ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES

PHASE II INVESTIGATION

Ashland Petroleum Company	Site No. 915061
City of Tonawanda	Erie County

E-FILED

Prepared for:

New York State
Department of
Environmental Conservation
50 Wolf Road, Albany, New York 12233
Thomas C. Jorling, *Commissioner*

Division of Hazardous Waste Remediation
Michael J. O'Toole, P.E., *Director*

By:

ENGINEERING-SCIENCE

ENGINEERING INVESTIGATIONS AT INACTIVE HAZARDOUS WASTE SITES IN THE STATE OF NEW YORK

PHASE II INVESTIGATIONS

ASHLAND PETROLEUM COMPANY SITE

NYS SITE NUMBER 915061
TOWN OF TONAWANDA
ERIE COUNTY
NEW YORK STATE

PREPARED FOR

DIVISION OF HAZARDOUS WASTE REMEDIATION
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD
ALBANY, NEW YORK 12233-0001

PREPARED BY

ENGINEERING-SCIENCE, INC.
290 ELWOOD DAVIS ROAD
LIVERPOOL, NEW YORK 13088

OCTOBER 1989

Daniel H. Johnson

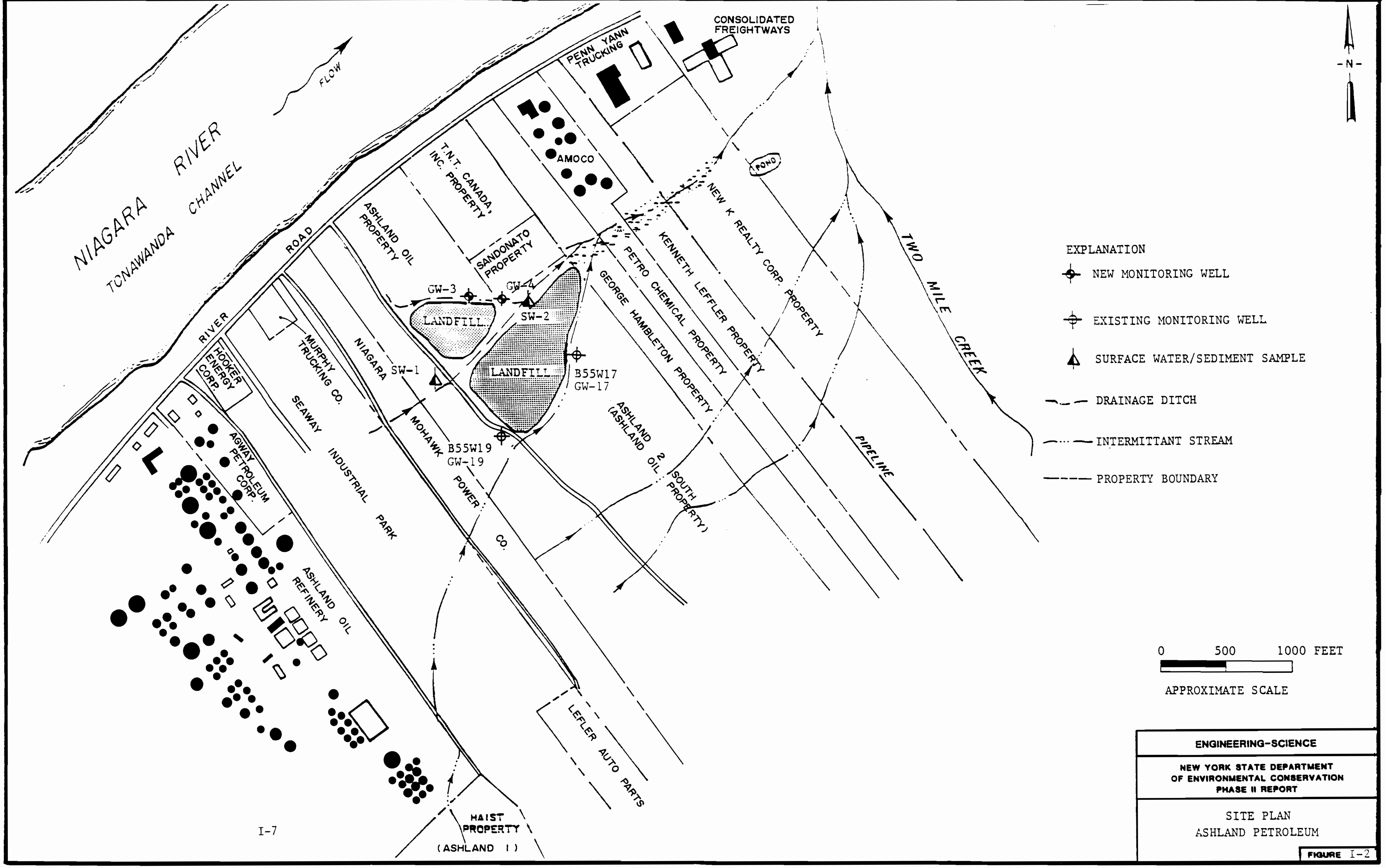
TABLE OF CONTENTS

ASHLAND PETROLEUM COMPANY SITE
PHASE II REPORT

TABLE OF CONTENTS, CONTINUED

LIST OF TABLES

LIST OF FIGURES



ENGINEERING-SCIENCE

**NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT**

SITE PLAN
ASHLAND PETROLEUM

FIGURE I-2

SECTION I

EXECUTIVE SUMMARY

SITE BACKGROUND

The Ashland Petroleum site is located in the Town of Tonawanda, Erie County, New York (Figure I-1). The population of Tonawanda in 1980 was 18,693 (Rand McNally, 1981). The site is owned by The Ashland Petroleum Company of Tonawanda, New York, who landfilled industrial waste at the site until 1982.

The Ashland Petroleum Company operated their Tonawanda facility for refining petroleum products between 1957 and 1982. Ashland operated the landfill between 1957 and 1982 to dispose of plant refuse and industrial wastes. The wastes reportedly deposited at the site include lime slurry sludges, phosphoric acid polymerization catalyst, spent clay from oil refining and low level radioactive wastes from another site. When the landfill was closed in 1982, dried spent lime material was bulldozed into the landfill, and subsequently covered with a clay-bentonite layer about two feet thick.

During the period 1944-1946, the former Haist property served as a repository for uranium ore tailings (Figure I-2). The tailings were generated by Linde Air Products (a Division of Union Carbide) during their period of participation in the ore refinery operations program of the Manhattan Engineering District (MED). The Haist property received approximately 8,000 tons of low level radioactive material. In 1979, an estimated 30-40% of that material was transferred to the Seaway Industrial Park. An unknown quantity of these radioactive materials were also deposited at the Ashland Petroleum Company Site.

In 1974, the U. S. Energy Research and Development Administration (ERDA), presently the Department of Energy (DOE), initiated a program to identify, remediate, or control sites where radioactive contamination remains from activities conducted under contract to MED or the Atomic Energy Commission (AEC). Two sites currently owned by the Ashland Oil and Refining Company are listed under the Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites are the former Haist Property, designated as Ashland 1, and a portion of the Ashland Petroleum site being investigated during this NYSDEC Phase II investigation, designated as Ashland 2. The property south of the Ashland 2 (Phase II) site is currently being investigated by Bechtel National, Inc. under contract to DOE as a possible disposal site for FUSRAP wastes. This site has been designated Ashland 2 South.

The Ashland 1 (Haist Property) site was listed as an inactive hazardous waste site by the NYSDEC as site number 915008C. The site was delisted in December 1985.

A NYSDEC Phase I investigation for the Ashland 2 site was completed in 1986 and concluded that a Phase II investigation was necessary to complete a Final Hazard Ranking System (HRS) score. This Phase II investigation was conducted to determine the presence of hazardous substances at the site and in the local surface water and groundwater systems. The Ashland Petroleum Company site is situated in an industrial area. The Seaway Industrial Park and Niagara Mohawk Power Company property lie south of the Ashland site. Land owned by several different property owners lies to the north. The site features are shown on Figures I-1 and I-2.

PHASE II INVESTIGATION

Two downgradient groundwater monitoring wells were installed as part of the Phase II investigation. Two existing groundwater monitoring wells were used as upgradient wells. Surface water, groundwater, and sediment sampling and analysis, and air monitoring were conducted to define the presence of hazardous substances at the Ashland Petroleum Company Landfill site.

SITE ASSESSMENT

The geologic stratigraphy of the site can be summarized as up to 85 feet of glacial deposits over Camillus Shale bedrock. The aquifer of concern is the weathered shale, a confined aquifer which is hydraulically connected to a glacial till layer directly above it. The depth to water in monitoring wells at the site is approximately 60 to 75 feet. The piezometric surface in the confined aquifer is very flat across the site, water level records from the Ashland 2 South site exhibit variable directions of flow. Due to the proximity of the Niagara River, water levels in the river are likely to influence groundwater in the vicinity of the site.

Four groundwater samples were collected at the Ashland Petroleum Company site and were analyzed for Hazardous Substance List (HSL) organic (volatile and semivolatile) compounds, six radioactive parameters and total halogenated organic compounds (TOX). The applicable Class GA groundwater standard for benzene was exceeded in GW-3. The concentrations of gross beta in wells GW-3, GW-4 and GW-17 were in excess of three times the concentrations in GW-19. This indicates the site may be acting as a source of radioactive particles to the groundwater. However, confirmation of this finding is uncertain, since the direction of groundwater flow is not consistent due to a very flat piezometric surface in the aquifer of concern.

Two surface water samples were collected and analyzed for HSL organic compounds, TOX, and radioactivity. The concentrations of four radioactive parameters were in excess of three times the concentrations found in the upgradient sample, indicating releases of those compounds from the site. Those parameters were gross alpha, gross beta, thorium-232, and uranium-238. In addition, the concentrations of gross alpha radiation in the downgradient sample exceeded the NYS Class A standard.

Two sediment samples were collected from this site and were analyzed for HSL organic (volatile, semivolatile and pesticide/PCB) compounds, TOX, and radioactivity. The concentrations of chloroform and uranium-238 in downgradient sample SED-2 were more than three times the concentrations found in the upgradient sample, indicating releases of those compounds to the sediment potentially attributable to the site.

The Photovac air quality monitoring did not detect the presence of volatile organic chemicals in the air and soils at concentrations significantly above background levels.

The analytical results for the Ashland Petroleum Company site indicate that hazardous and/or radioactive substances are present in the groundwater, surface water and sediments at the site. The data also indicate that hazardous substances are being released to the groundwater and sediments, and radioactive substances are being released to the groundwater, surface water and sediments.

The hazardous substances being released to the groundwater and sediments are not thought to pose a public health threat, because the concentrations are low. The groundwater is not used as a drinking water source in the area. The radioactive substances being released from the site are of concern, and may warrant generation or review of additional data to determine the potential for exposure of people gaining access to the site.

Also of concern are the radioactive substances being released to the surface water. Surface water is the principal drinking water source for the region, and surface water intakes are located less than three miles downstream of the site. Therefore, the surface water contamination at the site should be investigated further and remediated if necessary. It is doubtful that the contaminated surface water or groundwater could cause an adverse impact on the water quality in the Niagara River. The volume of flow in the Niagara River is many orders of magnitude greater than the intermittent stream which leaves the site and flows to the river via Two Mile Creek.

HAZARD RANKING SYSTEM SCORE

In an attempt to quantify the risk associated with this site, the Hazard Ranking System (HRS) was applied. As currently used by the NYSDEC, the HRS is employed to aid the evaluation of inactive hazardous waste sites in New York State. This system takes into account the types of wastes at the site, receptors, and transport routes to calculate a numerical score for the site. As stated in 40 CFR Subpart H Section 300.81, the HRS was developed for evaluating the relative potential of uncontrolled hazardous disposal facilities to cause human health or safety problems or ecological and environmental damage. It is assumed by the EPA that a uniform application of the ranking system in each state will permit EPA to identify releases of hazardous substances that pose the greatest hazard to human health and/or the environment.

Under the HRS, three numerical scores are computed to express the relative risk or danger from the site. These scores take into account the population at risk, the potential for contamination of drinking water supplies, for direct human contact, for destruction of sensitive ecological systems and other appropriate factors. The three scores are:

- S_M - reflects the potential for harm to humans or the environment from migration of a hazardous substance away from the facility by routes involving groundwater, surface water and air. It is a composite of separate scores for each of the three routes (S_{GW} = groundwater route score, S_{SW} = surface water route score, and S_A = air route score).
- S_{FE} - reflects the potential for harm from substances that can explode or cause fires.
- S_{DC} - reflects the potential for harm from direct contact with hazardous substances at the facility (i.e., no migration need be involved).

Based on the results of this and previous studies, the HRS scores for the Ashland Petroleum Company Landfill site have been calculated as follows:

S_M = 33.08

S_{FE} = 0

S_{DC} = 50.00

S_{GW} = 3.28

S_{SW} = 57.13

S_A = 0

These scores reflect the presence of hazardous substances in the groundwater and surface water and the use of surface water as the source of drinking water for the nearby residents.

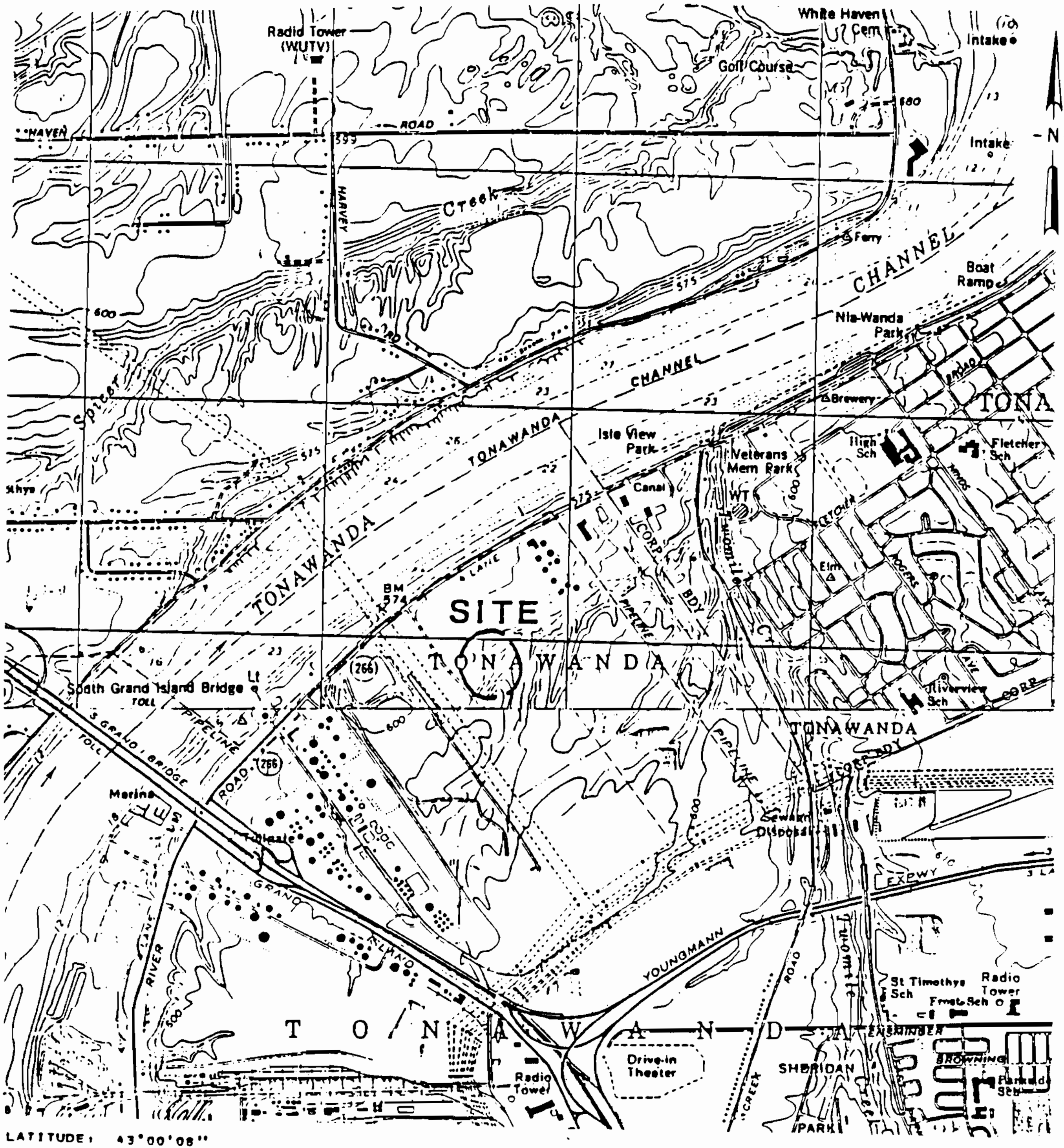
RECOMMENDATIONS

Based on the analytical results for the Ashland Petroleum Company site, it is apparent that the site is adversely affecting groundwater and surface water quality. The major concern at the site is the surface water contamination, which should be addressed. Further investigation will likely be necessary to determine whether remediation is necessary, and what remedial measures need to be undertaken. One solution may be to divert surface water flow around the landfill, rather than through it, as presently occurs.

The groundwater contamination is of less concern because the concentration of the contaminants are relatively low, and groundwater in the contaminated aquifer is not widely used by the public. However, the contaminated groundwater is likely in hydraulic connection with the Niagara River, and therefore there is a potential for an adverse impact on surface water quality in the river.

Prior to making decisions regarding further work at this site, it is recommended to coordinate with the United States Department of Energy and Bechtel National, Inc., who are conducting a remedial assessment and feasibility study of the site. A goal of the Bechtel National, Inc. study is to determine whether the Ashland Petroleum Company site is suitable as a potential disposal site for low-level radioactive wastes from the Ashland landfill site property and several other adjacent properties. Those studies are currently underway and scheduled for completion in December 1989. The findings of this Phase II investigation, combined with interim results from the

Bechtel National, Inc. study may provide enough useful information to determine what actions are necessary to remediate contamination at the site.



LATITUDE: 43°00'08"
LONGITUDE: 78°55'11"

SCALE

0 1000 2000 3000 4000 FEET

REFERENCE: U.S.G.S. 7.5' Topographic Map
Tonawanda West, NY (1980) and Buffalo NW,
NY-ONT. (1965) Quadrangles

ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT

SITE LOCATION MAP
ASHLAND PETROLEUM

FIGURE I-1

SECTION II

PURPOSE

The objective of a Phase II investigation is to determine if hazardous wastes have been disposed of in the site, if contaminants exist in the various mediums (air, groundwater, surface water or soils) and whether or not threats to human health or the environment exist. Information gathered relative to the above will allow the Department to reclassify the site or if warranted delist it.

A portion of the Ashland Petroleum Company property was used as a landfill. Among the wastes reportedly disposed in the landfill were lime slurry sludges, phosphoric acid polymerization catalysts, and low-level radioactive wastes. This Phase II investigation was designed to address the potential for migration of wastes off-site and into local surface water and groundwater systems.

SECTION III

SCOPE OF WORK

INTRODUCTION

Field work for the Phase II investigation at the Ashland Petroleum site began in January, 1988 and was completed in October, 1988. The Phase II Work Plan dated April 28, 1986 was approved by NYSDEC prior to commencing the field investigations. The Work Plan was later revised with NYSDEC approval, based on the preliminary findings of the field investigations.

A geophysical survey consisting of electrical resistivity and magnetic methods was originally proposed in the Work Plan for the site. The geophysical survey was intended to provide information on the subsurface stratigraphy and potentially locate buried drums and conductive plumes in the subsurface. Since Bechtel National, Inc. had already performed an investigation to the south of the site and had installed numerous monitoring wells, the geophysical survey was deleted from the Phase II Scope of Work.

