932054 NGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATION

VOLUME I

Nash Road Landfill

Site No. 932054

Town of Wheatfield

Niagara County

Date: July 1985



Prepared for:

New York State Department of Environmental Conservation

50 Wolf Road, Albany, New York 12233 Henry G. Williams, Commissioner

Division of Solid and Hazardous Waste Norman H. Nosenchuck, P.E., *Director*

By:

ENGINEERING-SCIENCE In Association With

DAMES & MOORE

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SECTION I

EXECUTIVE SUMMARY

The Nash Road site is an inactive landfill located in the Town of Wheatfield, Niagara County (NYS), adjacent to the North Tonawanda City boundary (Figure I.1). The site is rectangular, totaling approximately 25 acres. The Nash Road site is located in a suburban residential area, and is partly overgrown with trees and marsh vegetation. Nearby residents use the site as a jogging area, dirt bike track, and play area.

The Nash Road site was operated as a landfill by Niagara Sanitation Company between 1964 and 1968. Both municipal and industrial wastes, including caustic materials and sludges, are disposed at the site. In addition, between 6/6/68 and 7/15/68, approximately 900 cubic yards of waste material from a sewer excavation at the Love Canal site was disposed in an excavated trench on this site (memo of 8/9/78 to Hennessey, NYSDOT).

Although some wastes are covered, protruding refuse is visible from the ground surface. Current concern centers on the possible lack of containment of the waste and the migration of these wastes offsite.

The Phase II investigation included surface water, sediment, and groundwater sampling and analyses in order to identify the occurrence and location of contaminants and to assess the potential hazard associated with the landfill site (Figure I.2).

Seven onsite groundwater wells were installed and aquifer testing was performed. Water samples were tested for the 15 Love Canal indicator parameters (methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene, total organic halogens and pH). Sediment samples were tested for the 15 indicator parameters and for Pb, Cr, Cd, Cu, CN, Hg, Ni, and Zn. Geophysical surveys and downhole geophysics were used to help delineate the details of subsurface hydrogeology.

Site stratigraphy can be summarized as follows:

mixed sand/waste fill silt (MC) upper sand (SP) clay (CH and CL with sand seams) lower sand (SP) till (GM) dolomite bedrock

Most waste was mixed with and covered by the upper sand. The disposal trench for Love Canal waste was excavated through the sand into the clay unit.

The monitoring well screens were placed in the till and the silt/upper sand units. The piezometric surface within the fill shows a groundwater high beneath the north-center part of the site.

Surface water samples were found to contain low levels of methylene chloride and total organic halogens; no other contaminants were detected. Sediment taken from dried shallow puddles showed low levels of metals.

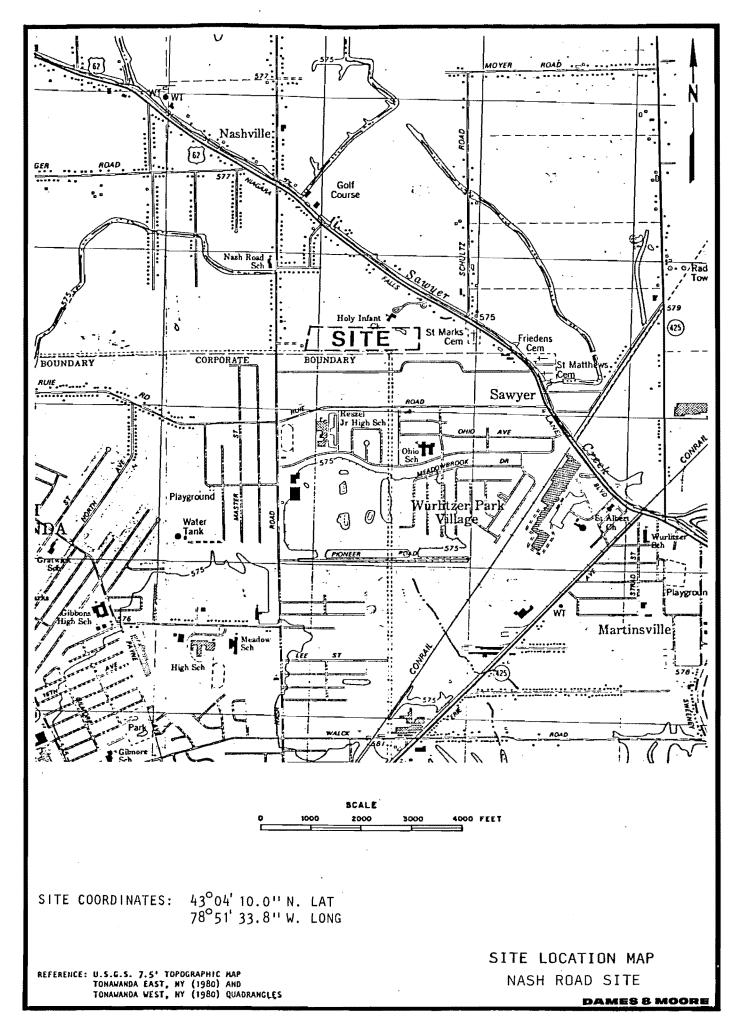
Limited analyses of ground water samples from new on-site monitoring wells indicated no organic contamination. One offsite residential well, approximately 80 feet deep, was analyzed for all priority pollutants; the analyses show metal contamination. An earlier USGS study showed metal contamination in the shallow aquifer.

Based upon the results of this study and previous studies, the HRS scores for the Nash Road site have been calculated as follows:

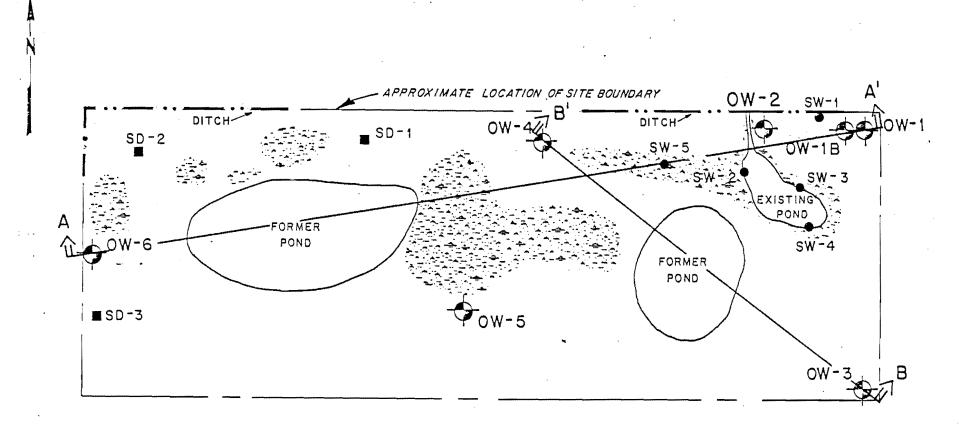
$$S_{M} = 5.37$$

$$S_{FE} = 26.25$$

$$S_{DC} = 37.50$$



BY D. Tomac DATE 83/84



EXPLANATION:

- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- SAMPLING WELL

OW-1

NOTE | OSTERMAN WELL IS LOCATED APPROXIMATELY 1000 FEET WEST OF SITE.

PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

400 FEET

SCALE

FIGURE I

SECTION II

PURPOSE

Purposes

The Nash Road site is an inactive disposal area containing municipal wastes and industrial wastes, including waste materials from a sewer excavation at the Love Canal site. Disposal has occurred in and above lacustrine sands and clays; there are no engineered containment facilities on the site.

The purposes of the Nash Road Phase II Site investigation were 1) to identify the presence and location of any hazardous substance migrating from the site, 2) to determine if any imminent hazard exists, 3) to gather necessary information and to complete the HRS scoring, and 4) to prepare a site investigation report.

SECTION III

SCOPE OF WORK

Scope of Work

Phase II investigations at the Nash Road site were begun in June, 1983 in conjunction with Phase I investigation and are ongoing as of the date of this report. The scope of the investigation was originally presented in the Phase I report (June, 1983) and later in the Quality Assurance Project Plan for Nash Road and Solvent Chemical Sites (March, 1984). During the performance of the field investigation, the scope of the work was expanded at the request of the NYSDEC, in order to obtain a more comprehensive understanding of the entire Nash Road landfill.

The scope of our investigation is summarized in tabular form on Table III.1 and is summarized below.

<u>Step 1 - Emergency Evaluation Surface Water</u>

A surface water monitoring program was implemented in June 1983 to determine if any imminent hazard exists at the site and to evaluate the movement of surface contaminants in a northerly and northeasterly direction. Five surface water samples were collected around the ponds (including trench) and ditch in the eastern part of the site (see Figure III.1). These samples were analyzed for the 15 indicator parameters (methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethylene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene,

total organic halogens, and pH). The procedure for collecting the samples is discussed in Appendix A. The results of these analyses are presented in Appendix D and are discussed in Section IV.

Step 2 - Site Investigation

Geophysical Survey (east end) - Resistivity and magnetometer surveys were performed in late May 1984 to define the boundaries and depth of the disposal trench, to identify the presence of buried metal objects, to provide stratigraphic information, and to evaluate the presence of a contaminant plume. Prior to the survey, standing water was drained from the site in order to provide access for the field team.

The magnetic survey of the Nash Road site was conducted using a 40-foot grid pattern over the entire site. A north-south orientation was used on the traverses across the site. The magnetic base station was located offsite in a wooded area west of the site.

The electrical resistivity (ER) survey of the Nash Road site was conducted using both soundings and profiles. Soundings were conducted first to a depth of 100 feet in order to interpret geologic and stratigraphic features. Other soundings were conducted to a depth of 30 feet and others only as deep as necessary to distinguish lenses of interest. Profiles were conducted at electrode spacings of 10, 20, 30, 50, and 70 feet.

Figure III.2 shows the location of the ER sounding and profile stations. Field procedures are outlined in Appendix A. Magnetometer, sounding, and profile field data are included in Appendix C.

Groundwater Monitoring - A network of five deep and two shallow groundwater sampling wells was installed in June 1984. The locations of the wells were chosen to provide information about the geology of the subsurface and the groundwater flow regime at the entire Nash Road Landfill (see Figure III.1). Soil was drilled and sampled from the ground surface to the top of the bedrock. Stainless steel wells were installed with filter sand packs, and primary and secondary bentonite seals.

Each well was logged visually during drilling and later with a downhole gamma logging unit. Additionally, aquifer characteristics were evaluated by means of in-situ falling head permeability tests and routine water level measurements. To further characterize the lithology of the site soils, a grain size analysis of each soil unit was performed in the laboratory, according to ASTM D-422-63.

Groundwater samples were taken in July 1984 from the seven sampling wells and from a nearby unused residential well. Groundwater samples were analyzed for the 15 indicator parameters; the chemical analytical results are discussed in Section IV and listed in Appendix D. All field procedures are detailed in Appendix A. Boring logs and well schematics and

grain size analyses are included in Appendix B. Gamma logs are shown on Figures IV.16 and IV.17.

Sediment Sampling - Sediment samples were collected in July 1984 at three locations in the western part of the site, as shown on Figure III.l. It was originally planned that surface water would also be collected at these locations, but no surface water was present on this end of the site at the time of sampling. Locations of the sampling points are along the western and northern margins of the site and were chosen to complement the earlier surface water sampling network and to provide information about offsite surface movement of contaminants in a westerly and northerly direction. Sediments are being analyzed for Pb, Cr, Cu, Cd, CN, Hg, Ni, Zn, and organic priority pollutants. Results are discussed in Section IV and listed in Appendix D.

Air Survey - An HNU meter survey was performed during July 1984 to evaluate the presence of organic vapor contaminants. No contamination was detected. The procedure for this survey is described in Appendix A. Field data is presented in Appendix D.

TABLE III.1

WORK PLAN - TASK DESCRIPTION (as implemented) NIAGARA SANITATION, NASH ROAD

MINORIAL DIMITITION, MIDIT NOTED								
TASKS	DESCRIPTION OF TASK							
Step 1 - Emergency Evaluation	n							
Perform Surface Water Sampling and Analyses	Inspect the site and collect 5 water samples around the disposal trench. Analyze the samples for methylene chloride, chloroform, carbon tetrachloride, benzene, toluene, chlorobenzene, 1,1,2-trichloroethane, tetrachloroethene, 1,1,2,2-tetrachloroethane, trichloroethene, trichloroethene, trichlorobenzene (and isomers), dichlorobenzene (and isomers), hexachlorobutadiene, total organic halogens and pH.							
Step 2 - Site Investigation								
II-A Update Work Plan	Review the information in the Phase I report, and Step 1 evaluation, and revise the Phase II work plan.							
II-B Conduct Geophysical Studies	Conduct EM and resistivity to define the boundary and depth of the disposal trench and to provide hydrogeological information.							
<pre>II-C Conduct Boring/Instal Monitoring Wells</pre>	<pre>1 Install 7 stainless steel sampling wells.</pre>							
II-D Construct Test Pits/ Auger Holes	No further construction of test auger holes necessary.							
II-E Perform Sampling and Analysis								
Soil samples from borings	Collect samples during drilling at 5-foot intervals or at changes in subsurface lithology. Perform grain size analysis of each lithologic unit on site.							
Soil samples from surface soils	No further sampling necessary.							

Soil samples from test No further sampling necessary. pits and auger holes

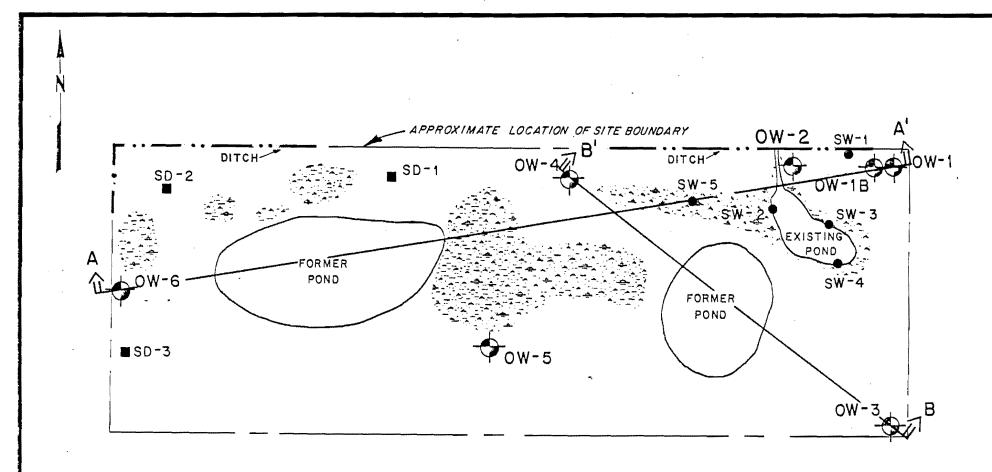
TABLE	III.1 (cont.)
TASKS	DESCRIPTION OF TASK
Sediment samples from surface water	Collect 3 sediment samples at the west end and analyze samples for Pb, Cr, Cd, Cu, CN, Hg, Ni, Zn, and a GC/MS organic priority pollutant scan.
Groundwater samples	Collect samples from the 7 new monitoring wells and analyze for the parameter listed in Step 1.
Surface water samples	No water at west end of site at time of investigation. Air samples Using the HNU meter, determine if organic vapors are present.
Waste samples	No further sampling necessary.
II-F Calculate Final HRS	Revise HRS based on the field data collected in Tasks IIB-IIE, complete the HRS form.

II-G Conduct Site Assessment

Prepare final report containing Phase I report, additional field HRS and HRS data, final documentation records, and site assessments. The site assessment will consist of a conceptual evaluation of alternatives and a preliminary cost estimate of the most probable alternative.

II-H Project Management

Project coordination, administration and reporting.



EXPLANATION:

- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- SAMPLING WELL

OW-1

NOTE | OSTERMAN WELL IS LOCATED APPROXIMATELY 1000 FEET WEST OF SITE.

PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

O 200 400FEET

FIGURE

田:1

ES ENGINEERING-SCIENCE

SECTION IV

SITE ASSESSMENT

Site Topography

The site is an inactive landfill located in the Town of Wheatfield, Niagara County, adjacent to the North Tonawanda City boundary. The site is a rectangular area, twenty five acres in size. It is surrounded by a suburban residential area, and is partially overgrown with trees and marsh vegetation. Dirt roads provide access to and within the site.

The landfill is visible to many of the residential neighbors south of the site. It is used by nearby residents as a jogging area, dirt bike track, and general play area.

Access to the site is open and unguarded. National Fuel Gas Corporation has a facility adjacent to the western border of the site. A gas pipeline, a salt-brine pipeline, and above-ground electrical lines also pass through the site along the southern boundary.

Before landfilling began, the site was a swamp area with surface water drainage to the north toward Sawyer Creek. General surface features are shown on Figures IV.1 and IV.2. Landfilling of wastes and excavation of a disposal trench (labelled "existing pond") has resulted in irregular ground surface topography. Relief on the site is greater than 10 feet.

The volume of onsite surface water fluctuates seasonally. In the

spring, approximately one-third of the site is underwater; in late summer, only the disposal trench and connected ponds are filled with water. The northern margin of the site is bounded in most parts by a ditch, which, in the spring, contains surface water. The large ponds and the disposal trench drain into this ditch.

During the field activities in May through July, 1984, abundant wildlife was observed on the site, including birds, rabbits, frogs, turtles. No human use of surface water was observed. Groundwater is similarly unused, although an older home adjacent to the site has a (unused) residential water well. It is possible that other older homes in the vicinity of the landfill have residential wells. (Niagara Co. Dept. of Health is unaware of any other existing wells.) All nearby residents presently are supplied with municipal drinking water.

Site Hydrogeology

Regional Geology

The Nash Road Site is located in the Erie-Ontario Lowlands physiographic province. The bedrock of this region is predominantly limestone, dolostone, and shale.

In the recent past, most of New York State, including the site, has been repeatedly covered by a series of continental ice sheets. The activity of the glacier widened preexisting valleys and deposited widespread accumulations of till. The melting of ice, ending approximately 12,000 years ago, produced large

volumes of meltwater; this water subsequently shaped channels and deposited thick accumulations of stratified, granular sediments.

As glacial ice retreated from the region, meltwater formed lakes in front of the ice margin. This region is covered by lake sediments, the most recent being from Lake Tonawanda, an elongate lake which occupied an east-west valley and drained north into Lake Iroquois. The sediments consist of blanket sands and beach ridges which are occasionally interlayered with lacustrine silts and clays.

Granular deposits in this region frequently act as shallow aquifers, whereas lacustrine clays, as well as tills, often inhibit groundwater movement. However, fine-grained, water-lain sediments, such as silts and clays, frequently contain horizontal laminations and sand seams. These internal features facilitate lateral groundwater movement through otherwise low permeability materials.

Site Geology

This analysis is based on subsurface information from the drilling program, downhole gamma logging and geophysical surveys and sounding of the site. Also used in this analysis were the USGS shallow borings made in 1982.

Bedrock is Lockport Dolostone, occurring at depths varying from 65 feet to 71 feet below the ground surface. The surface of the bedrock slopes generally northward (Figure IV.3) and forms a

north-trending channel in the center of the site. An ER profile of the 70-foot deep surface (Figure IV.4) resulted in electrical values indicative of bedrock. Values south of the disposal trench, as seen on Figure IV.4 and all ER profiles are numerically lower and suggest a wet area.

A till unit is located immediately above the bedrock surface. The till is a pink, very dense, silt and gravel with some sand. Grain size analyses show silt contents as great as 65%. Gravel size increases to the west. The till blankets the site with an average thickness of 25 feet. The 50-foot deep surface, which occurs within the till, has been mapped with ER profiling (Figure IV.5). The values are relatively consistent, except again for the low values south of the disposal trench. The top surface of the till, as shown on Figure IV.6, forms a channel trending generally northwest, with a maximum relief across the study area of 17 feet.

Overlying the till is a lower sand unit. A grain size analysis of the unit indicates that it is a fine sand with approximately 35% silt. This sand unit does not blanket the site, but rather occurs as a wedge-shaped unit, thickening to the north-center part of the site (Figure IV.7). At the western and eastern margin of the site, the sand unit has a thickness of less than one foot. An ER profile map of the 30-foot deep surface (Figure IV.8), which corresponds approximately with the depth of the lower sand, shows lower values south of the trench. Again, these can be interpreted as an increased water content of the soils in

this area. Based on its lithology and stratigraphic position, this sand unit is interpreted to be an early deposit of Lake Tonawanda.

Above the lower sand and blanketing the site is a layered "fat" clay unit which grades vertically into a layered silty "lean" clay. Both of these units contain numerous sand seams. Hydrometer analyses of these fat and lean clays confirm the vertically increasing silt content. These clay units are classic examples of Lake Tonawanda deposits, as mapped by Muller (1977). The most likely mineralogy for the clay minerals is illite. Two ER profile maps of the 20-foot deep and 10-foot deep surfaces (both of which are within this clay unit) show, again, an area south of the trench with distinctly low resistivity values. This again is interpreted as the result of increased water content. Contours on the top surface of the upper clay unit, as shown on Figure IV.11, show a surface sloping gently north and west; maximum relief is 3 feet.

An upper sand unit is located immediately above the clay unit, in all parts of the site except in the northeast corner. This sand unit varies in thickness from greater than 8 feet in the southwest to 0 feet in the northeast (Figure IV.12). A grain size analysis of this unit indicates a fine sand with approximately 20% silt. This unit probably originated as a late deposit of Lake Tonawanda.

In the eastern part of this site, the upper sand is overlain by a

layered silt. A grain size analysis of this silt shows that it contains approximately 20% sand and little clay. During testing, a suspension of this silt was extremely frothy and had a soapy odor. The occurrence of this fine-grained unit suggests a possible deepening of the Lake Tonawanda water.

The uppermost unit on the site is a mixed sand/waste fill. This unit is defined best from the results of the magnetometer survey. Readings on the site were highly variable due to the disturbed soil, landfill type debris and buried metallic objects. On Figure IV.13, the areas of very high magnetic readings (greater than 58,000 gammas) are interpreted as buried ferromagnetic metal objects. The magnetic readings of 57,500 gammas are interpreted as disturbed soil areas and possibly buried ferromagnetic metal objects.

The magnetic data indicates that there are five areas on the landfill that may be underlain by buried ferromagnetic metal objects. The data also suggest that the landfill has several distinct areas of disturbed soil, i.e., pits and/or trenches, and mixed soil/waste fill. Samples taken during drilling support this interpretation.

The stratigraphic relationship between the units can be seen on the cross sections prepared from boring logs (Figures IV.14 and IV.15). The locations of these lines are shown on the Plot Plan (Figure III.1). The sand/waste mixed fill covers part of the ground surface and is underlain by the upper sand or the clayey

silt. In virgin areas, the ground surface is either silt or sand. Excavation of the disposal trench, not shown on the cross section, would have exposed the fat clay in the base of the trench.

Cross sections have also been prepared based on gamma log records (Figures IV.16 and IV.17). These cross sections show the same stratigraphy as those based on boring logs, as well as some finer detail and time lines. For example, peaks A and B are on approximately horizontal lines suggesting site-wide thin sand seams within the lacustrine clay. Similarly, peak C corresponds to the occurrence of the lower sand unit and peak E to the upper sand and sand/waste fill units. It should be noted that the gamma log responses of the upper sand unit and the fill/sand unit are the same due to the presence of the sand. These units are plotted together on the gamma log cross sections.

A cross section based on ER sounding values has been prepared and is shown on Figure IV.18. The location of this cross section line is shown on Figure IV.19. On the cross section, all lithologic units are discernable. In addition, a "wet zone" is indicated between depths of 16 feet and 26 feet, sloping to the north. This ER peak corresponds roughly with the depths of peak B on the gamma log cross sections and therefore may indicate a silt or other low gamma count density material. Boring logs (OW-l and OW-3) show this depth range to be a very soft wet clay. This anomaly is of particular interest to the study because it coincides with the approximate depth of the disposal trench.

Hydrology

To date, the hydrology of the Nash Road site is known from insitu permeability tests, groundwater elevation measurements, surface and groundwater chemical information, and interpretations from the subsurface geology.

Surface Water Hydrology:

The occurrence and location of surface water on the Nash Road site is variable and seasonal. Most surface water bodies occur in small enclosed depressions, less than 3 feet deep. They are formed by either snow meltwater or rainwater and generally disappear, due to evaporation, during the summer months. Water in these ponds was observed to be either clear or rust-colored. Most of these ponds are rimmed with marsh-type vegetation. Due to their temporal and enclosed nature, no water samples were taken in these ponds.

In contrast to the small ponds, several large connected ponds, including one which was a disposal trench, are located in the northeast section of the site and contain water year-round. The color of this water is clear, with occasional patches of green floating algae and weeds. The edges of these ponds are rimmed with marsh-like vegetation. Rusty barrels and other debris can be seen floating in these ponds. Nearby residents reported to our field team that these ponds do not freeze in the winter. In the spring and early summer, these ponds drain into a ditch along the northern margin of the site.

Groundwater Hydrology:

Permeabilities for the various screened units are shown in Table IV.1. The magnitudes of the values are typical of the corresponding soil lithologies. The till/bedrock interface permeability is variable, depending upon the degree of fracture of the bedrock and the sand and gravel content of the till.

The piezometric surface within the till is mapped on Figure IV.20. The configuration of the contours suggests a groundwater mound beneath the center of the site. This mound may be attributable to the occurrence of the lower sand unit, immediately above the till, acting as a source of recharge for the till.

The thick, soft clay unit above the lower sand may act as an aquitard, thus allowing only lateral recharge of the lower sand unit. Alternately, the clay may be permeable due to its soft (low density) consistency and layered fabric with numerous sand seams (see gamma logs). Additionally, the excavation of the disposal trench removed part of the clay unit and possibly disturbed the clay floor of the trench during the drag-line excavation procedure. This activity may have opened a new flow path by which surface water now may be connected with sand seams in the clay and possibly with the lower sand unit.

The upper sand unit probably forms a shallow aquifer, although no wells were placed in this unit. Based on our interpretation of the upper clay unit surface geometry (Figure IV.11), we expect

that flow direction within the shallow aquifer to follow the contours of the underlying clay unit. Again, this clay unit has been partially excavated in the trench, thereby providing a connection between the upper aquifer and trench water, and, by extension, possibly into the lower aquifer.

Contamination

Contamination of the environment within the site boundaries has been evaluated by chemical analyses of surface water, sediment, and groundwater samples and an HNU air quality survey. Migration of contamination away from the site is assessed by chemical analyses of surface water and one nearby (unused) residential well, as well as our interpretation of groundwater and surface water flow characteristics.

Surface Water Contamination

Water samples from ponds and from the ditch were analyzed in July 1983, as an emergency measure to assess the migration of contamination off-site via a surface water pathway. The results of these analyses are shown on Table IV.2. The samples were analyzed for the indicator parameters. Only very low levels of total organic halogens and methylene chloride were found. The ditch water sample had slightly greater levels than any of the pond and trench samples. This may indicate another subsurface or surface water source to the ditch, either west or north of the site. The ToX values (10 ppb and less) could be indicative of background levels. Alternately, the low levels of methylene chloride could be due to the laboratory contamination. These

chemical analyses were performed without complete quality assurance procedures due to the emergency response nature of this part of the study.

A sample of ponded water was collected by Region 9 DEC on July 11, 1983 and analyzed for GC/MS organics. Two compounds were identified at low concentrations including: Diethylphthalate (identified) and Toluene (42.7 ug/l).

From these analyses, no significant surface water contamination from organic indicator pollutants is believed to exist at the eastern end of the site.

Sediment Contamination

In the summer of 1984, three sediment samples were taken from "dried puddles" in the western end of the site (see Figure III.1 for sampling locations). These samples were analyzed for organic priority pollutants and metals. The results of these analyses are presented in Table IV.3. Also presented in this table are ranges of concentrations of metals in non-contaminated soils. The values for cadmium, chromium, copper, lead, nickel and zinc are all within the range of "typical" soils. Also there is no significant variation between the values for different sampling locations. Values for mercury and cyanide were not presented in Friberg, Nordberg and Vouk (1979); however, the values of cyanide are less than the detection limit. Mercury was detected at very low levels. Based on the results of the analysis of these

samples, no sediment contamination is believed to exist at the site.

Groundwater Contamination

Seven on-site monitoring wells and one nearby off-site unused residential well (Osterman well) were sampled in the summer of 1984. The on-site wells were analyzed for volatile organics, base/neutral extractable organics, total organic halogens and pH. The results of compounds that were detected are presented on Table IV.4. Based on the results of these analyses, no significant organic contamination is believed to exist at the site.

The Osterman well sample was analyzed for priority pollutants (volatiles, acid extractables, base/neutral extractables, pesticides/PCBs, metals, cyanides and phenolics). The results of the analyses for organics that were detected are presented in Table IV.4. The results of analysis of two samples for metal are presented in Table IV.5. Only metals that were detected in at least one of the ground water samples are presented in this table.

Lead was found in one of these two Osterman well samples at levels in excess of the New York State Class GA water quality standard (25 ug/1). However, in the other sample the concentration of lead was less than the detection limit. Cadmium was detected in both samples. The concentration in one of the samples was at the water quality limit (10 ug/1) and the

concentration in the other sample was less than the water quality limit. The concentrations of other metals were below water quality limits. It should be noted that the analytical results presented in Table IV.5 are total metals on unfiltered samples and that the monitoring well samples were not analyzed for metals. Additional sampling is required to determine if metals < contamination exists at the site and to determine whether or not the contamination is migrating from the site.

Air Contamination

An HNU air quality survey was performed in the summer of 1984 and nor airborne organic contaminants were detected.

TABLE IV.1

Summary In-Situ Permeability

Well	Permeability c	m/sec
open (Ant Miles Miles	The state area. The thirty time tops then that him are then then are state are then then are seen.	
OW-1	4.37×10^{-4}	silt
OW-2	6.75×10^{-4}	silt and sand
OW-1B	8.43×10^{-7}	till/bedrock
OW-3	1.43×10^{-6}	wet zone in till
OW-4	7.88×10^{-7}	till/bedrock
OW-5	7.5×10^{-4}	till/bedrock
OW-6	6.8×10^{-4}	till/bedrock

TABLE IV.2

Analytical Results for Surface Water Samples

Parameter (ug/l)	SW-l	SW-2	sw-3	SW-4	SW-5
Methylene Chloride	11	<10	10	<10	<10
Chloroform	<10	<10	<10	<10	<10
Carbon Tetrachloride	<10	<10	<10	<10	<10
Benzene	<10	<10	<10	<10	<10
Toluene	<10	<10	<10	<10	<10
Chlorobenzene	<10	<10	<10	<10	<10
1,1,2,2,-trichloroetha	ne<10	<10	<10	<10	<10
Tetrachloroethane	<10	<10	<10	<10	<10
1,1,2,2,-tetrachloro- ethene	<10	<10	<10	<10	<10
Trichloroethene	<10	<10	<10	<10	<10
Trichlorobenzene (isomers)	<10	<10	<10	<10	<10
Dichlorobenzene (isomer)	<10	<10	<10	<10	<10
Hexchlorobutadiene	<10	<10	<10	<10	<10
рн	6.9	8.1	7.1	7.4	7.4
Total organic halogens	10.	5.	7.	7.	8.

(See Figure III.1 for location of sampling points)

TABLE IV.3
Analytical Results (1) for Sediment Samples

Parameter (ug/g)	SD-1	Sample No. SD-2	SD-3	Range of Concentration in non-contaminated soils (2)
Cadmium	0.30	< .2	< .2	<1
Chromium	6.8	6.3	5.6	trace to 250
Copper	5.7	8.2	10.0	2 to 100
Lead	18.	7.0	14.	2 to 200
Mercury	0.0084	0.064	0.010	(3)
Nickel	6.5	8.5	9.4	3 to 1,000
Zinc	40.	34.	48.	10 to 300
Cyanide	<1	<1	<1	(3)

- (1) Samples were analyzed for volatile organics, acid and base/neutral extractable organics and pesticides/PCB's. All results for organics analysis were less than detection limits
- (2) Source: Handbook on the Toxicology of Metals, Edited by L. Friberg, G. F. Nordberg and V. Vouck, 1979.
- (3) No information for this parameter available in Friberg, Nordberg, and Vouk (1979) (See Figure III.1 for location of sampling points)

TABLE IV.4

ANALYTICAL RESULTS (ORGANICS AND pH) FOR GROUND WATER SAMPLES

SAMPLE IDENTIFICATION

Parameter	ow-1	OW-1B	ow-2	OW-3	OW-4	OW-5	OW-6	FT-1	Osterman Well	Osterman Property	OST-1
Methylene Chloride (ug/1)	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	14
Toluene (ug/l)	ND	ND	ND	ND	ND	ND	ND	ND	<6.0	ND	ND
1,1,1,- trichloroethane (ug/1)	ND	<3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzy1phthalate (ug/1)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33
Total Organic Halides (mg/l)	<0.02	<0.02	0.04	4 0.04	0.09	<0.03	2 Ø.12	2	0.04		
рĦ	8.05	8.14	8.1	2 8.11	8.14	8.16	5 8.Ø [.]	7 6.4	5 8.20		

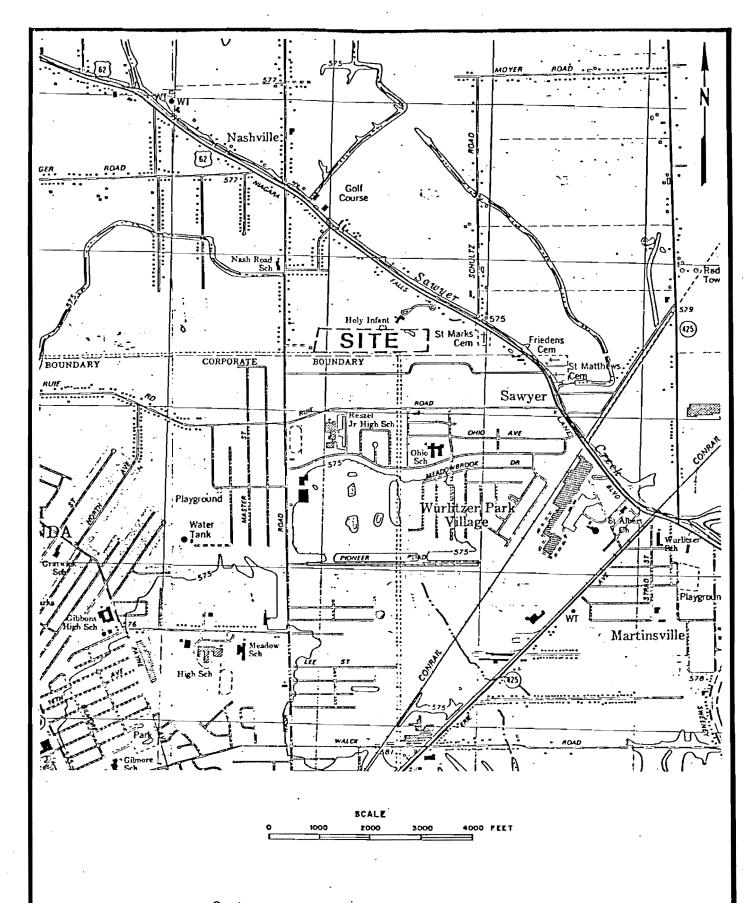
ND = Not Detected

TABLE IV.5

Results of Metals Analysis For Osterman Well

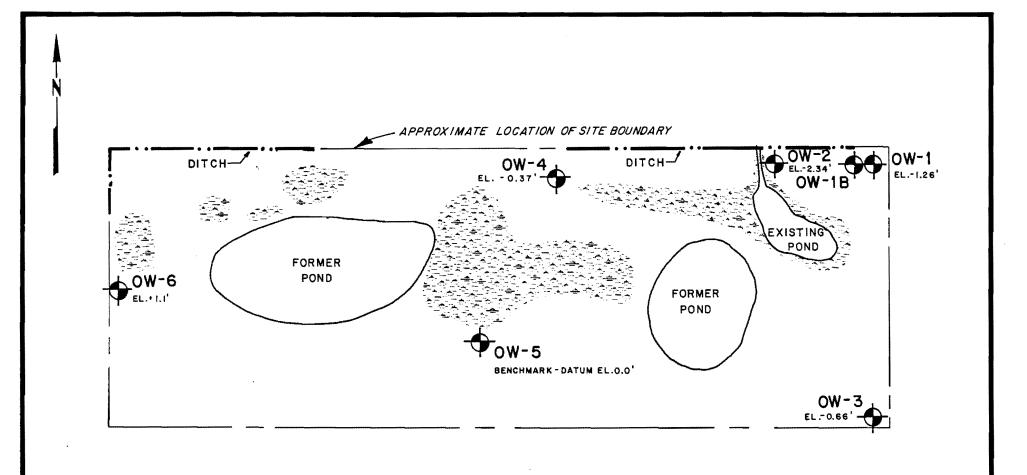
Sample Identification

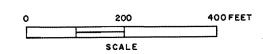
Parameter	Osterman Property	OST-1	Class GA Water Quality Standards
Total Cadmium (ug/l)	6	10	10
Total Copper (ug/1)	13	10	1,000
Total Zinc (ug/l)	258	50	5,000
Total Lead (ug/l)	<5	140	25
Total Mercury (ug/l)	<0.5	Ø.8	2



SITE COORDINATES: 43°04' 10.0" N. LAT 78°51' 33.8" W. LONG

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP TOMAWANDA EAST. NY (1980) AND TOMAWANDA VEST, NY (1980) QUADRANGLES SITE LOCATION MAP NASH ROAD SITE





SURFACE TOPOGRAPHY
NASH ROAD SITE

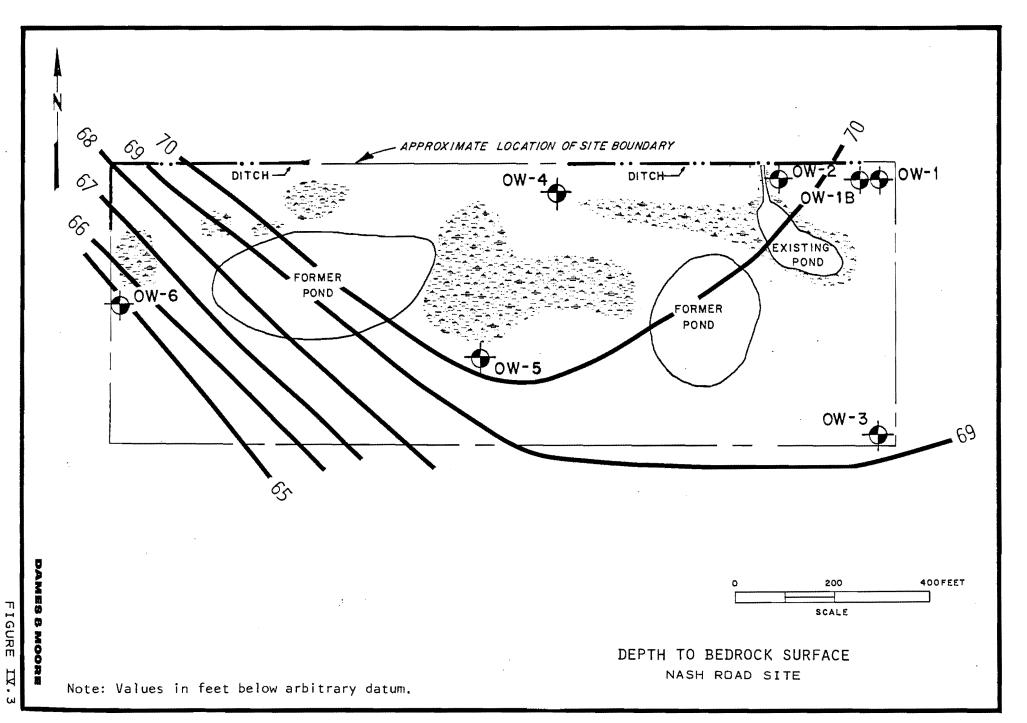
Note: Elevation values in feet relative to arbitrary datum

FIGURE

TV. 2

FILE 13305 -003/19

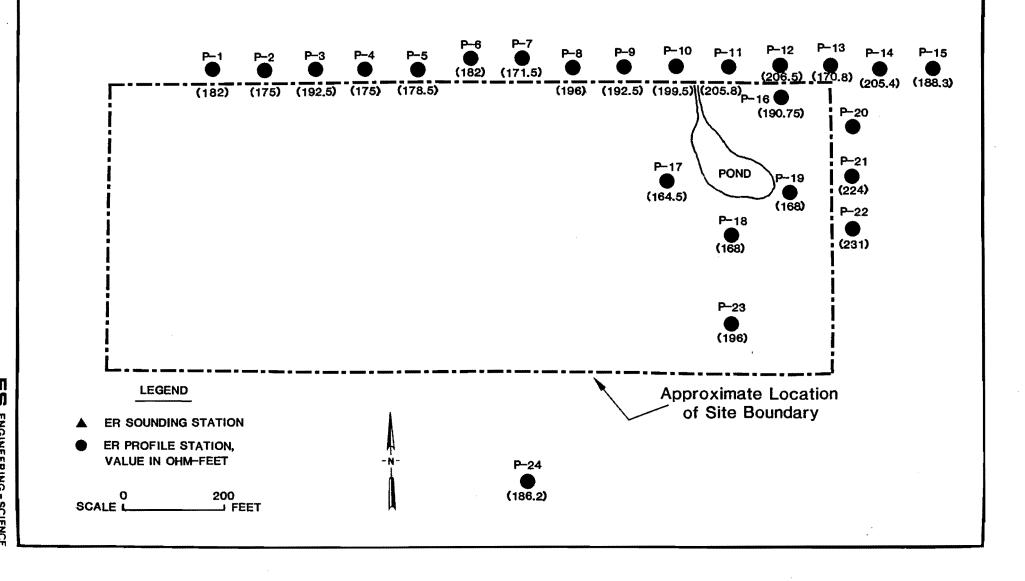
BY 0. Tame DATE 7/85/84



NIAGARA SANITATION -NASH ROAD SITE

ER PROFILE MAP

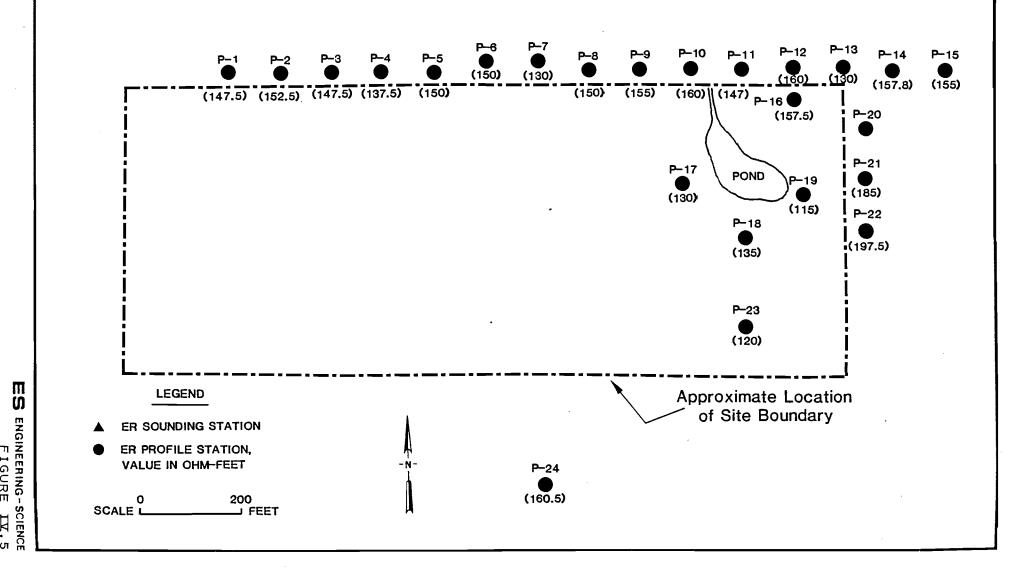
(Electrode Spacing =70 feet)



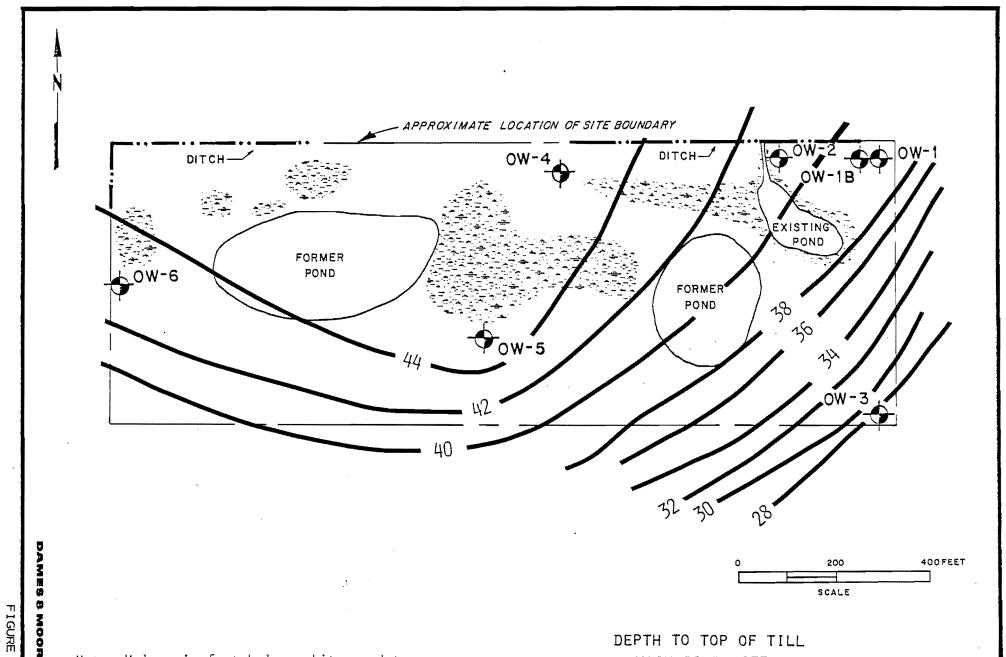
NIAGARA SANITATION -NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing =50 feet)



DATE 7/25/84 D. Toma



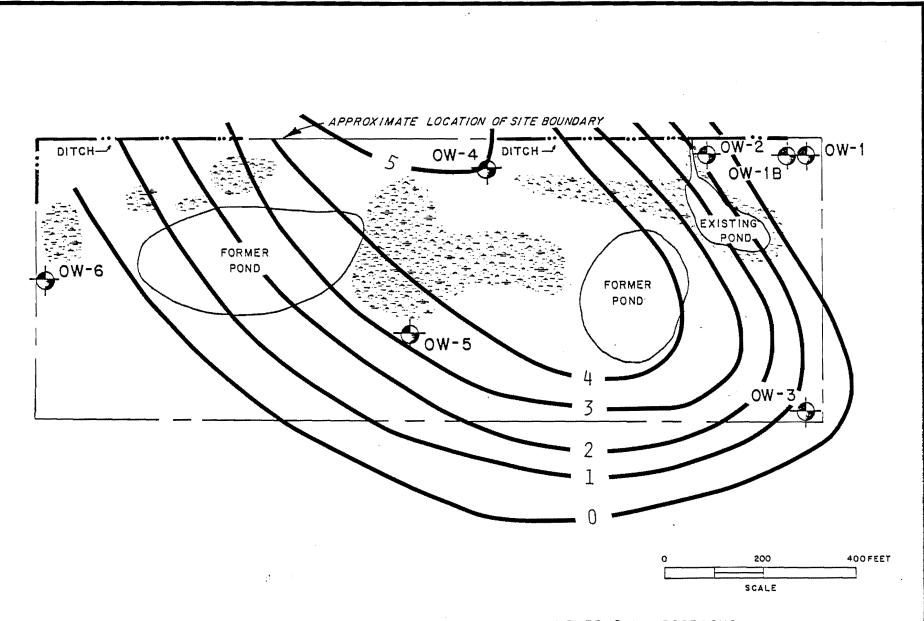
Note: Values in feet below arbitrary datum.

