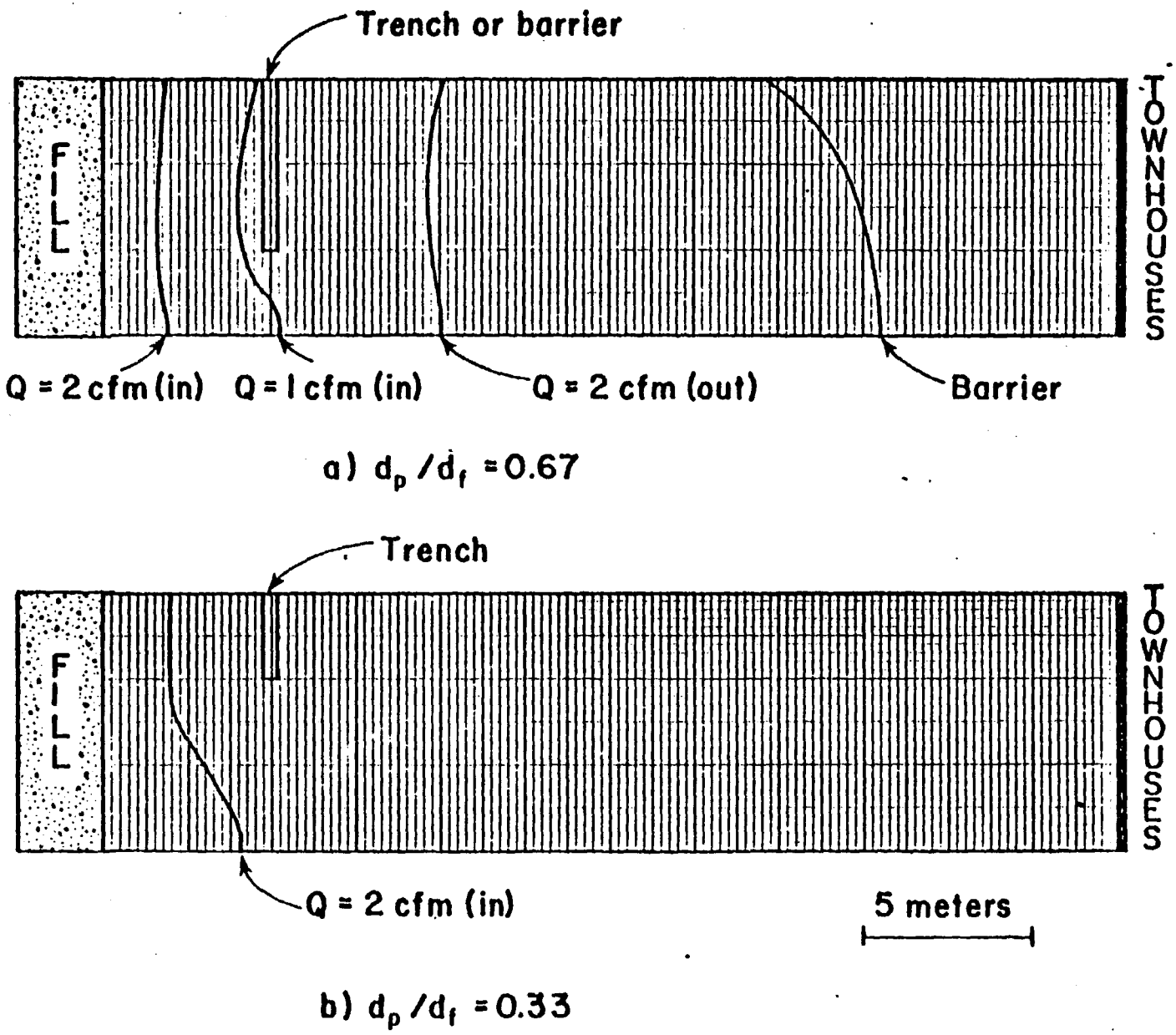


FIGURE 4 Comparison of Effectiveness of Methane Migration Control Devices Showing Steady State 5% Methane Contours

SECTION 5

TIME CONSIDERATIONS AFTER INSTALLATION

Studies were performed to determine the time required for the recommended system to become effective. Initially the system was allowed to come to steady state and, as shown in figure 5a, the 5 percent methane level was exceeded in all areas between the landfill and the townhouses. The control device was then activated and figure 5b through f shows the effectiveness as a function of time. Note that the steady state is reached after 250 days. Beginning at about 100 days, the region within which methane concentrations exceed 5 percent bifurcates with a high methane pocket being forced back toward the townhouses. During this period, careful monitoring should be undertaken to insure that excessively high methane concentrations are not encountered near the townhouses.

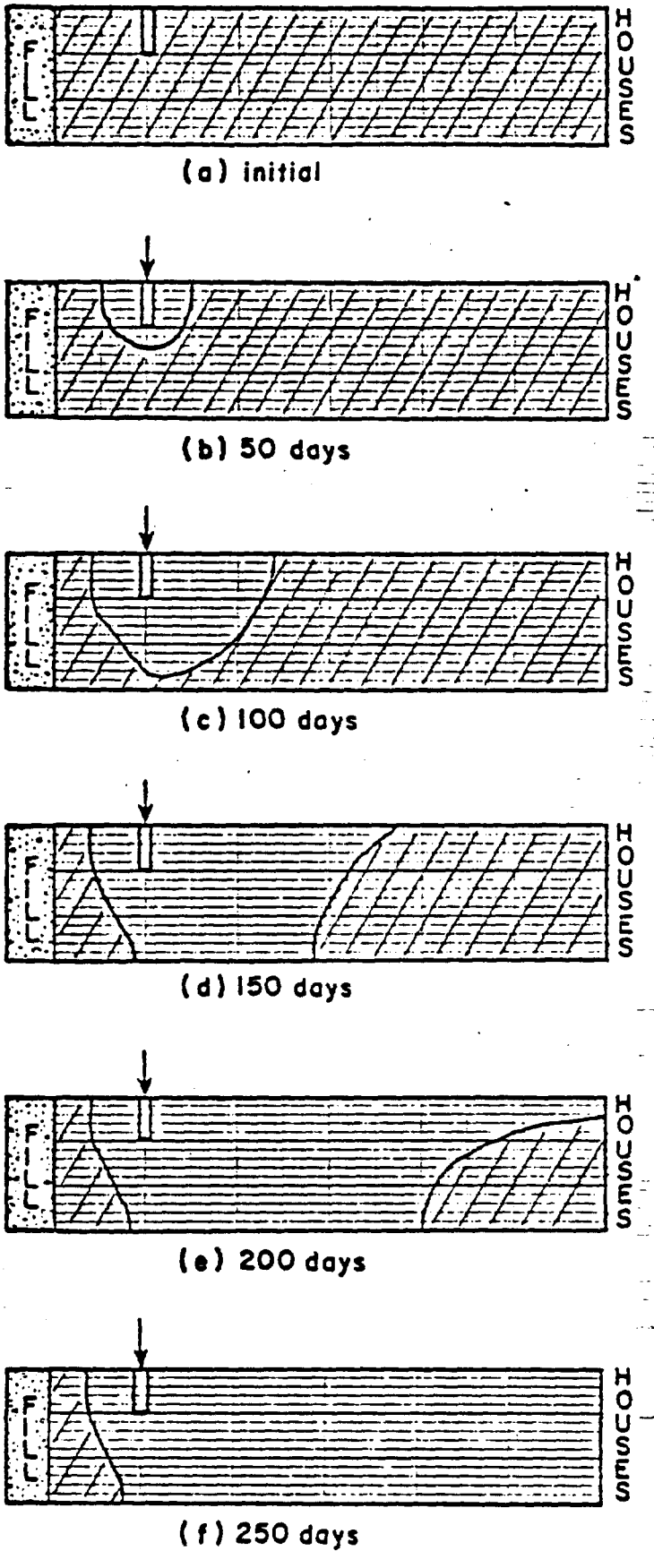
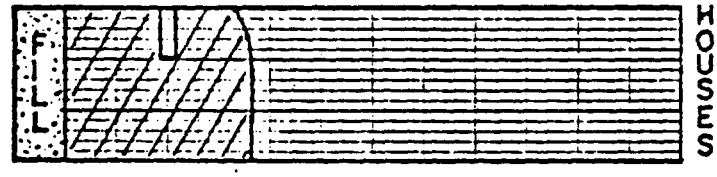
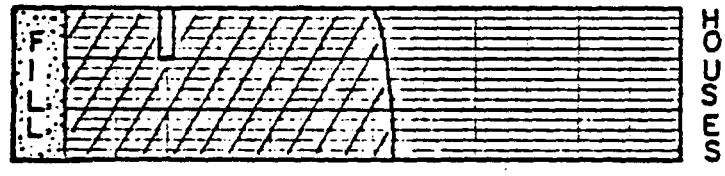


FIGURE 5 Regions Where Methane Exceeds 5% (shaded) at Various Times After Initiating Control Device

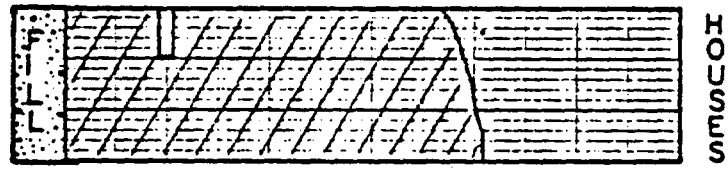
(a) initial



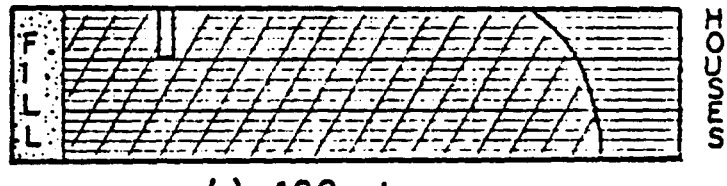
(b) 50 days



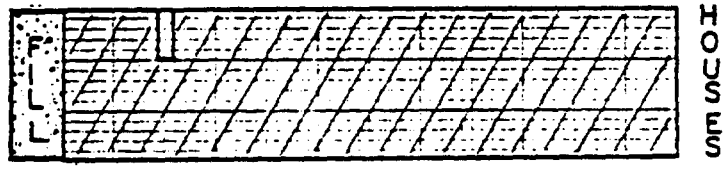
(c) 150 days



(d) 250 days



(e) 400 days



(f) 600 days

FIGURE 6 Extent of Readvance of 5% Methane Level (shaded) as a Function of Time After System Shut Down

SECTION 6

AFFECTS OF SYSTEM BREAKDOWN

Computer simulations were performed to determine the rate at which methane recharge would occur in the event that the recharge pumps ceased to function. The results are shown in figure 6. It may be seen that it would require in excess of one year for the 5 percent methane level to again reach the townhouses. It should be pointed out, however, that after the pumping is reinitiated, a plug of methane will be forced outward toward the townhouses in a manner similar to that shown in figure 5c through f. The longer the pumping system is inoperable, the more methane will be contained in this plug. Reference to figure 6b shows that even after 50 days, the 5 percent methane contour has moved out far enough to initiate a plug flow upon system reactivation.

SECTION 8

REFERENCE

Wefald, E. (1975), Report on Investigation of Sanitary Landfill, City of Hopkins, Minnesota.

SECTION 7

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that it is possible to develop a system to alleviate methane migration to the subject townhouses. A conceptual design consisting of a pumped recharge trench should provide adequate protection. However, it is important that monitoring be employed particularly during system startup.

DESIGN CHARTS

FOR

GAS MOVEMENT

AROUND

SANITARY LANDFILLS

by

Charles A. Moore

Katherine L. Jayko

DRAFT REPORT

September 1977

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A.1 Design chart for granular soil (pervious ground surface and radial boundary).

A.2 Design chart for granular soil (impervious ground surface and pervious radial boundary).

A.3 Design chart for granular soil (pervious ground surface and impervious radial boundary).

A.4 Design chart for fine grained soil (pervious ground surface and radial boundary).

A.5 Design chart for fine grained soil (impervious ground surface and pervious radial boundary).

B.1 Time overlay for design chart for granular soil (pervious ground surface and radial boundary).

B.2 Time overlay for design chart for granular soil (impervious ground surface and pervious radial boundary).

B.3 Time overlay for design chart for granular soil (pervious ground surface and impervious radial boundary).

LIST OF SYMBOLS

C_i	concentration of gas i
d_f	depth of landfill
d_s	depth to impervious layer
$\bar{D}_{AB}$	diffusion coefficient for gas A in gas B
$f_v(r)$	volume fraction having pore radius, r
K_i	Knudsen diffusion coefficient for gas i
M_i	molecular weight of gas i
n	soil porosity
N_i	flux of gas i relative to fixed coordinates
r	pore radius
r_{min}, r_{max}	limits on pore size distribution approximation
r_f	radius of landfill
r_s	radius to surrounding soil boundary
r_t	radius to maximum excursion of 5% methane level
R	gas constant
t	time
T	temperature
z	spatial distance
τ	tortuosity
Å	angstrom = 1×10^{-10} meters
∞	infinity

SECTION 1

INTRODUCTION

In order to predict gas concentrations around sanitary landfills, appropriate mathematical analogues have been developed (Moore and Alzaydi, 1977) and solved (Moore and Rai, 1977). The computer codes developed in these reports can be used to predict time dependent concentrations of gases at any position around sanitary landfills. Complicated geometries and boundary conditions can be treated and the effects of carbon dioxide on ground water quality can be determined.

The techniques for application of these computer codes to field problems are documented in Moore and Rai, 1977. While these codes are user oriented, they nevertheless require access to a relatively large computer and presume that the user is familiar with standard Fortran IV programming.

The purpose of this report is to provide design charts for methane distribution based on relatively simple landfill site geometry and flow boundary conditions. These charts can be used by designers to assess potential gas hazards. If use of these charts indicates that a particular field situation may be problematical, it is recommended that site-specific studies be performed using the computer codes.

SECTION 2

SUMMARY OF THEORETICAL APPROACH

Moore and Alzaydi (1977) have developed equations to describe flow of gases around sanitary landfills. A flux equation must be written for each component:

$$-N_A = \frac{1}{\tau} \sum_{r_{min}}^{r_{max}} f_v(r) \left\{ \frac{\frac{\bar{D}_{AB}}{RT} \cdot \frac{\partial C_A}{\partial Z}}{\left(1 - \sqrt{\frac{M_A}{M_B}}\right) C_A + \frac{\bar{D}_{AB}}{RTK_A \cdot r}} \right.$$

where N_A = diffusional flux of gas A relative to fixed coordinates

τ = tortuosity factor

r = pore radius

r_{min}, r_{max} = limits on pore size distribution approximation

$f_v(r)$ = volume fraction having pore radius, r

$\bar{D}_{AB}$ = diffusion coefficient for gas A in gas B

R = gas constant

T = temperature

C_i = concentration of gas i

Z = spatial distance

M_i = molecular weight of gas i

K_i = Knudsen diffusion coefficient for gas i.

In addition, conservation of matter must be reflected in a continuity equation:

$$\frac{\partial C_A}{\partial t} = -\frac{\partial N_A}{\partial z}$$

where t = time.

Note that in these equations the properties of the gases and of the porous medium are decoupled:

gas properties: $\bar{D}_{AB}$, M_A, M_B, K_A

porous medium properties: r, r_{min}, r_{max}, $f_v(r)$, τ.

SECTION 3

APPLICATIONS TO SANITARY LANDFILLS

3.1 GEOMETRICS OF LANDFILL AND SURROUNDING SOIL

Simplified geometric conditions (see Figure 1) are assumed in developing the design charts for sanitary landfills. The landfill itself is assumed cylindrical in shape and of radius, r_f, and depth, d_f. The soil surrounding the landfill is assumed to have a horizontal soil-atmosphere interface varying in perviousness from completely pervious to completely impervious. At some depth, d_s, an impervious stratum (bedrock or groundwater table) is assumed to be encountered. At some radial distance, r_s, another soil stratum which is either pervious or impervious is assumed to be encountered. The mathematical model does not extend beyond r_s.

3.2 TIME DEPENDENT MOVEMENT OF METHANE

Figure 2 shows a cross-section through Figure 1. Typically refuse decomposes, generating methane in the landfill. Through time, methane migrates out through the soil surrounding the landfill. Methane is explosive in concentrations between 5% and 15% in air. Thus, the contour line of 5% methane can be used to delineate areas in which there is an explosion hazard from safe areas. (Note that this presumes that methane concentration greater than 15% still present a hazard; the rationale being that in such high concentration areas oxygen to cause explosions could be available in building basements, etc.) Figure 2 shows that the 5% methane contour progresses outward from the landfill as decomposition proceeds. However, at the end of a certain period of time, the decomposition ceases. Subsequently, the 5% methane contours begin to retreat back toward the landfill. Thus, it is possible to delineate the maximum outward excursion of methane and to predict the time required for this maximum excursion to occur. In the hypothetical example of Figure 2, the maximum excursion is r_t and occurs in 10 years.

3.3 ASSUMPTIONS ON WHICH DESIGN CHARTS ARE BASED

A set of design charts has been prepared for the conditions described in sections 3.1 and 3.2. These charts were developed to allow the designer to predict the maximum distance of excursion, r_t, of the 5% methane level. In addition, the time required for maximum excursion can be determined. Because equations (1) and (2) are nonlinear, it is difficult to present normalized solutions in the form of charts. The approach used to circumvent these difficulties was to assume typical average values for landfill dimensions (d_f = 16 meters, r_f = 160 meters), for gas compositions and decomposition times (70% methane, 30% carbon dioxide; decomposition time = 5 years), and for soil properties (see Table 1). A pressure of one atmosphere and a temperature of 25° C were used. Charts were prepared for two soil types (granular and fine grained) and for three sets of boundary conditions (permeable ground surface-permeable radial boundary, impermeable ground surface-permeable radial boundary and permeable ground surface-impermeable radial boundary). Additional charts were then prepared to allow for correction of nonidealized conditions.

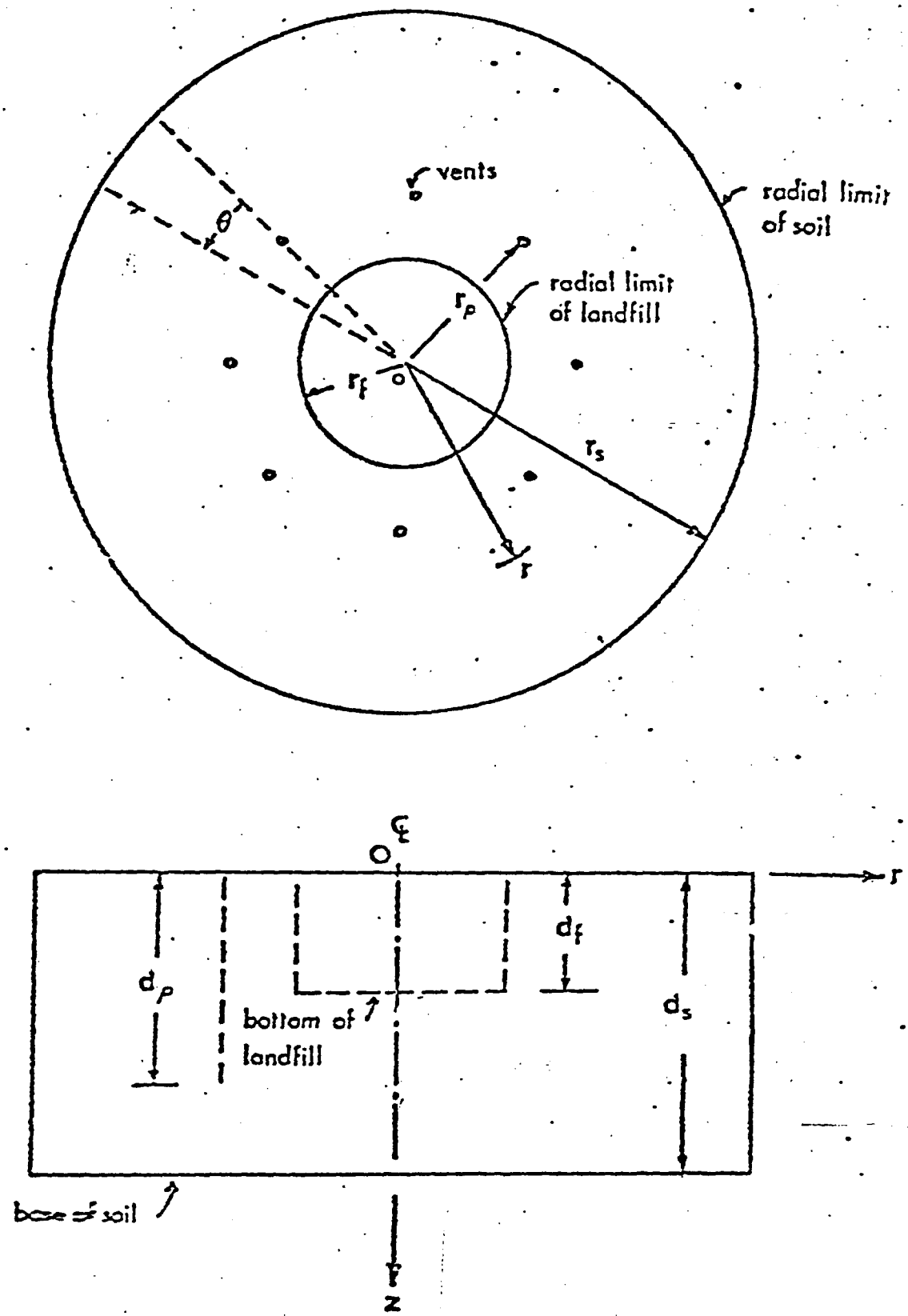

Figure 1 - Simplified landfill geometry.

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- **Flares and well testing equipment for North Sea and North Slope**
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- **Vertical/horizontal smokeless air blower flares for offshore platforms, pipelines and gas plants**
- **Liquid burnpits and flares**
- **Ammonia and low heat flares**
- **Automatic steam control with composition adjustment**
- **Pilot and purge gas conservation systems**
- **Ignition systems for remote location without electric or compressed air**
- **Flare for heavy water plant**
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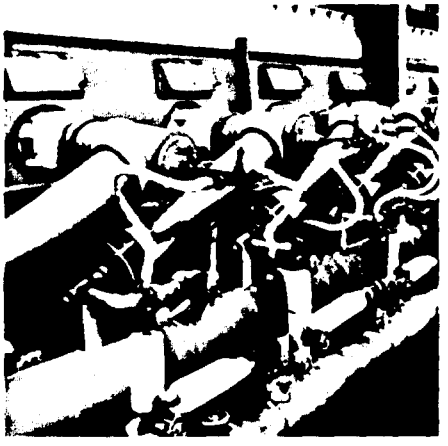
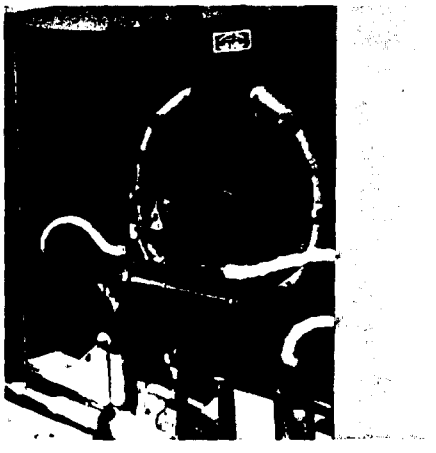
- **Flares for the steel industry**
- **Development of low NOx burner systems**
- **High intensity gas/oil burner using low air pressure without a combustion chamber**

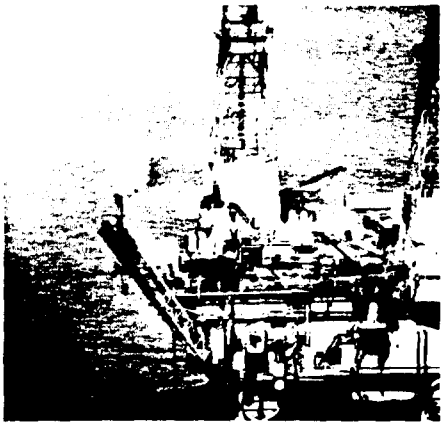


Previous installation

Modernization of NAO Integrated Shroud Low Noise Burners at east coast refinery to meet OSHA regulations.

New installation





NAO Forced Air Vortex Smokeless Burner, Cook Inlet, Alaska

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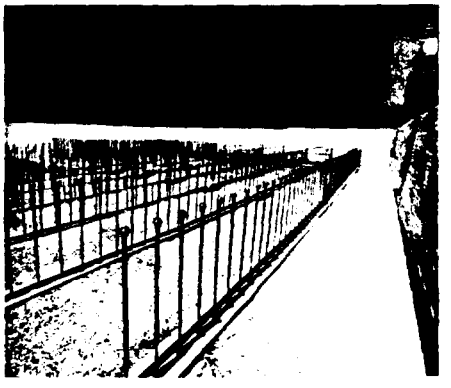
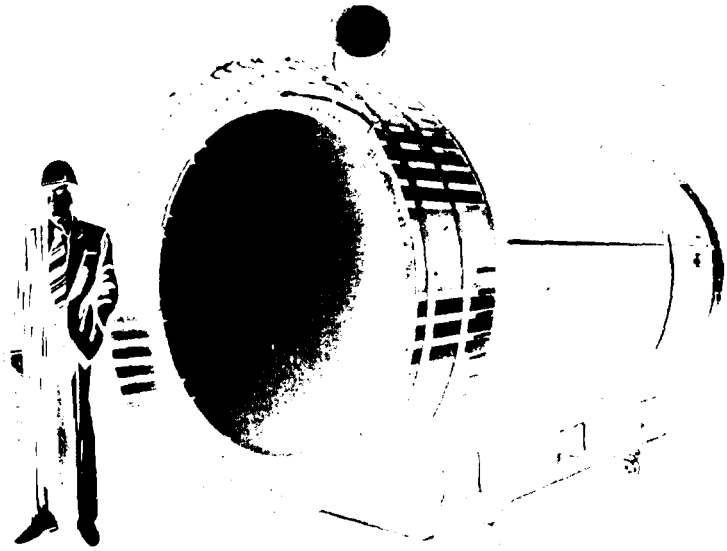
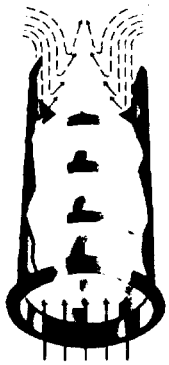
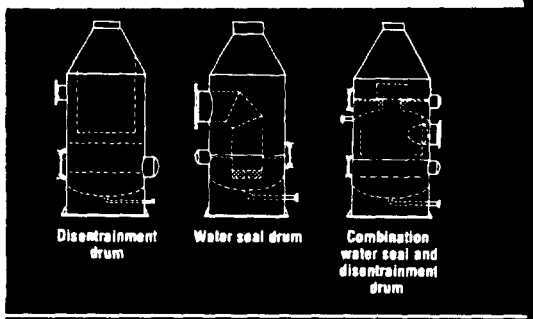


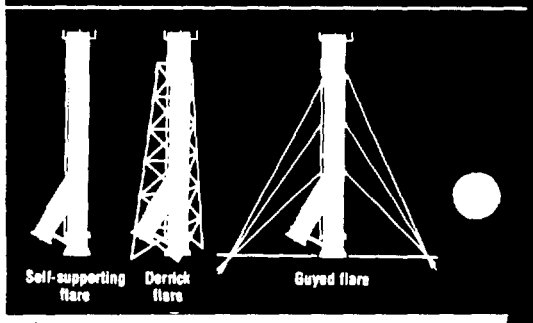
NAO Iso-Fluidic Oxidizer Smokeless Ground Flare, Mexico

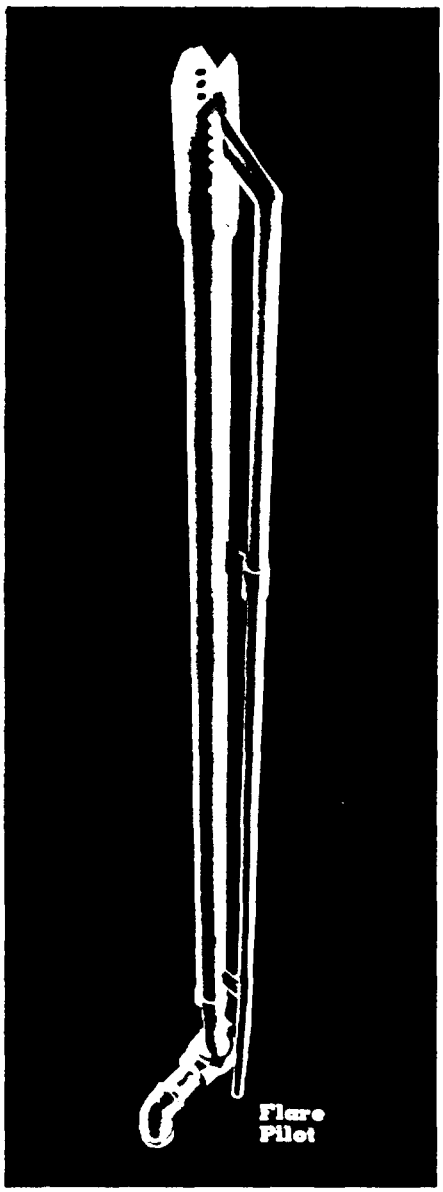
- Fully automatic ignition system which adjusts for a variation in gas composition
- Vapor disposal systems for gasoline loading terminals and service stations
- Special vapor disposal systems for ship and barge loading, such as benzene loading

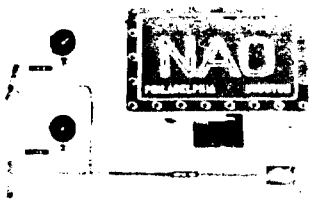


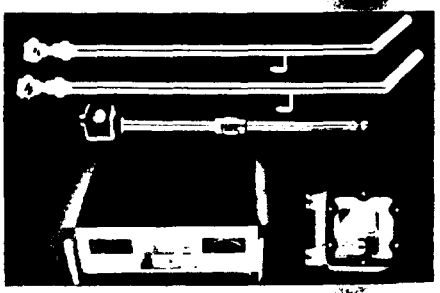



Disentrainment drum
Water seal drum
Combination water seal and disentrainment drum


Self-supporting flare
Derrick flare
Guyed flare


Flare
Pilot


NAO

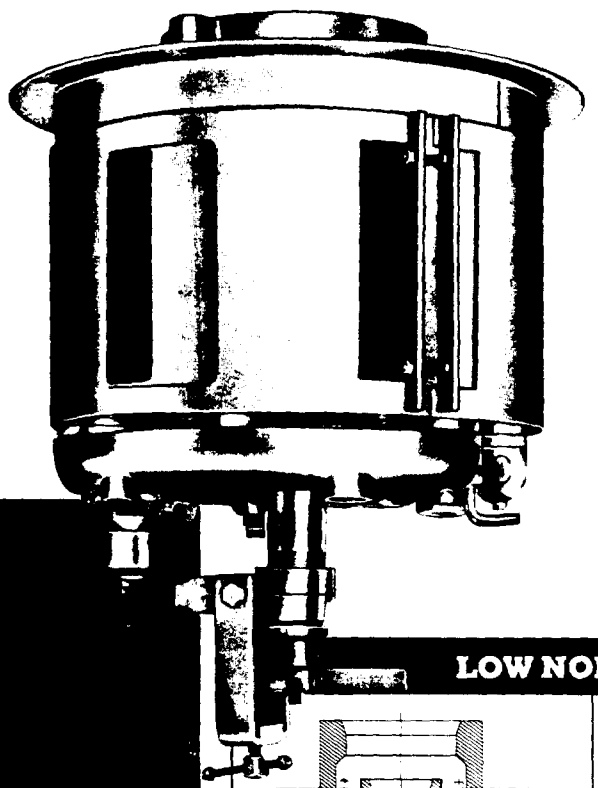


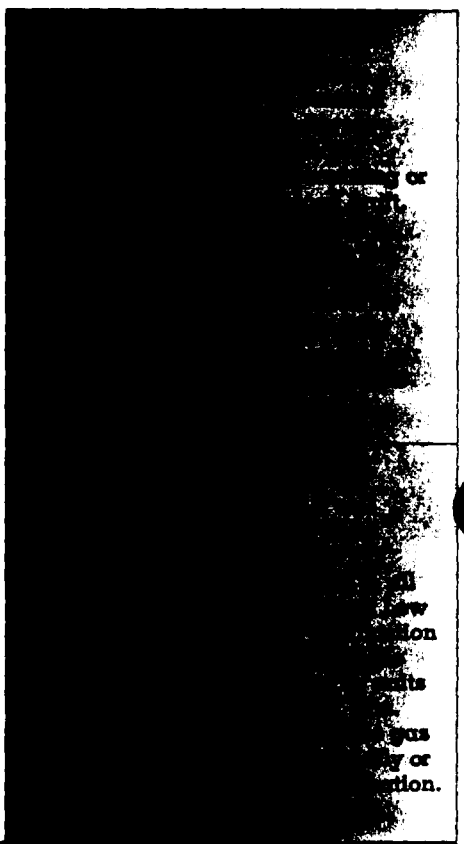
THE C. HOFFBERGE

High performance, low maintenance, field-proven reliability

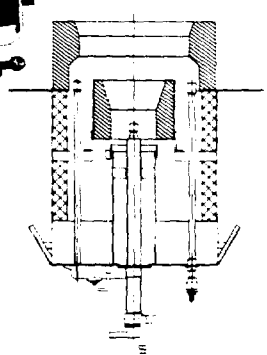
Low Air Hexad® Combustion Units

Designed for natural draft operation, firing oil, gas and waste gas, individually or in combination, NAO's standard Low Air units have gained acceptance worldwide. Performance, ease of maintenance, and versatility are key factors in this success.

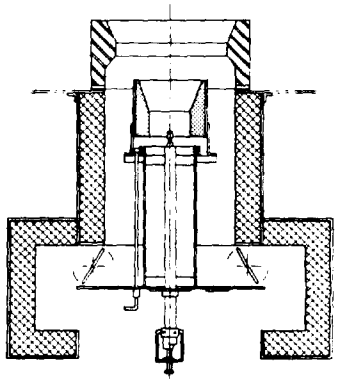




LOW NOISE COMBUSTION UNITS



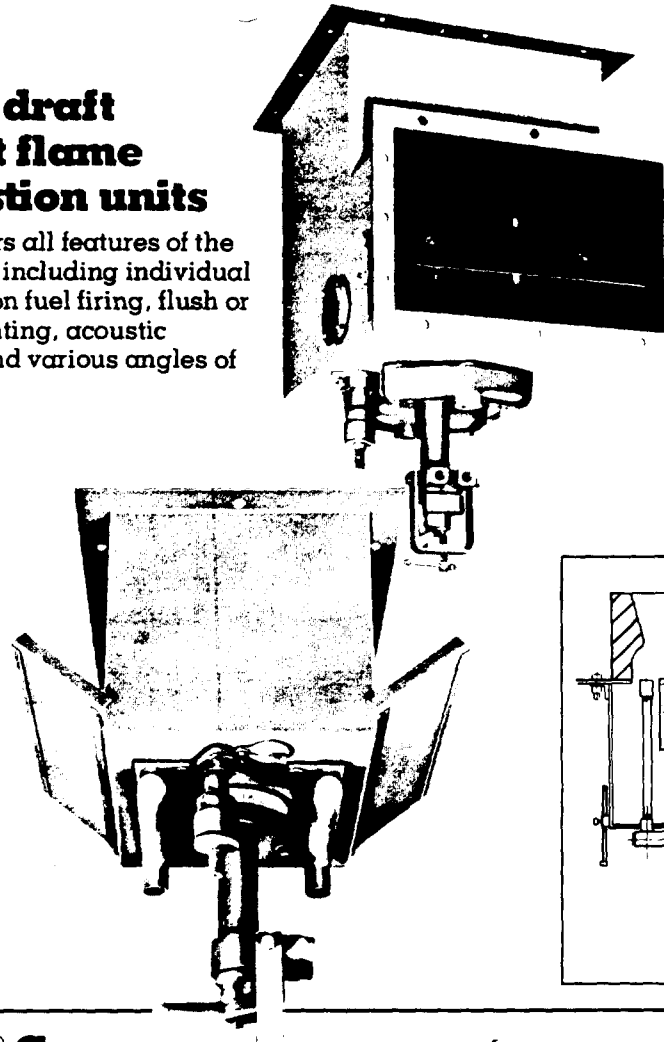
Standard Design Integrated Shroud Burners (Model FI) have a single unit noise rating of 84 dB (A), measured 3 feet from the burner.

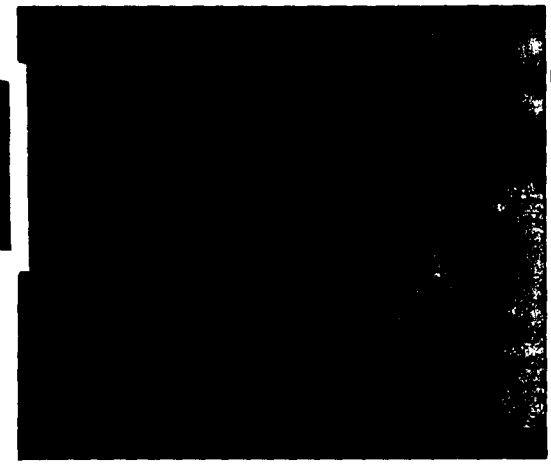


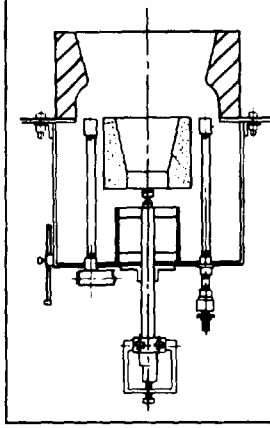
Special Design Integrated Shroud Burners (model FI-75) have a single burner noise rating of 75 dB (A), measured 3 feet from the burner. Multiple burner noise ratings are available from NAO.

Forced draft and flat flame combustion units

This unit offers all features of the Low Air units including individual or combination fuel firing, flush or plenum mounting, acoustic shrouding, and various angles of firing.



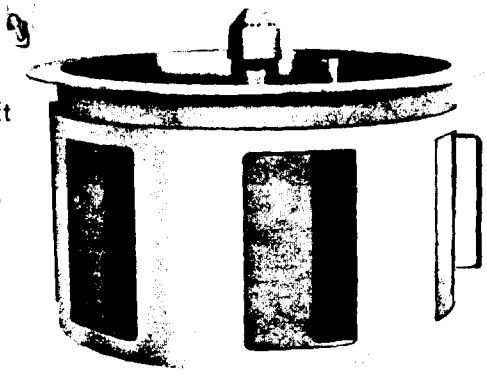


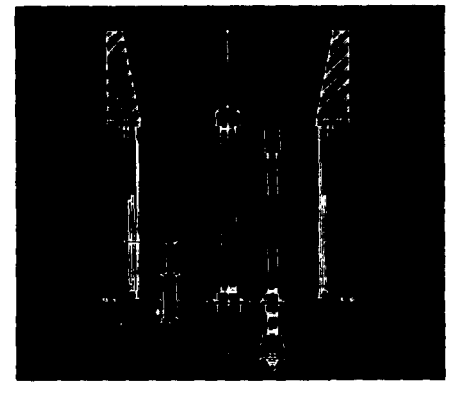


Flat Flame Units are designed for natural draft operation and provide the controlled flame configuration required for special heater designs.

Jet Mix® Gas Combustion Units

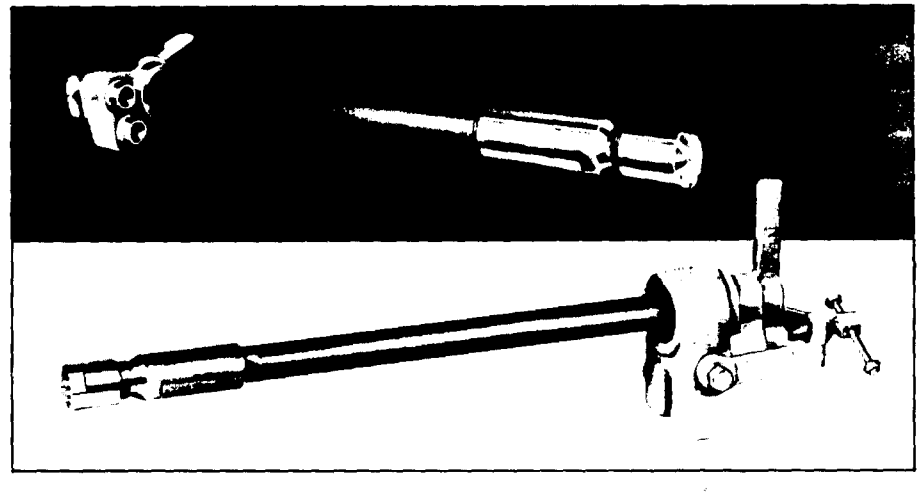
Designed for natural or forced draft operation; flush or plenum mounted. Acoustic shrouds, as shown on the Low Noise Units, are available with Jet Mix® burners. The unique design of this burner generates turbulent mixing and produces the short, hot flame desired for optimum heat transfer and fuel economy.





Oil Guns and Accessories

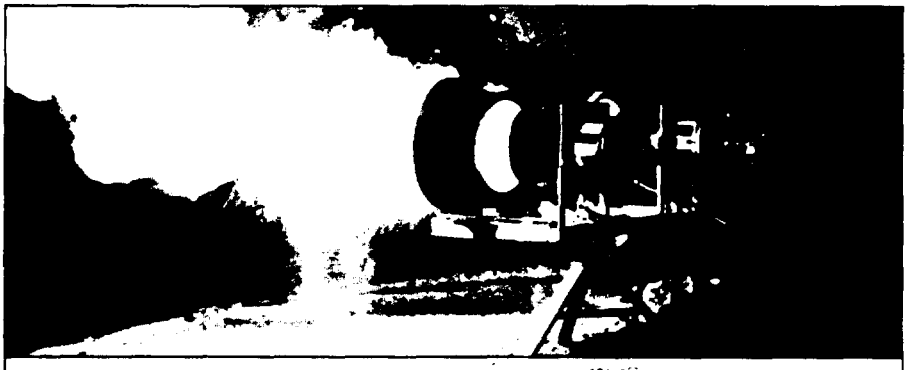
NAO atomizing oil guns use steam, compressed air, or gas as the atomizing medium. Dual-stage atomizing designs are available for use with high volatile fuels. Solid cone, long circular jet, and flat flame patterns are provided to meet specific requirements. NAO burner guns will accommodate liquid and semi-liquid fuels, ranging from No. 2 oil to tars, pitches and asphalts. Quick detaching gear facilitates gun installation and removal.



Components with field-proven performance and reliability

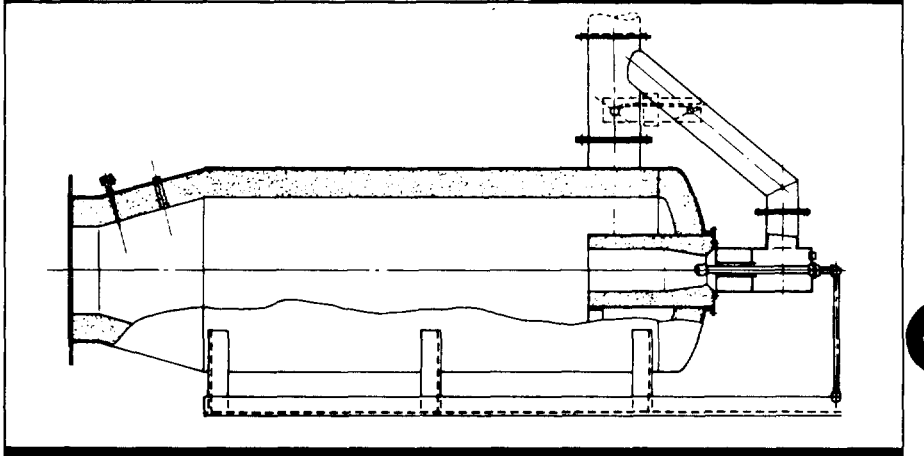
Well Test Units

NAO produces a complete range of well test and liquid disposal units. These units are designed for open burning of crude oil, oil spills, waste chemicals and water-oil mixtures. There are seven sizes from 100 gph to the world's largest at 20,000 BOPD. These units provide a clean, effective method of economically disposing of liquid waste.



Air Preheaters

NAO produces gas and oil fired air preheaters for research and process applications. These direct fired air heaters are available in vertical or horizontal configurations with all necessary controls as a complete package.



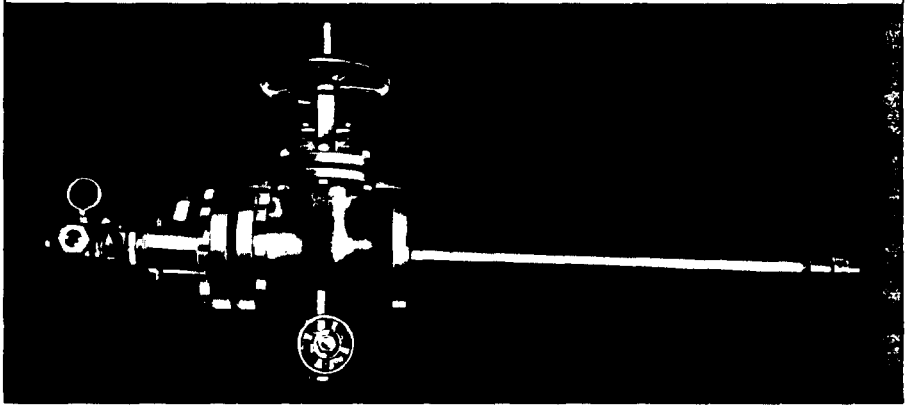
Sprayers

EFFECTIVE CONTROL OF CATALYST REGENERATOR TEMPERATURES AND REACTOR FEED SYSTEMS.