The original Work Plan included four monitoring wells. Based on the findings of a study by Bechtel National, Inc. and the initial Phase II borings, the locations were revised, the number of wells was reduced to two, and the screened zones were altered. The waste sample from a drum called for in the Work Plan was not collected since the drum did not contain waste. Field work was performed in accordance with a NYSDEC-approved project Quality Assurance/Quality Control Plan and site-specific Health and Safety Plan.

PHASE II SITE INVESTIGATION

The scope of the investigation is summarized in Table III-1 and is described below. All field work was performed or supervised by qualified Engineering-Science, Inc. (ES) personnel, using procedures described in Appendix A.

Monitoring Well Installations

Two bedrock monitoring wells were installed around the perimeter of the site between January 22 to February 3, 1988 by Rochester Drilling Co. Inc. (Figure III-1). These wells were installed downgradient of the landfill site (Table III-2). The existing upgradient wells installed by Bechtel National, Inc. monitor the upper bedrock. Downgradient wells GW-3 and GW-4 monitor the upper bedrock zone along the north side of the landfill. The Bechtel wells B55W17 and B55W19 have been redesignated for the purpose of this Phase II report as GW-17 and GW-19, respectively.

The Phase II wells were drilled and constructed in accordance with NYSDEC guidelines. Soil samples were generally collected at intervals of five feet to ten feet throughout the depth of the well boring. Selected soil samples were analyzed for grain-size characteristics, Atterberg Limits and permeability.

The Phase II monitoring wells were constructed with two-inch inside diameter threaded NSF-approved flush-joint PVC pipe and slotted screen. The well screen was installed in the bedrock with a PVC collar at the top of the screen and quartz sandpack to one foot above the screen. A bentonite slurry seal was used to isolate the screened section from above. Well development generally consisted of removing at least three well volumes of water by air-lift utilizing compressed air. The monitoring wells were capped with a PVC cap and covered by a locking steel protective casing.

The existing wells installed by Bechtel National, Inc. were constructed with two-inch inside diameter stainless steel casing and screen. Field procedures for the Phase II monitoring well installations are presented in Appendix A. Boring logs and well schematics for the existing and Phase II wells, and geotechnical analyses results are included in Appendix B.

Surface Water and Sediment Sampling and Analysis

Two surface water and two sediment samples were collected on February 23, 1988. All surface water and sediment samples were analyzed for Hazardous Substance List (HSL) volatiles, semivolatiles, total organic halogens (TOX), gross alpha, gross beta, gamma spectrometry, radium 226, thorium 232, and uranium 238 by Nanco Labs, Inc. In addition, a trip blank and field blank were analyzed for HSL volatiles. The sediment locations were resampled by ES on October 18, 1988 and analyzed for HSL pesticide/PCBs by York Laboratories, Inc. Analyses and reporting were performed utilizing the applicable NYSDEC Superfund and Contract Laboratory Protocols dated June, 1986 and its latest revision dated November, 1987 (NYSDEC CLP). The surface water and sediment samples were collected from the intermittent stream which crosses the site. SW/SED-1 were the upstream samples and SW/SED-2 were the downstream samples (Figure III-1. The surface water samples were collected with stainless steel beakers, and the sediment samples were collected with stainless steel spoons. The field procedures utilized are presented in Appendix A, and the analytical results are discussed in Section IV and listed in Appendix C.

Groundwater Sampling and Analysis

Groundwater samples were collected from the two Phase II bedrock monitoring wells and two Bechtel National, Inc. wells on February 24, 1988. These samples were analyzed for HSL volatiles, semivolatiles, TOX and radioactive parameters by Nanco Labs, Inc. In addition, a trip blank and field blank were analyzed for HSL volatiles. Analyses and reporting were performed utilizing applicable NYSDEC CLP methods. The groundwater samples were collected with teflon bailers and dedicated polypropylene line. Field procedures for groundwater sampling are presented in Appendix A. Analytical results are discussed in Section IV and listed in Appendix C.

Air Monitoring

A Photovac Total Ionizables Present (TIP-II) calibrated to 100 ppm isobutylene was used to screen for volatile organic compounds present in the air. This monitoring was performed as a health and safety measure during on-site field work. Air in the breathing zone (4 to 5 feet above ground) was monitored during drilling and sampling activities. Soil samples were also screened, as was the headspace over each monitoring well, as a preliminary means of determining the presence of volatile organic compounds.

TABLE III-1

Summary of Phase II Tasks
Ashland Petroleum Company Site

Tasks	Description of Task
Prepare and Update Work Plan	Reviewed the information in the Phase I report and supplemental data, conducted a site visit, examined aerial photography and, prepared the Phase II work plan.
Conduct Records Search / Data Compilation	Reviewed previous Phase II information and conducted or visited central and local offices of NYSDEC, NYSDOH, County DOH, NYSDOT, etc.
Site Reconnaissance	Checked locations and conditions of existing wells, examined terrain for accessibility by drill rigs, examined suitability for geophysical surveys, and determined appropriate locations of sampling points.
Conduct Geophysical Studies	The ER and magnetometer surveys were not conducted.
Conduct Borings / Install Monitoring Wells	Installed two wells. The borings were drilled to a depth of approximately 100 feet. Wells were constructed of 2-inch PVC pipe.
Soil samples from borings	Soil samples were collected at five to ten-foot intervals during drilling and at changes in subsurface lithology. Performed grain size analyses, Atterberg limits, and permeability tests as specified in the text.

TABLE III-1, Continued

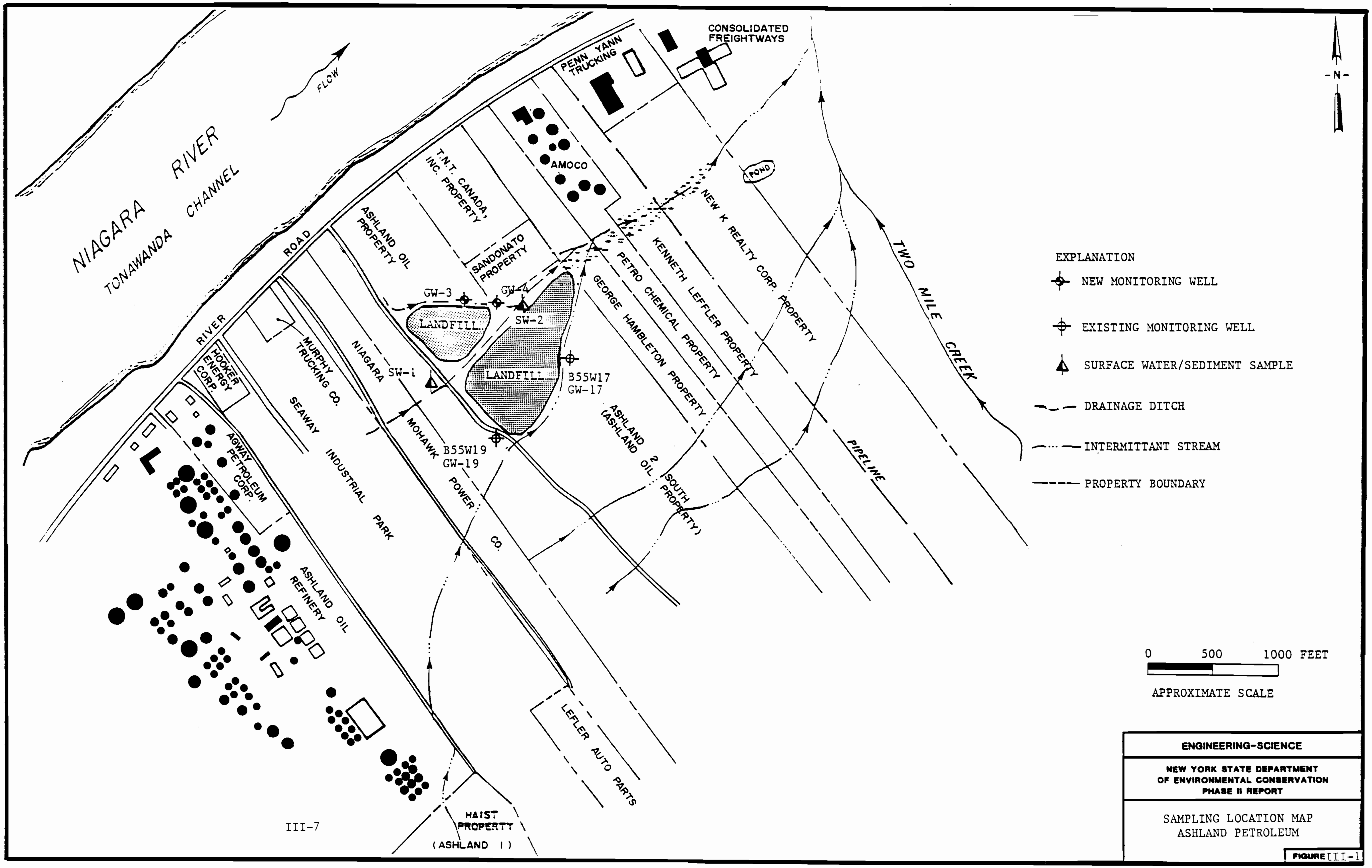
Summary of Phase II Tasks
Ashland Petroleum Company Site

Tasks	Description of Task
Perform Sampling and Analysis	
Sediment samples from surface waters	Two sediment samples were collected and analyzed for HSL organics, TOX, gross alpha, gross beta, gamma spectrometry, radium 226, thorium 232, and uranium 238.
Groundwater samples	Four groundwater samples were collected and analyzed for HSL organics, TOX, gross alpha, gross beta, and gamma spectrometry.
Surface water samples	Two surface water samples were collected and analyzed for HSL organics, TOX, gross alpha, gross beta, gamma spectrometry, radium 226, thorium 232, and uranium 238.
Air monitoring	Using the Photovac Tip II, the presence of volatile organic compounds was monitored during on-site activities.
Waste sample	The waste sample was not collected.
Conduct Site Assessment	A preliminary site contamination assessment was conducted to complete the final HRS and HRS documentation records.
Report Preparation	Prepared a draft and a final report containing significant Phase I information, additional field data, final HRS and HRS documentation records, and site assessments.
Project Management	Project coordination, administration and reporting.

Table III-2

Phase II Monitoring Well Specifications
Ashland Petroleum Company Site

Well Number	Unit Screened	Location	Depth (ft)	Screen Interval (ft)
GW-3	Camillus Shale	Downgradient	111	101-111
GW-4	Camillus Shale	Downgradient	97	87- 97



ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

SAMPLING LOCATION MAP
ASHLAND PETROLEUM

FIGURE III-1

SECTION IV

SITE ASSESSMENT

SITE HISTORY

The Ashland Petroleum Company Tonawanda Refining Facility, engaged in the refining of petroleum products, was established in 1928 as the Frontier Oil & Refining Company. The Ashland Petroleum Company assumed ownership of Frontier Oil in 1952, and is the current owner of the refining plant. In July 1982, the Ashland refining plant ended production and remains mostly inactive. The landfill site presently under review is located northeast of the Ashland plant and has the same ownership history as the plant site (Ashland Petroleum Company, 1978). The processes used at the Ashland Petroleum plant included crude oil distillation, catalytic cracking, platinum reforming, light ends treating and asphalt blowing. The products produced at the plant from these manufacturing activities included gasoline, liquified petroleum gas, distillates, aromatics, asphalt and synthetic natural gas (Scalise, 1976).

From 1957 to 1982, the Ashland Petroleum Company operated a landfill to dispose of general plant refuse (i.e., wood, tires, trash) and several types of industrial wastes. The type and quantity of industrial wastes disposed in the landfill include phosphoric acid polymerization catalyst (5 tons/year); spent clay (50 tons/year); and lime slurry sludge (72 tons/year) (NYSDEC, 1987). The phosphoric acid polymerization catalyst was used in the petroleum refining process to absorb impurities (dirt and coke materials). The clay material was used for color control of jet fuel. The clay was scrubbed (steamed) to drive off the absorbed hydrocarbons prior to being landfilled. The spent lime material was generated during the treatment of the petroleum plant's process wastewater. The lime material (approximately 90% solids), was piled at the landfill site and allowed to drain and dry (Scalise, 1985).

During the period 1944-1946, the former Haist property served as a repository for uranium ore tailings. The tailings were generated by Linde Air Products (a Division of Union Carbide) during their period of participation in the ore refinery operations program of the Manhattan Engineering District (MED) (USDOE, 1978). The Haist property received approximately 8,000 tons of low level radioactive material. In 1979, an estimated 30-40% of that material was transferred to the Seaway Industrial Park. An unknown quantity of these radioactive materials were also deposited at the Ashland Petroleum Company site (Scalise, 1985).

In 1974, the U.S. Energy Research and Development Administration (ERDA), presently the Department of Energy (DOE), initiated a program to identify, remediate or control sites where radioactive contamination remains from activities conducted under contract to MED or the Atomic Energy Commission (AEC). Two sites currently owned by the Ashland Oil and Refining Company are listed under the Formerly Utilized Sites Remedial Action Program (FUSRAP). These sites are the former Haist Property, designated as Ashland 1, and a portion of the Ashland Petroleum site on which this NYSDEC Phase II investigation is being conducted, designated as Ashland 2 (USDOE, 1978). The property south of the Ashland 2 site is currently being investigated by Bechtel National, Inc. under contract to DOE as a possible disposal site for FUSRAP wastes. This site has been designated Ashland 2 South (Bechtel, 1987).

The Ashland 1 (Haist Property) site was listed as an inactive hazardous waste site by the NYSDEC as site number 915008C. The site was delisted in December 1985 since it contained only radioactive waste, which is not within the scope of the Division of Hazardous Waste Remediation's program of engineering investigations at hazardous waste sites (NYSDEC, 1989).

In June 1982, the Ashland landfill (Ashland 2) was removed from service due to discontinuation of plant production activities. The dried spent lime material was bulldozed into the landfill and a clay-bentonite cover approximately two feet thick was put in place (Scalise, 1985).

In January 1986, a Phase I investigation for the Ashland Petroleum (Ashland 2) site was completed. The Phase I report concluded that additional data was necessary for completion of a final Hazard Ranking System (HRS) score. This Phase II investigation was designed to supplement information previously compiled for the site and to assess the presence of hazardous substances and the potential for off-site migration.

REGIONAL SETTING

Regional Geology

The Ashland Petroleum Company site, located in Tonawanda, New York, is situated within the Erie-Ontario Lowlands physiographic province (Muller, 1965). The landforms and surficial geology of the Erie-Ontario Lowlands were shaped by complex erosional and depositional processes of both water and glacial ice.

The sedimentary bedrock in this region is predominantly limestone, dolostone and shale of the Silurian and Devonian periods. The bedrock has a gentle dip to the south, averaging between 30 and 40 feet per mile. The bedrock units consist of fine-grained sediments deposited in ancient seas (LaSala, 1968).

The unconsolidated deposits are mostly glacial deposits formed during Pleistocene time about 10,000-15,000 years ago, when an ice sheet covered the area (LaSala, 1968). The glacial deposits consist of glacial till, a nonsorted mixture of clay, silt, sand, and stones deposited directly from the ice sheet; glacial lake deposits, which are bedded clay, silt, and sand that settled out in lakes fed by the melting ice; and outwash sand and gravel deposits, which were laid down in glacial streams. The glacial deposits generally are less than 50 feet thick in the northern part of the lowlands. They are considerably thicker in valleys to the south, reaching a maximum thickness of 600 feet. Other unconsolidated deposits are alluvium deposited by streams in recent times, and swamp deposits formed by accumulation of decayed plant matter in poorly drained areas (LaSala, 1968).

Regional Hydrology

The Ashland Petroleum Company lies within the Lake Erie and Niagara River drainage basin. Surface waters in this basin ultimately reach the Atlantic Ocean via Lake Ontario and the St. Lawrence River. A tributary to Two Mile Creek flows off the site property toward the northeast. Two Mile Creek is classified as a Class B stream (6NYCRR Vol. E) and flows into the Niagara River which is classified as a Class "A" stream. Class A streams are used for drinking water supplies and Class B streams are used for primary and secondary contact recreation, and fishing. A public water supply intake is located in the Niagara River, less than three miles downstream from the Ashland site.

SITE GEOGRAPHY

Site Topography

The Ashland Petroleum Company site is located in the Town of Tonawanda, Erie County, NY about one-half mile from the City of Tonawanda as shown on Figure IV-1. About 5,000 people live within one mile of the site, and more than 50,000 live within three miles of the site. The site is approximately four acres in size and divided by a tributary to Two Mile Creek (Figure IV-2). The landfill rises about 20 feet above the surrounding low-lying marshy land. The landfill is bordered to the north and west by brush and marsh. To the east is the remaining portion of the 114 acre property owned by Ashland Petroleum Company. To the south is the Niagara Mohawk Power Company transmission right-of-way, the BFI disposal area, and the Niagara Landfill. Access to the Ashland Petroleum Company landfill site is via an access road off River Road. A locking gate is across the access road, and permission to enter the site must be received from Ashland Petroleum Company. However, a fence does not surround the site, and unauthorized access can and does occur. The highest elevation on site is the fill at the southeastern end of the site at about 600 feet above mean sea level (AMSL); the lowest elevation on site is along the intermittent stream, at about 580 feet AMSL.

While most of the area around the site is industrial and commercial, about one-half mile from the site is the City of Tonawanda, a residential community which had a population of 18,693 in 1980 (Rand McNally, 1981). Most residences are served by municipal water supplies having sources in the Niagara River. Groundwater is used by local industries for various industrial processes.

Soils

This discussion is based on the on-site well borings and information from the U.S. Department of Agriculture, Soil Conservation Service (SCS) Soil Survey of Erie County, New York

(USDA, 1986). The surface soil surrounding the landfill is classified as Cayuga silt loam. The Cayuga silt loam has formed in clay-rich lacustrine (lake) sediments. The Cayuga soil has a perched, seasonally-high water table and a permeability of 1 x 10^{-3} to 4 x 10^{-5} cm/sec. In the well borings conducted on site, a thin layer of topsoil overlies a reddish brown silt and clay soil which resembled descriptions given for the Cayuga silt loam.

SITE HYDROGEOLOGY

The discussions in this subsection are based on the Phase II site investigation activities which included two borings and monitoring well installations. Additional information used to develop an understanding of the on-site hydrogeology included United States Geological Survey (USGS) and New York State Geological Survey (NYSGS) geological maps, a regional groundwater study (LaSala, 1968) and site investigations by Bechtel National, Inc. (Bechtel National, Inc., 1987).

Site Geology

As part of the Phase II site investigation activities, two monitoring well installations were conducted at the site (Figure IV-2). The boring log and well schematics are included in Appendix B of this report. The subsurface geology of the landfill area consists of up to 85 feet of glacial deposits over Camillus Shale. A generalized stratigraphic column is presented in Figure IV-3. The geologic cross sections are located on Figure IV-4 and presented on Figures IV-5 and IV-6.

The bedrock at the site is in the upper Silurian Camillus shale, occurring at depths between 72.5 and 85 feet below the surface, in the vicinity of the landfill. The upper five to ten feet of bedrock is highly fractured and weathered. The unweathered bedrock is green to gray shale with interbeds of gypsum and gypsum-filled fractures. The upper shale layers are weathered, fractured, and brittle. The weathered zone extends from four to fourteen feet into the bedrock. The gypsum occurs as fill material in joints and solution cavities, indicating secondary deposition. The upper bedrock layers show evidence of solution-widened cavities, while the deep layers show little secondary porosity development. The bedrock is nearly flat-lying and similar to other descriptions of bedrock in the region (LaSala, 1968).