IV.6

DEPTH TO TOP OF TILL NASH ROAD SITE

BY D. 13304 - 003/19

BY DATE 7/25/84



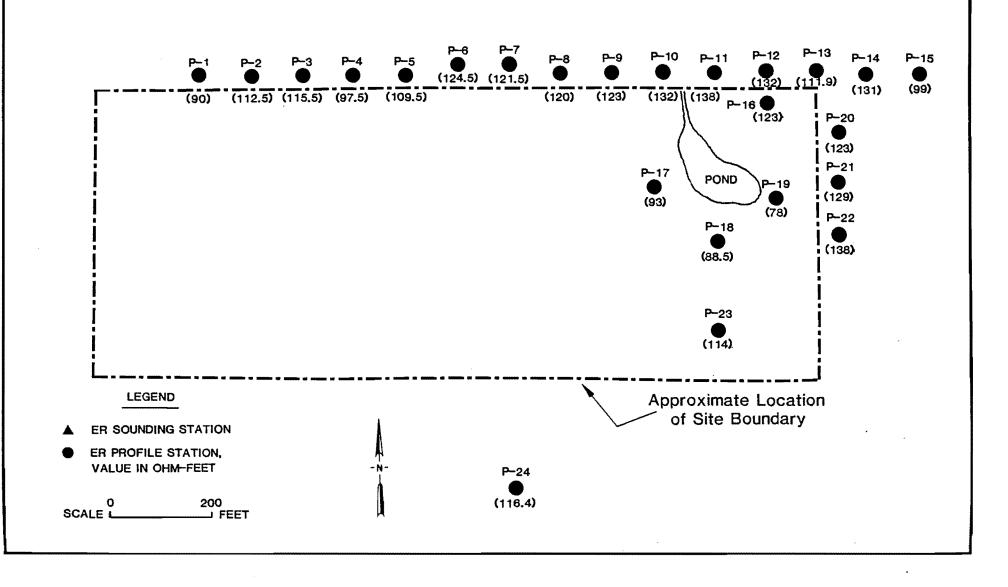
LOWER SAND ISOPACHS
NASH ROAD SITE

Note: Values in feet

NIAGARA SANITATION -NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing = 30 feet)



M

U

ENGINEERING-SCIENCE

NIAGARA SANITATION -NASH ROAD SITE **ER PROFILE MAP** (Electrode Spacing = 20 feet) P-15 (113) (108)(124.8) (126) (141) P-16 (100) (89) (110) (103) (107) (97) (125) || (110)P-20 (113)P-21 P-17 POND (74) (122) (47)P-22 P-18 (126) (83) P-23 (78)LEGEND **Approximate Location** of Site Boundary **ER SOUNDING STATION** ER PROFILE STATION. **VALUE IN OHM-FEET** P-24 200 (84.6)SCALE L → FEET

S

ENGINEERING - SCIENCE

NIAGARA SANITATION -NASH ROAD SITE

ER PROFILE MAP

(Electrode Spacing = 10 feet)

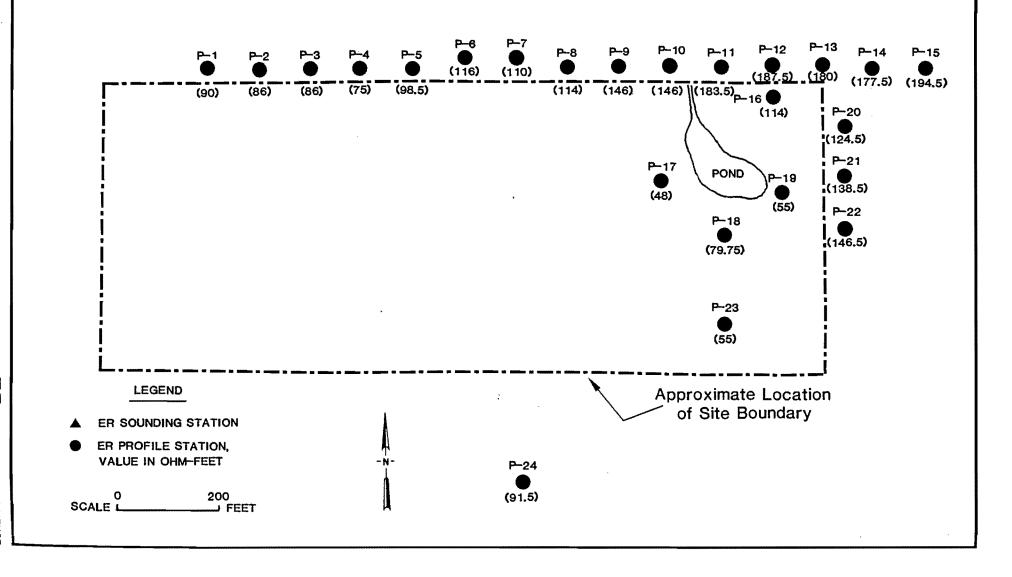
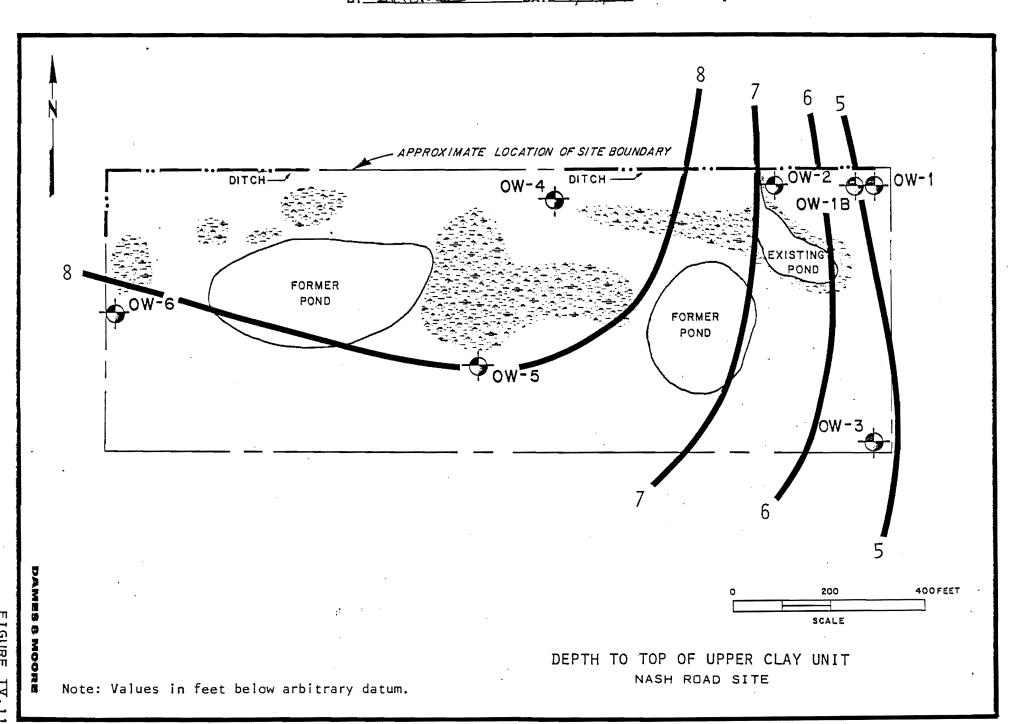
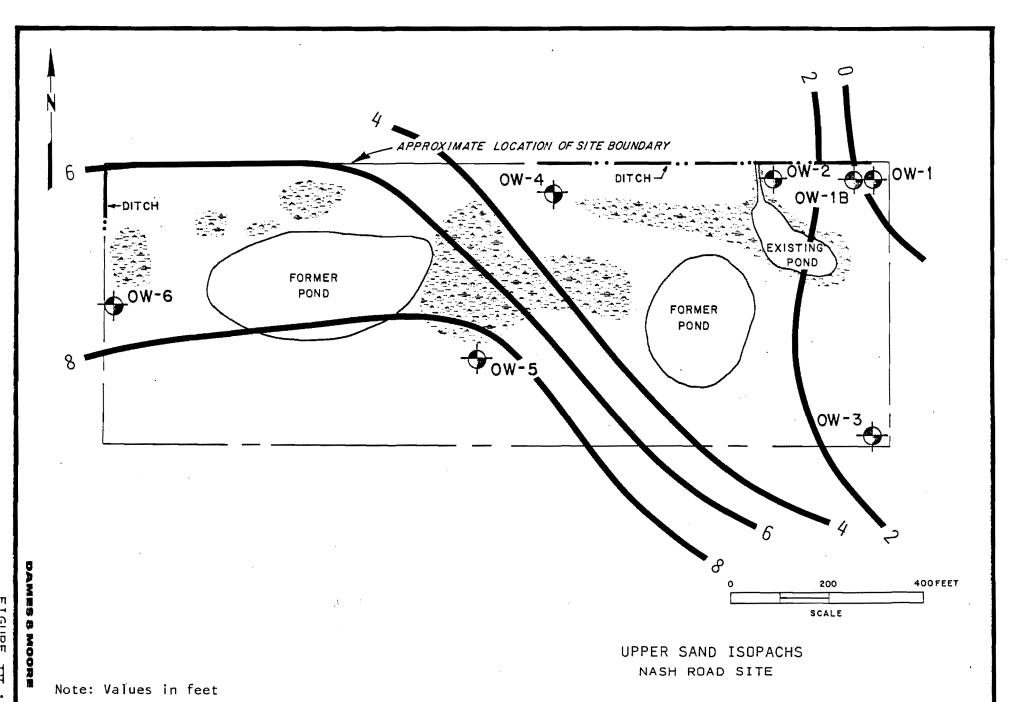


FIGURE IV. 10

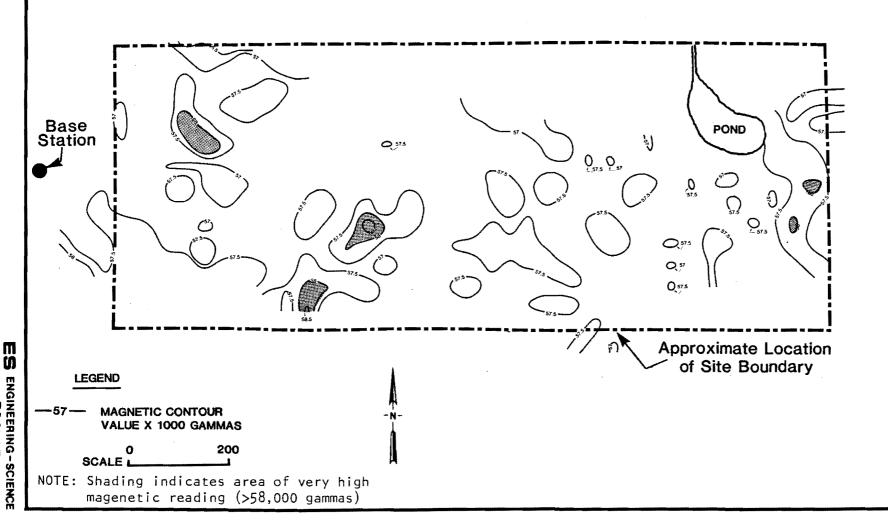
FILE : 3305 : 43/19 1 1

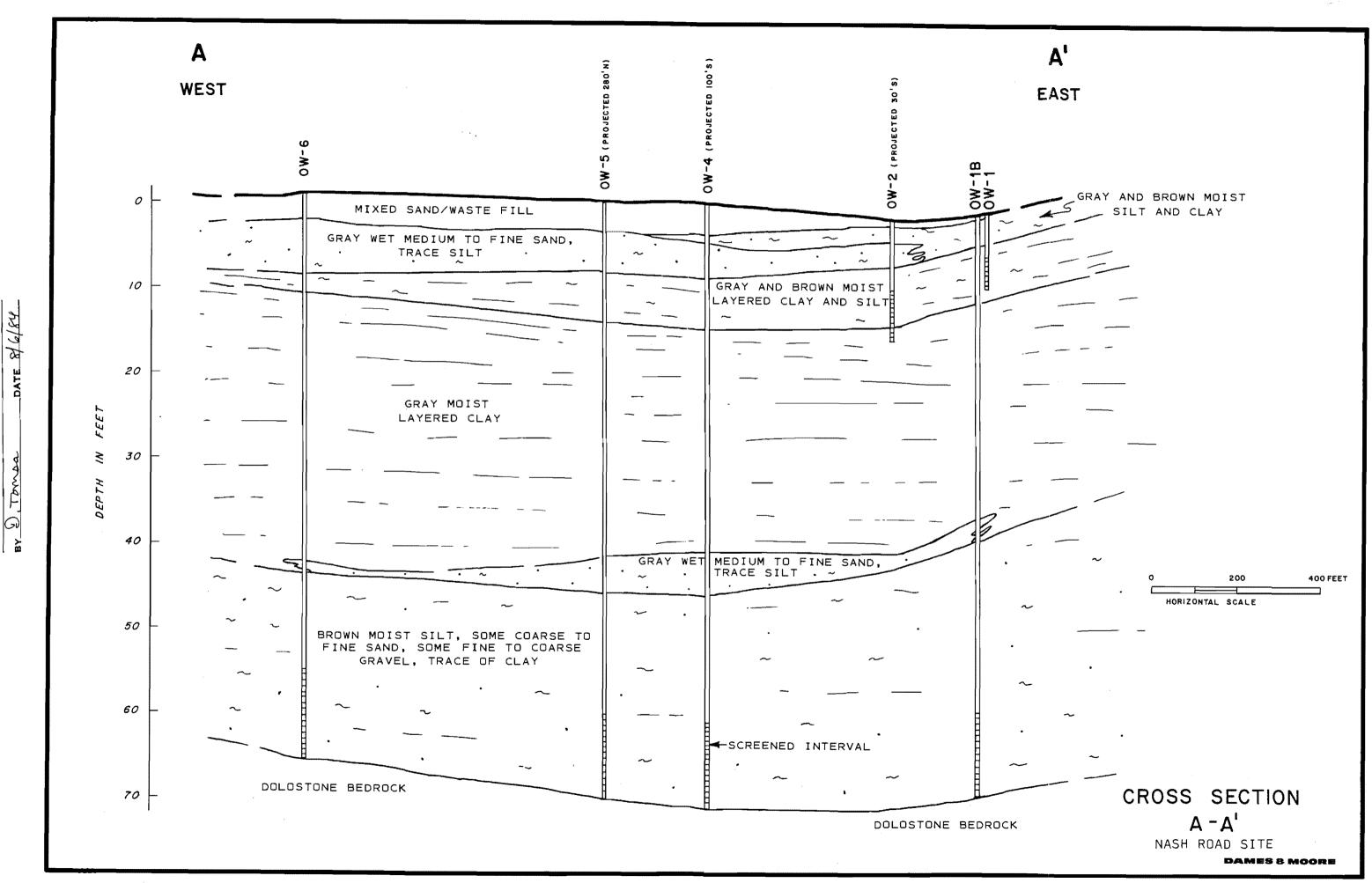


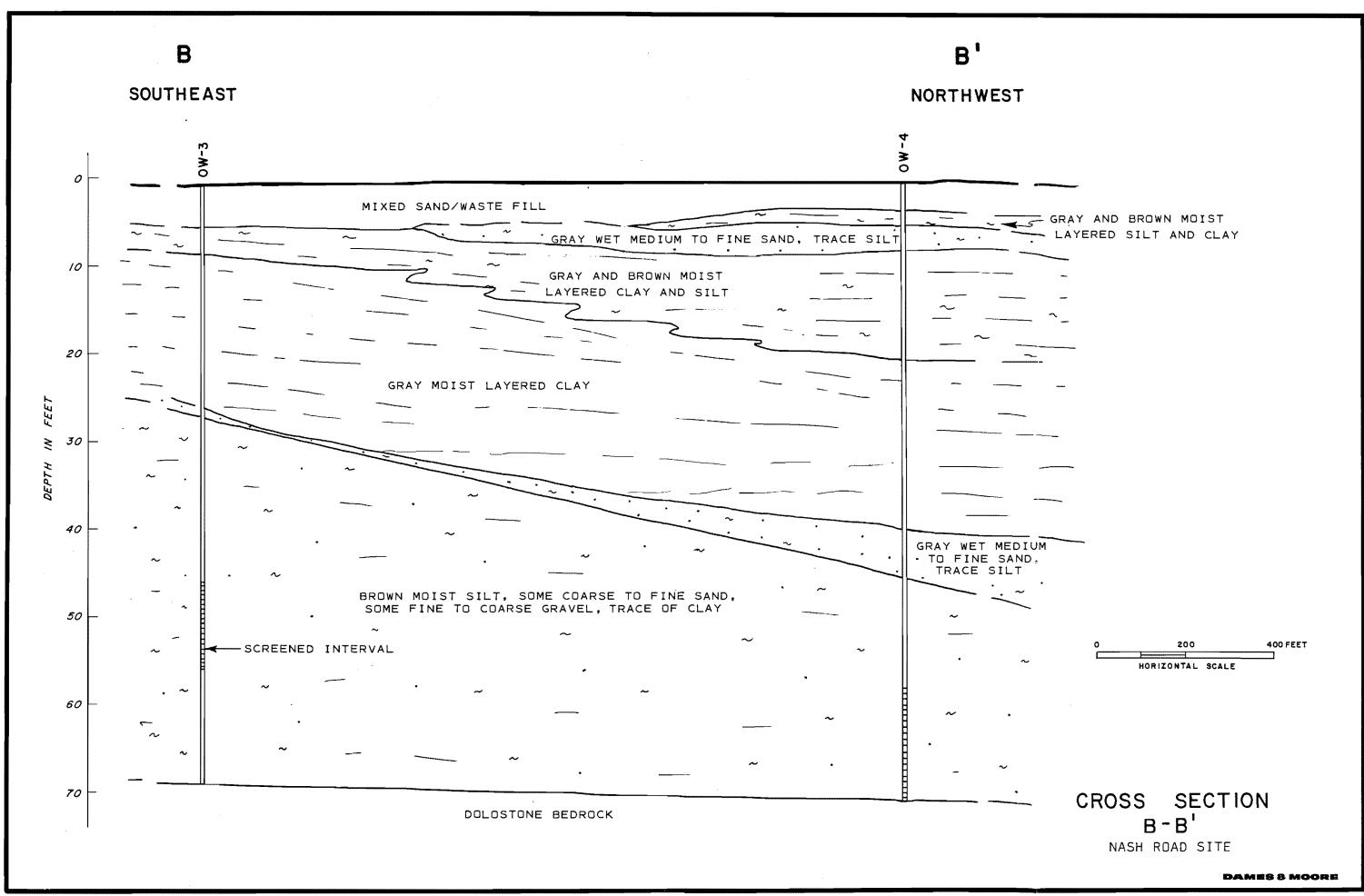
BY Q Tomba DATE 7/25/84



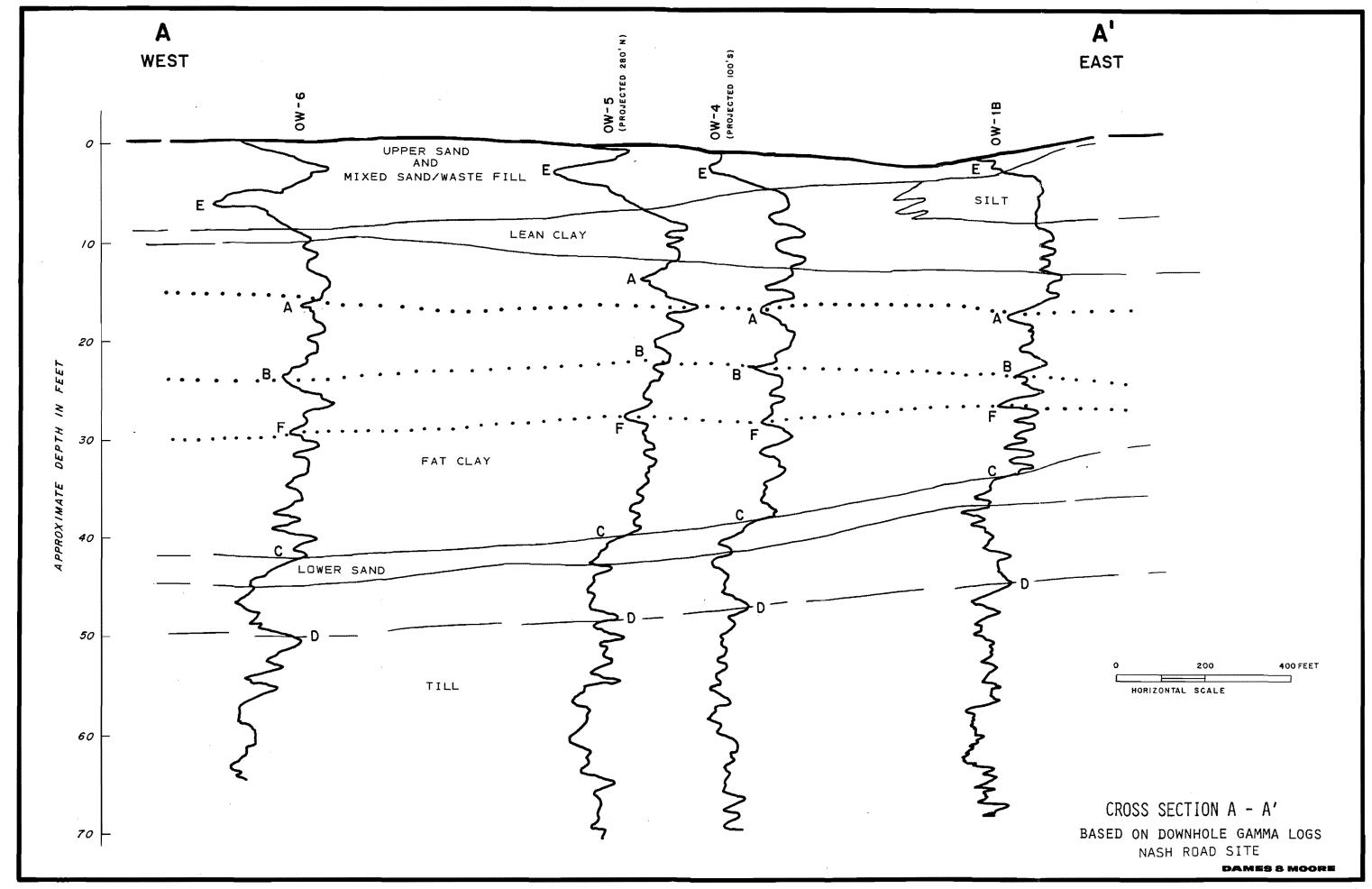
MAGNETIC CONTOUR MAP

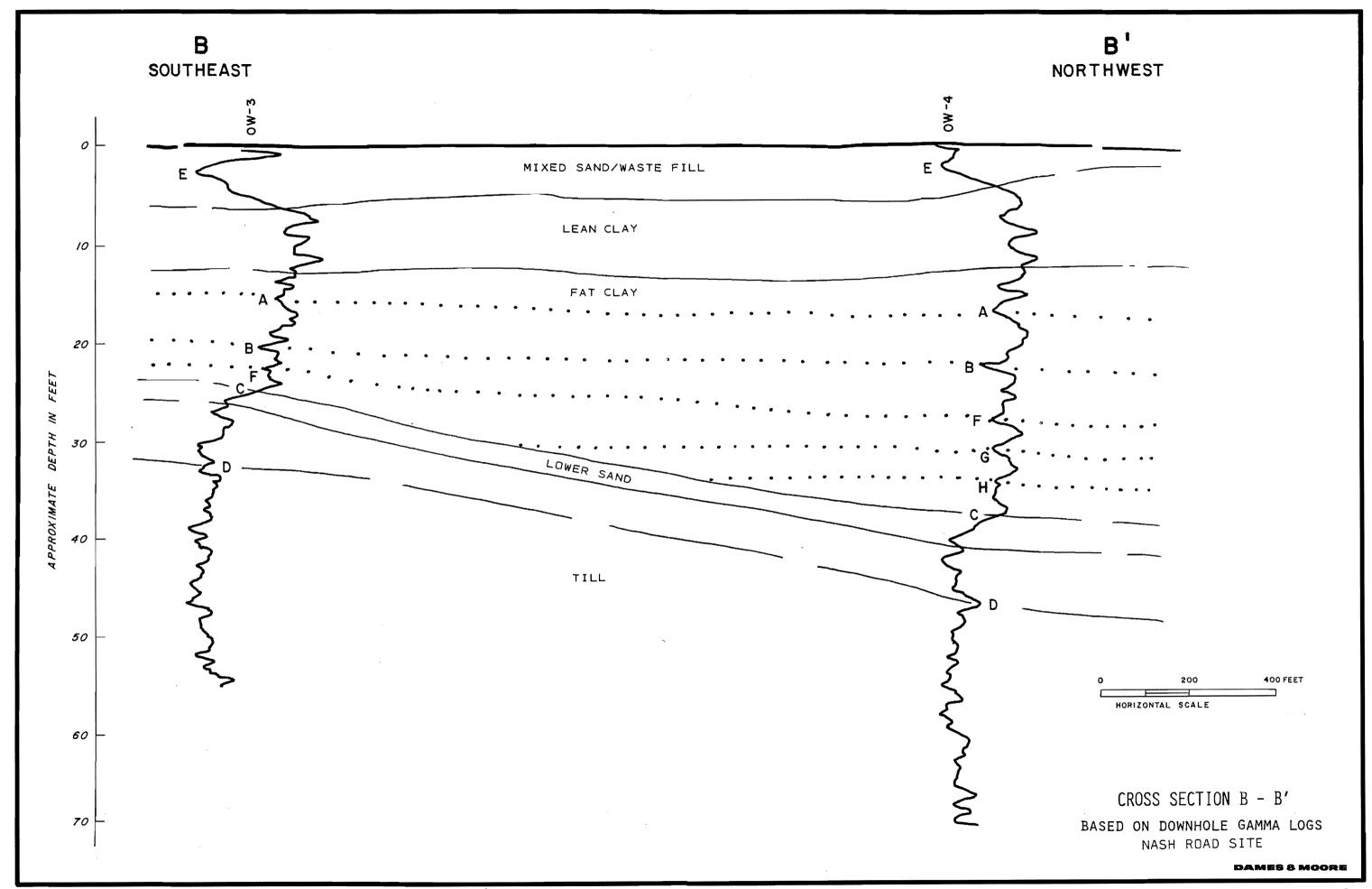




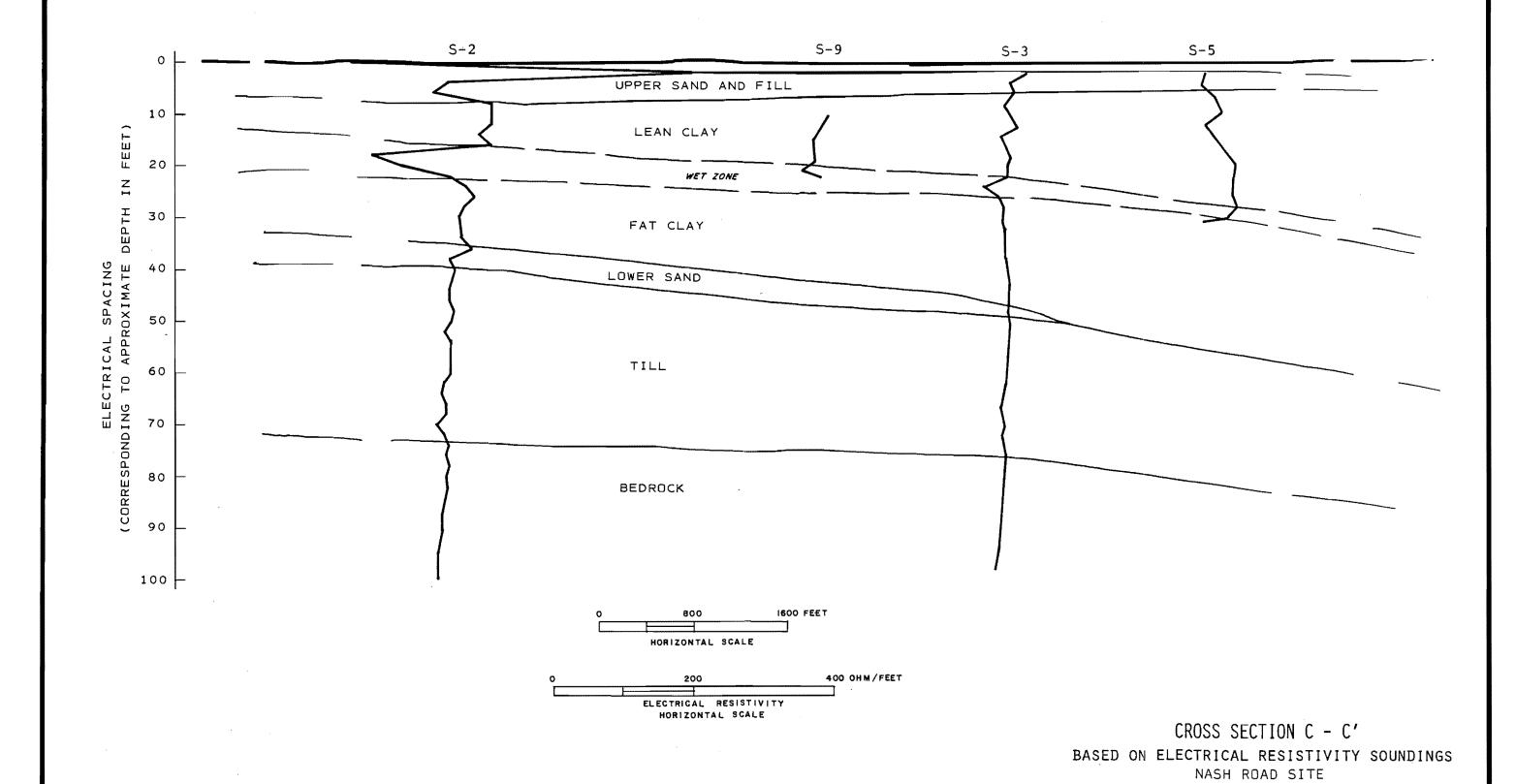


BY O James





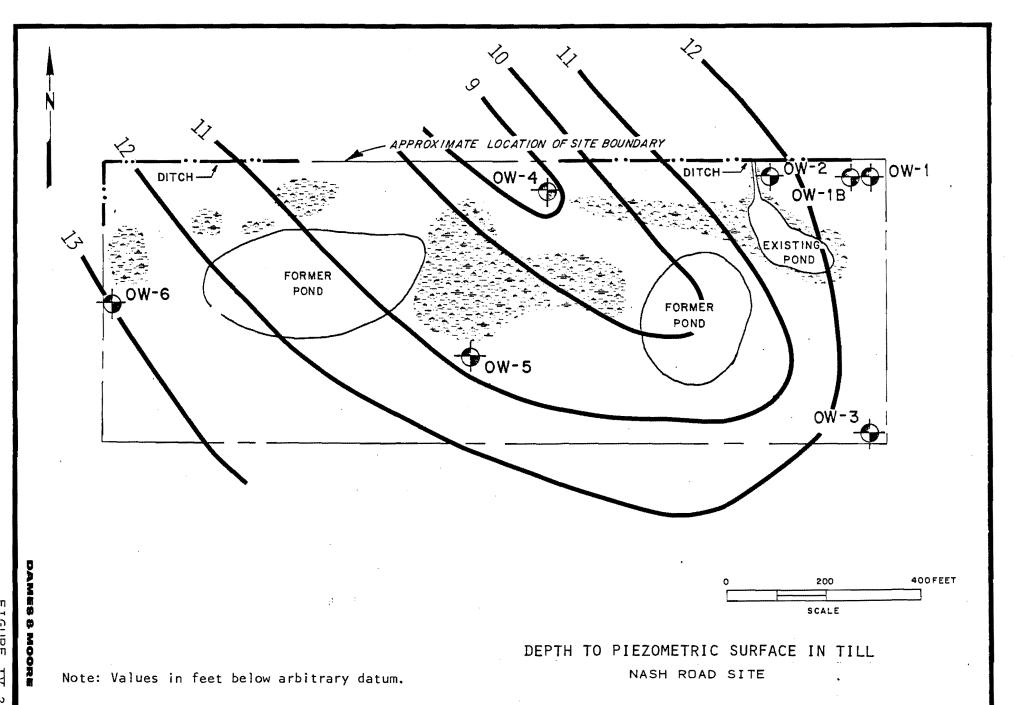




DAMES 8 MOORE

FIGURE IV.19

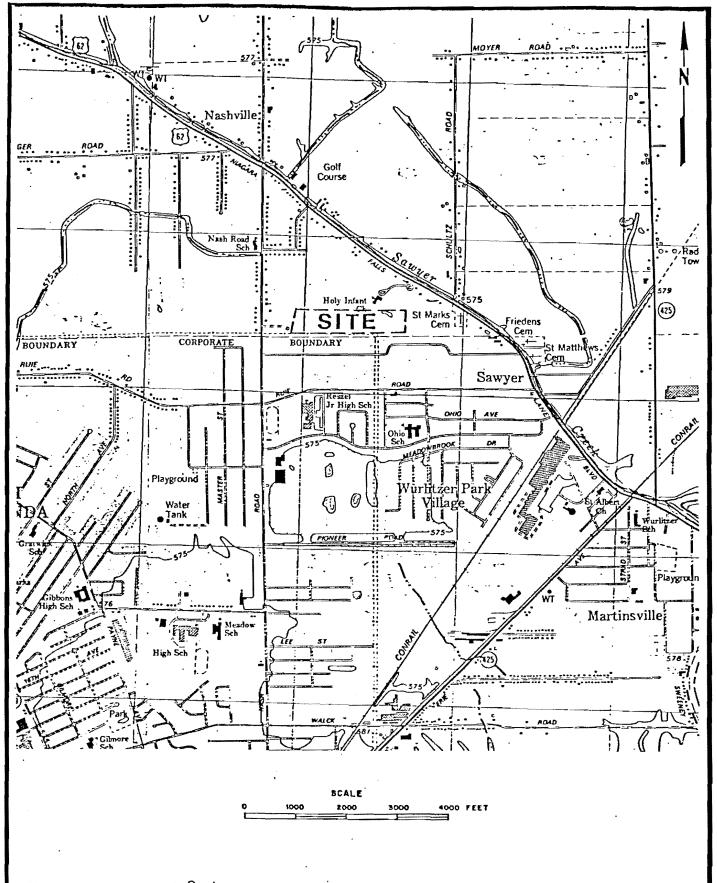
BY O Done DATE 2/25/84



FINAL HAZARD RANKING SYSTEM
for
Niagara Sanitation Landfill
Nash Road
Town of Wheatfield
Niagara County, New York State

The 25-acre site is an inactive landfill in the Town of Wheatfield, Niagara County (NYS) adjacent to the North Tonawanda City boundary. It is located in a suburban residential area, and is partly overgrown with trees and marsh vegetation. Nearby residents use the site as a jogging area, dirt bike track, and play area. The landfill was operated by Niagara Sanitation Company between 1964 and 1968. Both municipal and industrial wastes, including caustic materials and sludges, are disposed at the site. In addition, between 6/6/68 and 7/15/68, approximately 900 cubic yards of waste materials from the excavation of a sewer line at the Love Canal site were disposed in an excavated trench on this site (memo of 8/9/78 to Hennessy, NYSDOT).

Although some wastes are covered, protruding refuse is visible on the ground surface. For the Phase II study, several surface water, sediment and groundwater samples were chemically analyzed for a limited number of contaminants. Sediment was found to contain low levels of metals. No organic contaminants were found in the groundwater or surface water. A USGS (1982) investigation identified metal contamination in the shallow aquifer; current concern centers on the possible lack of containment of the waste and the migration of contaminants off-site. At the present time, no cleanup or enforcement actions are ongoing.