In addition to relief gas flaring systems and combustion equipment for process furnaces, NAO designs and builds sprayers for various process applications, generally for service in pressurized vessels. NAO spray units excel in fluid catalyst regenerating units and chemical reactor feed applications. Water and torch oil sprayer are designed with tips to provide specific spray patterns and degrees of atomization.

A retraction gear assembly is provided to permit withdrawal of the sprayer without interrupting the process.

NAO also produces Water Sprayers equipped with a tip for a conical spray. Typical applications are catalyst regenerators, plenum chambers and gas ducts. This sprayer head design is particularly satisfactory in resisting catalyst erosion of the metal components.



An NAO Torch Oil Sprayer is also available with an emulsion type atomizer with a flat flame tip design to fire into and distribute heat to a catalyst bed. These sprayers are used for preheating the catalyst bed during cold start-up and for supplementary heat during periods of reduced coke formation.

SPECIFY

NAO

Handling combustion problems the right way since 1912.

National AirOil Burner Company, Inc.

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Offices in major cities of the world.

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Volume 1, Number 2
Winter 1977

Flare Tips

Published by National AirOil Burner Company, Inc.

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Very-Low-BTU Gases Serve As Fuel for VorTuMix® Burners **page 3**

Noiseless and Smokeless Disposal Of Volatile Vapors **page 5**

Smokeless Flaring of Hydrocarbon Vapors, Onshore or Offshore **page 6**

Special Ground Flare Handles Eight Different Waste Gases Plus a Sour-Water Stream **page 8**

Introduction to Safe, Efficient Flaring and Venting

John F. Straitz, III
Director, Pollution Control Div.
National AirOil Burner Co., Inc.

For decades, flaring and venting have been as uncomplicated as igniting waste gases or venting hydrocarbon vapors to the atmosphere unburned.

But things have changed. And they are continuing to change — drastically.

Economy-conscious companies are emphasizing energy conservation and overall efficiency.

Ecology-conscious companies are more concerned than ever about emissions.

Safety and environmental regulations now exert a decided influence on the design aspects involved in the flaring or venting of various waste gases, onshore or offshore.

New flaring and venting systems must be capable of doing a better job than their predecessors.

With this new publication, we will try to present basic information and create a better understanding of the problems involved in engineering safe, efficient flaring or venting systems. . . systems that exceed the requirements of ever-tightening pollution-control regulations . . . systems that incorporate engineered solutions to the tremendous energy expenditures associated with flaring . . . and systems that insure maximum protection for plant personnel and equipment, with automatic implementation of fire-suppression/explosion-prevention controls.

Dirty Gases From BOF Steel-making Process Burn Clean With Clear Glo® Flares

NAO Clear Glo® flares, used in conjunction with a wet-scrubber system, will each handle 200,000 cu. ft. per minute of noxious flume gases.

To comply with California's stringent environmental pollution-control regulations, a major steel producer on the West Coast is installing a pair of 78" diameter Clear Glo flaring systems.

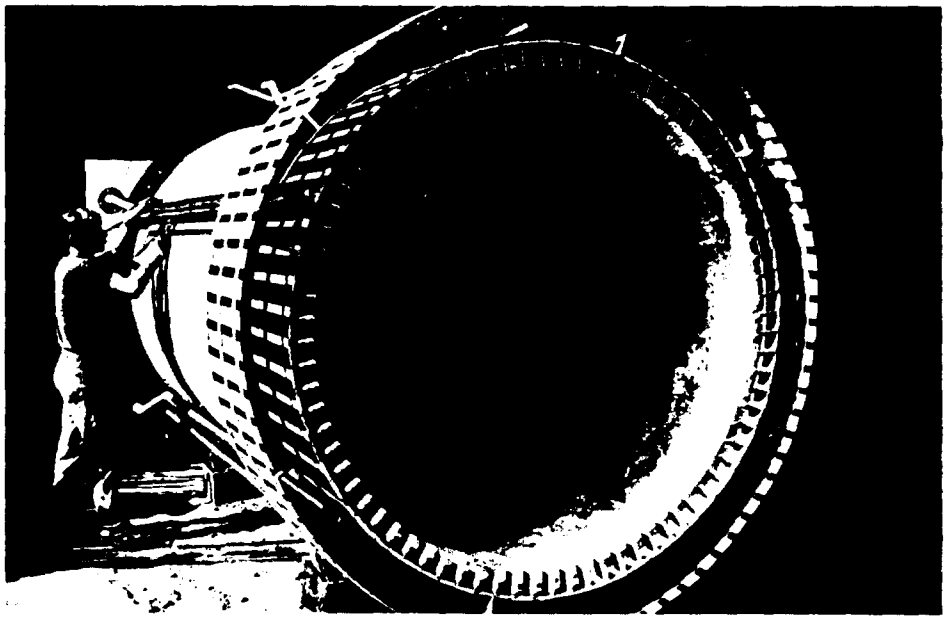
These clear-burning waste-gas disposal systems, designed and manufactured by National AirOil Burner Company, Inc., will be used to safely and efficiently dispose of carbon monoxide, nitrogen and carbon dioxide from a basic oxygen steelmaking process.

The 78" Clear Glo flares were designed for use with an existing wet-scrubber gas system, installed at Kaiser Steel Corporation in Fontana, California. Each flare will handle 200,000 cubic feet per minutes of noxious BOF flume gases.

Nominal composition of the flume gases is 61% CO, 19% CO_2 and 20% N_2. The exit temperature of these dirty, noxious gases is approximately 170°F.

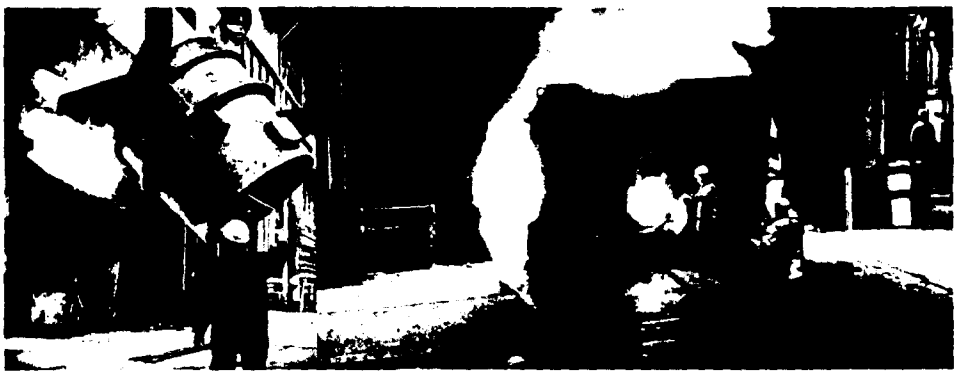
Low Pressure Drop: The pressure drop of the BOF waste gases is very low. It is in the neighborhood of 2" of water column. Hence, the pressure drop at each flare tip is extremely important. There must be no obstacles to impede the flow of the deadly waste-gas mixture.

In designing these very large diameter Clear Glo flaring systems, NAO engineers had to incorporate the expertise of an organization that has



One of six flare pilots for special Clear Glo flare is aligned prior to shipment to a large steel plant on the West Coast. This flare tip, one of two for a pair of 78" diameter NAO flare systems, incorporates a dual-windshield design and a unique flame retention ring.

Dirty Gases Burn Clean *(Continued)*



been solving combustion problems the right way since 1912. . . in order to deliver two complete flaring systems with 78" diameter flare tips within six weeks of the date of order.

Each of these Clear Glo flaring systems incorporates: six pilots with individual windshields to assure continuous pilot operation, regardless of wind conditions; a fully automatic pilot-ignition system; a monolithic Uni-Pour* lining of low-density insulating refractory material; an oversize flare windshield with a complete floor plate to prevent the flame from licking down the outside of the flare tip, thus extending flare life; and a unique (patent pending) flame-retention ring with NAO's new VorTuSwirl* vanes.

Holds Flame Erect: NAO's special VorTuSwirl angled vanes "tip over" the flame to create a vortex-type swirling action. This swirling action imparts a high exit velocity to the waste gases. The swirling gases entrain ambient air for ultra-efficient combustion. . . combustion that is controlled by the flame-retention ring, totally within the Clear Glo thermal pattern.

The swirling, gyroscopic action also holds the flame erect, regardless of the wind, and thus minimizes grade-level radiation.

In addition to insuring maximum flame stability, the unique flame-retention ring operates with a lower pressure drop at the flare tip.

Unlike conventional flame retainers, there are no sharp edges on the teeth of the VorTuSwirl vanes. Hence, the noise level of the waste gases is reduced substantially as the flume gases are swirled in a turbulent fashion to insure optimum combustion.

Dirty Pilot Gas: For this application, raw coke-oven gas serves as fuel for the NAO flare pilots. Since this pilot fuel is very dirty, the venturi for each pilot is located near the base of the stack, for convenient cleaning and routine maintenance.

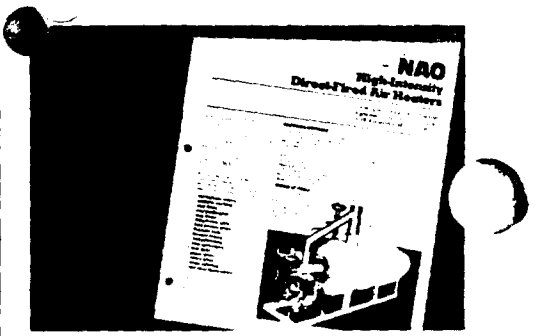
All six pilots are controlled by an NAO automatic pilot-ignition system. This system, with manifold flame splitter, is capable of shooting a dependable flame front through a one-mile equivalent length of one-inch pipe to light all six pilots simultaneously.

Automatic pilot-failure alarms, for continuous monitoring of the pilots, are included for each of these Clear Glo flaring systems.

Worldwide Installations: NAO manufactures a complete line of on-shore and offshore flare/vent systems, burners, incinerators, sprayers, valves, noise shrouds, and combustion/pollution-control systems. This equipment is installed all over the world. . . from Alaska to South America. . . from the Gulf Coast to the Middle East . . . Europe to the Far East.

*NAO trademark

Swirling action, created by NAO's VorTuSwirl vanes, acts like a gyroscope to hold flame erect regardless of wind conditions.

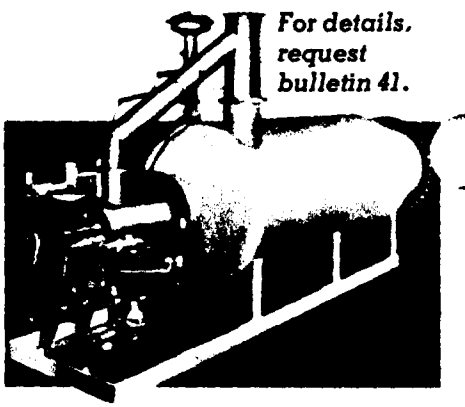


Direct-Fired Air Heaters for process applications

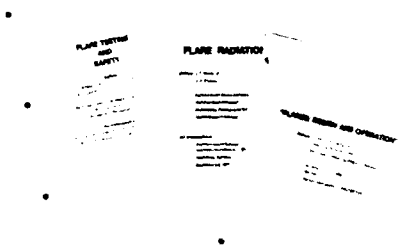
NAO's high-intensity, direct-fired air heaters are custom engineered to match the requirements of a wide range of research and process applications.

Each of these high-intensity air heaters employs an NAO high-turndown, center-fired burner to insure complete combustion with all types of gaseous and liquid fuels.

Designed to the ASME code for high-pressure applications, these burners produce 100-thousand to 100-million BTU/hr with outlet temperatures from 200° to 2800°F.



For details, request bulletin 41.



New Technical Papers

Here are just a few examples of informative reports on various aspects of flaring.

For copies of all current technical papers, please drop us a note. Or ask your Man From NAO for a complete set of the new tech papers.

NAO Continues Expansion Of Worldwide Operations

John F. Straitz, Jr.
President
National AirOil Burner Co., Inc.

Efforts to increase our penetration in worldwide markets for combustion, pollution, energy and process control have been greatly enhanced by the opening of a new office in Milan, Italy.

That new office for National AirOil Burner Co. — Italiana and our branch office in Bedford, just outside of London, are evidence of NAO's total and complete commitment to servicing the European and North African marketplaces.

Houston and Tokyo, too: Other NAO branch/affiliate offices are located in Houston and Tokyo to strengthen the worldwide services available from our Philadelphia corporate office.

Anywhere on earth, wherever energy is sought, found, produced or consumed — onshore or offshore — from Alaska's North Slope to the deserts of Saudi Arabia to major petroleum, natural gas, chemical, petrochemical, iron and steel, and other process facilities, *YOU* are not far from an NAO agent or representative.

Authorized agents and representatives, factory-trained by NAO, are located in major cities of the world . . . from Anchorage to Buenos Aires to Kuwait City . . . Madrid to Tulsa to Calgary . . . Mexico City to Alkhobar to Caracas. If you don't know the name of your NAO agent or representative, please drop us a note.

John F. Straitz, Jr.

Engineered Solutions: Our business centers on solutions to combustion, pollution, energy and special process-control problems; and we have been dedicated to solving the problems involved in the production or burning of fossil fuels since 1912.

More recently, we have been involved in pioneering automatic energy-conservation systems for efficient flaring. And instead of sticking completely to fossil fuels, we have manufactured very sophisticated "self-diagnostic" ignitor panels for use in nuclear power plants and for NASA's aerospace applications. Thus, our operations are actually more than just worldwide.

Flaring represents a very important portion of our worldwide marketing efforts. Since the flaring process involves the release of tremendous amounts of energy — up to tens of billions of BTUs in a few minutes — in the form of thermal radiation, we had to become experts in pollution and energy control.

With the introduction of this new publication, FLARE TIPS, I would like to stress the following points:

1. **The primary function of a flare is to convert flammable, toxic or corrosive vapors to less objectionable compounds by means of combustion.**
2. **The primary objective of National AirOil Burner Company is to provide proven solutions to your combustion, pollution, energy or process-control problems.**

Looking forward to helping you with engineered solutions to your combustion- and pollution-control problems, I am

Cordially yours,

Very-Low-BTU Gases Serve as Fuel for VorTuMix® Burners

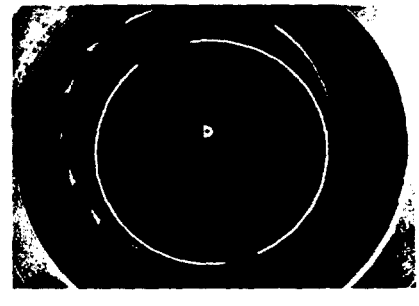
A pair of forced-draft VorTuMix® burners, designed for use with existing ground flares, are being fueled with very dirty, low-BTU gases. The heat content of these dirty, alternate fuels is very low — in the neighborhood of 60 to 200 BTU/cu ft or even lower.

With the addition of natural gas, injected directly into the throat of these NAO burners, the heat content of the dirty, alternate fuel can drop to 30 BTU/cu ft.

Since tremendous volumes of the dirty gas — with tars and other entrained solids — must be burned to obtain any significant heat release, a large diameter pipe serves as the fuel inlet to each burner.

Combustible Mixture: Small openings would be clogged by the dirty, tar-laden gas. Therefore, conventional techniques cannot be used to impart high velocity and turbulence to the low-BTU gas to achieve a combustible gas/air mixture.

To insure turbulent mixing, each VorTuMix® burner employs a special vane configuration with center swirl-deflector cone (patent pending) in the throat of the inlet chamber. The VorTuMix® vanes

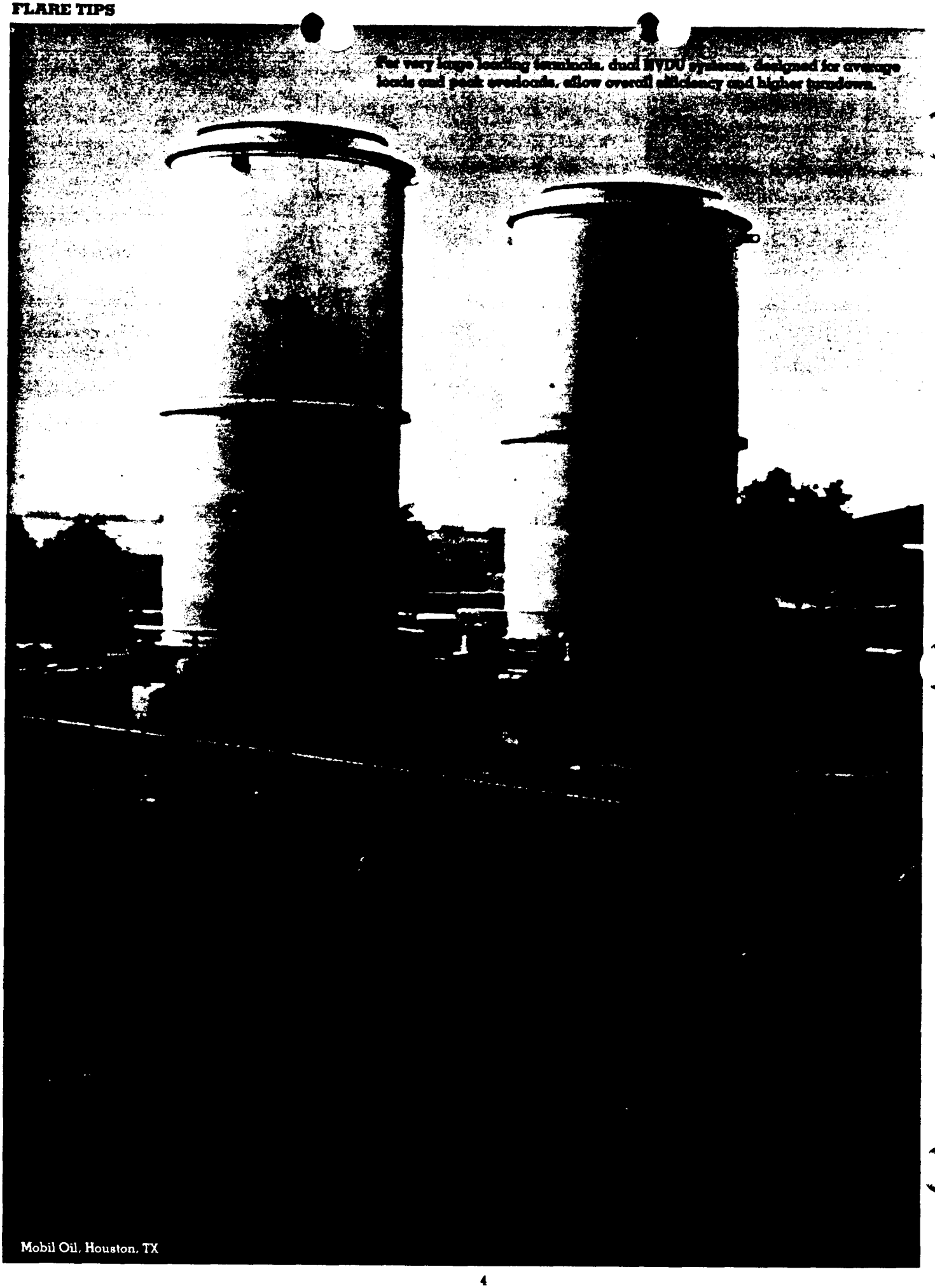


swirl the air which, in turn, swirls the tar-laden gas to create a high velocity and hence turbulent mixing of the gas with the air.

To minimize No_x formation, these NAO burners employ a two-stage combustion process. Initial combustion is substoichiometric, with final air delayed until the "fuel fixed" nitrogen has been released.

Like all NAO VorTuMix® burners, the special units for dirty, low-BTU gases are designed so that approximately 10% of the air bypasses the burner throat. This bypass air is introduced in the final stage of the two-stage process to insure complete combustion.

Ask Your Man From NAO for more information about standard and special VorTuMix® burners. Or *request bulletins 42 and 44.*



For very large loading terminals, dual HVDU systems, designed for average loads and peak overloads, allow overall efficiency and higher turndown.

Mobil Oil, Houston, TX

Noiseless and Smokeless Disposal of Volatile Vapors

NAO Vapor-Disposal Units combine unsurpassed safety with maximum efficiency for loading terminals handling gasoline, benzene and other flammable or volatile fluids.

For gasoline, benzene and other hydrocarbons, all but the largest loading terminals rely on oxidation as the most efficient — and most economical — method to control the emission of volatile hydrocarbon vapors to the atmosphere.

Safety is the main concern for these volatile-vapor applications.

NAO's patented Vapor-Disposal Units (NVDU) provide fully automatic, ultra-safe solutions to vapor-disposal problems for gasoline loading terminals, including terminals in populated areas. NVDU systems also are used for ship and barge loading of flammable hydrocarbons, including gasoline and benzene.

Safety Plus: To insure safety, plus an efficiency in the order of 99 plus-plus percent, each NVDU employs dual water seals and a special burner head with full-interlock safety controls to prevent flashback. No blowers or vapor holders are required for the basic NVDU.

Flashback protection is provided in two stages. The first is a series of quenching slots in the vapor burner. The second stage of protection is the dual water seals. They serve the same functions as a check valve and flame arrestor. . . to prevent vapor emission, whenever the unit is shut down, and any possibility of flame coming back through the vapor header.

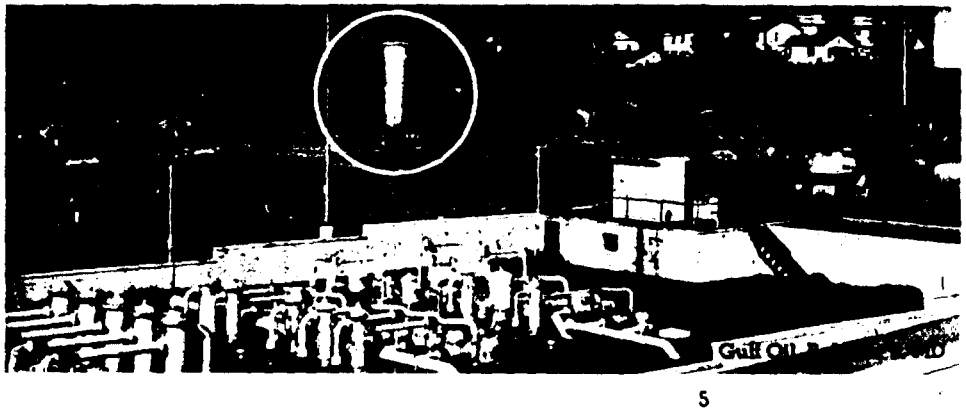
Operation of the NVDU is completely dependent upon the safety-interlock system. Before the unit can be started, this automatic control system will check out all flame-safeguard controls. Each pilot, for example, has its own flame scanner which must prove ignition before the main control system takes over and turns on the main fire burner.

Continuous Monitoring: The main control system continuously monitors the flow of hydrocarbons and the temperature of the combustion chamber. Some or all of the burners in the main chamber are turned on automatically, depending upon the temperature in the combustion zone.

When a clean tank truck is loaded, all burners are activated automatically to assure complete combustion of the "mostly air" vapor stream. With high- and rich-vapor flows, the pneumatically-actuated air dampers will be opened automatically to control cooling air flow and to minimize the generation of excessive temperatures. This will also assure sufficient oxygen for complete combustion of the rich vapors.

Should the combustion temperature vary from the normal operating range, the control system will make automatic re-adjustments. If the system cannot be brought back into adjustment, the process will be shut down automatically. (Automatic shutdown also will be triggered by flame failure or if the liquid level in the water seals drops too low.)

Exceptionally low-noise levels, no smoke, no odor and no visible flame: All make the NVDU a practical solution to volatile- vapor-disposal problems. . . even when residential areas are nearby. Capacities for single units range from 50 to 5000 gpm.



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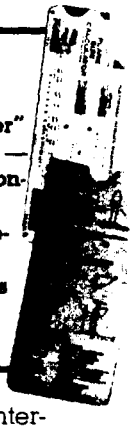


We've repackaged our "best seller" — the NAO Flare-Size Calculator — in a convenient vinyl cover that contains all the basic equations and conversion values you need to determine approximate flare-tip diameters and overall stack heights for preliminary evaluations. Quantities are limited.

Whenever any major safety interlock is actuated, a warning light will be illuminated on the main control panel. Alarm horns (optional) can also be actuated.

Economy: Low initial cost, easy installation and very low operating expenses. . . all contribute to the overall economy of the NVDU. Each factory-packaged system includes an oxidizer (combustion chamber), dual water seals, all necessary safety-interlock controls and piping.

The oxidizer and the water seals are mounted on a small, unitized concrete pad. A single buried main connects the vapor-disposal unit with the loading rack.

NVDU features include:

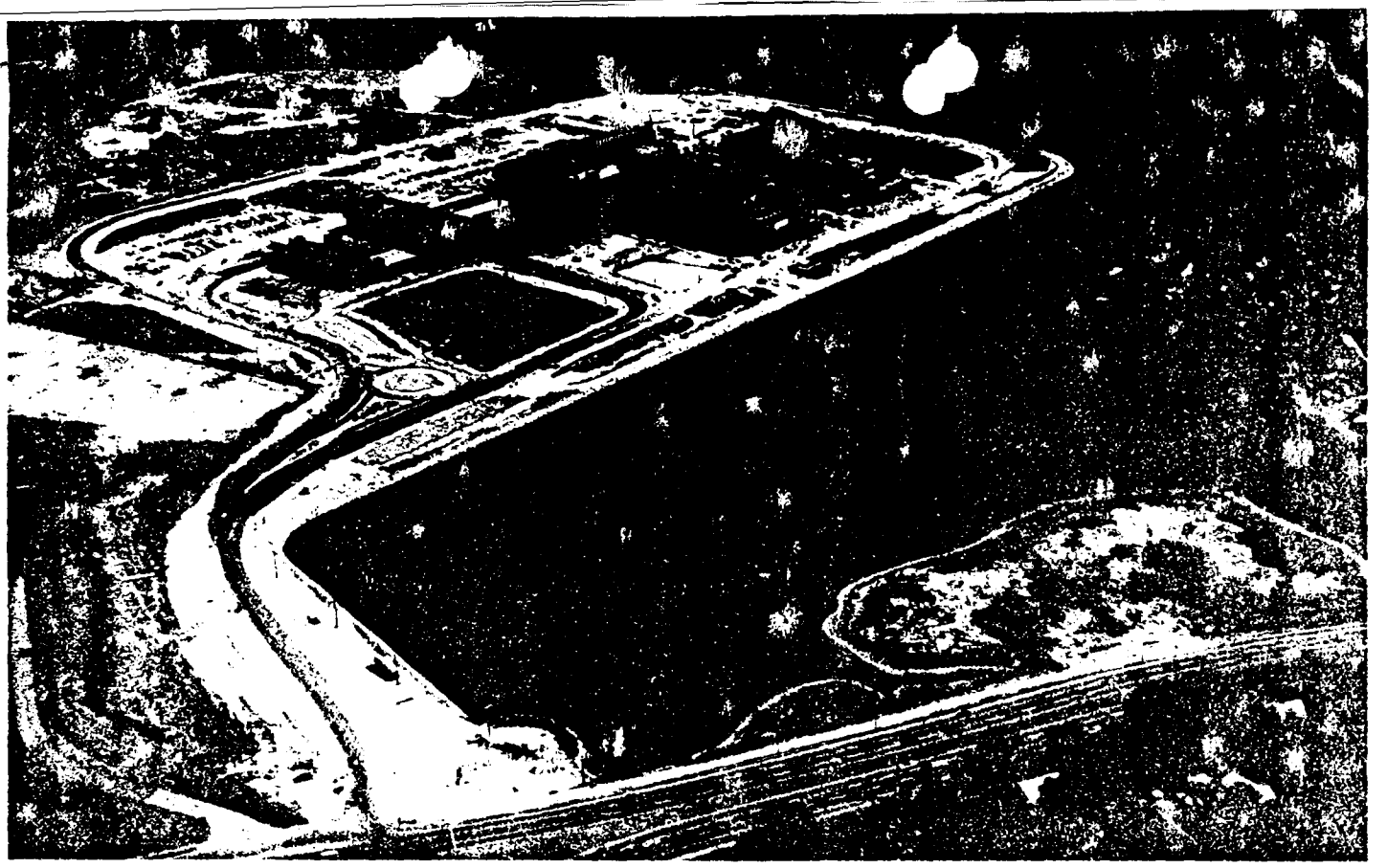
- **fully automatic elimination of air pollution from volatile vapors at loading terminals**
- **no smoke. . . no visible flame. . . no objectionable noise**
- **safety interlocks insure safe start-ups, efficient operation and smooth shutdowns**

Vapor Recovery: Although the NVDU is generally used alone, it can be used in conjunction with a vapor-recovery unit. This type of installation is designed to handle peak loads or to increase the overall efficiency of a vapor-recovery system. . . to allow a terminal to meet local environmental regulations.

NAO also offers small NVDU systems for gasoline service stations and very small loading terminals. These compact systems are fully automatic, with or without optional heat-recovery sub-systems.

Capacities: Single- and dual-NVDU systems are available in standard configurations. The standard-size single units offer a capacity range from 50 to 5000 gpm.

A 10-minute film describes the NVDU in detail, including controls and safety features. If you have application, we would be pleased to show you this film.



VIEW FROM THE BRIDGE. The property jutting into south Boston Harbor was a sanitary landfill until the University of Massachusetts built its Harbor Campus on the site. Methane from 30 years worth of packed refuse is watched by alarm system with computer-controlled infrared analyzers which also actuate fresh air purging system before gas buildup reaches danger level.

in Boston Harbor

Methane monitoring, purging system keeps university classes in session

Above ground, the University of Massachusetts' new Harbor Campus in Boston looks like many other colleges. Beneath the turf and concrete, however, lies the difference.

The university, completed in 1974, is built atop a sanitary landfill jutting into southern Boston Harbor. The landfill facility had been used by the city for over 30 years until it reached its maximum capacity.

Building a campus on a unique site also provided some unique problems. From previous construction on the landfill, project architects knew that natural methane gas released from decomposition was a potential hazard. The university retained Engineering-Science, Inc. of Arcadia, California to perform an analysis at the building site and make recommendations on handling methane leakage into building areas.

The recommended and adopted safety system is a combination of an impervious membrane, gravel barriers and a computer-based methane detection system that continuously samples for methane build-up, records concentrations and triggers alarms when it reaches the danger level and automatically actuates a fresh air purging system. Heart of the monitoring, alarm and control system are infrared gas analyzers supplied by Mine Safety Appliances Company.

Four times an hour, a pump draws air samples from probes installed through the cement slab below each building and starts a complex chain of testing. Eight above-ground sampling probes are also located in stairwells and other occupied space in basements.

Six of the seven buildings on the campus are equipped with the active monitoring, alarm and purging system involving 16 test points and a separate infrared analyzer. The seventh structure has a monitoring and alarm system only, relying on physical barriers and passive venting to prevent methane buildup.

If methane build-up is detected, a report is quickly transmitted from the instrument to a central computer in the supervisory data control center. Instru-

FRESH AIR FIEND. Infrared methane analyzers and oxygen detectors keep electronic eye on methane buildup under and in college buildings. Exhaust valves and fresh air inlets are automatically actuated.

If you need more info contact

ment alarms are triggered when methan levels under or in a building reach 50 percent of the Lower Explosive Limit (the LEL for methane is 5 percent by volume.)

In addition to triggering a red alarm light at the central computer, the system automatically actuates purge pumps located on the top floor of each building. The pumps can also be started by the central computer operator who can override analyzer control.

The pumps draw methane out of a rock blanket below the building and vent the gas through riser pipes extending 10 feet above the roof. At the same time, an inlet valve opens, drawing fresh air into the rock blanket to dilute the methane concentration.

According to Myron Nosanov of Engineering-Science, there were several reasons why complete reliance on a passive venting system (no purging) was not feasible: 1) building areas were large and the system would have to depend to an unreliable degree on the integrity of an impervious membrane; 2) frozen ground during winter and the need for protecting against frost have precluded venting with a gravel blanket at the sides of the buildings; and 3) the buildings were to be constructed on pilings because of extremely poor bearing conditions.

Continuous 24-hour-a-day monitoring is necessary at the Harbor Campus Complex because build-up of methane can occur rather rapidly, according to Peter Verrochi, chief engineer of the Physical Plant Department of the university.

"In some 'hot spots' we can get enough methane to set off the alarm in 30 minutes time," says Verrochi.

To keep the system functioning with minimum downtime, routine inspection is conducted daily by a technician responsible for maintaining the methane/oxygen detection system.

During these inspections, fresh air inlet valves are checked and the analyzers recalibrated if necessary. A combination of a training school at MSA's headquarters and on-the-job training enables university personnel to handle maintenance problems.

NOT A RE-RUN. System continuously monitors methane levels, displays gas concentrations on CRT in central control room. Data can also be printed out for permanent record.

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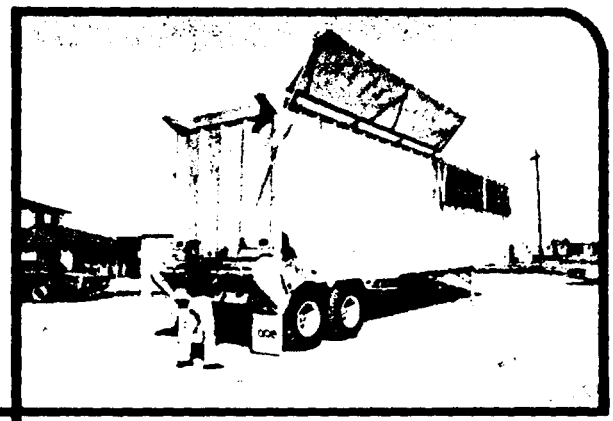

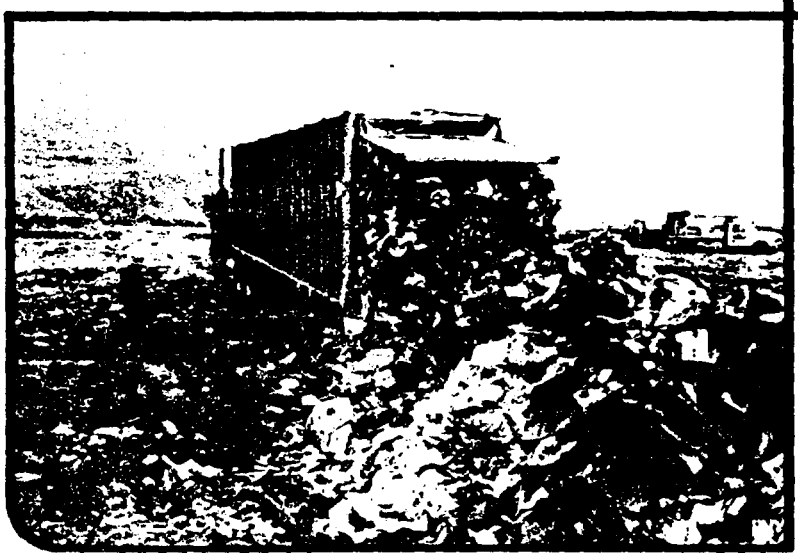

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Gas Control Safeguards Development of a Landfill Site

M. E. NOSANOV
Manager
Special Projects Department
and
ROBERT L. WHITE
President
Engineering-Science, Inc.
Arcadia, California

NESTLED into the City of Los Angeles' Santa Monica Mountains, south of Mulholland Drive and west of the San DiegoFreeway, is the MountainGate Country Club and an adjacent associated townhouse development. The country club presently includes an 18-hole tournament size golf course along with tennis courts and club house facilities. The townhouses are now under development.

These developments would not necessarily be of interest if it were not for several unique circumstances concerning the site. The golf course is atop a completed sanitary landfill, in what was once one of many unusable, inaccessible canyons. The townhouses are to be constructed on the ridges of the mountains which partially encircle the golf course. The ridges were cut and graded to provide daily and final cover for the landfill and to prepare for final tract grading.

The sanitary landfill was operated under lease to the Los Angeles County Sanitation District. Landfilling operation began in 1964, and in February, 1971, after the controlled placement of six million tons of compacted refuse, the fill was covered and contoured with from 20 to 40 feet of soils graded from the ridges. The landfill was operated as a Class II Waste disposal site (State of California designation) accepting wastes consisting primarily of nontoxic chemically or biologically decomposable material in addition to nonwater soluble, nondecomposable inert solids.

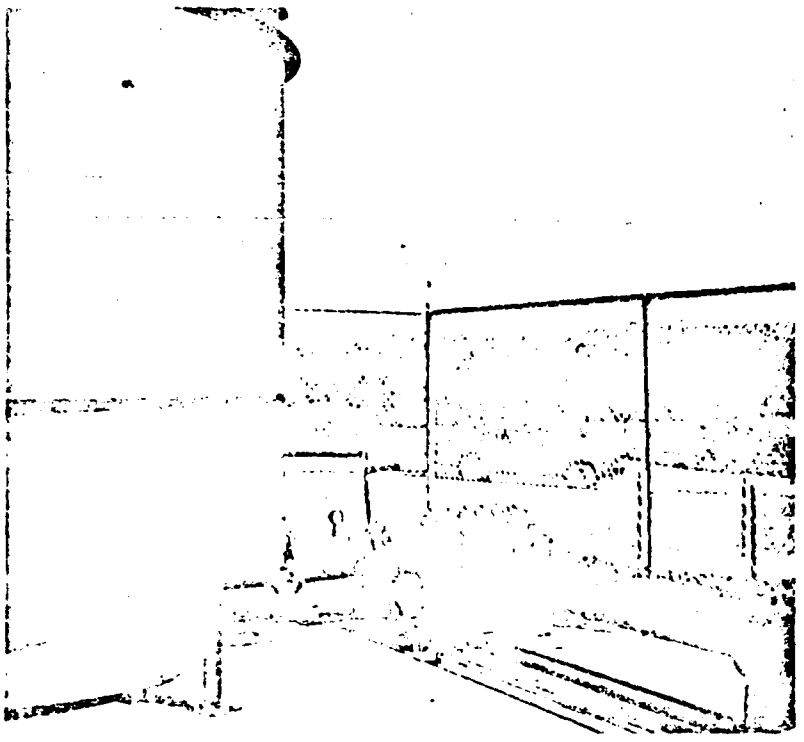
Conditions within most landfills generally favor the formation of gases of which the principal components are methane, carbon dioxide and nitrogen. Other gases which may be found, usually in lesser quantities, include hydrogen sulfide, other acid gases, organic gases, and argon.

At MountainGate, a study of the presence of and potential for gas generation and migration was performed by Engineering-Science, Inc. (ES) in 1971. At that time, the need for the study was recognized by the developer, Barclay Hollander Corporation, because of the possibility of migrating methane gas collecting in buildings, underground structures, and piping ways. In concentrations within 5 to 15 percent (by volume, in air) and in the presence of a spark or glowing heat source exceeding 1100°F, with adequate oxygen, methane will explode. Explosions from landfill gas, although rare, have been well documented throughout the United States and Canada.

The 1971 investigation revealed a potential for the generation of large quantities of gas within the landfill but the absence of measurable quantities of methane at the proposed building sites. The existing geology did not appear sufficiently permeable to permit methane migration. However, it was determined that although the soil would prevent migration of gases to adjacent developable sites, the continued integrity of boundary soils could not be assured and further, migration of gases through utility lines and/or bedding materials could occur. Hence, precautionary gas control measures were judged necessary for the proposed development and made part of the conditions of approval by the City of Los Angeles.

Criteria and design details were developed by ES for a landfill gas venting system, and gas control criteria were also prepared for buildings and hardware subsystems. The gas venting system was later constructed and placed in operation in January, 1976. A proposed gas monitoring program and building plans incorporating gas barrier hardware are being completed.

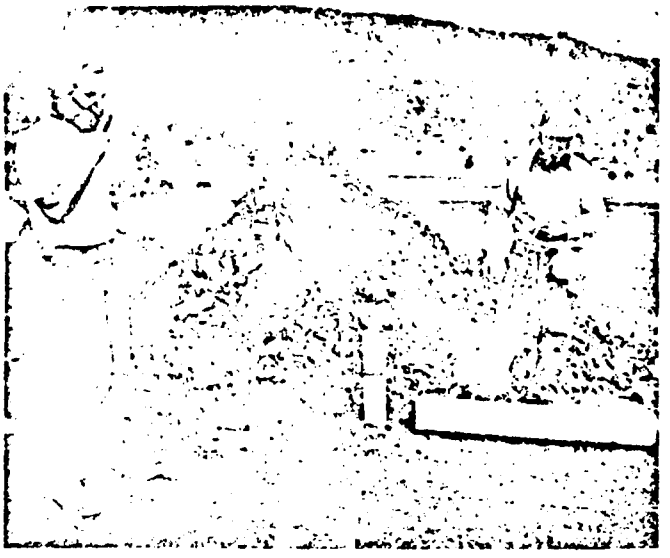
VACUUM pump draws gas from the venting system and delivers it to the incinerator. Shown below are the pump, burner shield and related controls.

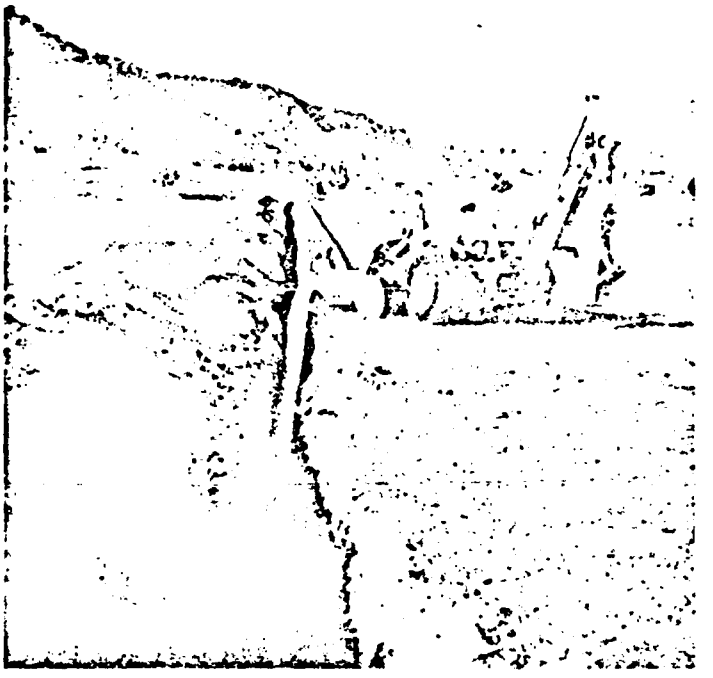


Gas Venting System

The vent wells and interceptor trench system consist of a series of slotted vertical and horizontal pipe which are connected to a collector system of solid exhaust header pipes. An outfall pipe connects to a vacuum pump. When the vacuum pump is operating, negative pressure is induced within the soils surrounding the slotted pipe, causing gases within the area of influence to flow towards and into the venting system. The collected gases are then incinerated in a gas burner.

All piping is underground except at the pump and incinerator station which is located on a reinforced concrete slab and surrounded by a chain link fence. In each interceptor trench are both the slotted trench pipe which is connected to the vertical well pipe, and the solid collector pipes. The trenches and wells are backfilled with crushed rock and





■ PERFORATED vent well pipe is placed in a boring, prior to placing rock and connecting pipes. For protection, workmen on the job used respirators. Outfall pipe was assembled at grade and eased into the trench with the aid of a loader.

covered with a layer of PVC sheeting and concrete. Each collector pipe connects to a pipe outfall which runs in a smaller trench covered with native soils to the pumping station. Butterfly valves control the amount of vacuum supplied to each segment of the venting system. All pipes and valves are of PVC to reduce the danger of sparking.

The gas venting system includes 20 wells installed along the periphery of the landfill adjacent to the proposed townhouse locations. These wells vary from 30 to 50 feet deep. Four special wells were installed within the landfill, three to vent high gas concentrations and one to function as a pilot methane mining extraction well. There are 2,670 feet of interceptor piping and 3,445 feet of outfall and special vent well piping.

Pump and Incinerator

The pump at the incinerator station provides subatmospheric pressures throughout the vent wells and interceptor lines and forces the collected gases through a waste gas incinerator. The vacuum pump has aluminum impellers and a fiberglass housing; a flame check and automatic shutoff are built into the burner instrumentation controls.

The pump, a belt-driven centrifugal turboblower, is powered by a 20 hp electric motor. Immediately downstream from the blower discharge are two 6-inch valves. The first valve is a manual latch-operated reset safety shut-off valve. This valve is open only when the ultraviolet sensing unit on the incinerator detects the flame, or when a pressure sensing switch detects a predetermined reduction in pressure in the line between the pump and the incinerator. The second valve is a gear-operated flow control butterfly valve and is the system's primary flow controller. Flow is indicated by the measure of pressure drop through a venturi tube located adjacent to the flow control valve. A flame arrestor has been installed to prevent back burn from the incinerator.

The incinerator unit has 288 burner tubes inside a 6-foot diameter, 2-foot high ceramic shield, which in turn is surrounded by an 8-foot diameter, 14-foot high shell. A propane gas line feeds a pilot light within the incinerator to initiate combustion. The pilot flame goes out approximately one minute after incinerator start-up and must be electronically re-ignited during the start-up procedure.

The pump and incinerator unit has a maximum flow capacity of approximately 1,134 cfm. The landfill gas has a BTU rating of between 250 to 500 per cubic foot. The pilot gas propane tank has a 500 gallon capacity with 40 SCFH capacity to the pilot flame.