Over most of the site a layer of glacial till overlies bedrock. The till is up to 20 feet thick and contains sand, gravel, silt, and clay with some sand interlayers (Table IV-1). The till is saturated and the permeability likely varies, depending on the texture at various locations.

The dominant glacial unit at the site is a lacustrine silt and clay layer, which is 58 to 70 feet thick in the vicinity of the landfill. This unit was deposited in a deep glacial lake that covered the site during the late Pleistocene. This unit consists of 75 to 80 percent silt and clay, and 20 to 25 percent sand and fine gravel (Table IV-1). The clay becomes saturated and softer near the top of the glacial till unit. At well boring GW-4, red-gray varves or laminations were evident beginning at depths of 20 to 22 feet, indicating seasonal deposition. The thin layer of topsoil at the site formed in the lacustrine silt and clay unit, and contains organic matter. The majority of the site has either been covered with fill, or the topsoil has been mostly removed.

Groundwater Hydrology

The aquifer of concern investigated at the site consists of the hydraulically connected weathered portion of the Camillus Shale and the overlying glacial till. Two monitoring wells, GW-3 and GW-4, were installed in the upper portion (top 12 feet) of the Camillus shale on the western perimeter of the fill area. Existing Bechtel wells, GW-17 and GW-19 (Bechtel well numbers B55W17 and B55W19, respectively) along the eastern perimeter of the site were sampled as part of the Phase II investigation. These wells are also screened in the upper portion of the bedrock. Water levels measured in these four wells on February 23, 1988 indicated a very shallow gradient in the area with groundwater flow toward the northwest (Figure IV-7). Water level data has been recorded from all Bechtel monitoring wells from February 3, 1988 through June 1989 (Bechtel, 1989). Readings have been taken at a minimum of twice monthly; most months have weekly water level data available. Data from Bechtel's bedrock wells indicate that the gradient on February 25, 1988 in the Ashland 2 South area is fairly flat, and direction of flow varies from north to southeast with generally small differences in water level across the site (Figure IV-8). Although the water levels were not measured in GW-3 and GW-4 as part of Bechtel's investigation, it is probable that water level in these wells and hence, across the Ashland 2 landfill, behaved in a similar fashion. This indicates that a consistent gradient and direction of flow does not exist in the area. Comparisons of upgradient and downgradient groundwater contaminant concentrations are not able to be made with confidence because of the variable flow directions.

The east branch of the Niagara River flows approximately 2000 feet west of the site. The USGS Topographic Map shows a benchmark adjacent to the river channel which measures 574 feet above mean sea level. This indicates that the river elevation and groundwater levels are comparable; however, data do not exist to demonstrate locations of groundwater discharge to or recharge from the Niagara River in the vicinity of the site.

The glacial till alone generally yields only small quantities of groundwater due to its low permeability, estimated at 1×10^{-8} to 1×10^{-6} cm/sec. (Freeze and Cherry, 1979). The sandy layers or lenses within the till may be capable of yielding greater quantities of water, however the lateral extent of these layers appears limited. The lacustrine silt and clay acts as a confining layer for the aquifer of concern. When the bottom of the lacustrine unit was penetrated, groundwater from the glacial till and bedrock rose more than 50 feet up into the augers. Based on field tests conducted by Bechtel National, Inc., the lacustrine unit has a permeability estimated at between 2.2×10^{-8} to 9.4×10^{-9} cm/sec (Bechtel National, Inc., 1987). Laboratory permeability tests of the lacustrine unit conducted as part of the Phase II investigation were in agreement with Bechtel's results, yielding estimates in the range of 1.28×10^{-8} to 7.00×10^{-9} cm/sec (Appendix C).

The water-providing capacity of the Camillus shale is largely dependent on the solubility of the gypsum layers, which create openings for groundwater passage and storage. The fractured upper layers of the Camillus shale increase the secondary porosity and the permeability of the shale. Field permeability tests conducted in wells in the Camillus shale by Bechtel National, Inc. yielded estimates in the range from 1.1 x 10^{-5} to 8.1 x 10^{-4} cm/sec (Bechtel National, Inc., 1987). Large diameter industrial wells in the area produce from 300 to 1200 gpm; the Camillus shale is the most productive bedrock aquifer in the area (LaSala, 1968). Within one mile of the site are industrial wells that operate at 300 gpm continuously (Pyanowski, 1986). Due to the presence of calcite, dolomite, gypsum and salt in the Camillus formation, the levels of calcium, magnesium, sodium, bicarbonate, sulfate and chloride are naturally high in the groundwater (LaSala, 1968).

Groundwater in the topsoil is perched at very shallow depths (less than two feet). Monitoring wells are not used under such shallow water conditions. Water in this perched zone is ephemeral; the zone becomes saturated after periods of precipitation, then dries up. During saturated conditions, the water likely discharges to the streams and shallow drainages around the site. Therefore the Camillus shale is the shallowest, actual aquifer.

Surface Water Hydrology

Surface water bodies on site are intermittent streams which flow to the northeast into Two Mile Creek. A wet, marshy area borders the streams, varying in width from a few feet to about 40 feet across. Two Mile Creek flows into the east branch of the Niagara River, about one mile north of the site. The Niagara River is approximately 2,000 feet west of the site. Two Mile Creek is classified by the NYSDEC as a Class B stream (6NYCRR Vol. E) and the Niagara River is classified by the NYSDEC as a Class A stream.

There are three municipal water supply intakes in the east branch of the Niagara River, all within three miles of the site. The three intakes are for the City of Lockport, the City of North Tonawanda, and the City of Tonawanda. The combined population served is 79,000 people (NYSDOH, 1982).

SITE CONTAMINATION ASSESSMENT

Potential contamination of the environment within the site boundary was evaluated by a review of the character and quantity of wastes suspected at the site, chemical analysis of the groundwater, surface water, and sediments, and a survey of the air quality with a Photovac Tip II photoionization meter. In addition, previous surface water sampling and analytical results from the Erie County Department of Environment and Planning were also considered in the site contamination assessment.

Waste Characterization

From 1957 to 1982, the Ashland Petroleum Landfill (Ashland 2) received industrial wastes from refining operations, including phosphoric acid polymerization catalyst (5 tons/year); spent clay (50 tons/year); and lime slurry sludge (72 tons/year) (NYSDEC, 1987). In addition, an unknown quantity of soil contaminated with low level radioactive material was disposed in the

Ashland Landfill (Ashland Petroleum Company, 1985). The source of that waste was the nearby Haist property (Figure IV-2).

The U. S. Energy Research and Development Administration (ERDA) and the Erie County Department of Environment and Planning (ECDEP) collected and analyzed surface water and soil samples from the tributary stream flowing to Two Mile Creek. This stream receives surface water runoff from the "Haist Property" (which received an estimated 8,000 tons of low-level radioactive wastes); the Niagara Landfill (which received between 2,400 to 3,200 tons of radioactive materials removed from the Haist site); and the Ashland Petroleum landfill (which received industrial wastes and small quantities of radioactive wastes). The surface water conveyed by this tributary flows to Two Mile Creek, which in turn flows into the Niagara River.

Sediment and water samples from drainage ditches upgradient and downgradient of the site were collected by ERDA in 1976 and analyzed for radium (226), uranium (234, 235, and 238), and thorium (228, 230, and 232). The results of this sampling and analysis effort detected low-level radiation (EPA, 1985). The sampling locations are depicted in Figure IV-9. The analytical data for that study are provided in Table IV-4 and Table IV-5.

The ECDEP collected and analyzed water samples from drainage ditches leading to Two Mile Creek. The sampling locations are also shown in Figure IV-9. It should be noted that three of the four sampling locations were upgradient from the Ashland Petroleum Company landfill site. The collected samples were analyzed for heavy metals, radioisotopes (alpha, beta, and gamma) and selected organic compounds. Low-level radiation was detected during that investigation. The concentration of several parameters increased more than three times between sampling locations No. 3 and No. 4, including manganese, phenol, arsenic and PCBs. A summary of the ECDEP data are presented in Table IV-6.

A radiological walkover survey was made by TMA/Eberline during July 28-August 12, 1986 in the vicinity of the Ashland Petroleum Company Landfill. At a meeting between TMA/Eberline and Ashland Petroleum Company staffs following the survey, it was stated that there was "a large contaminated area to the east of their clay cap on the Ashland #2 'Fill Area'" (TMA/Eberline, 1986). On January 22, 1988, ES conducted a walk over survey of the eastern half of the landfill area with a scintillation counter and gamma meter. The survey found surface radiation in a one to two-acre area to be ten to twenty times the background levels. The area of elevated readings had a distinct boundary, as readings increased sharply over a short distance. Also, a slight change in the topography along the southwestern edge of the contaminated area was noted. This may mark the edge of the cover material or different type of fill. The radiological survey findings were similar to the results of the TMA/Eberline walkover radiation survey conducted in 1986 (TMA/Eberline, 1986). The western half of the landfill did not show any unusual levels of radioactivity in either the ES or TMA/Eberline surveys.

The following subsections summarize the results of the Phase II investigation sampling and analysis tasks. Whenever possible, samples were collected upstream or upgradient of the site to establish ambient or background conditions. These levels were compared to those found on-site, downstream, or downgradient of the site. Concentrations downstream or downgradient of the site in excess of three times the upgradient concentrations may indicate a release from a contaminant source located on-site. The value of three times is generally recognized by the USEPA and NYSDEC as constituting a "significantly higher" concentration for purposes of scoring an HRS observed release for a particular pathway. Therefore, reference is made to the number and types of analytes considered to be observed releases under each pathway, as discussed in the following subsections.

The analytical results have also been compared to applicable New York State standards or guidance values. Standards and guidance values are provided for the applicable surface water and groundwater classifications. Standards that have been promulgated for surface water appear in 6 NYCRR Parts 701 and 702 and for groundwater in Part 703. These regulations also provide authority for the use of guidance values when a standard does not exist for a given water classification. In most cases, the standards and guidance values cited are for sources of drinking water. Soil and sediment results have been compared to the background soil sample results and published, naturally-occurring ranges in New York State or conterminous United States soils.

The analytical data were reviewed and validated for data usability. Included in the evaluation was a review of the results of "blank" sample analyses. In cases where blank (method, trip, or field) contamination was detected, the individual constituent concentrations were judged as follows: 1) If the sample value was less than 10 times the highest blank value, the sample value was rejected (flagged "R"); 2) If the sample value was between 10 and 20 times the highest blank value, the sample was considered an estimate (flagged "X"); 3) If the sample value was greater than 20 times the highest blank value, it was accepted (unflagged). These criteria were used as guidance limits to help determine whether blank contamination was potentially responsible for the presence of these constituents in the field samples.

Groundwater Contamination Assessment

Groundwater samples were collected from the two Phase II monitoring wells and two existing wells and analyzed for HSL organic (volatile, semivolatile) compounds and radioactivity (gross alpha, gross beta, and gamma spectral analysis).

Seven HSL organic compounds were detected in the groundwater samples (Table IV-7). One compound, bis(2-ethylhexyl)phthalate, was present in GW-4 at a concentration which was more than three times the concentration found in wells GW-17 and GW-19. This may indicate a release to the groundwater attributable to the site. Bis(2-ethylhexyl)phthalate detected in GW-3 was rejected by data validation due to its detection in a laboratory blank analyzed with GW-3. Bis(2-ethylhexyl)phthalate is a common plasticizer, and its presence may also be introduced during sampling and analysis. Samples collected and analyzed by Bechtel National, Inc. (Bechtel, 1989) do not show a consistent pattern of detection for this compound. Additionally, levels of bis(2-ethylhexyl)phthalate detected in Bechtel's samples are almost an order of magnitude (10 times) lower than the samples collected during the Phase II study. Bechtel has rejected all the April 1989 detections of bis(2-ethylhexyl)phthalate because the compound was also detected in blanks. Similarly, di-n-octylphthalate, detected in GW-17, should be confirmed by additional sampling. Two samples collected by Bechtel in September 1987 and January 1988 did not contain this compound. It is therefore recommended that these wells, including Bechtel's wells, be resampled. As discussed in the Groundwater Hydrology section, a consistent groundwater hydraulic gradient is difficult to determine in the Ashland II site vicinity, making the assessment of potential groundwater contaminant releases from the site difficult to determine.

The concentration of benzene in GW-3 exceeded the Class GA standard. The concentrations of gross beta in wells GW-3, GW-4 and GW-17 were in excess of three times the concentration in GW-19. This indicates the site may be releasing radioactive particles to the groundwater (Table IV-8). However, even if the groundwater is discharging to the Niagara River, the concentrations of compounds detected in the groundwater are less than the Class A surface water standards, with the exception of bis(2-ethylhexyl)phthalate.

Surface Water Contamination Assessment

Two surface water samples were collected and analyzed for HSL organic (volatile, semivolatile) compounds and radioactivity (gross alpha, gross beta, radium-226, thorium-232, and uranium-238).

Four HSL organic compounds were detected in the surface water samples (Table IV-9). Most of those results were rejected as being present due to laboratory contamination. There were no releases of HSL organic compounds indicated by those results. Analytical results for radioactivity were positive for five of the six parameters assessed in the surface water samples: gross alpha, gross beta, radium-226, thorium-232, and uranium-238. The downgradient concentrations of four parameters were greater than three times the upgradient concentrations: gross alpha, gross beta, thorium-232, and uranium-238 (Table IV-8). This indicates releases to the surface water attributable to the site. The concentration of gross alpha radiation in SW-2 exceeded the NYS Class A standard.

Sediment Contamination Assessment

Two sediment samples were collected and analyzed for HSL organic (volatile, semivolatile, and pesticide/PCBs) compounds and radioactivity (gross alpha, gross beta, radium-226, thorium-232, and uranium-238).

Six HSL organic compounds were detected in the sediment samples (Table IV-10). The results for these compounds were rejected as being present due to laboratory contamination. Chloroform was detected in SED-2; however, chloroform was also detected in the field blank (GW-3A.13) analyzed on the same day. The chloroform detection in sample SED-2 was rejected due to laboratory contamination. This detection indicates that resampling is advisable to confirm the chloroform detection in the sediment sample. Analyses for radioactivity were positive for five of the six parameters assessed in the sediment samples. The concentration of uranium-238 in SED-2 was in excess of three times the upgradient concentration (Table IV-11). This tends to indicate a release to the sediments attributable to the site. However, since SED-2 is not located off-site or at the site boundary, it cannot be conclusively shown that an off-site release is occurring. One PCB compound, Aroclor 1260, was detected in SED-2; however detection limits were unusually high, and the value was estimated. Confirmatory sampling is recommended due to the estimated value.

Air Quality Monitoring

The air quality monitoring with the Photovac Tip II did not indicate the presence of volatile organic compounds (VOCs) in the breathing zone at concentrations above background. Monitoring of the soil samples and monitoring well headspace did not detect VOCs at concentrations above background.

Contamination Assessment Summary

In summary, the analytical results for the Ashland Petroleum Company site indicate that hazardous and/or radioactive substances are present in the groundwater, surface water and sediments at the site. The data also indicate that hazardous substances are being released to the groundwater and sediments, and radioactive substances are being released to the groundwater surface water and sediments.

The hazardous substances being released to the groundwater and sediments are not thought to pose an immediate public health threat because the concentrations are low, and the groundwater is not used as a drinking water source in the area. The radioactive substances present on-site are of concern, due to the potential for exposure of people gaining access to the site.

The route of groundwater flow to the Niagara River is not clear due to variable directions of groundwater flow indicated by Bechtel (1989). Groundwater which is potentially affected by the site is not expected to significantly impact the Niagara River, because of low concentrations, distance to the river, low hydraulic gradient, variable groundwater flow directions, and the dilution of groundwater once it reaches the river.

Also of concern are the radioactive substances being released to the surface water. Surface water is the principal drinking water source for the region, and surface water intakes are located less than three miles downstream of the site. Therefore, the surface water contamination at the site should be investigated further and remediated if necessary. It is doubtful at this time that the contaminated surface water would cause an adverse impact on the water quality in the Niagara River. The volume of flow in the Niagara River is many orders of magnitude greater than the intermittent stream which leaves the site and flows to the river via Two Mile Creek. Further investigations will likely be necessary to determine whether remediation is necessary, and what remedial measures need to be undertaken. One solution may be to redirect surface water flow around the landfill, rather than through it, as presently occurs.

The groundwater contamination is of less concern because the concentration of the contaminants are relatively low and groundwater in the contaminated aquifer is not widely used by the public. However, the contaminated groundwater is likely in hydraulic connection with the Niagara River, and therefore there is a potential for an adverse impact on surface water quality in the river.

Prior to making decisions regarding further work at this site, it is recommended to coordinate with the United States Department of Energy and Bechtel National, Inc., who are conducting a remedial assessment and feasibility study of the site. A goal of the Bechtel National, Inc. study is to determine whether the Ashland 2 South site is suitable as a potential disposal site for low-level radioactive wastes from the Ashland Landfill site property and several other adjacent properties. Those studies are currently underway and scheduled for completion in December 1989. The findings of this Phase II investigation, combined with final results from the Bechtel National, Inc. study may provide enough useful information to determine what actions are necessary to remediate contamination at the site.

Table IV-1

Summary of Grain-Size Characteristics
Ashland Petroleum Company Site

Well Boring ID	Sample Depth (ft)	Gravel %	Sand %	Silt %	Clay %	Unified Soil Classification	Stratigraphic Unit
GW-3	50-52	3.8	23.3	36.4	36.5	CL-ML	Lacustrine Silt and Clay
GW-3	80-82	14.7	26.7	37.1	21.5	ML	Glacial till
GW-4	35-37	2.7	21.2	36.5	39.6	CL	Lacustrine Silt and Clay
GW-4	65-67	20.8	42.1	25.3	11.8	SM	Glacial till

Table IV-2

Monitoring Well Data
Ashland Petroleum Company Site

Well ID	Ground Surface Elevation (Feet)	Top of Bedrock Depth/Elevation (Feet/Feet*)	Top of Well Screen Depth/Elevation (Feet/Feet*)	Bottom of Well Screen Depth/Elevation (Feet/Feet*)
GW-17	594.1	80.0/514.1	80.6/513.5	85.6/508.5
GW-19	590.0	72.5/517.5	71.8/518.2	76.8/513.2
GW-3	596.3	85.0/511.3	101.0/495.3	111.0/485.3
GW-4	589.3	81.0/508.3	87.0/502.3	97.0/492.3
B55SW23	596.65	85.5/511.15	85.8/510.9	90.8/505.9
B55W27	604.4	75.8/528.57	79.4/525.0	84.4/520.0
B55W28	602.33	86.0/516.33	88.8/513.5	93.8/508.5

* Above mean sea level

Table IV-3

Water Level Data
Ashland Petroleum Company Site

Well ID	Ground Surface Elevation (Feet*)	Top of Well Pipe Elevation (Feet*)	Well Screen Interval Elevation (Feet*)	Depth to Water Level (Feet**)	Water Level Elevation (Feet*)
FEBRUARY 23, 1988					
GW-17 (B55W17)	594.1	594.5	513.5-508.5	26.0	568.5
GW-19 (B55W19)	590.0	591.1	518.2-513.2	22.6	568.5
GW-3	596.3	598.3	495.3-485.3	30.6	567.7
GW-4	589.3	591.5	502.3-492.3	23.4	568.1
FEBRUARY 25, 1988* **					
GW-17 (B55W17)	--	--	--	25.1	569.4
GW-19 (B55W19)	--	--	--	21.1	570.0
B55W23	596.7	598.0	510.8-505.8	28.9	569.1
B55W27	604.4	605.9	525.0-520.0	35.4	569.0
B55W28	602.3	603.8	513.5-508.5	33.3	569.0

Note: Water Levels measured on February 23, 1988 for wells with "GW" prefix. Water levels measured on February 25, 1988 for wells with "B55W" prefix.