SITE COORDINATES: 43°04' 10.0" N. LAT 78°51' 33.8" W. LONG

REFERENCE: U.S.G.S. 7.5' TOPOGRAPHIC MAP TONAMANDA EAST, NY (1980) AND TONAMANDA WEST, NY (1980) QUADRANGLES SITE LOCATION MAP NASH ROAD SITE

DAMES 8 MOORE

HRS COVER SHEET

,		
Facility name:	NASH R	OAD LANDFILL
Location:	TOWN O	F_WHEATFIELD
EPA Region:	II	
Person(s) in charge of the	e facility:_	Ed Greinert
		Town Supervisor
	, M anagement	Town of Wheatfield, N.Y.
Name of Reviewer: Eileen	Gilligan	Date: 11/8/84
hazardous substances; loc concern; types of informa Landfill used by Nia industrial wastes. Waste Love Canal site disposed	cation of the ation needed agara Sanitate materials for the site	dment, pile, container; types of facility; contamination route of major for rating; agency action, etc.) ion 1964-1968 for both municipal and rom the excavation of a sewer at the in 1968. Improperly closed, rubbish found in soil and groundwater samples.
Constitution of the Consti		
	·	
Scores: $S_M = 5.37 (S_{gw} =$	5.65 S _{sw} =	$7.38 S_a = 0.0)$
S _{FE} = 26.25		
$S_{DC} = 37.50$		
		•

HRS COVER SHEET

Facility Name: <u>Nash</u>	Road Landfill	Date	11/	8/84				
Surface Water Route Work Sheet								
Rating Factor Assigned Value Multi-plier Score Max. Ref. (Section)								
1 Observed Release	() 45	1	O	45	4.1			
If observed release is If observed release is								
2 Route Characteristics					4.2			
Facility Slope and Intervening Terrain	0 1 2 3	1	0	3				
1-yr. 24-hr. Rainfall Distance to Nearest	0 1 2 3	1 2	2 6	3 6				
Surface Water Physical State	0 1 2 3	· 1	3	3				
Total Route C	haracteristics Scor	е	11	15				
3 Containment	0 1 2 3	1	3	3	4.3			
Waste Characteristics								
Toxicity/Persistence			18	18				
Hazardous Waste Quantity	0 1 2 3 4 5 6 7	8 1	6	8	-			
Total Waste C	haracteristics Scor	e	24	26				
5 Targets					4.5			
Surface Water Use Distance to a Sensiti	0 1 (2) 3 ve (0) 1 2 3	` 3 2	6 0	9 6				
Environment Population Served/ Distance to Water Intake Downstream	① 4 6 8 10 12 16 18 20 24 30 32 35 40	1	o	40				
Total T	argets Score		6	55				
6 If line 1 is 45, mul		5]] × [5]	4752	64,350				
7 Divide line 6 by $64,350$ and multiply by 100 $S_{sw} = 7.38$								

SURFACE WATER ROUTE WORK SHEET

Facility Name: Nash Road Landfill Date: 11/8/84									
Ground Water Route Work Sheet									
Rating Factor		ned Value :le One)	Multi- plier	Score	Max. Score	Ref. (Section)			
1 Observed Release	0	45)	1	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				
Net Precipitation Permeability of the	0 1 0 1	2 3 2 3	1 1		3 3	:			
Unsaturated Zone Physical State	0 1	2 3	1 .		3				
Total Route (Characte	ristics Sc	ore		15				
3 Containment 0 1 2 3 1 3									
Waste Characteristics						3.4			
Toxicity/Persistence Hazardous Waste Quantity	0 3 6 0 1 2	9 12 15 (1 3 4 5 6 7	8) 1 8 1	18 6	18 8				
Total Waste Ch	naracter	istics Sco	re	. 24	26				
5 Targets						3.5			
Ground Water Use Distance to Nearest Well/Population Served	$ \begin{array}{ccc} 0 & 1 \\ 0 & 4 \\ 12 & 16 \\ 24 & 30 \end{array} $		3	0	9 40				
Total Tar	3	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					57,330				
7 Divide line 6 by 57,3	330 and	multiply b	y 100	\$ = !	5.65	-			

GROUND WATER ROUTE WORK SHEET

Air Route Work Sheet Assigned Value Multi-Max. Ref. Score Rating Factor (Section) (Circle One) plier Score 1 Observed Release 45 45 0 5.1 Date and Location: July 1984 Air Quality Survey Sampling Protocol: HNU survey If line $\boxed{1}$ is 0, the $S_a = 0$. Enter on line $\boxed{5}$. \checkmark If line 1 is 45, then proceed to line 2. Waste Characteristics 5.2 0 1 2 3 1 3 Reactivity and Incompatibility Toxicity 0 1 2 3 4 5 6 7 8 Hazardous Waste Total Waste Characteristics Score 20 3 Targets 5.3 0 9 12 15 18 30 Population Within 4-Mile Radius 21 24 27 30 6 Distance to Sensitive Environment 3 0 1 2 3 Land Use 39 Total Targets Score 4 Multiply $1 \times 2 \times 3$ 35,100 Divide line 4 by 35,100 and multiply by 100 $S_a = 0$

Date: 8/13/84

Facility Name: Nash Road Landfill

AIR ROUTE WORK SHEET

290	Facility Name: Nash R	Road Landfill	Date	8/13	3/84				
1	Direct Contact Work Sheet								
	Rating Factor	Assigned Value (Circle One)	Multi- plier	Score	Max. Score	Ref. (Section)			
~	1 Observed Incident	0 45	1	0	45	8.1			
·**	If line 1 is 45, pro		<i>,</i>						
*	2 Accessibility	0 1 2 3	1	3	3	8.2			
۱.	3 Containment	0 (15)	1	15		8.3			
	Waste Characteristics Toxicity	0 1 2 (3)	5	15	15	8.4			
	5 Targets					8.5			
	Population Within 1-Mile Radius	0 1 2 3 4	5 4	12	20				
	Distance to a Critical Habitat	(1) 2 3	4	0	12				
	Total Ta	argets Score		12	32	,			
	6 If line 1 is 45, mul	tiply 1 x 4 x	5						
	If line 1 is 0, mult	8100	21,600						
,	7 Divide line 6 by 21,	600 and multiply	by 100	s _{DC} =	37.50				

DIRECT CONTACT WORK SHEET

Date: 8/13/84 Fire and Explosion Work Sheet Assigned Value Multi-Max. Ref. Rating Factor Score (Circle One) plier Score (Section) 1 Containment 3 7.1 3 2 Waste Characteristics 7.2 Direct Evidence Ignitability Reactivity Incompatibility 3 Hazardous Waste Quantity Total Waste Characteristics Score 20 3 Targets 7.3 0 1 2 (3) 4 5 Distance to Nearest 1 5 Population Distance to Nearest 1 3 Building Distance to Sensitive 3 Environment Land Use Population Within 2-Mile Radius Buildings Within 5 2-Mile Radius Total Targets Score 24 14 4 Multiply $1 \times 2 \times 3$ 378 1,440 5 Divide line 4 by 1,440 and multiply by 100 26.25 S_{FF} =

Facility Name: Nash Road Landfill

FIRE AND EXPLOSION WORK SHEET

Worksheet for Computing S_{M}

	S	s ²
Groundwater Route Score (S _{gw})	5.65	31.92
Surface Water Route Score (S _{sw})	7.38	54.53
Air Route Score (S _a)	0.0	0.0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		86.45
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		9.30
$\sqrt{s_{gw}^2 + s_{sw}^2 + s_a^2} / 1.73 = s_M =$		5.37

WORK SHEET FOR COMPUTING SM

HRS DOCUMENTATION RECORDS

- 1) HAZARD RANKING SYSTEM
- 2) HNU PHOTO-IONIZER READING
- 3) OSTERMAN WELL
- 4) TRIP BLANKS
- 5) SEDIMENT DATA
- 6) GROUNDWATER DATA
- 7) SURFACE WATER DATA
- 8) BORING LOGS
- 9) SAMPLING LOCATION MAP
- 10) PERMEABILITY TEST DATA
- 11) BACKGROUND INFORMATION

1) HAZARD RANKING SYSTEM

DOCUMENTATION RECORDS FOR HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY	NAME:	Nash	Road	Landf	i11					
TOGRATON		Nach	Poad	Town	of	Wheatfield,	Niagara	Co	New	York
LOCATION:	:	Nasii	Roau,	TOWIT	Οī	wileactieta,	Miayara	CO.,	MCM	TOLK

GROUND WATER ROUTE

1. OBSERVED RELEASE

Contaminants detected (5 maximum):

lead

total halogenated organics

nickel

arsenic

phenol

Rationale for attributing the contaminants to the facility:

groundwater sample from USGS study (1982)

* * *

2. ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) in concern:

- 1) shallow aquifer in upper (surface) sand unit

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

- 1) approximately 0 feet
- 2) approximately 8 feet

(ES/D&M soil borings and field investigations)
Depth from the ground surface to the lowest point of waste disposal/
storage:

27 feet in disposal trench

(New York State Department of Transportation memorandum of August 9, 1978)

(Niagara County Department of Health memorandum from M. Hopkins, January 27, 1984)

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

40"

(Federal Register, Volume 47 no. 137, Friday, July 16, 1982)

Mean annual lake or seasonal evaporation (list months for seasonal):

27"

(Federal Register, Volume 47 no. 137, Friday, July 16, 1982)

Net precipitation (subtract the above figures):

$$40" - 27" = 13"$$

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

In western part of site, surface soil is a fine to medium sand. In eastern part of site, surface soil is clayey silt with trace of fine sand.

Permeability associated with soil type:

- 1) western part: 10^{-3} cm/sec (Lambe & Whitman)
- 2) eastern part: 5×10^{-4} cm/sec (in-situ test)

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

solids

liquids in drums

(Dames & Moore site visit) (Memo of August 9, 1978)

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

drums and uncontained wastes

Method with highest score:

drums

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

phenol lead nickel

arsenic (USGS study of 1982)

Compound with highest score:

lead (3,3) → 18

chlorotoluenes benzoyl chloride benzoic acid (Hooker letter of May 9, 1968)

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

900 cubic yards of chemical waste from Love Canal plus unknown quantity of other industrial waste

Basis of estimating and/or computing waste quantity:

DOT memo of August 9, 1978

5 TARGETS

Ground Water Use

Uses(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Available for industrial use

(Discussion with M. Hopkins, Niagara Co. Dept. of Health, 1983)

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

Osterman residential well at 7403 Nash Road (presently unused but useable)

Distance to above well or building:

1,000 feet west of site

(USGS Topographic map; Tonawanda East, NY quadrangle)

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

None.

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

Not applicable.

Total population served by ground water within a 3-mile radius:

0

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

XOT

methylene chloride

(Very low levels (11 ppb) may be indicative of background levels)

Rationale for attributing the contaminants to the facility:

Analysis of surface water samples in June, 1983 by Engineering Science/Dames & Moore

* * *

2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

0%

(USGS topographic map; Tonawanda East, NY)
Name/description of nearest downslope surface water:

Sawyer Creek (USGS topographic mapl Tonawanda East, NY)

Average slope of terrain between facility and above-cited surface water body in percent:

<1%

(USGS topographic map; Tonawanda East, NY)

Is the facility located either totally or partially in surface water?

Yes. Wastes in swamp areas and in water-filled disposal trenches.

Is the facility completely surrounded by areas of higher elevation?

No. (USGS topographic map; Tonawanda East, NY)

1-Year 24-Hour Rainfall in Inches

2.1"
(Federal Register vol. 47, no. 137, Friday, July 16, 1982)

Distance to Nearest Downslope Surface Water

0.25 miles
(USGS topographic map; Tonawanda East, NY)

Physical State of Wastes

liquid and solid (Dames & Moore site visit memo of 8/9/78)

* * *

3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

drums and uncontained (NYSDEC memo of August 9, 1978)

Method with the highest score:

drums

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

phenol lead iron nickel chlorotoluenes benzoyl chloride benzoic acid

(Hooker letter of May 9, 1968)

(USGS study - 1982)

Compound with the highest score:

lead (3,3) → 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

900 cubic yards of chemical waste from Love Canal and unknown quantity of other industrial waste

Basis of estimating and/or computing waste quantity:

NYSDOT memo of August 9, 1978

* * *

5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

recreation transportation (numerous ES/D&M site visits)

Is there tidal influence?

No.

Distance to a Sensitive Environment (Ref: USGS topographic map)

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

none within 2 miles.

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile.

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

None within 1 mile. (Conversation with G. Batcheller, NYSDEC, Region 9)

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

None. (USGS topographic map; Tonawanda East, NY)

Computation of land area by above-cited intake(s) and conversion to population (1.5 people per acre):

Not applicable.

Total population served:

0.

Name/description of nearest of above water bodies:

Not applicable.

Distance to above-cited intakes, measured in stream miles:

Not applicable.

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

None detected with HNU meter during air survey of site by Dames & Moore in July, 1984.

Date and location of detection of contaminants

Not applicable.

Methods used to detect the contaminants:
Not applicable.

Rationale for attributing the contaminants to the site:

Not applicable.

2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Not applicable.

Most incompatible pair of compounds:

Not applicable.

Toxicity

Most toxic compound:

Not applicable.

Hazardous Waste Quantity

Total quantity of hazardous waste:

Not applicable.

Basis of estimating and/or computing waste quantity:

Not applicable.

* * *

3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi

0 to 1/2 mi

0 to 1/4 mi

Approximately 1,800 people (estimate from USGS topographic map)

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

None within 2 miles. (USGS topographic map)

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

None within 1 mile. (USGS topographic map)

Distance to critical habitat of an endangered species, if 1 mile or less:

None within 1 mile.
(Conversation with G. Batcheller of NYSDEC, Region 9)

Land Use (Ref: Numberous site visits by ES/D&M personnel)

Distance to commercial/industrial area, if 1 mile or less:

0.01 mile (adjacent to National Fuel Gas installation)

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

None within 2 miles.

Distance to residential area, if 2 miles or less:

0.01 mile (adjacent to suburban area)

Distance to agricultural land in production within past 5 years, if 1 mile or less:

0.01 mile (adjacent to corn field)

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

None within 2 miles.

Is a historic or landmark site (National Register of Historic Places and National Natural Landmarks) within view of the site?

No.

2) HNU PHOTO-IONIZER READING

13305-003-19 SUBJECT HNO DHOTO-IONIZER 7/10/84 4 ppm/cm SCALE HORZ 2"= 1 HR

2467

CHECKED BY

CATE.

SIOIS

3) OSTERMAN WELL

COMPUCHEM LABORATORIES

August 30, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

Customer Service Dept. CompuChem®

Enclosure:

Report: 0ST-1 - 32303

DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of asreceived material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	Date
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

^{*}While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

REPORT OF DATA

SAMPLE IDENTIFIER: OST-1

COMPUCHEM SAMPLE NUMBER: 32303

SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

TECHNICAL SPECIALIST, OPERATIONS

DIÀNA A. SCAMMELL

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER DIRECTOR OF QUALITY ASSURANCE

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

:		••	<u>Date</u>
Recei	ved/Refrigerated		7-27-84
0rgani	ice		
or yan	103		
E	Extracted	,	7-30-84
	Analyzed		
	1. Volatiles	•	7-31-84
3	2. Acid		8-8-84
	3. Base/Neutrals		8-7-84
λ	4. Pesticides/PCBS		8-7-84
Inorga	ınics	e [‡]	
-) "	1. Metals		8-14-84
	2. Cyanide		8-9-84
	3 Phonole		Not Requested

VOLATILES ORGANICS

COMPOUND LIST

SAMPLE IDENTIFIER: OST-1
COMPUCHEM SAMPLE NUMBER: 32303

		DETECTION	
		CONCENTRATION LIMIT	
		(UG/L) (UG/L)	
1,1			
1 V	CHLOROMETHANE	BDL 10	
27.	VINYL CHLORIDE	BDL 10	
3V.	CHLOROETHANE	BDL 10	
	BROMOMETHANE	BDL 10	
	ACROLEIN	BDL 100	
	ACRYLONITRILE	BDL 100	
	METHYLENE CHLORIDE	14(BG)* 10	
	TRICHLOROFLUOROMETHANE	BDL 10	
	1,1-DICHLOROETHYLENE	BDL 10	
		BDL 10	
111	1,1-DICHLOROETHANE	BDL 10	
104	TRANS-1,2-DICHLOROETHYLENE CHLOROFORM	BDL 10	
		BDL 10	
	1,2-DICHLOROETHANE	BDL 10	
	1,1,1-TRICHLOROETHANE	BDL 10	~
	CARBON TETRACHLORIDE	BDL 10	
	BROMODICHLOROMETHANE	BDL 10	
	1,2-DICHLOROPROPANE		
187.	TRANS-1,3-DICHLOROPROPENE		
190.	TRICHLOROETHYLENE BENZENE		
		·	
	CIS-1,3-DICHLOROPROPENE	· ·	
22V.	1,1,2-TRICHLOROETHANE	BDL 10 BDL 10	
23V .	DIBROMOCHLOROMETHANE	BDL 10	
	BROMOFORM	BDL 10	
257	1,1,2,2-TETRACHLOROETHYLENE	BDL 10	
	1,1,2,2-TETRACHLOROETHANE	BDL 10	
	TOLUENE	BDL 10	
	CHLOROBENZENE	BDL 10	
297	ETHYLBENZENE	BDL 10	
	2-CHLOROETHYL VINYL ETHER	BDL 10	
31V.	DICHLORODIFLUOROMETHANE [†]		
JZV.	BIS(CHLOROMETHYL)ETHER†	BDL	

BDL=BELOW DETECTION LIMIT

[†]See Data Report Notice

^{*}See Quality Control Notice

QUALITY ASSURANCE NOTICE

CompuChem	Sample	No.	32303
compachem	Jamp I C	110	32303

Although not required by the Federal Register, December 3, 1979 (modified July, 1982) Volatile Method 624 procedure, the laboratory prepares VOA blanks when compositing water samples and preparing low and medium level hazardous waste VOA samples. This is to insure that the glassware used is free from contamination, and to monitor the possibility of cross-contamination from high levels of volatile organic compounds in some samples and the laboratory atmosphere.

The compositing or method blank (# 32333) prepared with this sample contained the compound(s) listed below. The concentration in the associated sample has been adjusted and the data flagged with a qualifier.

Compound(s)	Adjusted Sample Concentration (ug/l)		Applicable Qualifier	
Methylene Chloride	14	.*	BG	**

The following data qualifiers are used by EPA and adopted by CompuChem® for reporting purposes:

BG = The concentration in the blank is greater than $\frac{1}{2}$ of the method detection limit and is less than or equal to $\frac{1}{2}$ the concentration detected in a sample; the concentration in the blank is subtracted from the sample.

COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: 0ST-1 COMPUCHEM SAMPLE NUMBER: 32303

	CONCENTRATION (UG/L)	LIMIT (UG/L)
1A. PHENOL	BDL	25
2A. 2-CHLOROPHENOL	BDL	25
3A. 2-NITROPHENOL	BDL.	25
4A. 2,4-DIMETHYLPHENOL	BDL	25
5A. 2.4-DICHLOROPHENOL	BDL	2 5
6A. P-CHLORO-M-CRESOL	BDL	25
7A. 2,4,6-TRICHLOROPHENOL	BDL.	25
8A. 2.4-DINITROPHENOL	BDL	250
	BDL	25
	BDL	250
10A. 4,6-DINITRO-O-CRESOL	BDL	25
11A. PENTACHLOROPHENOL	ODL.	23

			:
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		,	
			: :
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	r,		

COMPOUND LIST : -- BASE-NEUTRAL EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

		CONCENTF (UG/L		DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE BIS (2-CHLOROETHYL) ETHER		BDL BDL	10 10
	1,3-DICHLOROBENZENE	1,	BDL	10
	1,4-DICHLOROBENZENE		BDL	10
	1,2-DICHLOROBENZENE		BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	* * ,	BDL	10
	HEXACHLOROETHANE		BDL	10
	N-NITROSODI-N-PROPYLAMINE		BDL	10
9B.	NITROBENZENE		BDL ·	10
	ISOPHORONE		BDL	10
	BIS(2-CHLOROETHOXY) METHANE		BDL BDL	10 10
	1,2,4-TRICHLOROBENZENE	•	BDL	10
	NAPHTHALENE HEXACHLOROBUTADIENE		BDL	10
	HEXACHLOROCYCLOPENTADIENE		BDL.	10
	2-CHLORONAPHTHALENE		BDL	10
	DIMETHYLPHTHALATE		BDL	10
	ACENAPHTHYLENE		BDL.	10
	2,6-DINITROTOLUENE	4.3	BDL	10
	ACENAPHTHENE		BDL	10
21B.	2,4-DINITROTOLUENE		BDL	10
	DIETHYLPHTHALATE		BDL.	10
	FLUORENE		BDL	10
	4-CHLOROPHENYL PHENYL ETHER		BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	-	BDL	10
26B. §	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)		BDL	10 10
	4-BROMOPHENYL PHENYL ETHER		BDL BDL	10
200 ·	HEXACHLOROBENZENE	*	טטנ	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

		CONCENT (UG)		LIMIT (UG/L)
29B . PHENANTHRENE			BDL	10
30B. ANTHRACENE	•		BDL	· 10
31B. DI-N-BUTYLPHTHALATE			BDL	10
32B. FLUORANTHENE		* * *	BDL	10
33B. BENZIDINE			BDL	10
34B. PYRENE		`	BDL	10
35B BUTYLBENZYLPHTHALATE		33		10
36B. BENZO(A)ANTHRACENE		•	BDL	10
37B. 3.3'-DICHLOROBENZIDINE			BDL	10
38B. CHRYSENE			BDL	10
39B. BIS(2-ETHYLHEXYL)PHTHALAT	Έ		BDL	10
40B. DI-N-OCTYLPHTHALATE			BDL	10
41B. BENZO(B)FLUORANTHENE			BDL	10
42B. BENZO(K)FLUORANTHENE			BDL	10
43B. BENZO(A)PYRENE	*		BDL	10
44B. INDENO(1,2,3-C,D)PYRENE	, C.	*	BDL	25
45B. DIBENZO(A,H)ANTHRACENE			BDL	25
46B. BENZO(G,H,I)PERYLENE	•		BDL	25

COMPOUND LIST -- PESTICIDES/PCB'S

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

			· · · · · · · · · · · · · · · · · · ·			CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1P.	ALDRIN					BDL	10
2P.	ALPHA-BHC	•				BDL	10
3P.	BETA-BHC	4				BDL	10
4P.	GAMMA-BHC			• •		BDL	10
5P.	DELTA-BHC					BDL	10
6P.	CHLORDANE					BDL	10
7P.	4,4'-DDT					BDL	10
8P.	4,4'-DDE					BDL	10
	4,4'-DDD	•	.,			BDL	10
10P.	DIELDRIN				•	BDL	10
11P.	ALPHA-ENDOS	SULFAN	:			BDL	10
12P.	BETA-ENDOS	JLFAN			,	BDL	10
13P.	ENDOSULFAN	SULFATE	u u			, BDL	10
14P.	ENDRIN					BDL.	10
15P.	ENDRIN ALD	EHYDE				BDL	10
16P.	HEPTACHLOR		*	*		BDL	10
17P.:	HEPTACHLOR	EPOXIDE	,	**		BDL	10
18P.	PCB-1242	.:				BDL	10
19P.3	PCB-1254	÷ .		*		BDL	10
20P.	PCB-1221		* ¥			BDL.	10
21P.	PCB-1232	•		**		BDL	10
22P.	PCB-1248			1 1	1	BDL	10
23P.						BDL	10
24P.		·		• .	:	BDL	10
25P.	TOXAPHENE			,		BDL	10

COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: OST-1
COMPUCHEM SAMPLE NUMBER: 32303

	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
1. CADMIUM, TOTAL 2. CHROMIUM, TOTAL 3. COPPER, TOTAL 4. LEAD, TOTAL * 5. MERCURY, TOTAL 6. ZINC, TOTAL 7. NICKEL, TOTAL 8. CYANIDE	BDL BDL BDL 0.0008 0.05 BDL BDL	0.010 0.050 0.10 0.50 0.0002 0.020 0.10 0.01
)	p.05

BDL=BELOW DETECTION LIMIT

*Lead analyzed by flame AAS because of concentration level found.





Send copy to
Gilligan, DEM
File
Rocco

NOV 19 1984

November 8, 1984

Mr. Rocco Palazzolo Engineering Science, Inc. 57 Executive Park South Suite 590 Miles Atlanta, GA 30329

RE: Data Inquiry for sample OST-1/32303

Dear Mr. Palazzolo:

Enclosed is an amended compound list for sample number 32303 that reflects the correct detection limit for lead.

We apologize for any inconvenience you may have experienced. If you have further questions please feel free to call me at 1/800-334-8525.

Sincerely,

Diana A. Scammell

Technical Specialist, Operations

cc: Robert Meierer Mickey Cartagena File #32303

COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: OST-1 COMPUCHEM SAMPLE NUMBER: 32303

			2	CONCENTRATION (MG/L)	DETECTION LIMIT (MG/L)
	•	* · · · · · ·			
1.	CADMIUM, TOTAL	:		. BDL	0.010
	CHROMIUM, TOTAL			BDL	0.050
	COPPER, TOTAL			BDL	0.10
	LEAD, TOTAL*	•		0.14	0.050
	MERCURY, TOTAL			0.0008	0.00020
	ZINC, TOTAL			0.05	0.020
	NICKEL, TOTAL			BDL	0.10
	CYANIDE			BDL	0.010

BDL=BELOW DETECTION LIMIT *Lead analyzed by flame AAS because of concentration level found.



RECRA ENVIRONMENTAL LABORATORIES

1st sample of Gill Creek Solv. Chen 1st sample of Osterman Welf Nac

H₂M

PRIORITY POLLUTANT ANALYSES

Prepared For:

H₂M 575 Broadhallow Road Melville, NY 11747

Prepared By:

Recra Environmental Laboratories 4248 Ridge Lea Road Amherst, NY 14226

Report Date: October 3, 1984

H2M PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

INTRODUCTION:

On September 5, 1984 samples were received at Recra Environmental Laboratories. A request was made by H2M to have the samples analyzed for selected fractions of the Environmental Protection Agency decreed priority pollutants.

This report will address the results of those analyses.

METHODS:

Priority pollutant analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

Organic priority pollutants were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). Pesticide priority pollutants were analyzed by Gas Chromatography.

RESULTS AND DISCUSSION:

No Volatile field blank was received.

Analyses for specific Pesticides/PCB's are based upon the matching of retention times between samples and standards on a single gas chromatographic column. Gas chromatographic values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Pesticides identified by Gas Chromatography are at concentrations too low for confirmation via Gas Chromatography/Mass Spectrometry.

Compounds reported as ND are "not detected".

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Barbara & Krajewsh



ECRA ENVIRONMENTAL LABORATORISE

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

ACID/PHENOLICS

		SAMPLE IDENTIFICATION		
COMPOUND .	DETECTION LIMIT • (ug/1)	GILL CREEK	OSTERMAN PROPERTY	
2-chlorophenol	3.3	ND	ND APPLA 6 TO	
2,4-dichlorophenol	2.7	ND	ND	
2,4-dimethylphenol	2.7	ND	ND	
4,6-dinitro-o-cresol	24	ND	ND	
2,4-dinitrophenol	42	ND	ND .	
2-nitrophenol	3.6	ND	ND	
4-nitrophenol	2.4	ND	ND	
p-chloro-m-cresol	3.0	ND	ND	
pentachlorophenol	3.6	ND	ND	
pheno1 ,	1.5	ND	ND ND	
2,4,6-trichlorophenol	2.7	ND °	ND	

ADDITIONAL SAMPLE INFORMATION

Sample Date	7/11/84	7/11/84
Extraction Date	9/7/84	9/7/84
Analysis Date	9/19/84	9/19/84
Internal Standard (IS) - Level	20 μg/1	20 μg/1
deuterated phenanthrene - Recovery	100%	110%
Surrogate Standard (SS1) - Level	120 μg/l	120 µg/1
2-fluorophenol - Recovery	55%	30%
Surrogate Standard (SS2) Level	120 µg/1	120 µg/1
pentafluorophenol - Recovery	43%	27%

FOR RECRA ENVIRONMENTAL LABORATORIES

DATE 10/3/84

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

BASE/NEUTRALS

		SAMPLE IDE	NTIFICATION
	DETECTION		* * * * * * * * * * * * * * * * * * *
COMPOUND	LIMIT (ug/1)	GILL CREEK	OSTERMAN PROPERTY
icenaphthene	1.9		. ND
acenaphthylene	3.5	ND	ND
inthracene	1.9	· ND	מו י
*benzidine	44	ND	ND
benzo(a)anthracene	7.8	ND	ND
enzo(a)pyrene	2.5	ND	ND
benzo(b)fluoranthene	4.8	ND	ND .
penzo(g,h,i)perylene	4.1	ND	ND
benzo(k)fluoranthene	2.5	ND	ND
is(2-chloroethoxy)methane	5.3	ND	ND_
bis(2-chloroethyl)ether	5.7	ND	ND
bis(2-chloroisopropy1)ether	5.7	ND	ND
tis(2-ethylhexyl)phthalate	2.5	ND_	ND .
4-bromophenylphenylether	1.9	ND	ND
putylbenzylphthalate	2.5	ND	ND
2-chloronaphthalene	1.9	· ND	ND
4-chlorophenylphenylether	4.2	' ND_	ND
chrysene	2.5	ND	ND
dibenzo(a,h)anthracene	2.5	ND	ND
1,2-dichlorobenzene	1.9	ND ND	ND
1,3-dichlorobenzene	1.9	ND	ND
1,4-dichlorobenzene	4.4	ND	ND
3,3'-dichlorobenzidine	16.5	ND	ND
diethylphthalate	22	ND	ND
dimethylphthalate	1.6	ND	ND
di-n-butylphthalate	2.5	ND	ND 1 of

(Continued)



H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date:

RASE /NEUTRALS

	BASE/NEUTRALS SAMPLE IDENTIFICATION				
COMPOUND	DETECTION LIMIT (µg/1)	GILL CREEK	OSTERMAN PROPERTY		
2,6-dinitrotoluene	1.9	ND ND	ND		
2,4-dinitrotoluene	5.7	ND .	ND .		
di-n-octylphthalate	2.5	ND	ND		
1,2-diphenylhydrazine	25	ND ;	ND		
fluoranthene	2.2	ND	ND		
fluorene	1.9	ND	ND ND		
hexachlorobenzene	1.9	ND ·	ND		
hexachlorobutadiene	0:9	· ND	ND ND		
hexachlorocyclopentadiene	25 '	ND	· ND		
hexachloroethane	1.6	ND	ND '		
indeno(1,2,3-cd)pyrene "	3,7	ND	ND		
isophorone	2.2	ND	ND		
naphthalene	1.6	ND	ND		
nitrobenzene	1.9	ND	ND		
N-nitrosodimethylamine	25	ND.	ND		
N-nitrosodi-n-propylamine	25	ND	ND		
N-nitrosodiphenylamine	1.9	ND	ND		
phenanthrene	5.4	ND	ND		
pyrene	1.9	ND	ND .		
1,2,4-trichlorobenzene	1.9	ND	ND .		

ADDITIONAL SAMPLE INFORMATION

Sample Date	7/11/84	7/11/84
Extraction Date	9/7/84	9/7/84
Analysis Date	9/19/84	9/19/84
Internal Standard - Level	20 ug/1	20 µg/1
deuterated phenanthrene - Recovery	100%	110%
Surrogate Standard (SS3) - Level	120 ug/1	120 µg/1
decafluorobiphenyl - Recovery	55%	45%
Surrogate Standard (SS4) - Level	100_ug/1	100 μg/1
2-fluorobiphenyl - Recovery	60%	47%

FOR RECRA ENVIRONMENTAL LABORATORIES Author Shapeuslu

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY , PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

VOLATILES

	voi	LATILES		
	1. S. S.	SAMPLE IDENTIFICATION		
	DETECTION	1. 多性性的原因 建二氯		
СОМРОИИ	(µg/1)	GILL CREEK	OSTERMAN PROPERTY	
acrolein	400	ND	ND TO THE STATE OF	
acrylonitrile	400	ND_	ND CONTRACTOR	
benzene	4.4	ND	ND ND	
bromodichloromethane	2.2	ND_	ND THE PLANT	
bromoform	4.7	ND	ND ND	
- bromomethane	10	ND	ND	
carbon tetrachloride	2.8	ND	ND	
chlorobenzene	6.0	ND	ND	
chloroethane	10	ND	ND	
2-chloroethylvinyl ether	10	ND	ND	
chloroform	1.6	, ND	° ND	
chloromethane	10	ND	ND	
dibromochloromethane	3.1	ND .	ND ND	
1,1-dichloroethane	4.7	ND	ND MARK A	
1,2-dichloroethane	2.8	ND	ND	
1,1-dichloroethylene	2.8	ND	ND Baseline	
trans-1,2-dichloroethylene	1.6	ND	ND ND	
1,2-dichloropropane	6.0	ND _	ND Section 1984	
1,3-dichloropropene	5.0	ND	ND ND	
ethylbenzene	7.2	ND	ND ** A **	
methylene chloride	2.8	ND	ND GALL	
1,1,2,2-tetrachloroethane	6.9	ND	ND ND	
tetrachloroethylene	4.1	ND ND	ND Av	

(Continued)



H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: : 10/3/84

VOLATILES

The contract of the contract o	٠.	SAMPLE IDENTIFICATION		
	DETECTION	大学 经基本条件		
COLMOTHIN	,			
COMPOUND	(ug/1)	GILL CREEK	OSTERMAN PROPERTY	
toluene	6.0	ND	ND	
1,1,1-trichloroethane	3.8	ND	ND	
1,1,2-trichloroethane	5.0	ND	ND '	
trichloroethylene	1.9	ND	ND	
vinyl chloride	10	ND	ND ND	
	COMPOUND toluene	COMPOUND LIMIT (ug/1) toluene 6.0 1,1,1-trichloroethane 3.8 1,1,2-trichloroethane 5.0 trichloroethylene 1.9	DETECTION LIMIT GILL CREEK	

ADDITIONAL SAMPLE INFORMATION

ADDITIONAL DATE DE INFORMITON		·
Sample Date	7/11/84	7/11/84
Analysis Date	9/17/84	9/17/84
Internal Standard - Level	40 µg/1	40 μg/1
bromochloromethane - Recovery	73%	80%
Internal Standard - Level	40 μg/1	40 µg/1
T 2-bromo-1-chloropropane - Recovery	70%	73%
Internal Standard - Level	40 μg/1	40 μg/1
1,4-dichlorobutane - Recovery	76%	76%

FOR RECRA ENVIRONMENTAL LABORATORIES

DATE 10/3/84



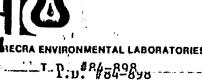
H2M GAS CHROMATOGRAPHY PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

PESTICI	'/PCB'S
LEGILL	. 1 (11)

	SAMPLE IDENTIFICATION (DATE)				
COMPOUND	UNITS OF MEASURE	GILL CREEK (7/11/84)	OSTERMAN PROPERTY (7/11/84)		
aldrin	ug/1	0.10	<0.01		
α-ВНС	ug/l	0.36	<0.01		
в-внс	ug/1	0.26	<0.01		
б-ВНС	ug/1	0.05	<0.01		
у-внс	ug/1	0.04	<0.01		
chlordane	μg/1	<0.2	<0.1		
4,4'-DDD	ug/1	<0.02	<0.01		
4,4'-DDE	ug/1	<0.02	<0.01		
4,4'-DDT	ug/1	<0.02	<0.01		
dieldrin	ug/l	<0.02	<0.01		
α-endosulfan	ug/l	<0.02	<0.01		
β-endosulfan	ug/1	<0.02	<0.01		
endosulfan sulfate	ug/1	<0.02	<0.01		
endrin	ug/1	<0.02	<0.01		
endrin aldehyde	ug/1	<0.02	<0.01		
heptachlor	μg/1	<0.02	<0.01		
heptachlor epoxide	μg/1 .	<0.02	<0.01		
PCB-1016	μg/1	<0.2	<0.1		
PCB-1221	μ g/1	<0.4	<0.2		
PCB-1232	μg/1	<0.4	<0.2		
PCB-1242	μg/1	<0.2	<0.1		
PCB-1248	μg/l	<0.2	<0.1		
PCB-1254	μg/l	<0.2	<0.1		
PCB-1260	μg/1	<0.2	<0.1		
toxaphene	μg/l	<0.2	<0.1		

FOR RECRA	ENVIRONMENTAL	LABORATO	RIES	7. Boyele	en e	***************************************	
•		· .	DATE	10/3/84			٠.,



H2M PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

METALS

		METALS	*			
		SAMPLE IDENTIFICATION (DATE)				
	UNITS OF	• GILLCREEK	OSTERMAN PROPERTY			
COMPOUND	MEASURE	(7/11/84)	(7/11/84)			
Total antimony	mg/l	<0.005	<0.005			
Total arsenic	mg/l	<0,005	<0.005			
Total beryllium	mg/l	<0.005	<0,005			
Total cadmium	mg/1	0,007	0,006			
Total chromium	mg/l	<0.005	<0.005			
Total copper	mg/1	0.010	0.013			
Total lead	mg/l	<0.005	<0.005			
Total mercury	mg/1	0.003	<0.0005			
Total nickel	mg/l	<0.005	<0.005			
Total selenium	mg/l	<0.005	<0.005			
Total silver	mg/1	<0.02	<0.02			
Total thallium	mg/1	<0.005	<0.005			
Total zinc	mg/1	0.061	0.258			

FOR RECRA ENVIRONMENTAL LABORATORIES

DATE

10/3/84



H2M PRIORITY POLLUTANT ANALYSES

Report Date: 10/3/84

MISCELLANEOUS

MISCELLANEOUS			
10 to		SAMPLE IDENTIFICATION (DATE)	
COMPOUND	UNITS OF MEASURE	GILL CREEK (7/11/84)	OSTERMAN PROPERTY (7/11/84)
ryest of symmetric and the	٠,		1 3 4 4 4
Total cyanide	mg/l	<0.010	<0.01
Total recoverable			
phenolics	mg/l	<0.01	<0.01

FOR RECRA ENVIRONMENTAL LABORATORIES DATE

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 10/3/84

EXTRACTABLE RECOVERY ANALYSIS OF SAMPLE GILL CREEK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	Z RECOVERY
2-chlorophenol	. 50	43	86
1,3-dichlorobenzene	50	29	58
2,4-dichlorophenol	50	46	. 92
di-n-octylphthalate .	50	29_	58
fluoranthene	50	50	100
naphthalene	50	34	68
nitrobenzene	50	36	72
2,4,6-trichlorophenol	50	29	58

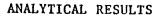
ADDITIONAL SAMPLE INFORMATION

Sample Date	7/11/84
Extraction Date	9/7/84
Analysis Date	9/19/84
Internal Standard (IS) - Level	20 μg/1
deuterated phenanthrene - Recovery	120%
Surrogate Standard (SS1) - Level	120 µg/1
2-fluorophenol - Recovery	36%
Surrogate Standard (SS2) - Level	120 µg/1
pentafluorophenol - Recovery	27%
Surrogate Standard (SS3) - Level	120 µg/1
decafluorobiphenyl - Recovery	46%
Surrogate Standard (SS4) - Level	100 ug/1
2-fluorobiphenyl - Recovery	52%

FOR RECRA ENVIRONMENTAL LABORATORIES

Brilaca & Krajewski DATE

CRA ENVIRONMENTAL LABORATORIES I.D. #84-898



H2M GAS CHROMATOGRAPHY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 10/3/84

PESTICIDE RECOVERY ANALYSIS OF SAMPLE GILL CREEK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
aldrin_	0.26	0.20	77
ү-внс	0.24	0.19	79
4,4'-DDE	0.25	0.20	80 -
β-endosulfan_	0.66	0.61	92
endrin	0.23	0.29	126
heptachlor	0.24	0.18	75

FOR RECRA ENVIRONMENTAL LABORATORIES L. Beyolc

DATE 10/3/84



4) TRIP BLANKS

SAMPLE IDENTIFIER: SD-1 Trip Blank COMPUCHEM SAMPLE NUMBER: 32302

	VOLATILE ORGANICS	CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)	SCAN NUMBER
17.	CHLO ROME THANE	BDL	10	
24.	VINYL CHLORIDE	BDL	10	
34.	CHLOROETHANE	BDL	10	i di
47.	BROMOMETHANE	BDL	10	
5V.	ACROLEIN	BDL	100	
	ACRYLONITRILE	BDL	100	
. 77.	•	BDL	10	
	TRICHLOROFLUOROMETHANE	BDL	10	की है। १ के किस
97.	1,1-DICHLOROETHYLENE	BDL	. 10	
107.	1,1-DICHLOROETHANE	BDL	10 .	q = i
117.	TRANS-1,2-DICHLOROETHYLENE	BDL	10	
12V.		BDL	10	
	1,2-DICHLOROETHANE	BDL	10	
147.	1,1,1-TRICHLOROETHANE	BDL.	10	
157.	CARBON TETRACHLORIDE	BDL	10	
167.	BROMODICHLOROMETHANE	BDL	10	
177.	1,2-DICHLOROPROPANE	BDL	10	. :
	TRANS-1,3-DICHLOROPROPENE	BDL	10	
	TRICHLOROETHYLENE	BDL -	10	
200	BENZENE	BDL	10	
	CIS-1,3-DICHLOROPROPENE	BDL	10	
	1,1,2-TRICHLOROETHANE	BDL.	10	
237.	DIBROMOCHLOROMETHANE	BDL	10	The state of
	BROMOFORM	BDL	10	
	1,1,2,2-TETRACHLOROETHYLENE	BDL	10	Ç.
267.	1,1,2,2-TETRACHLOROETHANE	BDL.	10	
27V.	TOLUENE	BDL	10	
287		BDL	10	
297.	ETHYLBENZENE	BDL	10	
30V ·	2-CHLOROETHYL VINYL ETHER	BDL	10	
	DICHLOROD IFLUOROMETHANE [†]	BDL	_	
32V.	BIS(CHLOROMETHYL)ETHER [†]	BDL		

BDL=BELOW DETECTION LIMIT

†See Data Report Notice

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-1 Trip Blank COMPUCHEM SAMPLE NUMBER: 32302

				<u>Date</u>
Receiv	ed/Ref	rigerated	13	07/27/84
•	•			•
Organi	cs		•	
E	xtract	ed		Not Required
, ,	Analyze	ed		
	1.	Volatiles		07/30/84
r	2.	Acid		Not Requested
	3.	Base/Neutrals		Not Requested
•	4.	Pesticides/PCBS	•	Not Requested
Inorga	inics	7	1	
	1.	Metals		Not Requested
	2.	Cyanide		Not Requested
, <u>, , , , , , , , , , , , , , , , , , </u>	3.	Pheno1s	,	Not Requested

SAMPLE IDENTIFIER: SD-2 Trip Blank COMPUCHEM SAMPLE NUMBER: 32300

	VOLATILE ORGANICS	CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)	SCAN NUMBER
17.	CHLOROMETHANE	BDL	10	
	VINYL CHLORIDE	BDL	10	
3٧.	CHLOROETHANE	BDL	10	
		BDL	10	
. 5V .		BDL	100	
6٧.		BDL	100	1 ×
	METHYLENE CHLORIDE	BDL	10	
	TRICHLOROFLUOROMETHANE	BDL.	10	
	1,1-DICHLOROETHYLENE	BDL	10	• ,
	1,1-DICHLOROETHANE	BDL.	10	
	TRANS-1,2-DICHLOROETHYLENE	BDL	10	* *
127.		BDL	10	
	1,2-DICHLOROETHANE	BDL	10	
	1,1,1-TRICHLOROETHANE	BDL	10	
157.	CARBON TETRACHLORIDE	5 BDL	10	
167.		BDL	10	
177.	1,2-DICHLOROPROPANE	BDL	10	
187.		BDL.	10	4
	TRICHLOROETHYLENE	BDL	10	A
207.		BDL	10	
217.		BDL	10	
	1,1,2-TRICHLOROETHANE	BDL	10	
237.		BDL	10	
	BROMOFORM	BDL	10	*
25V.	1,1,2,2-TETRACHLOROETHYLENE	BDL	10	
267.	1,1,2,2-TETRACHLOROETHANE	BDL	10	
	* TOLUENE	BDL -	10	
	CHLOROBENZENE	BDL	10	*
	ETHYLBENZENE	BDL	10	
	2-CHLOROETHYL VINYL ETHER	BDL	10	
317.		BDL		
32V.	BIS(CHLOROMETHYL)ETHERT	BDL.	•	*

BDL=BELOW DETECTION LIMIT

See Data Report Notice

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-2 Trip Blank COMPUCHEM SAMPLE NUMBER: 32300

		Date
Received/Ref	rigerated	07/27/84
	,	•
Organics		
Extract	ced	Not Required
Analyze	ed .	
1.	Volatiles	07/30/84 J
2.	Acid	Not Requested
3.	Base/Neutrals	Not Requested
4.	Pesticides/PCBS	Not Requested
Inorganics		
1.	Metals	Not Requested
2.	Cyanide	Not Requested
. 3.	Pheno1s	Not Requested

SAMPLE IDENTIFIER: SD-3 Trip Blank COMPUCHEM SAMPLE NUMBER: 32298

	VOLATILE ORGANICS		co	NCENTRATION (UG/L)	DETECTION LIMIT (UG/L)	SCAN NUMBER
17.	CHLO ROME THANE	,		BDL	10	
27.	VINYL CHLORIDE	•		BDL	10	
				BDL	10	•
47	CHLOROETHANE BROMOMETHANE			BDL.	10	
5V •	ACROLEIN			BDL	100	
6V.				BDL	100	
77.				BDL	10	* * 1
87.				BDL	10	• ,
	1.1-DICHLOROETHYLENE		1	BDL	10	1. 1
	1,1-DICHLOROETHANE			BDL	10	
	TRANS-1,2-DICHLOROETHYLENE			BDL	10	
12V.	CHLOROFORM			BDL :	10	7;
	1,2-DICHLOROETHANE			BDL	10	
	1,1,1-TRICHLOROETHANE			BDL.	10	
	CARBON TETRACHLORIDE			BDL	10	
	BROMODICHLO ROMETHANE			BDL	10	
177.				BDL -	10	*
	TRANS-1,3-DICHLOROPROPENE			BDL	10	
	TRICHLOROETHYLENE			BDL	10	
201				BDL	10	the second
217.				BDL.	10	
	1,1,2-TRICHLOROETHANE			BDL.	10	
	DIBROMOCHLOROMETHANE			BDL	10	
247.			1	BDL	10	
	1,1,2,2-TETRACHLOROETHYLENE			BDL.	10	· See
26V.	1,1,2,2-TETRACHLOROETHANE			BDL	10	
27V.	TOLÚENE			BDL	10	i s an
287.				BDL	10	
	ETHYLBENZENE		1.	BDL	10	
307.	2-CHLOROETHYL VINYL ETHER			BDL .	10	
31V.	DICHLORODIFLUOROMETHANE [†]			BDL		
32V.	BIS(CHLOROMETHYL)ETHER [†]			BDL		

BDL=BELOW DETECTION LIMIT

†See Data Report Notice

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-3 Trip Blank COMPUCHEM SAMPLE NUMBER: 32298

			Date
Received/Ref	rigerated		07/27/84
Organics			
Extract	ced		Not Required
Analyze	ed 🖰		
1.	Volatiles		07/30/84
2.	Acid _r		Not Requested
. 3.	Base/Neutrals		Not Requested
4.	Pesticides/PCBS		Not Requested
Inorganics		8	
1.	Metals	•	Not Requested
2.	Cyanide		Not Requested
3.	Pheno1s		Not Requested

CompuChem LABORATORIES

REPORT OF DATA

SAMPLE IDENTIFIER: SD-3 Trip Blank COMPUCHEM SAMPLE NUMBER: 32298
SD-2 Trip Blank 32300
SD-1 Trip Blank 32302

SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

DIANA A. SCAMMELL
TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT.