Under minimum flow conditions gusty winds were occasionally found to extinguish the incinerator, causing the ultraviolet sensor to shut down the pump. A wind brake added to the open cyclone-type fencing surrounding the station subsequently prevented recurrence of windcaused flameout.

Tests of the system operation indicate that the turboblower is capable of displacing the design volume of gas. The flow controlling and gauging devices work accurately and the incinerator is capable of sustained combustion under design flows.

Safety Criteria and Procedures

During excavation in soils above the landfill and drilling through the cover to the fill material, significant concentrations of combustible and obnoxious gases were measured. Provisions were made for the protection of men and equipment working in the proximity of these potentially hazardous excavations.

The contractor and ES' engineers were equipped with combustible gas indicators, acid gas and organic vapor respirators, and safety goggles. Protective skin cream was also available for any persons with sensitive skin problems. When gas was detected within a trench or in proximity to a drill hole, the workmen wore respirators and goggles. Trenches and drill holes were wetted during excavation to reduce the hazards of sparking. Operating equipment was equipped with high exhaust stacks and foam type fire extinguishers. During construction of the underground portion of the system the golf course was closed.

Methane Mining Possibilities

The existing outfall and pump and incinerator station have been recently utilized as one of several mechanisms to investigate the feasibility of collecting methane gas from the landfill and converting it to useful purposes. A specially designed pilot extraction well has been constructed and valved into the system and a report on the feasibility of commercial methane mining is scheduled for publication in the near future.

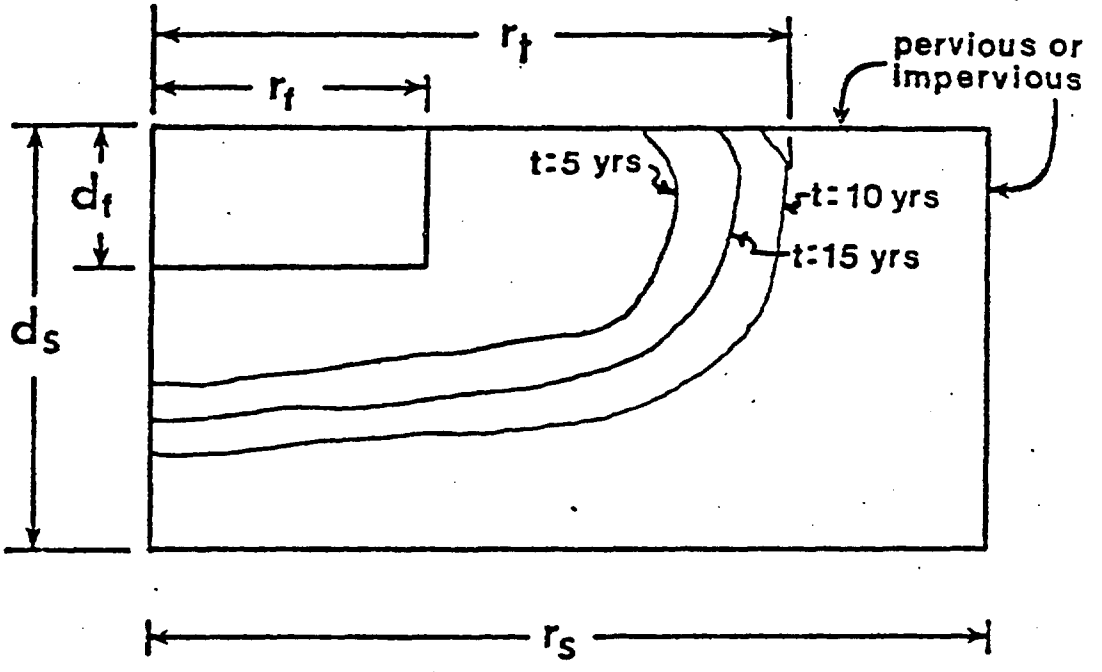


Figure 2 Cross - section through Figure 1.

Table 1 Soil Properties Assumed for Design Charts

soil type	porosity, n	tortuosity, τ	pore size distribution	
			pore radius (Å)	volume fraction
granular	.4	2.25	4×10^5	0.4
fine grained	.4	2.25	6.35×10^1	.022
			1.385×10^2	.038
			3.0×10^2	.044
			6.55×10^2	.048
			1.45×10^3	.0456
			3.15×10^3	.0464
			6.85×10^3	.048
			1.52×10^4	.048
			3.30×10^4	.038
			2.25×10^4	.022
				$\Sigma = .40$

3.4 CONFIGURATION OF DESIGN CHARTS

The design charts, included in Appendix A, plot r_t/r_f versus d_s/d_f for several values of r_s/r_f. It is presumed that for a given landfill r_f, d_f, r_s and d_f will be known. Thus, d_s/d_f and r_s/r_f can be calculated. The charts are entered at the value of d_s/d_f. The value of d_s/d_f is projected vertically until the proper curve for r_s/r_f is intersected. The value of r_t/r_f may then be read. This value is multiplied by r_f to obtain r_t.

The time for maximum excursion can also be determined if the time overlay charts of Appendix B are used.

3.4.1 Example Problem I

A sanitary landfill is approximately circular in shape with a radius of 200 meters. The depth of the landfill is 15 meters. The soil surrounding the landfill is a sand (granular) and the groundwater table is encountered at a depth of 20 meters. Because of frequent rainfall, it is assumed that the ground surface is saturated and, therefore, impervious. It is presumed that decomposition will be complete in 5 years. Compute the maximum excursion of the 5% methane level. Compute the time after beginning of filling when the maximum excursion is reached.

Solution: From the description given above:

$$r_f = 200 \text{ m}, \; d_f = 15 \text{ m}, \; d_s = 20 \text{ m},$$

The soil is granular, and the ground surface is impermeable. Because no limit to the horizontal extent of the soil is mentioned, it is presumed that $r_s = \infty$.

Thus:

$$\frac{d_s}{d_f} = \frac{20}{15} = 1.33; \qquad \frac{r_s}{r_f} = \frac{\infty}{200} = \infty \geq 5.$$

Figure A.2 is appropriate for granular soils with impervious surface boundaries and pervious radial boundaries. Entering for d_s/d_f = 1.33 and proceeding upward to the curve for $r_s/r_f \geq 5$ we find $r_t/r_f = 2.04$. Because $r_f = 200$ m, $r_t = 2.04 \; (r_f) = 2.04 \; (200) =$ 408 meters. From Figure B.2, the time required for maximum excursion is slightly over 100 years.

3.4.2 Example Problem II

The situation is the same as in Example Problem I except that the ground surface is dry (pervious).

Solution: Same as Example Problem I except use Chart A.1 to get $r_t/r_f = 1.234$.

$\therefore r_t = 1.234 \; (200) = 250$ meters.
From B.1 the time required for maximum excursion is a little over 5 years.

3.5 EFFECT OF VARYING ASSUMED VALUES FOR DECOMPOSITION TIME, SOIL POROSITY, AND TEMPERATURE

A study was made of the effects of varying the typical values assumed for decomposition time, soil porosity and temperature on r_t.

The effects of varying decomposition time are shown in Figure 3. For short decomposition times, corrections of as much as -12% were required. However, decomposition times of up to 15 years required corrections of only +7%.

3.5.1 Example Problem III

The situation is the same as Example Problem I except that the decomposition time is 7 years rather than 5 years.

Solution: From Problem I, $r_t/r_f = 2.04$ for a 5 year decomposition time.

$$\frac{t_o}{5} = \frac{10}{5} = 2.0$$

From Figure 3, factor = 1.044.

Thus

$$\left.\frac{r_t}{r_f}\right|_{t_o} = \left.\frac{r_t}{r_f}\right|_{5} \times \text{factor} = 2.04(1.044) = 2.13$$

Therefore $r_t = 2.13 \quad r_f = 2.13 \quad (200) = 426$ m.

Figure 4 shows the effects of varying porosity. Here correction factors are quite small, with factors of -10% being required for porosities of 0.1.

3.5.2 Example Problem IV

The situation is the same as Example Problem I except that the soil porosity is 0.3 instead of 0.4.

Solution: From Problem I, $r_t/r_f = 2.04$ for a porosity of 0.4.

$$\frac{n}{.4} = \frac{.3}{.4} = .75$$

From Figure 4 for $n/.4 = .75$, factor = .982.

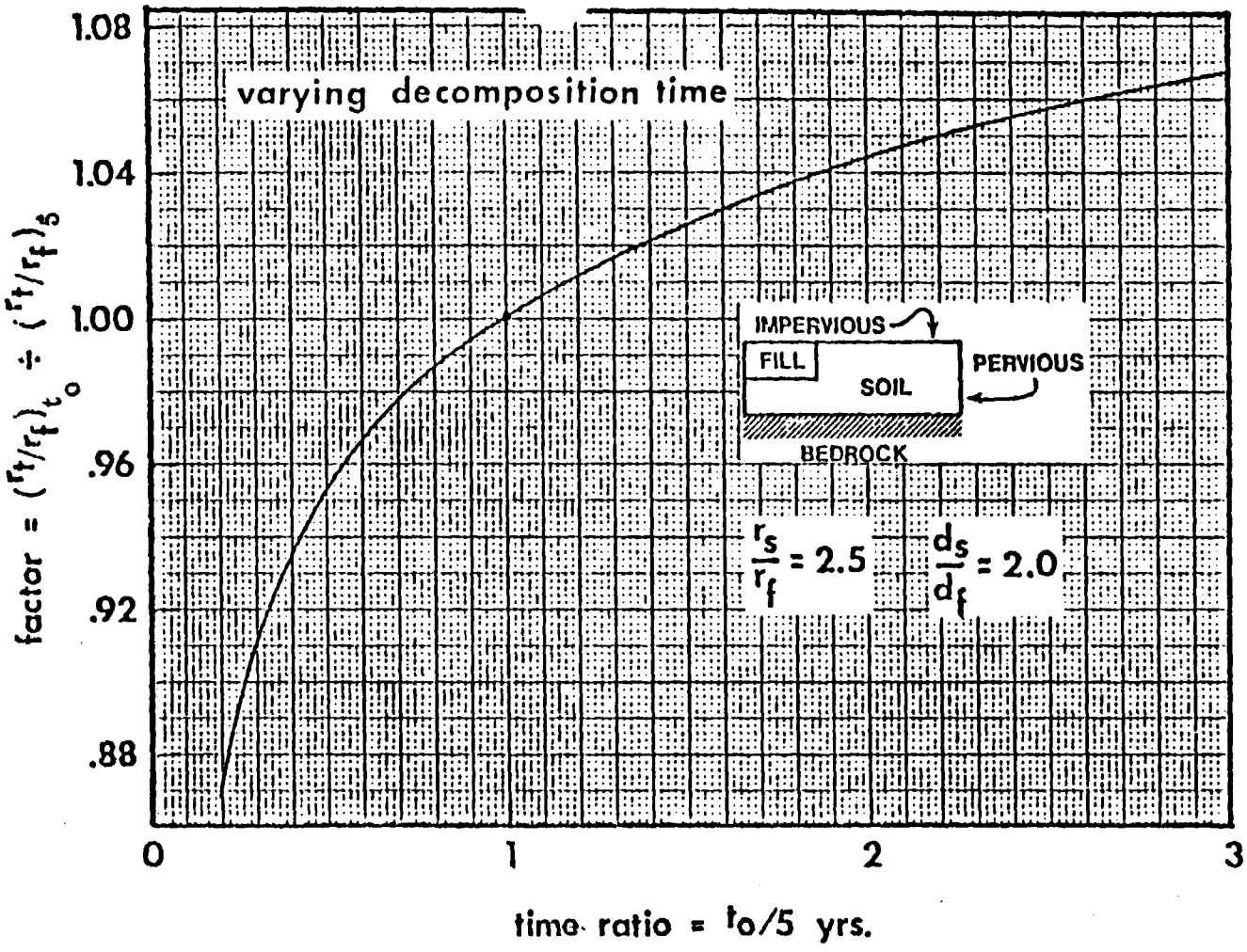


Figure 3 Effect of varying decomposition time on maximum excursion of 5% methane level in granular soil.

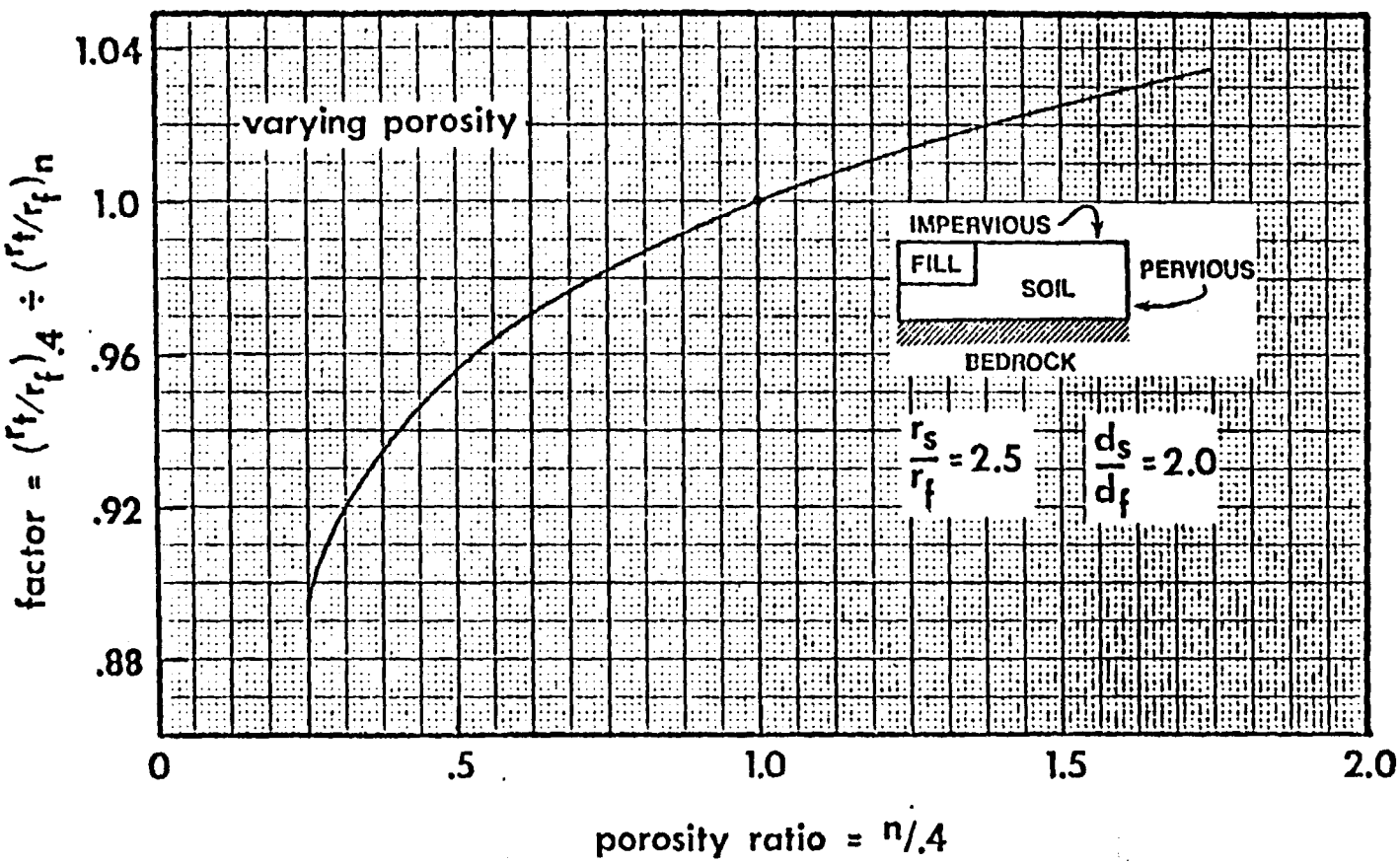


Figure 4 Effect of varying soil porosity on maximum excursion of 5% methane level in granular soil.

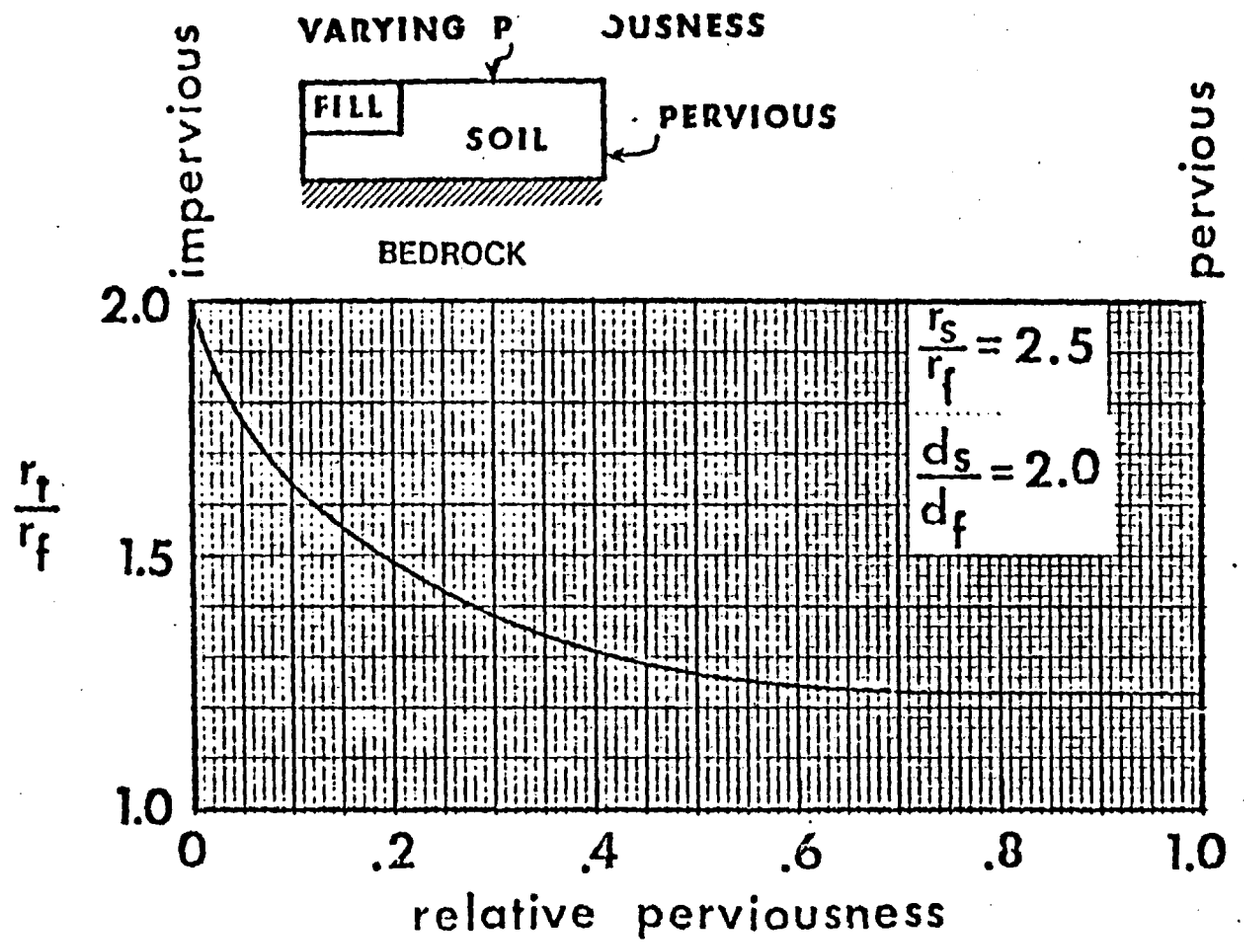


Figure 6 Effect of varying ground surface perviousness on maximum excursion of 5% methane level in granular soil.

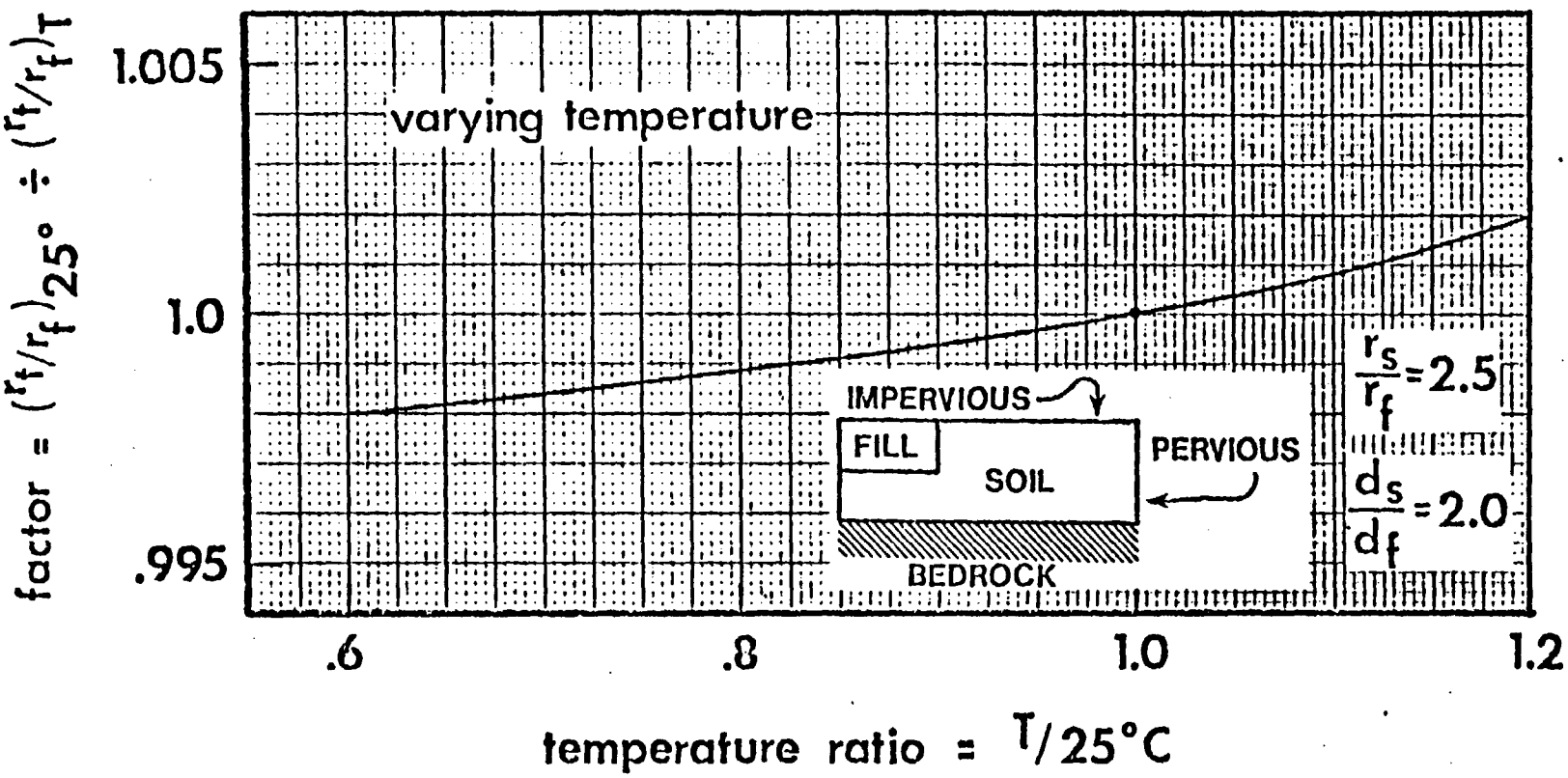


Figure 5 Effect of varying temperature on maximum excursion of 5% methane level in granular soil.

Thus

$$\left.\frac{r_t}{r_f}\right|_n = \left.\frac{r_t}{r_f}\right|_{.4} \quad \text{x factor} = 2.04\ (.982) = 2.00$$

Finally, the effect of temperature variation is shown in Figure 5. The effect is negligibly small.

3.6 EFFECT OF VARYING PERVIOUSNESS OF GROUND SURFACE

Factors such as rainfall infiltration, frost, vegetation, paving, etc., can result in the ground surface having perviousness varying between completely pervious and completely impervious. The effect of relative perviousness of the ground surface boundary is shown in Figure 6. The variation can be seen to be nonlinear with a high degree of imperviousness being required to approach the totally impervious permeation limits.

3.6.1 Example Problem V

The situation is the same as in Example Problem I except that the ground surface is not saturated by rain. Instead, 75% of the ground surface is impervious due to buildings with flat slab foundations. Thus, 25% of the ground surface is pervious.

Solution: From Problem I for a completely impervious ground surface r_t = 408 m. From Problem II for a completely pervious ground surface r_t = 250. From Figure 6 for 25% perviousness r_t/r_f = 1.43.

Thus $r_t = 1.43\ \ r_f = 1.43\ \ (200) = 286$ m.

3.7 EFFECT OF RADIAL BOUNDARY CONDITIONS

The concept of a radial soil boundary at r_s was introduced to allow for finite grid sizes in the computer codes. In practice, if the radial soil boundary is large relative to r_f, then the existence of the boundary has little effect on the solution. This is bourne out by noting that on all of the design charts, one curve holds for all r_s/r_f greater than some particular value (1.5 on A.1, A.3, A.4; and 5 on A.2 and A.5). Moreover, if the soil boundary is far away from the landfill, it is unimportant whether the boundary is taken as pervious or impervious. Thus, the curves for r_s/r_f = 1.5 are identical on Chart A.1 (pervious radial boundary) and A.3 (impervious radial boundary).

SECTION 4

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1. Moore, Charles A., and Alzaydi, Ayad A., "Development of Predictive Models for Landfill Gas Movement - Theoretical Considerations," US EPA, in press (1977).

2. Moore, Charles A., and Rai, Iqbal S., "Development of Predictive Models for Landfill Gas Movement - Computer Program Development," US EPA, in press (1977).

APPENDIX A

DESIGN CHARTS FOR METHANE

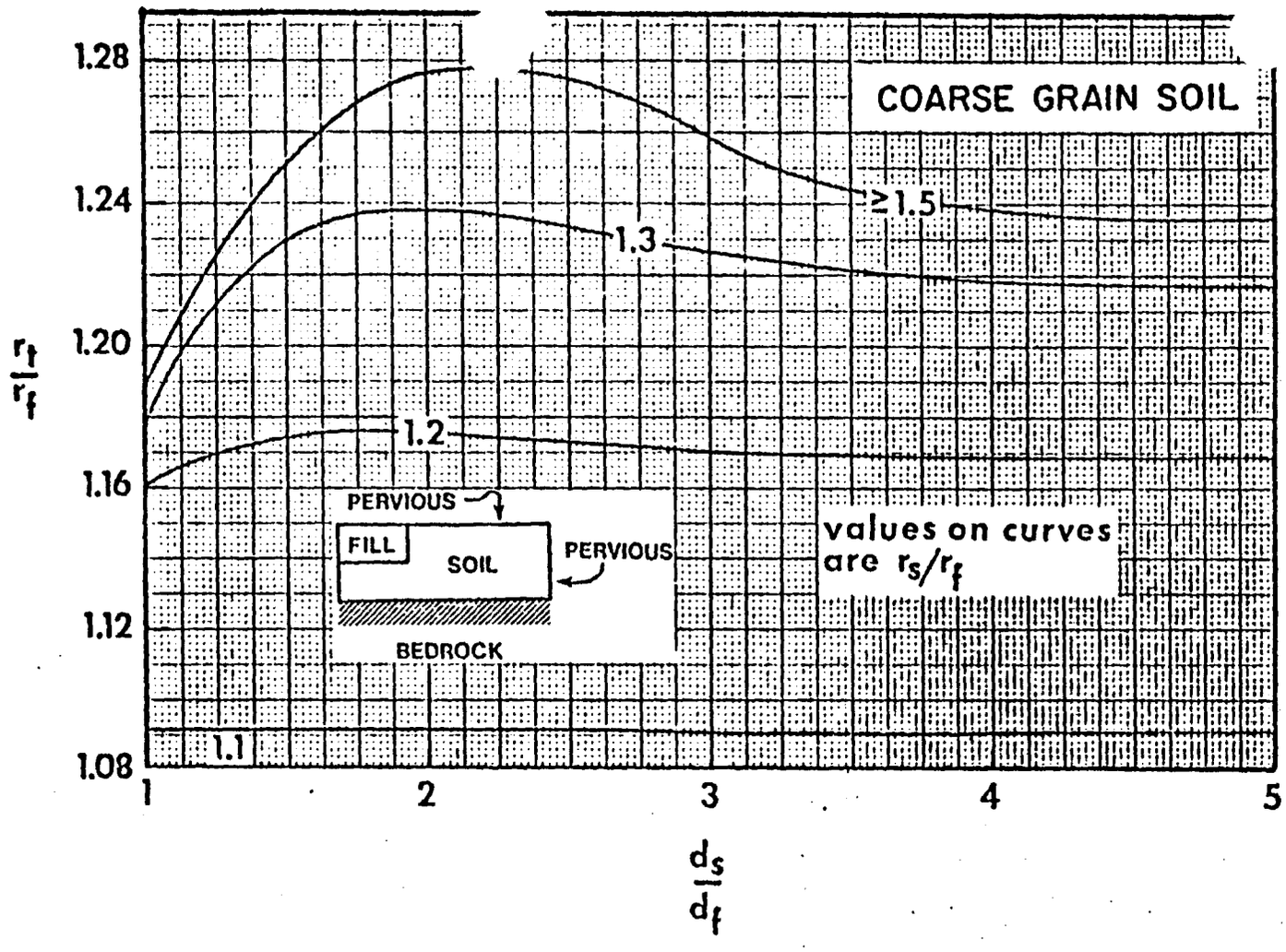

Figure A.1 Design chart for granular soil (previous ground surface and radial boundary).

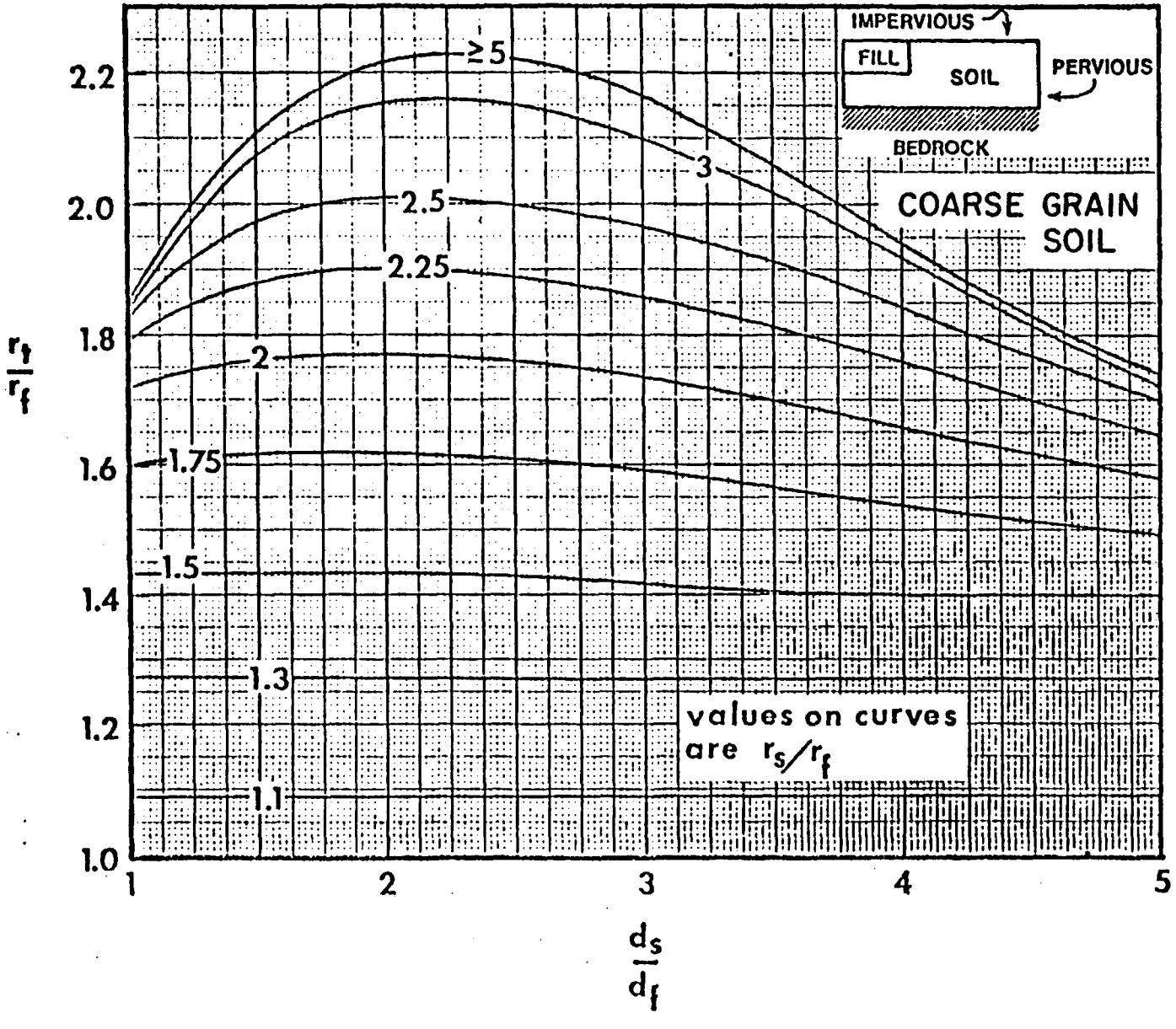

Figure A.2 Design chart for granular soil (impervious ground surface and pervious radial boundary).

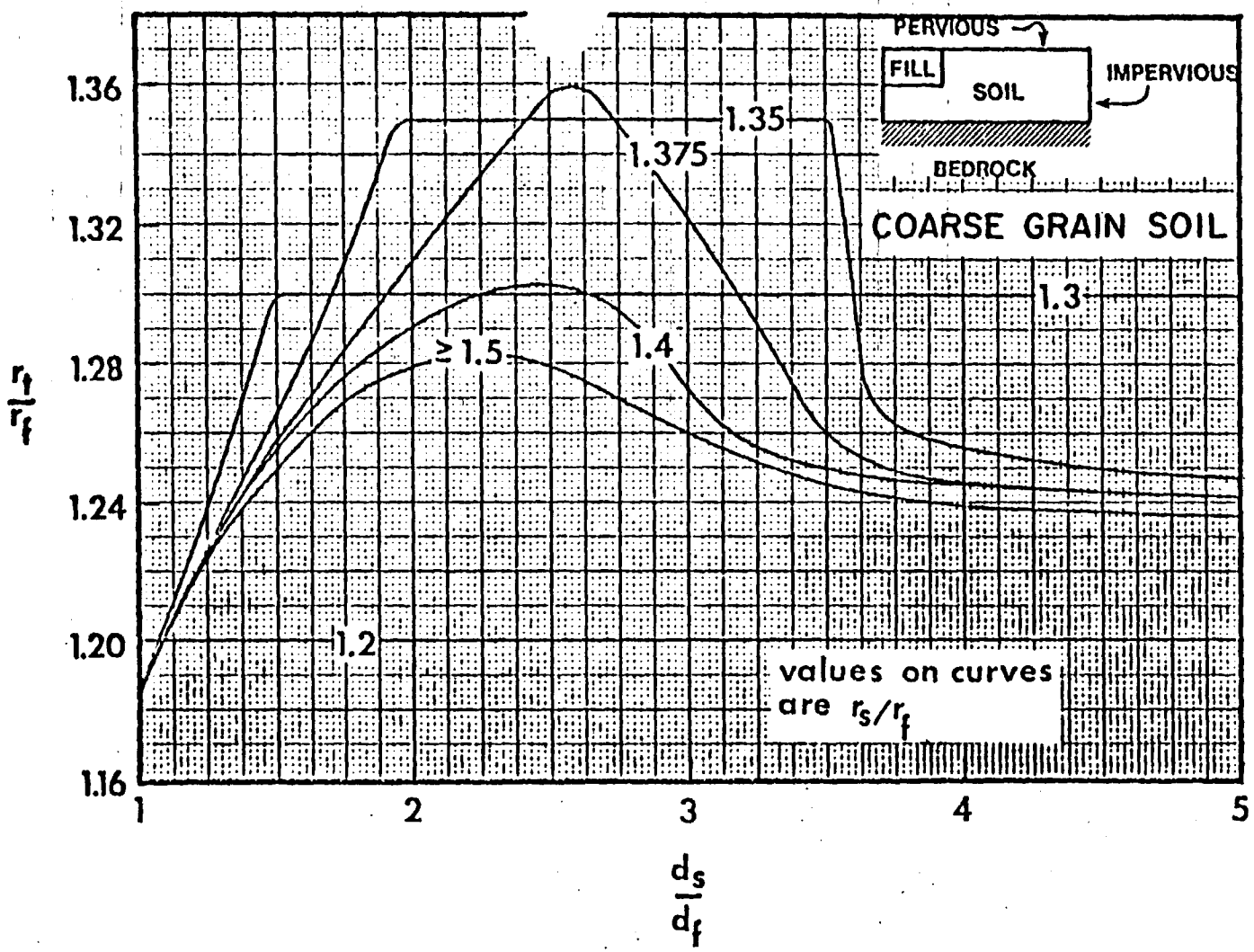

Figure A.3 Design chart for granular soil (previous ground surface and impervious radial boundary).

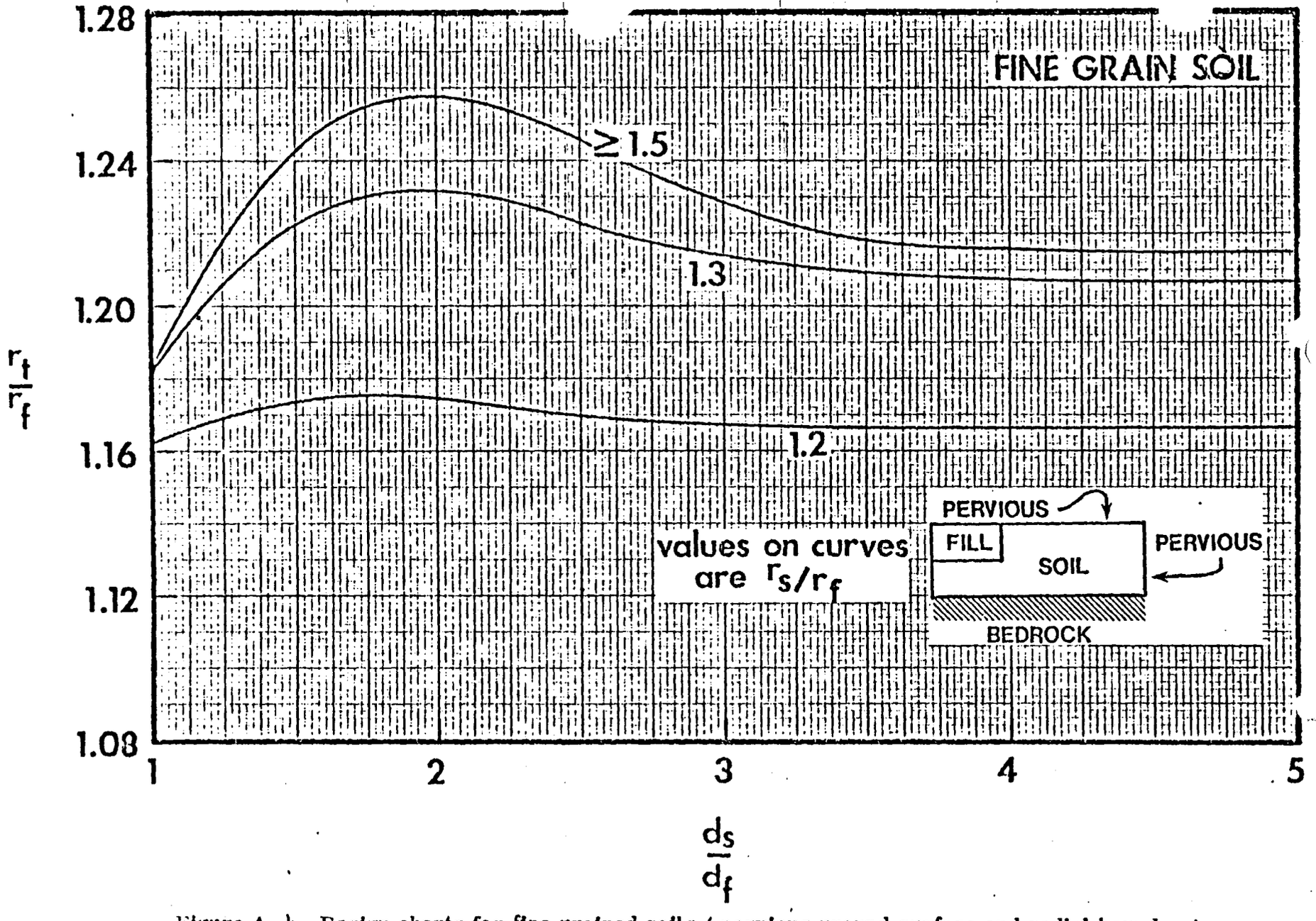

Figure A. 4 - Design charts for fine grained soils (pervious ground surface and radial boundary).

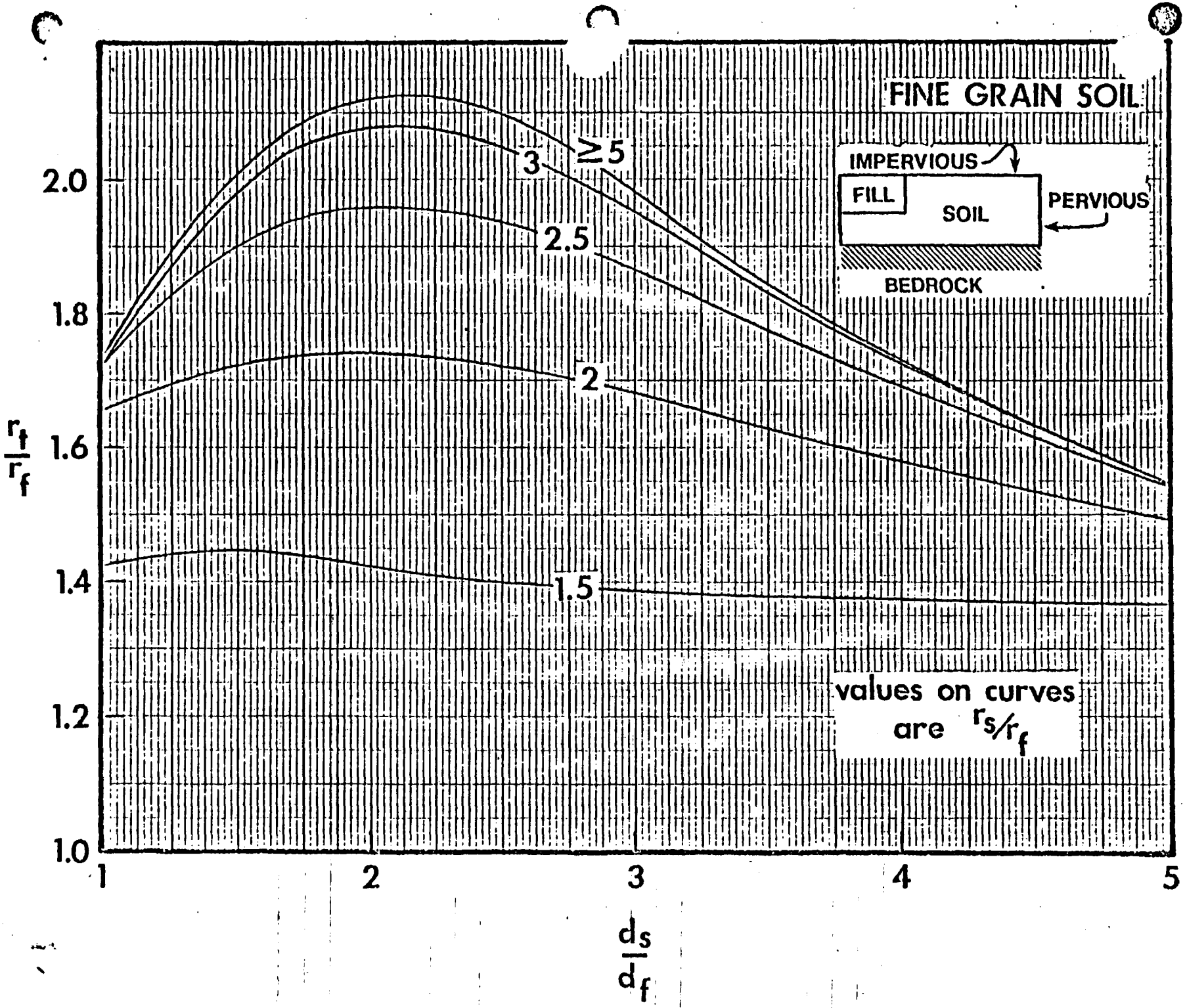

Figure A.5–Design chart for methane in fine grained soil (impervious ground surface and pervious radial boundary):

APPENDIX B

DESIGN CHARTS FOR METHANE WITH TIME OVERLAYS

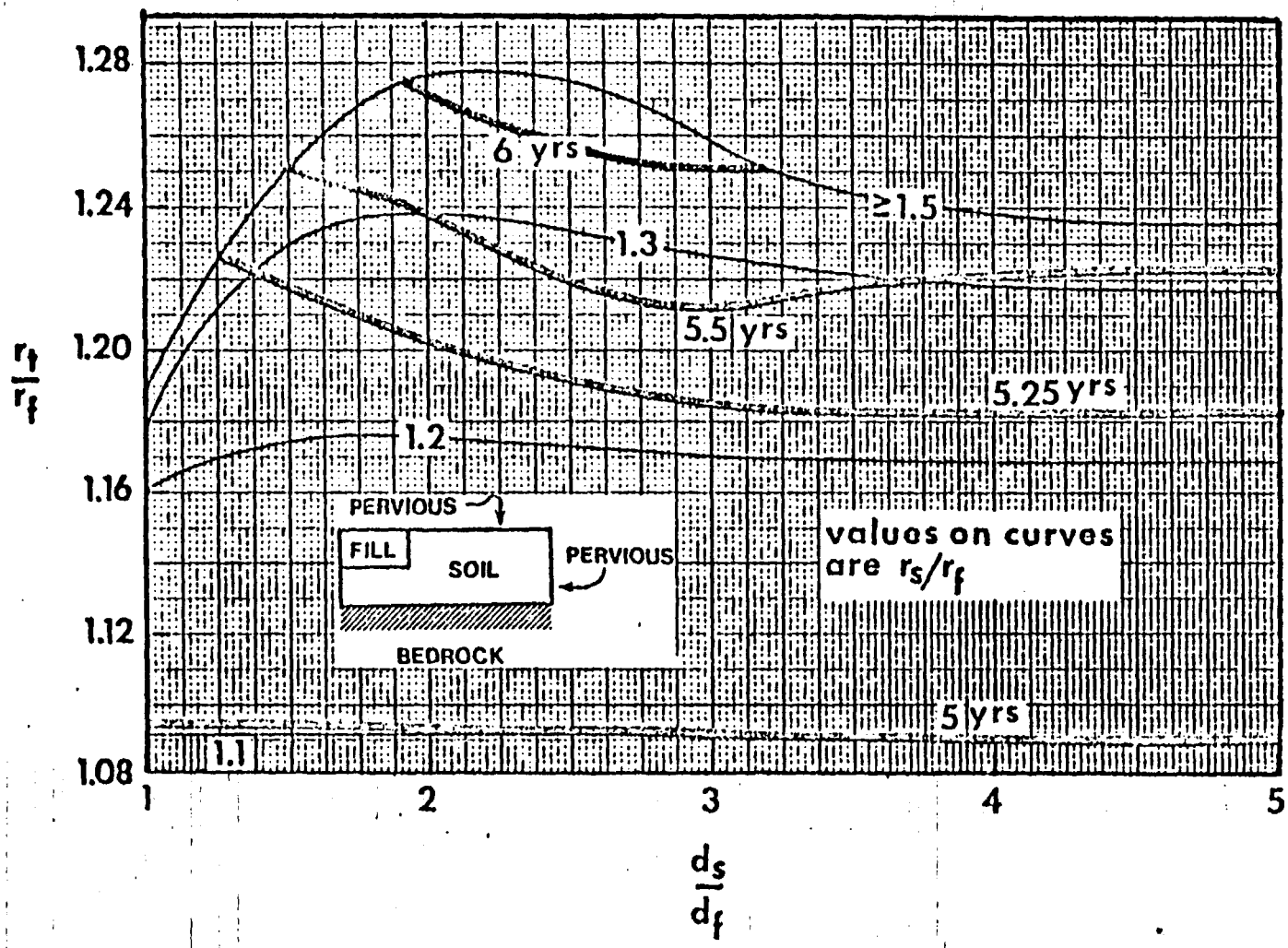

Figure B. 1 Time overlay for design chart for granular soil (pervious ground surface and radial boundary).