* - Above mean sea level.

** - Water level depth from top of casing.

*** - Water levels measured by Bechtel National, Inc., 1988.

Table IV-4

Summary of U238 Concentrations of Sediment Samples Collected in a Two Mile Creek Tributary

Sample I.D.	Concentrations In pCi/g
M 1	3.9
M 2	11.0
M 3	3.0
M 4	19.8
M 5	32.5
M 6	15.4
M 8	26.0
M 9	24.7
M10	1.4

Source: US Energy Research and Development Administration, 1976

Table IV-5

Summary of Radionuclide Concentrations in Surface Water Samples Collected from a Two Mile Creek Tributary

Sample	^{226}Ra	^{234}U	^{235}U	^{238}U	^{228}Th	^{230}Th	^{232}Th
W 1	4.0×10^{-4}	2.8×10^{-2}	1.5×10^{-3}	2.8×10^{-2}	3.9×10^{-4}	1.8×10^{-4}	7.2×10^{-4}
W 2	1.0×10^{-3}	2.0×10^{-2}	1.0×10^{-3}	2.0×10^{-2}	3.7×10^{-4}	9.0×10^{-5}	$<4.0 \times 10^{-4}$
W 3	1.6×10^{-3}	4.1×10^{-2}	3.4×10^{-4}	4.2×10^{-3}	3.6×10^{-4}	7.6×10^{-5}	1.1×10^{-4}
W 6	6.3×10^{-4}	4.1×10^{-3}	1.3×10^{-2}	5.3×10^{-2}	3.2×10^{-4}	9.0×10^{-4}	6.8×10^{-4}
W 7	9.0×10^{-4}	1.0×10^{-2}	4.4×10^{-4}	1.0×10^{-2}	3.0×10^{-4}	1.4×10^{-4}	$<3.0 \times 10^{-4}$
W 8	5.8×10^{-4}	4.0×10^{-2}	1.4×10^{-3}	3.9×10^{-2}	3.7×10^{-4}	1.1×10^{-4}	4.4×10^{-4}
W 9	8.0×10^{-4}	5.0×10^{-2}	2.1×10^{-3}	5.0×10^{-2}	3.2×10^{-4}	8.6×10^{-5}	$<3.0 \times 10^{-4}$
W10	1.1×10^{-3}	1.4×10^{-2}	7.6×10^{-4}	1.1×10^{-2}	3.2×10^{-4}	7.2×10^{-5}	$<3.0 \times 10^{-4}$

(Concentrations in pCi/ml)

Source: US Energy Research and Development Administration, 1976

Table IV-6

Summary of Analytical Results of Surface Water Sampling Conducted at a Two Mile Creek Tributary

		Sampling Locations			
Parameter	Water Quality Standards*	No. 1 Upgradient of Niagara LF	No. 2 Downgradient of Niagara LF	No. 3 Upgradient of Ashland LF	No. 4 Downgradient of Ashland LF
Benzene (ug/l)	ND	LT 0.035	LT 0.035	LT 0.035	0.043
Toluene (ug/l)	NA	LT 0.035	LT 0.035	LT 0.035	0.295
Xylene (ug/l)	NA	LT 0.035	LT 0.035	LT 0.035	LT 0.035
Phenol (mg/l)	0.002	0.003	0.004	0.013	0.258
PCB (ug/l)	ND	0.06	0.13	LT 0.05	0.14
TOC (mg/l)	NA	104.2	97.3	84.1	123
Cadmium (mg/l)	0.02	0.006	0.007	0.005	0.005
Arsenic (mg/l)	0.05	LT 0.02	LT 0.02	LT 0.02	0.07
Chromium (mg/l)	0.10	0.02	LT 0.01	0.02	LT 0.01
Copper (mg/l)	1.0	0.02	0.15	0.05	LT 0.02
Magnesium (mg/l)	NA	138	113	96	86
Manganese (mg/l)	0.6	0.32	0.50	0.84	4.1
Zinc (mg/L)	5.0	0.20	0.05	0.14	0.05
Sodium (mg/l)	NA	246	320	261	322
Alpha Radiation (pCi/l)	ND	2.0	3.1	4.3	2.2
Beta Radiation (pCi/l)	ND	127	140	121	121
Gamma Radiation (pCi/l)	ND	5,700	LT 50	LT 50	LT 50

Source: ECDEP, Site Report for Haist Property (date of sample collection: 6/17/81).

*	Effluent standards for GA Class Waters, potable water supply source
NA	Not Available
ND	Not Detectable
LT	Less Than

TABLE IV-7
ASHLAND PETROLEUM
GROUNDWATER RESULTS
HSL ORGANIC COMPOUNDS (ug/L)

		Sample Location			
COMPOUND (a)	NYS STANDARDS/ GUIDANCE VALUES (b)	GW-17 (c)	GW-19 (c)	GW-3	GW-4
Methylene chloride	50 G	R	R	R	R
Acetone		R	R	R	R
Carbon disulfide	50 G	---	---	4.1 J	---
1,1,1-Trichloroethane	50 G	---	R	---	---
Benzene	ND (d)	---	---	1.8 J	---
bis(2-Ethylhexyl)Phthalate	4200	110.0	110.0	R	880.0
Di-n-Octyl Phthalate	50 G	12.0	---	---	---

FOOTNOTES:

(a) Only HSL organic compounds that were detected are presented.
(b) Referenced from; "Ambient Water Quality Standards and Guidance Values" for Class GA groundwater drinking supply waters, 6 NYCRR Part 703, NYSDEC, 9/1/78, as amended through 4/1/87. The value presented is the standard except where noted by "G", in which case it is the guidance value. All units are ug/L.
(c) Upgradient well location.
(d) ND = not detectable; i.e., the standard is the lower limit of detectability as defined by the NYSDEC.

DATA QUALIFIERS:

B: This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
J: Indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero.
---: Indicates compound was analyzed for but not detected. Refer to Appendix C for detection limit.
R: Data validation recommends this value be rejected.
X: Data validation recommends this value be considered an estimate.

TABLE IV-8
ASHLAND PETROLEUM
GROUNDWATER AND SURFACE WATER RESULTS
RADIOACTIVITY DATA (pCi/L)

		Surface Water		Groundwater			
PARAMETER	NYS STANDARDS (a)	SW-1 (b)	SW-2	GW-17 (c)	GW-19 (c)	GW-3	GW-4
Gross Alpha	15	<2	30 +/- 8	<2	<2	<2	<2
Gross Beta	1000	<3	33 +/- 8	28 +/- 5	<3	31 +/- 7	18 +/- 13
Gamma Spectralanalysis		---	---	---	---	---	---
Radium-226	3	<2	1.6 +/- 1.0	@	@	@	@
Thorium-232		<1	4.64 +/- 0.90	@	@	@	@
Uranium-238		1.88 +/- 0.90	29.97 +/- 7.65	@	@	@	@

FOOTNOTES:

(a) Referenced from; "Ambient Water Quality Standards and Guidance Values" for Class A and/or AA drinking supply surface waters, 6 NYCRR Parts 701 and 702, NYSDEC, 7/24/85, as amended through 4/1/87. All units are pCi/L.
(b) Upgradient location (SW = surface water sample).
(c) Upgradient location (GW = groundwater sample).

DATA QUALIFIER:

@: Not analyzed.
---: Analyzed, but not detected. Refer to Appendix C for detection limit.

TABLE IV-9
ASHLAND PETROLEUM
SURFACE WATER RESULTS
HSL ORGANIC COMPOUNDS (ug/L)

		Sample Location	
COMPOUND (a)	NYS STANDARDS/ GUIDANCE VALUES (b)	SW-1 c	SW-2
Methylene chloride	50 G	R	R
Acetone		R	R
1,1,1-Trichloroethane	50 G	R	R
bis(2-Ethylhexyl)Phthalate	4200	4.7 J	R

FOOTNOTES:

(a) Only HSL organic compounds that were detected are presented.

(b) Referenced from; "Ambient Water Quality Standards and Guidance Values" for Class A drinking supply waters, 6 NYCRR Parts 701 and 702, NYSDEC, 7/24/85, as amended through 4/1/87. The value presented is the standard except where noted by "G", in which case it is the guidance value. All units are ug/L.

(c) Upgradient location.

DATA QUALIFIERS:

B: This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

J: Indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero.

---: Indicates compound was analyzed for but not detected. Refer to Appendix C for detection limit.

R: Data validation recommends this value be rejected.

X: Data validation recommends this value be considered an estimate.

TABLE IV-10
ASHLAND PETROLEUM
SEDIMENT RESULTS
HSL ORGANIC COMPOUNDS (ug/kg)

COMPOUND (a)	Sample Location SED-1 (b)	 SED-2
Methylene chloride	---	R
Acetone	---	R
Chloroform	---	16.0 J
Di-n-butylphthalate	---	620.0 J(c)
bis(2-Ethylhexyl)Phthalate	R	680.0 J(c)
Aroclor - 1260	---	120.0 J

FOOTNOTES:

(a) Only HSL organic compounds that were detected are presented.
(b) Upgradient location.
(c) Concentration/dilution factor = 2.

DATA QUALIFIERS:

B: This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.
J: Indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero.
---: Indicates compound was analyzed for but not detected. Refer to Appendix C for detection limit.
R: Data validation recommends this value be rejected.

TABLE IV-11
ASHLAND PETROLEUM
SEDIMENT RESULTS
RADIOACTIVITY DATA (pCi/g)

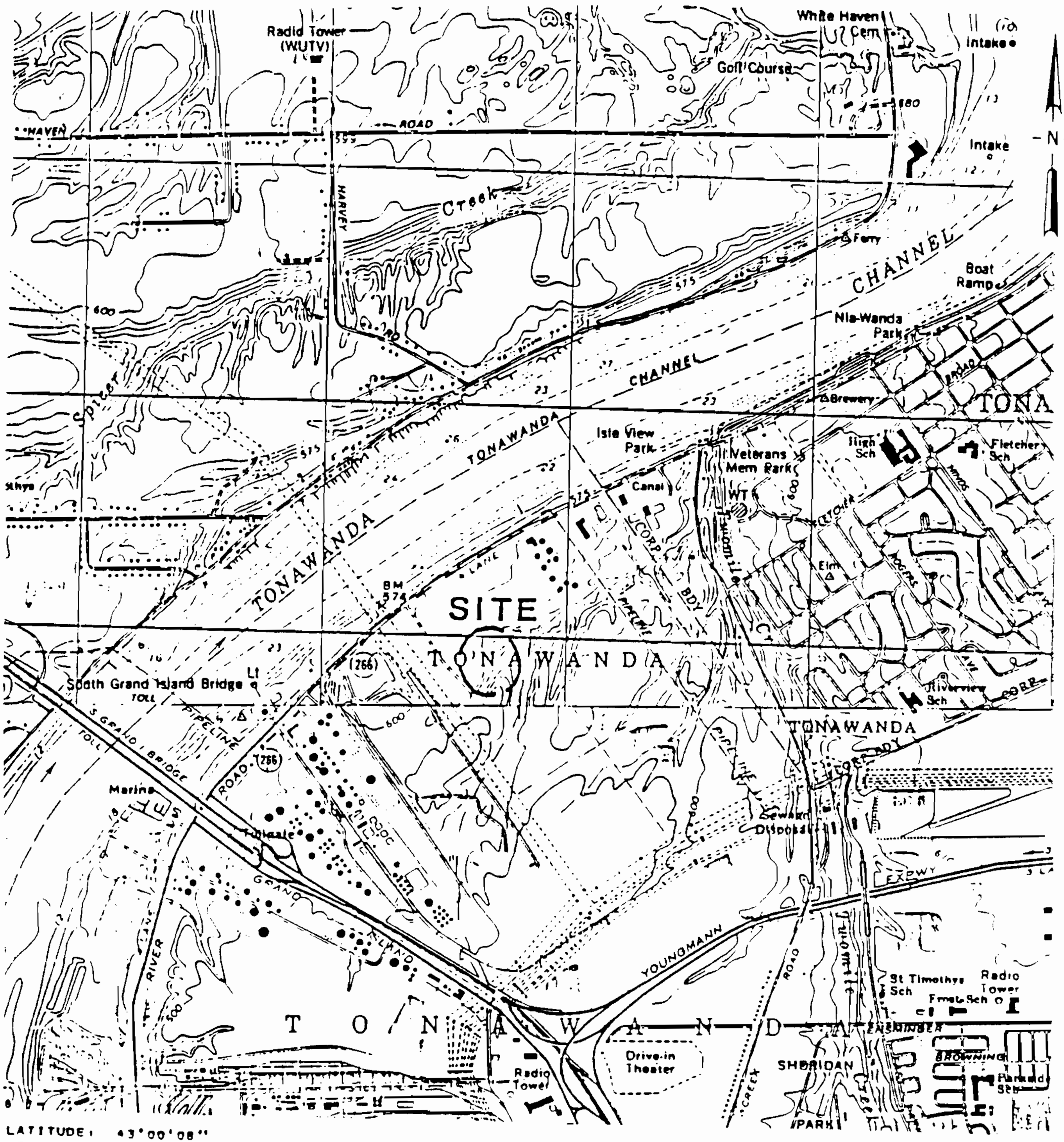
	Sample Location	
PARAMETER	SED-1(a)	SED-2
Gross Alpha	4.7+/-2.0	11.1+/-3.3
Gross Beta	7.7+/-0.9	6.0+/-0.9
Gamma Spectralanalysis	---	---
Radium-226	0.43+/-0.15	0.70+/-0.12
Thorium-232	0.31+/-0.16	0.53+/-0.15
Uranium-238	0.15+/-0.02	3.84+/-0.59

FOOTNOTE:

(a) Upgradient location.

DATA QUALIFIER:

---: Analyzed, but not detected. Refer to Appendix C for detection limit.



LATITUDE: 43°00'08"
LONGITUDE: 78°55'11"

SCALE

0 1000 2000 3000 4000 FEET

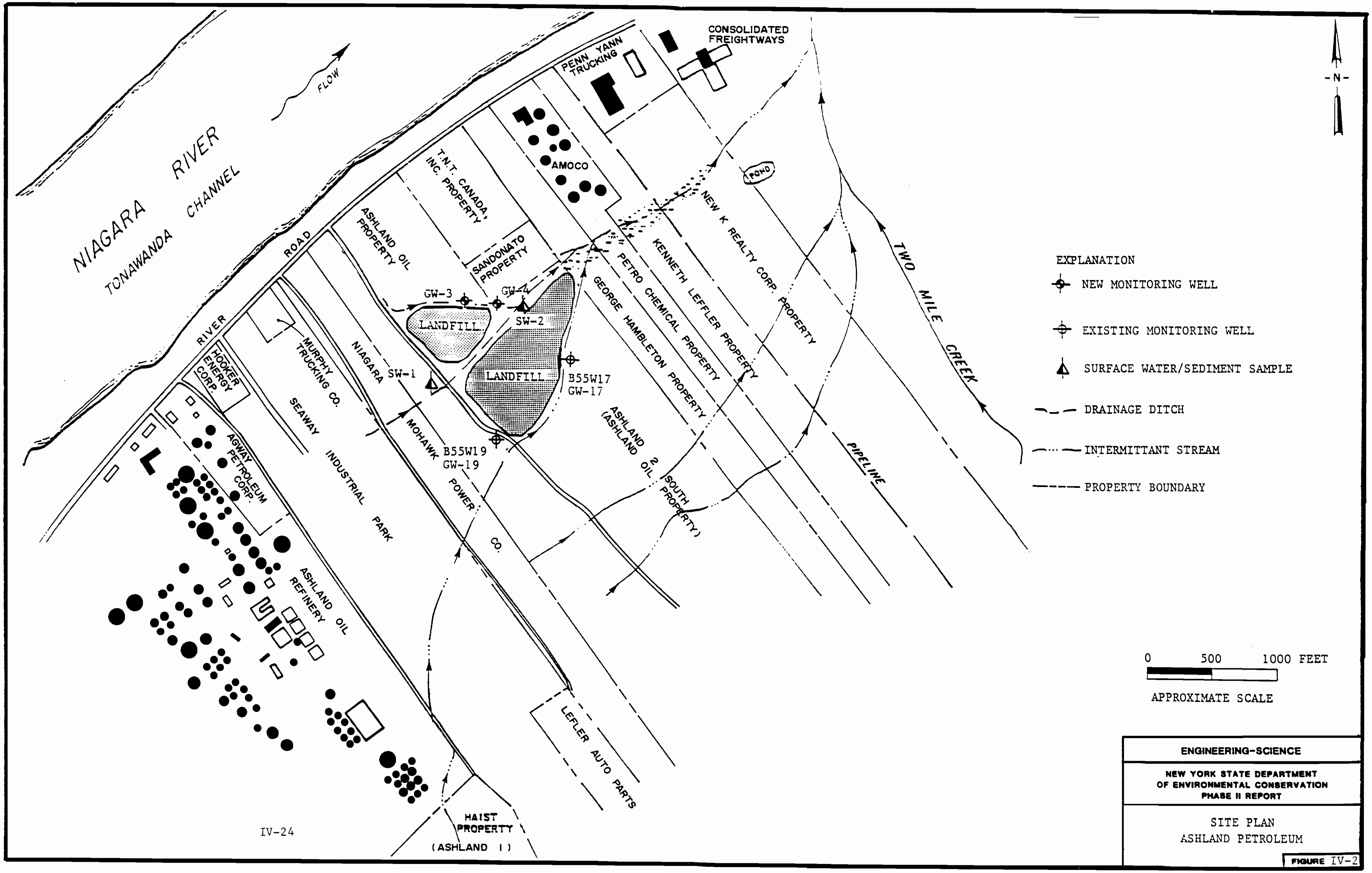
REFERENCE: U.S.G.S. 7.5' Topographic Map Tonawanda West, NY (1980) and Buffalo NW, NY-ONT. (1965) Quadrangles

ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

SITE LOCATION MAP
ASHLAND PETROLEUM

FIGURE IV-1

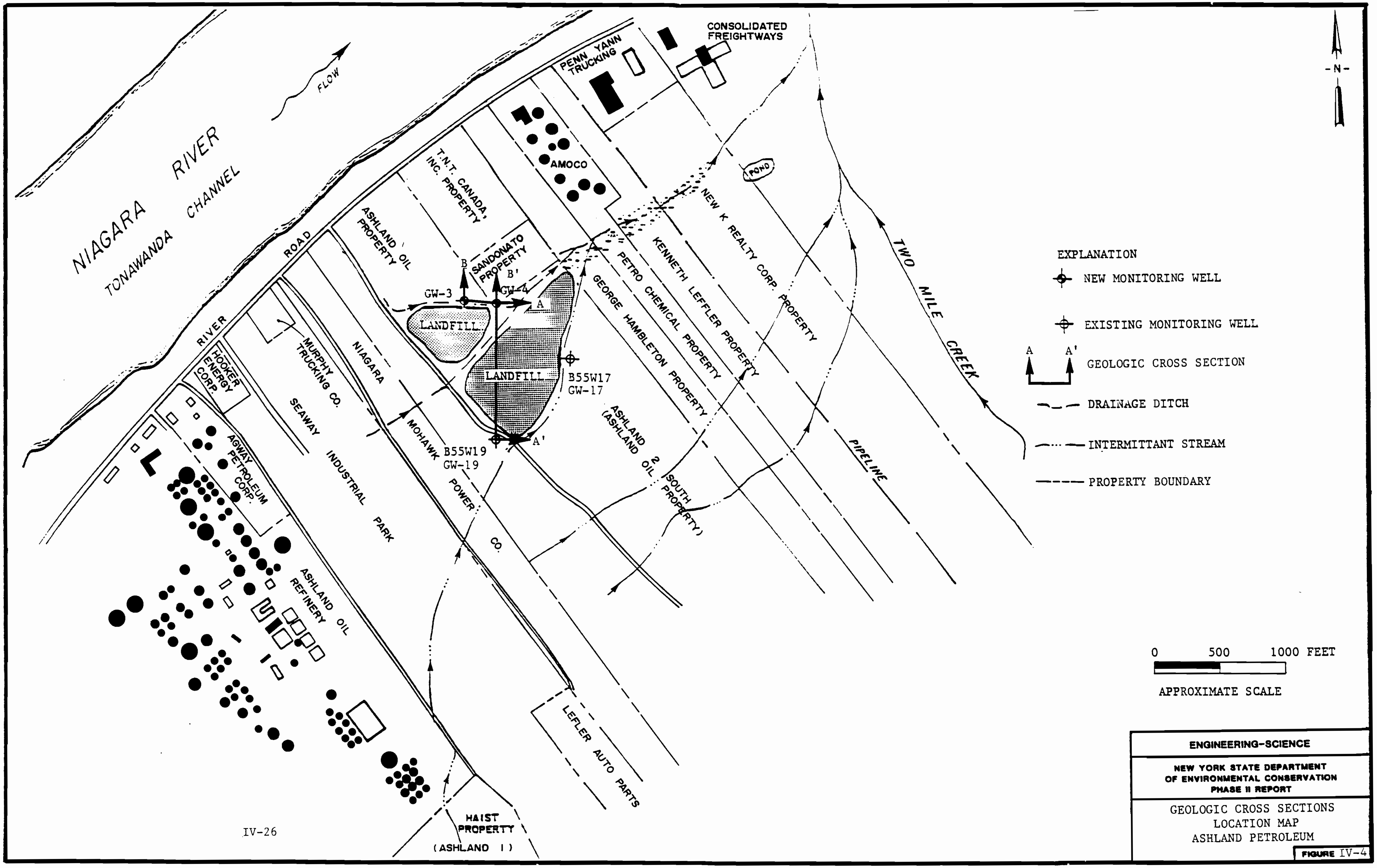


ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

SITE PLAN
ASHLAND PETROLEUM

FIGURE IV-2

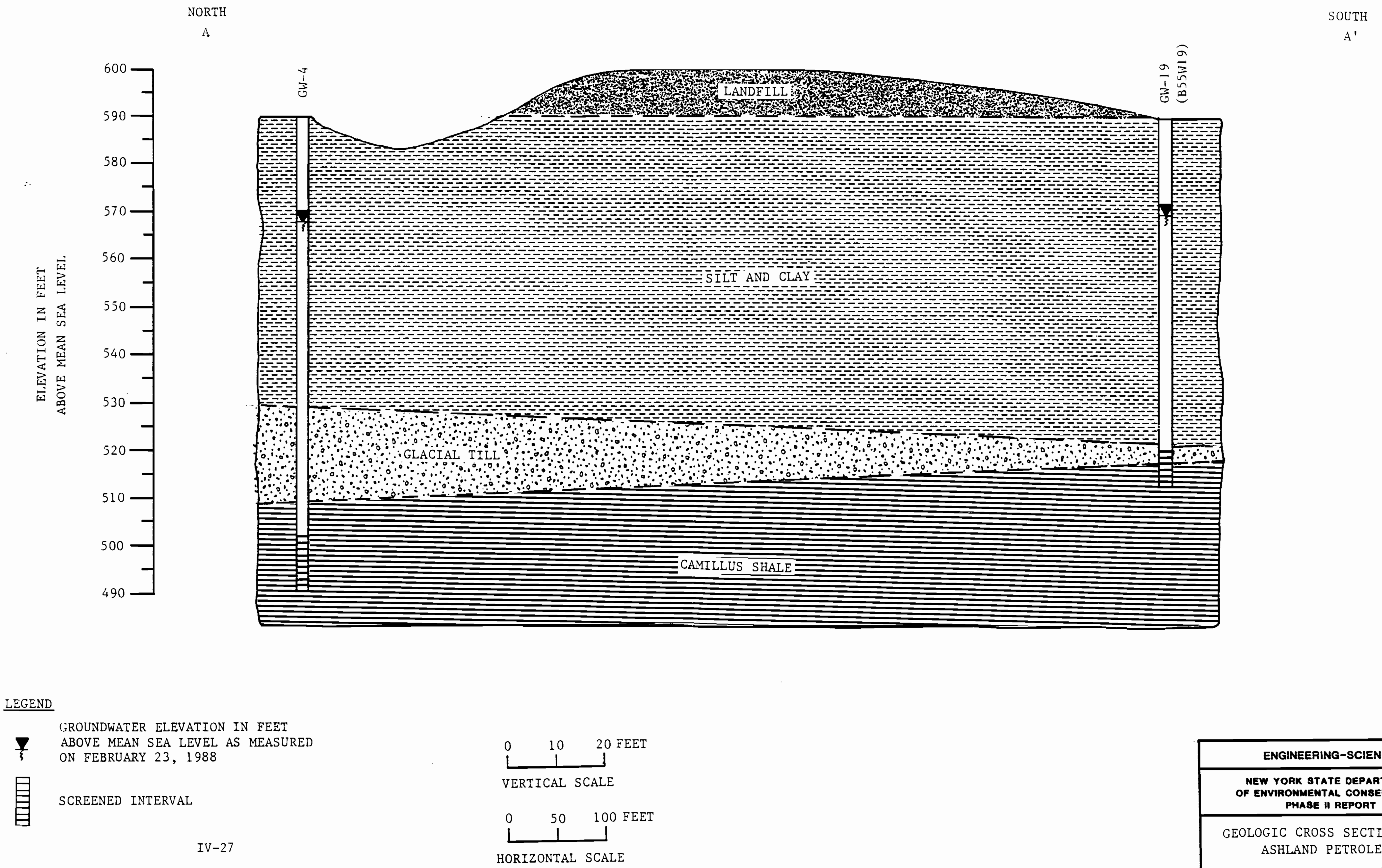


ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT

GEOLOGIC CROSS SECTIONS
LOCATION MAP
ASHLAND PETROLEUM

FIGURE IV-4

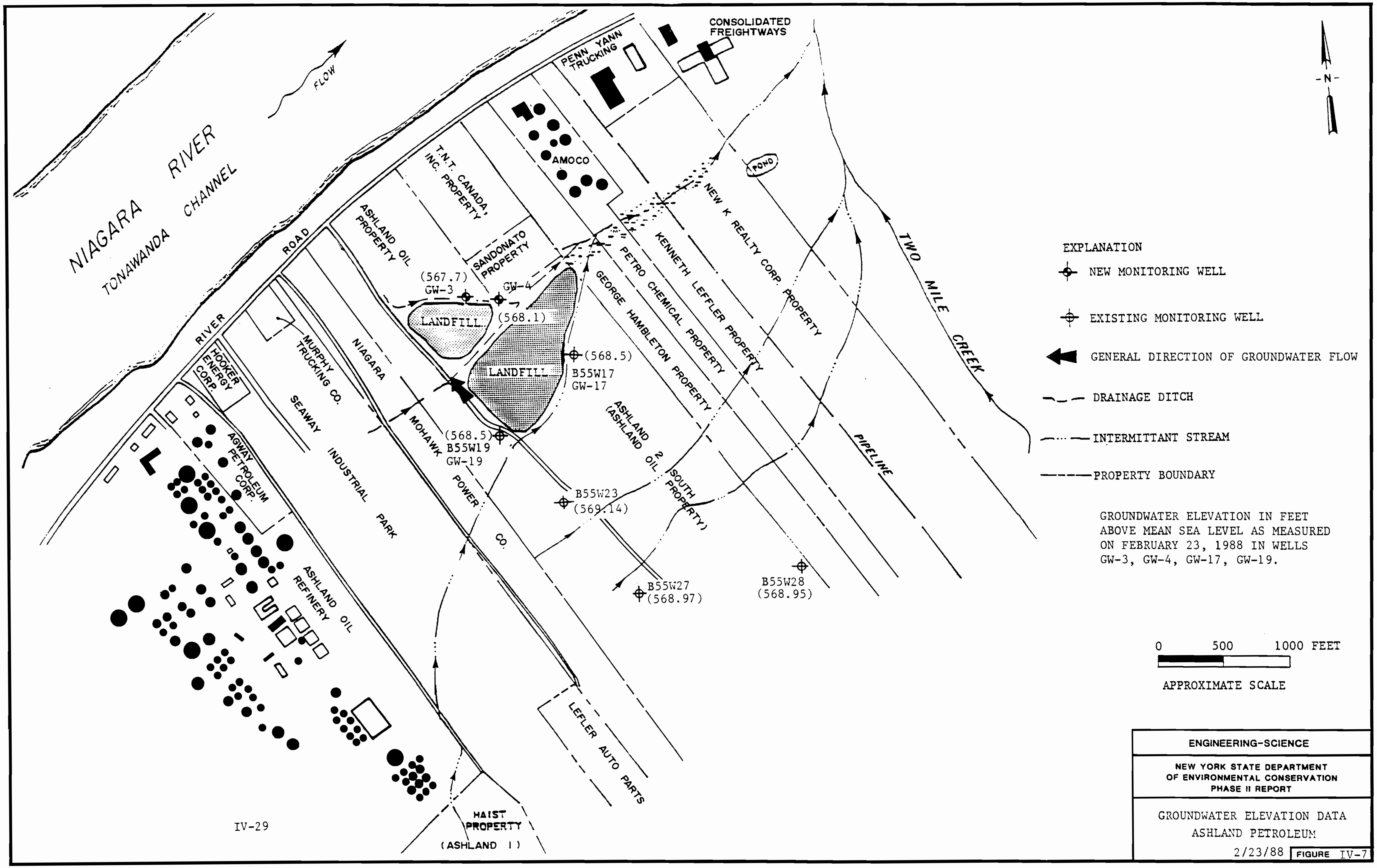


ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

GEOLOGIC CROSS SECTION A-A'
ASHLAND PETROLEUM

FIGURE IV-5



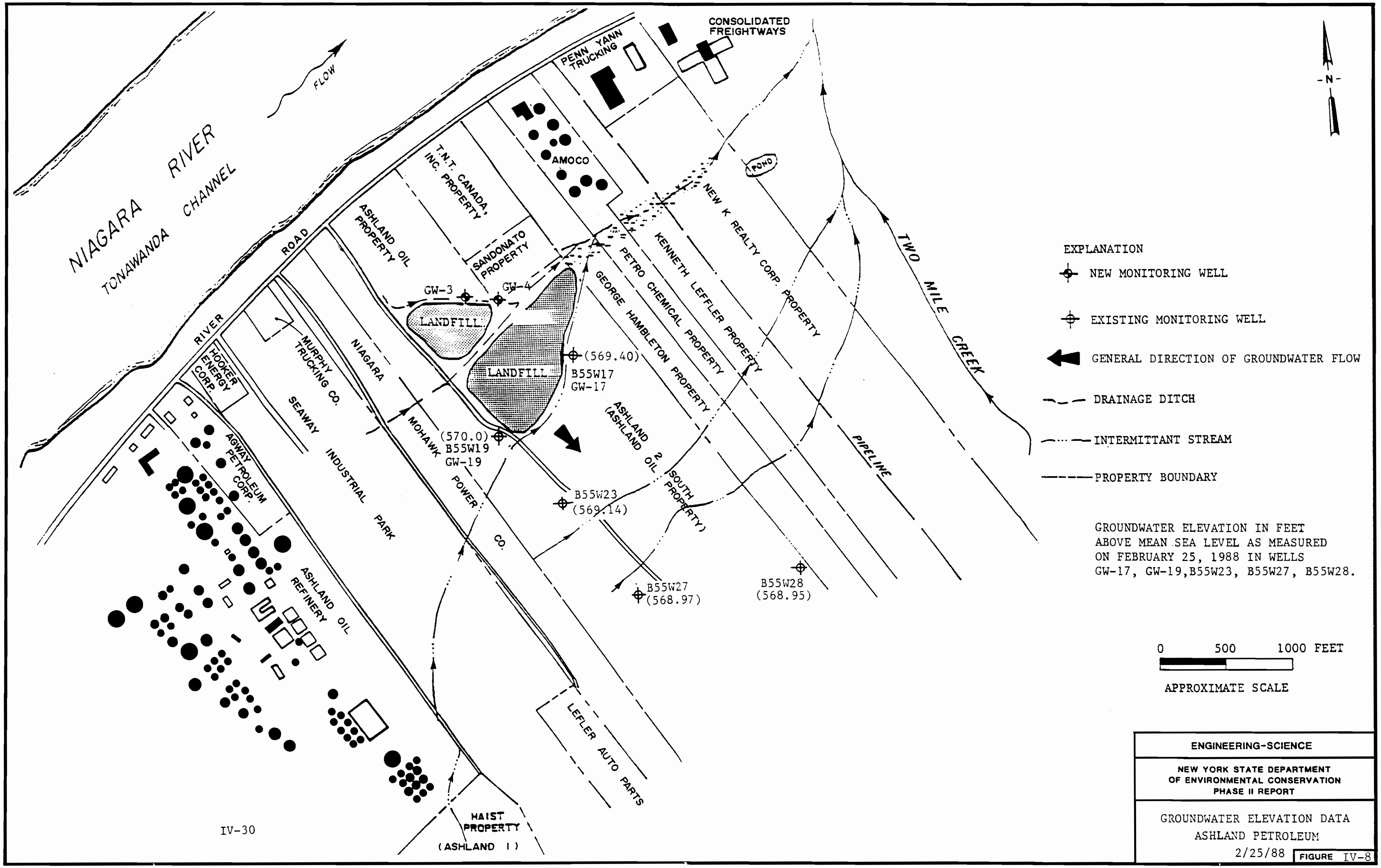
GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL AS MEASURED ON FEBRUARY 23, 1988 IN WELLS GW-3, GW-4, GW-17, GW-19.

ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

GROUNDWATER ELEVATION DATA
ASHLAND PETROLEUM

2/23/88 **FIGURE** IV-7



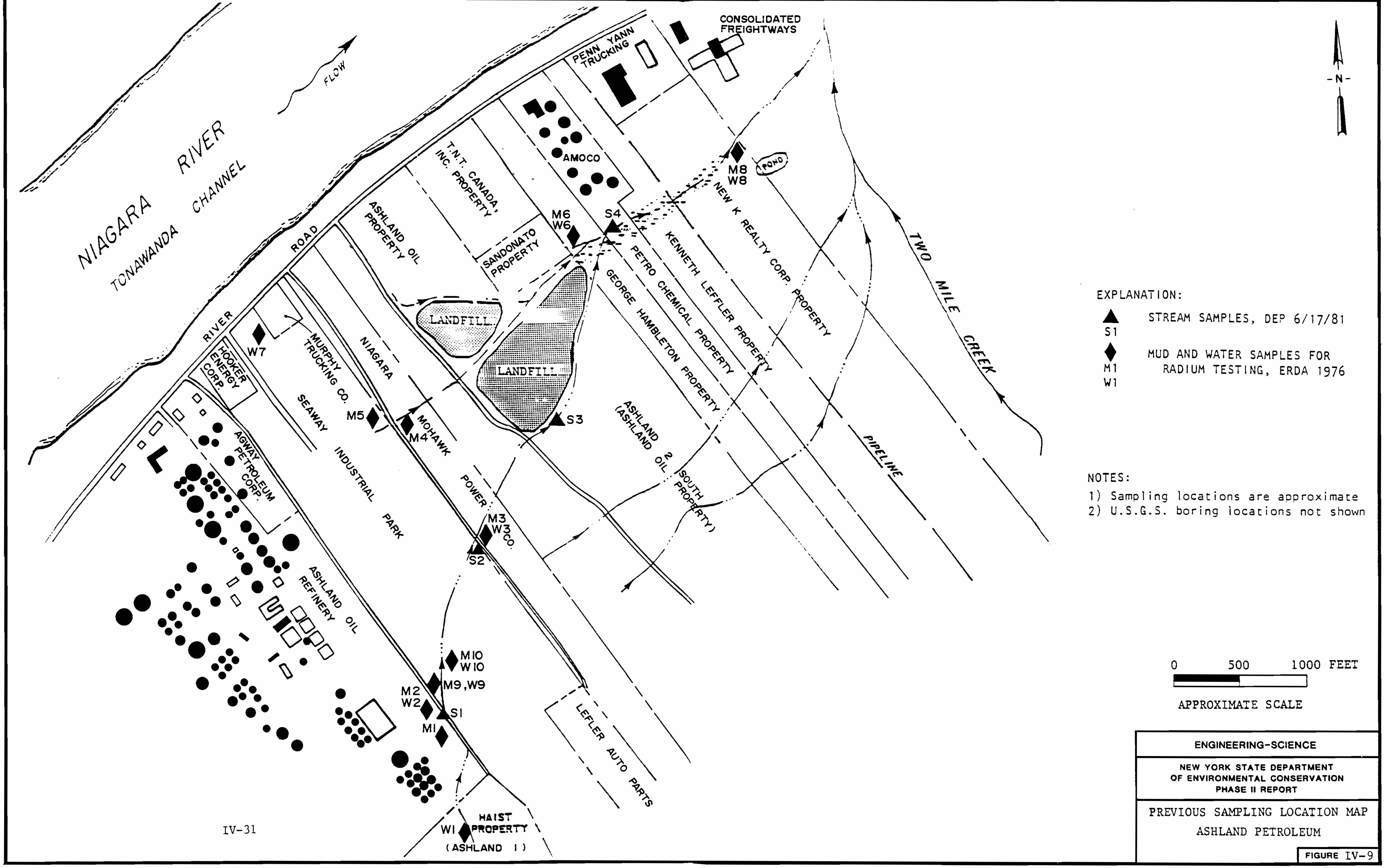
GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL AS MEASURED ON FEBRUARY 25, 1988 IN WELLS GW-17, GW-19, B55W23, B55W27, B55W28.

ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

GROUNDWATER ELEVATION DATA
ASHLAND PETROLEUM
2/25/88

FIGURE IV-8



ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT

PREVIOUS SAMPLING LOCATION MAP
ASHLAND PETROLEUM

FIGURE IV-9

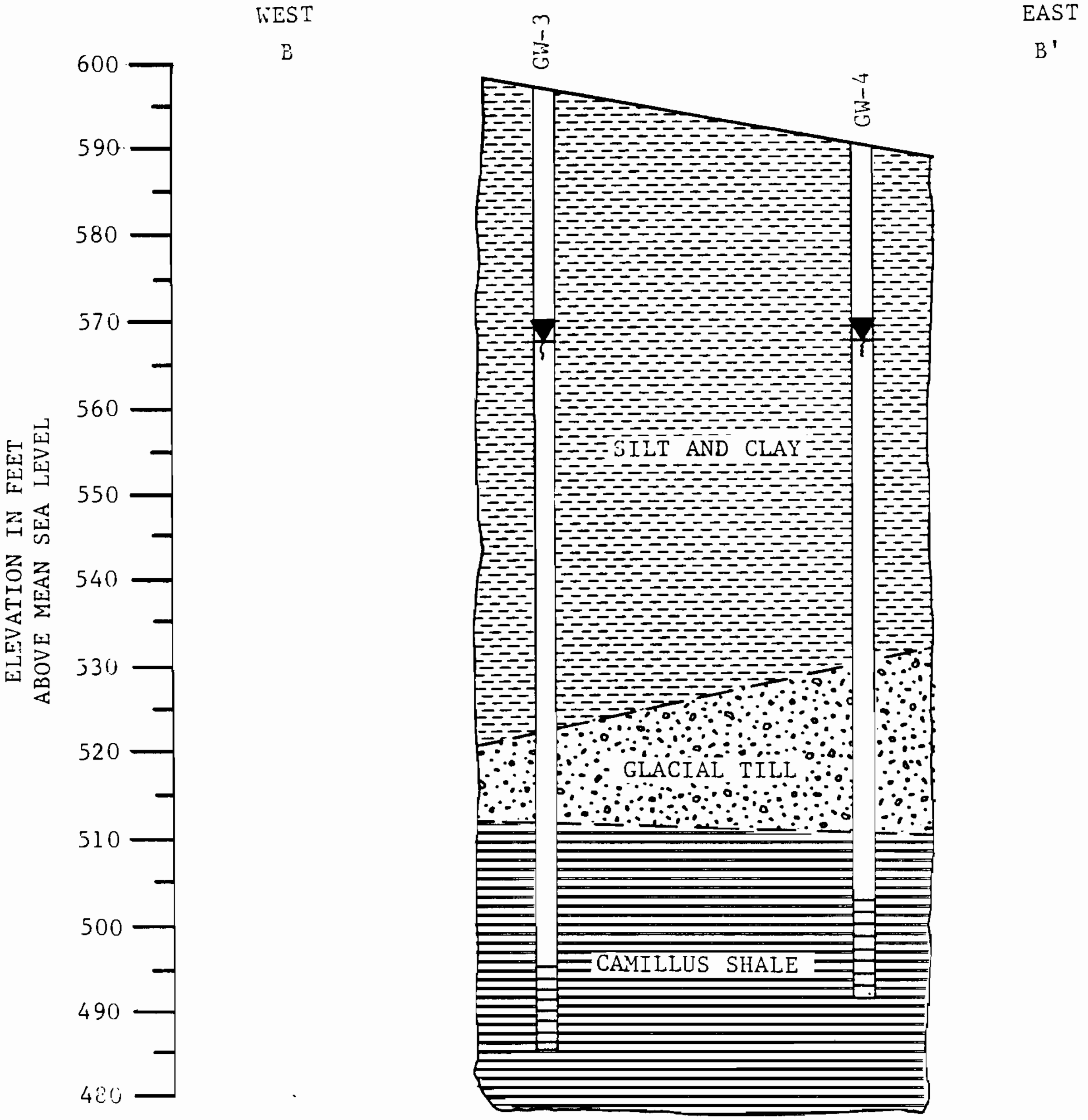
UNIT	PATTERN ON GEOLOGIC CROSS-SECTION	APPROXIMATE THICKNESS IN FEET	DESCRIPTION
TOPSOIL/ LANDFILL	▓	0-20	BROWN SILT AND SAND/FILL
LACUSTRINE SILT AND CLAY	┄	58-70	RED/BROWN SILT WITH SOME CLAY AND FINE SAND. PROBABLY OF GLACIAL/ LACUSTRINE ORIGIN.
GLACIAL TILL	░	0-20	POORLY SORTED CLAY AND SILT WITH INTERBEDDED SAND AND GRAVEL ALL OF GLACIAL ORIGIN.
CAMILLUS SHALE	▤	200	GRAY SHALE WITH THIN GYPSUM LAYERS. UPPER PORTION IS WEATHERED. FRESH, HARDER WITH SOLUTION CAVITIES ALONG BEDDING PLANES AND NEAR VERTICAL JOINTS.

ENGINEERING-SCIENCE

**NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT**

STRATIGRAPHIC COLUMN
ASHLAND PETROLEUM

FIGURE IV-3



EXPLANATION

0 10 20 FEET
VERTICAL SCALE

0 50 100 FEET
HORIZONTAL SCALE

▼ GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL AS MEASURED ON FEBRUARY 23, 1988

▤ SCREENED INTERVAL

ENGINEERING-SCIENCE

**NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT**

GEOLOGIC CROSS SECTION B-B'
ASHLAND PETROLEUM

FIGURE IV-6

SECTION V

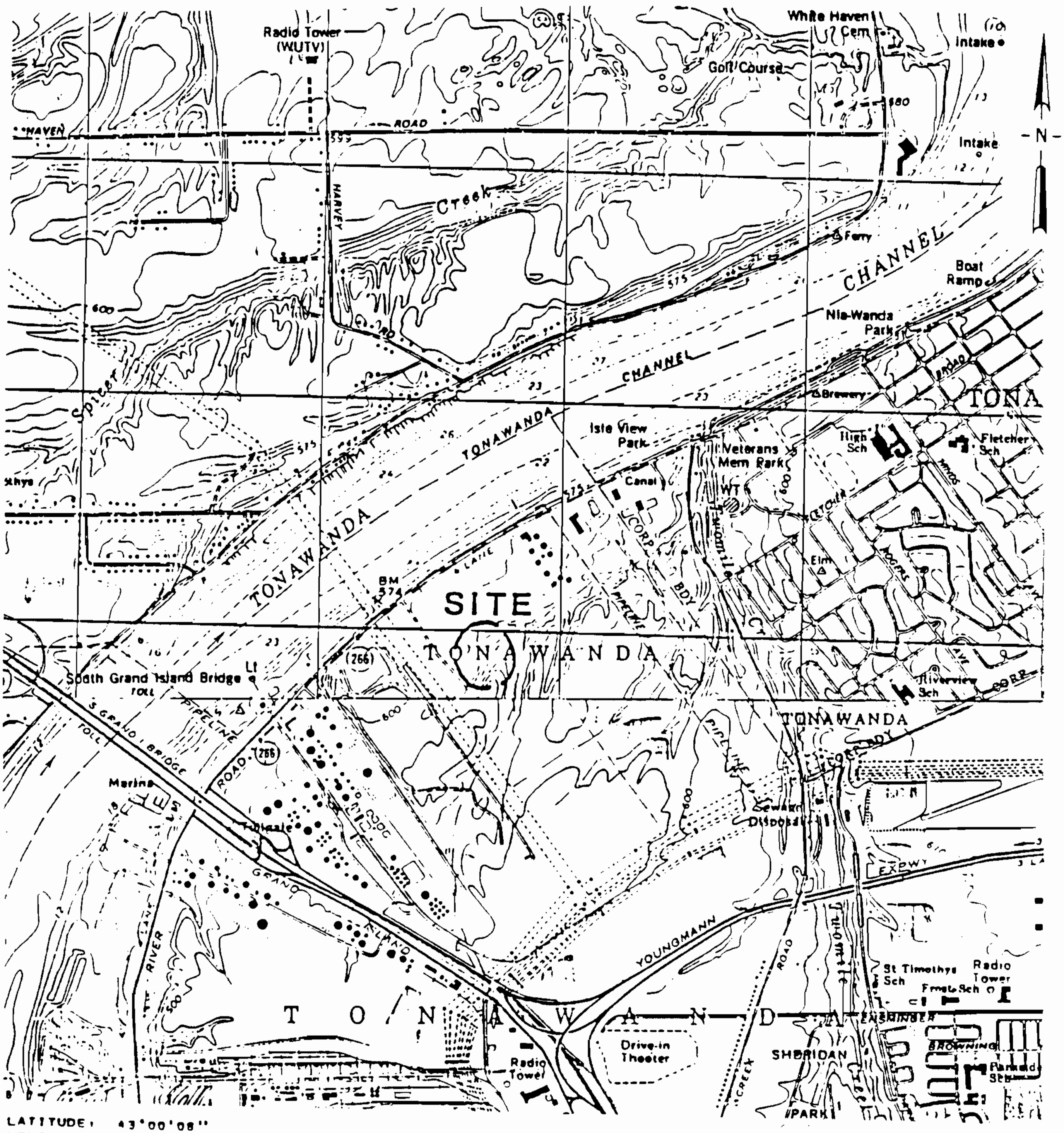
FINAL APPLICATION OF HAZARD RANKING SYSTEM

NARRATIVE SUMMARY

The Ashland Petroleum Company site is owned by the Ashland Petroleum Company, who operated a landfill during the period 1957 to 1982. Refuse and industrial waste from the Ashland Petroleum refinery was disposed on-site. These wastes involved lime slurry sludges, phosphoric acid polymerization catalyst, spent clay from oil refining and low-level radioactive waste from the Ashland 1 site (former Haist property). The four-acre landfill is located off River Road in the Town of Tonawanda, Erie County, New York. Wastes were disposed at the site until 1982, when a clay-bentonite layer two feet thick was placed over the landfill. Since that time, the site has been inactive.

Sampling and analyses conducted during the Phase II investigation indicate contamination of the groundwater, surface water and sediments with hazardous and or radioactive substances. The groundwater in the site vicinity is only used on a limited basis for industrial purposes. Surface water intakes on the Niagara River are located less than three miles downstream of the site. These intakes provide public drinking water to approximately 79,000 people. There are approximately 5,000 residents within one mile of the site, and 50,000 residents within three miles of the site.

The site is currently being investigated as a potential low-level radioactive waste disposal site by Bechtel National Inc. for the U.S. Department of Energy.



LATITUDE: 43°00'08"
LONGITUDE: 78°55'11"

SCALE
0 1000 2000 3000 4000 FEET

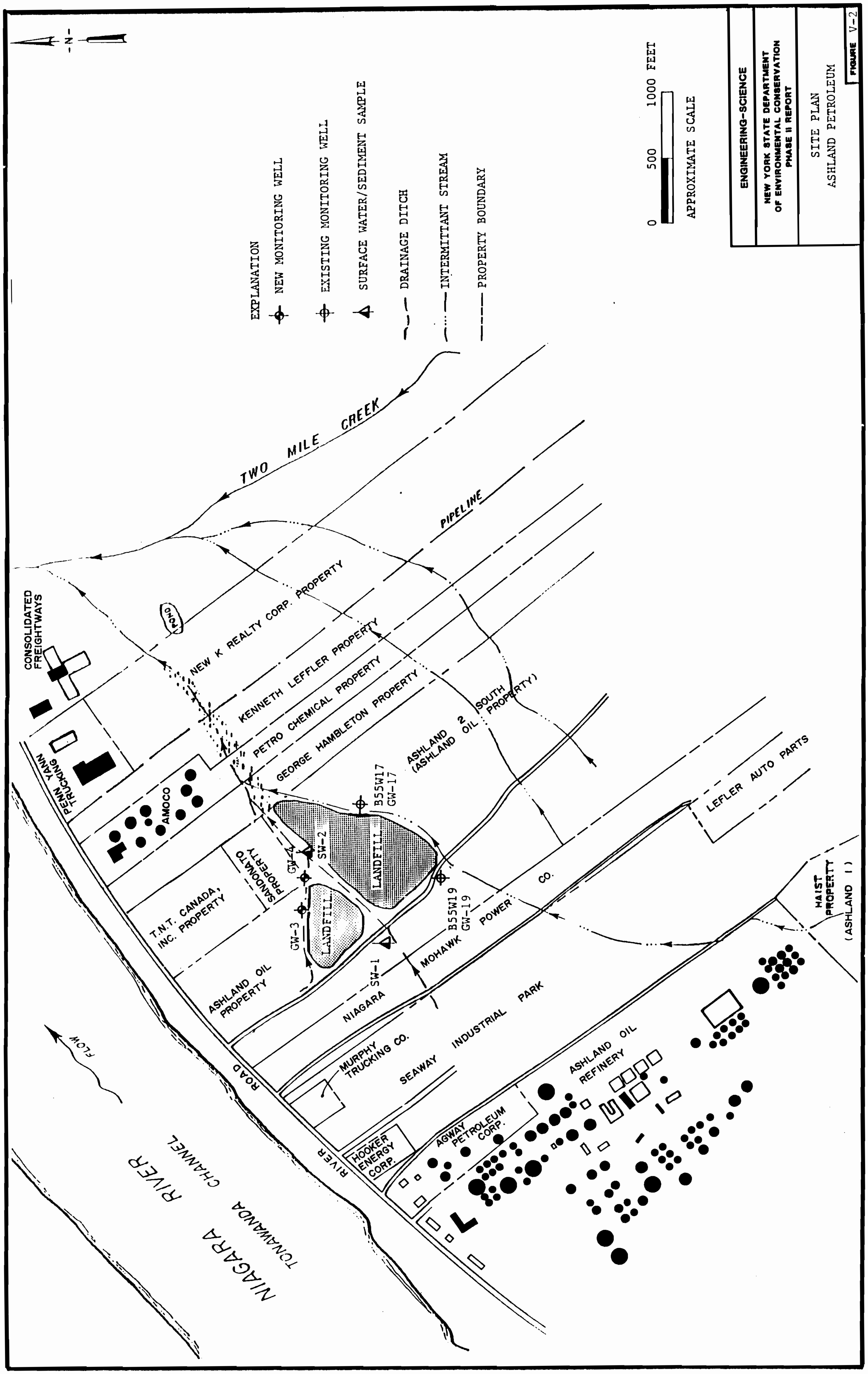
REFERENCE: U.S.G.S. 7.5' Topographic Map Tonawanda West, NY (1980) and Buffalo NW, NY-ONT. (1965) Quadrangles

ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

SITE LOCATION MAP
ASHLAND PETROLEUM

FIGURE V-1



ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PHASE II REPORT

SITE PLAN
ASHLAND PETROLEUM

FIGURE V-2

Facility Name: Ashland Petroleum Date: 5/5/88

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Observed Release	[✓ 0]	1	0	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	4	6	
Net Precipitation	0 1 [✓ 2] 3	1	2	3	
Permeability of the Unsaturated Zone	0 1 [✓ 2] 3	1	2	3	
Physical State	0 1 2 [✓ 3]	1	3	3	
Total Route Characteristics Score			11	15	
3 Containment	0 1 2 [✓ 3]	1	3	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 12 15 [✓ 18]	1	18	18	
Hazardous Waste Quantity	0 [✓ 1] 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					3.5
Ground Water Use	0 [✓ 1] 2 3	3	3	9	
Distance to Nearest Well/Population Served	[✓ 0] 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			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			1,881	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 3.28		

GROUND WATER ROUTE WORK SHEET

Facility Name: Ashland Petroleum

Date: 5/3/88

Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 [✓ 45]	1	45	45	4.1
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					4.2
Facility Slope and Intervening Terrain	0 1 2 [✓ 3]	1	3	3	
1-yr. 24-hr. Rainfall	0 1 [✓ 2] 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 [✓ 3]	2	6	6	
Physical State	0 1 2 [✓ 3]	1	3	3	
Total Route Characteristics Score			14	15	
3 Containment	0 1 2 [✓ 3]	1	3	3	4.3
4 Waste Characteristics					4.4
Toxicity/Persistence	0 3 6 9 12 15 [✓ 18]	1	13	18	
Hazardous Waste Quantity	0 [✓ 1] 2 3 4 5 6 7 8	1	1	8	
Total Waste Characteristics Score			19	26	
5 Targets					4.5
Surface Water Use	0 1 2 [✓ 3]	3	9	9	
Distance to a Sensitive Environment	0 1 [✓ 2] 3	2	4	6	
Population Served/ Distance to Water Intake Downstream	0 4 6 8 10 12 16 18 20 24 [✓ 30] 32 35 40	1	30	40	
Total Targets Score			43	55	
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			36,765	64,350	
7 Divide line 6 by 64,350 and multiply by 100			S_{sw} = 57.13		

SURFACE WATER ROUTE WORK SHEET

Facility Name: Ashland Petroleum Date: 5/5/88

Air Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
$\boxed{1}$ Observed Release	[✓ 0] 45	1	0	45	5.1
Date and Location: Ashland Petroleum Site March 1985 and January 1988					
Sampling Protocol:					
If line $\boxed{1}$ is 0, the S_a = 0. Enter on line $\boxed{5}$. If line $\boxed{1}$ is 45, then proceed to line $\boxed{2}$.					
$\boxed{2}$ Waste Characteristics					5.2
Reactivity and Incompatibility	[✓ 0] 1 2 3	1	0	3	
Toxicity	[✓ 0] 1 2 3	3	0	9	
Hazardous Waste	[✓ 0] 1 2 3 4 5 6 7 8	1	0	8	
Total Waste Characteristics Score			0	20	
$\boxed{3}$ Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 [✓ 21] 24 27 30	1	21	30	
Distance to Sensitive Environment	[✓ 0] 1 2 3	2	0	6	
Land Use	0 1 2 [✓ 3]	1	3	3	
Total Targets Score			24	39	
$\boxed{4}$ Multiply $\boxed{1}$ x $\boxed{2}$ x $\boxed{3}$			0	35,100	
$\boxed{5}$ Divide line $\boxed{4}$ by 35,100 and multiply by 100			S_a = 0		

AIR ROUTE WORK SHEET

Facility Name: Ashland Petroleum Date: 5/5/88

Fire and Explosion Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1 Containment	[✓ 1] 3	1	1	3	7.1
2 Waste Characteristics					7.2
Direct Evidence	[✓ 0] 3	1	0	3	
Ignitability	[✓ 0] 1 2 3	1	0	3	
Reactivity	[✓ 0] 1 2 3	1	0	3	
Incompatibility	[✓ 0] 1 2 3	1	0	3	
Hazardous Waste Quantity	[✓ 0] 1 2 3 4 5 6 7 8	1	0	8	
Total Waste Characteristics Score			0	20	
3 Targets					7.3
Distance to Nearest Population	0 1 2 [✓ 3] 4 5	1	3	5	
Distance to Nearest Building	0 [✓ 1] 2 3	1	1	3	
Distance to Sensitive Environment	[✓ 0] 1 2 3	1	0	3	
Land Use	0 1 2 [✓ 3]	1	3	3	
Population Within 2-Mile Radius	0 1 2 3 4 [✓ 5]	1	5	5	
Buildings Within 2-Mile Radius	0 1 2 3 4 [✓ 5]	1	5	5	
Total Targets Score			17	24	
4 Multiply 1 x 2 x 3			0	1,440	
5 Divide line 4 by 1,440 and multiply by 100			S_{FE} = 0		

FIRE AND EXPLOSION WORK SHEET

Facility Name: Ashland Petroleum   Date: 5/5/88

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, proceed to line 4 If line 1 is 0, proceed to line 2					
2 Accessibility	0 1 2 [✓ 3]	1	3	3	8.2
3 Containment	0 [✓ 15]	1	15		8.3
4 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	16	20	
Distance to a Critical Habitat	[✓ 0] 1 2 3	4	0	12	
Total Targets Score			16	32	
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			10,800	21,600	
7 Divide line 6 by 21,600 and multiply by 100			S_{DC} = 50.00		

DIRECT CONTACT WORK SHEET

Facility Name: Ashland Petroleum Date: 3/5/88

Worksheet for Computing S_M

	S	S^2
Groundwater Route Score (S_{gw})	3.28	10.76
Surface Water Route Score (S_{sw})	57.13	3263.84
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		3274.60
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		57.22
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		33.08

WORK SHEET FOR COMPUTING S_M

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: Ashland Petroleum Company Landfill

LOCATION: 4545 River Road, Tonawanda, Erie County, New York

Net Precipitation Assigned Value = 2

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

Mean annual precipitation across the site area is 34 inches. (USDOC, 1979).

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

Mean annual lake evaporation across the site areas is 27 inches. (USDOC, 1979).

Net precipitation (subtract the above figures):

Net annual precipitation = 7 inches.

Permeability of Unsaturated Zone Assigned Value = 2

Soil type in unsaturated zone:

The soil present in the unsaturated zone is classified as the Cayuga silt loam. (USDA, 1986)

Permeability associated with soil type:

1 x 10^{-3} to 4 x 10^{-5} cm/sec (USDA, 1986)

Physical State Assigned Value = 3

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

Solids (soil contaminated with radiation (radium, thorium, uranium), spent lime, and spent clay from oil refining) and sludges (phosphoric acid polymerization catalyst) were disposed of at the site. (Scalise, 1985; NYSDEC, 1987).