ROBERT E. MEIERER
DIRECTOR OF QUALITY ASSURANCE

DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of asmreceived material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic polluant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	<u>Date</u>
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

*While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

COMPUCHEM LABORATORIES IS NO LONGER AFFILIATED WITH MEAD CORPORATION.

Washy for rediment & 6 W

3308 East Chapel Hill/Nelson Highway P.O. Box 12652 Research Triangle Park, NC 27709

Telephone: 919-549-8263 800-334-8525

August 7, 1984

CompuChem LABORATORIES

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

Customer Service Dept. CompuChem®

Enclosure:

Report: SD-3 Trip Blank - 32298 SD-2 Trip Blank - 32300

SD-1 Trip Blank - 32302



5) SEDIMENT DATA

COMPUCHEM LABORATORIES

August 29, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

Dear Mr. Schroder:

SEP 04 1984

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

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Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

Customer Service Dept. CompuChem®

Enclosure:

Report:	SD-3		,	32411
	SD-2	-		32412
	SD-1	- '.		32413

DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

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The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	<u>Date</u>
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

^{*}While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32411

Samples:

Received - 7-26-84 Analyzed - 8-02-84

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32411

SD-2 SD-1

32412 32413

SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

DIANA A. SCAMMELL
TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER DIRECTOR OF QUALITY ASSURANCE

SD-3 32411

SAMPLE IDENTIFIER: COMPUCHEM SAMPLE NUMBER:

INORGANICS PRIORITY POLLUTANTS	CONCENTRATION (MG/KG)	DETECTION LIMIT (MG/KG)	
CYANIDE, TOTAL	BDL	1.0	

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32412

INORGANICS PRIORITY POLLUTANTS	CONCENTRATION DETEC (MG/KG)	CTION LIMIT (MG/KG)
energia. National de la companya de la compa		
CYANIDE, TOTAL	BDL	1.0

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32413

INORGANICS PRIORITY POLLUTANTS		CONCENTRATION (MG/KG)	DETECTION LIMIT (MG/KG)
	•		÷
CYANIDE, TOTAL	• •	BDL	1.0

COMPUCHEM LABORATORIES



August 31, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

SEP 06 1984

Eaginearing Common Atlanta

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

Customer Service Dept. CompuChem®

Enclosure:

| Report: SD-2 - 32299

DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of asreceived material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	Date
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
*Trichlorofluoromethane : Bis(Chloromethyl)Ether	Volatile Volatile	46FR2264 46FR10723	1/8/81 2/4/81

^{*}While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

REPORT OF DATA

SAMPLE IDENTIFIER: SD-2

COMPUCHEM SAMPLE NUMBER: 32299

SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

> DIANA A. SCAMMELL TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER
DIRECTOR OF QUALITY ASSURANCE

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

	<u>Date</u>
Received/Refrigerated	07/27/84
Organics	
Extracted	08/01/84
Anal yzed	•
1. Volatiles	07/03/84
2. Acid	08/08/84
3. Base/Neutrals	08/06/84
4. Pesticides/PCBS	08/06/84
Inorganics	
1. Metals	08/14/84
2. Cyanide	Not Requested
3. Phenols	Not Requested

COMPOUND LIST - VOLATILES ORGANICS

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

			•	- D	ETECTION
		CONCE	NTRATION		LIMIT
,			G/KG)		UG/KG)
		- 101	4) NG /		00/110/
1.4	CHI ODOMETHANE		BDL		10
	CHLOROMETHANE	*			10
	VINYL CHLORIDE	* · · · · · · · · · · · · · · · · · · ·	BDL	٠,	
	CHLOROETHANE		BDL 3		10
	BROMOMETHANE		BDL.		10
5V .	ACROLEIN		BDL		100
6V .	ACRYLONITRILE		BDL		100
	METHYLENE CHLORIDE	NDB*		٠	10
8V.	TRICHLOROFLUOROMETHANE		BDL		10
90 .			BDL		10
	1,1-DICHLOROETHANE	,	BDL		10
11V.	· · · · · · · · · · · · · · · · · · ·		BDL		10
	CHLOROFORM	.: ,	BDL		10
	1,2-DICHLOROETHANE		BDL		10
			BDL		10
144	1,1,1-TRICHLOROETHANE		BDL		10
	CARBON TETRACHLORIDE	•			10
	BROMODICHLOROMETHANE		BDL.		
	1,2-DICHLOROPROPANE		BDL	•	10
18V 🍇	TRANS-1,3-DICHLOROPROPENE		BDL		10
191.	TRICHLOROETHYLENE TRICHLOROETHYLENE		BDL		10
201.	BENZENE		BDL		10
217.	CIS-1,3-DICHLOROPROPENE	,	BDL = 1		10
22V .	1.1.2-TRICHLOROETHANE		BDL		10
234		•	BDL		10
	BROMOFORM	A_{g} .	BDL		10
25V.	1,1,2,2-TETRACHLOROETHYLENE		BDL		10
264	1,1,2,2-TETRACHLOROETHANE		BDL		10
271	TOLUENE		BDL		10
	CHLOROBENZENE		BDL	-	10
	ETHYLBENZENE		BDL		10
	2-CHLOROETHYL VINYL ETHER		BDL		10
	DICHLORODIFLUOROMETHANET		BDL.		- ,
	BIS(CHLOROMETHYL)ETHERT		BDL.		•
الإرفية عاف	DIG! OHEOVOURTHIE FEITHER				

BDL=BELOW DETECTION LIMIT *See Quality Assurance Notice

[†]See Data Report Notice

QUALITY ASSURANCE NOTICE

CompuChem Sample No. 32299

Although not required by the Federal Register, December 3, 1979 (modified July, 1982) Volatile Method 624 procedure, the laboratory prepares VOA blanks when compositing water samples and preparing low and medium level hazardous waste VOA samples. This is to insure that the glassware used is free from contamination, and to monitor the possibility of cross-contamination from high levels of volatile organic compounds in some samples and the laboratory atmosphere.

The compositing or method blank (# 32330) prepared with this sample contained the compound(s) listed below. Sample data associated with this blank have been adjusted and/or flagged according to the EPA-recommended methods.

Compound(s)	Concentration Found In Sample (ug/kg)	Applicable Qualifier*
Methylene Chloride	44	NDB

The following data qualifiers are used by EPA and adopted by CompuChem® for reporting purposes:

NDB = The concentration of a priority pollutant in the blank is greater than $\frac{1}{2}$; the detection limit and is greater than $\frac{1}{2}$ the concentration in the sample

*No adjusted sample concentration is reported.

COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

Applications of the second sec	CONCENTRATION (UG/KG)	DETECTION [†] LIMIT (UG/KG)
1A. PHENOL	BDL	500
2A. 2-CHLOROPHENOL	BDL	500
3A. 2-NITROPHENOL	BDL	500
4A. 2,4-DIMETHYLPHENOL	BDL	500
5A. 2,4-DICHLOROPHENOL	BOL	500
6A. P-CHLORO-M-CRESOL	BDL	500
7A. 2,4,6-TRICHLOROPHENOL	BDL.	500
8A. 2,4-DINITROPHENOL	BDL.	5000
9A. 4-NITROPHENOL	BD L	500
LOA. 4,6-DINITRO-O-CRESOL	BDL-	5000
LIA., PENTACHLOROPHENOL	BDL.	500
The state of the s		

BDL=BELOW DETECTION LIMIT †See Data Report Notice

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

		-	CONCENT		DETECTION ¹ LIMIT (UG/KG)	r
1B.	N-NITROSODIMETHYLAMINE			BDL	200	
2B.	BIS (2-CHLOROETHYL) ETHER			BDL	200	
	1,3-DICHLOROBENZENE			BDL	200	
4B.		•		BDL	200	
5B• '	1,2-DICHLOROBENZENE			BDL	200	
6B.	BÍS (2-CHLOROISOPROPYL) ETHER			BDL	200	
7B.	HEXACHLOROETHANE			BDL	200	•
8B.	N-NITROSODI-N-PROPYLAMINE			BDL	200	
9B.	NITROBENZENE			BDL	200	
10B.	ISOPHORONE			BDL	200	
11B.	BIS(2-CHLOROETHOXY) METHANE			BDL	200	
12B.	1,2,4-TRICHLOROBENZENE			BDL	200	
	NAPHTHALENE			BDL	200	
14B.	HEXACHLOROBUTADIENE			BDL	200	
15B.	HEXACHLOROCYCLOPENTADIENE			BDL	200	
16B.	2-CHLORONAPHTHALENE			BDL	200.	
	DIMETHYLPHTHALATE			BDL	200	
	ACENAPHTHYLENE		1	BDL	200	
19B.	2,6-DINITROTOLUENE			BDL	200	
20B.	ACENAPHTHENE	٠.		BDL	200	
21B.	2,4-DINITROTOLUENE			BDL	200	
22B.	DIETHYLPHTHALATE	٠	' ,	BDL	200	
	FLUORENE			BDL	200	
	4-CHLOROPHENYL PHENYL ETHER	,		BDL.	200	
25B.	DIPHENYLAMINE (N-NITROSO)			BDL	200	
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)			BDL	200	
	4-BROMOPHENYL PHENYL ETHER		,	BDL	200	
28B	HEXACHLOROBENZENE		* * *	BDL ,	200	

BDL=BELOW DETECTION LIMIT See Data Report Notice

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

		CONCENTRATION (UG/KG)	LIMIT (UG/KG)
29B.	PHENANTHRENE	BDL	200
30B.	ANTHRACENE	BDL	200
31B.	DI-N-BUTYLPHTHALATE	BDL	200
32B.	FLUORANTHENE	BDL	200
33B.	BENZIDINE	BDL	200
34B.	PYRENE	BDL	200
35B.	BUTYLBENZYLPHTHALATE	BDL	200
36B.	BENZO(A)ANTHRACENE	BDL	200
37B.	3,3'-DICHLOROBENZIDINE	BDL	200
38B.	CHRYSENE	BDL	200
39B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	200
40B.	DI-N-OCTYLPHTHALATE	BDL.	200
41B.	BENZO(B)FLUORANTHENE	BDL	200
42B.	BENZO(K)FLUORANTHENE	BDL	200
	BENZO(A)PYRENE	BDL	200
	INDENO(1,2,3-C,D)PYRENE	BDL	500
	DIBENZO(A,H)ANTHRACENE	BDL	500
46B.	BENZO(G,H,I)PERYLENE	BDL	500

COMPOUND LIST -- PESTICIDES/PCB'S

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

		CONCENTRATION (UG/KG)	LIMIT (UG/KG)
1P.	ALDRIN	BDL	200
2P.	ALPHA-BHC	BDL	200
3P.	BETA-BHC	BDL	200 .
4P.	GAMMA-BHC	BDL	200
5P.	DELTA-BHC	BDL	200
6P.	CHLORDANE	, BDL	200
7P.	4,4'-DDT	BDL	200
8P.	4,4'-DDE	BDL	200
9P •	4,4'-DDD	BDL.	200
10P •	DIELDRIN	BDL	200
11P.	ALPHA-ENDOSULFAN	BDL	200
12P.	BETA-ENDOSULFAN	BDL.	200
13P.	ENDOSULFAN SULFATE	BDL	200
14P	ENDRIN	BDL	200
15P	ENDRIN ALDEHYDE	BDL	200
16P.	HEPTACHLOR	BDL	200
17P • 📾	HEPTACHLOR EPOXIDE	BDL	200
18P • •	PCB-1242	BDL	200
19P.	PCB-1254	BDL	200
20P 🚉	PCB-1221	BDL	200
21P .	PCB-1232	BDL	200
22P •	PCB-1248	BDL	200
23P 🔐	PCB-1260	BDL	200
24P •		BDL	200
25P .	TOXAPHENE	BDL	200

BDL=BELOW DETECTION LIMIT
†See Data Report Notice

COMPOUND LIST - INORGANICS (METALS

SAMPLE IDENTIFIER: SD-2 COMPUCHEM SAMPLE NUMBER: 32299

INORGANICS PRIORITY POLLUTANTS		CONCENTRATION (UG/G)	DETECTION LIMITY (UG/G)	
1. CADMIUM, TOTAL 2. CHROMIUM, TOTAL 3. COPPER, TOTAL 4. LEAD, TOTAL* 5. MERCURY, TOTAL 6. NICKEL, TOTAL 7. ZINC, TOTAL			BDL 6.3 8.2 7.0 0.064 8.5 34	0.20 0.50 1.0 0.50 0.0020 1.0 0.20

BDL=BELOW DETECTION LIMIT TSee Data Report Notice

*Lead analyzed by Flame AAS because of concentration level found.

3308 East Chapel Hill/Nelson Highway P.O. Box 12652 Research Triangle Park, NC 27709

CompuChem

LABORATORIES

Telephone: 919-549-8263

800-334-8525

August 27, 1984

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

SEP 04 1984

Dear Mr. Schroder:

Thank you for selecting CompuChem® Laboratories for your recent sample analysis. We have completed the analysis that you requested and have enclosed a summary of the CompuChem® data for your review. Additional data details are available for purchase if you require them.

As you know, EPA has proposed detection limits for the priority pollutants in the December 3, 1979, Federal Register, and we have reported all priority pollutant concentrations which have exceeded these limits (or their equivalent for solid matrices). In addition, we have permanently stored a complete record of your data on magnetic tape. This includes chromatograms, mass spectra, calibration and quality control data for the organics. Therefore, your original data is readily available for future reference. Should you require additional information from your data base, please contact us at 1/800-334-8525.

In order to expedite data to you, we have forwarded the results for all completed analyses. If you submitted more samples than are included in the enclosed results, the data will be forthcoming upon completion of our final review.

Your confidence in our CompuChem® service is appreciated. We look forward to a continuing association.

Sincerely,

1. 15

Customer Service Dept. CompuChem®

Enclosure:

Report: SD-3 - 32297

SD-1 - 32301

DATA REPORT NOTICE

CompuChem employs Methods 624 and 625 for GC/MS analysis of organics in liquid matrices. These methods were proposed on December 3, 1979 by the U.S.E.P.A. in Volume 44 of the Federal Register. These methods were subsequently revised and reissued in July, 1982 as publication EPA-600/4-82-057. The EPA Environmental Monitoring and Support Laboratory (EMSL-Cincinnati) has subsequently issued method modifications which provide for the analysis of solid matrices. These modifications specify changes in the sample preparation procedures.

Additionally, for solid samples detection limits and any analytical results reported are based on processing the method specified sample size of asreceived material.

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

CompuChem® presents these compounds in its sample data report for completeness as many of the government compound list forms continue to display the affected compounds. For consistency, these compounds are reported as "BDL" or "Below Detection Limit" as they are either not likely to exist in the sample or are not likely to be detected by the method. Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	<u> Date</u>
Dichlorodifluoromethane	 Volatile	46FR2264	1/8/81
<pre>*Trichlorofluoromethane</pre>	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

^{*}While this compound has been deleted, CompuChem® continues to identify and quantitate for it.

CompuChem LABORATORIES

REPORT OF DATA

SAMPLE IDENTIFIER

COMPUCHEM SAMPLE NUMEBER

SD-3 SD-1 32297 32301

SUBMITTED TO:

Mr. Ernie Schroder Engineering Science, Inc. 57 Executive Park South Suite 590 Atlanta, GA 30329

> DIANA A. SCAMMELL TECHNICAL SPECIALIST, OPERATIONS

R. L. MYERS, PH.D., PRESIDENT

ROBERT E. MEIERER
DIRECTOR OF QUALITY ASSURANCE

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

	•
	Date
Received/Refrigerated	7-27-84
Organics	
Extracted	8-1-84
Analyzed	•
1. Volatiles	7-30-84
2. Acid	8-8-84
3. Base/Neutrals	8-4-84
4. Pesticides/PCBS	8-4-84
Inorganics	
1. Metals	8-14-84
2. Cyanide	Not Requested
3. Phenols	Not Requested

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

		CONCENTRATION (UG/KG)	DETECTION LIMIT (UG/KG)
17.	CHLOROMETHANE	BDL	10
	VINYL CHLORIDE	BDL	10
	CHLOROETHANE	BDL	10
4٧.	BROMOMETHANE	BDL	10
5V.	ACROLEIN	BDL	100
	ACRYLONITRILE	BDL	100
	METHYLENE CHLORIDE	BDL	10
	TRICHLOROFLUOROMETHANE	BDL	10
	1,1-DICHLOROETHYLENE	BDL	10
10V.:	1,1-DICHLOROETHANE	BDL	10
110.3	TRANS-1,2-DICHLOROETHYLENE	BDL	10
	CHLOROFORM	BDL	10
13V.	1,2-DICHLOROETHANE	BDL	10
140.:	1,1,1-TRICHLOROETHANE	BDL	. 10
15V.	CARBON TETRACHLORIDE	BDL	10
16V.	BROMODICHLOROMETHANE	BDL	10
17V.	1,2-DICHLOROPROPANE	BDL	10
180.	TRANS-1,3-DICHLOROPROPENE	BDL	10
190.	TRICHLOROETHYLENE	BDL	10
20V.	BENZENE	BDL	10
217.	CIS-1,3-DICHLOROPROPENE	BDL	10
22V .	1,1,2-TRICHLOROETHANE	BDL.	10
23V.	DIBROMOCHLOROMETHANE	BDL	10
247.	BROMOFORM	BDL	10
25V.	1,1,2,2-TETRACHLOROETHYLENE	BDL.	10
	1,1,2,2-TETRACHLOROETHANE	BDL	10
	TOLUENE	BDL	10
	CHLOROBENZENE	BDL	10
29V ·	ETHYLBENZENE	BDL	10
30V.	2-CHLOROETHYL VINYL ETHER	BDL	10
31V.;	DICHLORODIF LUUROME I HANE!	BDL	
32V.	BIS(CHLOROMETHYL)ETHER [†]	BDL	

BDL=BELOW DETECTION LIMIT

[†]See Data Report Notice

COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

CONCENTRATION (UG/KG)	LIMIT (UG/KG)
1A. PHENOL BDL	500
2A. 2-CHLOROPHENOL BDL	500
3A. 2-NITROPHENOL BDL	500
4A. 2,4-DIMETHYLPHENOL BDL	500
5A. 2,4-DICHLOROPHENOL BDL	500
6A. P-CHLORO-M-CRESOL BDL	500
7A. 2,4,6-TRICHLOROPHENOL BDL	500
8A. 2,4-DINITROPHENOL BDL	5000
9A. 4-NITROPHENOL BDL	500
10A. 4.6-DINITRO-O-CRESOL BDL	5000
11A. PENTACHLOROPHENOL BDL	500

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-3
COMPUCHEM SAMPLE NUMBER: 32297

1B. N-NITROSODIMETHYLAMINE 2B. BIS (2-CHLOROETHYL) ETHER 3B. 1,3-DICHLOROBENZENE 4B. 1,4-DICHLOROBENZENE 5B. 1,2-DICHLOROBENZENE 6B. BIS (2-CHLOROISOPROPYL) ETHER 7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS (2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL 23B. FLUORENE	TECTION* LIMIT (UG/KG)
3B. 1,3-DICHLOROBENZENE 4B. 1,4-DICHLOROBENZENE 5B. 1,2-DICHLOROBENZENE 6B. BIS (2-CHLOROISOPROPYL) ETHER 7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS (2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
3B. 1,3-DICHLOROBENZENE 4B. 1,4-DICHLOROBENZENE 5B. 1,2-DICHLOROBENZENE 6B. BIS (2-CHLOROISOPROPYL) ETHER 7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS (2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
4B. 1,4-DICHLOROBENZENE 5B. 1,2-DICHLOROBENZENE 6B. BIS (2-CHLOROISOPROPYL) ETHER 7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS(2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 15B. HEXACHLOROAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 22B. DIETHYLPHTHALATE BDL 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL	200
5B. 1,2-DICHLOROBENZENE 6B. BIS (2-CHLOROISOPROPYL) ETHER 7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS (2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 18B. ACENAPHTHYLENE 18B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE 3DL 23B. FLUORENE 3DL	200
6B. BÍS (2-CHLOROISOPROPYL) ETHER 7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS (2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROGYCLOPENTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
7B. HEXACHLOROETHANE 8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS(2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
8B. N-NITROSODI-N-PROPYLAMINE 9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS(2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 18B. ACENAPHTHENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL	200
9B. NITROBENZENE 10B. ISOPHORONE 11B. BIS(2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
11B. BIS(2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 18B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
11B. BIS(2-CHLOROETHOXY) METHANE 12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 18B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
12B. 1,2,4-TRICHLOROBENZENE 13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
13B. NAPHTHALENE 14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
14B. HEXACHLOROBUTADIENE 15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
15B. HEXACHLOROCYCLOPENTADIENE 16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
16B. 2-CHLORONAPHTHALENE 17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL BD	200
17B. DIMETHYLPHTHALATE 18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE 23B. FLUORENE BDL BDL BDL BDL BDL BDL BDL	200
18B. ACENAPHTHYLENE 19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE 23B. FLUORENE BDL BDL BDL BDL	200
19B. 2,6-DINITROTOLUENE 20B. ACENAPHTHENE 21B. 2,4-DINITROTOLUENE 22B. DIETHYLPHTHALATE 23B. FLUORENE BDL BDL BDL	200
20B. ACENAPHTHENE 21B. 2.4-DINITROTOLUENE 22B. DIETHYLPHTHALATE 23B. FLUORENE BDL BDL BDL	200
21B. 2,4-DINITROTOLUENE BDL 22B. DIETHYLPHTHALATE BDL 23B. FLUORENE BDL	200
22B. DIETHYLPHTHALATE 23B. FLUORENE BDL BDL	200
TODY / LOOKERIE	200
	200
24B. 4-CHLOROPHENYL PHENYL ETHER BUL	200
25B. DIPHENYLAMINE (N-NITROSO) BDL	200
26B. 1,2-DIPHENYLHYDRAZINE (AZOBENZENE) BDL	200
27B. 4-BROMOPHENYL PHENYL ETHER BDL	200
28B., HEXACHLOROBENZENE BDL	200

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

						CONCENT (UG/		· L1	MIT IG/KG)
29	ЭВ.	PHENANTHRENE					BDL		200
-	-	ANTHRACENE					BDL		200
	lB.	DI-N-BUTYLPHTHALATE		p			BDL		200
	2B .	FLUORANTHENE				,	BDL		200
	3B .						BDL		200
	B.	PYRENE	•				BDL		200
	В.	BUTYLBENZYLPHTHALATE			,		BDL		200
	6B.	BENZO(A)ANTHRACENE					BDL	`	· 200
	7B .	3.3'-DICHLOROBENZIDINE		•			BDL	•	200
	3B.	CHRYSENE	A	4			BDL		200
	9B .	BIS(2-ETHYLHEXYL)PHTHALAT	ΓE				BDL .		200
	DB	· · · · · · · · · · · · · · · · · · ·	*		•	•	BDL		200
	lB.	BENZO(B)FLUORANTHENE				×	BDL		200
	2B.	BENZO(K)FLUORANTHENE					BDL		200
	3B.	BENZO(A)PYRENE					BDL		200
	4B.	INDENO(1,2,3-C,D)PYRENE					BDL		5 00
	5B.	DIBENZO(A,H)ANTHRACENE	r			*	BDL		500
	6B.	BEN70(G.H.I)PERYLENE	•	٠.			BDL		500

COMPOUND LIST -- PESTICIDES/PCB'S

SAMPLE IDENTIFIER: SD-3 COMPUCHEM SAMPLE NUMBER: 32297

			CONCENTI (UG/		DETECTION LIMIT (UG/KG)	
1P.	ALDRIN	A	BI	DL /	200	4
	ALPHA-BHC		BI	DL i	200	
	BETA-BHC		BI	DL	200	,
	GAMMA-BHC		BI	DL	200	
	DELTA-BHC		· BI	DL :	200	
	CHLORDANE	\$ 15 m		DL	200	
	4,4'-DDT			DL	200	
	4.4'-DDE			DL	200	
	4.4'-DDD			DL '	200	
	DIELDRIN			DL	200	
11P.	ALPHA-ENDOS	SULFAN		DL	200	
12P.	BETA-ENDOSU	JLFAN		DL	200	
13P.	ENDOSULFAN	SULFATE		DL	200	
14P.	ENDRIN			DL	200	
15P.	ENDRIN ALDE	HYDE		DL	200	
	HEPTACHLOR	* •		DL .	200	
17P. :	HEPTACHLOR	EPOXIDE ,		DL	200	
18P.	PCB-1242			DL	200	
19P.	PCB-1254			DL	200 -	
20P.	PCB-1221			DL	200	
21P.	PCB-1232			DL	200	•
	PCB-1248			DL	200	
	PCB-1260		4*	DL	200	
24P.	PCB-1016			DL	200	
25P.	TOXAPHENE		Bi	DL.	200	

COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: SD-3
COMPUCHEM SAMPLE NUMBER: 32297

		CONCENTRATION (UG/G)	DETEC	TION LIMIT (UG/G)	
2. 3. 4. 5.	CADMIUM CHROMIUM COPPER LEAD * MERCURY NICKEL ZINC	BDL 5.6 10.0 14 0.010 9.4 48		0.20 0.50 1.0 0.50 0.0020 1.0 0.20	

BDL=BELOW DETECTION LIMIT

*Lead analyzed by Flame AAS because of concentration level found.

LABORATORY CHRONICLE

SAMPLE IDENTIFIER: SD-1
COMPUCHEM SAMPLE NUMBER: 32301

१			<u>Date</u>
Received/Ref	rigerated		7-27-84
Organics .			
Extract	ed		8-1-84
Analyze	ed .		
1.	Volatiles		7-31-84
2.	Acid	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	8-8-84
3.	Base/Neutrals		8-6-84
. 4.	Pesticides/PCBS		8-6-84
Inorganics			
1. 1.	Metals		8-14-84
2.	Cyanide		Not Requested
3.	Pheno1s		Not Requested

COMPOUND LIST

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

· 编辑 · 编码 · 对 。				NTRATION G/KG)	DETECTION LIMIT (UG/KG)	
17.	CHLOROMETHANE			BDL	10	
27.	VINYL CHLORIDE			BDL	10	
	CHLOROETHANE	•		BDL.	10	
47	BROMOMETHANE	Ÿ		BDL	10	
	ACROLEIN		* ,	BDL	100	
6V.	ACRYLONITRILE			BDL	100	
	METHYLENE CHLORIDE			BDL	10	,
8V.	TRICHLOROFLUOROMETHANE			BDL	10	
	1,1-DICHLOROETHYLENE			BDL	10	
	1,1-DICHLOROETHANE			BDL	10	
	TRANS-1,2-DICHLOROETHYLENE			BDL	10	
12V.	CHLOROFORM			BDL	10	
	1,2-DICHLOROETHANE			BDL	10	
	1.1.1-TRICHLOROETHANE			BDL	10	
	CARBON TETRACHLORIDE			BDL	10	
	BROMODICHLOROMETHANE			BDL	10	
	1,2-DICHLOROPROPANE			BDL	10	
18V.		· · · · · · · · · · · · · · · · · · ·		BDL	10	
197	TRICHI OROETHYLENE	•		BDL	10	
20V.	BENZENE			BDL	10	
217.				BDL	10	
22V.	1,1,2-TRICHLOROETHANE	•		BDL	10	
	DIBROMOCHLOROMETHANE	e	*	BDL	10	
24V.	BROMOFORM		· , · ,	BDL	10	
25V.	1,1,2,2-TETRACHLOROETHYLENE	,		BDL	10	
26V.	1,1,2,2-TETRACHLOROETHANE			BDL	10	
27V 🎳	TOLUENE	1.		BDL	10	•
28V 🎳	CHLOROBENZENE			BDL	. 10	
	ETHYLBENZENE	,		BDL	10	
	2-CHLOROETHYL VINYL ETHER			BDL	10	
31V.		. •	e e e e e e e e e e e e e e e e e e e	BDL	•	
32V.	BIS(CHLOROMETHYL)ETHER†			BDL		

BDL=BELOW DETECTION LIMIT

[†]See Data Report Notice

COMPOUND LIST -- ACID EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

	CONCENTRATION (UG/KG)	DETECTION* LIMIT (UG/KG)
1A. PHENOL	BDL	500
2A. 2-CHLOROPHENOL	BDL	500
3A. 2-NITROPHENOL	BDL	500
4A. 2,4-DIMETHYLPHENOL	BDL	500
5A. 2.4-DICHLOROPHENOL	BDL	500
6A. P-CHLORO-M-CRESOL	BDL.	500
7A. 2,4,6-TRICHLOROPHENOL	BDL	500 .
8A. 2.4-DINITROPHENOL	BDL	5000
9A. 4-NITROPHENOL	BDL	500
10A. 4,6-DINITRO-O-CRESOL	BDL	5000
11A. PENTACHLOROPHENOL	BDL	500

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLE ORGANICS

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

1				DE	TECTION*
		CONCENT (UG/			LIMIT (UG/KG)
2B. 3B. 4B. 5B. 6B. 7B. 8B. 9B. 10B. 11B. 12B.	1,2,4-TRICHLOROBENZENE		BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	•	200 200 200 200 200 200 200 200 200 200
14B. 15B. 16B. 17B. 18B. 19B. 20B. 21B. 22B. 23B. 24B. 25B. 26B. 27B.	DIPHENYLAMINE (N-NITROSO)		BOL BOL BOL BOL BOL BOL BOL BOL BOL BOL		200 200 200 200 200 200 200 200 200 200

SAMPLE IDENTIFIER: SD-1
COMPUCHEM SAMPLE NUMBER: 32301

			DETECTION*
1 :		CONCENTRATION	LIMIT
Ţ	•	(UG/KG)	(UG/KG)
	•		
29B.	PHENANTHRENE	BDL	200
30B.	ANTHRACENE	BDL	200
31B.	DI-N-BUTYLPHTHALATE	BDL	200
32B.	FLUORANTHENE	BDL	200
33B.	BENZIDINE	BDL	200
34B.	PYRENE	BDL	200
35B.	BUTYLBENZYLPHTHALATE	BDL	200
36B.	BENZO(A)ANTHRACENE	BDL	a 200
37B.	3,3'-DICHLOROBENZIDINE	BDL	200
38B.	CHRYSENE	BDL	200
39B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL.	200
40B.	DI-N-OCTYLPHTHALATE	BDL	200
41B.	BENZO(B)FLUORANTHENE	BDL	200
42B.	BENZO(K)FLUORANTHENE	BDL	200
43B.	BENZO(A)PYRENE	BDL.	2 00
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	500
45B.	DIBENZO(Á, H) ANTHRACENE	BDL	500
46B.	BENZO(G.H.I)PERYLENE	BDL	500

COMPOUND LIST -- PESTICIDES/PCB'S

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

	CONCENTRATION(UG/KG)	LIMIT (UG/KG)
1P. ALDRIN	BDL	200 .
2P. ALPHA-BHC	BDL	200
3P. BETA-BHC	BDL	200
4P. GAMMA-BHC	BDL	200
5P. DELTA-BHC	BDL	200
6P. CHLORDANE	BDL	200
7P. 4,4'-DDT	BDL	200
8P. 4,4'-DDE	BDL	200
9P. 4,4'-DDD	BDL	200
10P. DIELDRIN	BDL	200
11P. ALPHA-ENDOSULFAN	BDL	200
12P. BETA-ENDOSULFAN	BDL	200
13P. ENDOSULFAN SULFATE	BDL	. 200
14P. ENDRIN	BDL	200
15P. ENDRIN ALDEHYDE	BDL	200
16P. HEPTACHLOR	. BDL	200
17P. HEPTACHLOR EPOXIDE	. BDL	200
18P. PCB-1242	BDL	200
19P • PCB-1254	BDL	200
20P. PCB-1221	BDL	200
21P. PCB-1232	BDL	200
22P. PCB-1248	BDL	200
23P. PCB-1260	BDL	200
24P. PCB-1016	BDL	200
25P. TOXAPHENE	BDL	200
		· ·

COMPOUND LIST -- INORGANICS PRIORITY POLLUTANTS

SAMPLE IDENTIFIER: SD-1 COMPUCHEM SAMPLE NUMBER: 32301

		CONCENTRATION (UG/G)	(UG/G)
1. CADMIUM, TOTAL	4	0.30	0.020
2. CHROMIUM, TOTAL		6.8	0.50
3. COPPER. TOTAL		5.7	1.0
4. LEAD, TOTAL *		18	0.50
5. MERCURY, TOTAL		0.0084	0.0020
6. NICKEL, TOTAL		6.5	1.0
7. ZINC. TOTAL		40	0.20

BDL=BELOW DETECTION LIMIT

*Lead analyzed by flame AAS because of concentration level found.

6) GROUNDWATER DATA



ENVIRONMENTAL and INDUSTRIAL ANALYTICAL SERVICES

November 1, 1984

Mr. Rocco Palazolo Engineering Sciences 57 Executive Park S. Atlanta, Georgia 30329

Re: Sample results for OW-1A, OW-1B, OW-2, OW-3, OW-4, OW-5, & OW-6.

Dear Rocco:

Enclosed please find additional copies of the reports for the above referenced samples. As we discussed, they were shipped to RECRA Environmental Laboratories for analysis, since we were unable to meet your turnaround time needs at the time.

Should you have any questions or comments, please do not hesitate to contact me at anytime.

Very truly yours,

H2M CORPORATION

Stanley C. Lewis
Operations Manager - Laboratory

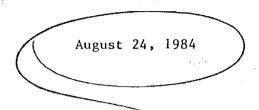
SCL/jes Enclosure





RECRA ENVIRONMENTAL LÁBORATORIES

Division of Recra Research, Inc.



Mr. Stan Lewis H2M 575 Broadhallow Road Melville, NY 11747

Re: Analytical Results

Dear Mr. Lewis:

Please find enclosed results of the analyses of the samples received at our laboratories on July 30 and August 1, 1984.

If you have any questions concerning these data, do not hesitate to contact our Customer Service Representative at (716) 692-7620.

Sincerely,

RECRA ENVIRONMENTAL LABORATORIES

James A. Ploscyca Laboratory Manager

BJK/JAP/mdc/jhs Enclosure

> I.D. #84-746 84-746 A 84-746 B



Division of Recra Research, Inc.

ANALYTICAL

REPORT



RECRA ENVIRONMENTAL LABORATORIES

Division of Recra Research, Inc.

ANALYTICAL RESULTS

H2M PRIORITY POLLUTANT ANALYSES

Prepared For:

H2M 575 Broadhallow Road Melville, NY 11747

Prepared By:

Recra Environmental Laboratories 4248 Ridge Lea Road Amherst, NY 14226

Report Date:

August 24, 1984

H2M PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

INTRODUCTION:

On July 30, and August 1, 1984 samples were received at Recra Environmental Laboratories. A request was made by H2M to have the samples analyzed for selected fractions of the Environmental Protection Agency decreed priority pollutants, total organic halide, and to determine the pH.

This report will address the results of those analyses.

METHODS:

Priority pollutant analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

Organic priority pollutants were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).

RESULTS AND DISCUSSION:

Analysis for total organic halide was subcontracted. Sample FT-1 for total organic halide was not received.

Total organic halide values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Sample OW-2 was analyzed in duplicate for the base neutral compounds but no positive values resulted.

Compounds reported as ND are "not detected". Compounds reported as BDL are confirmed as being present in the sample at a level "below detection limit", and are not subject to reliable quantitation.