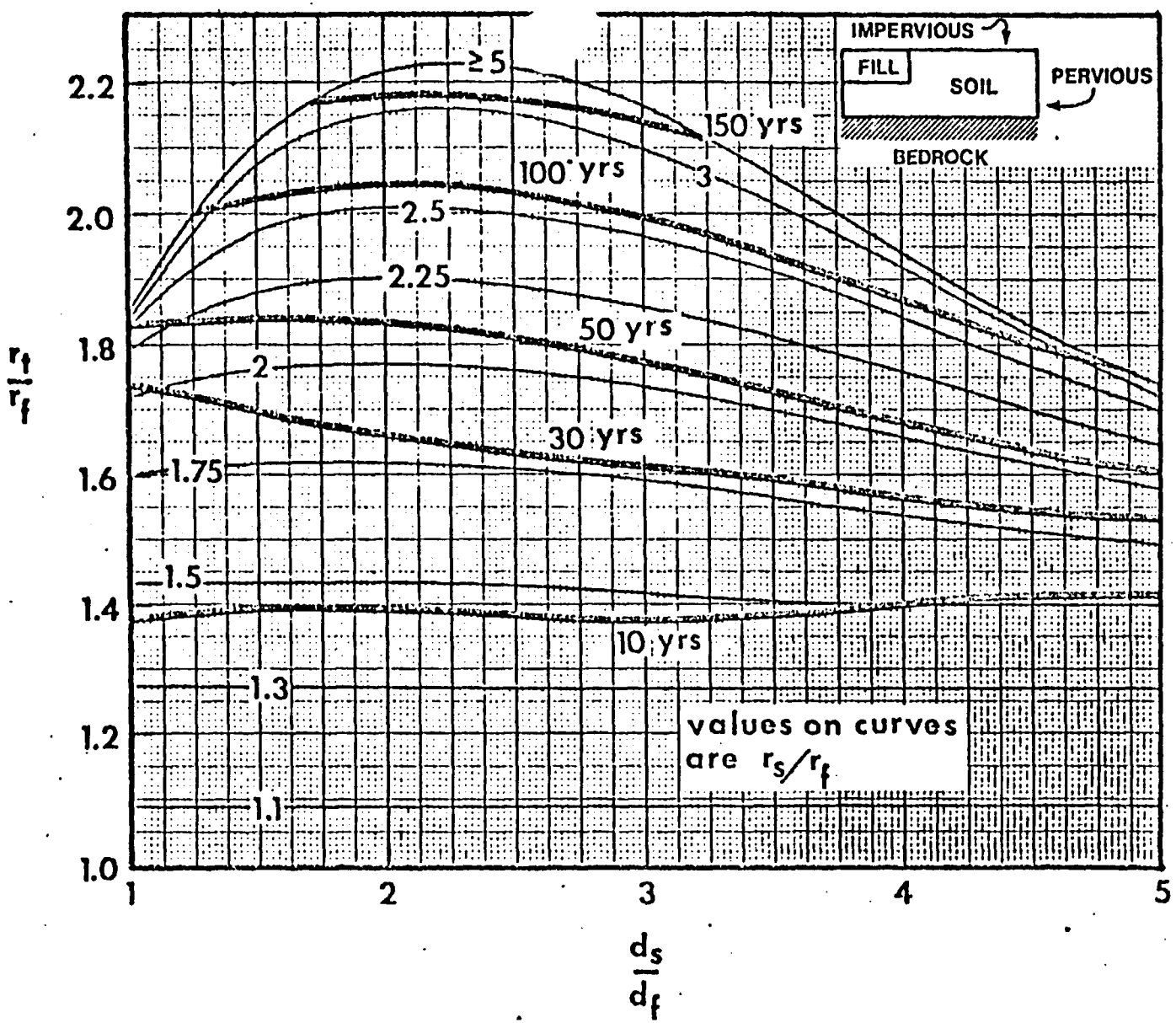

Figure B.2 Time overlay for design chart in granular soil (impervious ground surface and pervious radial boundary).

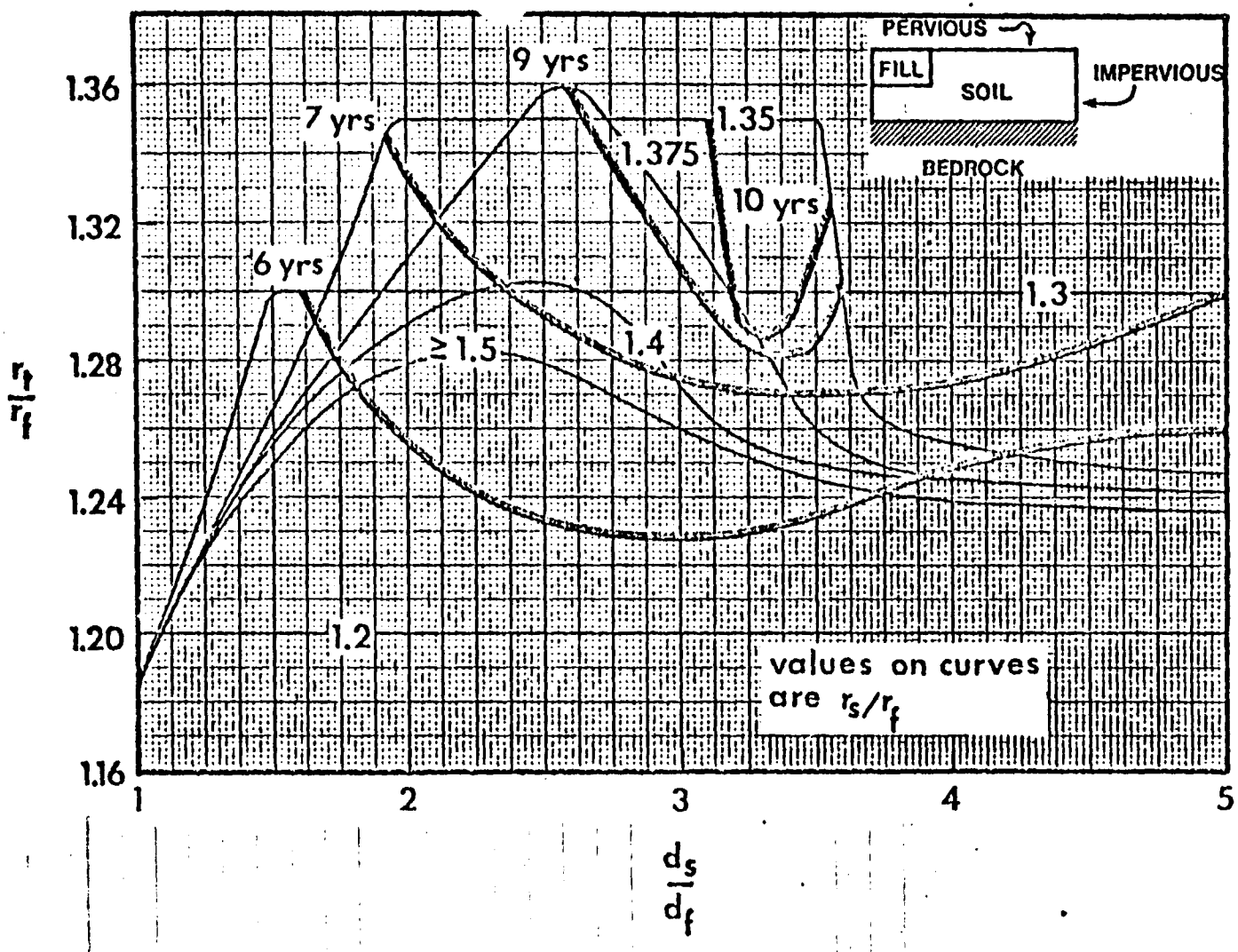

Figure B.3 Time overlay for design chart for granular soil (pervious ground surface and impervious radial boundary).

DESIGN CRITERIA

FOR

LANDFILL GAS MIGRATION CONTROL DEVICES

by

Charles A. Moore

John E. Lynch

DRAFT REPORT

September 1977

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SECTION 1

INTRODUCTION

The objective of this study was to provide guidelines for design of gas migration control facilities for sanitary landfills. Computer codes developed under a previous study (c.f. Moore and Alzaydi, 1977; and Moore and Rai, 1977) were modified to incorporate pressure flow as well as diffusional flow. In addition, the codes were modified to incorporate the more realistic case of constant gas generation rates within the landfill as opposed to the constant concentrations used in the previous studies. It should be noted, however, that additional research is required on gas generation within the landfill before entirely satisfactory modeling can be undertaken.

The migration control devices studied included trenches venting under natural convection, trenches with exhaust pumping, trenches with recharge pumping, barriers, hybrid systems consisting of a barrier with a pumped (exhaust or recharge) or unpumped trench on the landfill side, and pumped (exhaust or recharge) pipe vents.

SECTION 2

SUMMARY OF THEORETICAL APPROACH

The Fundamental equation governing combined transition region flow of multicomponent gases in porous media is given by Rai and Moore (1977) as:

$$\sum_{\substack{i=1 \\ i \neq j}}^{m} \frac{x_j N_i^o - x_i N_j^o}{c \, \overline{D}_{ij}} - \frac{N_j^o}{\overline{K}_j} = \frac{1}{RT} \quad P_j \qquad (1)$$

where N_i^o = diffusive flux vector of component i (g mole/cm^2-s)

P_i = partial pressure of component i (atmos)

x_i = mole fraction of component i (dimensionless)

$\overline{D}_{ij}$ = molecular diffusion coefficient of component i diffusing in components j (cm^2/s)

T = temperature (K)

R = gas constant (dyne - cm/g-mole-K)

$c = \sum_{r_{min}}^{r_{max}} \frac{f_r(r)}{\tau}$

$f_v(r)$ = volume fraction of pores of radius r

τ = tortuosity

$\overline{K}_j = c \, D_{kj}$

D_{kj} = Knudsen diffusion coefficient

$= k_j r$

r = pore radius

$k_j = 9.7 \times 10^{-5} \sqrt{T/M_j}$

M_j = molecular weight of components j (g)

In these equations the properties of the gases and of the porus medium are decoupled:

gas properties: $\overline{D}_{ij}$, k_j, M_j,

porous medium properties: r, $f_v(r)$, τ.

SECTION 3

APPLICATIONS TO SANITARY LANDFILLS

3.1 GEOMETRICS OF LANDFILL AND SURROUNDING SOIL

Simplified geometric conditions (figure 1) are assumed in applying the model to sanitary landfills. The landfill itself is assumed cylindrical in shape and of radius, r_f, and depth, d_f. The soil surrounding the landfill is assumed to have a horizontal soil-atmosphere interface with interchange between the soil gas and the atmospheric gas being related to concentration differences and wind velocity.

At some depth, d_s, an impervious stratum (bedrock or groundwater table) is assumed to be encountered. At some radial distance, r_s, a region of prescribed gas concentration is assumed to be encountered in order to limit the areal extent for modeling.

Gas migration control facilities are installed at radius, r_p, and penetrate to depth, d_p. In the case of a hybrid system, a twin node scheme is employed with one node at r_p representing the vent and a twin node at r_p representing the barrier. In the case of pipe vents, the pipes must be equally spaced around the circumference generated by r_p.

3.2 ASSUMPTIONS ON WHICH DESIGN CRITERIA ARE BASED

Several types of gas migration control facilities were studied for a typical landfill. The specific geometry is:

radius of landfill, r_f = 160 m

depth of landfill, d_f = 16 m

radius to limit of study, r_s = 400 m

depth to impervious layer, d_s = 32 m

radius out to control facility, r_p = 192 m

depth of control facility, d_p = 16 m.

Thus,

$$r_s/r_f = 2.5;\ d_s/d_f = 2.0;\ r_p/r_f = 1.2;\ \text{and}\ d_p/d_f = 1.0.$$

The spatial mesh size was 16 m.

The venting at the ground surface was that which would be expected for a uniform 5 mph wind; however, at the vent itself varying degrees of sealing were investigated.

Two soil types were studied; a fine grained soil having a mean pore radius of 1450Å and a coarse grained soil having a pore radius of 20,000Å. Both soil

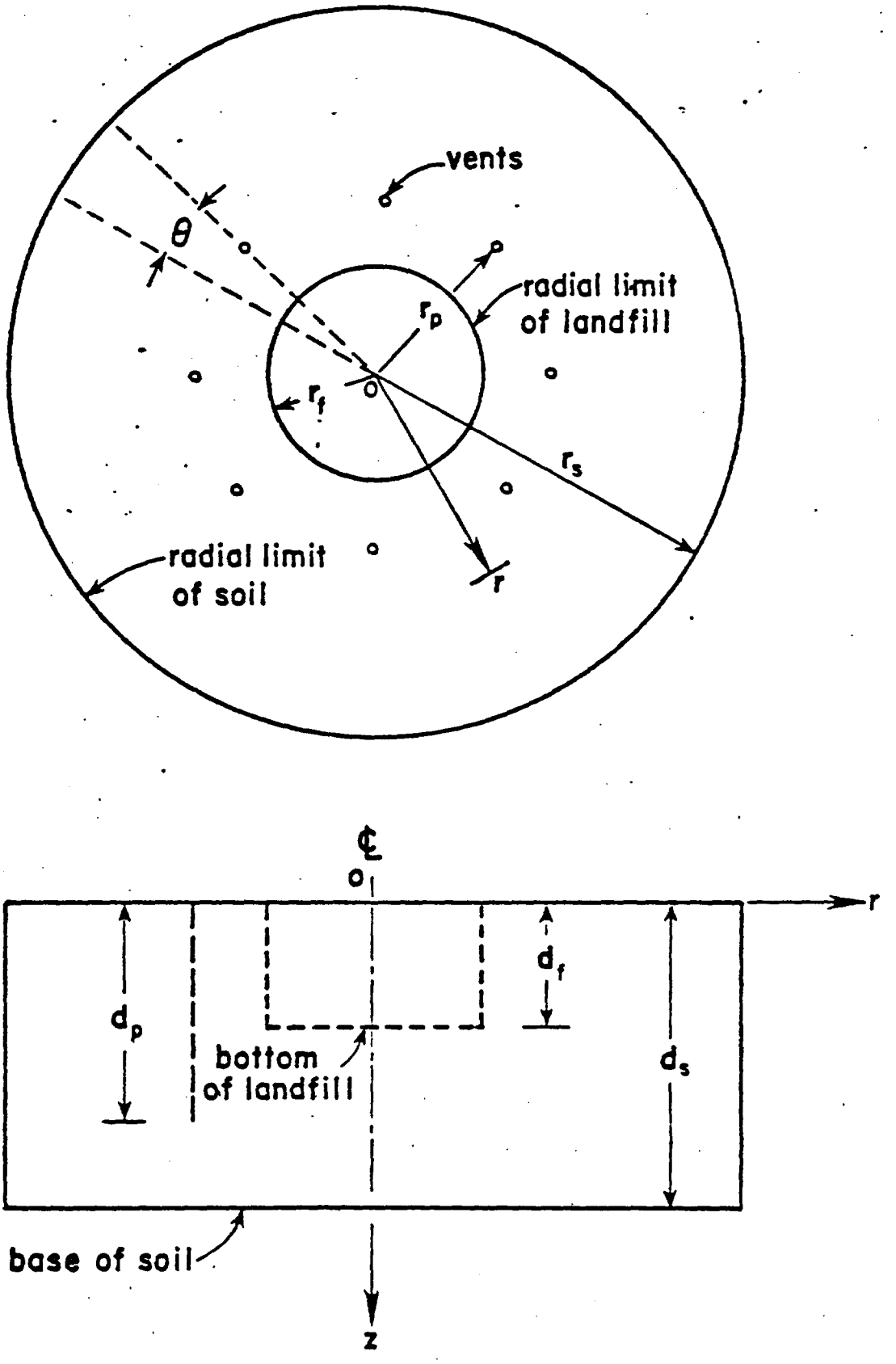


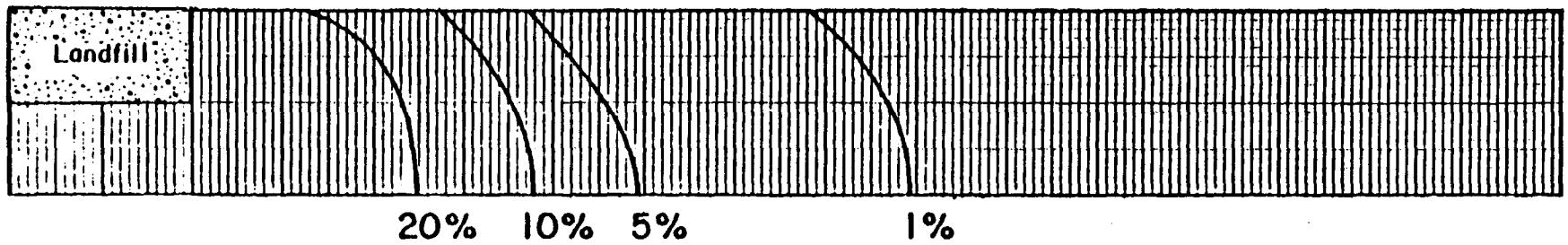
FIGURE 1 Simplified Landfill Geometry

types had a porosity of 0.40 and a degree of saturation of zero. The fine grained soil had a tortuosity, $\tau = 1.55$ and the coarse grained soil had $\tau = 2.71$.

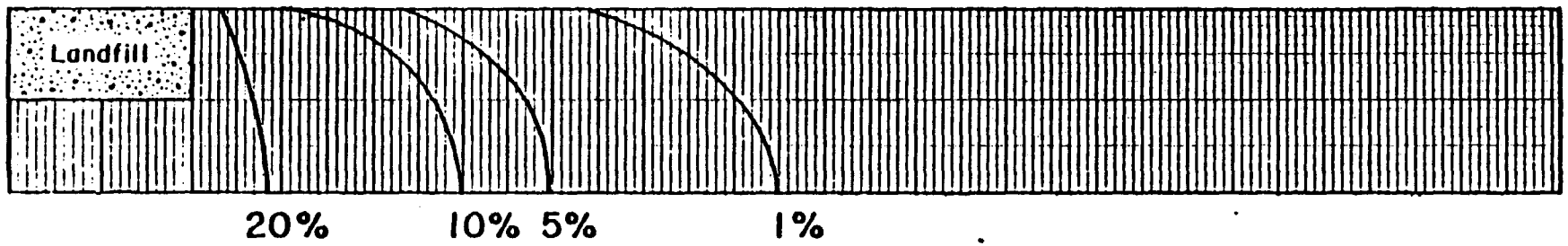
A two component gas system composed of methane and air was used to limit computing costs. Within the landfill methane was initially present at a mole fraction of 70 percent and was continuously generated at a constant rate. Pressure within the fill was initially atmospheric, but increased to a few inches of water due to gas generation.

Total pressure at the soil-atmosphere interface was maintained at 1 atmosphere. The mole fraction of methane was held at zero; while the mole fraction of air was held at 100 percent.

A datum case was examined with no control device installed to serve as a basis for comparing the effectiveness of the various methods. Figures 2a and b show methane mole fraction contours for the two soil types studied. The extent of migration of the 5 percent methane level is of the order of 3 times the radius of the landfill. Based upon these data, it was decided that an appropriate location for the gas migration control facility would be 1.2 times the radius of the landfill or at a radial distance of 192 m. The exact location, of course, was dictated by the grid used to model the problem.



a. Coarse grained soil



b. Fine grained soil

FIGURE 2 Methane Mole Fraction Contours for Datum Runs without Gas Migration Control Devices

SECTION 4

STUDY OF MIGRATION CONTROL FACILITIES

4.1 TRENCH VENTS WITH NATURAL CONVECTION TO THE ATMOSHPERE

Previous experience (c.f. Moore and Rai, 1977) with natural convection trenches indicated that they would be only marginally effective. In some cases, covered trenches actually increase the distance of gas migration by providing a horizontal path of higher perviousness than the natural soil. These conclusions were substantiated in the present study. For the coarse grained soil the results for the natural convection trench could not be distinquished from the datum; whereas, for the fine grained soil, as shown in figure 3, there was a measurable but small effectivenss. Such control facilities might be useful in situations where high total pressures build up in the vicinity of the control device. However, this migration control approach cannot be generally recommended.

4.2 TRENCH VENTS EMPLOYING FORCED CONVECTION (PUMPING)

A trench was introduced at $r_p/r_f = 1.2$ having a depth ratio, $d_p/d_f = 1.0$. For each of the two soil types, the trenches were evaluated for various pumping rates both into and out of the trench, and for both a sealed and an unsealed trench top. Typical methane mole fraction contours are shown in figure 4 for exhaust pumping and in figure 5 for recharge pumping at 5 cubic feet per minute per linear foot of trench (CFM, hereafter). Reference to these figures shows that there is a measurable effectiveness in each case. In order to study the effectiveness in more detail a variety of different pumping rates was employed. Figure 6 plots the steady state extent of travel of the 5 percent methane contour for both exhaust and recharge pumping in coarse grained soils. Figure 7 plots the same relationships for fine grained soils. Reference to these figures shows that recharge pumping systems are consistently more effective than exhaust systems. In only one case (Q = 8, fine grained) was an exhaust system capable of retracting the 5 percent contour back to the landfill side of the trench. The effectiveness of recharge pumping systems lies in their providing a positive pressure barrier driving methane bck into the landfill. Conversely, exhaust pumping systems attract methane away from the landfill toward the trench.

However, it is important to point out one potentially detrimental aspect of recharge pumping systems. If such a system is installed where methane has already migrated beyond the proposed installation point, imposing the recharge system will result in the bifurcation of methane forcing one plug back toward the landfill and a second plug out from the trench. This second effect may results in a high methane plug travelling to areas beyond the trench. Thus, in practice, careful monitoring must be employed.

Studies were performed varying the conditions of the seal at the trench top. It was found that there was little effect on the extent of methane migration. Of course, all studies presume that the trench remains free of water.

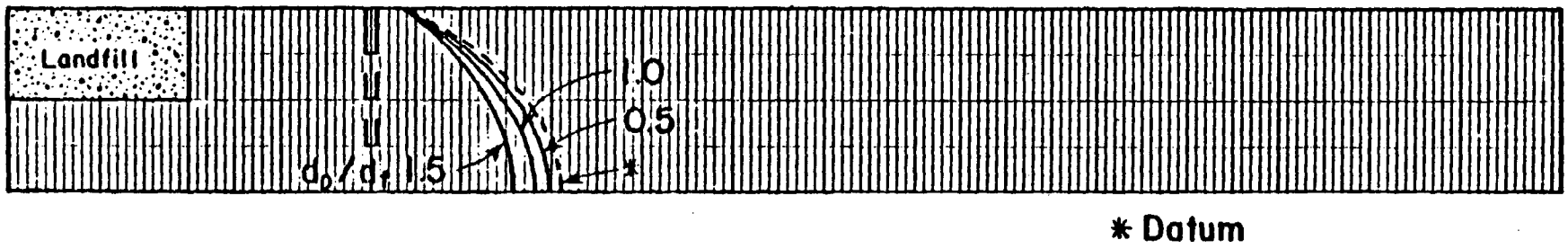


FIGURE 3 Methane 5% Mole Fraction Contours for Various Depths of Penetration for Natural Convection Trenches in Fine Grained Soils

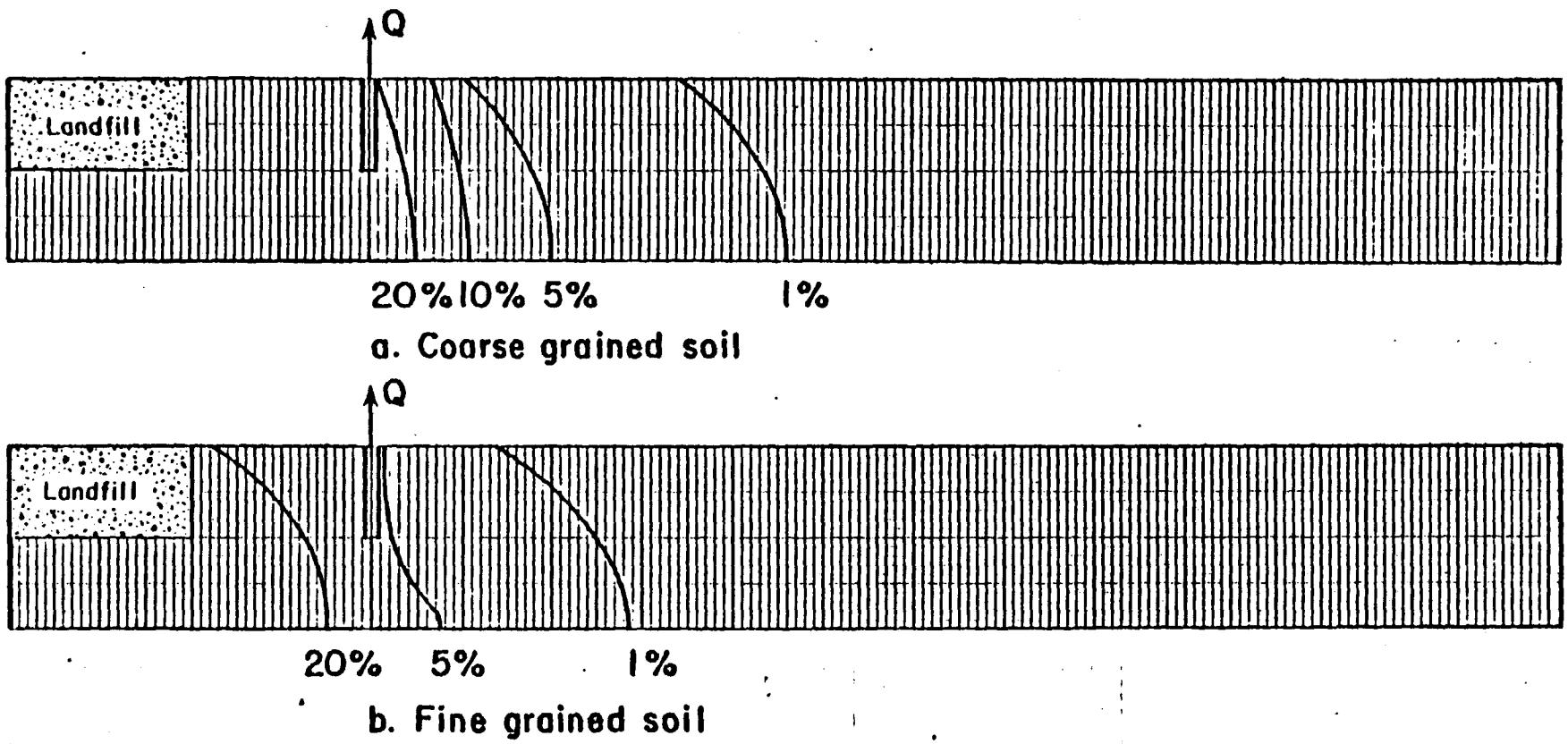


FIGURE 4 Methane Mole Fraction Contours for Trench Vents Exhaust Pumped at Q = 5 CFM

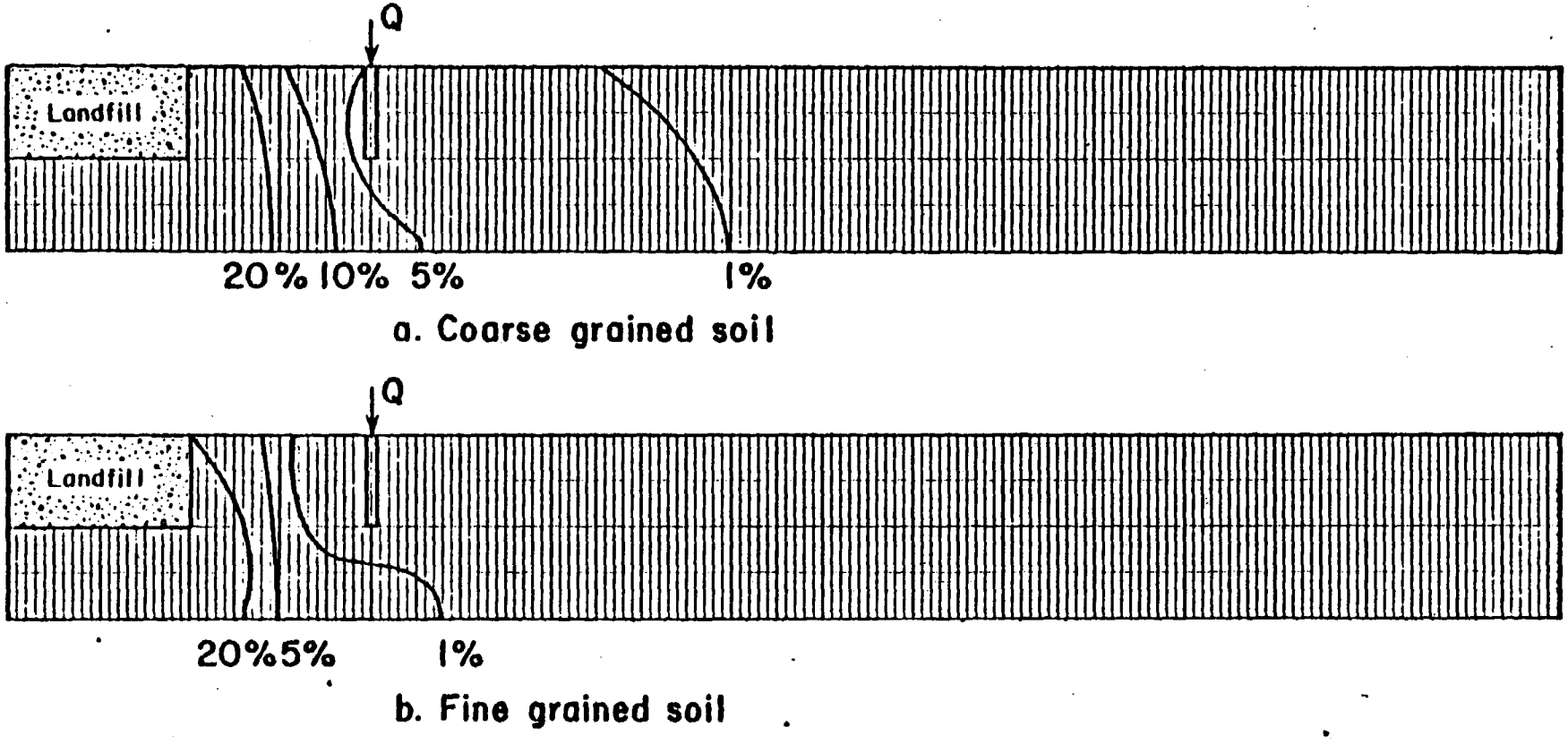


FIGURE 5 Methane Mole Fraction Contours for Trench Vents Recharge Pumped at Q = 5 CFM

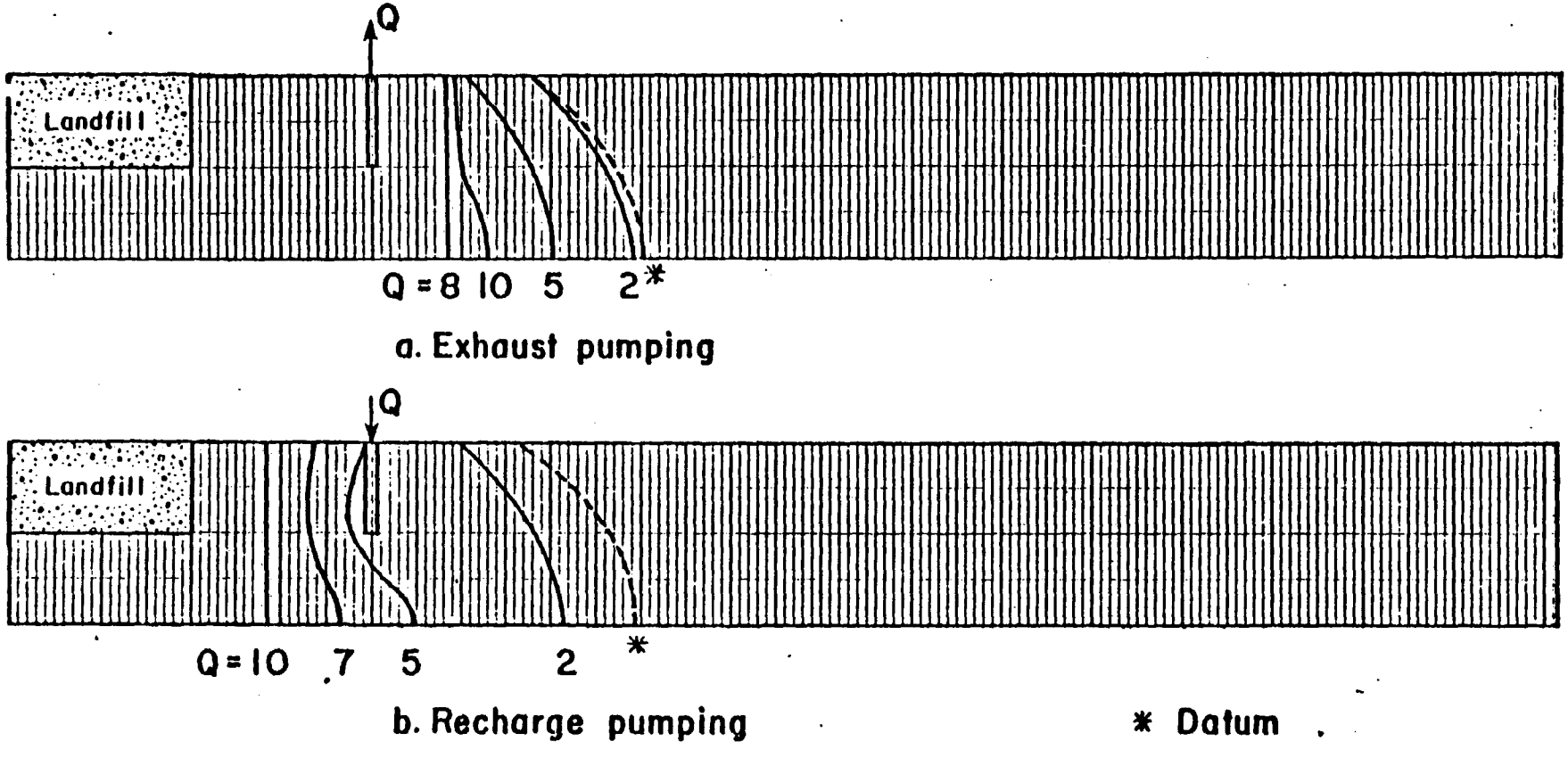


FIGURE 6 Methane 5% Mole Fraction Contours for Various Pumping Rates, Q(CFM), for Exhaust and Recharge Pumping in Coarse Grained Soils

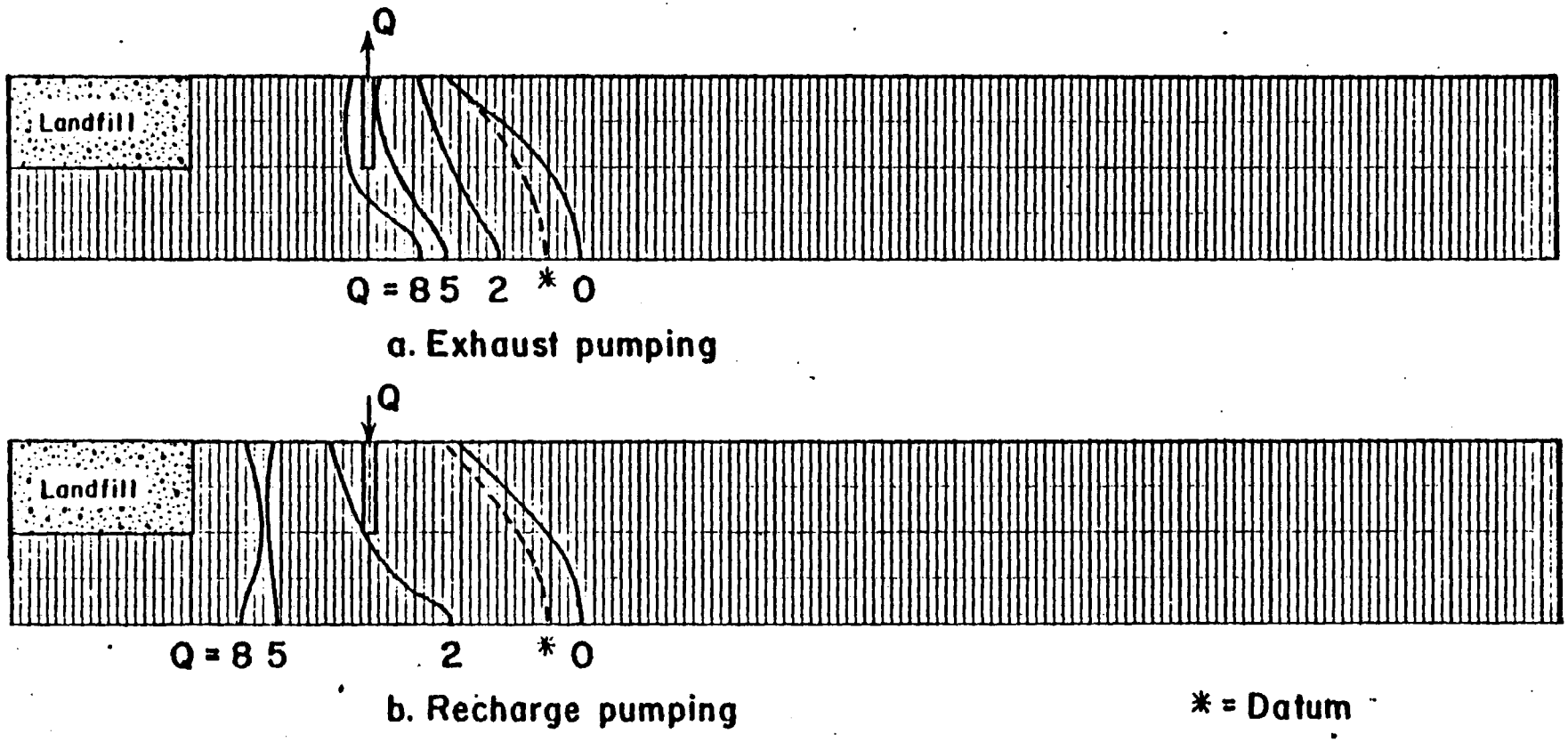


FIGURE 7 Methane 5% Mole Fraction Contours for Various Pumping Rates, Q(CFM), for Exhaust and Recharge Pumping in Fine Grained Soils

Studies were also performed to determine the effect of approximating a fine grained soil by a single mean pore radius. Results showed that for practical purposes, a single mean pore radius gave essentially the same result as a more accurate approximation using ten pore radii.

In order to summarize the results of the pumped trench studies, figure 8 was prepared. In this figure, the steady state maximum 5 percent migration distance with a control device active divided by the maximum 5 percent migration distance without a control device is plotted versus pumping rate. The relationships differed somewhat depending upon soil type and degree of trench top seal; however, a representative curve has been constructed.

4.3 IMPERVIOUS TRENCH BARRIERS

A barrier type control facility is perhaps the most economical to construct and maintain. Either an impervious synthetic liner or saturated soil can be used. It should be pointed out, however, that whereas compacted, partially saturated clay is relatively impermeable to water, it is not impervious to gas. Reference to figures 2a and b shows that the fine grained soil allows only slightly less extensive methane migration than the coarse grained soil at the same porosity and degree of saturation.

Computer simulation showed that partially penetrating barriers are disappointingly ineffective. Figure 9 compares to data with barriers penetrating 16 m (d_p/d_f = 1.0) and 24 m (d_p/d_f = 1.5) in coarse soil. Of course, an impervious barrier penetrating down to the impervious base at d_s would be effective in restricting methane to the landfill side of the barrier.

Thus it is recommended that impervious barriers be used only when they can penetrate to the groundwater table or to another impervious soil or rock stratum.

4.4 HYBRID TRENCH SYSTEMS

Hybrid systems consist of a trench, which can be either pumped or unpumped, having a barrier placed on the side away from the landfill. Computer simulations of unpumped hybrid systems (figure 10) showed them to be marginally effective. This is expected since neither an umpumped trench (figure 3) nor a partially penetrating barrier (figure 9) was particularly effective. Figure 10 also shows the results for various pumping rates both into and out of the trench. The effectiveness of the system is apparent, with recharge pumping again being the most effective.