***

3. CONTAINMENT

Containment Assigned Value = 3

Method(s) of waste or leachate containment evaluated:

Unlined landfill with no leachate collection system. (ES; D&M, 1985).

Method with highest score:

Unlined landfill with no leachate collection system.

4. WASTE CHARACTERISTICS

Toxicity and Persistence **Assigned Value = 18**

Compound(s) evaluated:

PCBs were detected in sediments on-site (SED-2).

Compound with highest score:

PCBs

Hazardous Waste Quantity **Assigned Value = 1**

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):

1-10 cubic yards.

Basis of estimating and/or computing waste quantity:

The volume of hazardous wastes deposited in the landfill is unknown. For purposes of rating the site, the HRS score is 1 because hazardous wastes are known to be present on-site, so the minimum quantity score is assigned.

***

5. TARGETS

Ground Water Use **Assigned Value = 1**

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

The aquifer of concern is used by the Dunlop Tire and Rubber Company (located at Sheridan Drive and River Road in Buffalo, 1.2 miles south of the site) as an industrial water supplier. Three wells yielding approximately 300 gpm are in use at this location (Pyanowski, 1986; Koczasa, 1985).

Distance to Nearest Well **Assigned Value = 0**

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

The nearest well drawing from the aquifer of concern is located at the Dunlop Tire and Rubber Company (corner of Sheridan Drive and River Road in Buffalo, New York). (Pyanowski, 1986).

Distance to above well or building:

1.2 miles south of the site. (Koczaja, 1985).

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:

No municipal wells are drawing from the aquifer, however, 3 industrial wells located at Dunlop Tire and Rubber Company are drawing from the aquifer. (NYSDOH, 1982; Pyanowski, 1986).

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):

No land area is irrigated by the supply wells at Dunlop. The water is used for industrial cooling operations. (Pyanowski, 1986)

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

Groundwater is not used as a residential drinking source within a 3-mile radius of the site (Koczaja, 1985).

Surface Water Route

1. OBSERVED RELEASE **Assigned Value = 45**

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

Radioactive parameters - Gross Alpha and Gross Beta. (Nanco Labs, 1988).

Rationale for attributing the contaminants to the facility:

Gross alpha (30 pCi/l, SW-2) and gross beta (33 pCi/l, SW-2) radiation were detected in downgradient surface water samples. The values exceeded those found in upgradient samples (gross alpha <2 pCi/l, SW-1, and gross beta <3 pCi/l, SW-1) more than three times.

***

2. ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain **Assigned Value = 3**

Average slope of facility in percent:

1.5%. (USGS, 1980)

Name/description of nearest downslope surface water:

A small stream and marshy area draining into Two Mile Creek, which drains into the Niagara River, is located adjacent to the site's northeastern margin. (USGS, 1980).

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

2.1%. (USGS, 1980).

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

The facility is partially located in the surface waters of a stream flowing across the site. (ES, 1988).

Is the facility completely surrounded by areas of higher elevation?

The facility is not completely surrounded by areas of higher elevation. (USGS, 1980).

1-Year 24-Hour Rainfall in Inches **Assigned Value = 2**

2.1 inches. (USDOC, 1963).

Distance to Nearest Downslope Surface Water **Assigned Value = 3**

A marsh area and stream are located adjacent (0.0 feet from site) to the site's northeastern and eastern margins. (ES, 1988).

Physical State of Waste **Assigned Value = 3**

Solids (soil contaminated with radioisotopes; radium, thorium, uranium; spent lime and spent clay from oil refining) and sludges (phosphoric acid polymerization catalyst) were disposed of at the site. (Scalise, 1985; NYSDEC, 1987).

***

3. CONTAINMENT **Assigned Value = 3**

Containment

Method(s) of waste or leachate containment evaluated:

The landfill was covered with 2 feet of clay in 1982; however, the site does not have an adequate diversion system. (ES and D&M, 1985; Scalise, 1985).

Method with highest score:

Inadequate diversion system (HRS Score = 3).

4. WASTE CHARACTERISTICS

Toxicity and Persistence **Assigned Value = 18**

Compound(s) evaluated

PCBs in sample SED-2 from the surface water on-site (York Laboratories, 1988; ES, 1988).

Compound with highest score:

PCBs (EPA, 1984).

Hazardous Waste Quantity **Assigned Value = 1**

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):

1 - 10 cubic yards.

Basis of estimating and/or computing waste quantity:

The quantity of hazardous wastes disposed on-site is unknown; however since hazardous substances have been detected in the surface water sediments on-site the minimum quantity score of 1 is assigned.

***

5. TARGETS

Surface Water Use **Assigned Value = 3**

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

Surface waters within 3 miles downstream of the site are primarily used for drinking water supplies, transportation, and recreation (NYSDOH, 1982; USGS, 1980).

Is there tidal influence?

No, there is no tidal influence at the site because western N.Y. is not in a coastal area. (USGS, 1980).

Distance to a Sensitive Environment **Assigned Value = 2**

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

There are none present within 2 miles of the site; western N.Y. is not in a coastal area (USGS, 1980).

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

None within 1 mile of site (Farquhar, 1987).

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

There are none located within 1 mile of the site. (Ozard, 1988).

Population Served by Surface Water **Assigned Value = 30**

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:

	Distance	Population
City of Tonawanda intake	1.8 miles	18,538
City of North Tonawanda intake	2.1 miles	36,000
City of Lockport intake	2.6 miles	25,000
Total		79,538

These intakes are located on the Niagara River - East branch. (NYSDOH, 1982; USGS, 1980).

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

There is no land irrigated by water from the cited intakes; the site is in an industrial/residential area. The surface waters are used as drinking water supplies. (NYSDOH, 1982; USGS, 1980).

Total population served:

	Population
City of Tonawanda intake	18,538
City of North Tonawanda intake	36,000
City of Lockport intake	25,000
Total	79,538

(NYSDOH, 1982)

Name/description of nearest of above water bodies:

Niagara River, East Branch (USGS, 1980)

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

	Distance
City of Tonawanda intake	1.8 miles
City of North Tonawanda intake	2.1 miles
City of Lockport intake (NYSDOH, 1982)	2.6 miles

AIR ROUTE

1. OBSERVED RELEASE

Contaminants detected: **Assigned Value = 0**

No volatile organic compounds were detected above background during on-site air monitoring. HNu meter and Photovac Tip II readings were taken upgradient and downgradient of the site. (ES and D&M, 1985; ES, 1988).

It should be noted that radon is an airborne contaminant, a breakdown product of radium 226. A device to measure radon concentrations in pci/l should be used if structures are planned to be constructed at the site. See Reference 34, pg. 2.

Date and location of detection of contaminants:

No contaminants were detected on-site.

Methods used to detect the contaminants:

HNu meter

Photovac Tip II

Rationale for attributing the contaminants to the site:

Contaminants are not attributable to the site based on air monitoring conducted on-site.

***

2. WASTE CHARACTERISTICS

Reactivity and Incompatibility **Assigned Value = 0**

Most reactive compound:

No reactive compounds are known to exist on-site. The phosphoric acid catalyst is spent, and therefore, is not reactive.

Most incompatible pair of compounds: **Assigned Value = 0**

There are no known incompatible compounds on-site with the potential to impact the air pathway.

Toxicity **Assigned Value = 0**

Most toxic compound:

Although toxic materials (soils contaminated with radioactive isotopes; radium, thorium, uranium) exist on-site, none of the compounds are present in a form with the potential to impact the air pathway. It is noteworthy that radon is a breakdown product of radium 226. This contaminant should be addressed for future construction of commercial or industrial buildings over "hot areas". See Reference 34, pg. 2.

Hazardous Waste Quantity **Assigned Value = 0**

Total quantity of hazardous waste:

The score is zero because no hazardous waste with the potential impact the air pathway is known to exist on-site.

Basis of estimating and/or computing waste quantity:

The waste quantity is zero because no known hazardous waste with the potential to impact the site's air pathway exist on-site.

***

3. TARGETS

Population Within 4-Mile Radius **Assigned Value = 21**

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

0 to 4 mi **0 to 1 mi** **0 to 1/2 mi** **0 to 1/4 mi**

101,373 people. (US Census, 1980)

Distance to a Sensitive Environment **Assigned Value = 0**

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

There are none present within 2 miles of the site; western NY is not in a coastal area. (USGS, 1980).

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

There are no wetlands within 1 mile of the site (Farquhar, 1987).

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

There are none located within 1 mile or less of the site. (Ozard, 1988).

Land Use **Assigned Value = 3**

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

0.0 miles. The site is located in an industrial area. (USGS, 1980).

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

There are none within 2 miles of the site. (USGS, 1980).

Distance to residential area, if 2 miles or less:

There are residential areas located approximately 0.6 miles east, 0.3 miles northwest, and 1.7 miles southeast of the site. (USGS, 1980).

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

There is none within 1 mile or less; the site is located in an industrial area. (USGS, 1980).

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

There is none within 2 miles or less; the site is in an industrial area. (USGS, 1980).

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

There are none within view of the site. (Federal Register, 1983; USDOI, 1983).

FIRE AND EXPLOSION

1. CONTAINMENT

Assigned Value = 1

Hazardous substances present:

No records were found during the Phase II investigation which indicate that a past or present fire and explosion hazard exists at the site.

Type of containment, if applicable:

No records were found during the Phase II investigation indicating that hazardous substances which were flammable or explosive were presently contained on-site.

***

2. WASTE CHARACTERISTICS

Direct Evidence

Assigned Value = 0

Type of instrument and measurements:

Measurements taken with an explosimeter during the Phase II investigations indicated that there were no explosive gases present on-site at concentrations above the lower explosive limit (LEL). (ES, 1988).

Ignitability

Assigned Value = 0

Compound used:

No ignitable compounds with the potential to create a fire and explosion hazard are known to exist on-site.

Reactivity

Assigned Value = 0

Most reactive compound:

No reactive compounds with the potential to create a fire and explosion hazard are known to exist on-site.

Note: The phosphoric acid catalyst is spent and, therefore, is not reactive.

Incompatibility Assigned Value = 0

Most incompatible pair of compounds:

No incompatible compounds with the potential to create a fire and explosion hazard are known to exist on-site.

Hazardous Waste Quantity Assigned Value = 0

Total quantity of hazardous substances at the facility:

No hazardous wastes which pose a fire or explosive hazard are known to exist on-site.

Basis of estimating and/or computing waste quantity:

Estimated based on data from the NYSDEC Registry Sheet, 1987 (NYSDEC, 1987; and ES site investigations, 1988).

***

3. TARGETS

Distance to Nearest Population Assigned Value = 3

The nearest population is located 1,000 feet northeast of the site at the Amoco plant. (USGS, 1980; ES, 1988).

Distance to Nearest Building Assigned Value = 1

The nearest building is located 1,000 feet northeast of the site on the Amoco property. (USGS, 1980; ES, 1988).

Distance to Sensitive Environment Assigned Value = 0

Distance to wetlands:

There are none within 1 mile of the site (Farquhar, 1987).

Distance to critical habitat:

There are no critical habitats located within 1 mile of the site. (Ozard, 1988).

Land Use Assigned Value = 3

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

0.0 miles. The site is located in an industrial area. (USGS, 1980; ES, 1988).

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

There are none within 2 miles of the site. (USGS, 1980).

Distance to residential area, if 2 miles or less:

There are residential areas located approximately 0.6 miles east, 0.3 miles northwest, and 1.7 miles southeast of the site. (USGS, 1980).

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

There is none within 1 mile or less, the site is in an industrial area. (USGS, 1980).

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

There is none within 1 mile or less, the site is in an industrial area. (USGS, 1980).

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

There are none within view of the site. (USGS, 1980).

Population Within 2-Mile Radius Assigned Value = 5

14,340 people. (US Census, 1980).

Buildings Within 2-Mile Radius **Assigned Value = 5**

3,374 buildings.

Note: An estimate of buildings was made due to lack of available data: it was assumed that for every 3.8 persons there was 1 building. Therefore, by dividing the population with a 2-mile radius (14,340) by 3.8 we arrive at 3,374 buildings.

DIRECT CONTACT

1. OBSERVED INCIDENT **Assigned Value = 0**

Date, location, and pertinent details of incident:

No information was collected during the Phase II investigation which indicates that a direct contact incident has occurred at this site.

***

2. ACCESSIBILITY **Assigned Value = 3**

Describe type of barrier(s):

The access road to the site is restricted by a locked gate, however, the site is not surrounded by fencing to prevent unauthorized access. (ES and D&M, 1985).

***

3. CONTAINMENT **Assigned Value = 15**

Type of containment, if applicable:

The landfill has a two-foot clay cover which will prevent the landfill wastes from being a direct contact threat.

Note: However, the sediments in the stream flowing across the site were found to contain hazardous wastes that may become a direct contact threat. (Nanco Labs, Inc., 1988).

***

4. WASTE CHARACTERISTICS

Toxicity **Assigned Value = 3**

Compounds evaluated:

PCBs in SED-2 (Nanco Labs, Inc., 1988).

Compound with highest score:

PCBs Toxicity = 3 (EPA, 1984).

5. TARGETS

Assigned Value = 4

Population within one-mile radius

4,988 people. (US Census, 1980).

Distance to critical habitat (of endangered species)

Assigned Value = 0

There are no critical habitats located within 1 mile of the site. (Ozard, 1988).

EPA 2070-13

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Site Inspection Report

Ashland Petroleum

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. SITE NAME AND LOCATION

01 SITE NAME *(Legal, common, or descriptive name of site)*: Ashland Petroleum Company

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: 4545 River Road

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Tonawanda	NY	14150	Erie	029	36

09 COORDINATES: LATITUDE 43 00 08.0 LONGITUDE 078 55 11.

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

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 3 / 19 85 * (MONTH DAY YEAR)

02 SITE STATUS: ☐ ACTIVE ☒ INACTIVE

03 YEARS OF OPERATION: 1957 (BEGINNING YEAR) | 1982 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION *(Check all that apply)*: ☐ A. EPA ☐ B. EPA CONTRACTOR Engineering-Science *(Name of firm)* ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ______ *(Name of firm)* ☐ E. STATE ☒ F. STATE CONTRACTOR Dames & Moore *(Name of firm)* ☐ G. OTHER ______ *(Specify)*

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
S. Robert Steele, II	Environmental Scientist	ES	(703)591-7575

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Eileen Gilligan	Geologist	D & M	(315) 638-2572
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Mr. Charles Patton	Ashland	4545 River Road Buffalo, NY	(716) 879-8600
Mr. Donald Scalise	Ashland	4545 River Road Buffalo, NY	(716) 879-8600
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY *(Check one)*	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	2:00 pm	cold, overcast

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF *(Agency/Organization)*	03 TELEPHONE NO.
George Moreau	Engineering-Science (ES)	(315)451-9560

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
George Moreau		ES	315-451-9560	1 / 16 / 89 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

* Revised January 16, 1989

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES *(Check all that apply)*

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

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

TONS 3175
CUBIC YARDS ______
NO. OF DRUMS ______

03 WASTE CHARACTERISTICS *(Check all that apply)*

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

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	5	tons/yr	phosphoric acid polymerization cataly
OLW	OILY WASTE	50	tons/yr	spent clay from oil refining sludge
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	unknown		soil contaminated with radioisotopes
ACD	ACIDS			
BAS	BASES	72	tons/yr	spent lime
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	Lead	7439-92-1	(suspected) LF		
OLW	Benzo (a) Anthracene	56-55-3	(suspected) LF		
OLW	Benzo (a) Pyrene	50-32-8	(suspected) LF		
OLW	Oils		(suspected) LF		
BAS	Phenols	108-95-2	(suspected) LF		
BAS	Chlorides	999	(suspected) LF		
BAS	Sulfides	999	(suspected) LF		
LOC	Uranium-238		(detected) LF	3.84	p Ci/g
	Gross alpha		(detected) LF	30	p Ci/L
	Gross beta		(detected) LF	33	p Ci L
SOL	Acetone	67-64-1	(detected) LF	130.0	ug/L

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

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

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

NYSDEC, Inactive Hazardous Waste Disposal Site Report,1987
Interview with Ashland Petroleum Company employee, Mr. Donald Scalise, 4/15/85
Nanco Labs,1988

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION
02 ☒ OBSERVED (DATE: 3/88) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0
04 NARRATIVE DESCRIPTION

bis(2-ethylhexyl) phthalate was detected at elevated concentrations downgradient of the site. Groundwater is not used for drinking within 3 miles of the sit

01 ☒ B. SURFACE WATER CONTAMINATION
02 ☒ OBSERVED (DATE: 3/88) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: about 79,000
04 NARRATIVE DESCRIPTION

Gross alpha and gross beta radioactivity were detected at elevated concentrations downgradient of the site.

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

None detected with Photovac

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

No

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

The site is capped, but is not fenced

01 ☒ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 1 to 3 (Acres)
04 NARRATIVE DESCRIPTION

Observed contamination of surface water, sediments, and groundwater indicate probable contamination of soils.

01 ☒ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE:) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 79,538
04 NARRATIVE DESCRIPTION

There was an observed release into surface water at the site and there are water intakes in the Niagara River within 3 miles downgradient.

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

None known

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

None known, but possible

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

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

unknown

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ______) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION *(include name(s) of species)*

unknown

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

unknown

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

Landfill is unlined

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

No

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

No

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

No

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

No

III. TOTAL POPULATION POTENTIALLY AFFECTED: 79,538

IV. COMMENTS

No

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

Site inspection conducted by ES and D & M, 3/19/85
NYS Atlas of Community Water System Sources, 1982.
Nanco Laboratories, Inc., 1988

EPA FORM 2070-13 (7-81)

ES site visit, 1985

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. PERMIT INFORMATION

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

III. SITE DESCRIPTION

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

04 TREATMENT (Check all that apply)

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

05 OTHER

☐ A. BUILDINGS ON SITE

06 AREA OF SITE

unknown (Acres)

07 COMMENTS

The landfill site was placed in a naturally occurring ravine. General plant refuse and industrial wastes including polymerization sludge, spent lime and clay were disposed on-site. Small, unknown quantities of radioactive wastes from the "Haist Site" were also disposed on-site.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

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

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

The wastes were placed on the ground in the unlined landfill.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

The access road to the landfill site is restricted. The site is not enclosed by fencing to prevent unauthorized entry.

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

Interview of Ashland Petroleum Company employee, Mr. Donald Scalise, 4/15/85
ES Site Visit, 1985.

EPA

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

I. IDENTIFICATION

01 STATE NY

02 SITE NUMBER D063653133

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY *(Check as applicable)*

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

02 STATUS

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

03 DISTANCE TO SITE

A. 1.7 (mi)

B. ______ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY *(Check one)*

☐ A. ONLY SOURCE FOR DRINKING

☐ B. DRINKING *(Other sources available)* COMMERCIAL, INDUSTRIAL, IRRIGATION *(No other water sources available)*

☒ C. COMMERCIAL, INDUSTRIAL, IRRIGATION *(Limited other sources available)*

☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER estimate less than 10

03 DISTANCE TO NEAREST DRINKING WATER WELL N/A (mi)

04 DEPTH TO GROUNDWATER 20 to 30 (ft)

05 DIRECTION OF GROUNDWATER FLOW N-NE

06 DEPTH TO AQUIFER OF CONCERN more than 15 (ft)

07 POTENTIAL YIELD OF AQUIFER 500 gpm (gpd)

08 SOLE SOURCE AQUIFER ☐ YES ☐ NO unknown

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

Industrial wells south of the site have yielded hard water, 125-500 gpm. These wells are likely screened deep into bedrock.