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Eulaia I Kajenski



GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

BASE	E/NEUTRALS		
	SA	MPLE IDENTIFICA	TION
DETECTION			
LIMIT (µg/1)	OW-1	OW-1B	OW-2
1.9	ND	ND	ND '
3.5	ND	ND	ND
1.9	ND	ND	ND
44	ND	ND	ND
7.8	ND	ND	ND
2.5	ND	ND	ND
4.8	ND	ND	ND
4.1	ND	ND	ND ·
2.5	ND	ND	ND
5.3	ND	ND	ND
5.7	ND	ND	ND -
5.7	ND	ND	ND
2.5	ND !	ND	ND
1.9	ND !	ND !	ND
2.5	ND	ND	ND
1.9	ND	ND	ND
4.2	ND	ND	ND
2.5	ND	ND	ND
2.5	ND	ND	ND
1.9	ND	ND	ND
1.9	ND	ND	ND
4.4	ND	ND	ND
16.5	ND	ND	ND
22	ND :	ND	ND
1.6	ND	ND	ND
2.5	ND ·	ND	ND
	DETECTION LIMIT (µg/1) 1.9 3.5 1.9 44 7.8 2.5 4.8 4.1 2.5 5.3 5.7 5.7 2.5 1.9 2.5 1.9 4.2 2.5 2.5 1.9 4.2 2.5 2.5 2.5 1.9 1.9 4.1	DETECTION LIMIT (μg/1) (μg/1) OW-1 1.9 ND 3.5 ND 1.9 ND 44 ND 7.8 ND 2.5 ND 4.8 ND 4.1 ND 2.5 ND 5.3 ND 5.7 ND 5.7 ND 2.5 ND 1.9 ND 4.2 ND 2.5 ND 1.9 ND 1.9 ND 1.9 ND 1.9 ND 1.9 ND 1.0 ND	SAMPLE IDENTIFICA DETECTION LIMIT (µg/1)

(Continued)



H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS				
	SAMPLE IDENTIFICATION			
COMPOUND	DETECTION LIMIT (µg/1)	OW-1	OW-1B	OW-2
2,6-dinitrotoluene	1.9	ND	ND	ND
2,4-dinitrotoluene	5.7	ND	ND	ND
di-n-octylphthalate	2.5	ND	ND	ND_
1,2-diphenylhydrazine	25	ND	ND	ND
fluoranthene	2.2	ND	! ND_	ND
wfluorene	1.9	ND	ND	ND
hexachlorobenzene	1.9	ND	ND	ND
hexachlorobutadiene	0.9	ND_	ND	ND
nexachlorocyclopentadiene	25	ND	ND	ND
hexachloroethane	1.6	ND	ND	ND
indeno(1,2,3-cd)pyrene	3.7	ND	ND	ND
isophorone	2.2	ND	ND	ND
naphthalene	1.6	ND	ND	ND
nitrobenzene	1.9	ND	ND	ND
N-nitrosodimethylamine	25 °.	ND	ND	ND
N-nitrosodi-n-propylamine	25	ND	ND	ND
N-nitrosodiphenylamine	1.9	ND	ND i	ND
phenanthrene	5.4	ND ·	ND ·	ND
pyrene	1.9	ND	ND	ND
1,2,4-trichlorobenzene	1.9	ND	ND	ND
ADDITIONAL SAMPLE INFORMATION	N			٠, .
Sample Date		7/2/84	7/3/84	7/3/84

7/2/84	7/3/84	7/3/84
7/31/84	8/22/84	7/31/84
8/14/84	8/23/84	8/15/84
20 μg/1	20 μg/1	20 μg/l
102%	82%	130%
120 µg/1	120 μg/1	120 µg/1
54%	62%	65%
100 μg/1	100 μg/1	100 µg/1
61%	70%	63%
	7/31/84 8/14/84 20 µg/1 102% 120 µg/1 54% 100 µg/1	7/31/84 8/22/84 8/14/84 8/23/84 20 µg/1 20 µg/1 102% 82% 120 µg/1 120 µg/1 54% 62% 100 µg/1 100 µg/1

FOR RECRA ENVIRONMENTAL LABORATORIES BALAIS | Kajeusla

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

		NEUTRALS S	AMPLE IDENTIFICAT	ION
	DETECTION LIMIT (ug/1)	OW-3	OW-4	OW-5
« cenaphthene	1.9	ND .	ND	ND
acenaphthylene	3.5	NDND_	: ND	ND
nthracene	1.9	ND	ND	ND ·
benzidine	44	ND	ND	ND
enzo(a)anthracene	7.8	ND	ND	ND
benzo(a)pyrene	2.5	ND .	ND_	ND
enzo(b)fluoranthene	4.8	ND	ND	ND
benzo(g,h,i)perylene	4.1	ND	ND	ND
enzo(k)fluoranthene	2.5	ND	ND	ND
wis(2-chloroethoxy)methane	5.3	ND	ND	ND
his(2-chloroethyl)ether	5.7	ND	ND	ND
is(2-chloroisopropyl)ether	5.7	ND_	ND	ND
bis(2-ethylhexyl)phthalate	2.5	ND	ND	NDND
-bromophenylphenylether	1.9	ND	ND	ND_
butylbenzylphthalate	2.5	ND	· ND	ND
-chloronaphthalene	1.9	ND	ND	ND
4-chlorophenylphenylether	4.2	ND	ND	ND ·
hrysene	2.5	ND	ND	ND
dibenzo(a,h)anthracene	2.5	ND	ND	ND
1,2-dichlorobenzene	1.9	ND	ND	ND
,3-dichlorobenzene	1.9	ND	ND	ND
l,4-dichlorobenzene	4.4	ND	ND	ND
,3'-dichlorobenzidine	16.5	ND	ND	ND
diethylphthalate	22	ND	, ND	ND
imethylphthalate	1.6	· ND	ND	ND -
di-n-butylphthalate	2.5	ND	ND	ND

(Continued)



H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

,	BASE/I	NEUTRALS			
SAMPLE IDENTIFICATION					
	DETECTION				
COMPANIE	LIMIT	2011 2	011.7	011 5	
COMPOUND	(µg/1)	OW-3	<u>OW-4</u>	OW-5	
2,6-dinitrotoluene	1.9	ND	ND	ND	
2,4-dinitrotoluene	5.7	ND	ND	ND	
di-n-octylphthalate	2.5	ND	ND	NDND	
1,2-diphenylhydrazine	25	ND !	ND	ND	
fluoranthene	2.2	ND '	ND_	ND	
fluorene	1.9	ND .	ND	ND	
hexachlorobenzene	1.9	ND	ND	ND	
hexachlorobutadiene	0.9	ND .	ND	ND	
hexachlorocyclopentadiene	25	ND ·	ND	ND	
hexachloroethane	1.6	ND :	ND	ND	
indeno(1,2,3-cd)pyrene	3.7	ND	ND	ND ·	
isophorone	2.2	ND	ND	ND	
naphthalene	1.6	ND	ND	ND	
nitrobenzene	1.9	ND	ND	ND	
N-nitrosodimethylamine	25	ND	ND	ND	
N-nitrosodi-n-propylamine	25	ND	ND	ND	
N-nitrosodiphenylamine	1.9	ND	ND	ND	
phenanthrene	5.4	ND	ND	ND	
pyrene	1.9	ND	ND	ND	
1,2,4-trichlorobenzene	1.9	ND	ND	ND	
ADDITIONAL SAMPLE INFORMATION	l				
Sample Date		7/2/84	7/3/84	7/10/84	
Extraction Date		7/31/84	7/31/84	7/31/84	
Analysis Date		8/15/84	8/15/84	8/15/84	
Internal Standard - Level		20 μg/l	20 μg/l	20 μg/l	
deuterated phenanthrene - Rec		110%	130%	1 35%	
Surrogate Standard (SS3) - Le		120 µg/1	120 µg/1	120 µg/1	
decafluorobiphenyl - Recovery		65%	58%	59%	
Surrogate Standard (SS4) - Le	vel	100 μg/1	100 μg/1	100 µg/l	
2-fluorobiphenyl - Recovery		56%	47%	45%	

FOR RECRA ENVIRONMENTAL LABORATORIES <u>Subau</u> <u>Hugeuslu</u>

DATE <u>9/24/34</u>

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

SAMPLE IDENTIFICATION					
COMPOUND	DETECTION LIMIT (ug/1)	OW-6	OSTERMAN WELL	FT-1	
acenaphthene	1.9	ND	ND	ND	
_acenaphthylene	3.5	ND	ND	ND	
anthracene	1.9	ND_	ND	ND	
benzidine	44	ND	ND	ND	
benzo(a)anthracene	7.8	ND	ND	ND	
benzo(a)pyrene	2.5	ND	ND	ND	
benzo(b)fluoranthene	4.8	ND	ND .	ND	
benzo(g,h,i)perylene	4.1	ND	ND	ND	
benzo(k)fluoranthene	2.5	ND	i ND	ND	
bis (2-chloroethoxy) methane	5.3	ND	i ND	ND	
bis(2-chloroethyl)ether	5.7	ND	ND	ND	
bis(2-chloroisopropyl)ether	5.7	ND	i ND	ND	
bis(2-chloroisopropyl)ether bis(2-ethylhexyl)phthalate	2.5	ND	ND	ND	
4-bromophenylphenylether	1.9-	ND	! ND	ND	
butylbenzylphthalate	2.5	ND	: ND	ND	
2-chloronaphthalene	1.9	ND	ND	ND	
4-chlorophenylphenylether	4.2	ND	ND	ND	
chrysene	2.5	ND	ND	ND	
dibenzo(a,h)anthracene	2.5	ND	ND	ND	
1,2-dichlorobenzene	1.9	ND	ND	ND	
1,3-dichlorobenzene	1.9	ND	ND	ND	
1,4-dichlorobenzene	4.4	ND	ND	ND	
3,3'-dichlorobenzidine	16.5	ND	ND	ND	
diethylphthalate	22	ND	ND	ND	
dimethylphthalate	1.6	ND	ND	ND	
di-n-butylphthalate	2.5	ND	ND	ND ·	



(Continued)

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

BASE/NEUTRALS

BASE/NEUTRALS						
Area	SAMPLE IDENTIFICATION					
COMPOUND	DETECTION LIMIT (µg/1)	OW-6	OSTERMAN WELL	FT-1		
2,6-dinitrotoluene	1.9	ND	ND	ND		
2,4-dinitrotoluene	5.7	ND	ND	ND		
di-n-octylphthalate	2.5	ND	ND	ND		
1,2-diphenylhydrazine	25	ND	ND	ND		
fluoranthene	2.2	ND :	ND	ND		
fluorene	1.9	ND :	ND	ND		
" hexachlorobenzene	1.9	ND	ND	ND		
hexachlorobutadiene	0.9	ND :	ND	ND		
, hexachlorocyclopentadiene	25	ND	ND	ND		
hexachloroethane	1.6	ND	ND	ND		
indeno(1,2,3-cd)pyrene	3.7	ND	ND :	ND		
isophorone	2.2	ND	ND I	ND		
naphthalene	1.6	ND	ND :	ND		
nitrobenzene	1.9	ND	ND	ND		
N-nitrosodimethylamine	251	ND	ND	ND		
N-nitrosodi-n-propylamine	25	ND	ND	ND		
N-nitrosodiphenylamine	1.9	ND	ND	ND		
phenanthrene	5.4	ND	ND ·	ND		
pyrene	1.9	ND	ND	ND		
1,2,4-trichlorobenzene	1.9	ND	ND	ND		

A	.DD	TT	TONAL.	SAMPLE	INFORMATION	

MDDITIONAL DAME BE INFORMATION			
Sample Date	7/10/84	7/11/84	7/3/84
Extraction Date	7/31/84	7/31/84	7/31/84
Analysis Date	8/15/84	8/15/84	8/15/84
Internal Standard - Level	20 μg/1	20 µg/l	20 μg/l
deuterated phenanthrene - Recovery	130%	78%	1 35%
Surrogate Standard (SS3) - Level	120 μg/1	120 μg/1	120 μg/1
decafluorobiphenyl - Recovery	71%	50%	64%
Surrogate Standard (SS4) - Level	100 µg/1	100 μg/1	100 μg/l
2-fluorobiphenyl - Recovery	63% -	52%	55%

FOR RECRA ENVIRONMENTAL LABORATORIES <u>Sulface</u> Majeurlie

DATE 8/24/34

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

24	VO	LATILES			
		SAMPLE IDENTIFICATION			
	DETECTION			•	
COMPOUND	LIMIT (µg/l)	OW-1	OW-1B	OW-2	
acrolein	400	ND	ND	ND ·	
acrylonitrile	400	N <u>D</u>	ND	ND	
benzene	4.4	ND	ND	ND '	
bromodichloromethane	2.2	ND	ND	ND	
bromoform	4.7	ND	ND	ND	
bromomethane	10	ND	ND	ND	
carbon tetrachloride	2.8	ND	ND ·	ND	
chlorobenzene	6.0	ND	ND	ND	
chloroethane	10	ND	ND .	ND	
2-chloroethylvinyl ether	10	ND	ND	ND	
chloroform chloroform	1.6	ND	ND	ND	
chloromethane	10	ND	ND	. ND	
- dibromochloromethane	3.1	ND	ND	ND	
1,l-dichloroethane	4.7-	ND	ND	ND	
1,2-dichloroethane	2.8	ND	ND	ND	
1,1-dichloroethylene	2.8	ND	ND	ND	
trans-1,2-dichloroethylene	1.6	ND	ND	ND	
1,2-dichloropropane	6.0	ND	ND	ND	
1,3-dichloropropene	5.0	ND	ND	ND	
ethylbenzene	7.2	ND	ND	ND ·	
methylene chloride	2.8	ND	ND	ND	
1,1,2,2-tetrachloroethane	6.9	ND	ND	ND	
tetrachloroethylene	4.1	ND	, ND	ND .	

(Continued):



H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

	V(TRITTED				
		SAMPLE IDENTIFICATION				
COMPOUND	DETECTION LIMIT (ug/1)	OW-1	OW-1B	OW 2		
toluene	6.0	ND	ND	ND .		
1,1,1-trichloroethane	3.8	ND	BDL	ND		
1,1,2-trichloroethane	5.0	ND	ND	ND		
<u>trichloroethylene</u>	1.9	ND	ND	ND		
vinyl chloride	10	ND	ND	ND		

ADDITIONAL SAMPLE INFORMATION

Sample Date	7/2/84	7/3/84	7/3/84
Analysis Date	8/13/84	8/13/84	8/13/84
Internal Standard - Level	40 µg/1	40 μg/1	40 μg/1
bromochloromethane - Recovery	99%	120%	96%
Internal Standard - Level	40 μg/1	40 μg/l	40 μg/1
2-bromo-1-chloropropane - Recovery	99%	110%	<u>96%</u>
Internal Standard - Level	40 μg/1	40 μg/1	40 pg/1
1,4-dichlorobutane - Recovery	99%	120%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Bubia & Kapudii

GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

	VO	LATILES	•		
	SAMPLE IDENTIFICATION				
COMPOUND	DETECTION LIMIT (µg/1)	OW-3	OW-4	OW-5	
acrolein	400	ND	ND	ND ND	
acrylonitrile	400	ND	ND	ND	
- benzene	4.4	ND	ND	ND	
bromodichloromethane	2.2	ND	ND	ND	
bromoform	4.7	ND	ND	ND	
bromomethane	10	ND	ND	ND	
carbon tetrachloride	2.8	ND	ND	ND .	
chlorobenzene	6.0	ND	ND	ND	
chloroethane	10	ND	ND_	ND	
2-chloroethylvinyl ether	10	ND	ND	ND	
chloroform	1.6	ND	ND	ND	
chloromethane	10	ND	ND	ND	
· dibromochloromethane	3.1	ND	ND	ND	
l,1-dichloroethane	4.7:	ND	ND	ND	
1,2-dichloroethane	2.8	ND	ND	ND	
1,1-dichloroethylene	2.8	ND	ND	ND	
trans-1,2-dichloroethylene	1.6	ND	ND	ND	
1,2-dichloropropane	6.0	ND	ND	ND	
1,3-dichloropropene	5.0	ND	ND	ND .	
ethylbenzene	7.2	ND	ND	ND	
methylene chloride	2.8	ND	ND	ND	
1,1,2,2-tetrachloroethane	6.9	ND	ND	ND	
tetrachloroethylene	4.1	ND	ND	ND	

(Continued)



H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATTLES

	V O L.	RIILEO			
i		SAMPLE IDENTIFICATION			
COMPOUND	DETECTION LIMIT (µg/1)	OW-3_	OW-4	OW-5	
toluene	6.0	ND	ND	ND	
1,1,1-trichloroethane	3.8	ND	ND	ND	
1,1,2-trichloroethane	5.0	ND	ND	ND	
trichloroethylene	1.9	ND	ND	ND	
vinyl chloride	10	ND	ND	ND	

ADDITIONAL SAMPLE INFORMATION

Sample Date	7/2/84	7/3/84	7/10/84
Analysis Date	8/13/84	8/13/84	8/10/84
Internal Standard - Level	40 μg/l	40 μg/1	40 µg/1
bromochloromethane - Recovery	120%	97%	99%
Internal Standard - Level	40 μg/1	40 μg/1	40 μg/1
2-bromo-1-chloropropane - Recovery	130%	97%	90%
Internal Standard - Level	40 μg/l	40 µg/1	40 μg/1
1,4-dichlorobutane - Recovery	130%	100%	85%

FOR RECRA ENVIRONMENTAL LABORATORIES

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

THE ARCH WAY IN TO S	VO	LATILES	SAMPLE IDENTIFICATION		
COMPOUND	DETECTION LIMIT	0W-6	OSTERMAN	FT-1	
acrolein	400	ND ND	ND	ND	
acrylonitrile	400	ND	ND	ND	
benzene	4.4	ND	ND	ND	
bromodichloromethane	2.2	ND	ND	ND	
-bromoform	4.7	ND	ND	ND	
bromomethane	10	ND	ND_	ND ·	
_carbon tetrachloride	2.8	ND .	ND	ND	
chlorobenzene	6.0_	ND_	ND	ND .	
<u>chloroethane</u>	10	ND	ND	ND ND	
2-chloroethylvinyl ether	10	ND_	ND .	ND	
<u>chloroform</u>	1.6	ND	ND	ND	
chloromethane	10	ND :	ND	ND	
dibromochloromethane	3.1	ND	ND	ND	
1,1-dichloroethane	4.7 °*	ND	ND	ND	
-1,2-dichloroethane	2.8	ND	ND	ND	
1,1-dichloroethylene	2.8	ND .	ND	ND	
trans-1,2-dichloroethylene	1.6	ND	ND	ND	
1,2-dichloropropane	6.0	ND :	ND	ND	
1,3-dichloropropene	5.0	ND	ND	ND_	
ethylbenzene	7.2	ND	ND	ND	
methylene chloride	2.8	15 μg/1	ND	ND	
1,1,2,2-tetrachloroethane	6.9	ND	· ND_	ND	
tetrachloroethylene	4.1	ND .	ND	ND '	

(Continued)



H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES

Report Date: 8/24/84

VOLATILES

	SAMPLE IDENTIFICATION			
COMPOUND	DETECTION LIMIT (µg/1)	OW-6	OSTERMAN WELL	FT-1
toluene	6.0	ND	BDL	ND
1,1,1-trichloroethane	3.8	ND_	ND	ND
,1,2-trichloroethane	5.0	ND	ND	ND
trichloroethylene	1.9	ND	ND	ND ND
vinyl chloride	_10	ND	ND	ND

ADDITIONAL SAMPLE INFORMATION

		AND THE RESERVE OF THE PERSON
7/10/84	7/11/84	7/3/84
8/10/84	8/10/84	8/10/84
40 µg/1	40 µg/1	40 ug/1
94%	98%	89%
40 µg/1	40 μg/1	40 µg/l
99%	95%	77%
40 µg/1	_40 μg/1	40 ug/1
97%	96%	84%
	8/10/84 40 µg/1 94% 40 µg/1 99% 40 µg/1	8/10/84 8/10/84 40 µg/1 40 µg/1 94% 98% 40 µg/1 40 µg/1 99% 95% 40 µg/1 40 µg/1

FOR RECRA ENVIRONMENTAL LABORATORIES



н2м

Report Date: 8/24/84

,		PARAMETER (UNITS OF MEASURE)
SAMPLE IDENTIFICATION	SAMPLE DATE	TOTAL ORGANIC HALIDE (mg/1)
OW-1	7/2/84	<0.02
OW-1B	7/3/84	<0.02
OW-2	7/3/84	0.04
OW-3	7/2/84	0.04
OW-4	7/3/84	0.09
OW-5	7/10/84	<0.02
OW-6	7/10/84	0.12-
Osterman Well	7/11/84	0.04

FOR RECRA ENVIRONMENTAL LABORATORIES / What / Majeust

DATE 8/4/84

P

H2M

Report Date: 8/24/84

	1	PARAMETER (UNITS OF MEASURE)
SAMPLE IDENTIFICATION	SAMPLE DATE	pH (STANDARD UNITS)
OW-1	7/2/84	8.05
OW-1B	7/3/84	8.14
OW-2	7/3/84	8.12
OW-3	7/2/84	8.11
OW-4	7/3/84	8.14
OW-5	7/10/84	8.16
OW-6	7/10/84	8.07
FT-1	7/3/84	6.45
Osterman Well	7/11/84	8.20

FOR	RECRA	ENVIRONMENTAL	LABORATORIES	RRS	for	Richard	V Finn	
	*		DATE	8/a	4/24			

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 8/24/84

BASE NEUTRAL RECOVERY ANALYSIS OF METHOD BLANK

TILITIOD BLINK					
COMPOUND	ng OF	ng	7.		
IDENTIFICATION	SPIKE	RECOVERED	RECOVERY		
1,3-dichlorobenzene	50	25	50		
di-n-octylphthalate	50	36	72		
fluoranthene	⁻ 50	20	40		
naphthalene	50	31	62		
nitrobenzene	50	31	62		

ADDITIONAL SAMPLE INFORMATION

Extraction Date	7/31/84
Analysis Date	8/14/84
Internal Standard (IS) - Level	20 μg/l
deuterated phenanthrene - Recovery	140%
Surrogate Standard (SS3) - Level	120 μg/1
Decafluorobiphenyl - Recovery	61%
Surrogate Standard (SS4) - Level	100 μg/1
2-fluorobiphenyl - Recovery	50%

FOR RECRA ENVIRONMENTAL LABORATORIES

H2M GAS CHROMATOGRAPHY/MASS SPECTROMETRY PRIORITY POLLUTANT ANALYSES QUALITY CONTROL

Report Date: 8/24/84

VOLATILE RECOVERY ANALYSIS OF · SAMPLE OW-3

	ITTE OW-J		1 01
COMPOUND	ng OF	ng	7
IDENTIFICATION	SPIKE	RECOVERED	RECOVERY
carbon tetrachloride	200	120	60
chlorobenzene	200	160	80
chloroethyl vinyl ether	200	180	90
chloroform	200	160	80
dibromochloromethane	200	11 <u>0</u>	55
1,1-dichloroethane	200	180	90
1,1-dichloroethylene	200	170	85
1,2-dichloropropane	200	170	85
methylene chloride	200	140	70
tetrachloroethylene	200	180	80
1,1,2-trichloroethane	200	170	85
trichloroethylene	200	160	80

ADDITIONAL SAMPLE INFORMATION

Sample Date	7/2/84
Analysis Date	8/13/84
Internal Standard - Level	40 μg/1
Bromochloromethane - Recovery	120%
Internal Standard - Level	40 μg/1
2-bromo-1-chloropropane - Recovery	1 30%
Internal Standard - Level	40 μg/1
1,4-dichlrobutane - Recovery	130%

FOR RECRA ENVIRONMENTAL LABORATORIES Subara | fragewall

DATE 8/24/84

CHAIN OF CUSTODY RECORD PROJ. NO. PROJECT NAME 13305 -NO. SAMPLERS: (Signature) OF CON-TAINERS **STATION LOCATION** TIME STA, NO. DATE 3 8 0Wcooler Date / Time | Received by: / Signatural 7-5 Relinquished by: (Signatura) Relinquished by: (Signature) Date / Time Received by: (Signature) Refinquished by: (Signalure) Received by: ISignatural Relinquished by: (Signatural Date / Time Received by: 15 monrel Date / Time Received for Laboratory by: Remarks Relinquished by: [Signature] Date / Time [Signature]

Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received for Laborate					by: (Signature	Relinquished by: 15:gne						Date / Time Received by: (Signature)					
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. NO.	DATE	TIME	COMP.	GRAB			ON LOCATION			25		A A	73	7/			
yur M. Earmanao							CON-						REMARKS				
AMPLERS: [Signature]								,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	OF	J. J. J.				FF)	*//		
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CHAIN OF CUSTODY RECORD PROJ. NO. PROJECT NAME 13305-NO. ∞ SAMPLERS: (Signature) OF CON-TAINERS STATION LOCATION DATE TIME STA. NO. In croper IV Relinquished by: [Signature] Date / Time | Recgived by: (Signatural 7-5 Relinquished by: (Signature) Received by: (Signature) Date / Time Refinquished by: (Signerage) Relinquished by: (Signature) Relinquished by: (Signature) Date / Time Received for Laboratory by: Date / Time Remarks [Signature]

CHAIN OF CUSTODY RECORD , PROJ. NO. PROJECT NAME 13305-500 SAMPLERS: (Signature) OF CON-TAINERS TIME STATION LOCATION STA. NO. DATE 8 In proper I Date Time | Received by: Signature 7-5 Relinquished by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: Isigneturel Received by: (Signature) Relinquished by: (Signature) Dete / Time Received for Laboratory by: Date /Time Remarks Relinquished by: (Signature)

CHAIN OF CUSTODY RECORD 🛱 🕟 PROJECT NAME PROJ. NO. 13305-CON-TAINERS STA, NO. DATE TIME **STATION LOCATION** 8 In oppler II Date / Time Received by: Isignature 7/16/84 Relinquished by: (Signature) Relinquished by: (Signature) Date / Time Received by: ISignature) Relinquished by: (Signature) Date / Time Received by: (Signature) Relinquished by: (Signature) Date / Time Received by: (Signature) ... Date / Time Received for Laboratory by: Relinquished by: (Signeture) Date / Time Remarks [Signatura]

CHAIN OF CUSTODY RECORD CO PROJ. NO. PROJECT NAME 13305 -CON-TAINERS DATE TIME **STATION LOCATION** STA, NO. TEST UNLESS Relinquished by: [Signeture] Received by: Isignatural Relinquished by: [Signature] Date / Time Received by: Isignaturel Date / Time Date / Time | Received by: (Simeture) Received by: (Signature) Relinquished by: 15-gnesurel Date / Time Received for Laboratory by: Date / Time Remarks Relinquished by: (Signature) ISian alura! Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

CHAIN OF CUSTODY RECORD CO. The Control of the Cont PROJ. NO. PROJECT NAME 13305-CON-TAINERS STATION LOCATION STA. NO. DATE TIME CSFERNING 8 Osterman ornoertu In oppler VIII 2.00 DO NOT TEST IF UNIQUE SFAL IS NOT INTART DAMES + MONRE LABEL Date / Time | Received by: [Signature] Relinquished by: [Signature] Relinquished by: [Signesure] Date / Time Received by: Isignaturel Relinquished by: (Signesure) Date / Time | Received by: (Signature) Relinquished by: [Signeture] Date / Time Received by: (Simowell Date / Time Received for Laboratory by: Date / Time Relinquished by: [Signature] Remarks -(Signature) Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

PROJ. NO. PROJECT NAME OF REMARKS CON-TAINERS STATION LOCATION TIME STA, NO. Relinquished by: (Signeswell Date / Time Relinquished by: [Signature] Date / Time | Received by: Isignature !-Received by: Isignature! Relinquished by ISignature! Date / Time Relinquished by: ISignatural Date / Time Relinquished by: [Signature] Date / Time Received for Laboratory by: Date / Time Remerks (Signature) Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

CHAIN OF CUSTODY RECORD

7) SURFACE WATER DATA

Engineering-science LABORATORY ANALYSIS REPORT

) te: 7/15/83 SDB: NASH ROAD-PHASE I 3NUMBER: 36330

mae 10. Pive samples received 7/1/83 for volatile organics, total organics, total organic helosons and pt) analyse

Parameter / sample 10	SW-1,	સ-પ્ર	5W-3	5W-4	SW-1
Thetryline Chloride (ug/L)	11	410	10	410	410
Chloroform (ug/L)	410	210	410	410	410
jerson tetradeorde (ug/L)	< 10	Z10	410	410	10
Bensyne (ug/L)	LIO	<10	210	<10	410
Tolulne (ug/L)	410	410	410	410	410
alrobense (ug/L)	410	<10	410	410	410
1,1,2-TRillbroetrase(18/4)	410	<10	410	<10	<10
Tetrachlorothere (us/1)	LIO	410	410	<10	410
1,1,2,2-Tetrachloroetrans	210	410	KID	410	410
"trick love there (us/L)	210	<10	410	410	<10
trichlorethere (us/L) (18/2)	410	410	410	LID.	410
- Dicherobenspre sprees	410	410	410	210	L10
- Hexachlorountaliene (nost)	<10 ·	410	210	410	410
of (611)	6.9	8.1	7.1	7.4	7.4
Total Organic halogns(ppn)	0.010	0.005	0.007	0.007	0.008
		1		•	, , , ,

3.L. Thorpe Laboratory Superuson

DAYANNAH LABUKATUKILS AND ENVIRONMENTAL SERVICES, INC.

P.O. Box 13842 • Savannah, Ga. 31406

912/354-7858 .



REPORT OF ANALYSIS

B. L. Thorpe Engineering-Science 57 Executive Park South, NE Suite 590 Atlanta, GA. 30329

REPORT NO.

DATE RECEIVED

SAMPLED BY

Client

NATIFICATION: Samples submitted to laboratory

TETHODS:

lanette M. Davis

iel Chemiss, YF

EPA Methods of Analysis (Model 610/0.I. Corp.)

	SAMPLE ID.#		T	OX CONTENT	(ppm)
	07-1000-01	•	:	0.010	
	07-1001-01	* 1	<u>;</u>	0.005	
•	07-1002-01	* *		0.007	
	07-1003-01		· !	0.007	
	07-1004-01	<i>:</i>		0.008	

Janétte M. Davis

8) BORING LOGS

SHEET I DE 2 OW-I BORING 907 FRACTURES SAMPLING NASH ROAD SITE * CAMPLE AO B RUN TIPE NO WELL SCHEMATICS DEPTH 51 C# CORE 0W-1 DESCRIPTIVE GEOLOGIC NOTES OW-1B PHOTECTIVE CASING WITH LOCKING CAP SURFACE CONCITTONS: GRASSY, DET. 1 ,03 07 LIGHT PROBE MISS MEDIUM SILT AND CLAY, TRACE OF BAND, DECASIONAL BLACK DREAMS STAINS GHOUND SUNFACE - CONCRETE -15 2 15 2" ID STAINLESS -STEEL PIPE PRIMARY BENTONITE SEAL GRAY MOIST STIFF LAYERED CLAY AND SILT WITH DECASIONAL SEAMS OF FINE 1D MEDIUM SAND, 1/8" IN THICKNESS 15 3 (1 5 - SUPPLEMENTARY PENTONITE SCAL CL 35 4 13 STRINLESS STEEL -O.PJC SLOTTED WELL SCREEN GRADES TO LESS STIFF 15 5 (3 FILTER SAND -6 13 10. GRAY MOIST MEDIUM LAYERED CLAY, RED CLAY LAYERS APPROXIMATELY 1/20° THICKNESS AT TRREGULAR INTERVALS 10 7 (7 GRADES TO VERY SOFT CLAY 6 (1 15. - NATURAL BACKFILL 2 9 0 10 0 20 11 0 GRADES TO SOFT 25 9 18,15 30 18120 GRADES TO VERY SOFT 35. 38 /6" 18:38 BROWN, MOIST SILT AND COARSE TO FINE GRAVEL, LITTLE CLAY, LITTLE FINE SAND (TILL) 55.46" 1814 0 40 18155 16/6 GRADES TO WET 20/6" (B) 6 N 45 50 GRADES TO MOIST, DENSE SILT, SOME FINE TO COARSE SAND, LITTLE FINE GRAVEL 98 18:70 - PRIMARY BENTONITE SEAL 55 55/6"|10:00 - FILTER SAND 10-ROK 60 GRADES TO WET 18:90 MEM TOP OF BEDROCK SOIL SATILING INFORMATION M STANDARD PENETRATION TEST # UNDISTURBED SAMPLE M DISTURBED SAMPLE FRACTURES FIG. TO NELL SCHEMATIC D NO SAMPLE RECOVERED TITE Jene of core loss Eig# Grout TITE Brerele pone good pententie Seal ROCE COID INCOMMATION Dip-slip stirlensions ETD Sand Filter COPE LOSS ZONE fractures shown at approximate angle to core exis-₩9 Well Boreen Pinoralized fracture c - calcife s - suffide 💷 , rereser core TT free fured zone

a Vold

82

COST POD

1		SAM	PL II	v <i>G</i>	1	ACTURES	IN FEET	907 2	BORING OW-I : NASH ROAD SITE
WELL SCHEMATICS	EL CH COUAT	SAMPLE NO B TYPE	AUA	CCFI PEC	COME NOD	FRACT	DEPTH !	GP APH!	DESCRIPTIVE GEOLOGIC NOTES
							657		
		18+11					70-	GM	TOP DE REDROCK AT 68.6". BEDROCK 15 DOLOSTONE. BORING TERMINATED AT A DEPTH OF 68.6"

SOIL SAMPLING INFORMATION

M STANDARD PENETRATION TEST

m preisturbed SAMPLE

M DISTURBED SAMPLE

DI NO SAMPLE RECOVERED

ROCT CORD, INFORMATION

PEPCENT COPE RECOVERY

PRACTURES

Biercia zone

Dip-stip slickensides
Fractures-shown at approximate angle to core axis
Mineralized fracture c = catcite s = suitide
Fractured zone

Yord

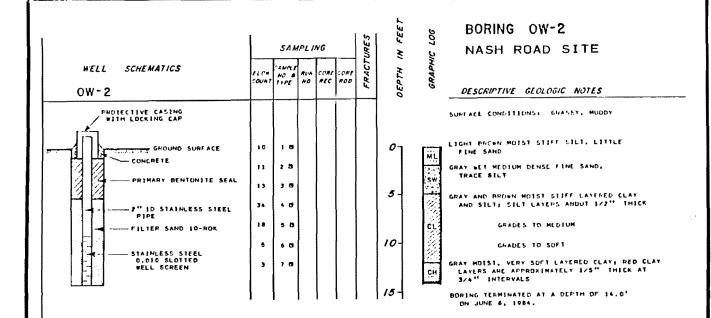
FIS TO WILL SCHEMATIC

FMF Grout

E222 Pentonite Seal

Comp Sand Filter

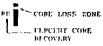
西田 Well Screen



SOIL SAMELING INFORMATION

- M STANDARD PENETRATION TEST
- B UNDISTURBED SAMPLE
- E DISTURPED SAMPLE
- D NO SAMPLE RECOVERED

POCE COPE INFORMATION



FRACTURES

TIE Brecele zone

Dip-slip stickensides

Fractures-shown at approximate angle to core axis ميميد Fineralized fracture c - catcife s - suffide

fearfured rone

KLY TO KELL, SCHEMATIC

打造 Grout

1777 Destonite Scal

t⊐ Sand Filter

⊨ Well Sercen

SHEET 1 OF 2 BORING OW-3 907 SAMPLING ₹ DHIC NASH ROAD SITE AMPLI HELL SCHEMATICS CORE Š ALC A D OW - 3 DESCRIPTIVE GEOLOGIC NOTES PROTECTIVE CASING BITH LOCKING CAP SURFACE CONDITIONS: GRASSY, TALL PRUSH GROUND SURFACE MIXED SAND/WASTE FILL --- CONCRETE 3A 🛭 GRAY AND BROWN MOIST MEDIUM LATERED CLAY AND SILT, TRACE FINE SAND, FRITCH SILT LAYERS APPROXIMATELY 1/2" -1" IN THICKNESS AT 1 1/2" INTERVALS 97.5 31. 13 5 . 0 32 - 7" ID STAINLESS STEEL PIPE 20 5 0 GRADES TO STIFF AT 8.0" GRAY MOIST MEDIUM LAYERED CLAY RED CLAY LAYERS APPROXIMATELY 1/10**
THICK AT 1/2" INTERVALS . . 10 7 5 GRADES TO SUFT WITH DECASIONAL SILT LAYERS APPROXIMATELY 1/2" THICK AT 18.0" - NATURAL BACKFILL 8 0 CLAY LAYERS BECOME LESS DISTINCT AT 12.0" 15 ĆH GRADES 70 VERY SOFT AT 16.0" 9 6 10 🗷 11 0 20 GRAY AND BROWN/FED MOIST MEDIUM STIFF LAYERED CLAY AND SILT AT 26.0" 25 SEAM OF MOIST MEDIUM TO FINE SAND AT 26.3' BROWN MOIST MEDIUM SILT AND CDARSE TO FINE GRAVEL, TRACE FINE SAND, TRACE CLAY (TILL) ĆĻ: 124 3 128 5 7245 13 6 14 (3 GRADES TO DRY AND VERY STIFF SILT AT 28.5" 30 65451 15 8 GRADES TO MOIST AND HARD SILT 35 16 G 1004 GRADES TO MOIST AND MEDIUM 29 17 6 40 PRIMARY BENTONITE SEAL 21 18 🖾 45 GRADES TO WET STAINLESS STEEL 0.010 SLUTTED WELL SCREEN 19 📆 23 50 - FILTER SAND 10-ROK 17 20 0 55 --- GRAVEL PACK - BENIONITE SEAL GRADES TO COARSE TO FINE GRAVEL AND BROWN DRY HARD SILT. SOME WEATHERED ROCK FRAGMENTS, TRACE FINE SAND 75/5' 21 13 60 - GRAVEL PACK HITH TOP OF BEORDEK 2-01-80 SOIL SAMPLING INFORMATION PIETOMETRIC SURFACE Ţ. N STANDARD PENETRATION TEST . DATE TESTED **UDDISTURBED SAMPLE** M DISTURBED SAMPLE PACTORES ELY TO WILL PORPMITE D DO SAMPLE RECOVERED TITE Jean of core loss Fig. Grout TEE Brencie zone 1222 Bentonite Scal BOCK CORE THEORWATTON Dir-stip stickensides tim Sond Filter ⊨∃ Well Screen CORE LOSS ZONE - Exectures shown at approximate angle to core axis Minoralized fracture c - catrile s - suffide مميير LI ECURT COPE II fractured rome PECOVERY Verid 82 Cohir bob

SHEET 2 OF 2

			SAM	PL IN	r G		TURES	IN FEET	907 21	BORING OW-3 NASH ROAD SITE
WELL	SCHEMATICS	ALCH COUNT	AMPLE AC B TYPE	RUA: NO	CORE REC	COMP RCD	FRACT	ОЕРТИ	GRAPH	DESCRIPTIVE GEOLOGIC NOTES
								65 ₇	1200	
					٠			70	G S	TOP OF BEDROCK 68.7' REDROCK IS DOLOSIONE

SOIL SAUTLING INCORMATION

M STANDARD PENETRATION TEST

UNDISTURBED SAMPLE

M DISTURBLE SAMPLE

D BO SAMPLE RECOVERED

BOCK COME INTORMATION

ED CORE LOSE ZONE

PLECINT CORE
PECOVERY

FRACTURES

Erry Zone of core loss

Reccia zone

Dip-slip slickensides

Fractures shown at approximate angle to core axis

Mineralized tracture c - calcite s - sulfide

Fractured zone

Yold

KID TO WELL SCHEWALL

料理 Grout

1772 Bentonite Scal

t∵⊐ Sand Filter

四海 Well Screen

SOIL SAULING INCOMMATION

KEY TO WELL SCHEMATIC

M STANDARD PENETRATION TEST

fine Grout

• UNDISTURBED SAMPLE

EZZ Bentonite Scal

& DISTURBED SAMPLE

t□ Sand Filter □ Well Screen

D NO SAMPLE RECOVERED

SHEET 2 01 2

WELL SCHEMATICS	SAMPLING SAMPLI	
	10P OF HEDHOCK 70.3' BEDROCK 15 DOLOSTONE BURING TERMINATED AT A DEFTH OF 70.3' ON JUNE 13, 1984.	

5011, SABELING INFORMATION

- S STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- E DISTURPED SAMPLE
- CI NO SAMPLE RECOVERED

BOCK CORE INFORMATION

PECOVERY

CORP. LOSE ZONE

FRACTIPES

TTT Zone of core loss

TITE Brerele 2000

Dip-911p stickensides

Fractures shown at app.

fractures shown at approximate angle to core axis المريد Mineralized fracture c - calcite s - suilide

Frentured from

KEY TO WELL SOMEWHIC

Hag Grout

EDD Bentonite Seal

Too Sand Filter

度用 Rell Screen

907

FRACTURES

₹

DEPTH

0-

5

10.

15

20

25

30

35

40

45-

50-

55

60

ĆL:

ćij

SP

SAMPLING

TAMPLE AC B TIPE

1 0

6 8

17

9/6

2 9 5

2 11 0

2 12 5

3945' 13 B

5042' 15 8

60%4° 16 B

65/5 17 19

10 0

WELL SCHEMATICS

PROTECTIVE CASING

- CONCRETE

STATE GROUND SUPFACE

SUPPLEMENTARY BENTONITE SEAL

- 2" 1D STAINLESS STEEL PIPE

- NATURAL BACKFILL

FRIMARY BENTONITE SEAL

FILTER SAND 19-RDK

STAINLESS STEEL 0.010 SLOTTED WELL SCREEN

THEM TOP OF BEDROCK

OW - 5

GRADES TO MORE GRAVEL, LESS SILT.

GHADES TO WET SILT, SOME MEDIUM TO FINE GRAVEL, LITTLE MEATHERED REDROCK FRAGMENTS AT 65.01

SOLL SAMPLING INCORNATION

M STANUARD PENETRATION TEST

UNDISTURBED SAMPLE

S DISTURBUD SAMULE

D BO SAMELE PECOVERED

KEY TO BELL PHUMATIC

SST Creat

ECO Bentonite Scal

. CID Sand Pilter

四日 Well Screen

•	L	344	PLI	NG.		3
HELL SCHEMATICS	Si CO COUNT	SAWPLE MO B TEPE	NUA NO	CORE	COME NOD	FRACTURES

BORING OW-5 NASH ROAD SITE

DESCRIPTIVE GEOLOGIC NOTES

TOP OF DOLOSTONE BEDROCK AT 69.81

BURING TERMINATED AT A DEPTH OF 70.0° ON JUNE 14, 1984.

SOIL PASPLING INCOMMATION

- STANDARD PENETRATION TEST
- # empisturnin SAMPLE
- R DISTURBED SAMPLE
- D NO SAMPLE RECOVERED

ROCE CORE INFORMATION

PECOVERY

THACTIFIES

weid .

Brecle zone

Dip-alip alichensides

Fractures-chose at approximate angle to core exis

Mineralized fracture c - calcife s - suffide

Fractured zone

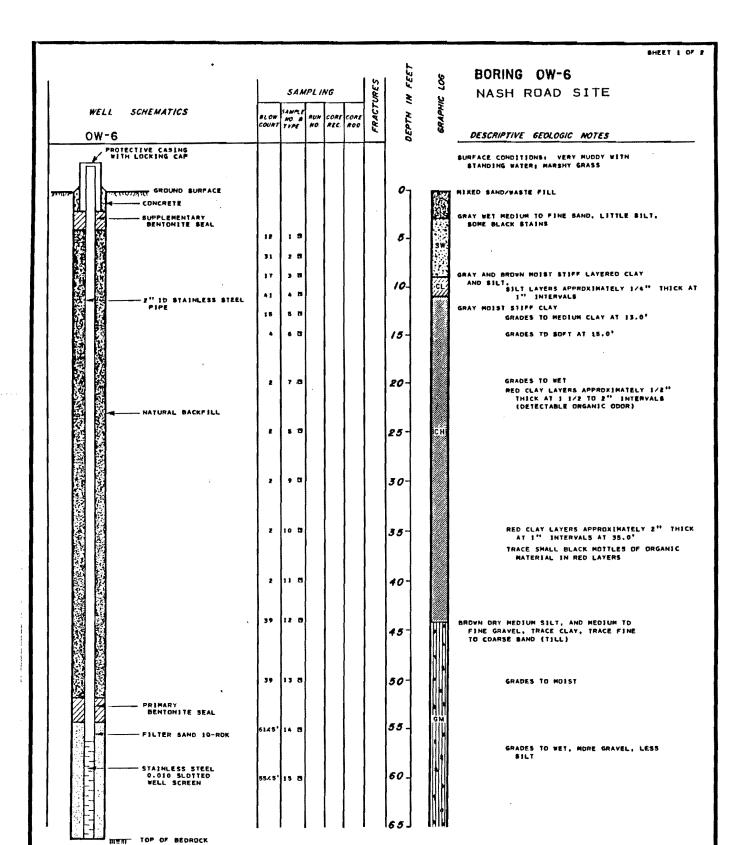
KEY TO WELL SCHENATIC

tron Grout

2002 Bentonite Seal

Cam Rand Filter

関ヨ Well Bereen



SOIL SAMPLING INFORMATION

- S STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- B DISTURBED SAMPLE
- O NO SAMPLE RECOVERED

ROCK CORE INFORMATION

PERCENT CORE
RECOVERY

FRACTURES

TITE Zene of core loss

TAFE Breccis zone

Dip-tilp slickensides

Fractures-shown at approximate angle to core exis منيد Minorelized fracture | c = catcite | s = suifide

Free tured zone

KEY TO WELL SCHEMATIC

₽# Grout

222 Bentonite Seal

Sand Filter

Well Screen

1			SAM	IPL II	v <i>G</i>		URES	IN FEET	907 Ju	BORING OW-6 NASH ROAD SITE
	WELL SCHEMATICS	COUNT	AMPLE NO A TYPE	RUA WO	CORE REG	CORT	FRACT	DEPTH !	GRAPHI	DESCRIPTIVE GEOLOGIC NOTES
						-	aphre Aug T	70-		10P OF REURDCK 66.0° BEDROCK IS DOLOSTONE BORING TERMINATED AT A DEPTH OF 66.0° ON JUNE 19, 1984.