However, reference to figure 7 shows that, for the same non-zero pumping rate, the pumped trench alone is more effective than the corresponding hybrid system for both recharge and exhaust pumping. The rationale behind this is not immediately apparent; however, the following reasoning appears logical. As shown in figure 9 a barrier with d_p/d_f = 1.0 is almost imperceptibly effective in retarding migration when employed alone. Thus its principal role in the hybrid system would be to modify the effect of the pumping. Whereas the pump remains effective (in fact, more effective for a given Q)

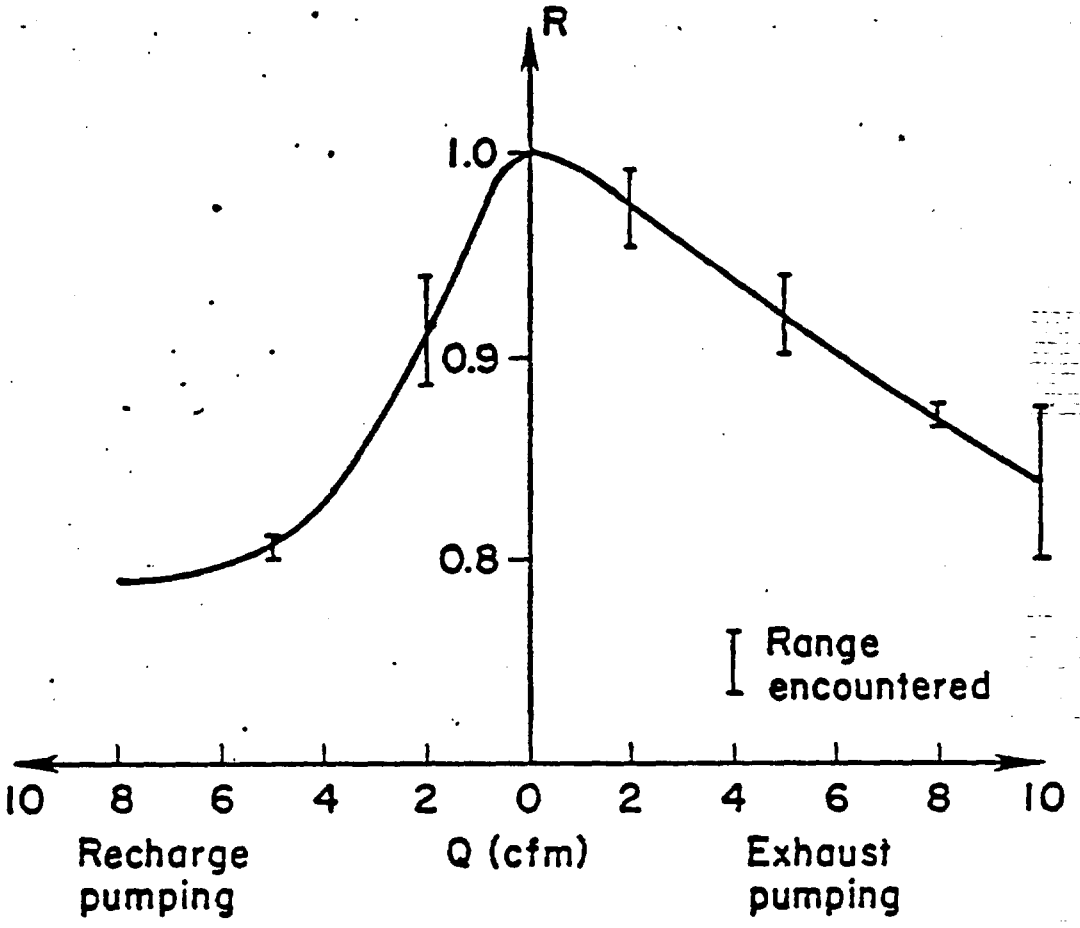


FIGURE 8 Ratio of Maximum 5% Methane Migration Distance with Control Device to Distance without Control Device for Trenches with Exhaust and Recharge Pumping

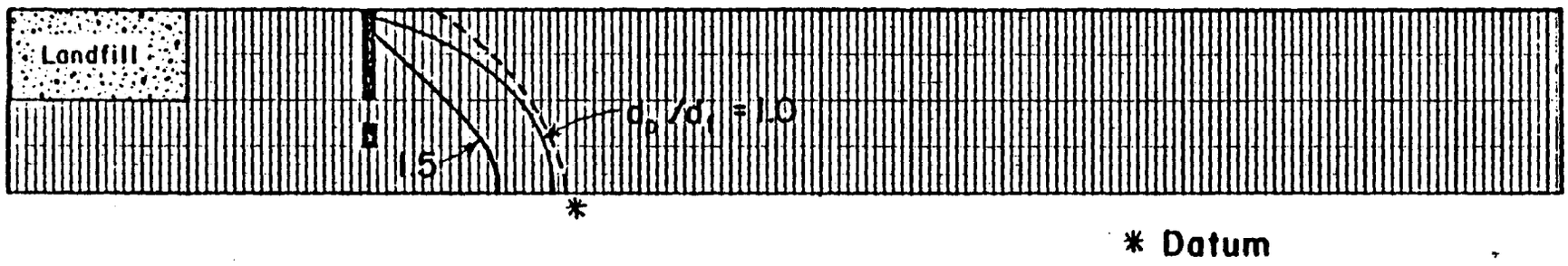


FIGURE 9 Methane 5% Mole Fraction Contours for Trench Barriers Penetrating to Different Depths in Coarse Grained Soils

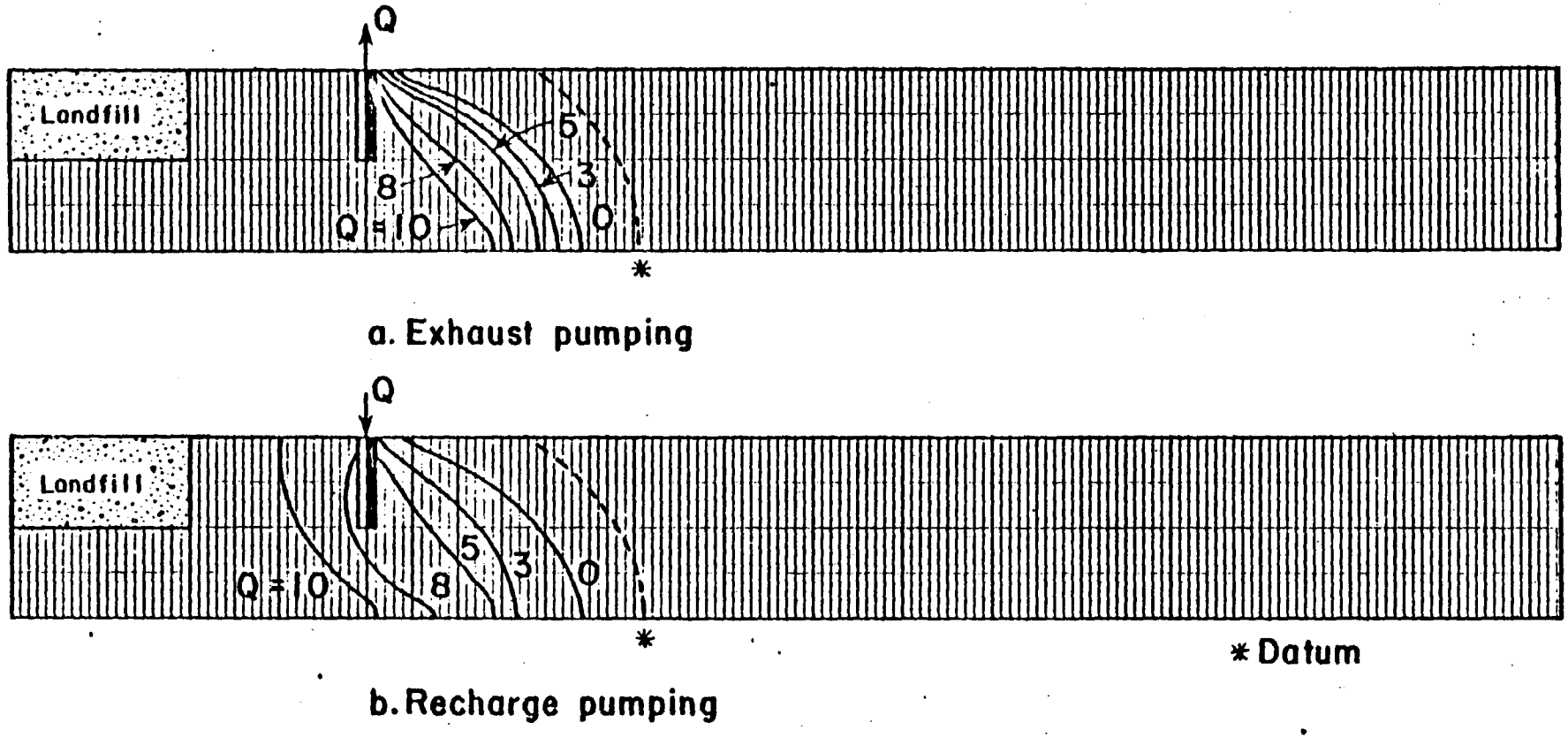


FIGURE 10 Methane 5% Mole Fraction Contours for Various Pumping Rates, Q(CFM), for Exhaust and Recharge Pumped Hybrid Systems in Fine Grained Soils

on the landfill side of the installation, its effectiveness on the side opposite to the landfill is severly reduced. Thus it appears that hybrid systems may offer a decrement in effectiveness at an increment in cost.

Figure 11 presents data in the form of figure 8 showing the effectivenss of hybrid systems as a function of pumping rate.

4.5 PIPE VENT SYSTEMS

Three dimensional computer codes were used to simulate partially penetrating pumped pipe vents. The configuration chosen consisted of six pipes spaced equally at 60° around the circumference of a circle of radius 192 m ($r_p/r_f = 1.2$). Three cases were studied:

1. recharge pumping at 5 CFM into pipes penetrating to $d_p/d_f = 1.0$,
2. recharge pumping at 5 CFM into pipes penetrating to $d_p/d_f = 2.0$ (i.e. to the impervious lower stratum), and
3. exhaust pumping at 10 CFM from pipes penetrating to $d_p/d_f = 1.0$.

Figure 12 plots 5 percent methane contours for these cases for values of θ as defined in figure 1. It may be seen that in all cases a retraction occurs for $\theta = 0°$ (i.e. along a radial line passing through the vent); however, there is actually an increase in migration distance for intermediate values of . Thus it appears that the pumped vents set up a circulation pattern that decreases migration distances directly behind the vent at the expense of increased migration distances along planes within the area between vents. Figure 13 shows the plan view for 5 percent migration at the elevation of the bottom of the landfill (i.e. $d/d_f = 1.0$).

It may be concluded that pumped pipe vents are not particularly effective for the cases studied; however, closer spaced vents might be more effective. Of course, in the limit of an infinite number of pipe vents along a circumference, the results are identical to those obtained for a trench.

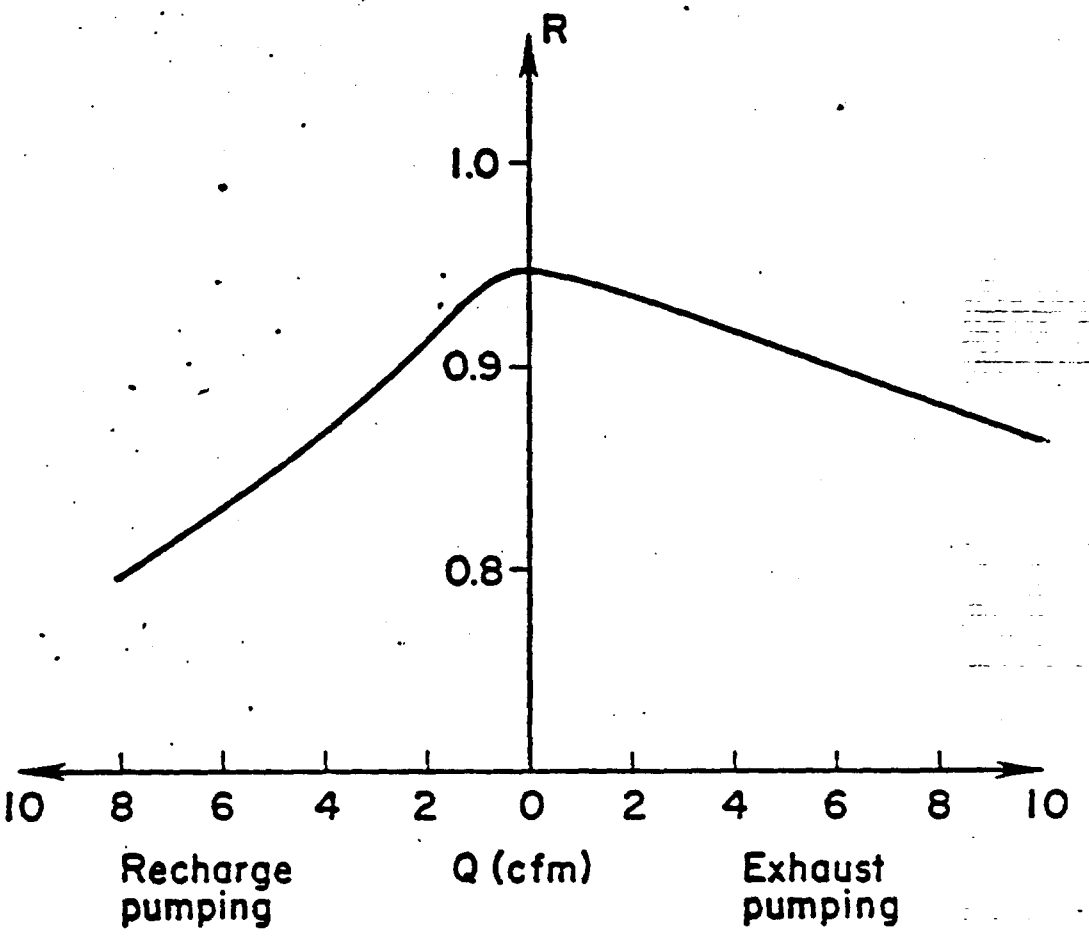


FIGURE 11 Ratio of Maximum 5% Methane Migration Distance with Control Device to Distance without Control Device for Hybrid Trench Systems with Exhaust and Recharge Pumping

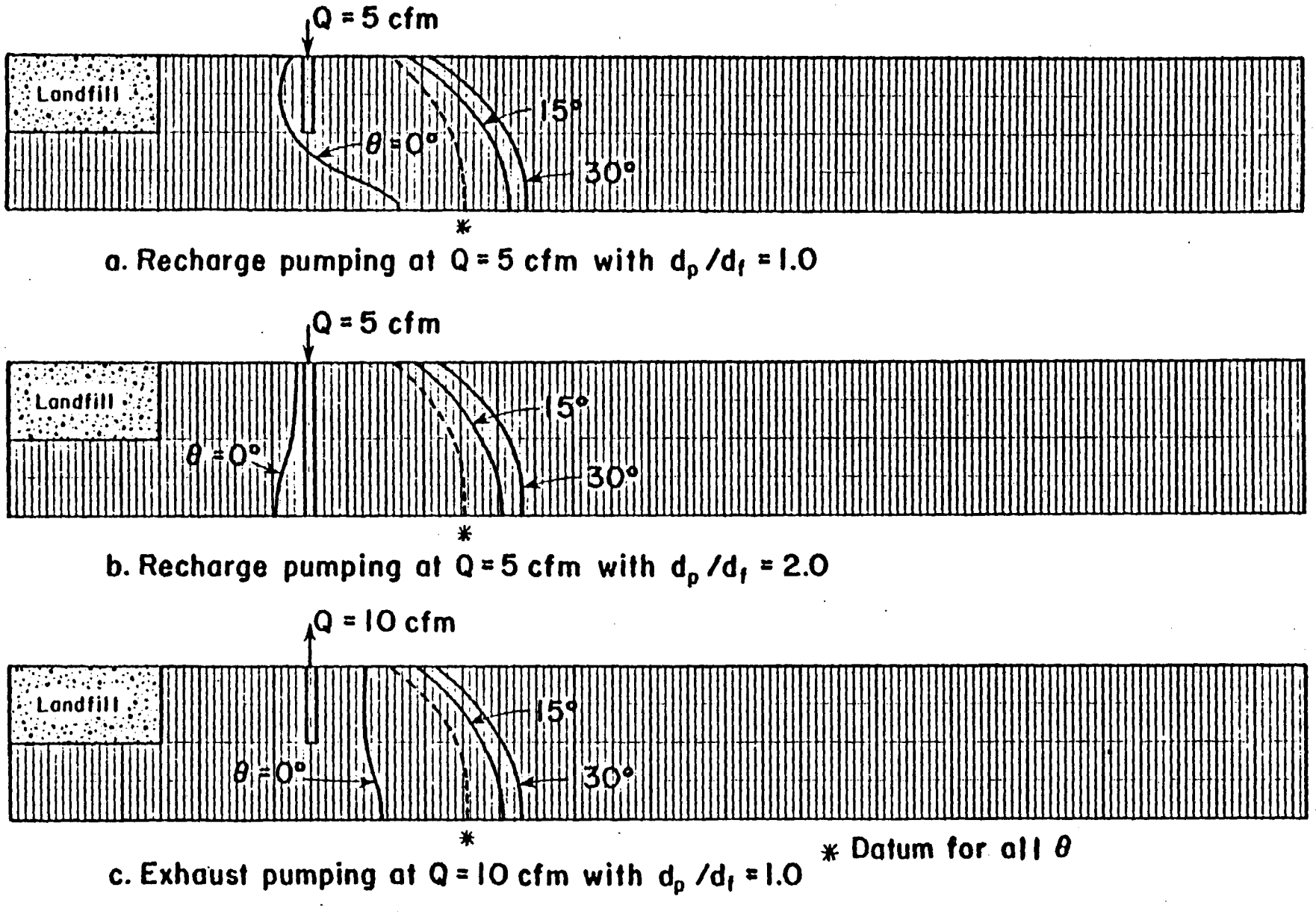
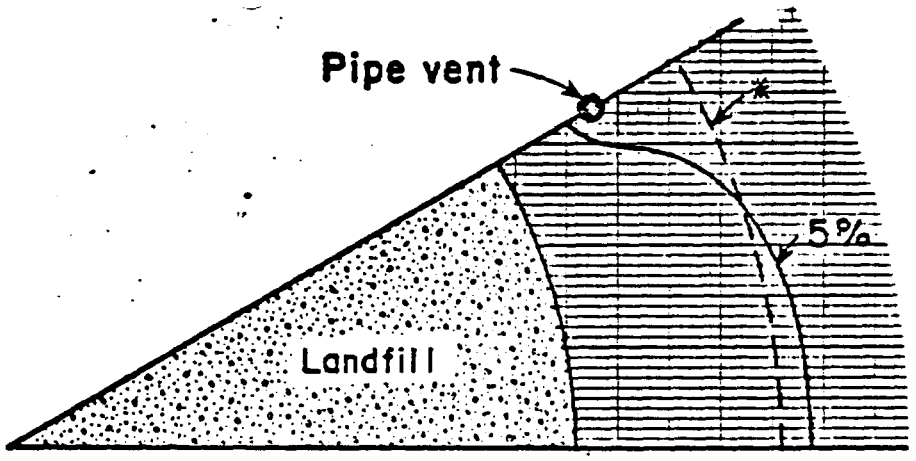
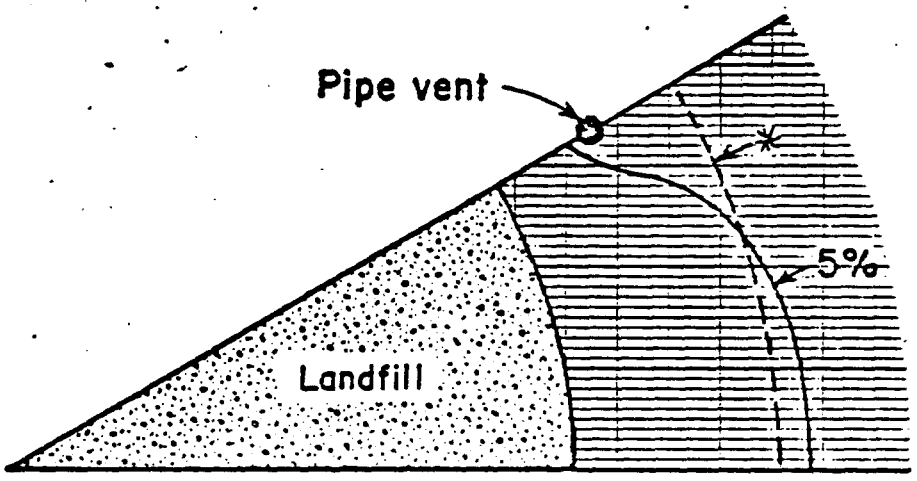


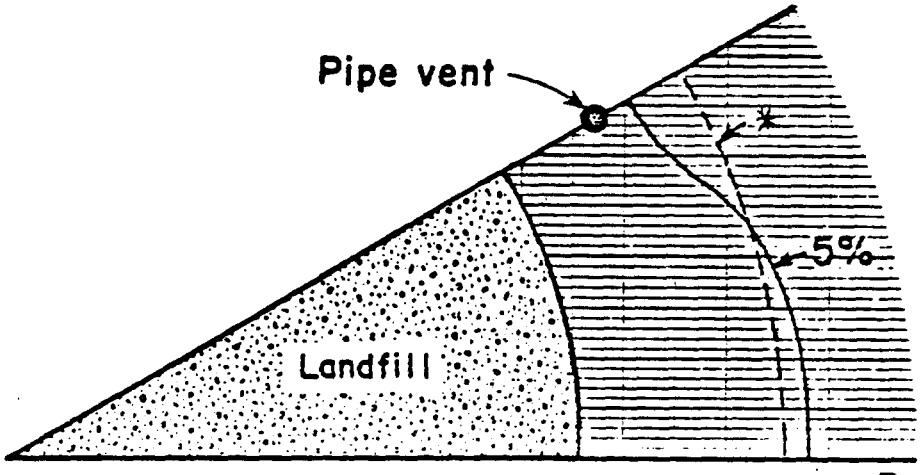
FIGURE 12 Methane 5% Mole Fraction Contours for Various Values of Q for Pumped Pipe Systems for Coarse Grained Soils



a) Recharge pumping at Q = 5 cfm with d_p/d_f = 1.0



b) Recharge pumping at Q = 5 cfm with d_p/d_f = 2.0



* Datum

c) Recharge pumping at Q = 10 cfm with d_p/d_f = 1.0

FIGURE 13 Methane 5% Mole Fraction Contours for Pumped Pipe Systems in Coarse Grained Soils

SECTION 5

RECOMMENDED CONFIGURATIONS

While the typical landfill conditions used for this study are reasonable average conditions, the reader should be cautioned that the conditions at each particular site are unique. It is in recognition of this that the user oriented computer codes described by Moore and Rai (1977) and Rai and Moore (1977) were developed. Thus, it is recommended that for design purposes the appropriate computer simulations be performed using site specific input.

Nevertheless, it is appropriate to make some summary comments based on the data presented in this work and upon the authors' experience with simulations for other landfill configurations (c.f. Moore and McOmber, 1977) which may serve to guide designers in selecting appropriate gas migration control device configurations.

In drawing these conclusions, two terms will be defined:

1. A system which alleviates migration will be defined as one which is capable of reducing methane concentrations, but which will probably not be effective in retracting the 5 percent methane contour back to the landfill side of the installation.

2. A system which controls migration will be defined as one which is capable of retracting the 5 percent methane contour back to the landfill side of the installation.

Of the systems considered:

1. Unpumped pipe vents placed around the landfill are not effective. Their sole effect is to relieve excess pressures which, in general, are not found very far from the landfill. This does not mean, however, that such vents placed within the landfill would not be beneficial. Such vents do relieve excess total pressures and thereby reduce migration.

2. Natural convection trench vents are not effective control devices. Such devices will be effective in relieving excess total pressures; however, as in the case of unpumped pipe vents, such excess pressures rarely occur at reasonable distances from the landfill.

3. Pumped trenches are capable of alleviating and controlling methane migration. Either recharge pumping or exhaust pumping is effective with recharge pumping being the most effective. Whether the trench top is sealed or open appears to make little difference.

A recharge pumping system has the disadvantage that when it is put into operation in an area which is already charged with methane, a plug of methane may be forced outward by increased total pressures.

An exhaust pumping system has the disadvantage that it actually attracts additional methane from the landfill out toward the control installation. If a system breakdown occurs, this accumulated methane can readily migrate outward.

4. Trench type barrier systems alleviate migration but do not serve as control devices unless they extend downward to an impervious stratum.

5. Hybrid systems consisting of a pumped trench backed up by an impervious trench can alleviate migration and can control migration if high recharge pumping is employed. However, such systems are usually less effective than pumped trenches alone and are probably not cost effective.

6. Pumped pipe vents alleviate migration along a radial line extending through the vent, but aggravate migration between vents. Clearly, because infinitely closely spaced vents are equivalent to a trench, in the limit their effectiveness is the same as the effectiveness of pumped trenches - that is, they could alleviate and control migration. However, the present studies do not allow conclusions to be drawn on the closeness of spacing required for an effective system to result.

SECTION 6

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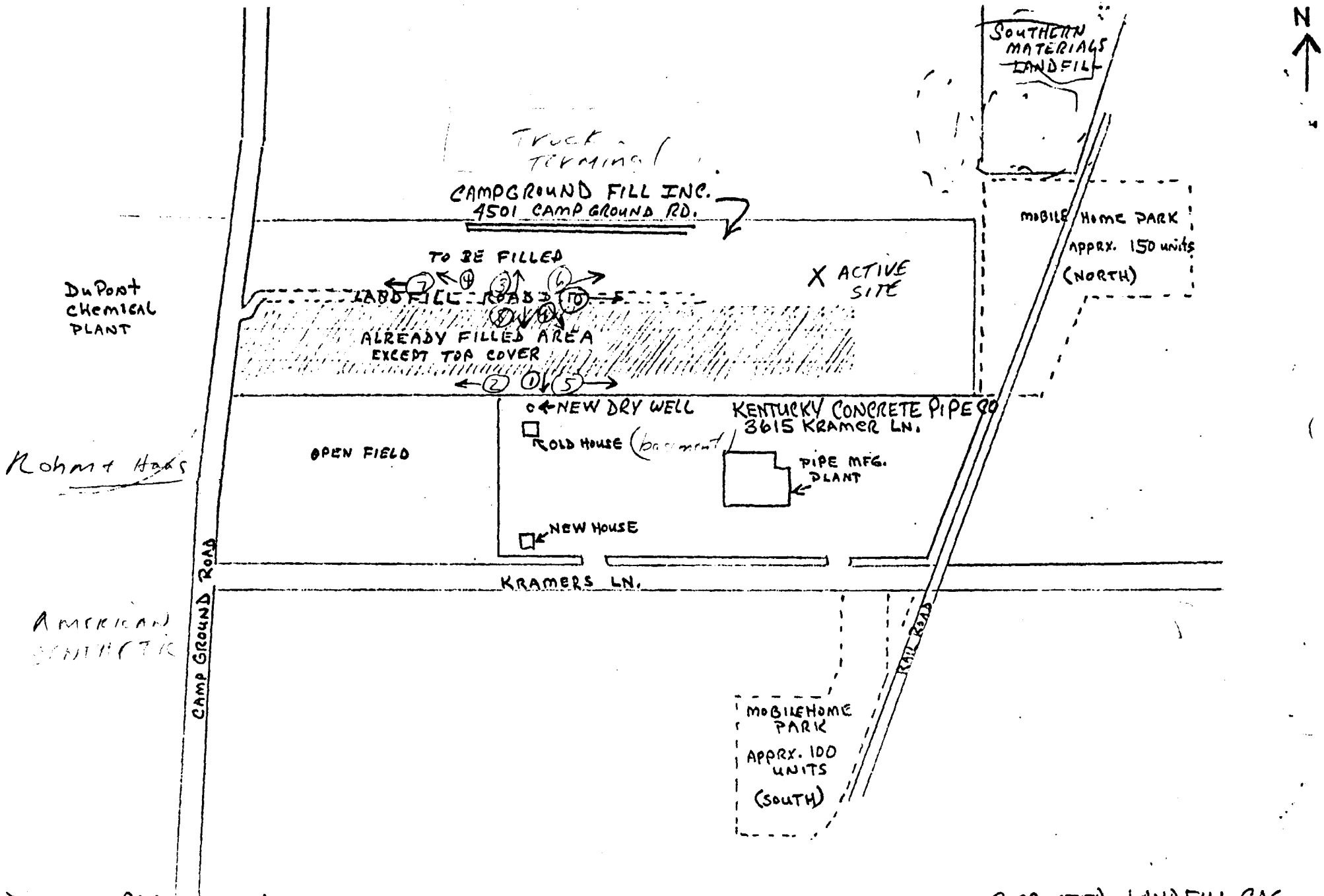
3. Moores, Charles A., and Rai, Iqbal S., "Development of Predictive Models for Landfill Gas Movement - Computer Program Development," US EPA, in press (1977).

4. Rai, Iqbal S., and Moore, Charles A., "Development of Predictive Models for Landfill Gas Migration Control Devices - Computer Program Development and User's Manual," US EPA, in press (1977).



DRAWING PRODUCED 6/5/78
By HAROLD DAVIS, Air Pollution Control District
Jefferson County Kentucky - 502/587-3327

SUSPECTED LANDFILL GAS MIGRATION

CAMPGROUND FILL INC.
4501 Campground Rd.
Louisville Kentucky

Scale: 1" approximately 100 yards

EPA RESULTS
(to complete)

Sample taken 6/5/78
by Harold D
Analyzed 6/8/78 @ ~ 1800 hrs
by EPA, Athens
Results Received 6/8/78 @ 22[illegible] hrs

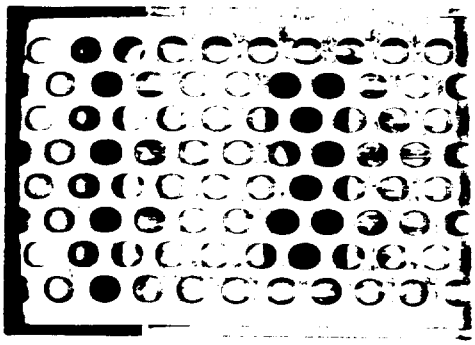
Benzene	25. ppm
Chloroform	.67 ppm
Dichloropropane	5.9 ppm
✓ Methane	59. %
Methylene Chloride	.4 ppm
Tetrachloroethene	5.8 ppm
✓ Toluene	23. ppm
Trichloroethane	5.4 ppm
Trichloroethene	1.3 ppm
Vinyl Chloride	1.38 ppm

OTHER EXOTICS TO FOLLOW:

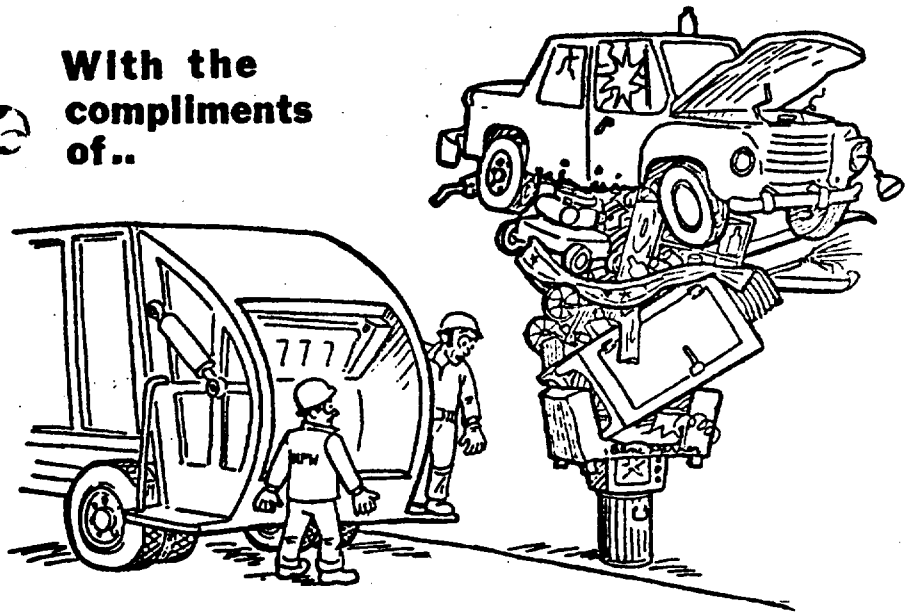
2-Dichloroethane 1.6 ppm
1-2 Dichloroethene 2.9 ppm
Dichlorodifluoromethane 2.7 ppm

6/9/78

Ben Glover Region I



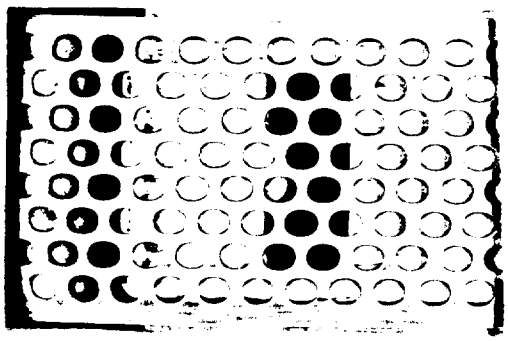
With the compliments of..



the SOLID WASTE PROGRAM
AIR & HAZARDOUS MATERIALS DIVISION
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203
617, 223-5775

Here is some info on venting at the Boston Campus of U. Mass. Also enclosed another article you might be interested in. We did have one landfill explosion in Holyoke, Mass. which damaged a school. Best source of information on this problem is Chris Rhyne in Washington office SMD FTS number is 7559116

Dennis Payne



TenEch
Environmental Consultants, Inc.
Mark W. Tenney, Sc.D., P.E.
Joseph L. Pavoni, Ph.D., P.E.

January 12, 1979
Louisville, Kentucky

Mr. Charles E. Weiter, Assistant Director
Division of Environmental Health
Louisville and Jefferson County Department
of Public Health
400 East Gray Street
Louisville, Kentucky 40202

Dear Mr. Weiter:

In accordance with your memorandum of December 21, 1978, I have reviewed with my staff the efficiency of the gas evacuation system at the Campground Landfill. We recommend that the following conditions be met immediately with regard to this system:

- A backup blower system of sufficient capacity including standby electrical power capabilities be installed in conjunction with the gas evacuation system to insure that a vacuum will be maintained at all times on all wells.

- All necessary explosive gas sensors are installed in Kentucky Concrete Pipe Company's plant. To date one sensor has been installed in each of the two restrooms and a third sensor has been installed in the main manufacturing building. A fourth sensor still has to be installed in the main manufacturing building.

- All explosive gas sensors installed in Kentucky Concrete Pipe Company's plant and the blower system should be tied into telephones of representatives of both Campground Landfill and Kentucky Concrete to insure that such representatives would be notified if the gas alarm activated or the blower was not functioning.

- All monitoring wells on Kentucky Concrete Pipe Company's property should be protected against accidental breakage by installing mutually agreed upon devices.

- A daily log of operation of the gas evacuation system be maintained.

744 W. Washington Street
South Bend, Indiana 46601
219/234-1166

Two North Riverside Plaza
Suite 1950
Chicago, Illinois 60606
312/454-0021

515 Park Avenue
Louisville, Kentucky 40208
502/636-3565

Assuming that the above conditions are met in the near future, I recommend a continuing monitoring of the evacuation system's efficiency three times per week to establish its reliability over a six to twelve month time frame. In addition, during this continuing time frame, arrangements should be finalized with regard to maintenance of the evacuation system after the landfill operations have ceased.

If you have any further questions concerning this matter, do not hesitate to contact me.

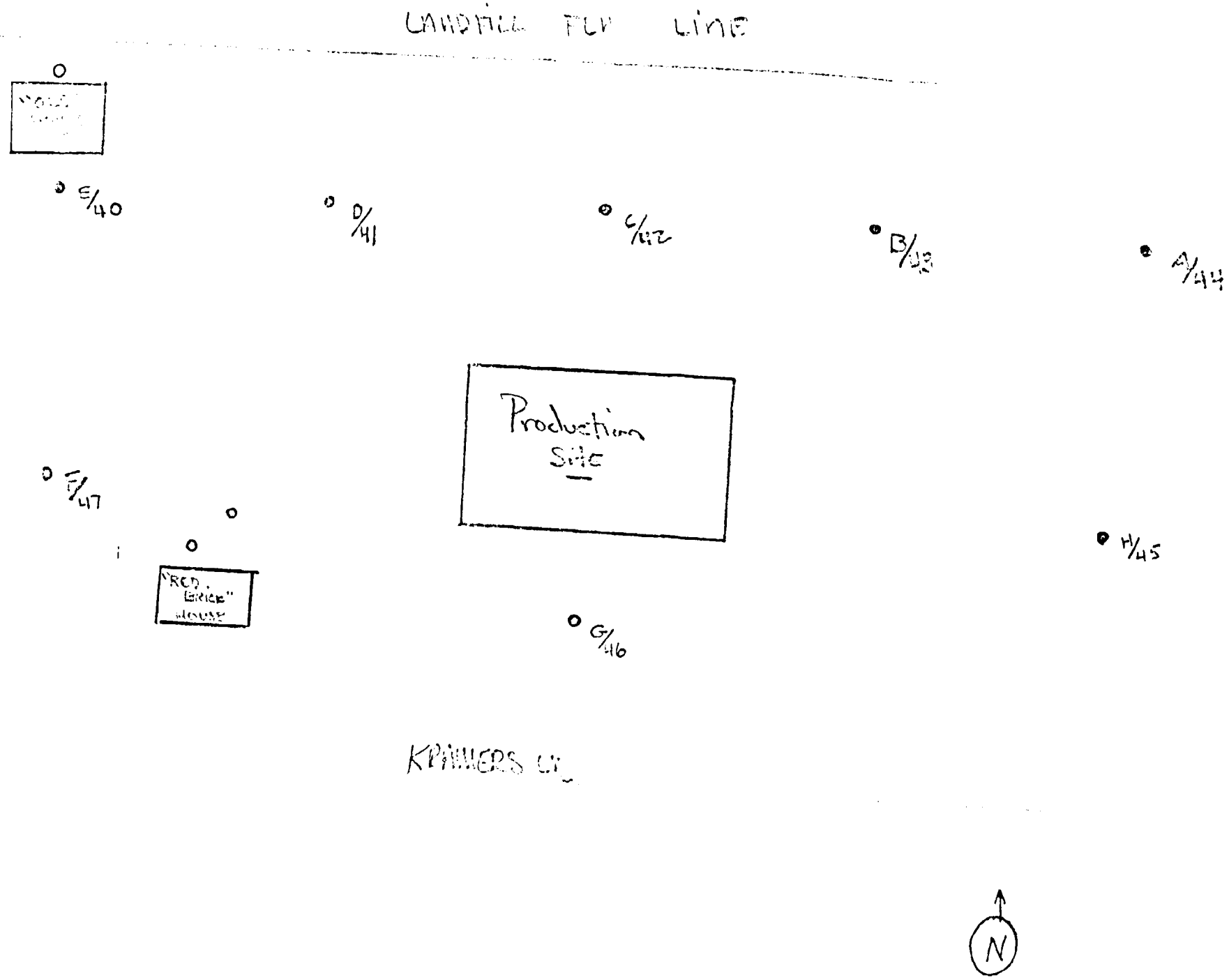
Very truly yours,

Joseph L. Pavoni, Ph.D., P.E.
Vice President

JLP:jat

	12/26	12/27	12/28	12/29	1/2	1/3	1/4	1/5	1/12	1/16	1/22
Pit Cap	0	0	0	0	0	0			0	0	0
Septic Tank	0	0	0	0	0	0			0	0	0
Pit Cap	NT	NT	NT	NT	NT	NT			NT	NT	NT
Pit Cap	0	0	0	0	Frozen	Frozen			0	0	0
Monitoring Well A/44	0	0	0	0	0	0			0	0	0
B/43	0	0	0	0	0	0			0	0	0
C/42	0	0	0	0	0	0			0	0	0
D/41	0	0	0	0	0	0			0	0	0
E/40	0	0	0	0	0	0			0	0	0
F/47	0	0	0	0	0	0			0	0	0
G/46	0	0	0	0	0	0			0	0	0
H/45	0	0	0	0	0	0			0	0	0
	5	12	30	20	10	20	0+	0+	0	4	0	0
SGS Well	12	12	15	0	12	0	30	25	35	0	65	60	0	40

Readings Taken


LANDFILL PLY LINE
E/40
D/41
C/42
B/43
A/44
Production Site
F/47
H/45
"RED BRICK" house
G/46
KRAMERS CR
N

JHS
Rita file

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

MEMORANDUM

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill

On Tuesday, December 19, 1978, a fourth meeting was held at the Louisville and Jefferson County Department of Health Building to discuss the progress of the migrating gas problem at the Campground Landfill. The following persons were in attendance: P. Clark Bledsoe, Engineer, Louisville and Jefferson County Department of Health; Harold Davis, Air Pollution Control District; John Brooks, Kentucky Division of Hazardous Material and Waste Management; Jerry Blankenship, Campground Fill Company; Randy Hockensmith, Kentucky Concrete Pipe Company; Marshall Eldred, Jr., Attorney for Kentucky Concrete Pipe Company; Ellen Ruch, Training Officer, Health Department; Jay Cordon, Jr., Kentucky Concrete Pipe Company; Thomas L. Coomes, Supervisor, Health Department; Richard Wellinghurst, Sanitarian, Health Department; and the writer.

The meeting was called to order at approximately 10:00 A.M., and the writer presented the following information:

(1) A chart listing the methane gas readings from November 27, 1978, through December 18, 1978, was presented. (see attachment) The majority of the readings were zero until December 18, 1978, when several readings appeared that were at or above the explosive level for methane gas. It was theorized that these readings appeared because Mr. Blankenship had turned the evacuation system down on December 14, 1978.

(2) The Health Department requested Mr. Blankenship to install an all-weather road that would allow Health Department personnel access to the evacuation system at all times.

(3) The Health Department will continue to sample the monitoring wells on Kentucky Concrete property daily until December 23, 1978. If gas readings disapate to zero the monitoring will be placed on a twice a week basis until January 23, 1979, when a decision will be made as to future monitoring of the wells. If gas does not disapate to zero by December 23, 1978, the Health Department will contact Mr. Blankenship and Kentucky Concrete Company to discuss future sampling procedures.

(4) If gas disapates to zero the Health Department will be agreeable to releasing Kentucky Concrete Pipe Company's construction plans for their proposed future building.

(5) The Health Department had received no comments from Dr. Pavoni and requested that if additional information was necessary for his office to make a decision upon the efficiency of the system that he please contact this office prior to January 23, 1979.

(6) The flooding of the three (3) wells adjacent to Kentucky Concrete's property by surface runoff was discussed. It is the understanding of the Health Department this situation is being coordinated with David Daugherty's office and Joe Ballard of Miller, Wihry & Lee, and the Health Department requested a copy of the final plans that are approved by Mr. Daugherty's office, for handling of the surface water.

The following comments were made by Mr. Harold Davis of the Air Pollution Control:

(1) The Air Pollution Control District collected samples on December 5, 1978, from the vent stack and also an ambient air sample downwind from the vent stack. The results indicated the system is venting 38% methane, one part per billion benzene, .2 parts per million toluene. The sample collected downwind revealed results well within acceptable limits for the three (3) compounds mentioned above.

(2) The methane present in the ambient air presented no explosion problems at this time. The Air Pollution Control District will collect additional ambient air samples some time in the future during inversion conditions, to check the amounts of the three (3) compounds in the ambient air during adverse conditions.

(3) The Air Pollution Control District had no objections to the venting systen now in existence, as long as no elevated readings are obtained in the ambient air. If, however, flaring of the gases is initiated there would be some concern over the inability to control the complete combustion of the gases.

Jerry Blankenship

(1) Mr. Blankenship stated three (3) wells adjacent to Kentucky Concrete Pipe Company property are being inundated with surface water and on December 15, 1978, he reconstructed his header system on the wells to go around the ponding water, and also reduced the flow of air from the evacuation system and speculates this is the reason for the positive gas readings on December 19, 1978.

(2) Mr. Blankenship indicated he would be willing to meet with Kentucky Concrete Pipe Company and develop a system for protection of the monitoring wells on their property.

(3) Mr. Blankenship also agreed to install an all-weather access road to the control house.

(4) Mr. Blankenship indicated a total of 33 wells are now connected to the evacuation system. He also estimated normal down time for maintenace of the system would be approximately one (1) hour.

Kentucky Concrete Pipe Company

(1) It was requested of the Health Department to continue daily monitoring of the wells on Kentucky Concrete Pipe Company property until the evacuation system has been accepted as an efficient method of preventing migrating gas. (See Health Department comment #3)

(2) It was also requested that Mr. Blankenship meet with them and provide protection for the monitoring wells located on Kentucky Concrete Pipe Company property. (See Mr. Blankenship's comment #2)

(3) Does the venting of these gases pose any threat to Kentucky Concrete Pipe Company employees during times of inversion? (See Air Pollution Control comment #2)

(4) It was questioned whether or not a flaring system would be more efficient than just the evacuation and venting. (See Air Pollution Control's response #2)

CEW/mlr

cc: T.S. Wallace, Jr., M.D.
Jay Gordon
Jerry Blankenship
Ross Singleton
Larry Schumer
Joseph Pavoni
David Ross Stevens
Robert Davis
Bruce K. Lane
Randy Hockensmith
David Daugherty
John Dickinson
Jack McClure
Pat Haight
Bert VanArsdale
Thomas Coomes
Larry Wood
Hal Blankenship
John Brooks
Harold Davis
Richard Wellinghurst
Thomas Mortof
Phillip Emery

1. C-78

Jim S.
Might help
for Bruce Lane

~~[illegible]~~
Note - file
Campground

~~[illegible]~~

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

M E M O R A N D U M

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill
Migrating Gas

On Wednesday, November 29, 1978, a third meeting was held at the Louisville and Jefferson County Department of Health Building to update all involved parties on the migrating gas problems at the Campground Landfill. The following persons were in attendance: Ms. P. Knight Kentucky Division of Hazardous Materials & Waste Management; Randy Hockensmith, Robert Hockensmith and S. Jay Gordon, Kentucky Concrete Pipe Company; Marshall Eldred, Jr. and H. VanArsdale, Attorneys for Kentucky Concrete Pipe Company; Dr. Joseph Pavoni; TenEch Environmental Consultants; Bill Manby, Louisville & Jefferson County Civil Preparedness; Harley Blankenship, Attorney for Campground Fill, Inc.; Jerry Blankenship, owner of Campground Fill, Inc.; Harold L. Davis, Air Pollution Control District; P. Clark Bledsoe, Thomas Coomes, Bruce K. Lane, Charles E. Weiter, and Richard Wellinghurst representing the Louisville and Jefferson County Department of Health.

The meeting was called to order at approximately 10:30 A.M., and the writer presented the following information:

(1) A chart was presented listing the methane gas readings in the monitoring wells from October 24, 1978, to November 28, 1978. The preliminary findings indicate the evacuation system is removing the gas from under Kentucky Concrete Pipe Company's property and preventing additional gas from migrating under said property.

(2) The Health Department, at the present time, will process construction plans for future expansion of the Kentucky Concrete Pipe Company or modifications to existing structures provided special design features are incorporated in the construction plans that will provide for a gas monitoring alarm system, a water trap between the septic tank and pit, and possibly an air exhaust system.