BOIL SAMPLING INFORMATION

- STANDARD PENETRATION TEST
- UNDISTURBED SAMPLE
- B DISTURDED SAMPLE
- O NO SAMPLE RECOVERED

BOCK CORE INCOMMATION

CORE LOSS ZONE
TERCIHT CORE
RECOVERY

FRACTURES

TTT Icne of core toss

Dip-slip slickensides

Fractures shown at approximate angle to core axis سيمير Mineralized fracture co-calcife so-suitide

Fractured zone

KEY TO WELL SCHEMATIC

578 Grout

EZZZ Bentonite Seni

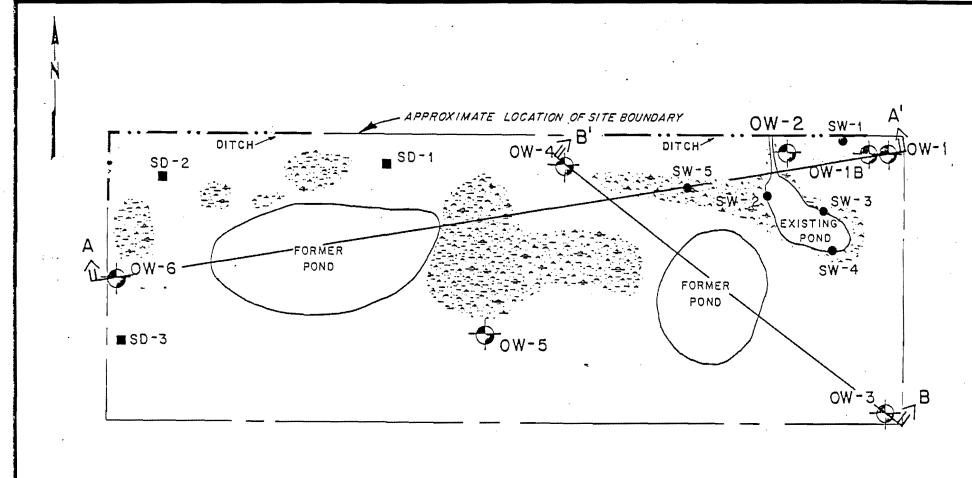
□□ Sand Filter

舞田 Well Sercen

9) SAMPLING LOCATION MAP

BY D. Tomas DATE 8/3/84

1 1 1 FIL 1/331 103/1



EXPLANATION:

- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- SAMPLING WELL

OW-1

NOTE | OSTERMAN WELL IS LOCATED APPROXIMATELY 1000 FEET WEST OF SITE.

PLOT PLAN
SHOWING CROSS SECTION LOCATIONS
NASH ROAD SITE

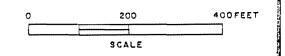


FIGURE V. IV.

10) PERMEABILITY TEST DATA

Sum In-5,7	mary Lu Permeabelity	
well	pear of a contract of the cont	
ω Oω-1	4,37 ×10-4	511
- Ow-2		silt sand
- βω-1β	8,43 ×10 ⁻⁷	1,11/bedrock
-ω-3	1,43 ×10-6	wet zove in till
0 w -4	7.88 × 10 -7	toll/bedrock
οω-5	7.5 +10-4	till/bedrock
οω-6	4.8 × 10-4	All bon ver le

in a second of the second

Months of the second se

THE PROPERTY AND ADDRESS OF THE PARTY.

TABLES A CONTRACTOR OF THE MANAGEMENT AND A CONTRACTOR OF THE SECOND

CALIBRATION DATA Well 1 0W1 A±-5.6258E 01 B= 6.4516E-02 D= 0.0000E 00 J0= 272 T0= 81493 ET(sec)= 30 WELL DRAWDOWN OW1 -2.96 ET(sec)= 61 WELL DRAWDOWN ом1 ^{5,01} / −3.63 ET(sec)= 90 WELL DRAWDOWN OW1 2011 - ~4.27 ET(sec)= 121 WELL DRAWDOWN OW1 -4.88 ET(sec)= 151 WELL DRAWDOWN OW1 -5.22 ET(sec)= 180 WELL DRAWDOWN OW1 -5.46 ET(sec)= 211 MELL DRAWDOWN

OW1 1.03 -5.61 ET(sec)= 241 WELL DRAWDOWN

OW1 // -5.26 ET(sec)= 271 WELL DRAWDOWN OW1 -5.87 ET(sec)= 301 WELL DRAWDOWN OW1 *** -5.93 ET(sec)= 330 WELL DRAWDOWN OW1 -6.00 ET(sec)= 361 WELL DRAWDOWN OW1 -6.06 ET(sec)= 390 WELL DRAWDOWN ОМ1 (0.5° д) -6.12

ET(sec)= 421 WELL DRAWDOWN

Garage Contract

g word

EI(sec)= 421 WELL DRAWDOWN OW1 -6.19 ET(sec)= 451 WELL DRAWDOWN OW1 -6.19 ET(sec)= 481 WELL DRAWDOWN OW1 -6.25 EI(sec)= 511
WELL DRAWDOWN

OW1 -6.32

EI(sec)= 540
WELL DRAWDOWN

OW1 -6.32 ET(sec)= 571 WELL DRAWDOWN OW1 -6.32 EI(sec)= 600 WELL DRAWDOWN ОW1 10 min -6.38 ET(sec)= 631 WELL DRAWDOWN OW1 --6.38 ET(sec)= 661 WELL DRAWDOWN ET(sec)= 690 WELL DRAWDOWN OW1 -6.38 EI(sec)= 721 WELL DRAWDOWN OW1 -6,45 ET(sec)= 751 WELL DRAWDOWN OW1 -6.45 ET(sec)= 781 WELL DRAWDOWN OW1 -6.45 EI(sec)= 811 WELL DRAWDOWN OW1 ~6.45 ET(sec)= 841 WELL DRAWDOWN OW1 -6.45 ET(sec)= 871 WELL DRAWDOWN -6.45 OM1

ET(sec)= 901 WELL DRAWDOWN 0W1 -6.49 ET(sec)= 930 WELL BRAWDOWN OW1 ~6.51

ET(sec)= 961 WELL DRAWDOWN

-6.51 OWI

ET(sec)= 990 WELL DRAWDOWN

ET(sec)= 1021 WELL DRAWDOWN

-6.51 OWI

ET(sec)= 1051 WELL DRAWDOWN

OW1 -6.51

ET(sec)= 1080 WELL DRAWDOWN

011 -6.51

ET(sec)= 1110 WELL DRAWDOWN

OW1 -6.51

ET(sec)= 1141 WELL DRAWDOWN

OW1 -6.51

ET(sec)= 1121 WELL DRAWDOWN

-6.59

ET(seo)= 1200 WELL DRAWDOWN

OWI

ET(sec)= 1231 WELL DRAWDOWN

OW1 ~6.58

ET(sec)= 1261 WELL DRAWDOWN

OW1 -6.58

ET(sec)= 1291 WELL DRAWDOWN

OW1 -6.58

ET(sec)= 1320 WELL DRAWDOWN

OW1 -6.58

ET(sec)= 1350 WELL DRAWDOWN

OW1 -6,59

ET(sec)= 1380 WELL DRAWDOWN

OWI -6.58

ET(sec)= 1410 WELL DRAWDOWN

ET(sec)= 1380 WELL DRAWDOWN

กมา

-6.58

ET(sec)= 1410 WELL DRAWDOWN

OWI

-6.59

ET(sec)= 1441 WELL DRAWDOWN

OWI

-6.58

ET(sec)= 1471 WELL DRAWDOWN

-6.58

ET(sec)= 1500 WELL DRAWDOWN

011

-6.58

ET(sec)= 1530 WELL DRAWDOWN

OW1 ~6.58

ET(sec)= 1561 WELL DRAWDDWN

OW1 -6.59

ET(sec)≈ 1591 WELL DRAWDOWN

CMI

-6.58

ET(sec)= 1621 WELL DRAWDOWN

0W1

-6.62

ET(sec)= 1651 WELL DRAWDOWN

OW1 -6.62

EI(sec)= 1681 WELL DRAWDOWN OW1 -6.64

ET(sec)= 1711 WELL DRAWDOWN

OW1 -6.64

ET(sec)= 1741
WELL DRAWDOWN

OW1 -6.64

ET(sec)= 1221 WELL DRAWDOWN

OMI

-6.64

ET(sed)= 1800 WELL DRAWDOWN

-6.64

ET(sec)= 1830 WELL DRAWDOWN

```
Y17×39.6
LE CALIBRATION DATA
Well 1 0W18
A=-5.6923E 01
B= 6.5279E-02
D= 0.0000E 00
d_{y_{k}} .
 JØ= 273
10= 62293
EI(seo)= 61 / (***)

DRANDOWN

OWIB (**-1.58*)
ET(sec)= 121
WELL DRAWDOWN
OW1B -1.26
ET(sec)= 180
WELL DRAWDOWN
0W1B ~1.89
ET(sec)= 241
WELL DRAWDOWN
OW18 -J.95
ET(sec)= 301
WELL DRAWDOWN
OWIB 51 -2.08 %
ET(sec)= 361
WELL DRAWDOWN
OW1B −2.19
ET(sec)= 420
WELL DRAWDOWN
OW1B -2.28
ET(sec)= 481
WELL DRAWDOWN
OW18 -2.35
ET(sec)= 541
WELL DRAWDOWN
OWIB -2.48

ET(sec)= 601 1/40"

WELL DRAWDOWN

OWIB -2.54
ET(sec)= 661
WELL DRAWDOWN
OW1B -2.61
ET(sec)= 721
WELL DRAWDOWN
OW1B -2.74
EI(sec)= ,780
WELL DRAWDOWN
OWIB
```

0118

ET(sec)= 840 WELL DRAWDOWN

-2.87

WILL เมเสาฝมเหลา OWIB -2.82 EI(sec)= 900 \(\sqrt{g}^2\)

DRAWDOWN -2.93

ET(sec)= 960 WELL DRAWDOWN

WELL

0418

-3,00 ONTB

ET(sec)= 1021 WELL DRAWDOWN

-3.06 0W1B

ET(sec)= 1081 DRAWDOWN WELL

OMIB

ET(sec)= 1141 WELL DRAWDOWN

-3.26 OWIB

ET(sec)= $1200 \frac{3^{O} e^{x^2}}{0}$ WELL DRAWDOWN OWIB . -3.32

ET(sec)= 1261 WELL DRAWDOWN

-3.39 OW1B

ET(sec)= 1321 WELL DRAWDOWN

-3.45 OWIB

ET(sec)= 1381 WELL DRAWDOWN

-3.52 OMIB

EI(sec)= 1410 WELL DRAWDOWN

OW1B -3.59
ET(sec)= 1500) (m)

OW18 -3.65

ET(sec)= 156! WELL DRAWDOWN

-3.72 OWIB

ET(sec)= 1621 WELL DRAWDOWN

-3.28 OMIB

ET(sec)= 1681 WELL DRAWDOWN

-3.85 OWIB

ET(sec)= 1741 WELL DRAWDOWN

OWIB

ET(sec)= 1800 $\frac{h_1^2}{h_1^2}$ WELL DRAWDOWN

OWIB ...-3.98

FT(sec)= 1861 WELL DRAWDOWN ETCscc)= 1081 WELL DROWDOWN

OW18 -4.12

El(sec)= 2041 WELL DRAWDOWN

OMTB

-4.21

Bernard Britain Committee of the Committ

ET(sec)= 2101 (...
BRAWDOWN

омів "Хі "-4.33

ET(sec)= 2161 WELL DRAWDOWN

OM1B

-4,43

ET(sec)= 2220 WELL DRAWDOWN

OW18 -4.46

ET(sec)= 2280 WELL DRAWDOWN

OWIB -4.56

ET(sec)= 2340 WELL DRAWDOWN

OWIB -4.56

EI(sec)= 2400 WELL DRAWDOWN

ONIB

-4.65

ET(sec)= 2461 WELL DRAWDOWN

OWIB -4.20

ET(sec)= 2520 WELL DRAWDOWN

OW1B -4.26

ET(sec)= 2580 WELL DRAWDOWN

OWIB

-4.83

ET(sec)= 2640 WELL DRAWDOWN

OW1B

-4.89

ET(sec)= 2701 WELL DRAWDOWN

OWIB , '- -4,96

EI(sec)= 2761 WELL DRAWDOWN

OWIB -5.02

ET(sec)= 2821 WELL DRAWDOWN

0W18

-5,09

ET(sec)= 2880 WELL DRAWDOWN

Elised) 2741 WELL DRAWDOWN

-5.02 OMIB

ET(sec)= 2821 WELL DRAWDOWN

-5.09 OMIB

ET(sec)= 2880 WELL DRAWDOWN

OWIB

-5.15

ET(sec)= 2941 WELL DRAWDOWN

-5.22 OMIB

ET(sec)= 3001 (F)
WELL DRAWDOWN

OW18 7.7. -5.28

ET(sec)= 3061 WELL DRAWDOWN

-5.35 OWIB

ET(sec)= 3121 WELL DRAWDOWN

-5.41 OWIB

ET(sec)= 3181 WELL DRAWDOWN

-5.46 0M18

EI(sec)= 3240 WELL DRAWDOWN

-5.48

0M1B

ET(sec) = 3300 /)

OWIB 1-5.54

ET(sec)= 3361 WELL DRAWDOWN

-5.61 ONTB

Mill of head

ET(sec)= 1370 Ø WELL DRAWDOWN

0W2 -3.05

ET(sec)= 1396 WELL DRAWDOWN

-2.85 DW2

ET(sec)= 1422 WELL DRAWDOWN

OW2

-2.69

ET(sec)= 1449 WELL DRAWDOWN

0W2

-2.51

ET(sec)= 1475 WELL DRAWDOWN -2,31

OW2

ET(sec)= 1501 WELL DRAWDOWN

0W2

-2.11

EI(sec)= 1527 WELL DRAWDOWN

0W2

-1.96

ET(sec)= 1554 WELL DRAWDOWN

0W2

-1.78

ET(sec)= 1580 WELL DRAWDOWN

OW2

-1.58

EI(sec)= 1606 WELL DRAWDOWN

0W2

-1.42

ET(sec)= 1633 WELL DRAWDOWN

-1.24 273 OW2 JØ= 273 TØ= 59355

ET(sec)= 16 WELL DRAWDOWN

0W2

-0.57

ET(sec)= 42 WELL DRAWDOWN

0W2 -0.57
EI(sec)= 68 WELL DRAWDOWN

0W2 -0.52

FI(sec)= 94 WELL DROWDOWN

```
HICSECT DRAWDOWN
OW2 -1.15
ET(sec)= 119
WELL DRAWDOWN
OW2 *** -1.23
FI(sec)= 145
WELL DRAWDOWN
OW2 -2.33
  ET(sec)= 121
WELL DRAWDOWN
DW2 1 -2.91
ET(sec)= 196
WELL DRAWDOWN

OW2 -3.51

ET(sec)= 222
WELL DRAWDOWN

OW2 -4.12
ET(sec)= 196
ET(sec)= 248
WELL DRAWDOWN
0W2 -4.22
ET(sec)= 273
WELL BRAWDOWN
0W2 -5.25
ET(sec)= 299
WELL DRAWDOWN
OW2 , -5,65
ET(sec)= 325
WELL DRAWDOWN
0W2 -5.99
ET(sec)= 351
WELL DRAWDOWN
OW2 -6.28
ET(sec)= 377
WELL DRAWDOWN
0W2 -6.52
ET(sec)= 403
WELL DRAWDOWN
OH2
             -6.72
ET(sec)=
           429
WELL DRAWDOWN
OW2 -6.86
ET(sec)= 455
WELL DRAWDOWN
OW2 -2.01
 1.
ET(sec)= .481
 WELL DRAWDOWN
OW2 ~7.12
 ET(sec)= 502
WELL DRAWDOWN
 0W2 -2.26
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ET(sec)= 533

MELL DRUMENTALL OW2 -7.26 ET(sec)= 533 WELL DRAWDOWN -7,32 0W2 ET(sec)= 560 WELL DRAWDOWN -7.39 0W2 ET(sec)= 586 WELL DRAWDOWN -7.46 0W2 ET(sec)= 612 WELL DRAWDOWN OW2 ', -7.50 EI(sec)= 638 WELL DRAWDOWN -7.52 OW2 ET(sec)= 665 WELL DRAWDOWN -7.59 0W2 ET(sec)= 691 WELL DRAWDDWN -7,59 0W2 ET(sec)= 212 WELL DRAWDOWN -2,66 0W2 ET(sec)= 243 WELL DRAWDOWN -7.66 0W2 ET(sec)= 769 WELL DRAWDOWN -7.66 OW2 ET(sec)= 796 WELL DRAWDOWN -2.20 0M2 ET(sec)= 822 WELL DRAWDOWN -2.72 0W2 ET(sec)= 848 WELL DRAWDOWN -7.72 0U2 EI(sec)= 824 WELL DRAWDOWN -7.72 0W2 EI(sec)= 900 WELL DRAWDOWN 0W2 . ~7.72

ET(sec)= 926 WELL 926 DRAWDOWN 0W2 / -2.79

ET(sec)= 952 WELL DRAWDONN OW2 -7.70

ET(sec)= 822 WELL DRAWDOWN

OW2 -7.72

ET(sec)= 848 WELL DRAWDOWN

W2 -7.72

ET(sec)≈ 874 WELL DRAWDDWN

0W2

-7.72

ET(sec)= 900 WELL DRAWDOWN

OW2 -7.72

ET(sec)= 926 WELL DRAWDOWN

0W2 /1 -7.79

ET(sec)= 95Z WELL DRAWDOWN

DW2 ~2.79

ET(seo)= 979 WELL BRAWDOWN

0W2 -2.79

ment for the second of the

CALIBRATION DATA HeII 1 0W3
A=-6.7066E 01
B= 8.2644E-02
D= 1.5000E 01
J0= 272
T0= 71820 ET(sec)= 60 WELL DRAWDOWN e0.8/1.12 ENO ET(seo)≒ 121 WELL DRAWDOWN 7.93 0M3 ET(sec)= 180 WELL DRAWDOWN 2.85 0M3 ET(sec)= 241 WELL DRAWDOWN OW3 7.76 ET(sec)= 301 WELL DRAWDOWN ом**э** - _{7,} 1, 2, 50 ET(sec)= 360 WELL DRAWDOWN 2.52 ET(sec)= 421 WELL DRAWDOWN 2, 43 OM3 ET(sec)= 481 WELL DRAWDOWN 7.30 0M3 ET(sec)= 541 WELL DRAWDOWN 7.19 DM3 ET(sec)= 600 WELL DRAWDOWN 2.10 6WO EI(sec)= 661 WELL DRAWDOWN 7.02 0M3 ET(sec)= 721 WELL DRAWDOWN 6.94 0M3 EI(sec)= 281 WELL DRAWDOWN 6.22 CM3 ET(sec)= 841 WELL DRAWDOWN 6.69 ET(sec)= 900

WELL DRAWDOWN
OW3 /, 6.61

ET(sec)= 961 WELL DRAWDOWN

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ET(sec)= 1021
WELL DRAWDOWN
  0M3
                 6.36
 ET(sec)= 1081
WELL DRAWDOWN
  OW3 6.28
 ET(sec)= 1141
WELL DRAWDOWN
  0W3 6.19
 ET(sec)= 1200
WELL DRAWDOWN
  oma -
                6.11
 ET(sec)= 1261
WELL DRAWDOWN
  0M3
                 6.36
 ET(sec)= 1321
WELL DRAWDOWN
  0M3
                 6.28
 ET(sec)= 1381
WELL DRAWDOWN
OW3 6.19
 ET(sec)= 1441
WELL DRAWDOWN
 OW3 6.11
  ET(sec)= 1501
WELL DRAWDOWN
 OW3 1 6.03
ET(sec)= 1561
WELL DRAWDOWN
1 0W3 5.95
 ET(sec)= 1621
WELL DRAWDOWN
  OM3
                 5.86
 ET(sec)= 1681
WELL DRAWDOWN
  0M3
 ET(sec)= 1241
WELL DRAWDOWN
  EW0
 ET(sec)= 1800
WELL DRAWDOWN
 OW3 , 5.61
 ET(sec)= 1861
WELL DRAWDOWN
: OW3 5.50
 ET(sec)= 1921
WELL DRAWDOWN
  0W3 5.37 i
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ET(sec)= 1981 WELL DRAWDOWN

DM3

El(sec)= 1UZI WELL DRAWDOWN 5.37 0M3 ET(sec)= 1981 WELL DRAWDOWN OW3 5.37 ET(sec)= 2041 WELL DRAWDOWN DISTRIBULIAN

DW3 5.28

EI(sec)= 2101

WELL DRAWDOWN омз , ... 5.15 ET(sec)= 2160 WELL DRAWDOWN DW3 5.04 ET(sec)= 2220 WELL DRAWDOWN 0W3 4.95 ET(sec)= 2280 WELL DRAWDOWN 4.87 EWO ET(sec)= 2340 WELL DRAWDOWN 043 4.79 ET(sec)= 2400 WELL DRAWDOWN DW3 4.21 ET(sec)= 2461 WELL DRAWDOWN OW3 4.62 ET(sec)= 2521 WELL DRAWDOWN OW3 4.54 ET(seo)= 2581 WELL DRAWDOWN DW3 4.46 ET(sec)= 2641 WELL DRAWDOWN ON3 4.38 ET(sec)= 2700 WELL DRAWDOWN омз 🦙 . 4.29 ET(sec)= 2760 WELL DRAWDOWN OM3 ET(sec)= 2821 WELL DRAWDOWN OM3

Marie Carlo Carlo

ET(sec)= 2881 WELL DRAWDOWN OW3 4.04

EI(sec)= Z/DU WELL DRAWDOWN омз 🦂 . ⁴ 4.29 ET(sec)= 2760 WELL DRAWDOWN ON3 4.21 ET(sec)= 2821 WELL DRAWDOWN 0113 4.13 ET(sec)= 2881 WELL DRAWDOWN OW3 4.01 ET(sec)= 2941 WELL DRAWDOWN OW3 3.96 ET(sec)= 3001 WELL DRAWDOWN 0W3 . . . 3.88 ET(sec)= 3061 WELL DRAWDOWN OW3 3,80 ET(sec)= 3121 WELL ORAWDOWN OW3 3.71 ET(sec)= 3181 WELL DRAWDOWN ○ ON3 3.63 ET(sec)= 3241 WELL DRAWDOWN 0W3 3.55 ET(sec)= 3301 WELL DRAWDOWN рыз 🛷 💛 3.47 ET(sec)= 3360 WELL DRAWDOWN OM3 3.38 ET(sec)= 3421 WELL DRAWDOWN OW3 3.30 ET(sec)= 3481 WELL DRAWDOWN OW3 3.22 ET(sec)= 3541 WELL DRAWDOWN OW3 3.14

ET(sec)= 3601 WELL DRAWDOWN OW3 3.08

ET(sec)= 3660 WELL DRAWDOWN

CALIBRATION DATA Well 1 0W4 A=-6.1285E 01 H=-0.1235 01 B= 7.1428E-02 D= 0.0000E 00 J0= 273 T0= 81079 EI(sec)= 60 WELL DRAWDOWN OW4 11.00 -14.00 ET(sec)= 121 WELL DRAWDOWN 0W4 -14.21 ET(sec)= 180 WELL DRAWDOWN -14.35 OW4 ET(sec)= 241 WELL DRAWDOWN -14.50 0W4 ET(sec)= 300 WELL DRAWDOWN -14.64 0W4 ET(sec)= 361 WELL DRAWDOWN 0W4 -14.78 ET(sec)= 420 WELL DRAWDOWN OW4 -14.85 ET(sec)= 481 WELL DRAWDOWN 0W4 75.00 ET(sec)# 541 WELL DRAWDOWN -15.82 0W4 ET(sec)= 600 WELL DRAWDOWN -15.14 **0W4** ET(sec)= 661 WELL DRAWDOWN ET(sec)= 720 WELL DRAWDOWN -15.28 0W4 ET(sec)= 281 WELL DRAWDOWN -15,35 0W4 ET(sec)= 841 WELL DRAWDOWN -15.42 0W4

EI(sec)= 960

0W4

EI(sec)= 900 WELL DRAWDOWN

-15.50

-15.50 OW4

ET(sec)= 960 WELL DRAWDOWN

-15.57 0W4

ET(sec)= 1021 WELL DRAWDOWN

-15.64 0W4

ET(sec)= 1081 WELL DRAWDOWN

-15.64 QW4

ET(sec)= 1141 WELL DRAWDOWN OW4 -15.21

ET(sec)= 1201 WELL DRAWDOWN

-15.78 0W4

ET(sec)= 1261 WELL DRAWDOWN

-15.85 **0W4**

ET(sec)= 1321 WELL DRAWDOWN

0W4 -15.85

ET(sec)= 1380 WELL DRAWDOWN

ET(sec)= 1440 (154 M)
WELL DRAWDOWN

-16,00 0W4

ET(sec)= 1501 WELL DRAWDOWN

-16.07 OW1

ET(sec)= 1561 WELL DRAWDOWN

0H4 ~16,07

ET(sec)= 1621 WELL DRAWDOWN

-16.14 0144

ET(sec)= 1680 WELL DRAWDOWN

-16.21 OW4

ET(sec)= 1740 WELL DRAWDOWN

~16,21 0W4

EI(sec)= 1801 WELL DRAWDOWN

OW4 -16.28

EI(sec)= 1861 WELL DRAWDOWN

-16.35

FI(sec)= 1920 WELL DRAWDOWN

EI(sec)= 1801 WELL DRAWDOWN 0W4 -16.28 ET(sec)= 1861 WELL DRAWDOWN 0W4 -16.35 ET(sec)= 1920 WELL DRAWDOWN 0W4 -16.42 ET(sec)= 1980 WELL DRAWDOWN -16.50 **0W4** ET(sec)= 2010 WELL DRAWDOWN 014 -16,50 ET(sec)= 2100 WELL DRAWDOWN -16.57 014 ET(sec)= 2161 WELL DRAWDOWN -16.57 0W4 ET(sec)= 2221 WELL DRAWDOWN -1.49 OW4 ET(sec)= 2280 WELL DRAWDOWN -1.35 0₩4 ET(sec)= 2341 WELL DRAWDOWN -1.21 0W4 ET(sec)= 2401

DRANDOWN

OW4

-0.99

ET(sec)= 2461

WELL DRANDOWN

ัพ4

-0.92

RECOVERY TEST 7/11/84

WATER LEVEL

15 WATER

ABOVE YOU'RE

TRANSDUCK AT

DEPP! OF 30'

OW-5 TIME WATER LEVEL 17.0556 16.7000 17.0611 16.7000 17.0625 16.7000

SHOOK

12.0933 15.2962 12.0933 16.2645 12.0933 15.2161 12.0933 15.4096 12.0933 15.6032 12.0933 15.6032 17.0933 15.6622 17.0933 15.6627 17.0933 15.2806 17.0933 15.9800 17.0933 15.580

17. 1122 15. 3451 17. 1122 15. 4741 17. 1122 15. 6032 17. 1122 15. 7322 17. 1122 15. 7367 17. 1122 15. 9258 17. 1247 16. 3129 17. 1318 16. 5709

117.1512 15.6032 117.1542 16.1838-17.1542 16.5064-17.1613 16.5064-17.1712 16.7645-17.1712 16.7645-17.1812 16.7645-17.1812 16.8290-17.1913 16.8290-17.2012 16.8290-17.2012 16.8290-17.2012 16.8290-17.2112 16.

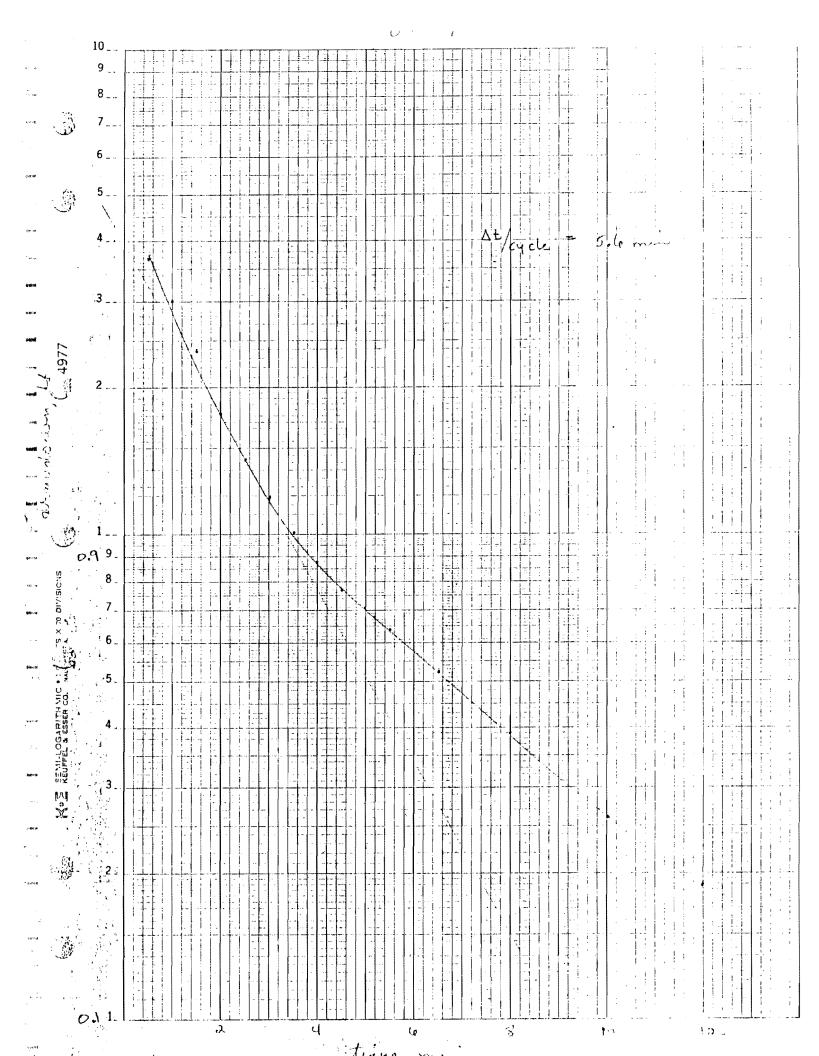
Ator 143 below top of carry S.U. 1.3' KDULFR AT

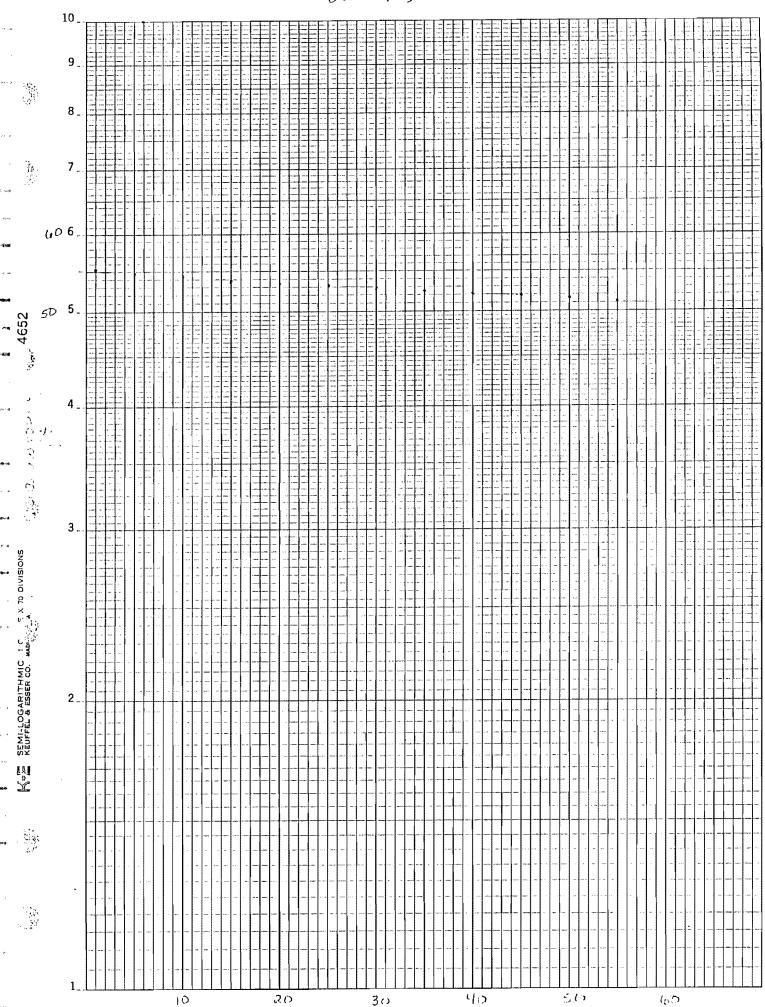
"35,0 Down

OW-6 TIME WATER LEUEL 17.4344 17.7653 17.4354 17.7653 17.4404 17.7653

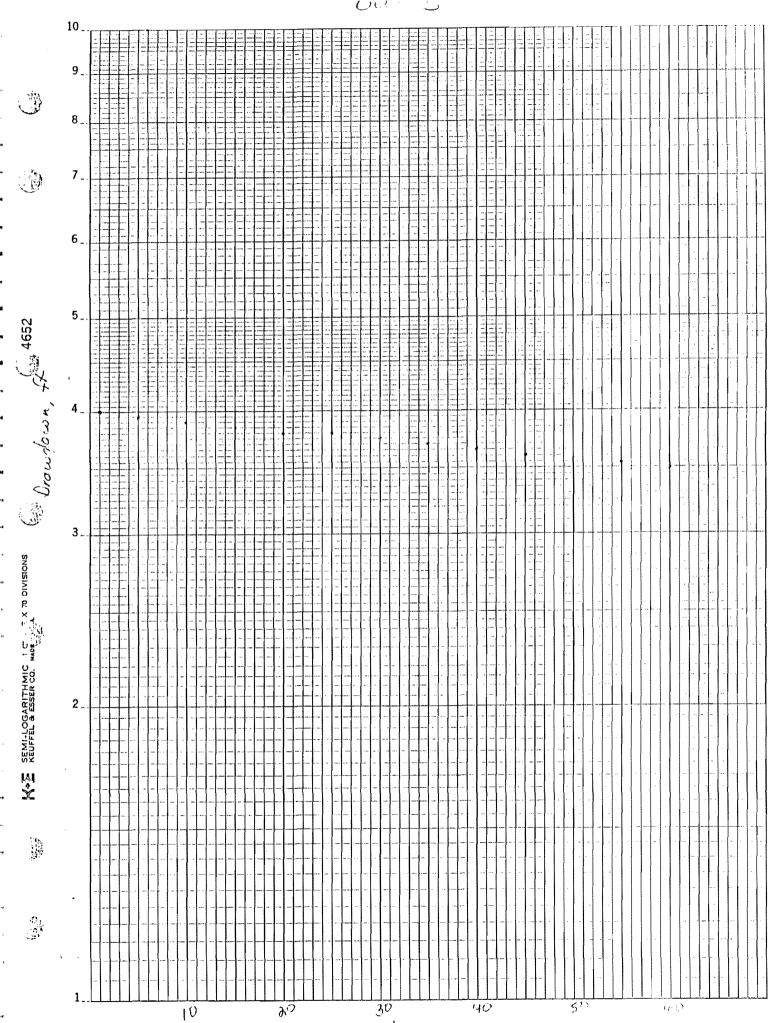
17.4923 15.0202 17.4933 15.8045 17.4944 16.0006

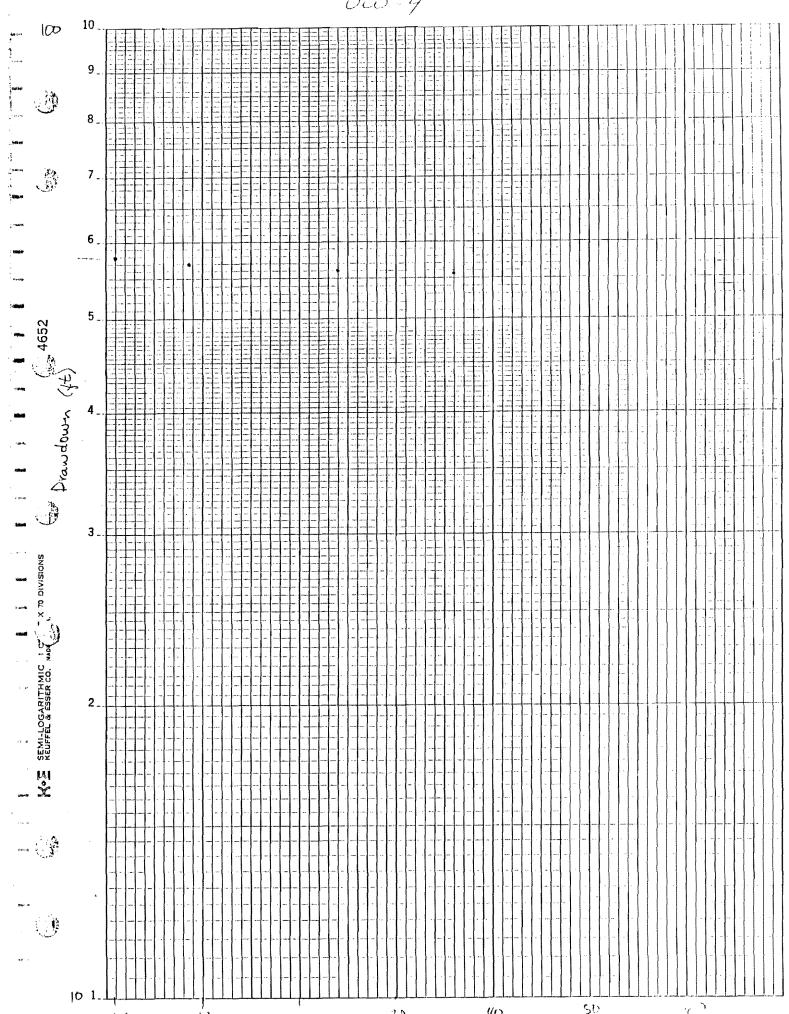
117.5021 15.8045 117.5036 16.0006 117.5051 16.2620 117.5121 16.5988 117.5121 16.5988 117.5136 16.7196 117.5205 17.54324 4 SUSPICT MAA

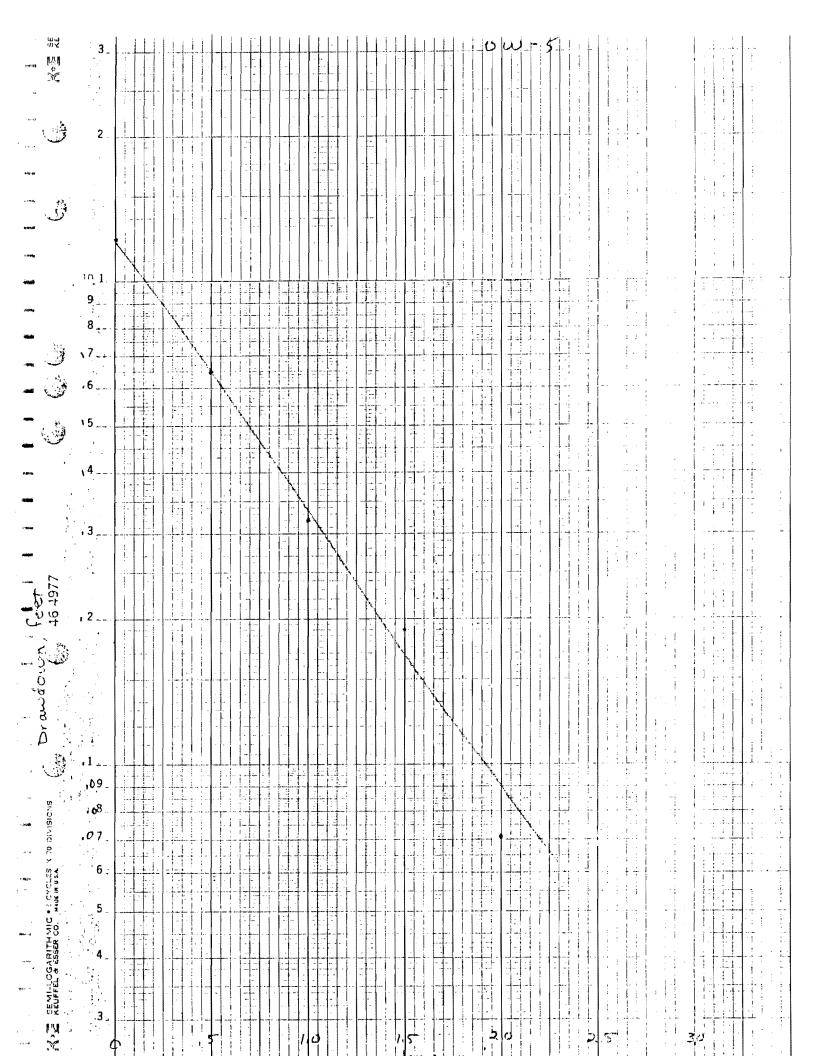


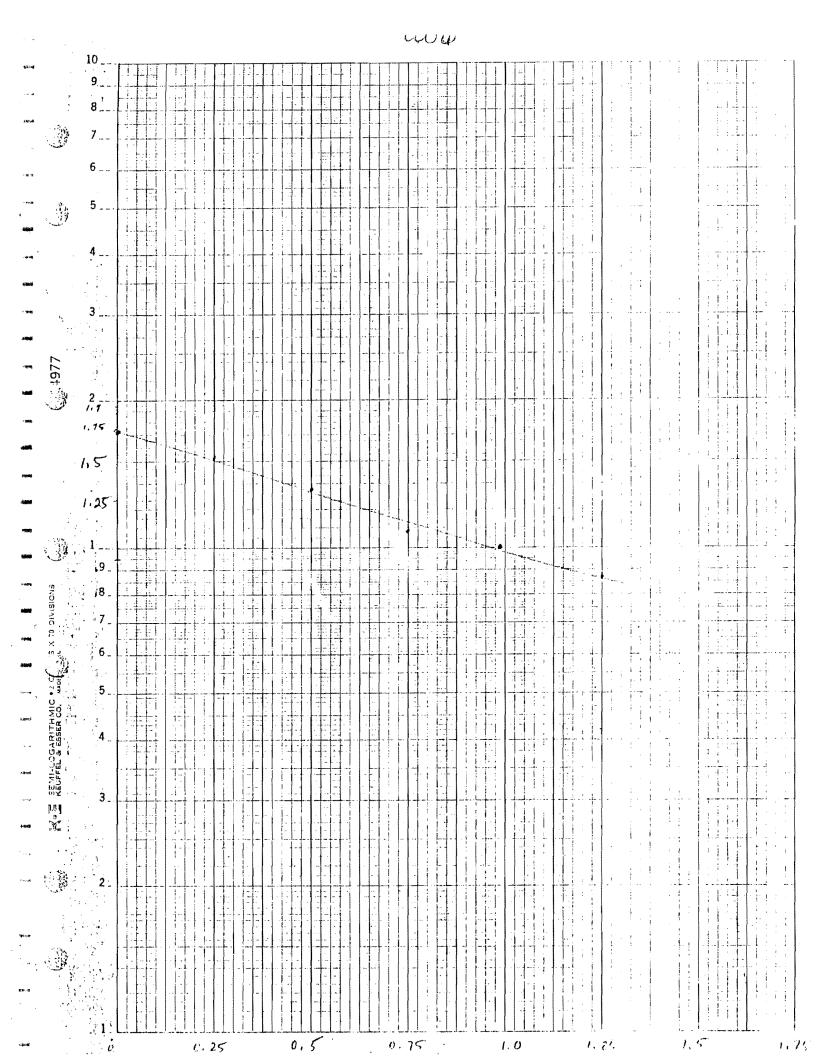


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Care F · 0w-1 from Atraight line H, = 2.63 pt = 80,2 cm L= 6 ft = 183cm 6, = 60 Rec D= 17 cm H= 0,34 ft = 10,4 em d= 5 cm t= 360 sec 3 (19 182,9) >4 $\frac{1}{8} \frac{h}{4} = \frac{d^2 \ln \left(\frac{4m4}{b}\right)}{8 + \left(\frac{4}{2} - \frac{b}{4}\right)} \ln \frac{\frac{14}{4}}{4a}$ $\frac{1}{8}h^{2} = \frac{5^{2} \ln \left(\frac{4(1)(183)}{17}\right)}{8(183)(300)} \ln \left(\frac{80.2}{10.4}\right)$ $\frac{25 (3,763)}{439200} (2.04)$

Rh= 4.37 ×10 4 cm/sec

-

assume m = 1 $H_1 = 55.3 \text{ ft} = 1685.5 \text{ cm}$ L = 14 ft = 426.7 cm $t_1 = 60 \text{ sec}$ 0 = 17 cm $H_2 = 51. \text{ ft} = 1554.5 \text{ em}$ d = 5 cm $t_3 = 3300 \text{ sec}$

hh= d2 ln (4mL) ln H,

8 L (t,-t,) H2

 $h = \frac{(5^2) \ln \left(\frac{4(.)(426.7)}{17}\right)}{8(426.7)(3300-60)} \ln \left(\frac{1686}{1535}\right)$

 $h = \frac{35 (4,609)}{11060064}$ for 0.08088

h/= 8,43×10-7 cm/sec

Assume m=1 L=9ft=2.74.3 cm $t_{1}=4.4'=4.70.6 \text{ cm}$ L=9ft=2.74.3 cm L=17 cm L=0.42'=12.8 cm L=5 cm L=4.4'=4.70.6 cm L=4.4'=4.80 pec

 $h = \frac{d^2 \ln \left(\frac{4mL}{0}\right)}{8L(t_2-t_1)} \ln \frac{H_1}{H_2}$

 $kh = \frac{5^2 \ln \left(\frac{4(1)(274.3)}{5}\right)}{8(274.3)(480-120)} \ln \left(\frac{670.6}{12.8}\right)$

789984

- lh = 6.75 × 10 4 cm/oc

assun	e m= 1 L= 12 ft = 366 cm		4/st = 1	21,9,	En
	D = 17 cm $d = 5 cm$	He =	60 sic 3.5/t = 3600 sec	•	en
kh=	d2 ln (4 m L) 8 L (k2-t,) ln H2				
A _L =	(5 ²) ln (4(1)(366)) 8 (366) (3600-60)	106.7			
sh-	. 25 (4.4557) 10365120 (0.1332))			
hh=	1.43×10 -6 cm/sec				

2m L 2(1) (396) - 46 L= 13 ft = 396 cm k. D = 5 ... 6.75 in = 17 cm pt2 H= 5.8 H= 17% d = 2 in = 5 cm t. = Weec 169
11 = 5.56/t= +36 = kl = d2 ln (4mL) ln H.
8 L (to-t.) ln H2 E2 = 2160 plc $\frac{-3h}{396} = (5)^{2} \ln \left(\frac{4(1)(396)}{17}\right) \ln \frac{1770}{1690}$ $= \frac{1770}{8(396)(3160-60)} \ln \frac{100}{100} \ln \frac{100}{100}$ 25 (4.53) (.04625) (1652800. 3085 De 10 CM/Lec

. जिल्लाकार राज्य हे Case F

L = 14 ft = 35 426.7 cm d = 5 cm H, = 0.65 = 19.8 t, = 0.5 min = 30 H, = 0009 = 2: $= 115.0(5^{2}) ln (46)(427)$ = 8(427) (120 - 30)

307440 (1.99

7.5 × 10 4

· .			1.5 = 45.78
L= 12.	1 = 33 368 8 (cm H ₂	. 87 = 26.5
D = 17			<i>مز</i>
d.= 5	.cm		•
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= (25) In (4.368,8) 8.(360.6)(30)	16.7 26.5	
****	(111.5).(54	66.0
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Pho.			

6.8 × 10-4

11) BACKGROUND INFORMATION

ACTION	INFO	
То:		File: 13305-001
		X-Ref:
		Date: 5/2/83
From: Eleon Gu	llipan	Reply Required By:
Subject: Concersal	ion with Neap	Reply Required By: ara Co DOH - Muke Hopk
Potoronanta).		
met with	Mike Hopkins	of Niagara Co DOH
to discuss Ph	are I siter	in Niapara Co. DOH
$\alpha = 11 + \alpha = 1$	1 1	
1/2	MALINIA Of C	any use for the although
Ne re	renaction of	Harrich
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industreal,	could be superset, if a	
		0
		Eleen

ROUTING

ACTION	INFO	
To:		File: 13305-00/
		X-Ref:
	\ . 1 \	Date: 5/2/83
From: Eleen Je	llipan	Reply Required By:
From: Ellen Di Subject: Endangered	Species / Critz	cal Habitat
Reference(s):		
On 5/2/83	3 d met with	bordon
Boy deller of	Fish + Wildlig	le NYSDEC
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make outline	up weltand +	Critical resources
Vac Ho Bu	flato & Majo	ue racce
Tho	area is in	The myrasty
Dathway of	factors -	
are not cret	ical habital	yer view
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ROUTING

(PL)

Peter Buechi, Senior Sanitary Engineer, Region 9 Hartin S. Ferguson, Environmental Chemist, Hazardous Site Control Sample Testing from the Nash Road Site

August 29, 1983 -

Enclosed is a Laboratory Test Report for the sampling of ponded water taken July 11, 1983 at the Nash Road Site. Diethyl phthalate, Terbutol and Toluene were identified in the extracted sample. The former and latter are hazardous wastes (priority pollutants).

MSF:cl Anclesure

cc: J. Rankin 'C. Goddard

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Solid Waste Mobile Laboratory Facility: Nash RQ. Sample Type: Pardel 16. Date Sampled: 7 11 83 Ponder Sampling Site H,O. Lab. Number 83-191-01 Parameter Units pll SU hductivity oluns Cdmg/1Fe mg/1Zn mg/1 Gr mg/1Рb mg/1Ni mg/1Cu mg/1indent Tarbutol ident diethyl phthabil Mg/2. 42.7 TOLUENE 111

1 11 1/4

NIAGARA COUNTY HEALTH DEPARTMENT

MEMORANDUM

DATE: Ja

January 27, 1984

TO:

Peter Buechi

FROM:

Michael Hopkins 11 Abych

SUBJECT:

INFORMATION REGARDING NIAGARA SANITATION

NASH ROAD LANDFILL (REQUESTED IN DECEMBER 1983

TELEPHONE CONVERSATION)

Attached are copies of various documents from our files regarding the Niagara Sanitation - Nash Road Site. These documents are provided for your information and may be provided to your consultants for Phase II State Superfund investigation provided this department is properly credited for any information used in the Phase II report or subsequent reports.

This department has various other information regarding this site which is not attached but is available for inspection if desired. This information includes drawings of the Hooker "Brine Line", City of North Tonawanda Sewer maps for nearby areas, original drawings by Krehbiel Engineers showing the proposed location and dimensions of the disposal trench for Love Canal wastes, original letters between DOT and NCHD (1968) and original boring logs and locator drawings for test borings made on site in 1968 prior to digging the disposal trench.

The investigation conducted by this department in June, July and August of 1983 came to the following conclusions:

- 1. There is reasonable evidence in the form of plans, correspondence, etc., which indicates that wastes from the Love Canal were disposed of at this site. It is suspected that disposal occurred in a trench dug specifically for this purpose.
- 2. This department was unable to locate any person who claims to have been present when Love Canal wastes were disposed of or who could provide first-hand information on such disposal.
- 3. Various area residents, former residents, City of North Tonawanda officials and a former equipment operator have reported that industrial wastes were observed in areas of landfill used for municipal disposal. Those wastes are said to include caustics in drums, battery cases, graphite, pallets and laminating compounds, but not the wastes from Love Canal.

Peter Buechi Page 2 January 27, 1984

- 4. It is believed that much of the municipal waste and the industrial wastes listed above were buried in former ponds and borrow pits. Most of the disposal area was always wet and swampy prior to disposal activity. At least one large trench was dug specifically for municipal waste disposal.
- 5. There is no specific evidence indicating that off site migration of contaminants has occurred or that a direct contact hazard is present; however, the available data is not conclusive in this respect.

This department considers follow-up investigation at this site to be necessary. Additional sampling and analysis of soil and groundwater are considered necessary to confirm whether or not residential areas adjacent to the site have been impacted by contaminants from the site. This department is also concerned that adequate data is not available to assess the potential of exposure to persons who may be on site, regardless of whether such persons are on site legally or illegally.

This department requests that we be kept informed of any activities of DEC with respect to this site and that we be kept informed of any additional information your department may have or obtain in the future.

Please feel free to contact me with any questions.

MEH:cs Attachments

cc: M. N. Vaughan

August 9, 1978.

Disposal of Chemical Waste
Contract FAC 67-15; PALSE 67-1
LaSalle Arterial, Miagara Falls, Miagara County ORIGINAL SIGNED BY
D. H. Ketchum, Regional Director - Region 5

W. C. Hennessy, Commissioner of Transportation, Bldg. 5, Foom 507

co Listing M.J. Coppy

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During the course of construction of the LaSalle Arterial in the City of Niagara Falls, buried chemical waste was encountered during excavation for a storm sever line along Frontier Avenue between 97th and 99th Streets. Further emploration revealed that the chemical waste material extended under the proposed location of relocated Frontier Avenue north of the existing street. The total quantity of chemicals in the proposed roadway was estimated to be 1100 CY. No chemicals were found under, or south of, existing Frontier Avenue.

When the sower line excavation first began, the chemicals were piled to one side along with the other excavated material. This prompted several complaints from adjacent property owners about the offensive odor of the material.

After consulting with Heoker Chemical and the Miagara County. Health Department, some of the chemicals were trucked to an existing dump owned by Hooker off Hydo Park Blvd. near the north city line of Miagara Falls. After approximately 200 CY were disposed of at this location, the contractor was advised by Mooker officials that no more would be accepted at their dump.

After negotiation with the Town of Wheatfield, and with the approval of the Niagara County Health Department, the remainder of the chemical waste was trucked to a Town dump area off Nash Road in the Town of Wheatfield.

The following is a chronological summary of events from March 15, 1968, when the chemicals were first encountered to July 15, 1968, when the disposal of the chemicals was completed.

Date	Event	Source
3-15-68	First encountered chemical waste material between 97th and 99th Sts. in relocated Frontier Ave. area.	Engineer's Dirry
3-15-68	Contacted Hooker Chem. Co. requesting information on material makeup.	Joe Cains Diary
3-19-68	Mr. Capong, property owner, complained of stench coming off chemical waste	Engineer's diary Joe Chin's diary

stockpile.

, ē	Event .	Source
) -68	Messrs. Popovici, Naida, Niagara County Health Dept. investigating	Joe Cain's diary
· 3-22-68	Ken Reitmeier, Supervising Soils and Naterials Engr., investigated and wrote memo this date recommending removal of chemical waste.	Memo dated 3-22-68
3-25-68	Mr. Popovici telephoned ordering chemica waste excavated to date, removed from project site and disposted of at a dump operated by Hooker Chemical Co. located off Hyde Park Blvd. near north city line	
3-27-68	Letter confirming the telephone conversation 3-25-68 from Ernest R. Gedeon, Niagara County Health Dept.	Letter dated 3-27-68
4-1-68	Letter from J.P. Cain, ordering con- tractor to remove chemical waste to the Hooker Dump on Hyde Park Blyd.	Letter dated 4-1-63
4-1-68	Stimm sent letter disputing work to removed chemical waste material.	Letter dated 4-1-63
4-3-68	Removal of chemical waste to Hooker'a dump site off Hyde Park Blvd. began.	Joe Cain's diary
4-8-68	Hooker officials (Fred T. Olotka) ordered a halt to further dumping of chemical waste at their Hyde Park Blvd. dump. Niagara County Health Dept. informed.	Joe Cain's diary.
4-15-68	Letter to Robert W. Sweet, Chief Engineer from A. J. Kopczynski necommending extra payment for work to remove approx. 1,000 CY of chemical waste.	
4-23-68	Letter to J. P. Cain from Stimm request- ing permission to use Town of Wheat- field dump site.	Letter dated 4-23-68
4-25-68	Maps and borings received from Krehbiel, Quay, Rugg & Hall, Engr Bel Air Subdivision.	Package dated 4-25-68
5-1-68	Letter to Ernest R. Godeon, Chief Air Pollution Control, Niagara County Health Dept. from J.P. Cain outlining proposed method of disposing of chemical waste.	Letter dated 5-1-68

Date	Event	Source
5-3-68	Wm. Friedman, Jr., Asst. Comm. of Env. Health, telephoned listing informa- tion he will require before approval of Wheatfield site is given.	Memo to Files dated 5-3-68
5-6-68	Letter from Friedman confirming the above telephone conversation (5-3-68) to Brzeninski (Stimm) requesting permission to use Cheatfield dump.	Letter dated 5-6-68
5-9-68	Letter from Hooker (Fred Olotka), listing makeup of chemical waste from ground samples taken.	Letter dated 5-9-68
5-16-68	Boring taken on Frontier Ave. between 97th and 99th Sts. to determine the limits of chemical waste.	Memo dated 5-15-68, P. Nowadl, to J.P.Cain
5-16-68	Borings of proposed Wheatfield dump site sent to Friedman, Niagara County Health.	Letter dated 5-16-68, P. Nowadly to Friedman
5-21-63	Verbal permission received from Friedman granting permission to use Wheatfield site. Letter ordering Stimm to excavate and remove chemical waste to Wheatfield.	J. Cain's diary. Letter dated 5-21-6 Cain to Stimm.
5-27-68	Began excavating Wheatfield dumpsite.	MURK II dated - 5-27-63
5-6-68	Began hauling chemical waste to dump.	MURK IT 6-6-68
7-15-68	Complete all work including regrading dump site.	MUNK II 7-15-68

The disposal area off Nash Road was visited on August 8, 1978 by J. Powers, Jr., and P. Goodman of my staff. Although they were unable to pin point the exact location of the buried chemicals, the approximate area was examined and no sign of the chemicals was found. The area in which the chemicals were buried was an excavation approximately 100 ft. by 30 ft. by 27 ft. deep. The area is located in a Town of Wheatfield dump just north of the North Tonawanda City Line, approximately 1/2 mile east of Nash Road and 1/2 mile south of Niagara Falls Blvd. There has been no development in the area and no apparent hazard exists at this time.

Our records indicate that the chemicals were placed in the 100' x 30' area to a depth of approximately 15 ft. and covered with at least 12 ft. of the excavated material. A review of Inspectors' reports indicates that the estimate of 1100 CY of chemicals was exceeded by about 50 percent for a total of 1600 CY + placed in this excavation.

Disposal of the chemicals in the Nash Road area was done with the full knowledge and consent of the Town of Wheatfield and the Niagara County Health Dept. Soil exploration was conducted by our Soils Engineer prior to disposal of the chemicals and the area was found to be acceptable for disposal purposes.

Attached are copies of all pertinent correspondence, drawings and boring logs.

DHK:JEP:mh

Attachments

I Teemer Industrial chemicals outsion

NIAGARA FALLS, NEW YORK 14302, PHONE (716) 285-6655

May 9, 1968

Mr J P Caine Resident Engineer NYS Dept of Transportation 355 - 77th Street Niagara Falls, New York

Subject: LaSalle Expressway - Ground Samples

Dear Mr Caine:

This letter is written in reply to your phone conversation with us on May 3rd.

Samples of liquors taken from the 97 - 99th Streets excavation on March 15, 1968 analyzed as follows:

 Specific gravity @ 25°C
 = 1.198

 pH
 = 3.0

 Loss on ignition
 = 86.4%

Flash pt °F 130 (Cleveland open cup)

Chlorate, Phosphorous and Fluoride = None

We were able to detect small amounts of chlorotoluenes, trace benzoyl chloride and approximately 5% benzoic acid in this material.

T sample taken represented the worst portion of the excavation. It was obtained from organic puddles in the vicinity of the dirt pile.

Very truly yours

Fred T Olotka

Technical Supervisor

ខៗ

cc W M Friedman - Niagara County Health Department

E R Gedeon - Niagara County Health Department

E Padlo

J N Brogard

NEW YORK STATE GEOLOGICAL ASSOCIATION 54th ANNUAL MEETING October 8-10, 1982 Amherst, New York

GUIDEBOOK FOR FIELD TRIPS IN WESTERN NEW YORK,
NORTHERN PENNSYLVANIA AND ADJACENT, SOUTHERN ONTARIO

Edward J. Buehler and Parker E. Calkin Editors

Department of Geological Sciences State University of New York at Buffalo Held in Conjunction with 11th Annual Meeting Eastern Section American Association of Petroleum Geologists

Published by the New York State Geological Association. Guidebook available from the executive secretary: M.P. Wolf, Geology Department, Gittleson Hall, Hofstra University, Hempstead, New York 11550.

NEW YORK STATE GEOLOGICAL ASSOCIATION 38th Annual Meeting April 29 - May 1, 1966

GUIDEBOOK

Geology of Western New York Edward J. Buehler, Editor

Department of Geological Sciences State University of New York at Buffalo

Additional copies are available from the permanent secretary of the New York State Geological Association: Dr. Kurt E. Lowe, Department of Geology, City College of the City University of New York, 139th St. at Convent Ave., New York, N. Y.

Soil Mechanics

T. William Lambe • Robert V. Whitman

Massachusetts Institute of Technology

1969

John Wiley & Sons, Inc.

New York

London

Sydney

Toronto

in which

k = the Darcy coefficient of permeability

 D_s = some effective particle diameter

 γ = unit weight of permeant

 $\mu = \text{viscosity of permeant}$

e =void ratio

C =shape factor

The following is an expression for the permeability of porous media, known as the Kozeny-Carman equation since it was proposed by Kozeny and improved by Carman:

$$k = \frac{1}{k_0 S^2} \frac{\gamma}{\mu} \frac{e^3}{(1+e)}$$
 (19.5)

in which

 k_0 = factor depending on pore shape and ratio of length of actual flow path to soil bed thickness

S = specific surface area

Since D_s is defined as the diameter of particle having a specific surface of S_s , Eq. 19.4 can be considered a simplification of the Kozeny-Carman equation.

Table 19.1 Coefficient of Permeability of Common Natural Soil Formations

Formation	Value of k (cm/sec)
River deposits	-
Rhone at Genissiat	Up to 0.40
Small streams, eastern Alps	0.02-0.16
Missouri	0.02-0.20
Mississippi	0.02-0.12
Glacial deposits	
Outwash plains	0.05-2.00
Esker, Westfield, Mass.	0.01-0.13
Delta, Chicopee, Mass.	0.0001-0.015
Till	Less than 0.0001
Wind deposits	
Dune sand	0.1-0.3
Loess	0.001 土
Loess loam	0.0001 土
Lacustrine and marine offshore	
deposits	
Very fine uniform sand,	
$U^a = 5-2$	0.0001-0.0064
Bull's liver, Sixth Ave., N.Y.,	
U = 5-2	0.0001-0.0050
Bull's liver, Brooklyn, $U = 5$	0.00001-0.0001
Clay	Less than 0.0000001

 $^{^{}a}$ U = uniformity coefficient. From Terzaghi and Peck, 1967.

Table 19.2 Classification of Soils According to Their Coefficients of Permeability

Degree of Permeability	Value of k (cm/sec)
High	Over 10 ⁻¹
Medium	10-1-10-3
Low	10-3-10-5
Very low	10-5-10-7
Practically impermeable	· Less than 10-7

From Terzaghi and Peck, 1967.

Equation 19.4 or 19.5 aids considerably in the following examination of the variables affecting permeability. In this examination those characteristics related to the permeant are considered first and then those related to the soil composition are treated.

Permeant

Equations 19.4 and 19.5 show that both the viscosity and the unit weight of the permeant influence the value of permeability. These two permeant characteristics can be eliminated as variables by defining another permeability, the *specific* or *absolute* permeability, as:

$$K = \frac{k\mu}{\gamma} \tag{19.6}$$

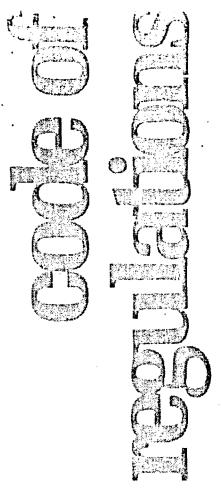
Since k is in units of velocity, K is in units of length²; e.g., if k is in cm/sec, the corresponding unit for K is cm². K is also expressed in terms of darcys; 1 darcy = 0.987 × 10⁻⁸ cm². For water at 20°C, the following two equations permit one to convert k in cm/sec to K in cm² or in darcys:

$$K \text{ in cm}^2 = k \text{ in cm/sec} \times 1.02 \times 10^{-5}$$
 (19.7)

K in darcys =
$$k$$
 in cm/sec × 1.035 × 10³ (19.8)

Figure 19.6 is a chart for the conversion of permeability values from one set of units to another. (Conversion factors are given in the appendix.)

While viscosity and unit weight are the only variables of the permeant that influence the permeability of pervious soils, other permeant characteristics can have a major influence on the permeability of relatively impervious soils. The magnitude of influence for characteristics other than viscosity and unit weight are illustrated in Fig. 19.7. In this figure values of permeability of saturated kaolinite are plotted for various permeants. The permeability is expressed in terms of the absolute permeability, thus the influences of viscosity and unit weight have been climinated. The data in Fig. 19.7 show that the nature of the permeant can be very important, with variations of many hundred percent in absolute permeability depending on the actual permeant. The



Protection of Environment

40

PARTS 190 to 399
Revised as of July 1, 1983

CONTAINING
A CODIFICATION OF DOCUMENTS
OF GENERAL APPLICABILITY
AND FUTURE EFFECT
AS OF JULY 1, 1983

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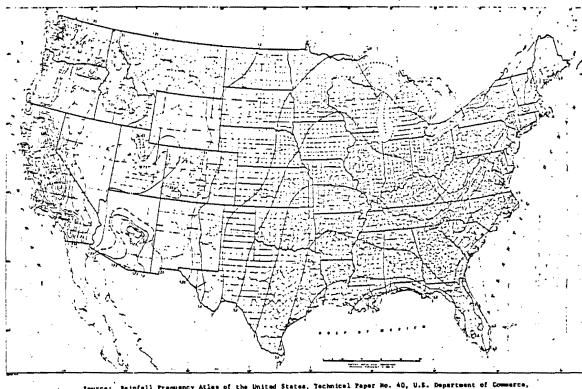
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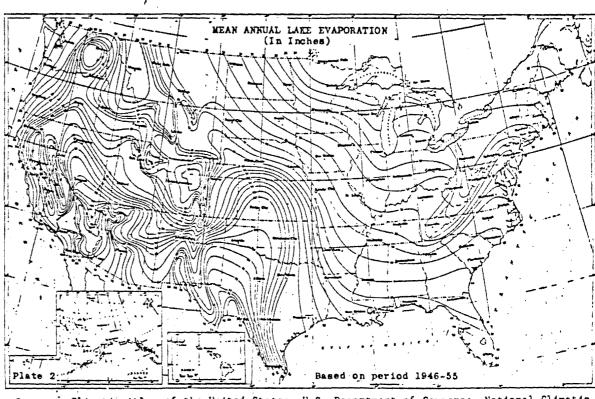






Source: Reinfell Prequency Atles of the United States, Technical Paper No. 40, U.S. Department of Commerc-U.S. Government Printing Office, Washington, D.C., 1963.

Figure 8
1-Year 24-Hour Rainfall (Inches)



Source: Climatic Atlas of the United States, U.S. Department of Commerce, National Climatic Center, Ashville, N.C., 1979.

Figure 4

Mean Annual Lake Evaporation (In Inches)

67



Figure 5 Normal Annual Total Precipitation (inches)

Niagara County DOH, 1981

NAME OF LANDFILL

NIAGARA SANITATION COMPANY (DEC #932054)

LOCATION :

Nash Road, Town of Wheatfield

The site is estimated to be about seven acres in size and located north of the Niagara Mohawk easement which straddles the North Tonawanda - Wheatfield town line. The site extends from the eastern end of the access road running from Nash Road approximately 350 yards east to the fork in the power easement (Tower #365). The site is estimated to be 120 yards wide at the western end tapering to about 70 yards wide at the eastern end.

The landfill location and extent are shown on the attached

drawing.

OWNERSHIP

The property is owned by the Town of Wheatfield.

HISTORY

This landfill was used by the Niagara Sanitation Company for waste disposal from 1964 to 1968. The refuse site was used for both industrial and municipal refuse. The site received refuse from Niagara Falls Air Force Base, Bell Aerospace, Carborundum, Frontier Chemical, Graphite Specialties, Continental Can and Grief Bros. Wastes disposed of may include caustics, plating tank sludge and municipal wastes.

Historical information was obtained from Hazardous Waste Disposal Sites in New York State, Volume 3, NYS DEC.

INVESTIGATION

A site visit was made by Mr. M.E. Hopkins of the Niagara County Health Department on June 11, 1981. The site was found to be poorly covered with protruding refuse. Visible items included rubber blocks, tubes and hoses, tires, concrete fragments and other demolition debris, broken glass, ash, wood, rusted cans and pieces of graphite rods. Also found were what appeared to be remnants of steel drums. There was evidence of some unauthorized dumping after the site was closed. Access to the site was not restricted.

Red-brown (rust-colored) stains were found on vegetation and soil in numerous locations around the perimeter of the site, particularly along the northern and western edges. Additional stained areas were found throughout the marshes and other low points within the site. Although most of these stained areas were dry, two areas were found beneath standing water. It was noted that although the ground was stained beneath the water, the water was not discolored. No flowing leachate streams were found. The sampling well was not found on the June 11th visit. A well was found on June19th on a subsequent visit. The well was located 20 feet east of Niagara Mohawk Tower #363. The location is shown on the attached drawing. The well had apparently been

INVESTIGATION (continued)

vandalized. The upper standpipe had been broken off at ground level and the well had, therefore, been left uncovered. The well may still be useable for sampling.

No evidence of landfill activity was noted east of Niagara Mohawk Tower #365. However, USDA aerial photographs (ARE 3V-75;1966) indicate that the landfilled area may extend 300 to 400 ft. east of Tower #365.

S01LS

The soils surrounding the site are Raynham and Canandaigua series soils. The composition of the soil contained with the site itself is not known, although it is expected to be largely composed of refuse. The surface is generally a silty clay material with some sand in spots. Portions of the site are marshy while others appear well drained, indicating that the soil may not be uniform throughout the site. Boring records of the sampling well immediately south of the site, indicate a profile of silty sand and sandy silt to a depth of about 9 feet over clay to an unknown depth. The records also show the water table at 4 feet. This suggests that the water table may be perched. Fluctuations of the water table are not known.

CONCLUSIONS

The potential for the migration of contaminants off-site is present. Visible leachate stains and the odor in the well south of the landfill indicate that material may be leaching in perched groundwater. Permeable soils in some areas could allow lateral migration. The site requires proper closing. The proximity of houses along Forbes Road and potential for migration justify sampling at this site.

SAMPLING

Well and soil samples were taken for THO, heavy metals and phenol analysis. It was noted at the time of sampling, that the water drawn from the well was discolored gray and strongly odorous with an organic odor. A slight oily sheen was present on the surface of the sample. Two soil samples were taken near Towers #364 and #365. These samples were taken from the bottoms of hand augered holes roughly 4 feet deep. The boring near pole #364 indicated a gray silt over a darker gray silty clay layer at the point of sampling. The second boring showed a tan silty clay over clay at about 4 feet. The sample was taken from this interface. Groundwater was encountered slightly below the 4 foot level in both holes.

RECOMMENDATIONS

This site must be properly closed. Additional sampling wells along the Niagara Mohawk easement would be desireable to facilitate future sampling. The existing well should be maintained. Annual inspection and periodic monitoring is recommended. The Town of Wheatfield was notified to submit an abatement plan for the site.

SUMMARY OF SAMPLES TAKEN

•	Summi				NEAREST
SAMPLE	LOCATION LOCATION	TYPE	PARAMETER	DATE	HOUR
1	Gratwick # 13	well	Metals	7/16/81	11:00
. 2	Gratwick # 10	well	Metals	7/16/81	11:00
3	Gratwick # 11	well	Hetals	7/16/81	11:00
4	Grativick # 12	well	Metals	7/16/81	11:00
5	Gratwick # 13	well	THO	7/16/81	11:00
6	Gratwick # 10	well	THO	7/16/81	11:00
7.	Gratwick # 11	well	THO	7/16/81	11:00 ·
8	Gratwick # 12	well	THO	7/16/81	11:00
9	Nia: Sonitation	well	Hetals	7/16/81	1:00
10	Nia. Sanitation i	well	THO	7/16/81	1:00
11	,,, · Zimmerman	well	THO	7/16/81	12:00
12	Helidiy Old Falls	well	THO	7/16/81	12:00
13	Artpark	Leachate	Metals	7/17/81	12:00
14	Artpark	Leachate	THO	7/17/81	12:00
15	PASNY .	Soil	Metals	7/21/81	10:00
16	PASNY	Soil	THO	7/21/81	10:00
17	Nia. Sanitation	Soil	Metals	7/24/81	12:00
18	Nia. Sanitation	Soil	THO	7/24/81	12:00
19	Nia. Sanitation	Soil	Hetals	7/24/81	12:00
20	Nia. Sanitation	Soil	THO	7/24/81	12:00
21	Walck Road	Soil	THO	7/24/81	12:00
22	Grativick # 13	well	Phenol	8/12/81	10:00
23	Gratwick # 10	well	Phenol	8/12/81	10:00
. 24	Gratwick # 11	well	Phenol	8/12/81	10:00
25	Gratwick # 12	well	Phenol	8/12/81	10:00
26	Zimmerman	well	Phenol	8/12/81	11:00
27	Old Falls	well	Phenol	8/12/81	11:00
28	[Nia: Sanitation	tell	Phenol	8/12/81	12:00
29	Olin-Industrial	Soil	THO, TOC	9/07/81	12:00
	Welding		Lindane		

ANALYTICAL RESULTS FOR SAMPLES TAKEN AT GRATWICK - RIVERSIDE PARK

WELL # 10			•
Sample # 2	Sampled 11:00	7/16/81	
Cadmium, total Chromium, total Lead; total Mercury, total Nickle, total	L.T. 0.1 MG/L		
Sample # 6	Sampled 11:00	7/16/81	
ТНО	35 MCG/L		
Sample #24	Sampled 10:00	8/12/81	
Phenol	3 MG/L		
WELL # 11			
Sample # 3	Sampled 11:00	7/16/81	
Cadmium, total Chromium, total Lead, total Mercury, total Nickle, total	2 L.T. 0.1 MG/L		
Sample # 7	Sampled 11:00	7/16/81	•
тно .	less than 1 MCG/L		•
Sample # 25	Sampled 10:00	8/12/81	
Phenol	3 MG/L	•	
WELL # 12			
Sample # 4	Sampled 11:00	. 7/16/81	
Cadmium, total Chromium, total Lead, total Mercury, total Nickle, total	L.T. 0.02 MG/L L.T. 0.1 MG/L L.T. 0.1 MG/L L.T. 0.4 MCG/L L.T. 0.05 MG/L		
Sample # 8	Sampled 11:00	7/16/81	
тно	4 MCG/L		
Sample # 26	Sampled 10:00	8/12/81	

Phenols

0.2

MG/L

GRATWICK - RIVERSIDE PARK (continued)

WELL # 13

Sample # 1	Sampled 11:00	7/16/81
Cadmium, total Chromium, total Lead, total Mercury, total Nickle, total	L.T. 0.02 MG/L L.T. 0.1 MG/L 0.1 MG/L L.T. 0.4 MCG/L 0.05 MG/L	
Sample # 5	Sampled 11:00	7/16/81
THO	18 MCG/L	
Sample # 22	Sampled 10:00	8/12/81
Phenols	17 MG/L	

RESULTS OF SAMPLES TAKEN AT NIAGARA SANITATION SITE

WELL SAMPLES

Sample # 9	Sampled 1:00	7/16/81
Cadmium, total Chromium, total Lead, total Mercury, total Nickle, total	L.T. 0.02 MG/L L.T. 0.1 MG/L 0.2 MG/L L.T. 0.4 MCG/L 0.12 MG/L	
Sample # 10	Sampled 1:00°	7/16/81
ТНО	4 MCG/L	
Sample # 28	Sampled, 12:00	8/12/81
Phenol	0.008 HG/L	

ISOIL SAMPLES ,

Samples # 17,18,19 & 20 all Sampled 10:00 7/24/81 Samples # 17 & 18 Metals - Results not yet available Sample # 19 L.T. 10 PPB THO Sample # 20 L.T. 10 PPB THO Sound or world

RESULTS OF SAMPLES TAKEN AT ARTPARK

LEACHATE SAMPLES