(3) The Health Department will require Jerry Blankenship to maintain a monthly log of operation for the gas evacuation system. This log will record the times of operation of the system along with the times of inoperation and any repairs or maintenance necessary to keep the system in proper operating condition. A copy of this log is to be kept on the premises and a copy is to be submitted to this office within ten (10) days following the preceding month.

(4) Mr. Blankenship is to provide immediate notification to the Health Department, Kentucky Division of Hazardous Materials & Waste Management and all surrounding property owners of any breakdown of the system. An alarm system is to be installed that will provide immediate notification of any breakdown.

(5) A design is to be worked out for capping and lowering to grade level, the monitoring wells on Kentucky Concrete Company's property.

(6) Jerry Blankenship is to submit, in writing, by March 1, 1979, to this office, a method for perpetual maintenance of the evacuation system. This method will be reviewed by Health Department and Kentucky Division of Hazardous Materials & Waste Management prior to the renewal of the landfill operation permit for 1979.

The following comments were made by participants attending the subject meeting:

Mr. VanArdsale

(1) He was interested as to when the evacuation system was first started up. (October 28, 1978)

(2) He requested a definition of manometer readings. (indicator of whether well is breathing in or out)

(3) He asked for the number of wells presently hooked to the evacuation system. (21 wells)

(4) He requested the number of wells adjacent to the Kentucky Concrete Pipe Company's property. (25 wells)

(5) He asked how many times the present system has been down since start-up. (twice; once because of breakdown; second time to replace existing equipment with a larger pump)

(6) He questioned whether all 21 wells were hooked up at the same time. (yes)

(7) He questioned how the gas being collected by the evacuation system is being disposed of. (venting to the atmosphere)

(8) He asked how many venting systems will be installed to completely service the landfill. (If possible all wells will be connected to one (1) pump house and vented at the same location.)

(9) He questioned whether a generator was available if power was lost. (no)

(10) He requested the Health Department continue checking the monitoring wells until the efficiency of the evacuation system has been established. (Health Department, Dr. Pavoni, Mr. Blankenship, Air Pollution Control District

will meet and sample to determine the system's efficiency within the next two (2) weeks)

Marshall Eldred

(1) He questioned whether or not the Health Department will allow permits to be issued for new construction until the evacuation system's efficiency has been established. (The Health Department will process plans but not issue permits until the system's efficiency has been established as mentioned in Mr. VanArsdale's comment #10.)

Dr. Pavoni

(1) He stated the data to date makes the system appear to be working but he would like the following data collected before agreeing to the system's efficiency:

(a) Check the venting system to determine if methane is truly being vented;

(b) Analyze what is leaving the venting system;

(c) Confirm the landfill is still producing methane gas and that it has not dissipated due to the change in temperature, or by increased rainfall.

Air Pollution

(1) Air Pollution will meet with the Health Department, Dr. Pavoni and Jerry Blankenship and monitor ambient air samples.

(2) Air Pollution will collect samples from the venting system and analyze for methane and two (2) other tracer compounds.

Kentucky Division of Hazardous Materials
and Waste Management

(1) Ms. Haight indicated that the Kentucky Department for Natural Resources and Environmental Protection had requested resubmittals by all industrial customers of the Campground Landfill for new chemical analyses of any industrial waste that is being deposited in the landfill. She indicated that the State had not received all information requested as of this date.

(2) Ms. Haight also indicated the State was collecting information from all industries in the area to complete their industrial inventory and that all of this information had not been collected and reviewed as of this date.

(3) Ms. Haight indicated the State had a hearing set for Southern Materials within the next month and that Environmental Protection Agency may be taking enforcement action against the Lees Lane Landfill but no other enforcement action is contemplated by the Kentucky Department for Natural Resources and Environmental Protection in the rubbertown area.

(4) Ms. Haight also indicated the manifest system which Mr. McClure alluded to at the August meeting was still in the process of being prepared and regulations still being drawn up, therefore, no industries in the area have yet received notifications of that future program.

NOVEMBER 30, 1978

cc: T.S. Wallace Jr., M.D.
Jay Gordon
Jerry Blankenship
Ross Singleton
Larry Schauer
Joseph Pavoni
David Ross Stevens
Robert Davis
Bruce K. Lane
Randy Hockensmith
John Dickinson
Jack McClure
Pat Haight
Bert VanArsdale
Thomas Coomes
Larry Wood
Harley Blankenship
John Brooks
Harold Dad[illegible]
Richard Wellingham[illegible]
Thomas Morgan
Phillip E[illegible]

1-23-79

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

MEMORANDUM

Rita file

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill

On Tuesday, January 23, 1979, a fifth meeting was held at the Louisville and Jefferson County Department of Public Health Building to discuss the progress of the migrating gas problem at the Campground Landfill. The following persons were in attendance: William J. Manby, Louisville & Jefferson County Civil Preparedness; Harley N. Blankenship, Attorney, Campground Landfill; S. Jay Gordon, Kentucky Concrete Pipe Company; Jerry Blankenship and Sherod Robinson, Campground Landfill; Marty Tittlebaum, TenEch Environmental Consultants; Harold Davis, Air Pollution Control; John G. Brooks, Kentucky Department for Natural Resources and Environmental Protection; P. Clark Bledsoe, Richard Wellinghurst, and the writer, from this office. Also in attendance was Marshall Eldred, Attorney for Kentucky Concrete Pipe. The meeting was called to order at approximately 10:00 A.M., and the writer presented the following information:

(1) A chart listing the methane gas readings from December 18, 1978, through January 22, 1979, was presented. (See Attachment). All readings from December 21, 1978 through January 22, 1979, were "zero" except for monitoring well "H". (See Attachment) It is the feeling of the Health Department the system was now functioning as designed and effectively preventing the migrating of methane gas from the Campground Property to the Kentucky Concrete Pipe Company Property.

(2) Surface water conditions were discussed concerning three (3) wells in the evacuation system and this is presently being investigated by an engineering firm employed by Jerry Blankenship and soon will be presented to David Daugherty, Water Management Engineer, for his approval.

(3) Well "H", with the positive reading, was discussed in some detail and at the time of this meeting there was no positive explanation of why gas still persists in this well. As can be seen from the enclosed drawing this well is one of the farest away from the gas migration system and if the migration system were not functioning effectively it would appear to be logical that wells "A", "B", and "C" would be producing a positive gas reading.

(4) Mr. Blankenship and Kentucky Concrete Pipe Company owners are in the process of securing the monitoring wells now located on Kentucky Concrete Pipe Company Property, from being damaged by vehicle traffic, etc.

(5) The Health Department will now place the Campground Landfill on routine inspection (approximately once every thirty (30) days) and at the time of inspection will check all monitoring wells for positive readings. This schedule is being initiated since the evacuation system appears to be effectively preventing gas migration from Campground Landfill to Kentucky Concrete Pipe Company Property and due to lack of manpower and funding. Also the Kentucky Concrete Pipe Company now has or will have in the very near future, monitoring alarm devices installed within their buildings.

(6) The Health Department will now process expansion plans for Kentucky Concrete Pipe Company and allow for the issuance of building and plumbing permits.

<u>Jerry Blankenship</u>

(1) Mr. Blankenship and his consultants have no explanation for the positive readings at well "H".

(2) Mr. Blankenship indicated the three (3) wells under water presently were being bypassed and, therefore, were not functional anytime surface water was present above them; however, this problem is presently being investigated by consulting engineers and a proposal will be forthcoming shortly for submittal to David Daugherty of the Works Department and to the Health Department for approval.

(3) Mr. Blankenship stated he has one smaller back-up system onsite. If existing blower system would fail this smaller system could be installed and operational within several hours. An additional larger standby blower system is on order and should be available for installation within the very near future.

(4) Mr. Blankenship indicated he is in the process of investigating the use of the methane gas that is being produced by his landfill and upon completion of his feasibility study another evacuation system will be installed on the fill site itself to collect the methane gas for re-use.

(5) Additional wells are yet to be constructed to the front of the fill paralleling Campground Road.

(6) A standby generator to supply power in case of emergency outages is being investigated by Mr. Blankenship, with the Wayne Supply Company. The intention here is for the Wayne Supply Company to provide a standby generator, when necessary, by contract with Mr. Blankenship.

(7) Mr. Blankenship indicated American Synthetic Rubber Company has now been made aware of the migrating gas problems that exist at the fill site and that he is working up a written proposal for perpetual maintenance of the system which must be submitted to the Kentucky Department for Natural Resources and Environmental Protection and the Health Department by March 1, 1979.

(8) Mr. Blankenship is also working on the installation of an all-weather access road that would provide ingress and egress for Health Department inspectors, to the blower house location.

Marshall Eldred

(1) Mr. Eldred questioned the gas readings that were being produced by well "H". (See Health Department response #3)

(2) Mr. Eldred requested more frequent monitoring by the Health Department than once every thirty (30) days. (See Health Department response #5)

(3) Mr. Eldred questioned whether additional analysis had been run by any of the agencies on the content of the gases that are being vented to the atmosphere. (See Air Pollution Statements 1, 2 and 3)

(4) Mr. Eldred presented a letter from Dr. Pavoni with six (6) requests concerning precautions to be taken with respect to the migrating gas system. (Copy is attached). Jerry Blankenship agreed to all items in said letter.

(5) It was also requested of Mr. Blankenship that an alarm system be installed and connected to telephones that would give immediate warning upon break down or shut down of the evacuation system. It was requested that this warning system not only be connected to Mr. Blankenship and his foreman's telephone, but also to telephones of personnel of the Kentucky Concrete Pipe Company. This also was agreed to by Jerry Blankenship.

Air Pollution Control

(1) No additional air samples have been taken by the Louisville and Jefferson County Air Pollution Control District for analyses of vented gases.

(2) Mr. Harold Davis restated as agreed to in previous meetings, the Air Pollution Control District would monitor the ambient air around the Campground Landfill sit during adverse conditions such as a period of inversion.

(3) If it is felt necessary by Kentucky Concrete Pipe Company for the safety of their personnel, a request should be made by them to the Air Pollution Control District for a continuous monitoring system to be installed in the immediate vicinity that would provide for continuous air monitoring.

CHARLES E. WEITER, ASSISTANT DIRECTOR
DIVISION OF ENVIRONMENTAL HEALTH

CEW/mlr

JANUARY 26, 1979

AUG 30 1978

Mr. Norman Schell, Director
Division of Hazardous Materials &
Waste Management
State Department for Natural Resources
& Environmental Protection
Capital Plaza Tower
Frankfort, Kentucky 40601

Dear Mr. Schell:

In reference to the Campground Landfill gas migration problem, we have contacted Mr. Bobby Carroll of our Athens laboratory regarding the purchase of a pyrolyzer-gas chromatograph unit. The laboratory does not have funds to purchase this unit. We have learned that Murray State University has a pyrolyzer-GC unit. Mr. Paul Goodley of the Chemistry Department said you could contact him at 502/762-2534 to arrange for analysis of the landfill gas samples.

A literature search on gas migration control has shown that some type of convective flow must be used if pipe vents are to be effective. A list of EPA publications on controlling landfill gas migration is attached.

Other EPA regions have found that induced convection is necessary for venting landfill gas. Some larger landfills are using the gas as a fuel source.

The cost of installing a flaring system would range from $10,000 to $100,000. Several options are available. Flares could be installed at each of the wells or, if a header is installed, one flare could be used. The size and price of the flare would depend on the amount of gas generated. I have included the names of two companies that provide flaring and venting systems.

Also enclosed is a summary of hazards for the components analyzed by EPA, Athens on June 8, 1978. The concentrations of benzene, vinyl chloride, and tetrachloroethane exceed inhalation threshold limit values.

If you have any questions, please call me or John Dickinson.

Sincerely,

James H. Scarbrough, P.E.
Chief
Residuals Management Branch

Enclosures

cc: Mr. Bruce K. Lane
Mr. Robert T. Offutt
Mr. James H. Finger

JHS
8/29/78

4ATS:RDavenport:cj:X3016:8/28/78
Davenport 8/29

AUG 30 1978

Methane Gas Migration

Ben Glover

FILE

REGION I, BOSTON, MA

Talked to Dennis Gagne.

Part of University of Massachusetts was built over an old landfill. A combination of an impervious membrane, gravel barriers and a computer-based methane detection system prevent gas accumulation in the building area.

REGION II, NEW YORK, NY

No report.

REGION III, PHILADELPHIA, PA

Talked to Charlie Howard.

Harleyville, PA - CO migration, explosion in 1975, no damage. Old quarry was made into a landfill. Gas migrated from fissures into an artesian (deep-bored) well. Solution: Vented the well and later vented the land area.

Richmond, VA - Methane migration. Hills on which Richmond built were filled with refuse. After landfilling, city cemented whole area. An abandoned well was still open. (Well was about 10 yards from landfill.) Cement slabs over the well formed cracks. Gas seeped through crack and exploded. Solution: Forced venting with pump. (Regular venting failed.) Mr. Howard recommended test boring with monitor well meter hookups to establish how much gas is there.

REGION V, CHICAGO, IL

Rita Davenport talked to Ken Berkchant
Hopkins, MI - Sandra Forrest FTS 776-7288
Illinois - Tom Kavinole FTS 956-6760
Michigan - B.P. Shaw FTS 253-6620

Check with State of Arkansas; they have strict closure procedures. Get State contact: Chief of Solid Waste Division in Little Rock, 501/371-1701.

REGION VI, DALLAS, TX

Talked to Bill Hathaway, FTS 729-2645.

Landfills are shallow. Have had minor problems to date.

REGION VII, KANSAS CITY, MO.

Talked to Chet McLoughlin, FTS 758-3307.

Have had few problems. NRG have a 10 year contract to tie up to methane gas rights. They plan to collect gas for use. City has development rights.

Weber Quarry (near St. Louis, MO) - Fred Weber of Asphalt Batch Company has a 14-acre landfill that is 240 feet deep. He plans to use gas for fuel (500 gal/day).

Kansas City, KS - Has a landfill that is 120 feet deep and shaped like a bowl. Monitored closely. When ice cap covers the landfill, gas flows laterally.

Omaha, NB - Gas found when a sewer system was being constructed. Gas was found in the trenches. Filled trenches with gravel for venting system.

REGION VIII, DENVER, CO

Talked to More Johnson.

He mentioned that there is a task force in Denver working on the problem. He mentioned some people that I should talk to:

1. Don Kennerson, Fire Chief
   South Adams Fire Dept.
   Commerce City (Denver)
   303/288-0835 and 4179

2. Consultant: Russ Herman
   Denver Associates
   303/234-1971

3. John Pacey (deals with big landfills)
   San Jose', CA
   408/275-1444, FTS 463-7011

REGION IX, SAN FRANCISCO, CA

Talked to Jim Schalor. Region IX has few problems.

REGION X, SEATTLE, WA

Vent the area. Maybe flare the gas.

NOTES: Talked to Don Kennerson, Fire Chief of South Adams Fire Dept. 303/288-4179. Three general methods of eliminating migrating gas:

1. **Passive bent system - use of gravel fill trenches around landfill. Gas flow into grave and up to the air.**

2. **Barrier - gas hits barrier and goes up.**

3. **Vacuum extraction - system of wells over landfill. Pump sucks air from wells; flare the gas.**

Method No. 3 is the best method. Two of 100 landfills used method No. 3 (sanitary landfills). The landfill which uses an extraction well system covers 100 acres.

Talked to:

Sandra Forrest
MN Pollution Control Agency
Hopkins, MN
FTS 776-7288

She told me to contact:

Mr. Beecher
Hopkin Sanitary Landfill
612/935-8474

Anoka Municipal Landfill
612/421-0540

BGD

4ATS:BGlover:cj:X3016:8/28/78

TOXIC LEVELS[1]

Sequence No.	Name of Compound	TLV[2] (PPM)	TWA[3] (PPM)
CY14000	Benzene	25	10
FS91000	Chloroform	25	50
TX96250	Dichloropropane	75	75
PA80500	Methylene Chloride	200	500
KI84000	Tetrachloroethane	5	-
XS52500	Toluene	100	200
KJ31500	Trichloroethane	10	10
KX45500	Trichloroethylene	100	100
KU96250	Vinyl Chloride	200	1
KY93600	1, 2-Dichloroethylene	200	200
PA82000	Dichlorodifluoromethane	1000	1000
KI05250	1, 2-Dichloroethane	50	50

1/ Registry of Toxic Effects of Chemical Substances, 1977 Edition.

2/ Threshold Limit Values (TLV) which are recommended limits proposed by the American Conference of Governmental Industrial Hygienists based on a consensus. The TLV is the recommended upper limit (ceiling) concentration of a substance to which most workers can be exposed without adverse effect.

3/ TWA refers to the time-weighted average standard set by OSHA.

FLARING AND VENTING SYSTEMS

Mr. John F. Straitz, III
Pollution Control Division
National AirOil Burner Company, Inc.
1284 East Sedgley Avenue
Philadelphia, PA 19134
215/743-5300

Mr. Roger Noble
Flare Department
John Zink Company
Post Office Box 5388
Tulsa, OK 74105
918/747-1371

REFERENCES FOR GAS MIGRATION CONTROL

OSW PUBLICATIONS

287. Sanitary landfill design and operation. D. R. Brunner and D. J. Keller, Environmental Protection Publication SW-65ts. Washington, U.S. Government Printing Office, 1972. 59 p.

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458. Anaerobic digestion of solid waste and sewage sludge to methane. S. J. Hitte. Environmental Protection Publication SW-159. (Washington), U.S. Environmental Protection Agency, July 1975. 13 p.

497. Waste Management Technology and Resource and Energy Recovery: Proceedings; 4th National Congress, Atlanta, Nov. 12-14, 1975. National Solid Wastes Management Association and U.S. Environmental Protection Agency. Environmental Protection Publication SW-8p. Washington, U.S. Government Printing Office, 1976. 382 p.

583. Treatment and utilization of landfill gas; Mountain View project feasibility study. M.J. Blanchet (Pacific Gas and Electric Company, San Francisco). (Washington), U.S. Environmental Protection Agency. 17 p.

587. Recovery of landfill gas at Mountain View; engineering site study. J.A. Carlson (City of Mountain View, Calif.). Environmental Protection Publication SW-587d. (Washington), U.S. Environmental Protection Agency, 1977. 63 p.

600. Resource recovery and waste reduction; fourth report to Congress. U.S. Environmental Protection Agency, Office of Solid Waste. Environmental Protection Publication SW-600. Washington, U.S. Government Printing Office, 1977. 142 p.

620. Resource recovery implementations; a status report. L. McEwen and S. Levy. Resource Recovery & Energy Review, 4(1): 21-25, Jan.-Feb. 1977.

NTIS REPORTS

PB-213 487. Landfill decomposition gases; an annotated bibliography. J.A. Geyer. U. S. Environmental Protection Agency, 1972. 28 p.

PB-218 672 Development of construction and use criteria for sanitary landfills; final report on a solid waste management demonstration grant. County of Los Angeles, Department of County Engineer, and Engineering-Science, Inc. Environmental Protection Agency, 1973. (511 p.)

PB-230 379 Sonoma County solid waste stabilization study. EMCON Associates. Environmental Protection Publication SW-65d. U.S. Environmental Protection Agency, 1974. 224 p.

PB-239 778 Sonoma County solid waste stabilization study. EMCON Associates. Environmental Protection Publication SW-65d.1. U.S. Environmental Protection Agency, 1975. 283 p.

PB 254 550 Twelve-month extension Sonoma County solid waste stabilization study. EMCON Associates. Environmental Protection Publication SW-120c. U.S. Environmental Protection Agency, 1976. (54 p.)

PB-272 595 Management of gas and leachate in landfills; proceedings of third annual municipal solid waste research symposium. 1977. 297 p.

Eugene F. Mooney
SECRETARY

JULIAN M. CARROLL
GOVERNOR

COMMONWEALTH OF KENTUCKY
DEPARTMENT FOR NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION
BUREAU OF ENVIRONMENTAL PROTECTION
JOHN A. ROTH
COMMISSIONER
FRANKFORT, KENTUCKY 40601

August 17, 1978

Mr. Tom Bennett
U.S. Environmental
Protection Agency
Surveillance and Analysis Section
College Street Road
Athens, Georgia 30605

Dear Mr. Bennett:

As we discussed yesterday, three (3) syringe wells had samples of gas from the Campground Landfill in Louisville, Kentucky. They are being forwarded under separate cover by the Jefferson County Air Quality Group.

If possible, please analyze these three (3) samples as one, that is by mixing them. If this is not feasible, please analyze the syringe that is indicated in the package.

What I am interested in is the amount of exotic hydrocarbons in trace and larger amounts.

Thank your for your cooperation.

Sincerely,

John E. McClure, Jr., Acting Chief
Hazardous Material Management Section
Division of Hazardous Material and
Waste Management
(502) 564-2424

JEM:cjg

cc: John Dickinson
Charles Weiter
Bob Sholar
Air Quality

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

August 14, 1978

Mr. Ben Glover
EPA
Solid Waste Department
345 Courtland Street, N.E.
Atlanta, GA 30308

Dear Mr. Glover:

As you requested, I am enclosing a list of users of the Pyroprobe Solids Pyrolyzer. We are sorry for the delay in getting this information to you.

Also enclosed is our Pyroprobe 100 Solids Pyrolyzer product bulletin, as well as a few reprints on the Pyroprobe.

If you have any questions or would like additional information, please feel free to contact us or our representative for your area, Mr. James Sasser of Sci-Con, Inc.

Sincerely,

Elaine V. Baccino

Elaine V. Baccino
Office Marketing Manager

EVTB:ckh
Encl.
CC: Sci-Con, Inc.
1268 Carrollwood Way
Stone Mountain, GA 30083
(404) 294-6181

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

FLORIDA

Dr. Bill McGee & Mr. Rodger Morrison
Forensic Science Department
Florida Technical University
P. O. Box 25000
Orlando, FL 32816
305-275-2788

J. Pulco
Air Force Eastern Test Range
Planetary Quarantine Lab
Building 49635
Cape Canaveral, FL 32920

Norman T. Lee, Criminalist
Monroe County Sheriff's Department
Crime Lab
P. O. Box 1269
Key West, FL 33040
305-296-2424 X36

Pratt & Whitney Aircraft
State Road 710
United, FL 33402
205-844-7311

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

ALABAMA

Mr. Richard Carter
State of Alabama
P. O. Box 119
Enterprise, AL 36330

Mr. William Landon
P. O. Box 231
Auburn, AL 36830

Mr. Brent Wheeler - 5 ordered 9/30/76
State of Alabama
Dept. of Toxicology & Criminal Investigation
P. O. Box 128
Huntsville, AL 36830
205-539-1401

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

GEORGIA

Dr. Eugene Reiner
Center for Disease Control
U.S.P.H.S.
Atlanta, GA 30333
404-633-3563

Mr. Joseph L. Glajch
University of Georgia
Department of Chemistry
Athens, GA 30602
404-542-2626 X80

Ms. Elizabeth B. Higman
U.S.D.A., ARS, Richard B. Russell
Agric. Research Center
P. O. Box 5677
College Station Road
Athens, GA 30604
404-546-3487

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

KENTUCKY

R. F. Vance
General Electric Company
Building 35, Room 1101
Appliance Park
Louisville, KY 40225
502-452-4642

Mr. Bill Lloyd
University of Kentucky
131 Anderson Hall
Lexington, KY 40506
606-257-2866

Mr. Edward Dance
Chem. Section Supv.
Kentucky State Police Lab
1250 Louisville Road
Frankfort, KY 40601
502-564-3876

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

MISSISSIPPI

Dr. Arthur Hume
Crime Lab
Miss. Highway Safety Patrol
P. O. Box 958
Jackson, MS 39200
601-362-1664

W. S. Kelly
Miss. Crime Lab
P. O. Box 5008
Jackson, MS 39216
601-354-7693

Miss. State University
Forest Product Lab
P. O. Box FP
Miss. State, MS 39762
601-325-2116

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

NORTH CAROLINA

Dr. Thomas A. Perfetti
Research Chemist
R. J. Reynolds Tobacco Co.
Research Center - Main Street
Winston-Salem, NC 27102
919-748-2773

Mr. Tom McSwain
North Carolina State Bureau of Investigation
109 E. North Street
Raleigh, NC 27603

Mr. Bryon Stembal
Law Enforcement Center
825 E. 4th Street
Charlotte, NC 28202
704-374-2316

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

SOUTH CAROLINA

Dr. Stephen L. Morgan
University of South Carolina
Chemistry Department
Columbia, SC 29208
803-777-8064 or 7414

Dr. Peter Hauser
Deering Milliken Research Corp.
P. O. Box 1926
Spartanburg, SC 29304
803-573-2223

Celanese Fibers Company
Cherry Road Station
Rock Hill, SC 29730
803-366-4121

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215-932-3636
Telex: 83-5308

PYROPROBE USERS LIST

TENNESSEE

Mr. William Darby, Director
Tenn. Bureau of Investigation
State Crime Lab
3021 Lebanon Road
Donelson, TX 37214
615-741-4476

Ms. Linda Hales
Tenn. Valley Authority
Laboratory Branch - 150-401 Bldg.
Chattanooga, TN 37401
615-755-3135

Mr. John Crockett
Ownes Corning Fiberglas
1167 Lower Brownsville Road
Jackson, TN 38301
901-424-5330

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19[illegible], U.S.A.
Tel [illegible]
Telex [illegible]

SUMMARY SHEET

The CDS 820WP Organic Water Pollution Analysis System makes possible in a single system, the analysis of trace organics in water at the PPB level, the analysis of total organic carbons (TOC) in water, and the analysis of total organics in sludge. When the 820WP is combined with the CDS 1200 Elemental Analyzer/Peak Identifier System, not only total organic analysis but specific organic compound identification in water pollutants and sludge becomes practical.

The CDS Model 1200 Elemental Analyzer/Peak Identifier is a unique instrument which provides an empirical formula or elemental analysis for each peak eluting from a gas chromatograph as well as a vapor phase controlled thermolytic dissociation pattern (CTD). This CTD pattern makes possible a direct molecular structural identification as well as a functional group analysis with sensitivities limited only by the detector used. The CTD pattern is in many ways the thermal equivalent of a mass spectrum, with a simpler interpretation because of the lower energies involved.

The 1200 is extremely simple to operate using only gas chromatographic technique. The results are very straightforward in interpretation and provide positive identification at the submicrogram level.

We feel the Pyroprobe 100 Solids Pyrolyzer represents a new concept in solids pyrolysis, and that it will replace the Curie Point units as they have replaced the old filament pyrolyzers. The Pyroprobe has the fastest heating rate of any commercial pyrolyzer - 75°C/msec to 600°C reached in 8 msec, as compared to 100-300 msec for commercial Curie Point devices.

Now, for the first time, you can specify complete control of the entire heating profile, resulting in added reproducibility and specificity. Also, almost any type of sample can be handled, due to the interchangeability of probes.

The Pyroprobe 120 is the 1400° version of the Model 100 and is equipped with a three position function selector switch which enables the operator to flash off solvent at 100°C, pyrolyze the sample at the selected final temperature and clean the probe at 1000°C.

The CDS 0100-381 Extended Interval Option permits the ribbon or coil probe to maintain any desired temperature up to 1400°C for a switch selectable interval of 1, 2, 4, 8, 15, 30, 60, 120, or 240 minutes. This extended interval is needed whenever there is a requirement to maintain a sample at an elevated temperature for more than 20 seconds. Examples include the stepwise heating of a sample to simulate the precombustion and combustion phenomenon useful in flame retardant studies.

The CDS 0100-382 Extended Temperature Programming Option enables the ribbon or coil probe to be temperature programmed at a switch selectable rate of 5°, 10°, 20°, 30°, 40°/min. followed by a variable isothermal final temperature interval. This control of temperature profile can be useful in studying coal gasification, rock shale oil recoveries, precombustion and combustion phenomenon and catalyst regeneration studies.

Both the Extended Interval Option and Extended Temperature Programming Option are invaluable for thermal evolution of organics from an inorganic matrix.

The Model 820 Controlled Atmosphere Pyrolysis System is extremely useful for simulating the thermal reaction of polymers in controlled atmosphere. It can be used for testing the formation of noxious vapors and smoke formation during the heating of a polymer in air, during processing or use. It provides organic content in shale, coal gasification data, and organic contaminates in air or water. It provides the means of converting from the reaction gas to helium so that successful gas chromatography or mass spectrometry analysis can be carried out.

Our Model 800 Reaction Systems are particularly valuable for catalyst evaluation and carrying out small scale reactions, both in the continuous and pulse mode at temperatures to $1000^{o}C$ and pressures up to 1500 PSI.

The CDS Series 700 Micro-Organism Identification System provides for characterization of anaerobic bacteria by examination of their metabolic products by gas chromatography, as well as by pyrolysis gas chromatographic pattern of the micro-organism itself. The pyrolysis GC of the micro-organism has been shown to provide strain, as well as species differentiation. The CDS 700 System is extremely simple to operate and can provide a micro-organism identification from a single culture in minutes.

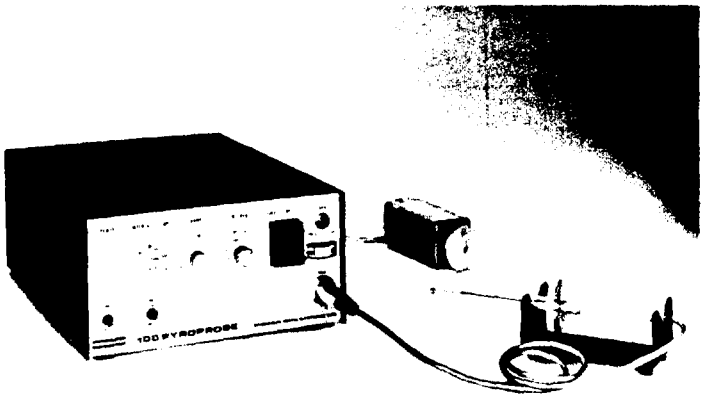
PYROPROBE™ 100 SOLIDS PYROLYZER

. . . . .CONTINUOUSLY SELECTABLE PYROLYSIS TEMPERATURE TO 1000°C
. . . . .EIGHT LINEAR TEMPERATURE HEATING RATES TO 20,000°C/SECOND
. . . . .FASTEST HEATING RATE AVAILABLE – TO 600°C IN 8 MILLISECONDS
. . . . .TEN PYROLYSIS INTERVALS – 20 MSEC TO 20 SEC.
. . . . .DUAL PROBES FOR ALL SOLID SAMPLES
. . . . .FITS ANY GAS CHROMATOGRAPH

Pyrolysis gas chromatography has established itself as a convenient and effective technique for the identification of polymers, paints, resins, rubbers and micro-organisms. In addition to identification, the technique can be used to determine the microstructure of polymers, the chemical composition of unknown compounds and end-use suitability of products such as brake linings and ablative materials.

The PYROPROBE represents the third generation in solids rolyzers. It is expected that it will replace the Curie Point units ,, they replaced the old filament pyrolyzers.

The PYROPROBE has the fastest heating rate of any commercial pyrolyzer – 75°C/msec to 600°C reached in 8 msec, as compared to 100-300 msec for commercial Curie Point devices.



The new concept is based on a precision platinum element that serves as a temperature sensor, heater and sample holder nultaneously. This element forms one leg of a conventional .neatstone bridge circuit and the temperature setting control forms a balancing leg. This permits extremely rapid and precise response. By electronically programming the balancing leg, controlled linear heating rates are obtained.

The PYROPROBE enables the entire heating profile to be defined. The final pyrolysis temperature can be varied to 1000°C and can be set to within 1°C. Additionally, the pyrolysis interval (the time during which power is supplied to the element) can be varied from twenty msec to twenty sec, in a choice of ten intervals. The heating rate of the ribbon element can be controlled from 0.1°C/msec to 20°msec (that is 100°C/second to 20,000°C/sec.) in a choice of eight rates. This "ramp" control can be bypassed so that the maximum available power is applied to the element until the final pyrolysis temperature is reached. This heats the ribbon element to 600°C in approximately 8 msec and to 1000°C in 17 msec. The coil element holding a quartz tube takes 600 msec to heat to 600°C since its higher mass causes it to heat more slowly.

The PYROPROBE is supplied with two different probes – ribbon and coil types. The ribbon probe is used for samples that can be dissolved or melted and deposited on the ribbon. The coil probe is used for material such as granular or fiber samples. It is generally used in conjunction with a replaceable quartz tube which acts as a sample holder.

Thus, the PYROPROBE can accept any type of sample due to the availability of two different probes and is therefore more versatile than either of the two types of conventional devices.

For those gas chromatographs into which the probes will not fit, a pyrolysis interface must be used. This fits onto the gas chromatograph and acts as an extension of the injection port or connects directly to the column. The temperature of the interface is sensed by a platinum resistance thermometer controlled by a zero crossing, fully proportional temperature controller in the PYROPROBE electronic module. Carrier gas preheated to the interface temperature sweeps the vaporized pyrolysis products from the interface as if the probe were actually in the gas chromatograph injection port.

CONVENIENCE FEATURES

The PYROPROBE is by far the most convenient of available pyrolyzers. The availability of a continuously variable temperature control enables a low setting to be chosen so that solvent may be flashed off before inserting the probe into the chromatograph.

The investigation of the optimum pyrolysis temperature can be made with repeated runs on the same sample at increasing pyrolysis temperatures without removing the probe from the gas chromatograph. The amount of organic residue remaining after the pyrogram has been obtained can then be determined by further pyrolysis at say 1000°C again without removing the probe.

The probe elements can readily be cleaned by burning off any organic residues in air at 1000°C.

APPLICATIONS

Pyrogram Operating Conditions

Pyroprobe 100

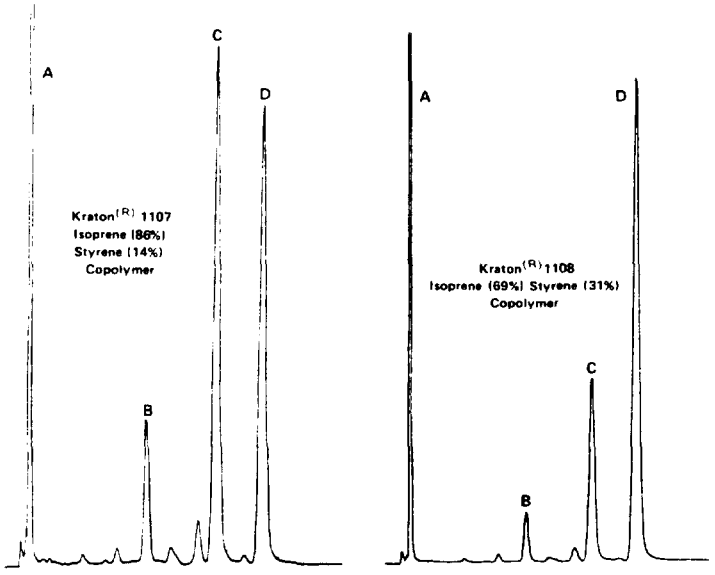
Interface Temp: 200°C
Ramp: 20°C/msec
Pyrolysis Interval: 10 seconds
Final Temperature: 600°C

Gas Chromatograph

Column: 10' x 1/8"O.D. containing 10% FFAP on Chromosorb W
Column Temp.: 100°C to 180°C at 4°C/minute
Helium Carrier: 30 ml/minute
Injection Port: 220°C
Detector: FID, 10^2 x 16

Peak Identity

A – Isoprene
B – 1, 4-Dimethyl-1-vinyl cyclohexane
C – Dipentene
D – Styrene



SPECIFICATIONS

Final Temperature Range: Continuously variable from ambient to 1000°C.

Heating Rates: Eight linear rates between 0.1 and 20°C/sec. With the linear control off, 600°C is reached in 8 msec and 1000°C 17 msec when the ribbon element is used.

Pyrolysis Intervals: Ten intervals between 20 msec and 20 sec.

Interface Temperature: Continuously variable between 50 and 500°C. The temperature used is limited by the septum and O-Ring materials.

Probe Types: Ribbon Element: 35 mm x 1.5 mm x 0.0127 mm thick platinum
Coil Element: Coiled platinum wire, 15 mm length by 3 mm diameter coil

Electronic Module: 10" x 5" x 13" Weight: 16½ lbs.
25 cm x 12.5 cm x 33 cm 7.5 KG

Interface: 5" x 2½" x 2" (12.5 cm x 6.2 cm x 5 cm)

HOW TO ORDER

Part Number	Description
CDS 100-371	PYROPROBE 100(1) Solids Pyrolyzer
	Options
CDS 100-372	Pyrolysis Interface with Temperature Controller(2) (3)
CDS 100-375	Additional Pyrolysis Interface without Temperature Controller(2). Cannot be used without CDS 100-372
CDS 100-376	Quartz Lined Option for above(3)
CDS 100-401	Function Switch(3) (4)
CDS 100-402	1400°C Option (3)
CDS 0100-381	Extended Interval Option 1, 2, 4, 8, 15, 30, 60, 120, or 240 minutes.
CDS 0100-382	Extended Temperature Programming Option – 5°, 10°, 20°, 30°, 40°/min. This option includes Option 0100-381
CDS 0100-1020-1	Ribbon Probe
CDS 0100-1020-2	Coil Probe
CDS 0100-1021-1	DuPont Mass Spec Ribbon Probe
CDS 0100-1021-2	DuPont Mass Spec Coil Probe
CDS 0100-1060	20 Quartz Tubes for Coil Probe
CDS 0100-1076	25 Probe Seals
CDS 1620-0059	20 Viton O-Rings for Interface
CDS 1620-0089	10 Graphite Ferrules for Interface
	Standard Probe Refurbishing
CDS 100-373	Large Probe Interface with Temperature Controller(2) (3)
CDS 100-377	Large Probe Interface without Temperature Controller(2)
CDS 0100-1020-3	Large Coil Probe
CDS 0100-1060-2	Quartz Boat for Standard Coil Probe
CDS 0100-1060-3	Alumina Tubes for above Mass Spec Coil Probe – 4/pack
CDS 0100-1062-2	Bulk Quartz Tube for Large Coil Probe (unslotted)
	Large Probe Refurbishing

(1) Includes PYROPROBE electronic module, one calibrated ribbon probe, one calibrated coil probe and probe stand.
(2) State chromatograph make and model number.
(3) These options cannot be field installed.
(4) This three position switch enables the operator to flash off solvent at 100°C, pyrolyze the sample at the selected final temperature and to clean the probe at 1000°C.

PRICES ARE FOB: Oxford, Pa 19363
* Specify 115V, 60 Hz or 230V, 50/60 Hz

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363 • 215 932-3697
Telex 83-5306

PYROPROBE™ is a registered tradename of Chemical Data Systems, Inc.

CDS Bulletin 100-371
Printed in U.S.A. 060173

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U.S.A.
Tel.: 215 932-3636
Telex 83-5363

PYROPROBE 100/120 SOLIDS PYROLYZER

HOW TO ORDER

Part Number	Description	Price
CDS 100-371	Pyroprobe 100(1) Solids Pyrolyzer, including interchangeable coil and ribbon probes.	$ 1585.00
CDS 120	Pyroprobe 120(1) Solids Pyrolyzer, including interchangeable coil and ribbon probes (1400° version) with CDS 100-401 Three Position Function Selector Switch which enables operator to flash off solvent at 100°C, pyrolyze the sample at the selected final temperature and clean the probe at 1000°C.	2[illegible].00

OPTIONS

CDS 100-372	Pyrolysis Interface with temperature controller (2,3)	429.00
CDS 100-375	Additional Pyrolysis Interface without temperature controller(2). Cannot be used without 100-372.	337.00
CDS 100-376	Quartz Lined Option for above(3)	151.00
CDS 100-401	Function Switch(3,4)	225.00
CDS 100-402	1400° Option(3)	215.00
CDS 0100-381	Extended Interval Option -1,2,4,8,15,30,60,120 or 240 minutes	1154.00
CDS 0100-382	Extended Temperature Programming Option -5°,10°, 20°,30°,40°,60°,120°,180°,240°,300°C/Minute. This option includes 0100-381.	1[illegible]
CDS 0100-1020-1	Ribbon Probe (Standard diameter 1/4")	2[illegible]
CDS 0100-1020-2	Coil Probe (Standard diameter 1/4")	2[illegible].00
CDS 0100-1021-1	Direct Insertion Ribbon Probe for DuPont Series 490 Mass Spec (Other Mass Spec Probes on request)	1[illegible]
CDS 0100-1021-2	Direct Insertion Coil Probe for DuPont Series 490 Mass Spec (Other Mass Spec Probes on request)	1[illegible]
CDS 0100-1060	20 Quartz Tubes for Coil Probe	[illegible]
CDS 0100-1062-3	Quartz Boat for Large Probe	[illegible]
CDS 0100-1076-1	25 Probe Seals	[illegible]
CDS 0100-1076-5	25 Large Probe Seals	[illegible]
CDS 1620-0059	20 Viton O-Rings for Interface	[illegible]
CDS 1620-0089	10 Graphite Ferrules for Interface	[illegible]
CDS 1640-0002	Quartz Wool	[illegible]
	Standard Probe Refurbishing	[illegible]
CDS 100-373	Large Probe Interface with temperature controller (2,3)	[illegible]
CDS 100-377	Large Probe Interface without temperature controller(2,3)	[illegible]

5/1/78

Chemical Data Systems, Inc. • Oxford, Pennsylvania 19363, U
Tel 215 932
Telex 83

ORDERING INFORMATION CONT'D

Part Number	Description	[illegible]
CDS 0100-378-2	Programmed Pyrolysis Interface with rapid cool-down capability to go to 800°C, limited to 400°C when used with probes. NOTE: The Model 210 Temperature Programmer is required to program above interface - CDS 0210-674 $1803.00	$ [illegible]
CDS 0100-1020-3	Large Coil Probe (Diameter 5/16")	[illegible]
CDS 0100-1060-2	Quartz Boat for Standard Coil Probe	[illegible]
CDS 0100-1060-3	Alumina Tubes for Standard Coil Probe (4/pack)	[illegible] pk
CDS 0100-1062-2	Bulk Quartz Tube for Large Coil Probe - Unslotted	[illegible] ea
	Large Probe Refurbishing	[illegible]

(1) Includes PYROPROBE electronics module, one calibrated ribbon probe, one calibrated coil probe and probe stand.
(2) State chromatograph make and model number.
(3) These options cannot be field installed.
(4) This three position switch enables the operator to flash off solvent at 100°C, pyrolyze the sample at the selected final temperature and to clean the probe at 1000°C.

ROUTING AND TRANSMITTAL SLIP

Date 6/9/78

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. ~~Jim Scarbrough~~		
~~Region IV~~		
3. ~~[illegible]~~ Rita		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate	✓	For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Illinois EPA gas sample analyses from sanitary landfill with lateral migration into adjacent residences.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Chuck Grigalauski	Phone No.

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

MESSAGE	REPLY
Chuck Grigalauski	To:
From: Scot Miller	From:
Date: 8/7/78	Date:
( ) TAKE NECESSARY ACTION	( ) TAKE NECESSARY ACTION
( ) FOR YOUR APPROVAL	( ) FOR YOUR APPROVAL
( ) APPROVED	( ) APPROVED
( ) REPLY	( ) REPLY
( ) RE-DO AND RE-SUBMIT	( ) RE-DO AND RE-SUBMIT
( ) FOR YOUR COMMENTS	( ) FOR YOUR COMMENTS
(✓) FOR YOUR INFORMATION	( ) FOR YOUR INFORMATION
( ) FOR YOUR SIGNATURE	( ) FOR YOUR SIGNATURE
( ) DRAFT *(LETTER) (MEMO)* FOR *(MY) (YOUR)* SIGNATURE	( ) DRAFT *(LETTER) (MEMO)* FOR *(MY) (YOUR)* SIGNATURE
(✓) PER YOUR REQUEST	( ) PER YOUR REQUEST
( ) SEE ME ABOUT ATTACHED	( ) SEE ME ABOUT ATTACHED
( ) RETURN	( ) RETURN
( ) FILE	( ) FILE
( ) SEE REVERSE SIDE FOR ADDITIONAL COMMENTS	( ) SEE REVERSE SIDE FOR ADDITIONAL COMMENTS
( ) DISCARD IF UNNECESSARY	( ) DISCARD IF UNNECESSARY

Comments:

you need more info or better copies let me know

Scot

RECEIVED
AUG 11 1978
SOLID WASTE MANAGEMENT BRANCH

EPA-4 (Rev. 7/15/75)

LPC/NPC Samples from Chicago Heights

9042 (B-1) (Abandoned Well in Vacant lot No. of Site)

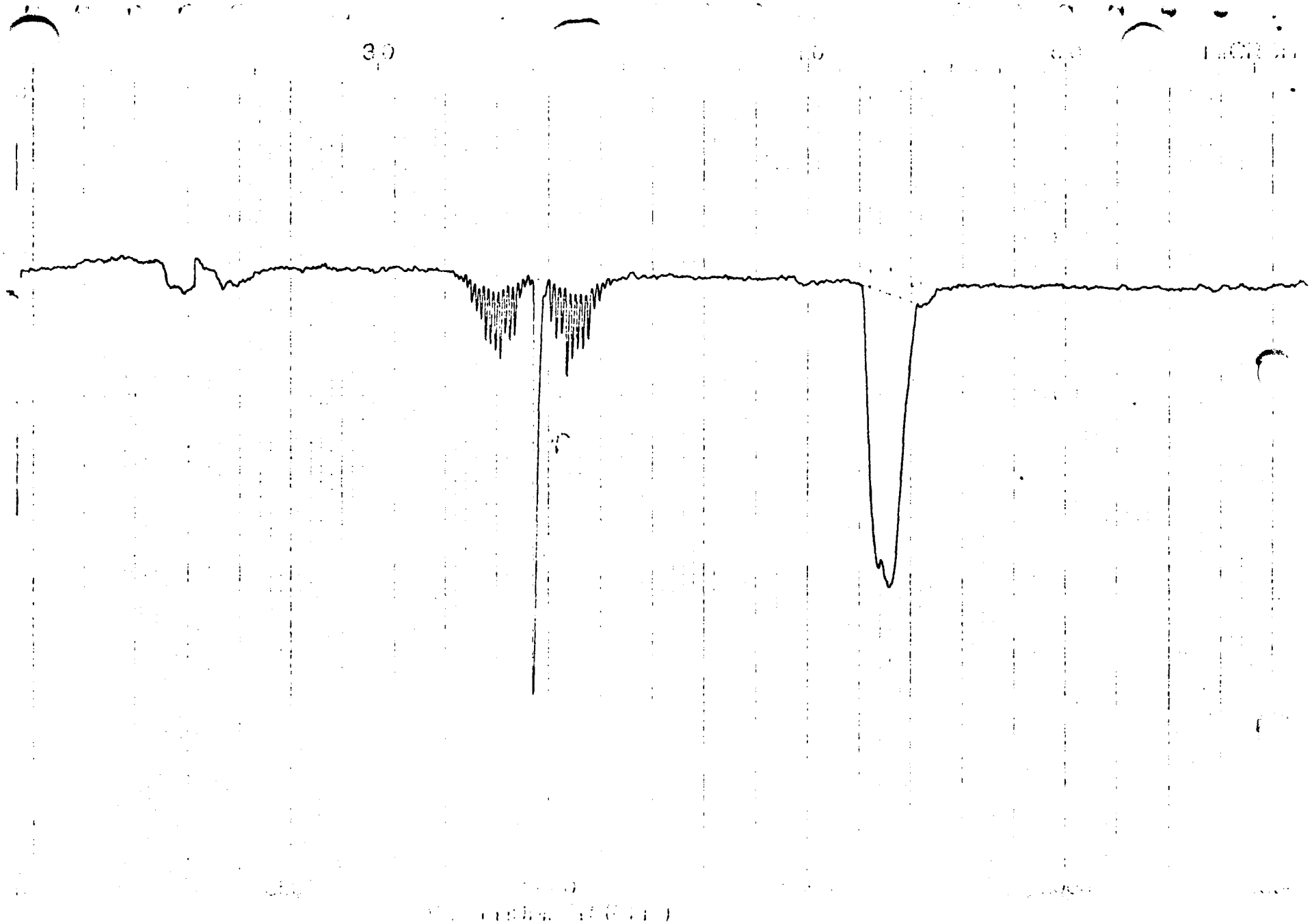
Methane 20.25%
CO_2 14.66%

9043 (B-2) (Soil probe just south of ℄ of 26th St.)