7/17/81 Sample # 13 Sampled 1:00 Cadmium, total 0.02 MG/L Chromium, total 0.1 MG/L Lead, total 0.5 MG/L Nickle, total 0.73 MG/L L.T. 0.4 MCG/L Hercury, total Sampled 1:00 Sample # 14 7/17/81 47 MCG/L THO

RESULTS OF SAMPLES TAKEN AT HOLIDAY PARK

WELL SAMPLES

WELL # 4

Sample # 11(Zimmerman) Sampled 12:00 7/16/81

THO 4 MG/L

Sample # 26 Sampled 11:00 8/12/81

Phenols .008 MG/L

WELL # 8

Sample # 12 (Old Falls) Sampled 12:00 7/16/81

THO 3 MCG/L

Sample # 27 Sampled 11:00 8/12/81

Phenol .01 MG/L

SOIL SAMPLES

Sample # 21 Walch Road Sampled 12:00 7/24/81

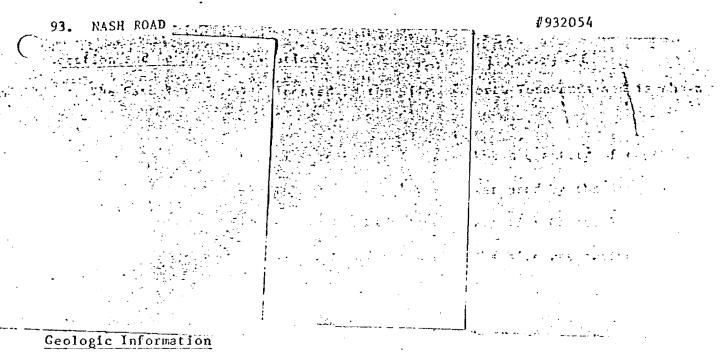
THO Less than 10 PPB

NIAGARA SANITATION NASH ROAD SITE (DEC # 932054) Approx. Scale. 1: 3600 (All distances estimated) 20070 100rd Morsh Area Treeline Powerlines Red - Brown Leachute stuins GARDEN Slope - downword toward SE ((1%) E/3 Mapped from field observation only by M. Hopkins NCHD Michael Hoplins

NASH

ROAD

NIAGARA SANITATION NASH ROAD SITE (DEC # 932054) Approx. Scale. 1: 3600 (All distances astimated) Morsh Area Treeline Powerlines Red - Brown Leachute stuins Slope - downward toward SE ((1%) 1 [15 Mapped from field observation only by M. Hopkins NCHD Michael Hopkins ROAD NASH



The geology of the site consists of a Holocene lacustrine clay unit overlying a bedrock of Camillus Shale. Four test borings were drilled on the site and their locations are shown in figure 1. The geologic description of the borings is as follows:

Well No.	Depth (ft)	Description
1/	0 - 5.0 5.0 - 6.5	Fill. Clay, pink. WATER SAMPLE: 6.0 ft.
2	0 - 8.0 $8.0 - 10.0$ $10.0 - 11.5$	Clay, tan to light green, sandy, dry. Clay, green. Clay, pink. SOIL SAMPLE: 8 - 10 ft.
3	0 - 1.5 1.5 - 3.5 3.5 - 7.0	Tan and black fill. Clay, greenish, sandy, dry. Clay, greenish, sandy, wet. SOIL SAMPLE: 7 ft.
4	0 - 1.0 1.0 - 3.5 3.5 - 6.5	Topsoil. Clay, sandy, dry. Clay, greenish, wet. SOIL SAMPLE: 6.5 ft.

Cich Cich Cich Cich Cich Cich Cich Cich	Holy Infant Ehurch Sun	Suscelled area	======================================		PLANATION O 460 , 920 FEET	well barthmounds - Town line	The second secon
 					174XII 6	301 1 .	

Figure 1. Location of sampling eites on the Nash Road proporty

SEPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

LIDENTIFICATION					
OI STATE	CZ SITE NUMBER				
ИХ	02 SITE MUMBER 00005 1 4 380				

	PART +-SITI	ELOCATION AND) INSPE	CTION INFORMA	ATION MOIT	70003]4380	
II. SITE NAME AND LOCA	THON.						
OT SITE NAME ILIQUE COMMON OF C		The second secon	02 STREET, ACUTE NO., OR SPECIFIC LOCK TOWNDENTIFIER				
Nash Road Landi	fill		Nash Road				
CICIY			04 STATE		CB COUNTY	OTCOUNTY DE CONG COCE DIST	
Town of Wheatfi	ield	10 TYPE CHOWNERS	NY	14150	Niagara	63 36	
43° 04° 10° 0"			GAFE	DERAL	C C. STATE C D. COUNTY C G. UNKNOW	N E MUNICIPAL	
IIL INSPECTION INFORM.	ATION 02 SITE STATUS	OR YEARS OF OPERA	TON				
4/28 / 83	D ACTIVE DC NACTIVE	ļ <u></u>	1964	<u>r</u> 1968	UNKNOWN		
OA AGENCY PERFORMINGINSP		98-5	INNING YE	AR ENDING YEAR	•		
	ONTRACTOR Engineer	ing Science	CICLM	LINICEPAR CTOTAL	INICIPAL CONTRACTOR		
	CCNTRACTOR Dames &		0,00		Sovery	(harne of time)	
OS CHIEF INSPECTOR		CS TITLE		-	07 ORGANIZATION Engineering	CS TELEPHONE NO.	
John Kubarewicz	z	Chemical	L Engi	neer	Science	703/591-7575	
OS OTHER INSPECTORS		10 m.s	_ 1_		Dames & Moore	12 TELEPHONE NO. 315/638-2572	
Art Seanor		Geologis	st 	**************************************	Dames & Moore	313/636-23/2	
					`	(,)	
						().	
		-	*		-	()	
- ·	•= _	÷	•			(); ·	
13 STEREPRESENTATIVES INT	TERMEWED C.	14TILE		Mheatfie	าเส	16 TELEPHONENO	
Ed Greinert		City Super	VISOL	wileatile	314		
			•			()	
			<u> </u>				
				400		()	
						()	
						()	
	***************************************	İ					
17 ACCESS GAMED BY	18 THE OF INSPECTION	19 WEATHER CON	DITICHE	- ·			
C.C.Z.C.H ZI PSEMISSICH CI WAYNAW CI	15:00	sunny			_		
IV. INFORMATION AVAIL	ABLEFROM .	•					
Ernie Schroede:		Enginee:		cience		404/325-0770	
ł						•	
Eileen Gilligar		GS AGENCY	- 1	es & Moore	315/638-2572	8 10 84	
EPA FORM 2070-13 (7-31)						WONTH DAY TELR	

SEPA

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

LIDENTIFICATION

O1.STATE | 02 STE NUMBER |

NY | 0000514380

	,			EINFORMATION	1		
	rates, quantities, an						
E A SOUD E A SOUD C S FOWDER II.C. SLUDGE	☐ G. GAS	TONS _	1600	C3 WASTE CHARACTERISTICS (CHECK MIDNIES) OF A TOXIC C E. SOLUE OF B. CORROSIVE C F. INFECT C C. RADIOACTIVE C G. FLAMI C D. PERSISTENT C H. IGNITA		JBLE CILHIGHLY VOLATILE CTIOUS CILL EXPLOSIVE AMABLE CILL FEACTIVE	
III. WASTE T	YPE		,	I			
CATEGORY	SUBSTANCEN	LAME	01 GROSS AMOUNT	DZ UNIT OF MEASURE	03 COMMENTS		
SLU	SLUDGE	**	Control of the Control of the State of the State of the Control of the State of the Control of the State of t				***************************************
OFM	OILY WASTE						
201	SOLVENTS						
PSD	. PESTICIDES					•	
(2003)	OTHER ORGANIC C	HEMICALS	900 cu. y	ðs.	Chemical v	waste/ Love Ca	anal
100	INCRGANIC CHEMIC	ALS					-
ACD	ACIDS						
BAS .	BASE S						
(MES	HEAVY METALS				lead, chro	mium, plating	sludge
IV. HAZARD	OUS SUBSTANCES (See A.	zewnalis for most friiquent	ry cried CAS Humbers)	-			
01 CATEGORY	. 02 SUBSTANCE N	ME	03 CAS NUMBER	04 STCRAGE/DS	POSAL METHOD	05 CONCENTRATION	DO MEASURE OF CONCENTRATION
MES	lead		999	landfill		67-20,000	ppb
0C <u>C</u>	2,4, dimethy	1 2 penten	e 999	landfill		182,000	ppb
occ	2-(1,1 dimet	hy1)-4-	999	landfill		183,000	ppb_
OCC	methylfuran			landfill			_
occ	phenol_		108-95-2	landfill		1,000	mg/l
MES	mercury		7439-97-6	landfill	7	0.5	ppb
SOL	benzen e	·	71432	landfill			
SOL	<u>toluene</u>		108883	landfill		-	
SOL	methylene ch	loride	999	landfill			-
OCC	dichlorobenz		25321-226	landfill	•		-
occ	tetrachlorid		999	landfill		_	_
OCC	trichloroeth		127184	landfill		-	<u> </u>
occ	trichloroeth	en e	999	landfill		_	
OCC .	hexachlorobu	tadiene	87683	landfill	not the second s	_	-
V. FEEDSTO	CXS (See Accounts for CAS Numb	-a					
CATEGORY	i i		02 CAS NUMBER	CATEGORY	O1 FEEDST	OCK NAME	02 CAS NUMBER
FD S			7439-97-6	FDS			
FD S	mercury		7433-37-6	FOS			
FDS		***************************************		FDS			
FDS				FDS			
VI, SOURCE	S OF INFORMATION (C)	specific references, s.a.	Train fine, surrow wratered. ?				
	vestigation of				ls in conjur	nction with th	ne Niagara

- Investigation of Selected Inactive Toxic Landfills in conjunction with the Niagara River Study," Aug. 1981, (U.S.G.S.)
- 2,) Memo to Hennesey NYSDOT, 8/9/78
- 3.) Letter to Caine NYSDOT from Hooker, 5/9/68

*

				/ '
SEPA.	SITEI	HAZARDOUS WASTE SITE NSPECTION REPORT	I. IDENTIFI	CATION 005.514 380
		HAZARDOUS CONDITIONS AND INCIDE	:N .	
II. HAZ ROOUS CONDIT				
01 & Y CHONNALES 03 CONTRACTOR COLEMA		02 S' OBSERVED (DATE: 7/24/81) C4 NARRATIVE DESCRIPTION	E POTENTIAL	C ALLEGED
Well	sampling shows cont	amination by lead and organ	ic chemicáls.	
01 D.B. SURFACE WATER 03 POPULATION POTENT		102 M OBSERVED (DATE: 7/83) 04 NARRATIVE DESCRIPTION	O POTEITIAL	C ALLEGED
Rust	colored red stains	in standing water and soil.	Chemical and	alyses show
. low level	s of methylene chlor	ide and TOX.		
01 G C, CONTAMINATION 03 POPULATION POTENT	OF AIR JAILY AFFECTED:	02 TOBSERVED (DATE: 1/84) C4 NAFRATIVE DESCRIPTION	O POTEMAL	☐ ALLEGED
None				
		<i>y</i> .		
01 C D. FIRE/EXPLOSIVE 03 POPULATION POTENT		02 E CESERVED (DATE: 7/84)	C POTENTIAL	C ALLEGED
. Sma.l.	l fire of unknown or	igin burning unattended.		
01 CVE, DIRECT CONTAC 03 POPULATION POTENT		02 SV OBSERVED (DATE: 7/84) 04 NARRATIVE DESCRIPTION	<u>CAPOTENTIAL</u>	CI ALLEGED
Site	used by local resid	ents as play area.		
/				
01 TO F. CONTAMINATION OF AREA POTENTIALLY A		02 GOBSERVED (DATE: 7/24/81) 04 NARRATIVE DESCRIPTION	POTENTIAL	[] ALLEGED
Soil	samples show metal	and organic contaminat(on.		
01 D G. DRINKING WATER 03 POPULATION POTENT		02 () CPSERVED (DATE:) 04 NARPATIVE DESCRIPTION	© POTEMBL	C ALLEGED
No.				
01 G H, WORKER EXPOS 02 WORKERS POTENTIAL None	LY AFFECTED:	02 (1) OBSERVED (DATE:) 04 NARRATIVE DESCRIPTION	C POTENTIAL	C ALLEGED
			· / .	
01 C.I. POPULATION EXP	DSUREINURY 6100	02 C OBSERVED (DATE:)	B POTENTAL	G ALLEGED

No known injuries.

SEPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

L IDENTIFICATION

01 STATE 02 STE NUMBER

NV 00005 14294

		ZARDOUS CONDITIONS AND INCIDENTS	NY 0000514380
	NS AND INCIDENTS (Contoured)		
01 J. DAMAGE TO FLORA 04 NAFIRATIVE DESCRIPTION		02 CESERVED (DATE:7/84)	C POTENTIAL C ALLEGED
	None observed.		
01 G K DAMAGE TO FAUNA 04 NARRATIVE DESCRIPTION		02 12 CESERVED (DATE: 7/84)	EV POTENTIAL C ALLEGED
	Abundant small anima	l wildlife on site. No dama	ge observed.
01 🖸 L. CONTAMINATION OF 04 NARRATIVE DESCRIPTION	1	02 C CESERVED (DATE:)	TOPOTENTIAL DI ALLEGED
	Potential to aquatic	microorganisms in ponds and	trenches
	·		
01 TVM. UNSTABLE CONTAIN ISCAURAGE OF POTENTIALL	NMENT OF WASTES	02 D OBSERVED (DATE: _4/28/83) 04 NARRATVE DESCRIPTION 7/83	POTENTIAL ALLEGED
from	Pools of orange tinte earth.	ed standing water observed,	rubbish protruding
01 D N. DAMAGE TO OFFSIT 04 NARRATIVE DESCRIPTION		02 CBSERVED (DATE:)	C POTENTIAL C ALLEGED
·	None.	<u>-</u>	
,		·	
01 [] 0. CONTAMINATION OF 04 NARRATIVE DESCRIPTION		02 C CBSERVED (DATE:)	C POTENTIAL C ALLEGED
	None.		
/			
01 12 P. ILLEGAL'UNAUTHOR 04 NARRATIVE DESCRIPTION		02 TOESERVED IDATE: 6/11/81)	C POTENTIAL C ALLEGED
	Niagara County DOH ol	bserved "evidence of dumping	" after site closed.
05 DESCRIPTION OF ANY OT	HER KNOWN, POTENTIAL, OR ALLEG	ED HAZARDS	
•	•		
IIL TOTAL POPULATION PO	OTENTIALLY AFFECTED: unl	known	
IV. COMMENTS			
conta		on, Phase II study did not a , total population potential	
V. SOURCES OF INFORMA	TIONICE a specific references, e. g., stelle lifes, s.	иточе владузия, / ягосия)	
1.) Niagara Coun 2.) U.S.G.S. Stu			

Site visits during Phase II investigations

SEPA

POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION

	IFICATION
01 SJ 47E	CZ STE NUMBER
NY	0000514380

			SCRIPTIVE INFORMA	111011		
II, PERMIT INFORMATION	A			erst verbishing quarters (along graphs in 1.5 April		
01 TYPE OF PERMIT ISSUED	Not	C3 CATE IS	SUED 04 EXPIRATION DAT	E 05 COMMENTS		
	applicable					
C A. NPDES	1 appricable					
□ B. UIC	<u> </u>				and the same and t	
□ C. AIR	1			_	A STATE OF THE STA	
D.D. RCRA		ļ				
DE RORA INTERIM STATUS	, , , , , , , , , , , , , , , , , , ,	<u> </u>		in the designation of the control of		
OF. SPCC PLAN						
□ G. STATE (Schredy)				<u> </u>		
☐ H. LOCAL				1		
DI. OTHER (SOME)						
D.J. NONE.		1.				
III. SITE DESCRIPTION						
	C TINU EG TRUCHAS	F MEASURE	D4 TREATMENT (Check at the	E ADON)	05 OTHER	
A. SURFACE IMPOUNDMENT		-	-	· •		
D B. PILES		···	D A INCENERATION		D A BUILDINGS ON SITE	
O C. DRUMS, ABOVE GROUND		·	□ B. UNDERGROUND IN□ C. CHEMICAL/PHYSIC			
D. TANK, ABOVE GROUND		D D. BIOLOGICAL	3nL			
D E JANK, BELOW GROUND			II E WASTE OIL PROCE	ESSING	05 AREA OF SITE	
OF LANDFILLU	inknown		G F. SOLVENT RECOVE	RY		
☐ G. LANDFARM			D G/OTHER RECYCLING/RECOVERY 7			
H. OPEN DUMP			D'H. OTHER None	Sorcey		
□ I. OTHER			1.			
Poorly close	a; tires, meta	it, och	er rubbish vis			
IV. CONTAINMENT		*************************************			-	
D1 CONTAINMENT OF WASTES (CHEE ONE)	•	***************************************				
C & ADEQUATE, SECURE	C B. MODERATE	☐ C. IN	ADEQUATE, POOR	DO INSECT	URE, UNSOUND, DANGEROUS	
2.) Disposal tre	d; tires, meta	Canal wa	er rubbish vis aste excavated	ible. in soft,	layered clay.	
V. ACCESSIBILITY	*					
01 WASTE EASILY ACCESSIBLE: EXYES	Q NO					
Unfenced, ea	asy access					
VI. SOURCES OF INFORMATION (C=+ +0+c	do references, e.g. since this, sens	(ve anat em, yapo	rail .		New risk in work in .	
l.) Site inspect	ion, summer 19	983				
2.) Memo to Henr						
2., Melio co helii.	reach wranor, c), J, U4				
1						

And the second s				· · · · · · · · · · · · · · · · · · ·		TIDE	ATTICLE TION	*	
ALDA	POTENTIAL HAZARDOUS WASTE SITE						I. IDENTIFICATION O1 STATE O2 SITE NUMBER		
SEPA	SITE INSPECTION REPORT PART 5- WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA						00005143		
	rants-maits,	DEMOGRAPHI	IU, AND EN	VINUNM	ENTALDATA				
II. DRINKING WATER SUPPLY									
O1 TYPE OF DRINKING SUPPLY		02 STATU S				03	DISTANCE TO SITE		
ਸ਼ਹਿਸਕ ਜ ਅਸੰਕਰਾ। SURFACE	\ MEIT	ENDANGERE	ED AFFEC	י מדני	MONITORED				
COMMUNITY A. D	B. C)	A. D	8. E		C. C	A.,	(m)	1	
иои-сомминту с. 🗆	0. 🖸 🕝	0. 🗆	E. (ב	F. 🖸		(mi)		
III, GROUNDWATER		Total Lance was Yearle - or chast action a Later Comme					The state of the s		
01 GAOUNDWATER USE IN VICINITY (CHEE	one)								
☐ A ORLY SOURCE FOR DRINKING	B. DRINKING (COM South of michology) COMMERCIAL, (ND) (NO OTHER WAY SOUTH)	USTRIAL JERIGATIO	(Lr	MMEPCIAL Y MODE SAM	INDUSTRIAL IFRIGAT	non à	D. NOT USED, UNUS	E4BL E	
C2 POPULATION SERVED BY GROUND WA	тен0		03 DISTANCE	ETO NEARES	ST DRINKING WATER V	VEIL	0.2 (mi)	
PETAWORUCES OT HTGG 40	05 DIRECTION OF GROU	WO JR KSTAWON	OF HTE30 60		07 POTENTIAL YIEL	۵.	DE SOLE SOURCE A	CUIFER	
4.0	SW,S,SE	S [*]	of conce		OF AQUIFER	(0.00)	C YES G	No	
DB DESCRIPTION OF WELLS increase washing	CAROL AND KONTON OF THE MEN			(11)		_{gpd}	**************************************		
	ork of samplin aroughout the	-	arying f	rom	10' to 70'	in de	pth		
10 RECHARGE AREA			11 DISCHARG	E AREA					
IZ YES COMMENTS				COMMENT	rs.				
□ NO .			D NO.						
IV. SURFACE WATER			<u></u>						
01 SURFACE WATER USE (Check size)									
B A. RESERVOIR, RECREATION DRINKING WATER SOURCE		, ECONOMICALLY TRESOURCES	, മൂമാ	OMMERCIA	AL INDUSTRIAL	G 0). NOT CURRENTLY	r used	
02 AFFECTED/POTENTIALLY AFFECTED 60	DOILS OF WATER								
NAME: small pond on s	ite				AFFECTED		DISTANCE TO SIT	F	
Sawyer Creek							0.25	(mi)	
Bull Creek							1.1	(mi)	
Tonawanda Creek							2.3	(cmi)	
V. DEMOGRAPHIC AND PROPERT	Y INFORMATION			***************************************					
01 TOTAL POPULATION WITHIN				02	PUSTANCE TO NEARE	ST POPU	LATION		
ONE (1) MILE OF SITE TO 1.800 E	VO (2) MILES OF SITE B. 6,100 MILES OF SITE		2) MILES OF S .2,000 10.0 F PERSONS	ITE -		350	1		
63 NUMBER OF BUILDINGS WITHIN TWO (2)	MILES OF SITE		04 DISTANCE	TO NEARES	T OFF-SITE BUILDING				
1620	_		-	350'					
US POPULATION WITHIN VICINITY OF SITE,	Ргомов пыгларие анасловол об гы	BITLE OF DISCUSSION WATER	wandy of see, e a	Jurac, vilada, d	iensely politikadel urben er	•æj			
	is located ad						nt.		

POTENTIAL HAZARDOUS WASTE SITE

1. IDENTIFICATION

SEPA		TION REPORT OLISTATEICZ SITE MUMBER C, AND ENVIRONMENTAL DATA NY 000514 380
M. CHUROLIMENTAL INSOCHATIO		C, AND ENVIRONMENTAL DATA
VI. ENVIRONMENTAL INFORMATIO OF PERMEABILITY OF UNSATURATED ZONE		
☐ A. 10 ⁻⁶ — 10 ⁻⁶ cm	1/550 B. 10 ⁻⁴ = 10 ⁻⁶ cm/sec ⊠	C. 10 ⁻⁴ = 10 ⁻³ cm/sec ☐ D. GREATER THAN 10 ⁻³ cm/sec
02 PERMEABILITY OF BEDHOCK (Circ) one)		
☐ A, IMPERMEAE it eas then 10 ⁻⁶	PLE UB. RELATIVELY IMPERMEABLE OF THE PROPERTY	S TO RELATIVELY PERMEABLE D. VERY PERMEABLE
D3 DEFTH TO BEDROCK 04	DEFTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
~ 70(H)	unknown (n)	5.6-7.3
CE NET PRECIPITATION	ONE YEAR 24 HOUR RAINFALL	CE SLOPE
$40 - 27 = 13_{(ln)}$	2.1 (in)	SITE SLOPE DIRECTION OF SITE SLOPE TERRAIN AVERAGE SLOPE 1.0
CS FLOOD FOTENTIAL	10	TICLAND COACTA DICHUATION ACTA DISCOULT TOOPHILY
SITE IS IN 7,500 YEAR FLOODE	PLAIN	ER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY
11 DISTANCE TO WETLANDS (5'MO) PHENOMI		12 DISTANCE TO CRITICAL HABITAT (of encourge to science)
ESTUARINE	OTHER	3_5(mi)
A(mi)	83.5 _(mi)	ENDANGERED SPECIES: Peregrine Falcon, Golden E
13 LAND USE IN VICINITY		
DISTANCE TO:	CECIDENTIAL ABEAR MATION	IAUSTATE FARKS. AGRICULTURAL LANDS
COMMERCIALINDUSTRIAL	RESIDENTIAL AREAS; NATION FORESTS, OR WILDLIFE	
	0.01	0.01
A(mi)	в	(mi) C(mi) D(ml)
14 DESCRIPTION OF SITE IN RELATION TO SU	URROUNDING TOPOGRAPHY	
~··		Duine to dumping
	a swamp, with drainage	poorly drained area. Prior to dumping,
Site was	a swamp, with diamage	to the notine
.•		
	•	•
		•
	•	· ·
	·	
÷		
VII. SOURCES OF INFORMATION ICE	Is appealed references, e.g., siste like, surrore granyers, in	north
	and the graph of the control of the	
• • • •		
	G.S. Study site Dossier	
	II Investigation	

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

LIDENTIFICATION DI STATETOS STE NUIMASA 0000514380

IL SAMPLES TAKEN					
SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	STANCSTANTES ED EPARVA STARIM		
GROUNDIYATER	8	8 Compu Chem			
SURFACE WATER	5	5 ES laboratory			
WASTE		·			
FILA		· .			
RUNOFF					
SAIT		-			
SOIL .			· .		
VEGETATION -					
отн еж sedimer	nt 3 .	Compu Chem	8/84		
IIL FIELD MEASUREMEN	ITS TAKEN				
on me Downhole gamma logging	02 COMMENTS Performed	in wells to define soil stratigraphy			
Geophysical sur	vey Performed	to locate disposal trench boundaries			
Permeability to	<u>-</u>	in wells to evaluate rate of contaminant move	ment		
IV. PHOTOGRAPHS AND	MAPS		100		
OF TYPE OF GROUND C.	AERIAL	02 IN CUSTODY OF Dames & Moore office			
O3 MAPS O4 LO	Dames	& Moore office			
V. OTHER FIELD DATA C	COLLECTED (Provos nameros de	acropoon)			
	Soil samples v	were collected during the drilling of the seve analyses of selected samples were performed i	n sampling n the		

VIL SOURCES OF INFORMATION (Che appecific referencies, e.g., state files, surfore analysis, recorts)

Phase II investigation

SEPA		POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT PART 7 - OWNER INFORMATION		IL IDENTIFICATION OF THE POST NY O	CATION SITE NUMBER 0000514380
II. CURRENT OWNER(S)	,		PARENT COMPANY (K M. L. C.		
DI NAME		C2 D+8 NUMBER	C8 NAME		09 0+8 NUMBER
Town of Wheatfield					
03 STREET ADDRESS (F.O. Sax. AFD F. HE.)	· · · · · · · · · · · · · · · · · · ·	C4 SIC CODE	10 STREET ADDRESS (P.O. Box, RED . etc.)		11 SIC CODE
2800 Church Road					
os ary	OB STATE	G7 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
N.Tonawanda	ИХ	14120	1		
OI NAME	· .	C2 D+E NUMBER	08 NAME		09 D+8 NUMBER
	`. <u>.</u> `	, : .		`	
03 STREET ADDRESS IP D. Box, RFD P. enc.)		04 SHC COCE	10 STEEET ADDRESS (P.O. ROL AND P. MC.)		11 SIC CODE
		•		×	7 1
05 CITY	08 STATE	07 ZIP CODE	12 017	13 STATE	14 ZIP CODE
O1 NAME		02 D+8 NUMEER	D8 NAME		C9 O+ & NUMBER
03 STREET ADDRESS (P. Q. 534, AFD 4, erg.)		104 SIC CODE	10 STREET ADDRESS (2 0, Box, RFO #, etc.)		11 SIC CODE
				У	
05 CTY	06 STATE	07 ZP CODE	12 014	13 STATE	14 ZIP CODE
	<u> </u>	O2 D+B NUMBER			200.2144.000
OI NAME		U2 D+B NOMBER	08 NAME		C9D+8 NUMBER
03 STREET ADDRESS (P. G. BOE, RFD #, ME.)		04 SC COD€	10 STREET ADDRESS (P.O. SOL, AFD P. MO.)		11 SIC CODE
DE STREET ADDRESSIF & SAC APPY, BELL	•	, S. C. D. E.	TO STREET ADDRESSIVE BOLLANDS, WC.	#*	11,500 0002
05 CTY	CA STATE	07 ZP COCE	12 CTY	13.2 57.175	14 ZIP CODE
50 (4)1	003,216		12011	1031412	
IIL PREVIOUS OWNER(S) (I Lest most receive from).	•		IV. REALTY OWNER(S) IF accompany (SA)		
O1 NAME.	* ** * *	102 D+B NUMBER	O1 NAME		RBBMUM 8+0 SO
03 STREET ADDRESS (P.O. BOL AFD #, ME.)		D4 SIC CODE	G3 STREET ADDRESS IP.O. SOL RED #, HOL		04 SC CODE
05 CITY	OBSTATE	07 ZIP CODE	05 CITY	OB STATE	07 ZIP CODE
O1 NAME		G2 D+8 NUMBER	O1 NAME		02 D+8 NUMBER
03 STREET ADDRESS (P.O. 501, RFD F, etc.)	>	04 SHC CODE	03 STREET ADDRESS (P.O. SOL AFD #, erc.)		04 SIC CODE
05 CITY	OB STATE	07 ZIP CODE	05 CITY	OB STATE	07 ZIP CODE
					,
O1 NAME		02 D+8 NUMBER	O1 NAME		Б ЗВМИИ Б+О 20
03 STREET ADDRESS (P.O. Sax AFD +, orc.)		04 SIC CODE	00 STREET ADDRESS (P. 0. 36x, RFO #, etc.)		C4 SXC CODE
osaty .	OBSTATE	97 ZIP COD€	os ary	GB STATE	07 ZIP CODE
-					
V. SOURCES OF INFORMATION (C)	references,	E.G., 2040 Fine, serriore energia	L records)		**************************************
				*	,

New York State Tax Records

	POT	ENTIAL HAZA	ARDOUS WASTE SITE	LIDENTIF	
SHA		SITE INSPE	CTION REPORT TOR INFORMATION		2 STE NUMBER 0000514380
IL CURBENT OPERATOR IFTO PEROPERATE	ent from owners		OPERATOR'S PARENT COMPAN	Y тухориожене	
1 HAME	jo:	2 D+8 NUMBER	10 NAME		11 0-6 NUMBER
None.	Í				
D3 STREET ADDRESS IP O. A.I., AND V. MIL.)		04 SIC CODE	12 STREET ADDRESS (P.O. SOL AFD P, ML)	Ang Consequence	13 SIC CODE
s City	OE STATE O	7 ZF CODE	14 CITY	15 STATE	1:6 DP CODE
OF OW	NEA			,	
III. PREVIOUS OPERATOR(S) (Laterna i	ream first; premos evey é	offerent from pennet	FREVIOUS OPERATORS' PAREN	T COMPANIES "	'acceptated
Niagara Sanitation C		R32WUM 6+0 2	1C NAME	·	R33MUN 8+0 11
STREET ACCRESS IP O. S.H. AFD P. ME.J	1.	04 SIC CODE	12 STREET ADDRESS (P.O. BOX. RFD #, enc.)		13 SC CODE
N. Tonawanda	CG STATE O	7 ZP CODE	14 CITY	15 STATE	16 ZIP CODE
DB YEARS OF OPERATION OF NAME OF CW	MER DURING THIS F	SAICO		<u> </u>	
1904-1906 D1 NAME	02	RESHUN B+C	10 NAME		REBAUN 6+0 II
DISTREET ADDRESS (P.O. SOL, HED P. HOL)		C4 SIC CODE	12 STREET ADDRESS IP 0. dox, AFD 0, ++c.)		13 SIC CODE
э <u>с</u> Стү	Ce STATE O	7 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
BYEARS OF CPERATION OR NAME OF ON	MER DURING THIS F	PERKOD			
I NAME	O	2 D+8 NUMBER	10 NAME .		F38MUA8+Q 11
NS STREET ADDRESS (2.0. BOX. RED F. ore.)		04 SIC COD€	12 STREET ADDRESS (P.O. BOX. AFD #, MGJ		13 SIC CODE
S CITY	OS STATE O	7 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
				1	į.

Niagara County Department of Health, 1981

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POTENTIAL HAZARDOUS WASTE SITE SITE INSPECTION REPORT

LIDENTIFICATION

OF STATE OF S

WITH.	PART 9 - GENERATOR/TRANSPORTER INFORMATION			NY 0000514380	
II. ON-SITE GENERATOR					
O1 NAME	***************************************	02 DTB NUMBER			
None.	F				
C3 STREET ADDRESS IP 0. SOL RED A. HC.)		04 S/C CODE			
C5 CITY	GE STATE	07 ZIP CODE			
III. OFF-SITE GENERATOR(S)				w. A no	****
OI NAME C2 (02 0-8 NUMBER	01 NAME	AND DESCRIPTION OF A CHARACTER STREET,	C2 D+B NUMBER
Hooker Chemical			Niagara Falls Air For	ce Base	
C3 STREET ADDRESS IP D BOL AFD . HC.)		0.4 SIC CODE	03 STREET ADDRESS (# 0. Box 2FD 4, etc.)		04 SIC CODE
озсту Niagara Falls	08 STATE NY	07 ZP CODE	oscary Niagara Falls	OB STATE NY	OT ZIP CODE
I NAME G2 C		G2 D+6 NUMBER	01 NAME . C2 D+		C2 D+6 NUMBER
Bell Aerospace			Camborumdum		
OB STREET ACCRESS IP O. SOL AFO P. MC.)		04 SKC CODE	03 STREET ADDRESS (P.O. Son. AFO F. em.) Buffalo Ave		04 SIC CODE
CS CITY	OB STATE	67 ZIP CODE	oscny Niagara Falls	ce state NY	07 ZIP CODE
IV. TRANSPORTER(S)					
OI NAME Niagara Sanitation Co	•	02 D+8 NUMBER	01 NAME		02 D+6 NUMBER
OB STREET ADDRESS (P.O. SOL AFD 4, etc.)		04 SKC CODE	C3 STREET ADDRESS (P.O. Sc.). AFD A. HC.)		C4 SKC CODE
05 CITY	08 STATE	07 ZIF CODE	05 City	OB STATE	O7 ZIP CODE
N. Tonawanda	ИА				7
O1 NAME		02 D+8 NUMBER	01 NAME		02 D+8 NUMBER
O3 STREET ADDRESS (P.O. BOL, AFD 4, MC.)	<u>-</u>	C4 SC CODE	03 STREET ADDRESS IP 0. 50x, AFD 4, HZ.)	***************************************	04 SIC CODE
05 CITY	OB STATE	07 ZIP CODE	OS CITY	06 STATI	07 ZIP CCD€
V. SQURCES OF INFORMATION (Che lock	fic returnova, i	g., sizie lena, samble anavso	1. records)		<u> </u>

Other off-site generator: Frontier Chemical

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

L IDENTIFICATION

O1.STATE ICS STE NUMBER

NY 0000514380

		ST RESPONSE ACTIVITIE S	:	NY 0000514380
IL PAST RESPONSE ACTIVITIES		And the second s		
01 D A WATER SUPPLY CLOSED		C2 DATE .	D3 AGENCY	
04 DESCRIPTION	No.			
01 G B. TEMPORARY WATER SUPPLY FE	OVIDED	02 DATE	O3 AGENCY _	
04 DESCRIPTION	No.			
01 (1) C. PERMANENT WATER SUPPLY PR	CVICED	G2 DATE	03 AGENCY _	
	No.			•
01 () D. SPILLED MATERIAL REMOVED 04 DESCRIPTION		C2 CATE	_ 03 AGENCY	
•	No.	•		
01 C E CONTAMINATED SOIL REMOVED 04 DESCRIPTION		02 DATE	03 AGENCY_	
·	No.			
01 () F. WASTE REPACKAGED 04 DESCRIPTION		02 DATE	03 AGENCY	- 4
	No.			
01 [] G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION	No.	02 DATE	03 AGENCY .	
01 C H. CN SITE BURIAL		02 DATE	03 AGENCY _	
04 DESCRIPTION	No.		•	
01 CLL IN SITU CHEMICAL TREATMENT 04 DESCRIPTION	No.	02 DATE	03 AGENCY _	
	NO.	<u> </u>		
01 (I) I IN STU BIOLOGICAL TREATMENT 04 DESCRIPTION	4	02 DATE	YOU AGENCY _	, , , , , , , , , , , , , , , , , , , ,
	No.		•	
01 CLK IN SITU PHYSICAL TREATMENT 04 DESCRIPTION		02 DATE	03 AGENCY	
· ·	No.			•
01 C L ENCAPSULATION 04 DESCRIPTION		02 DATE	_ 03 AGENCY	
	No.			
01 D M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION		02 DATE	_ YOMSDA ED _	
	No.	•		
01 © N. CUTOFF WALLS 04 DESCRIPTION	No.	02 DATE	03 AGENCY	
01 G O. EMERGENCY DIKING/SURFACE W	ATER DIVERSION	02 DATE	03 AGENCY	
ON DELOCIA FROM	No.			
01 CLP, CUTOFF TRENCHES/SUMP 04 DESCRIPTION	•	02 DATE	03 AGENCY .	
	No.			
01 () Q. SUBSURFACE CUTOFF WALL. 04 DESCRIPTION		02 DATE	. 03 AGENCY	
	No.			

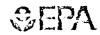
POTENTIAL HAZARDOUS WASTE SITE

Ļ	IDEN	RECATION	
01	NYTE	02 STE N. WEET 0000514380	,

CALLYA		ECTION REPOR T RESPONSE ACTIVIT	nes-	ที่ที่ที่ "วังไอ้เอีร์โล้380
ILPAST RESPONSE ACTIVITIES (Comment)				
01 O R. BARHER WALLS CONSTRUCTED		D2 DATE	03 ACENTY	
C4 CESCRIPTION		A UNIE		The state of the s
No.			_	
01 C S. CAPENNE/COVERING 04 DESCRIPTION		D2 DATE	03 AGENCY	
Incomplete	cover of waste	e (trash)		
01 D.T. BULK TANKAGE REPAIRED 04 DESCRIPTION	(2 DATE	03 AGENCY	
No.	-		·	•
01 () U. GROUT CURTAIN CONSTRUCTED 04 DESCRIPTION		D2 DATE	03 AGENCY	
No.		•		
01 D V. BOTTOM SEALED: 04 DESCRIPTION		2 DATE	03 AGENCY	
No.				
01 E W. GAS CONTROL		02 DATE	20 10 10 10	
04 DESCRIPTION	·	JZ DATE	W AUCNUT	
No.			<u> </u>	
01 C X. FIRE CONTROL 04 DESCRIPTION	C	D2 DATE	D3 AGENCY	
No.				
01 G Y. LEACHATE TREATMENT		D2 DATE	03 AGENCY	
04 DESCRIPTION NO.				
01 IJ Z. AREA EVACUATED		DZ DATE	D3 AGEHCY	
04 DESCRIPTION NO.		5		
01-D 1. ACCESS TO SITE RESTRICTED	. 0	2 DATE	- 03 AGENO	
04'DESCRIFTION No. Site i	s surrounded b	y incomplete	(although loc	ked) fence.
01 EL 2. POPULATION RELOCATED	C	2 DATE	03 AGENCY	
04 DESCRIPTION NO.		٠		
01 G 3, OTHER REMEDIAL ACTIVITIES.	C	2 DATE	YOKSDA E0	
04 DESCRIPTION None.				

III, SOURCES OF INFORMATION (Cresporate references, e.g., state find, samon analysis, records)

Site visits during Phase II investigation



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

1. IDENTIFICATION от этате ог яге нумеел 1 NY 0000514380...

IL ENFORCEMENT INFORMATION

OF PAST REGULATORY/ENFORCEMENT ACTION THE THE

02 DESCRIPTION OF FEDERAL STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III, SOURCES OF INFORMATION (CI) SPHORE PRIFFICES, S.G., MIRE FIRE, SEPTEM BENEFACE, PROCEEDING

SECTION VI

PRELIMINARY REMEDIAL ALTERNATIVES AND COST

Introduction

The purpose of this conceptual remedial alternative evaluation is to identify potential remedial action technologies and prepare a conceptual cost estimate for the most likely remedial alternative for the Nash Road site. Due to the preliminary nature of the data available, any remedial alternative evaluation must be considered very preliminary and, hence, would be conservative. A more detailed remedial investigation and feasibility study would be required to better define design criteria and costs for remedial alternatives.

Identification of Remedial Methods

The conceptual remedial alternatives considered for the Nash Road site were subjected to a three-tiered screening process. First, remedial action methods were screened to determine applicability to the site. The methods were selected to conform with the onsite actions for remediation of hazardous material releases, as presented in the National Contingency Plan. Remedial action methods were eliminated if they were considered unnecessary at the Nash Road landfill. The screening process and rationale for selection of engineering methods is summarized in Table VI.1. Based on this screening only surface water and ground water controls were retained for the second screening process.

Second Screening of Remedial Actions

In the second screening process, the engineering methods identified in the first screening process were further evaluated. The results of the second screening of remedial actions are presented in Table VI.2.

Remedial actions for surface water controls which were retained after this screening process include capping, grading, revegetation and perimeter fencing. Although no on-site surface water contamination or migration of contaminants was indicated during the Phase II investigation, these actions are considered to be applicable since they will 1) reduce the potential for future releases to surface water, 2) protect the public health by eliminating exposure to hazardous substances by direct contact and 3) minimize the risk of fires.

Actions for containment and/or pumping of ground water were eliminated during this phase of the screening process because, although some analytical results of ground water samples collected as part of the Phase II investigation indicated slight metals contamination, the migration of significantly contaminated ground water from the site was not found. Furthermore, due to the geology of the site, these remedial actions would be technically difficult and/or expensive to implement. Only continued monitoring of ground water was retained for further consideration. Collection and analysis of ground water samples from on-site wells will confirm or deny the existence of significant heavy metals contamination.

Evaluation of Remedial Alternatives

The third screening process involved a more detailed evaluation of several combinations of remedial actions that had passed the first two screening steps. Alternatives were scored in a general sense (unfavorable, fair, favorable) in each of five categories: technical feasibility, environmental impact, public health risk, and regulatory compliance. The total score for an alternative is not necessarily an indication of overall acceptability.

For example, alternatives may score high in all categories except regulatory compliance, and therefore would be eliminated. Conversely, the monitoring alternative is retained throughout, regardless of its rating, to act as the baseline (i.e., lowest) level of effort for comparison.

The basic elements of each of the five criterion are as follows:

Technical Applicability

The technical applicability of a remedial action technology refers to its ability to achieve performance standards such as:

a) protection of the groundwater aquifer, and b) minimization of emissions. In addition, the ease of implementation is important. This criterion provides an effective means of reducing a very large number of alternatives to only those that are applicable from an engineering standpoint.

Environmental Impact

The most important environmental impacts are the potentials for surface water, ground water and air emission contamination. Each alternative was screened in consideration of its ability to prevent contamination of these three media.

Public Health Risk

The key concern of the Superfund program is protection of the public health. Potential areas of risk are: contamination of ground water supplies and surface water supplies, emissions of volatile hazardous compounds to the atmosphere, spills of hazardous substances during transportation to acceptable disposal sites, exposure of the public or workers to toxic substances during cleanup operations, accidental or purposeful entry by unauthorized personnel into the sites and subsequent contact with hazardous wastes.

Regulatory Compliance/Acceptability

The involved regulatory agencies and their means of responsibility are as follows:

New York Department of Environmental Conservation (Albany)

New York Department of Environmental Conservation, Region 9 (Bufffalo)

U.S. Environmental Protection Agency, Region II (New York)

Preferred alternatives must comply with all regulatory requirements and have regulatory agency support.

The evaluation of potential remedial alternatives for surface

water controls and ground water controls is presented in Table VI.3. Capping, grading, revegetation and limiting site access by erection of a fence around the perimeter of the site is judged to be an appropriate remedial alternative for controlling migration of contaminants off-site, preventing human contact with hazardous substances and reducing the possibility of fires or explosions.

Collection and analysis of additional ground water samples is considered to be an appropriate remedial alternative, to determine whether or not significant contamination of ground water exists on the site. Although this remedial alternative scored only fair for environmental impact and regulatory compliance, since slight lead contamination (concentration in excess of state standards) was detected in one of two ground water samples; the public health risk is low since the ground water is not used for drinking water. This alternative is judged to be the appropriate level of response, based on existing data.

Conceptual Cost Estimate

A conceptual cost estimate was prepared for the alternatives which were developed for surface water controls and ground water controls. The following are assumptions which were made to generate a preliminary cost estimate for capping the landfill. The area of the landfill is estimated to be approximately 25 acres in size. The former disposal trench would have to be dewatered and filled prior to capping. Vegetation would need to be cleared and the site would have to be graded and recontoured prior to capping. The cap would consist of a one-foot layer of

compacted clay. The drainage ditch north of the site would require reconstruction after capping of the site. Revegetation would consist of a layer of topsoil, covered with grass seed and mulch. The perimeter fence will surround the 25-acre site and be six feet high. Using the above assumptions, published cost information, a contingency of 30% and engineering of 20%, the preliminary capital cost for this alternative is 2 million dollars. (Table VI.4).

The cost of the ground water monitoring alternative considers the collection of two rounds of samples from the monitoring wells and from the Osterman well. These samples would be filtered in the field to reduce variability in the analytical results. The estimated cost for collection and analysis for heavy metals of two rounds of samples is \$11,100.

TABLE VI.1
IDENTIFICATION OF REMEDIAL ACTION METHODS (FIRST SCREENING)

METHOD	APPLICABLE	NOT APPLICABLE	COMMENTS	
Air Emissions Controls		x	No air contamination detected.	
Surface Water Controls	X		No surface water detected, however, site capping would eliminate ponding and reduce leachate generation. Also reduces public health risk for exposure by direct contact and fire and explosion hazard.	
Ground Water Controls	х		Ground water contamination not confirmed. Additional sampling and analysis of monitoring wells is required.	
Comtaminated Water and Sewer Lines		x	No susceptible municipal sewer or water lines.	
Treatment		x	No treatment of air, water, wastes, sediment or soil required. Highest concentrations of metals detected in ground water samples are low enough for discharge to public sewer systems.	

TABLE VI.2
PRELIMINARY SCREENING OF REMEDIAL ACTIONS (SECOND SCREENING)

ALTERNATIVE	APPLICABLE	NOT APPLICABLE	COMMENTS	
Surface Water Controls				
Containment (capping)	Х		Conventional, demonstrated relatively low cost technology for reducing leachate generation and minimizing public health risk by direct contact.	
Grading	X		Site should be graded to promote surface runoff to drainage ditch north of landfill. Drainage ditch should be regraded and maintained to convey runoff away from site.	
Revegetation	x		Revegetation stabilizes the surface of the site, and controls erosion of the cap.	
Perimeter Fencing	x		Limits access to site to minimize public health risk and damage to the cap.	
Ground Water Controls				
Monitoring	x		Ground water contamination not confirmed, additional sampling and analysis of samples for metals is required.	
Impermeable Barriers -Slurry Walls -Grout Curtains -Sheet Piling		x x x	Depth to bedrock reduces technical feasibility and increases cost. Fractures in dolomite bedrock may be flow path.	
Permeable Treatment Bed		x	No practical means available to divert ground water to treat- ment bed. Synthetic ion exchange resins for metals removal may plug. Maintenance costly and difficult. Capital cost extremely high.	
Ground Water Pumping		x	Ground water pumping is not feasible due to low permeability of soils above bedrock. Bedrock may yield water from fractures, but may not contain contaminant plume.	
Leachate Control -Subsurface Drains -Drainage Ditches -Liners		x x x	Not practical as extensive soil excavation would be required for leachate control systems.	

TABLE VI.3 ELEVATION OF POTENTIAL REMEDIAL ALTERNATIVES (THIRD SCREENING)

ALTERNATIVE	TECHNOLOGY	ENVIRONMENTAL IMPACT	PUBLIC HEALTH RISK	REGULATORY ACCEPTANCE	ENGINEERING JUDGEMENT COMMENTS RETAIN OPTION
Surface Water Controls					
Capping, Grading, Revegetation and Perimeter Fencing	n 3	3	3	3	Provides effective means YES for control of migration of contaminants off-site and reduces public health risk and fire and explosion hazard.
Ground Water Controls					
Monitoring	3	2	3	2	Additional sampling and YES analysis for heavy metals would confirm or deny the existence of contamination. Present analytical results are inconclusive, however no significant contamination was found.

Legend:

^{1 =} Unfavorable (i.e., high cost, severe environmental impacts, high health risks, poor regulatory compliance, unproven or difficult technology)

^{2 =} Fair

^{3 =} Favorable

Table VI.4 Summary of Conceptual Remedial Cost Estimate Nash Road Landfill

Item No.	Description		Approximate Cost (1)		
I.	Site dewatering and preliminary site work prior to grading, capping, revegetation and perimeter fencing	\$	290,000		
II.	Site grading and drainage	\$	327,000		
III.	Surface sealing and capping (1' thick clay cap)	\$	592,000		
IV.	Revegetation Topsoil (1'), seed and mulch	\$	67,000		
v.	Perimeter fence (4600') with two gates (6' high)	\$ _	47,000		
Subtotal		\$1	,323,000		
Contigency (Engineering		\$	397,000 265,000		
Total Capita	l Cost	\$1	,985,000		

⁽¹⁾ Costs are in 1984 \$

⁽²⁾ These costs are considered preliminary conceptual costs.

REFERENCES

NASH ROAD SITE

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