Methane 31.50%
CO_2 18.38%

9044 (B-3) (shower drain in basement of 355 E. 26th St)

Methane	ND	20.54
CO_2	ND	10.17


9043
B-2
4cc of Sample
Air

Mr. J.E. McClure,Jr.

(1) Mr. McClure indicated that the Kentucky Department for Natural Resources and Environmental Protection is reviewing existing permits with the Campground Landfill by industrial customers and is requiring the industries to resubmit new chemical analysis for each waste presently being deposited in the landfill.

(2) The State is also investigating other landfills in the area and their wastes, both sanitary and industrial, being deposited in said landfills.

(3) The State recently took aerial photos and found a large number of surface ponds to exist in the area, which will be investigated.

(4) Mr. McClure also indicated the State was preparing to take enforcement action in the area.

(5) The State is instituting a manifest system which will require all producers to keep accurate records of quantities and analyses of waste being deposited. The industries should start receiving notices of the institution of the manifest system within the next three (3) months, in the Jefferson County area.

Mr. Jerry Blankenship

(1) Mr. Blankenship agreed with the installation of the new lateral field for the production building on the Kentucky Concrete Pipe Company property, along with the installation of an automatic gas monitoring system.

(2) Mr. Blankenship stated, at the present he had no costs figures of what a positive evacuation system would run and that he felt the wells recently installed had not been in long enough to give a true indication of whether or not additional gas reduction would occur off the landfill site.

(3) Mr. Blankenship indicated he would like to install another type of well, 3' in diameter with a 6" perforated pipe down the center, surrounded by crushed rock, to determine if this type well may be more efficient than what has presently been installed.

Jon Glover
8-1-78

Dr. Eugene Lewi
ph. (215) 932-3636
FTS Op. 597-3311
Chemical Data Systems
Oxford, Pa.

Spoke with Dr. Lewi and Greg Gagus

[redacted] Gave me Crime Labs
Univ. of Ga. → Nancy Moon
CDC → Eugene Wilder

Mr. Gagus gave a [redacted] retailer:
P.J. Colbert Co.
Phil Colbert, St. Louis, Mo
(314) 423-8388
Henry Durichion

[redacted]

Mr. Colbert gave me:
Murray State Univ.
Paul Goodley
Chem. Dept.
(502) 762-2584

Kentucky Highway Patrol

In summary, it was agreed that the wells installed by Mr. Blankenship have not solved the gas migration problem.

(1) It was felt by the Health Department that a positive evacuation system will be required to sufficiently prevent migrating gas from leaving the Campground Landfill site.

(2) The Health Department will request Air Pollution Control to collect two more air samples for analysis, one from the wells constructed on the landfill site and one from the trailer park pit.

(3) Health Department established the date of August 11, 1978, as a deadline for Jerry Blankenship to submit a schedule detailing the time frame necessary for monitoring and analysis, construction plans and specifications, and actual construction and start-up.

(4) A new lateral field system is to be installed to serve the Kentucky Concrete Pipe Company production building along with an automatic alarm system.

Upon submittal of Mr. Blankenship's proposed schedule the Health Department along with the Kentucky Department for Natural Resources and Environmental Protection will decide upon its acceptability. All interested parties will be kept abreast of any action taken.

cc: T. S. Wallace, Jr., M.D.
Bruce K. Lane
Larry Woods
Jay Gordon
Randy Hockensmith
Harley N. Blankenship
Jerry P. Blankenship
John Dickinson
John Brooks
Ross Singleton
Jack McClure
Harold Davis
Larry Schumer
Pat Haight
Richard Wellinghurst
Joseph L. Pavoni
Bert VanArsdale
Thomas J. Nortof
David Ross Stevens
Thomas Coomes
Phillip A. Emery
Robert W. Davis

Louisville
FTS 0.:352-5011

Info. 9-1-502-555-1212

Univ of [redacted] Louisville
Chem. Lab → 588-6798

Switch Board 588-5555

Pyrolyzer ⇒ GC

Dr. Zaté

Dr. Taylor → 2hrs.

Mr. Welter
(502) 587-3885

UK [redacted]
Lexington

Call Back Chemical and Environ Eng 588-6347
Prof. Plank

606
Switchboard
258-9000

Water Reconcepts
-6733
Prof. Neff.

Dept of [redacted] Pharmacology
-5158
Prof. Jarboe

Water Company
Polymers

584-5914

Louisville Testing Labs

National AirOil Burner Company, Inc., 1284 East Sedgley Avenue, Philadelphia, Pa 19134

Telephone (215) 743-5300 Telex 84-5403 Branch Offices: Houston, London, Milan and Tokyo

July 25, 1978

RECEIVED
JUL 27 1978
SOLID WASTE MANAGEMENT BRANCH

R. Davenport, Chemist
US Environmental Protection
Agency
345 Courtland Street NE
Atlanta, GA 30308

Dear Mr. Davenport:

Thank you for your interest in NAO products.

Since we cannot pinpoint your specific areas of interest, we have enclosed a copy of our Catalog N-30. This general catalog contains information about products for:

PROCESS COMBUSTION EQUIPMENT: gas, oil and combination-fuel-fired burners, atomizing oil guns, low-noise integrated-shroud burners, low NO_x burners, and accessories for reliable combustion.

ONSHORE AND OFFSHORE FLARING / VENTING SYSTEMS: elevated and ground flares, populated area combustors, smokeless flaring, pilot-ignition systems, efficient flare-system-components, and vent / fire suppression systems.

INCINERATION AND COMBUSTION SYSTEMS: vapor-disposal units for gasoline / benzene loading terminals, incineration equipment for liquids or gases with heat recovery, steam generation and / or scrubbers . . . also inert gas generators and direct fired air heaters.

For detailed information about NAO's reliable flaring, venting and incineration systems, please call / write: John F. Straitz, III, director of our pollution control division. . . . For additional information about NAO's burners, accessories, and dependable combustion systems, please call / write me.

NAO has been dedicated to solving combustion problems . . . heat generation, its application, and problems arising from its use . . . since 1912. We would like to offer our expertise and our "engineered solutions" for your combustion- and / or pollution-control applications.

Looking forward to hearing from you, I am

Very truly yours,

Paul J. Binker
Vice President — Sales

PJB / nas
ATTACHMENTS
Cat. plus reply card

Flares on Parade

DEPARTMENT OF PUBLIC HEALTH

LOUISVILLE AND JEFFERSON COUNTY

400 EAST GRAY STREET

P.O. BOX 1704
LOUISVILLE, KY. 40201

T. S. WALLACE, JR., M. D.
DIRECTOR OF HEALTH

July 24, 1978

Mr. Jerry Blankenship
Campground Landfill
7500 Grade Lane
Louisville, Kentucky 40219

Re: Migrating Gas Problem

Dear Mr. Blankenship:

As per our conversation on Friday, July 21, 1978, this will confirm the meeting set for Monday, July 31, 1978, at 10:00 A.M., at the Louisville and Jefferson County Department of Public Health Building, Room #202, to discuss the effectiveness of the system installed to correct the gas migrating problem at the Campground Landfill. By copy of this letter, all persons present at the June 13, 1978, meeting are invited to attend the above mentioned meeting.

Very truly yours,

Charles E. Weiter

Charles E. Weiter, Assistant Director
Division of Environmental Health

CEW/mlr

Rec'd 8/1/78 JHS

Rec'd 8/3/78 RD

John Dickinson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30308

JUN 1 3 1978

Mr. Norman Schell, Director
Division of Hazardous Materials &
Waste Management
State Department for Natural Resources
& Environmental Protection
Capital Plaza Tower
Frankfort, Kentucky 40601

Dear Mr. Schell:

In reference to the Campground landfill gas migration problem, enclosed is a copy of Mr. John Dickinson's field report. The report covers the inspection of the Campground landfill and the Southern Materials landfill, and the meeting at the Louisville-Jefferson County Health Department.

Based on this report and my own experience with a similar problem at Lee's Lane landfill in Louisville, we recommend that your Division require all landfills located in similar geologic formations to install gas control facilities as a permit condition.

Attached is a partial list of references my staff has compiled on controlling landfill gas migration. We can get you a copy of some of these if you do not already have them in your files. Reports from NTIS must be ordered by your office. We plan to contact the other EPA Regional offices to determine what the best management practice, in their judgment and experience, is for landfill gas control. In addition, we are calculating the amount of gas that the landfill site will produce as a function of time.

We have contacted Mr. Bobby Carroll of our Athens laboratory about the feasibility of simulating flaring conditions and determining combustion products. He informed us that there is a device called a pyrolyzer in which gas can be heated prior to passing into the GC/mass spec unit. Athens does not have one now but may be able to purchase one. Mr. Carroll is investigating the temperature and dwell time for these units and the price of the unit. The pyrolyzer will not exactly simulate a flare but

the data would give an idea of what decomposition products might be formed if flaring becomes necessary. My staff is investigating the types and costs of installing a conventional industrial flare system.

We will supply you and the Louisville-Jefferson County Health Department with any additional information we get. If you have any questions, please call me or John Dickinson.

Sincerely,

James H. Scarbrough

James H. Scarbrough, P.E.
Chief
Residuals Management Branch

Enclosures

cc: Mr. Bruce K. Lane, Director
Division of Environmental Health
Louisville, Kentucky

Mr. James H. Finger, Director
Surveillance and Analysis Division
EPA Region IV

Mr. Robert T. Offutt
Secretary-Treasurer
Jefferson County Air Pollution
Control District
Louisville, Kentucky

Evaluation of Landfill Gas Migration and a Prototype Gas Migration Barrier, PB-239, 357/7BA

Gas and Leachate from Landfills: Formation Collection and Treatment, PB-251, 161/6BA, EPA-600/9-76/004

Sanitary Landfill. A Bibliography, PB-215, 904/BA

Landfill Decomposition Gases. An Annotated Bibliography, PB-213, 487/2BA, 34 pp., EPA-SW-72-1-1

(2) He proposed to apply for an Air Pollution Permit to vent the gases to the atmosphere simultaneous with the installation of the wells.

(3) He would establish a sampling program.

(4) He would submit to the Kentucky Division of Hazardous Materials and Waste Management and the Louisville and Jefferson County Department of Health, "As Built" plans upon completion of the above mentioned installation.

Dr. Pavoni representing Kentucky Concrete Pipe Company suggested the following:

(1) The wells installed adjacent to Kentucky Concrete Pipe Company's property line be placed 50' on centers instead of 100'.

(2) An additional eight (8) monitoring wells be placed on the Kentucky Concrete Pipe Company property. By monitoring these wells the efficiency of the venting system could be determined, in respect to Kentucky Concrete Pipe Company's property.

(3) Dr. Pavoni suggested that a system of flaring off the gases be investigated and possibly be made mandatory at a later date.

John Dickinson from the Federal Environmental Protection Agency agreed to investigate and obtain answers to the following questions:

(1) Will the Environmental Protection Agency Laboratory in Athens Georgia analyze additional samples?

(2) What is the standard practice at other industrial fill sites around the country for eliminating migrating gas (a natural venting system or flaring off of the gases)?

(3) Would Environmental Protection Agency Laboratory at Athens, Georgia conduct tests of burning the gases and then analyzing the conbusted gases?

Mr. Dickinson suggested that at least one (1) well be sunk to ground water so as to afford the opportunity to obtain ground water samples for analysis. He also suggested that Air Pollution try to establish the flow rate of the gases that are presently being emitted by the fill.

Kita ← John D.
JHS

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

6-15-78

M E M O R A N D U M

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Road Landfill Migrating Gas Problem

On Tuesday, June 13, 1978, a meeting was held at the Louisville and Jefferson County Department of Public Health to discuss the migrating gas problem at the Campground Road Landfill. The following persons were in attendance: Jay Gordon, Kentucky Concrete Pipe Company; Randy Hockensmith, Kentucky Concrete Pipe Company; Harley Blankenship, Attorney for Campground Landfill; John Dickinson, Federal EPA; John Brooks, Ky. Division of Hazardous Material & Waste Management; Ross Singleton, Ky. Division of Hazardous Material and Waste Management; Jack McClure, Ky. Division of Hazardous Material and Waste Management; Harold Davis, Air Pollution Control; Larry Schumer, Air Pollution Control; Pat Haight, Division of Hazardous Materials and Waste Management; Richard Wellinghurst, Louisville & Jefferson County Department of Health; Dr. Joseph L. Pavoni, TenEch Environmental Consultants; Bert VanArsdale, Attorney for Kentucky Concrete Pipe Company; Thomas J. Nortof, Louisville & Jefferson County Civil Prepardness; David Ross Stevens, Jefferson County Government; Thomas Coomes, Charles E. Weiter and Bruce K. Lane, Louisville and Jefferson County Department of Public Health; Henry L. Stephens, Attorney for the Board of Health; Jerry Blankenship.

The meeting was called to order at approximately 11:15 A.M., and Jerry Blankenship presented the following as his recommendations for prohibiting the gas from migrating beyond the Campground Road property:

(1) He proposed to install a natural venting system composed of drilled wells with perforated pipe to extend 30' below ground surface with 30' above ground stacks. He proposed to place these wells every 100' along the east and south property lines of the landfill.

The Kentucky Division of Hazardous Materials and Waste Management agreed to review and check out previous letters of permission granted to industries for liquid waste disposal at the Campground Fill. This will be performed to try and determine the source of exotic chemicals present in the migrating gas. The State also will analyze ground water samples and investigate other systems in the area such as fly ash ponds, industrial waste lagoon systems, etc., as a possible source.

In summary it was agreed upon by all present, the following items would be performed:

(1) Mr. Blankenship would install wells on the east and south side property lines of the landfill 100' on centers and 50' on centers where the landfill property abutts Kentucky Concrete Pipe Company's property.

(2) At least one (1) well will be sunk to ground water so as to afford the opportunity to obtain ground water samples for analysis. Eight (8) additional sampling wells to be located on Kentucky Concrete Pipe Company's property at locations suggested by Dr. Pavoni.

(3) Simultaneous to the installation of the wells Mr. Blankenship would apply for an Air Pollution Permit to vent the gases to the atmosphere.

(4) Mr. Blankenship will submit "As Built" plans and specifications to the Kentucky Division of Hazardous Materials and Waste Management and the Louisville and Jefferson County Department of Health.

(5) Mr. Blankenship will establish a sampling program on a twice a day, once in the morning and once in the afternoon, for thirty (30) days following the installation to determine venting efficiency.

(6) All wells, weather permitting, are to be installed by the week of July 10, 1978.

(7) The Louisville and Jefferson County Health Department will continue to monitor the entire area surrounding the fill site for migrating gas.

Louisville - landfill

Septic Tanks

Home 394-7480

John Brooks - Pat Wright

Bob Sholar - Louisville 502 - 587-3871

502 - ~~587 3878~~
588-4254

Bob Offutt 502-587-3327

Doyle Brittain

8-250-3438

Hawkins

John Tate Campground Road

3'X25'

Kentucky Lemonte Pike

9-1-502-555-1212

242-3110

Louisville 352-5011

(8) Air Pollution will work with the Federal Environmental Protection Agency on collecting additional samples for analysis.

(9) The Kentucky Division of Hazardous Materials and Waste Management will review previous permission letters for industries to discharge liquid waste in the landfill, will check out ground water quality and investigate other above ground sources of possible pollution such as fly ash ponds, industrial waste lagoon systems, etc.

At the end of July all analyses shall be reviewed by the Kentucky Division of Hazardous Materials and Waste Management, Air Pollution and the Louisville and Jefferson County Department of Public Health, to determine the efficiency of the venting system and a decision will be made at that time, whether or not additional preventive measures will be necessary.

JUNE 15, 1978

cc: T. S. Wallace, Jr., M.D.
Bruce K. Lane
Henry L. Stephens
Jay Gordon
Randy Hockensmith
Harley N. Blankenship
Jerry P. Blankenship
John Dickinson
John Brooks
Ross Singleton
Jack McClure
Harold Davis
Larry Schumer
Pat Haight
Richard Wellinghurst
Joseph L. Pavoni
Bert VanArsdale
Thomas J. Nortof
David Ross Stevens
Thomas Coomes

— Coal animals
Goodrich Resins + Rubber
Amer. — Lime slurry
SYNT.

Thursday, May 11 (continued)

3:30 - 3:15	Break
3:15 - 4:15 State RA agreements, consolidated grants, etc. continued	Paul DeFalco, et. al.
4:15 - 5:15 Management Task Force Update	Bill Carter
5:15 - 5:30 Joint U.S./Canadian O&M Study	George Alexander
5:30 - 7:30 Transportation to dinner and back to hotel	Dinner Lab Staff
8:00 Informal Discussions (Hotel)	

Friday, May 12

Breakfast -- Restaurant opens at 7:00 AM Check out (bring luggage with you to lobby)	
8:15 Transportation to Lab	Lab Staff
8:30 - 10:00 Inflation, economy and EPA	Doug Costle/Bill Drayton
10:00 - 10:15	Break
10:15 - 11:00 Minority Business Enterprise	Beth Sullivan
11:00 - 12:00 Steel Strategy	Jodie Bernstein
12:00 - 1:30	Lunch (at Lab)
1:30 - 3:00 Policy Guidance Feedback	Douglas Costle
Summary	Barbara Blum
Transportation to Airport	Lab Staff

June 15, 1978

Campground Landfill Gas Migration Problem

John E. Dickinson, PE
Hazardous Waste Management Coordinator

James H. Scarbrough, Chief
Residuals Management Branch

Kentucky Hazardous Materials and Waste Management personnel accompanied me to the Campground landfill site 6/13/78. Pictures of the site are attached with a sketch prepared by Mr. Davis. The landfill was being operated satisfactorily. Waste is being deposited in the northeast area of the area that is "to be filled." There is an open space between the working face and the sides of the pit; this will minimize migration of the gas into the Mobile Home Park area in the northeast corner of the site. The Campground site accepts about 1000 tons/day municipal waste per Pat Haight; the site has 2-3 years life expectancy. Some industrial wastes are accepted by the site by special permission only.

We next inspected the Southern Materials landfill north of the Campground landfill. The Southern Materials landfill is permitted as an inert site but accepts putrescible and other wastes quite frequently. Kentucky is in the process of revoking the permit. The State suspects the Southern Materials landfill has taken industrial wastes in the past.

We next met with representatives of the Louisville and Jefferson County Health Department, representatives of the Jefferson County Air Pollution Control District, Mr. Blankenship, the operator of the site and

additional samples if "new information" would be obtained but they would not run the same types of samples over again.

o EPA was requested to supply information on best technology available for disposing of landfill gas.

o EPA was requested to explore the feasibility of running a gas sample through a furnace and then into the GC/mass spee unit to determine combustion products. The Air Pollution District was concerned that phosgene could be formed by incomplete combustion of the chlorinated hydrocarbons.

o Eight 2" gas monitoring wells will be installed on Kentucky Concrete Pipe property to determine if the venting is lowering methane concentrations. If substantial progress is not achieved within 2-3 weeks, a flare system or forced air blower system may be required. Other gas monitoring wells will be installed on the site perimeter.

o Water monitoring wells (3) will be installed per Kentucky Division of Hazardous Materials and Waste Management geologists to determine if groundwater is source of exotic chemicals that are found in the gas.

o The industrial facilities in the area will be inspected by the State to determine if on-site dumps are polluting the groundwater.

o All industrial permitted wastes going to Campground will be re-examined by the State.

his attorney, representatives of Kentucky Concrete Pipe Company and their attorney and consulting engineer.

The meeting was chaired by Mr. Charles Weiter, Public Health Engineer. The main points of the meeting are summarized below:

o Mr. Blankenship will immediately start installing vent pipes on the east and south ends of the landfill. Vent pipes will be 4" diameter perforated plastic pipe in 6" diameter hole on 50 foot centers on the Kentucky Concrete Pipe property line and 100 foot centers elsewhere. The pipes will extend 30' below grade and 30' above grade. Construction can be completed within three weeks. "As built" drawings will be supplied to the Air Pollution Control District for approval. Mr. Davis of the Air District originally suggested a 2-week approval time but agreed to the as built approval.

o Kentucky Concrete Pipe wanted the gas to be flared to increase gas excavation flow (chimney effect) and to prevent an explosive mixture from being formed on their property. It was pointed out that the methane should rise quickly and not form an explosive mixture but this should be monitored in the field.

o EPA was requested by Mr. Weiter to provide lab assistance on running air samples on the vent gas and ambient air after the pipes are installed. Mr. Dickinson of EPA reported that Athens had agreed to run

o The site operator should not fill all the way to the sand banks on the existing working face to provide an air gap between the site and adjoining structures.

o The site operator said he had not knowingly taken any wastes containing the "exotic" compounds found in the landfill gas. However, he does not check each waste load nor does the State.

o Mr. Weiter said that this gas problem was confined to the Concrete Pipe Company property primarily.

o Elevated o/o explosive limits readings have been obtained in the septic pits of the trailer park north of the fill but this could be from aneorobic decomposition of household sewage.

o The house labeled "New House" on Mr. Davis' sketch was occupied by the Kentucky Concrete Pipe Company plant superintendent, but he has vacated the house because the septic pit gas is in the 35-40% combustible range. There was some discussion about installing a conventional tile field so he can move back in.

o No gas was found in the "old house" basement.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: June 15, 1978

CT: Campground Landfill Gas Migration Problem

FROM: John E. Dickinson, PE
Hazardous Waste Management Coordinator

TO: James H. Scarbrough, Chief
Residuals Management Branch

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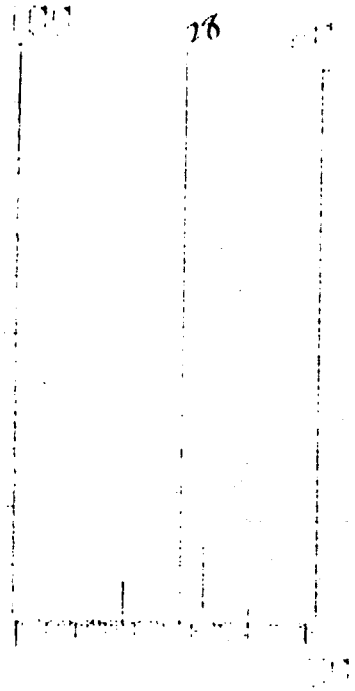


TECHNICAL ASSISTANCE [illegible]

1. REQUEST FROM: Jim [illegible] DATE: [illegible]

2. REQUEST: ✓ Contact EPA Region [illegible] [illegible]
   - [illegible] the amount of [illegible] functions of time
   - Determine [illegible] time [illegible]
   - [illegible] costs [illegible]
   - Determine [illegible]

3. BACKGROUND:

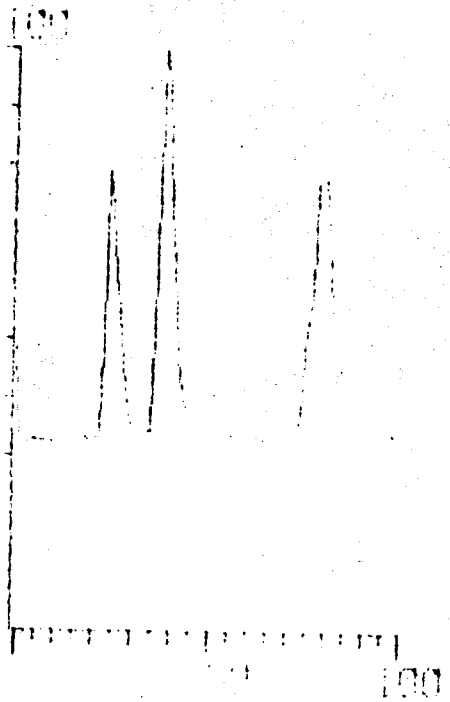
4. KEY PROPERTIES OF MATERIAL:
   3.7 ft^3 methane / 5 to 25 year period

5. DISPOSAL ALTERNATIVES:

6. RECOMMENDED DISPOSAL:

7. ACTUAL DISPOSAL:

8. REFERENCES:


100
100

904

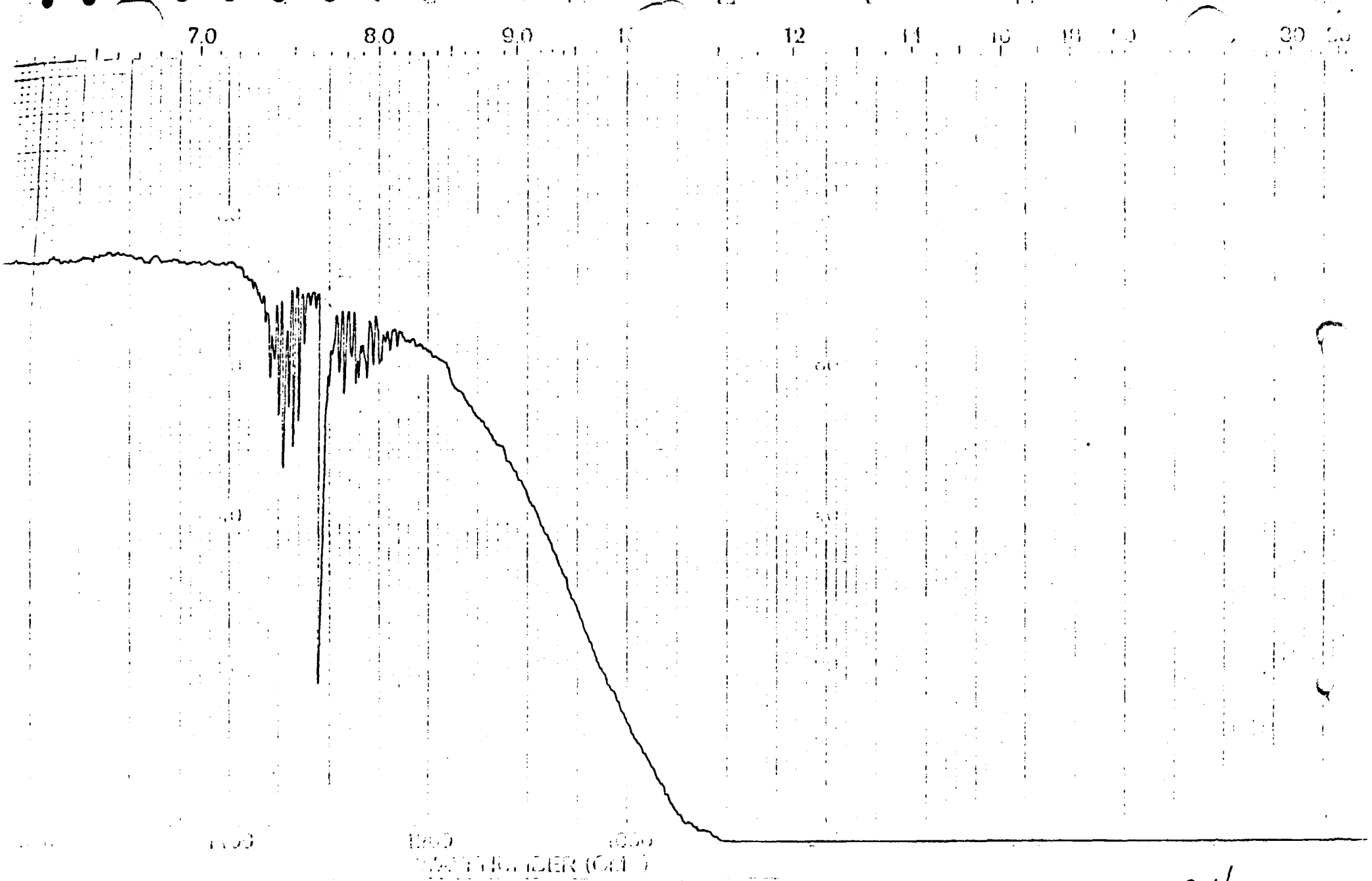
903604

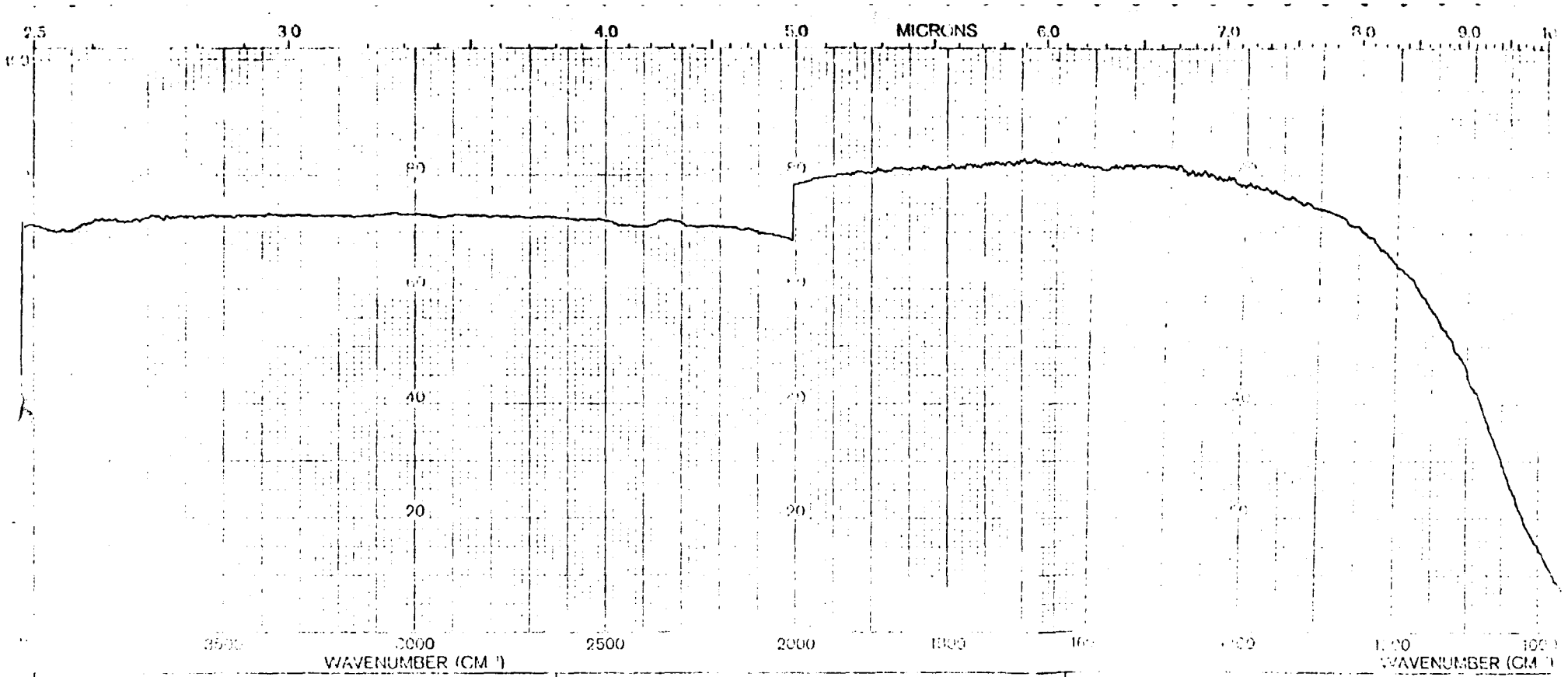
>P
MULT.FAST.? S

FILE :903605
TITLE:AIR SAMPLE 9043
MASS RANGE :10-150
INTEG. TIME:3
SCANS PER SCAN :0
THRESHOLD:2
MAX. RUN TIME:30
INST. RANGE SETTING:3

PS
T

PS
T
UNABLE TO QUANTITATE-SAMPLE IS SATURATED

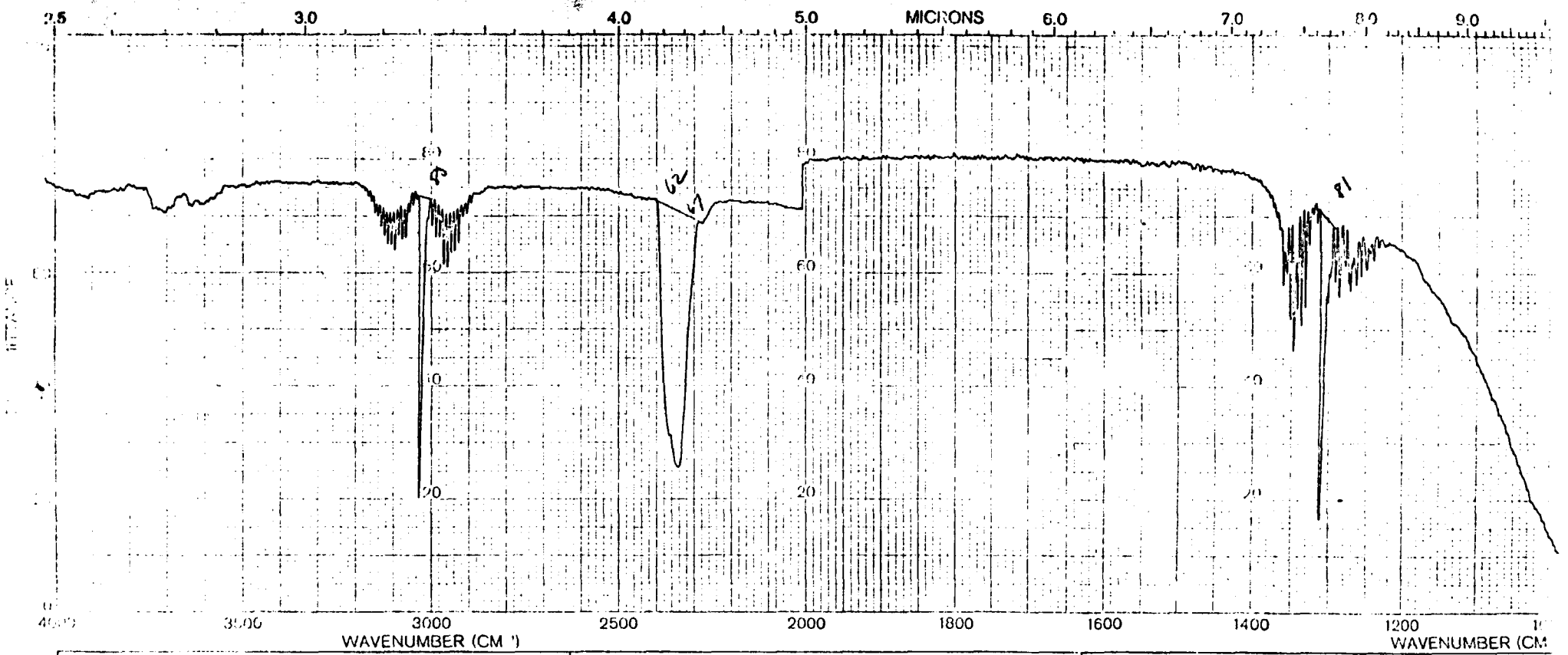

7.0
8.0
9.0
12
SCAN SPEED M
N
PART NO. 457 - 5001
DATE 8/29/77
IR 8 - 8/29/77



Air

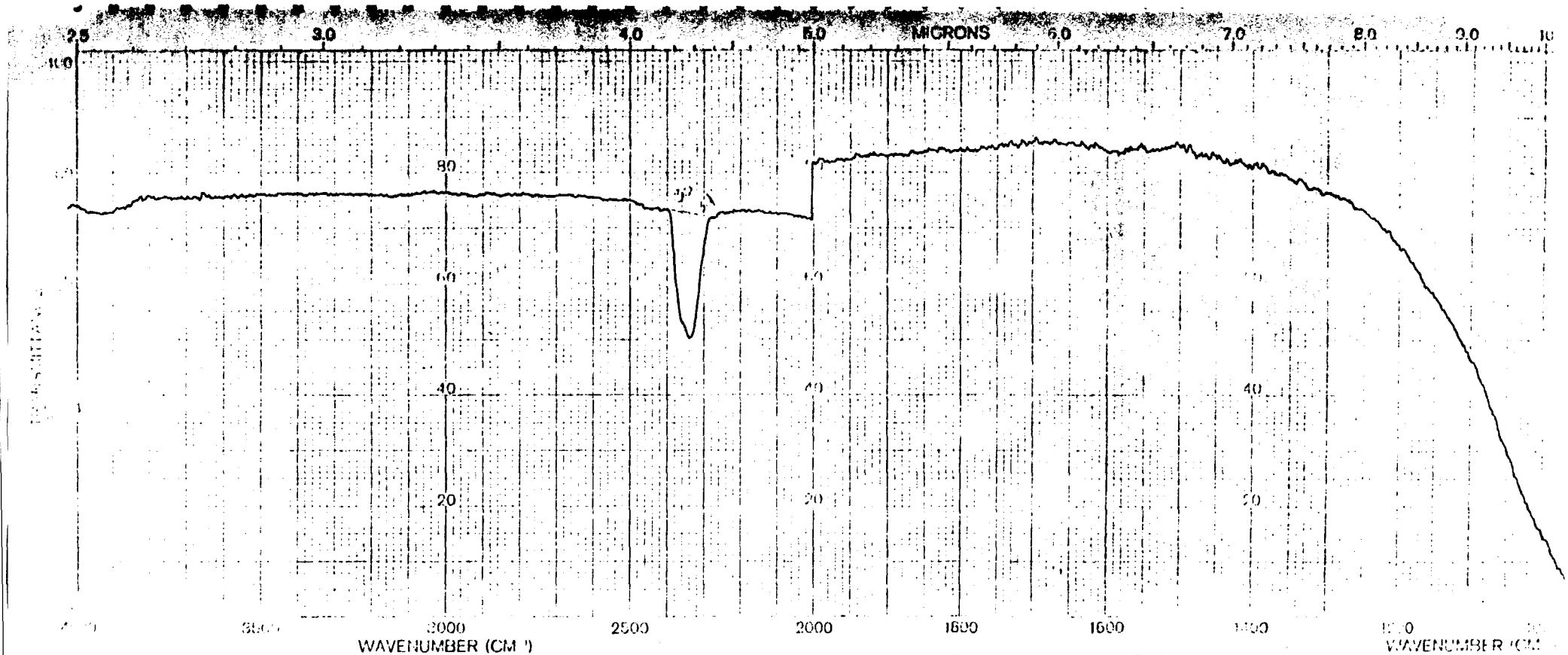
SOLVENT
CONCENTRATION
CELL PATH
REFERENCE Air

REMARKS



SAMPLE 9044 B-3 10cc	SOLVENT	REMARKS
ORIGIN	CONCENTRATION	
	CELL PATH	
	REFERENCE	

09/505,505



CO_2	SOLVENT	REMARKS
	CONCENTRATION ½cc CO_2	
	CELL PATH	
	REFERENCE Air	

FILE :90[illegible]06
TITLE:AUX SAMPLE 9044
MASS RANGE :10-150
INTEG. TIME:3
SECONDS PER SCAN :0
THRESHOLD:2
EXT. ION TIME:30
INST. RANGE SETTING:[illegible]

10^{-8}

0.2cc

90414

AIR	AREA =	5533400	HEIG. =	[illegible]	SIGN =	.00
CH4	AREA =	1362339	HEIG. =	[illegible]	SIGN =	.00
CO2	AREA =	1333487	HEIG. =	[illegible]	SIGN =	.00

MAY NOT BE ACCURATE, CHECK CO2 ION SAMPLE.

MIL SAMPLE 9044

SPEC.# 41

0	.00		.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.77	1.70	0.40
14	3.00	30.37	100.00	.70	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00				

SPEED	73						
0	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	1.70	.47	.00
14	.00	.00	0.05	.00	.00	.00	.00
21	.00	.33	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00
35	.00	.00	.00	.00	.00	.00	.00
42	.00	.57	100.00	1.43	.44	.00	.00
49	.00	.00					

JHS
↓
Rita (file)

LOUISVILLE AND JEFFERSON COUNTY
DEPARTMENT OF PUBLIC HEALTH
400 EAST GRAY STREET
LOUISVILLE, KENTUCKY 40202

MEMORANDUM

Aug 3, 1978

TO: File

FROM: Charles E. Weiter, Assistant Director
Division of Environmental Health

SUBJECT: Campground Landfill - Migrating Gas

On Monday, July 31, 1978, a second meeting was held at the Louisville and Jefferson County Health Department Building to discuss the migrating gas problem at the Campground Landfill. The following persons were present: John Brooks and J. E. McClure, Jr., Kentucky Department for Natural Resources, Division of Hazardous Materials & Waste Management; Jerry Blankenship; Philip A. Emery and Robert W. Davis, U.S. Geological Survey; David Ross Stevens, County Judge's Office; Harley Blankenship, attorney for Campground Landfill; Joe Pavoni, TenEch Environmental Consultants; H. VanArsdale, Attorney for Kentucky Concrete Pipe Company; Robert Hockensmith, Kentucky Concrete Pipe Company, and the writer.

The writer called the meeting to order at approximately 10:30 A.M., and presented the following update. Mr. Blankenship has installed 36 wells 50' on center along the south side of his property. Gas readings in those wells varied from 0% to 70%. He has also installed four (4) wells 100' on center along the east boundry of the landfill, and the gas readings range from 7% to 25%. One (1) well has been installed on the north side of the landfill and the gas readings there were 0%. One (1) well has been constructed by the U.S.G.S. on the west side across Campground Road, and the gas readings were 65%. Eight (8) monitoring wells have been installed on Kentucky Concrete Property and gas readings in those wells varied from 0% to 65%. The new house located on Kentucky Concrete Company's property has been equipped with a lateral field and disconnected from the seepage pit and gas readings from the roof vent were 0%.

From work that has been done as mentioned above, it has been determined that gas has not been eliminated from the Kentucky Concrete Company property. Therefore, the wells installed along the south side of the landfill will not be adequate to solve the problem. The reading in the well constructed by the U.S.G.S. indicates gas is also migrating in the westerly direction away from the fill. There are also several wells constructed on Kentucky Concrete Company property and along the boundry of the landfill which need to be capped and/or valved so gas readings may be taken.

The Health Department recommendations at this time, are as follows:

(1) Reduce the monitoring to three (3) days a week;

(2) Explore the possibility of the installation of a lateral field to service the plant production building and disconnect the seepage pit which now serves said building;

(3) Install a gas monitoring system within the plant production building so the doors may be closed before imlement weather arrives.

(4) Request Air Pollution Control to collect at least two (2) additional air samples for analysis, one from the new wells installed on the Blankenship Property and one from the pit cap in the trailer park area which abutts the landfill on the east;

(5) Request Mr. Blankenship to submit, in writing, by August 11, 1978, a schedule for testing, analyzing, designing and constructing a positive evacuation system.

The following are comments from the meeting participants:

Mr. VanArsdale

(1) He objected to the Health Department reduction of monitoring.

(2) He agreed with the installation of an alarm system.

(3) He requested information from the Kentucky Department for Natural Resources and Environmental Protection about illegal dumping of toxic materials and what effect these toxic chemicals in the atmosphere would have on workers and visitors to the Kentucky Concrete Pipe Company site.

(4) He agreed that the lateral field on the new house appears to have eliminated an immediate gas problem, however, questions the installation of an additional lateral field to service the plant production building.

(5) He indicated the Kentucky Concrete Pipe Company has been prohibited from constructing a new building because of the gas problem and the old house where the initial gas problem was detected has been rendered useless to the company due to the migrating gas. Therefore, Mr. VanArsdale requests the Health Department to direct a letter to Mr. Hockensmith stating that construction of a new building would be prohibited and recommending that the old dwelling not be occupied.

(6) He reiterated his concern to the State concerning possible illegal dumping of industrial waste into the landfill and requested the State to initiate steps to put an immediate stop to said dumping.

(7) Two (2) of the monitoring wells installed on the Kentucky Concrete Pipe Company property were left uncapped and he requested the capping of said wells as soon as possible.

Mr. Robert Hockensmith

(1) He endorsed Mr. VanArsdale's comments and added that something must be done before the winter months set in because they cannot continue to operate as they have with the doors wide open to provide for proper ventilation.

Dr. Joseph Pavoni

(1) TenEch Environmental Consultants, Inc., obtained gas readings from the eight (8) monitoring wells installed on the Kentucky Concrete Pipe Company property and their results coincided with the Health Department's findings.

(2) TenEch is also in the process of checking with the soils engineer who initially worked on the Kentucky Concrete Company's design to determine exactly what the soil conditions are on the property.

(3) Dr. Pavoni requested that two (2) additional monitoring wells be located on the other side of Kramers Lane from Kentucky Concrete Pipe Company's property to determine the full extent of the range of the migrating gas.

(4) Dr. Pavoni agreed with the installation of the lateral field, along with an automatic alarm system, for the Kentucky Concrete Pipe Company's production plant.

(5) He also feels a positive evacuation system is going to be mandatory to eliminate the gas problem from the Kentucky Concrete Pipe Company property.

(6) He also suggested the monitoring wells be checked for gas volume production and suggested that one (1) monitoring well be evacuated with a pump and monitored to determine the well's recharge capabilities.

EPA Notification of Hazardous Waste Si

United States
Environmental Protection
Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810609

KY5000001080

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: Hobart Corporation

Street: 3401 Jewell Avenue

City: Louisville State: KY Zip Code: 40212

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site: ~~Please see~~ Campground Landfill attached letter

Street: 4501 Campground Rd

City: Louisville County: State: KY Zip Code: 40204

KYD098951262

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Carleton, James J., Project Engineer

Phone: 513/335-7171 Hobart Corporation, Troy, OH 45374

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1950 To (Year): 1979 See Attached Letter

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

F001	F002	F003
F005	F006	F007
F008	F009	F017
F018		

RECEIVED EPA/REGION IV JUN 9 12 40 PM '81 ENVIRONMENT DIVISION

00177

Form Approved
OMB No. 2000-0138

EPA Form 8900-1

HOBART CORPORATION

WORLD HEADQUARTERS TROY, OHIO 45374 513 335-7171

May 13, 1981

TO R. McAfee
Hazardous Waste Coordinator, Louisville Plant

FROM J. J. Carleton
Corporate Hazardous Waste Coordinator

SUBJECT Superfund Notification

Copies To

F. Bazler
J. Delaney
W. E. Henson
R. Lenox
R. D. Leytze
D. Riley
File

The EPA has been charged by Congress to compile information regarding past disposal of hazardous waste. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (commonly known as Superfund) mandates in Section 103(c) that we furnish EPA by June 9, 1981, certain information concerning our past disposal practices.

In order to comply with this request for information, I am requesting that each of you send to my attention by June 3, 1981, the below information in letter form. I will then fill in the Superfund notification form and will include with it a copy of your letter. Even though we are on the fringes of what Superfund is really after, namely abandoned sites, our compliance with the request is mandatory.

Since time is of the essence, EPA is not requiring that you painstakingly document the information submitted. This information may be based on your knowledge or reasonably available records. Your best estimates involving quantities will be satisfactory.

The following information is requested:

1. EPA ID Number
2. Waste generated at your facility be EPA Hazard Code Number. These items are found on the Notification filed in August, 1980.
3. Name and address of disposal site or sites used prior to disposal under RCRA in 1980. Indicate the type of landfill (eg. County Sanitary, Private Industrial, etc.). If a recycling facility, so indicate.
4. Dates these sites were used.
5. Estimate of yearly quantities.

Please sign your letter to me, and be sure to use company stationary. In the event that you should have any questions, please contact either myself or Dick Lenox in Troy.

A copy of this letter and a copy of your response will be part of the Superfund notification which will be filed by Facilities Engineering and signed by J. J. Carleton.

Please be prompt in your information dispatch.

J. J. Carleton/smc

JJC/smc

EPA Notification of Hazardous Waste Site

R

United States Environmental Protection Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810608

Form 8 of 12

KYS000001089

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: The BFGoodrich Company Chemical Group

Street: 4100 Bells Lane - P.O. Box 32950

City: Louisville State: KY Zip Code: 40232

B Site Location:

Enter the common name (if known) and actual location of the site.

KYD098 951262

Name of Site: Camp Ground Landfill

Street: 4501 Camp Ground Road

City: Louisville County: Jefferson State: KY Zip Code: 40219

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Mosser, Ms. Paige, Senior Engineer, Environmental Services Group

Phone: 502/778-6631, Ext. 2490

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1974 To (Year): 1979

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste: Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☒ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☒ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☒ Unknown
11. ☐ Other (Specify)

Source of Waste: Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☒ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

RECEIVED EPA/REGION IV JUN 3 3 02 PM '81 ERT DIVISION

0 0 0 0 2 7

Form Approved
OMB No. 2000-0138

EPA Form 8900-1

HOBAR CORPORATION

WORLD HEADQUARTERS TROY, OHIO 45374

May 22, 1981

TO James Carleton

FROM Bob McAfee

SUBJECT Waste Disposal

COPIES TO
B. Wright
B. May
File

As requested in your letter dated May 13, 1981, I am sending you the following information on waste disposal before 1980.

1. EPA - ID Number - KYD006372205
2. Hazard Code Numbers - F-001 and F-002 Degreasers, D-008 Waste Paint.
3. Prior disposal site - Compground Landfill, 4501 Campground Road, Louisville, Kentucky (Private Industrial)
4. Dates Used - 1950 to 1979*
5. Yearly Quantities - 60 Cubic Yards.

Robert E. McAfee
Plant Engineer
Louisville Plant

*Actual delivery of waste was made by Industrial Disposal, Inc. This was the only landfill used to my knowledge.

No records were kept before 1980. These quantities are based on 1980 figures.

F-126

EPA Notification of Hazardous Waste Site

United States Environmental Protection Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

810609

KY5000001079

Person Required to Notify:
Enter the name and address of the person or organization required to notify.

Name: Mobil Chemical Co
Street: 1630 W. Hill St
City: Louisville State: KY Zip Code: 40201

Site Location:
Enter the common name (if known) and actual location of the site.

Name of Site: Campground Landfill
Street: 4501 Campground R
City: Louisville County: KY State: KY Zip Code: 40204

KYD 098 951262

Person to Contact:
Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Belt, R, Plant Mgr
Phone: 502-774-4411

Dates of Waste Handling:
Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1973 To (Year): 1981

Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. ☐ Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☒ Other (Specify) Oil fill

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☒ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet _____

gallons 500 tons

Total Facility Area

square feet _____

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ Nor

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessi hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person

Name _____

Street _____

City _____ State _____ Zip Code _____

☐ Owner, Presen
☐ Owner, Past
☐ Transporter
☐ Operator, Pres
☐ Operator, Past
☐ Other

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SIT USED FOR THE DISPOSAL OF PROCE WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: MOBIL OIL CORP Division/Subsidiary: MOBIL CHEMICAL
Facility Name: MOBIL CHEMICAL - Louisville Plant
Name of Site: CAMPGROUND LANDFILL EPA ID# KYD006388441
Address of Site: _____
no. street

LOUISVILLE, KY 40204
city state zip code

Name of Owner (while used by facility): UNKNOWN
Address: _____
no. street

_____
city state zip code

Current Owner (if different from above): _____
Address: _____
no. street

_____
city state zip code

1. Location (1= the property on which facility is located; 2= off-site) 2 (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership 9=don't know) 2 (11)
3. Current status (1= closed; 2= still in use; 9=don't know) 2 (12)
   IF CLOSED, specify year closed 19 (13-14)
4. Year first used for process waste from this facility 1973 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 1979 (17-18)
6. Total amount of process waste from this facility disposed at site:
   USE TONS ONLY IF POSSIBLE: thousand gallons ..... (19-26)
   Right justify response hundred tons 5 (27-33)
   thousand cubic yards ..... (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   landfill, mono industrial waste 9 (42)
   landfill, mixed industrial waste 1 (43)
   landfill, drummed waste 9 (44)
   landfill, municipal refuse co-disposed ... 9 (45)
   pits/ponds/lagoons 9 (46)
   deep well injection 9 (47)
   land farming 9 (48)
   incineration 9 (49)
   treatment (eg. neutralizing) 9 (50)
   reprocessing/recycling 9 (51)
   other (specify) _____ 9 (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) 9 (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

FORM B - Page 2 FINAL

| | | | | | | | | (1-8)
(DO NOT USE)

Company Name: MOBIL OIL CORP.
Division/Subsidiary: MOBIL CHEMICAL
Facility Name: MOBIL CHEMICAL - Louisville Plant EPA ID# KYD006388441

Site Name: CAMPGROUND LANDFILL

9. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 9=don't know)

FILL IN EVERY BLOCK SPACE

Acid solutions, with pH<3 ..... 2 (10)
- pickling liquor 2 (11)
- metal plating waste 2 (12)
- circuit etchings 2 (13)
- inorganic acid manufacture 2 (14)
- organic acid manufacture 2 (15)

Base solutions, with pH>12 ..... 2 (16)
- caustic soda manufacture 2 (17)
- nylon and similar polymer generation 2 (18)
- scrubber residual 2 (19)

Heavy metals & trace metals (bonded organically & inorganically) ..... 2 (20)*
- arsenic, selenium, antimony ..... 2 (21)*
- mercury 2 (22)
- iron, manganese, magnesium ..... 2 (23)*
- zinc, cadmium, copper, chromium (trivalent) ..... 2 (24)*
- chromium (hexavalent) ..... 2 (25)*
- lead ..... 2 (26)*

Radioactive residues, >50pico curies/gram 2 (27)
- uranium residuals & residuals for UF_6 recycling 2 (28)
- lathanide series elements and rare earth salts 2 (29)
- phosphate slag 2 (30)
- thorium 2 (31)
- radium 2 (32)
- other alpha, beta & gamma emitters 2 (33)

Organics 2 (34)
- insecticides & intermediates 2 (35)
- herbicides & intermediates 2 (36)
- fungicides & intermediates 2 (37)
- rodenticides & intermediates 2 (38)
- halogenated aliphatics 2 (39)
- halogenated aromatics 2 (40)
- acrylates & latex emulsions ..... 2 (41)*
- PCB/PBB's 2 (42)
- amides, amines, imides ..... 2 (43)*
- plastizers 2 (44)
- [illegible]ins ..... 2 (45)*
- [illegible]tomers ..... 2 (46)*
- solvents polar (except water) 2 (47)
- carbontetrachloride 2 (48)
- trichloroethylene 2 (49)
- other solvents nonpolar ..... 2 (50)*
- solvents halogenated aliphatic ..... 2 (51)*
- solvents halogenated aromatic ..... 2 (52)*
- oils and oil sludges 2 (53)
- esters and ethers ..... 2 (54)*
- alcohols ..... 2 (55)*
- ketones & aldehydes ..... 2 (56)*
- dioxins 2 (57)

Inorganics ..... 2 (58)*
- salts 2 (59)
- mercaptans 2 (60)

Misc ..... 2 (61)*
- pharmaceutical wastes 2 (62)
- paints & pigments ..... 2 (63) *
- catalysts (eg. vanadium, platinum, palladium) 2 (64)
- asbestos 2 (65)
- shock sensitive wastes (eg. nitrated toluenes) 2 (66)
- air water reactive wastes (eg. F.g. aluminum chloride) 2 (67)
- wastes with flash point below 100° F ..... 2 (68)*

*NOTE: This waste is General Trash (i.e., paper, wood, scrap metal, empty containers, spent filters and rags). Any organic residue, paint and pigments are present in such small quantities as to be inconsequential.

FINAL

| | | | | | (1-5)
(DO NOT USE)

FORM A: GENERAL FACILITY INFORMATION

Company Name: MOBIL OIL CORP.
Division/Subsidiary: MOBIL CHEMICAL
Facility Name: MOBIL CHEMICAL - Louisville Plant

EPA ID# KYD006388441

Address: 1630 W. HILL ST.
No. Street

LOUISVILLE, KY 40201
City State Zip Code

Name of Person Completing Form: R. BELT

Position: PLANT MANAGER

Phone Number: (502) 774-4411

1. Year Facility Opened ..... 19 |0|9| (10-11)

2. Primary SIC Code ..... |2|8|5|1| (12-15)

3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978:
USE ONLY TONS IF POSSIBLE - right justify response

thousand gallons ..... | | | | | | | | | (16-24)

hundred tons ..... | | | | | | | |8| (25-32)

thousand cubic yards ..... | | | | | | | | | (33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

in landfill ..... | |8|0| (42-44)

in pit/pond/lagoon ..... | | | | (45-47)

in deep well ..... | | | | (48-50)

incinerated ..... | | | | (51-53)

reprocessed/recycled ..... | |2|0| (54-56)

evaporated ..... | | | | (57-59)

unknown ..... | | | | (60-62)

other (Specify _____) ..... | | | | (63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? ..... |0|0|4| (66-68)

COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1; no=2) ..... |1| (69)

IF YES, COMPLETE FORM "C"

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1; no=2) ..... |2| (70)

IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms ..... 19|6|2| (71-72)

9. Specify the earliest year represented by information from employee knowledge supplied on this and other forms ..... 19|6|2| (73-74)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION	SITE NUMBER (to be assigned by Hq)
IV	

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (*Section II*). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (*EN-335*); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Campground Landfill

B. STREET (or other identifier): Campground Rd

C. CITY: Louisville

D. STATE: KY

E. ZIP CODE:

F. COUNTY NAME: Jefferson

G. SITE OPERATOR INFORMATION

1. NAME: Campground Fill Company

2. TELEPHONE NUMBER:

3. STREET:

4. CITY: Louisville

5. STATE: KY

6. ZIP CODE:

H. REALTY OWNER INFORMATION (*if different from operator of site*)

1. NAME:

2. TELEPHONE NUMBER:

3. CITY:

4. STATE:

5. ZIP CODE:

I. SITE DESCRIPTION: Sanitary Landfill w/ some industrial waste - methane generation problem

J. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION (*complete this section last*)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (*mo., day, & yr.*): 7/20/79

B. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE

C. PREPARER INFORMATION

1. NAME: Allan Hilliard

2. TELEPHONE NUMBER: 404/881-3234

3. DATE (*mo., day, & yr.*): 6/26/80

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME: John E. Dickinson

2. TITLE: Chemical Engineer

3. ORGANIZATION: EPA

4. TELEPHONE NO. (*area code & no.*): 404/881-3016

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
	KY-DWREP	502/564-6716

C. SITE REPRESENTATIVES INTERVIEWED (*corporate officials, workers, residents*)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS

Continued From Front

III. INSPECTION INFORMATION *(continued)*

D. GENERATOR INFORMATION *(sources of waste)*

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS

G. DATE OF INSPECTION *(mo., day, & yr.)* 6/15/78	H. TIME OF INSPECTION	I. ACCESS GAINED BY: *(credentials must be shown in all cases)* ☒ 1. PERMISSION ☐ 2. WARRANT

J. WEATHER *(describe)*

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN *(mark 'X')*	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER *(specify)*			

B. FIELD MEASUREMENTS TAKEN *(e.g., radioactivity, explosivity, PH, etc.)*

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS

Continue On Page 3

Continued From Page 2

IV. SAMPLING INFORMATION *(continued)*

C. PHOTOS

1. TYPE OF PHOTOS

[X] a. GROUND [ ] b. AERIAL

2. PHOTOS IN CUSTODY OF:

D. SITE MAPPED?

[ ] YES. SPECIFY LOCATION OF MAPS:

E. COORDINATES

1. LATITUDE *(deg.-min.-sec.)*

2. LONGITUDE *(deg.-min.-sec.)*

V. SITE INFORMATION

A. SITE STATUS

[X] 1. ACTIVE *(Those inductrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*

[ ] 2. INACTIVE *(Those sites which no longer receive wastes.)*

[ ] 3. OTHER *(specify)*: _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

[X] 1. NO [ ] 2. YES *(specify generator's four-digit SIC Code)*: _____

C. AREA OF SITE *(in acres)*

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [ ] 2. YES *(specify)*:

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity*(ies)* and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER *(specify)*:		6. OTHER *(specify)*:		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER *(specify)*:
					9. OTHER *(specify)*:		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[X] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [X] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [X] 7. INERT [X] 8. FLAMMABLE

[ ] 9. OTHER *(specify)*:

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

 Continue On Reverse

Continued From Front

VII. WASTE RELATED INFORMATION *(continued)*

2. Estimate the amount *(specify unit of measure)* of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
X (1) PAINT, PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER *(specify)*:	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER *(specify)*:	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER *(specify)*:			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER *(specify)*:
			(6) CYANIDE	(6) OTHER *(specify)*:	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER *(specify)*:		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE *(place in descending order of hazard)*

1. SUBSTANCE	2. FORM *(mark 'X')*			3. TOXICITY *(mark 'X')*				4. CAS NUMBER	5. AMOUNT	6. UNIT
	a. SOLID	b. LIQ.	c. VAPOR	a. HIGH	b. MED.	c. LOW	d. NONE			
Methane Gas			X							

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

☒ A. HUMAN HEALTH HAZARDS

Methane gas in the past has migrated into the septic systems of a nearby trailer park and into the Kentucky Concrete Pipe Company. A gas circulation system has been installed, however.

Continue On Page 5

Continued From Page 4

VIII. HAZARD DESCRIPTION *(continued)*

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☐ E. CONTAMINATION OF FOOD CHAIN

☐ F. CONTAMINATION OF GROUND WATER

☐ G. CONTAMINATION OF SURFACE WATER

 Continue On Reverse

Continued From Front

VIII. HAZARD DESCRIPTION *(continued)*

☐ H. DAMAGE TO FLORA/FAUNA

☐ I. FISH KILL

☒ J. CONTAMINATION OF AIR

Nitrous oxide ether gases

☐ K. NOTICEABLE ODORS

☐ L. CONTAMINATION OF SOIL

☐ M. PROPERTY DAMAGE

 Continue On Page 7

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA *(continued)*

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH *(specify unit)*	3. LOCATION *(proximity to population/buildings)*	4. NON-COMMUNITY *(mark 'X')*	5. COMMUNITY *(mark 'X')*

I. RECEIVING WATER

1. NAME

☐ 2. SEWERS ☐ 3. STREAMS/RIVERS

☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER *(specify)*:

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☐ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND

☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK *(specify below)*	'X'	C. OTHER *(specify below)*
	1. SAND				
	2. CLAY				
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH *(100,000 to 1000 cm/sec.)* ☐ C. HIGH *(1000 to 10 cm/sec.)*

☐ D. MODERATE *(10 to .1 cm/sec.)* ☐ E. LOW *(.1 to .001 cm/sec.)* ☐ F. VERY LOW *(.001 to .00001 cm/sec.)*

G. RECHARGE AREA

☐ 1. YES ☐ 2. NO 3. COMMENTS:

H. DISCHARGE AREA

☐ 1. YES ☐ 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.

J. OTHER GEOLOGICAL DATA

Continue On Reverse

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X')		
					1. YES	2. NO	3. UNKNOWN

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☐ NONE ☐ YES (*summarize in this space*)

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

Continued From Page 6

VIII. HAZARD DESCRIPTION *(continued)*

☐ N. FIRE OR EXPLOSION

In transport & Circuits company the potential for explosion exists.

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☐ Q. EROSION PROBLEMS

☐ R. INADEQUATE SECURITY

☐ S. INCOMPATIBLE WASTES

VIII. HAZARD DESCRIPTION *(continued)*

☐ T. MIDNIGHT DUMPING

☐ U. OTHER *(specify)*:

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE *(specify units)*
1. IN RESIDENTIAL AREAS	unk			unk
2. IN COMMERCIAL OR INDUSTRIAL AREAS	unk			unk
3. IN PUBLICLY TRAVELLED AREAS				
4. PUBLIC USE AREAS *(parks, schools, etc.)*				

X. WATER AND HYDROLOGICAL DATA

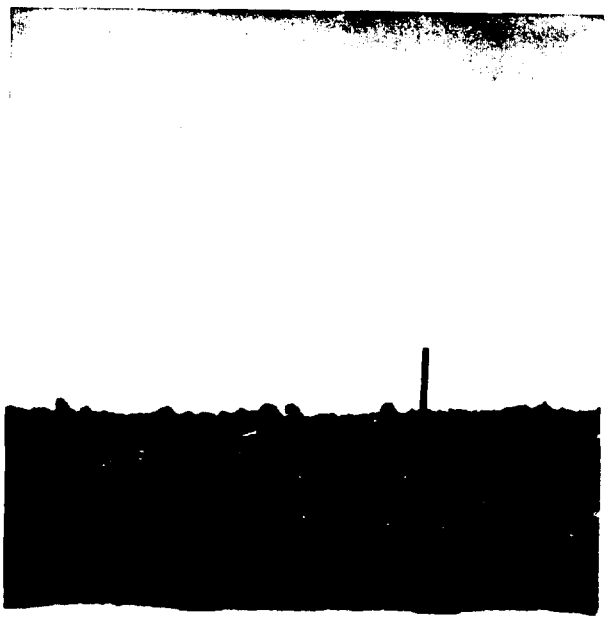
A. DEPTH TO GROUNDWATER *(specify unit)*	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
D. POTENTIAL YIELD OF AQUIFER	E. DISTANCE TO DRINKING WATER SUPPLY *(specify unit of measure)*	F. DIRECTION TO DRINKING WATER SUPPLY

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY < 15 CONNECTIONS* ☐ 2. COMMUNITY *(specify town)*: > 15 CONNECTIONS

☐ 3. SURFACE WATER ☐ 4. WELL

Continue On Page 9



Joseph L. Pavoni,
Ph. D., P.E.

TenEch
Environmental Consultants
515 Park Avenue
Louisville, Kentucky 40208
502/636-3565

KENTUCKY

COMPA

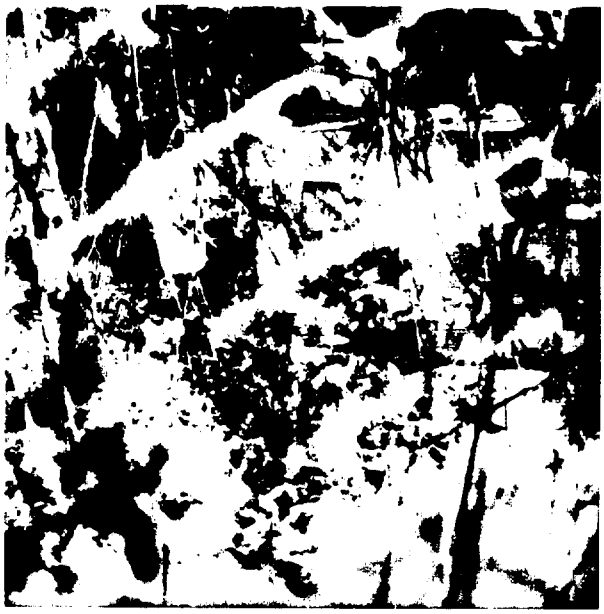
Louisville
and Jefferson County

DEPARTMENT OF
PUBLIC HEALTH

400 East Gray St.
Louisville, Ky 40202

OFFICE
PHONE
587-3885

CHARLES WEITER
PUBLIC HEALTH ENGINEER



MEMORANDUM

TO: Barry Burrus, Chief
Uncontrolled Site Section

FROM: Bob Burns, Environmentalist
Uncontrolled Site Section

SUBJECT: Preliminary Assessment Report for the Campground Landfill
Jefferson County
EPA ID: KYD098951262

DATE: September 18, 1984

This active landfill has disposed of wastewater treatment sludges from paint manufacturing, tank tar sludge from coking operations, spent potliners from primary aluminum production, dust/sludge from ferrochromium-silicon production, dust/sludge from ferrochromium production, dust/sludge from ferromanganese production, and asbestos. This facility has had a history of leachate outbreaks.

Conversations with field personnel indicate that this facility probably disposed of hazardous wastes in the past.

After the completion of a preliminary assessment and conversations with field personnel it is recommended that this facility be inspected on a medium priority.

BB/las

c John Brooks
U.S. EPA
File

LOW-S-11

EPA POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: IV

SITE NUMBER (to be assigned by Hq):

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

LOW-S-11

I. SITE IDENTIFICATION

A. SITE NAME: Campground Landfill

B. STREET (or other identifier): 4501 Campground Road

C. CITY: Louisville

D. STATE: KY

E. ZIP CODE:

F. COUNTY NAME: Jefferson

G. OWNER/~~OPERATOR~~ (if known)

1. NAME: Jerry Blankenship (Office 7500 Grade Lane)

2. TELEPHONE NUMBER: (502) 361-8125

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION: State inspected Landfill and defunct asphalt plant

J. HOW IDENTIFIED (i.e., citizen's complaints, OSHA citations, etc.): EPIC (1979) Site visit

K. DATE IDENTIFIED (mo., day, & yr.): 10/21/80

L. PRINCIPAL STATE CONTACT

1. NAME: Ms. PAT HAIGHT

2. TELEPHONE NUMBER: (502) 564-6716

II. PRELIMINARY ASSESSMENT (complete this section last)

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☒ 2. MEDIUM ~~☐ 3. LOW~~ ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED (no hazard)

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☒ 4. SITE INSPECTION NEEDED (low priority)

C. PREPARER INFORMATION

1. NAME: Will Stringfellow

2. TELEPHONE NUMBER: 404-255-7711

3. DATE (mo., day, & yr.): 10/28/80

III. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

☐ 2. INACTIVE (Those sites which no longer receive wastes.)

☐ 3. OTHER (specify): (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

☒ 1. NO

☐ 2. YES (specify generator's four-digit SIC Code):

C. AREA OF SITE (in acres): ~7

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE (deg.-min.-sec.):

2. LONGITUDE (deg.-min.-sec.):

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☒ 2. YES (specify): Trailer at asphalt plant and landfill

Continued From Front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Sanitary landfill, state inspected
owner says they receive no hazardous waste

V. WASTE RELATED INFORMATION

A. WASTE TYPE

X 1. UNKNOWN ☐ 2. LIQUID X 3. SOLID ☐ 4. SLUDGE ☐ 5. GAS

B. WASTE CHARACTERISTICS

X 1. UNKNOWN ☐ 2. CORROSIVE ☐ 3. IGNITABLE ☐ 4. RADIOACTIVE ☐ 5. HIGHLY VOLATILE
☐ 6. TOXIC ☐ 7. REACTIVE X 8. INERT ☐ 9. FLAMMABLE

☐ 10. OTHER (specify): Municipal landfill + industrial dump

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

unknown Eckhardt Report

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
'X' (1) PAINT, PIGMENTS	'X' (1) OILY WASTES	'X' (1) HALOGENATED SOLVENTS	'X' (1) ACIDS	'X' (1) FLYASH	'X' (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	X (6) OTHER (specify): Municipal waste	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify)		

 Continue On Page 3

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 4 | SITE NUMBER (to be assigned by HQ): 35

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Campground Fill Company

B. STREET *(or other identifier)*: 7500 Grade Lane (business office)

C. CITY: Louisville

D. STATE: Ky.

E. ZIP CODE: 40219

F. COUNTY NAME: Jefferson

G. OWNER/OPERATOR *(if known)*
1. NAME: Jerry Blankenship
2. TELEPHONE NUMBER: (502) 361-9477

H. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION
50 acre sanitary landfill-Entrance 4501 Campground Road

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*: Eckhardt Report

K. DATE IDENTIFIED *(mo., day, & yr.)*:

L. PRINCIPAL STATE CONTACT
1. NAME: Pat Haight
2. TELEPHONE NUMBER: (502) 564-6716

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM
☐ 1. HIGH ☒ 2. MEDIUM ☐ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION
☐ 1. NO ACTION NEEDED *(no hazard)*
☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 4. SITE INSPECTION NEEDED *(low priority)*
xx 5. Possible ground water monitoring would be advantagous

C. PREPARER INFORMATION
1. NAME: John Brooks
2. TELEPHONE NUMBER: (502) 564-6716
3. DATE *(mo., day, & yr.)*: 12-13-79

III. SITE INFORMATION

A. SITE STATUS
☒ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*
☐ 2. INACTIVE *(Those sites which no longer receive wastes.)*
☐ 3. OTHER *(specify)*: *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?
☒ 1. NO
☐ 2. YES *(specify generator's four-digit SIC Code)*:

C. AREA OF SITE *(in acres)*: 50

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE *(deg.—min.—sec.)*:
2. LONGITUDE *(deg.—min.—sec.)*:

E. ARE THERE BUILDINGS ON THE SITE?
☐ 1. NO ☒ 2. YES *(specify)*: Scale House & Pump House for methane gas system

T2070-2 (10-79)

Continue On Reverse

Continued from front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
X	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Company does small percentage of own hauling
Sanitary Landfill with only a few non-hazardous Industrial wastes allowed at present time.

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1 UNKNOWN [ ] 2. LIQUID [ ] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[ ] 1. UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4 RADIOACTIVE [ ] 5 HIGHLY VOLATILE
[X] 6. TOXIC [ ] 7 REACTIVE [ ] 8 INERT [ ] 9 FLAMMABLE

[ ] 10. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes-some Records (data) submitted by company

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE		b. OIL		c. SOLVENTS		d. CHEMICALS		e. SOLIDS		f. OTHER	
AMOUNT		AMOUNT		AMOUNT		AMOUNT		AMOUNT		AMOUNT	
UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE		UNIT OF MEASURE	
X	(1) PAINT, PIGMENTS	X	(1) OILY WASTES	X	(1) HALOGENATED SOLVENTS	X	(1) ACIDS	X	(1) FLYASH	X	(1) LABORATORY PHARMACEUT.
	(2) METALS SLUDGES		(2) OTHER (specify):	X	(2) NON-HALOGNTD. SOLVENTS		(2) PICKLING LIQUORS	X	(2) ASBESTOS		(2) HOSPITAL
	(3) POTW				(3) OTHER (specify):		(3) CAUSTICS		(3) MILLING/ MINE TAILINGS		(3) RADIOACTIVE
	(4) ALUMINUM SLUDGE						(4) PESTICIDES		(4) FERROUS SMLTG. WASTES		(4) MUNICIPAL
	(5) OTHER (specify):						(5) DYES/INKS		(5) NON-FERROUS SMLTG. WASTES		(5) OTHER (specify):
							(6) CYANIDE		(6) OTHER (specify):		
							(7) PHENOLS				
							(8) HALOGENS				
							(9) PCB				
						X	(10) METALS				
							(11) OTHER (specify)				

Continue On Page 3

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

roads are stabilized w/ waste oil
industrial waste unknown

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

asphalt plant no longer in operation, ponds will be filled
water flows from landfill to low spot (on property) where sand pit is.

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS	X			landfill odors
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS	X			Runoff prob. does not leave property
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES	X			
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

 Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

☐ 1. NPDES PERMIT ☐ 2. SPCC PLAN ☐ 3. STATE PERMIT *(specify)*: _____

☐ 4. AIR PERMITS ☐ 5. LOCAL PERMIT ☐ 6. RCRA TRANSPORTER

☐ 7. RCRA STORER ☐ 8. RCRA TREATER ☐ 9. RCRA DISPOSER

☐ 10. OTHER *(specify)*: _____

B. IN COMPLIANCE?

☐ 1. YES ☐ 2. NO ☐ 3. UNKNOWN

4. WITH RESPECT TO *(list regulation name & number)*: _____

VIII. PAST REGULATORY ACTIONS

☐ A. NONE ☐ B. YES *(summarize below)*

IX. INSPECTION ACTIVITY *(past or on-going)*

☐ A. NONE ☐ B. YES *(complete items 1,2,3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

X. REMEDIAL ACTIVITY *(past or on-going)*

☐ A. NONE ☐ B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION *(mo., day, & yr.)*	3. PERFORMED BY: *(EPA/State)*	4. DESCRIPTION

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

Continued From Page 2

V. WASTE RELATED INFORMATION *(continued)*

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

Mercury
CCl_4
Methanol
Acetone
Chloroform

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

Non-hazardous indistrial wastes from--Hillerich Bradsby (sludge) and Mid-East Sales Corp. (urea fertilizergel) now accepted-Also drummed asbestos from American Synthetic Rubber

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD *(mark 'X')*	C. ALLEGED INCIDENT *(mark 'X')*	D. DATE OF INCIDENT *(mo., day, yr.)*	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

 Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [X] 3. STATE PERMIT (specify): Sanitary landfill #056.27
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER (specify):

B. IN COMPLIANCE?

- [X] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN

4. WITH RESPECT TO (list regulation name & number): KRS 224

VIII. PAST REGULATORY ACTIONS

- [X] A. NONE
- [ ] B. YES (summarize below)

IX. INSPECTION ACTIVITY (past or on-going)

- [ ] A. NONE
- [X] B. YES (complete items 1,2,3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Routine Inspection	Fall '79	State	Site satisfactory

X. REMEDIAL ACTIVITY (past or on-going)

- [ ] A. NONE
- [X] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Methane gas extraction	1979	Landfill	Stopped migration of gas--installed evacuation system

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 4

SITE NUMBER (to be assigned by HQ): KYD 078 551 292

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II (*Preliminary Assessment*). File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (*EN-335*); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Campground Fill Company

B. STREET (or other identifier): 7500 Grade Lane (business office)

C. CITY: Louisville

D. STATE: Ky

E. ZIP CODE: 40219

F. COUNTY NAME: Jefferson

G. OWNER/OPERATOR (*if known*)

1. NAME: Jerry Blankenship

2. TELEPHONE NUMBER: (502) 361-9477

H. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION

50 acre sanitary landfill-Entrance 4501 Campground Road

J. HOW IDENTIFIED (*i.e., citizen's complaints, OSHA citations, etc.*)

Eckhardt Report

K. DATE IDENTIFIED (*mo., day, & yr.*)

L. PRINCIPAL STATE CONTACT

1. NAME: Pat Haight

2. TELEPHONE NUMBER: (502) 564-6716

II. PRELIMINARY ASSESSMENT (*complete this section last*)

A. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☐ 2. MEDIUM ☒ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION

☐ 1. NO ACTION NEEDED (*no hazard*)

☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:

☐ 4. SITE INSPECTION NEEDED (*low priority*)

xx 5. Possible ground water monitoring would be advantagous

C. PREPARER INFORMATION

1. NAME: John Brooks

2. TELEPHONE NUMBER: (502) 564-6716

3. DATE (*mo., day, & yr.*): 12-13-79

III. SITE INFORMATION

A. SITE STATUS

☒ 1. ACTIVE (*Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.*)

☐ 2. INACTIVE (*Those sites which no longer receive wastes.*)

☐ 3. OTHER (*specify*): (*Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.*)

B. IS GENERATOR ON SITE?

☒ 1. NO ☐ 2. YES (*specify generator's four-digit SIC Code*):

C. AREA OF SITE (*in acres*): 50

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES

1. LATITUDE (*deg.-min.-sec.*)

2. LONGITUDE (*deg.-min.-sec.*)

E. ARE THERE BUILDINGS ON THE SITE?

☐ 1. NO ☒ 2. YES (*specify*): Scale House & Pump House for methane gas system

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Continue On Reverse

Continued from front

IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION	X	1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
X	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS. TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER (specify):		6. OTHER (specify):		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify):
					9. OTHER (specify):		

E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Company does small percentage of own hauling
Sanitary Landfill with only a few non-hazardous Industrial wastes allowed at present time.

V. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. UNKNOWN [ ] 2. LIQUID [ ] 3. SOLID [ ] 4. SLUDGE [ ] 5. GAS

B. WASTE CHARACTERISTICS

[ ] 1. UNKNOWN [ ] 2. CORROSIVE [ ] 3. IGNITABLE [ ] 4. RADIOACTIVE [ ] 5. HIGHLY VOLATILE
[X] 6. TOXIC [ ] 7. REACTIVE [ ] 8. INERT [ ] 9. FLAMMABLE

[ ] 10. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Yes-some Records (data) submitted by company

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE
X (1) PAINT, PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER (specify):	X (2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	X (2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/ MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMLTG. WASTES	(4) MUNICIPAL
(5) OTHER (specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	(6) OTHER (specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			X (10) METALS		
			(11) OTHER (specify)		

 Continue On Page 3

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE: KY | 02 SITE NUMBER: D098951261

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Campground Landfill	4501 Campground Road				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Louisville	KY	40216	Jefferson	56	
09 COORDINATES LATITUDE	LONGITUDE				
38°11'29.5"	085°50'40"				

10 DIRECTIONS TO SITE (Starting from nearest public road)
I-264 W to Campground Rd. exit. Landfill is on the left of the road.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)		
Campground Landfill	7500 Grade Lane		
03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Louisville	KY	40219	(502) 361-8125
07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)		
Shird Robinson	7500 Grade Lane		
09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Louisville	KY	40219	(502) 361-8125

13 TYPE OF OWNERSHIP (Check one)
☑ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☑ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☑ YES DATE __/__/__ (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☑ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
_____ BEGINNING YEAR | _____ ENDING YEAR ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Waste water treatment sludges from paint manufacturing, decanter tank tar sludge from coking operations, spent potliners from primary aluminum production, dust/sludge from ferrochromium-silicon production, dust/sludge from ferrochromium production dust/sludge from ferromanganese, asbestos

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☑ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
John Brooks	KYNREPC, Louisville Field Office			(502) 588-4254
04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Robert Burns	KYNREPC	Waste Mgt	(502) 564-6716	4 9 84 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
KY	D098951261

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

If hazardous substances are on-site, direct contact is possible

01 ☐ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

If hazardous substances are on-site, worker exposure is possible

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	D098951261

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No mention in files

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

No mention in files

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES *(Spills/runoff/standing liquids/leaking drums)* — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☑ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Several leachate outbreaks have been observed during past inspections

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

There were no types of analyses concerning this site in our files.

V. SOURCES OF INFORMATION *(Cite specific references, e. g., state files, sample analysis, reports)*

KYNREPC files

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KY	D048951261

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☑ A. SOLID
- ☑ B. POWDER, FINES
- ☑ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS Unknown

NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☑ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	Unknown		
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Unknown				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

KYNREPC files

Continued From Page 2

V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard).

Mercury
CCl_4
Methanol
Acetone
Chloroform

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

Non-hazardous indistrial wastes from--Hillerich Bradsby (sludge) and Mid-East Sales Corp. (urea fertilizergel) now accepted-Also drummed asbestos from American Synthetic Rubber

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER (specify):				

 Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [X] 3. STATE PERMIT *(specify)*: Sanitary landfill #056.27
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER *(specify)*:

B. IN COMPLIANCE?

- [X] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN

4. WITH RESPECT TO *(list regulation name & number)*: KRS 224

VIII. PAST REGULATORY ACTIONS

- [X] A. NONE
- [ ] B. YES *(summarize below)*

IX. INSPECTION ACTIVITY *(past or on-going)*

- [ ] A. NONE
- [X] B. YES *(complete items 1,2,3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Routine Inspection	Fall '79	State	Site satisfactory

X. REMEDIAL ACTIVITY *(past or on-going)*

- [ ] A. NONE
- [X] B. YES *(complete items 1, 2, 3, & 4 below)*

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Methane gas extraction	1979	Landfill	Stopped migration of gas--installed evacuation system

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment *(Section II)* information on the first page of this form.

EPA

POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System, Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
C. CITY	D. STATE	E. ZIP CODE

II. FINAL DETERMINATION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*. List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo, day, & yr)	3. ACTION END DATE (mo, day, & yr)	4. ACTION AGENCY (EPA, State, Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo, day, & yr)	3. ACTION END DATE (mo, day, & yr)	4. ACTION AGENCY (EPA, State Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER (specify):		$

EPA

POTENTIAL HAZARDOUS WASTE SITE
IDENTIFICATION AND PRELIMINARY ASSESSMENT

REGION: 4

SITE NUMBER (to be assigned by HQ): KY0000000790 KYD981995735 1262

NOTE: This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

GENERAL INSTRUCTIONS: Complete Sections I and III through X as completely as possible before Section II *(Preliminary Assessment)*. File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Campground Fill Company

B. STREET *(or other identifier)*: 7500 Grade Lane (business office)

C. CITY: Louisville

D. STATE: Ky.

E. ZIP CODE: 40219

F. COUNTY NAME: Jefferson

G. OWNER/OPERATOR *(if known)*
1. NAME: Jerry Blankenship
2. TELEPHONE NUMBER: (502) 361-9477

H. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE ☐ 6. UNKNOWN

I. SITE DESCRIPTION
50 acre sanitary landfill-Entrance 4501 Campground Road

J. HOW IDENTIFIED *(i.e., citizen's complaints, OSHA citations, etc.)*
Eckhardt Report

K. DATE IDENTIFIED *(mo., day, & yr.)*

L. PRINCIPAL STATE CONTACT
1. NAME: Pat Haight
2. TELEPHONE NUMBER: (502) 564-6716

II. PRELIMINARY ASSESSMENT *(complete this section last)*

A. APPARENT SERIOUSNESS OF PROBLEM
☐ 1. HIGH ☒ 2. MEDIUM ☐ 3. LOW ☐ 4. NONE ☐ 5. UNKNOWN

B. RECOMMENDATION
☐ 1. NO ACTION NEEDED *(no hazard)*
☐ 2. IMMEDIATE SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 3. SITE INSPECTION NEEDED
a. TENTATIVELY SCHEDULED FOR:
b. WILL BE PERFORMED BY:
☐ 4. SITE INSPECTION NEEDED *(low priority)*
XX 5. Possible ground water monitoring would be advantagous

C. PREPARER INFORMATION
1. NAME: John Brooks
2. TELEPHONE NUMBER: (502) 564-6716
3. DATE *(mo., day, & yr.)*: 12-13-79

III. SITE INFORMATION

A. SITE STATUS
☒ 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*
☐ 2. INACTIVE *(Those sites which no longer receive wastes.)*
☐ 3. OTHER *(specify)*: *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?
☒ 1. NO
☐ 2. YES *(specify generator's four-digit SIC Code)*:

C. AREA OF SITE *(in acres)*: 50

D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES
1. LATITUDE *(deg.—min.—sec.)*
2. LONGITUDE *(deg.—min.—sec.)*

E. ARE THERE BUILDINGS ON THE SITE?
☐ 1. NO ☒ 2. YES *(specify)*: Scale House & Pump House for mill

T2070-2 (10-79)

→ On Reverse

Continued From Page 2

V. WASTE RELATED INFORMATION *(continued)*

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE *(place in descending order of hazard)*.

Mercury
CCl_4
Methanol
Acetone
Chloroform

4. ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

Non-hazardous indistrial wastes from--Hillerich Bradsby (sludge) and Mid-East Sales Corp. (urea fertilizergel) now accepted-Also drummed asbestos from American Synthetic Rubber

VI. HAZARD DESCRIPTION

A. TYPE OF HAZARD	B. POTENTIAL HAZARD (mark 'X')	C. ALLEGED INCIDENT (mark 'X')	D. DATE OF INCIDENT (mo., day, yr.)	E. REMARKS
1. NO HAZARD				
2. HUMAN HEALTH				
3. NON-WORKER INJURY/EXPOSURE				
4. WORKER INJURY				
5. CONTAMINATION OF WATER SUPPLY				
6. CONTAMINATION OF FOOD CHAIN				
7. CONTAMINATION OF GROUND WATER	X			
8. CONTAMINATION OF SURFACE WATER				
9. DAMAGE TO FLORA/FAUNA				
10. FISH KILL				
11. CONTAMINATION OF AIR				
12. NOTICEABLE ODORS				
13. CONTAMINATION OF SOIL				
14. PROPERTY DAMAGE				
15. FIRE OR EXPLOSION				
16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS				
17. SEWER, STORM DRAIN PROBLEMS				
18. EROSION PROBLEMS				
19. INADEQUATE SECURITY				
20. INCOMPATIBLE WASTES				
21. MIDNIGHT DUMPING				
22. OTHER *(specify)*:				

Continue On Reverse

Continued From Front

VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

- [ ] 1. NPDES PERMIT
- [ ] 2. SPCC PLAN
- [X] 3. STATE PERMIT (specify): Sanitary landfill #056.27
- [ ] 4. AIR PERMITS
- [ ] 5. LOCAL PERMIT
- [ ] 6. RCRA TRANSPORTER
- [ ] 7. RCRA STORER
- [ ] 8. RCRA TREATER
- [ ] 9. RCRA DISPOSER
- [ ] 10. OTHER (specify):

B. IN COMPLIANCE?

- [X] 1. YES
- [ ] 2. NO
- [ ] 3. UNKNOWN

4. WITH RESPECT TO (list regulation name & number): KRS 224

VIII. PAST REGULATORY ACTIONS

- [X] A. NONE
- [ ] B. YES (summarize below)

IX. INSPECTION ACTIVITY (past or on-going)

- [ ] A. NONE
- [X] B. YES (complete items 1,2,3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Routine Inspection	Fall '79	State	Site satisfactory

X. REMEDIAL ACTIVITY (past or on-going)

- [ ] A. NONE
- [X] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY	2. DATE OF PAST ACTION (mo., day, & yr.)	3. PERFORMED BY: (EPA/State)	4. DESCRIPTION
Methane gas extraction	1979	Landfill	Stopped migration of gas--installed evacuation system

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.