10 RECHARGE AREA

☐ YES
☐ NO

COMMENTS unknown

11 DISCHARGE AREA

☐ YES
☐ NO

COMMENTS unknown

IV. SURFACE WATER

01 SURFACE WATER USE *(Check one)*

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE

☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES

☐ C. COMMERCIAL, INDUSTRIAL

☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Niagara River	☐	0.5 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE A. 4,988 NO. OF PERSONS

TWO (2) MILES OF SITE B. 14,340 NO. OF PERSONS

THREE (3) MILES OF SITE C. 52,059 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION 0.6 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 13,700

04 DISTANCE TO NEAREST OFF-SITE BUILDING about 0.5 (mi)

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

Site is in industrial area between Cities of Buffalo and Tonawanda. Nearest residential area is less than 1 mile away.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE *(Check one)*

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

02 PERMEABILITY OF BEDROCK *(Check one)* Fissile shale

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

03 DEPTH TO BEDROCK 72.5 (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE unknown (ft)

05 SOIL pH unknown

06 NET PRECIPITATION 7 (in)

07 ONE YEAR 24 HOUR RAINFALL 2.1 (in)

08 SLOPE

SITE SLOPE 1.5 %

DIRECTION OF SITE SLOPE N-NW

TERRAIN AVERAGE SLOPE 2.0 %

09 FLOOD POTENTIAL

SITE IS IN more than 100 YEAR FLOODPLAIN

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

11 DISTANCE TO WETLANDS *(5 acre minimum)*

ESTUARINE A. more than 2 (mi)

OTHER B. more than 1 (mi)

12 DISTANCE TO CRITICAL HABITAT *(of endangered species)* more than 3 (mi)

ENDANGERED SPECIES:

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL A. 0.3 (mi)

RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES B. 0.72 (mi)

AGRICULTURAL LANDS

PRIME AG LAND C. more than 2 (mi)

AG LAND D. more than 1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site and surrounding area were initially low rolling hills with streams flowing between the hills. Now, landfilling has created mounds of refuse with an intermittent stream dissecting the fill area.

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

ES boring logs, 1988.
USGS Topographic Maps: Buffalo NW and Tonawanda West, NY Quadrangles
Erie Co. Dept. of Environment and Planning
Groundwater, Freeze and Cherry, 1979.
Ozard, J., 1988, NYSDEC Personal communication with W. Bradford of ES, 4/14/88

US Census Tract Data, 1980
NYS Wetlands Maps, 1986
NYSDEC Region 9, Dpet. of Fish and Wildlife files.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	4	Nanco Laboratories, RD 6 Robinson Lane Wappingers Falls NY	1988
SURFACE WATER	2	"	1988
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER sediment	2	Nanco Laboratories,RD 6 Robinson Lane Wappingers Falls,NY	1988

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Photovac	Photovac readings taken on-site did not detect volatile organics in concentrations above background in the breathing zone.

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF Engineering-Science (Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Site plan updated during site inspection

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

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

ES Site Visits, 1985-1988

EPA

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

I. IDENTIFICATION

01 STATE NY	02 SITE NUMBER D063653133

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

01 NAME Ashland Petroleum Co.		02 D+B NUMBER	08 NAME Ashland Oil Inc.		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* 4545 River Road		04 SIC CODE 2911	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)* P.O. Box 391		11 SIC CODE
05 CITY Tonawanda	06 STATE NY	07 ZIP CODE 14150	12 CITY Ashland	13 STATE KY	14 ZIP CODE 41101
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	10 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

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

01 NAME Frontier Oil & Refining Co.		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* 4545 River Road		04 SIC CODE 2911	03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY Tonawanda	06 STATE NY	07 ZIP CODE 14150	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE	03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

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

Letter from Ashland Petroleum Company to the Interagency Task Force, 20 October 1978.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. CURRENT OPERATOR *(Provide if different from owner)*

01 NAME Ashland Petroleum Co.		02 D+B NUMBER	
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* 4545 River Road		04 SIC CODE 2911	
05 CITY Tonawanda	06 STATE NY	07 ZIP CODE 14150	
08 YEARS OF OPERATION 1952-present	09 NAME OF OWNER same		

OPERATOR'S PARENT COMPANY *(If applicable)*

10 NAME Ashland Oil Inc.		11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)* P.O. Box 391		13 SIC CODE 2911
14 CITY Ashland	15 STATE KY	16 ZIP CODE 41101

III. PREVIOUS OPERATOR(S) *(List most recent first; provide only if different from owner)*

01 NAME Frontier Oil & Refining Co.		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* 4545 River Road		04 SIC CODE 2911
05 CITY Tonawanda	06 STATE NY	07 ZIP CODE 14150
08 YEARS OF OPERATION 1928-52	09 NAME OF OWNER DURING THIS PERIOD same	
01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD	
01 NAME		02 D+B NUMBER
03 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD	

PREVIOUS OPERATORS' PARENT COMPANIES *(If applicable)*

10 NAME		11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		13 SIC CODE
14 CITY	15 STATE	16 ZIP CODE
10 NAME		11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		13 SIC CODE
14 CITY	15 STATE	16 ZIP CODE
10 NAME		11 D+B NUMBER
12 STREET ADDRESS *(P.O. Box, RFD #, etc.)*		13 SIC CODE
14 CITY	15 STATE	16 ZIP CODE

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

Letter from Ashland Petroleum Company to the Interagency Task Force,20 October 1978

EPA

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

I. IDENTIFICATION

01 STATE: NY
02 SITE NUMBER: D063653133

II. ON-SITE GENERATOR

01 NAME: Ashland Petroleum Co.
02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 4545 River Road
04 SIC CODE: 2911
05 CITY: Tonawanda
06 STATE: NY
07 ZIP CODE: 14150

Landfill site closed in 1982. Wastes currently generated by plant activity are presently transported off-site for disposal.

III. OFF-SITE GENERATOR(S)

01 NAME: none
02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.)
04 SIC CODE
05 CITY
06 STATE
07 ZIP CODE

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

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

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

IV. TRANSPORTER(S)

01 NAME: Ashland Petroleum Co.
02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): 4545 River Road
04 SIC CODE: 2911
05 CITY: Tonawanda
06 STATE: NY
07 ZIP CODE: 14150

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

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

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

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

Interview of Ashland Petroleum Company employee, Mr. Donald Scalise, 4/15/85.

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ D. SPILLED MATERIAL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ E. CONTAMINATED SOIL REMOVED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ F. WASTE REPACKAGED 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ G. WASTE DISPOSED ELSEWHERE 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ H. ON SITE BURIAL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ I. IN SITU CHEMICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ J. IN SITU BIOLOGICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ K. IN SITU PHYSICAL TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ L. ENCAPSULATION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ M. EMERGENCY WASTE TREATMENT 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ N. CUTOFF WALLS 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ P. CUTOFF TRENCHES/SUMP 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

01 ☐ Q. SUBSURFACE CUTOFF WALL 02 DATE ______ 03 AGENCY ______
04 DESCRIPTION
no

EPA

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

I. IDENTIFICATION

01 STATE NY

02 SITE NUMBER D063653133

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☒ S. CAPPING/COVERING 02 DATE 4/85 03 AGENCY ____
04 DESCRIPTION yes,clay cap covers landfill

01 ☐ T. BULK TANKAGE REPAIRED 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ U. GROUT CURTAIN CONSTRUCTED 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ V. BOTTOM SEALED 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ W. GAS CONTROL 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ X. FIRE CONTROL 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ Y. LEACHATE TREATMENT 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ Z. AREA EVACUATED 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ 1. ACCESS TO SITE RESTRICTED 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ 2. POPULATION RELOCATED 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

01 ☐ 3. OTHER REMEDIAL ACTIVITIES 02 DATE ____ 03 AGENCY ____
04 DESCRIPTION
no

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

ES Site Visit, 1985 and 1988

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	D063653133

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

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

not applicable

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

NYSDEC, Environmental Enforcement Division
NYS, Attorney General Office

HRS DOCUMENTATION REFERENCES*

1. Nanco Labs Inc., 1988. Analytical data for Ashland Petroleum site.
2. ES, 1988. Boring logs for wells GW-3 and GW-4; Figure III-1; Ashland Petroleum site.
3. Bechtel National, Inc., 1987. "Preliminary Geological and Hydrogeological Characterization Report for the Southern Portion of the Ashland 2 Site Tonawanda, New York", Oak Ridge, Tennessee, Bechtel Job No. 14501, December 1987.
4. ES, 1989. Table IV-3 from Ashland Petroleum Company site Phase II report.
5. US DOC, 1979. "Climatic Atlas of the United States", National Climatic Center, U.S. Department of Commerce, Ashville, NC, 1979.
6. USDA, 1986, "Soil Survey of Erie County, New York", US Department of Agriculture - Soil Conservation Service.
7. Scalise, Donald, 1985. Ashland Petroleum Company, Personal Interview by S. Robert Steele II, Engineering-Science dated April 15, 1985.
8. NYSDEC, 1987. Inactive Hazardous Waste Disposal Report, Ashland Petroleum Company Site Code 915061.
9. ES and D&M, 1985. Site Inspection Report for Ashland Site dated March 19, 1985.
10. Sax, 1984. Dangerous Properties of Industrial Materials Sixth Edition Van Nostrand Reinhold Company, New York.
11. EPA, 1984. Uncontrolled Hazardous Waste Site Ranking System, A Users Manual (HW-10) USEPA, 1984.
12. Pyanowski, D., 1986. Dunlop Tire Company, Buffalo, NY, Communication with S. Robert Steele, (ES) dated December 17, 1986.
13. Koczaja, R. 1985. Erie County Department of Health, Interview with E. D. Gilligan (D&M) on September 20, 1985.
14. NYSDOH, 1982. New York State Department of Health, "Atlas of Community Water System Sources".
15. USGS, 1980. Topographic Maps: Buffalo, NW, NY (1965) and Tonawanda West, NY (1980) Quadrangles.

---

*All these references were used for HRS Documentation, while some of them were also used as General References.

16. USDOC, 1963. US Department of Commerce, Technical Paper No. 4, Figure 8.

17. York Laboratories, 1988. Analytical data for sample SED-2 Ashland Petroleum Company Site.

18. Farquhar, 1987. Letter to E. Dobson (ES) regarding wetland in vicinity of Ashland site, dated September 2, 1987. NYSDEC Fish and Wildlife Division Region 9.

19. Ozard, 1988. NYSDEC, Personal interview by W. Bradford (ES) dated April 14, 1988.

20. U.S. Census Data, 1980.

21. Federal Register, 1983. National Park Service National Registry of Natural Landmarks dated March 1, 1983.

22. USDOI, 1983. U.S. Department of the Interior National Park Service, National Register of Historic Places, dated July, 1983.

GENERAL REFERENCES**

23. Bechtel, 1989. Letter from R. C. Robertson, FUSRAP Project Manager, Bechtel National, Inc. to George H. Moreau, ES, dated July 18, 1989.

24. ECDEP; "Ashland Petroleum Co. #915008-C", Erie County Department of Environmental Protection, No date.

25. EPA, 1985; "Preliminary Evaluation of Chemical Migration to Groundwater and the Niagara River from Selected Waste Disposal Sites", EPA-905/4-85-001 March 1985.

26. Freeze and Cherry, 1979; "Groundwater", Prentice-Hall, Englewood Cliffs, NJ.

27. LaSala, A. M., Jr., 1968; "Ground-Water Resources of the Erie-Niagara Basin, New York", US Department of Interior, Geological Survey, For NYS Conservation Department, Basin Planning Report ENB-3.

28. McNamee, E. 1988; Bechtel National Inc. Personal communication to W. D. Lilley, dated December 22, 1988.

29. Muller, E. H., 1965; "Bibliography of New York Quarternary Geology". New York State Museum and Science Service, Albany, NY, Bulletin Number 398, May 1965.

30. 6NYCRR; New York Codes, Rules and Regulations Title 6 Environmental Conservation.

31. NYSDEC, 1989. New York State Department of Environmental Conservation, Memorandum from J. Hyden to C. Hoffman with enclosure; March 2, 1989.

32. Rand McNally, 1981; Worldmaster World Atlas, New Census Edition, Rand McNally and Company New York.

33. TMA/Eberline, 1986. "Walkover Scan of Seaway, Ashland 1, Ashland 2, Tonawanda, NY", 800 Oak Ridge Turnpike, Oak Ridge, Tennessee, July 28-August 12, 1986.

34. USDOE, 1978. "Radiological Survey of the Ashland Oil Company (former Haist Property), Tonawanda, New York" U.S. Department of Energy, Oak Ridge National Laboratory, Oak Ridge, Tennessee, Contract No. W-7405-ENG-26, May 1978.

35. Scalise, 1976. Information provided by Joseph D. Scalise, Ashland Petroleum Company to John E. Iannoti; NYSDEC, November 1976.

**These references were not used for HRS Documentation. See also "HRS References" above.

①

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
GW-3.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0252
Sample Matrix: WATER
Data Release Authorized By: P.J. Gunsoh

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: N/A
Date Sample Received: 02-25-88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-26-88
Date Analyzed:02-26-88
Conc/Dil Factor: 1 pH: 7.7
Percent Moisture:

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	7.4 B
67-64-1	Acetone	25.0 B
75-15-0	Carbon Disulfide	4.1 J
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	1.8 J
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
If the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM I

①

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-3.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-25-88
Date Analyzed: 03-03-88
Conc/Dil Factor:------------> 2
Percent Moisture:

GPC Cleanup: Yes____ [✓ No]
Separatory Funnel Extraction: Yes_XXX_
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	20.0 U
111-44-4	bis(-2-Chloroethyl)Ether	20.0 U
95-57-8	2-Chlorophenol	20.0 U
541-73-1	1,3-Dichlorobenzene	20.0 U
106-46-7	1,4-Dichlorobenzene	20.0 U
100-51-6	Benzyl Alcohol	20.0 U
95-50-1	1,2-Dichlorobenzene	20.0 U
95-48-7	2-Methylphenol	20.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	20.0 U
106-44-5	4-Methylphenol	20.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U
67-72-1	Hexachloroethane	20.0 U
98-95-3	Nitrobenzene	20.0 U
78-59-1	Isophorone	20.0 U
88-75-5	2-Nitrophenol	20.0 U
105-67-9	2,4-Dimethylphenol	20.0 U
65-85-0	Benzoic Acid	100.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	20.0 U
120-83-2	2,4-Dichlorophenol	20.0 U
120-82-1	1,2,4-Trichlorobenzene	20.0 U
91-20-3	Naphthalene	20.0 U
106-47-8	4-Chloroaniline	20.0 U
87-68-3	Hexachlorobutadiene	20.0 U
59-50-7	4-Chloro-3-Methylphenol	20.0 U
91-57-6	2-Methylnaphthalene	20.0 U
77-47-4	Hexachlorocyclopentadiene	20.0 U
88-06-2	2,4,6-Trichlorophenol	20.0 U
95-95-4	2,4,5-Trichlorophenol	100.0 U
91-58-7	2-Chloronaphthalene	20.0 U
88-74-4	2-Nitroaniline	100.0 U
131-11-3	Dimethyl Phthalate	20.0 U
208-96-8	Acenaphthylene	20.0 U
99-09-2	3-Nitroaniline	100.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	20.0 U
51-28-5	2,4-Dinitrophenol	100.0 U
100-02-7	4-Nitrophenol	100.0 U
132-64-9	Dibenzofuran	20.0 U
121-14-2	2,4-Dinitrotoluene	20.0 U
606-20-2	2,6-Dinitrotoluene	20.0 U
84-66-2	Diethylphthalate	20.0 U
7005-72-3	4-Chlorophenyl-phenylether	20.0 U
86-73-7	Fluorene	20.0 U
100-01-6	4-Nitroaniline	100.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	100.0 U
86-30-6	N-Nitrosodiphenylamine (1)	20.0 U
101-55-3	4-Bromophenyl-phenylether	20.0 U
118-74-1	Hexachlorobenzene	20.0 U
87-86-5	Pentachlorophenol	100.0 U
85-01-8	Phenanthrene	20.0 U
120-12-7	Anthracene	20.0 U
84-74-2	Di-n-Butylphthalate	20.0 U
206-44-0	Fluoranthene	20.0 U
129-00-0	Pyrene	20.0 U
85-68-7	Butylbenzylphthalate	20.0 U
91-94-1	3,3'-Dichlorobenzidine	40.0 U
56-55-3	Benzo(a)Anthracene	20.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	250.0 B
218-01-9	Chrysene	20.0 U
117-84-0	Di-n-Octyl Phthalate	20.0 U
205-99-2	Benzo(b)Fluoranthene	20.0 U
207-08-9	Benzo(k)Fluoranthene	20.0 U
50-32-8	Benzo(a)Pyrene	20.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U
53-70-3	Dibenz(a,h)Anthracene	20.0 U
191-24-2	Benzo(g,h,i)Perylene	20.0 U

(1) - Cannot be separated from diphenylamine

①

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
GW-4.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>F2214
Sample Matrix: WATER
Data Release Authorized By: R.J. Wunsch

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 3/03/88
Date Analyzed:3/03/88
Conc/Dil Factor: 1 pH: 7.0
Percent Moisture: N/A

CAS Number		[✓ ug/L] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	9.5
67-64-1	Acetone	130.0 B
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/L] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM 1

①

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-4.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/01/88
Conc/Dil Factor:------------> 1
Percent Moisture: N/A

GPC Cleanup: Yes_____ No__XX__
Separatory Funnel Extraction: Yes__X__
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	10.0 U
111-44-4	bis(-2-Chloroethyl)Ether	10.0 U
95-57-8	2-Chlorophenol	10.0 U
541-73-1	1,3-Dichlorobenzene	10.0 U
106-46-7	1,4-Dichlorobenzene	10.0 U
100-51-6	Benzyl Alcohol	10.0 U
95-50-1	1,2-Dichlorobenzene	10.0 U
95-48-7	2-Methylphenol	10.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	10.0 U
106-44-5	4-Methylphenol	10.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U
67-72-1	Hexachloroethane	10.0 U
98-95-3	Nitrobenzene	10.0 U
78-59-1	Isophorone	10.0 U
88-75-5	2-Nitrophenol	10.0 U
105-67-9	2,4-Dimethylphenol	10.0 U
65-85-0	Benzoic Acid	50.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	10.0 U
120-83-2	2,4-Dichlorophenol	10.0 U
120-82-1	1,2,4-Trichlorobenzene	10.0 U
91-20-3	Naphthalene	10.0 U
106-47-8	4-Chloroaniline	10.0 U
87-68-3	Hexachlorobutadiene	10.0 U
59-50-7	4-Chloro-3-Methylphenol	10.0 U
91-57-6	2-Methylnaphthalene	10.0 U
77-47-4	Hexachlorocyclopentadiene	10.0 U
88-06-2	2,4,6-Trichlorophenol	10.0 U
95-95-4	2,4,5-Trichlorophenol	50.0 U
91-58-7	2-Chloronaphthalene	10.0 U
88-74-4	2-Nitroaniline	50.0 U
131-11-3	Dimethyl Phthalate	10.0 U
208-96-8	Acenaphthylene	10.0 U
99-09-2	3-Nitroaniline	50.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	10.0 U
51-28-5	2,4-Dinitrophenol	50.0 U
100-02-7	4-Nitrophenol	50.0 U
132-64-9	Dibenzofuran	10.0 U
121-14-2	2,4-Dinitrotoluene	10.0 U
606-20-2	2,6-Dinitrotoluene	10.0 U
84-66-2	Diethylphthalate	10.0 U
7005-72-3	4-Chlorophenyl-phenylether	10.0 U
86-73-7	Fluorene	10.0 U
100-01-6	4-Nitroaniline	50.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	50.0 U
86-30-6	N-Nitrosodiphenylamine (1)	10.0 U
101-55-3	4-Bromophenyl-phenylether	10.0 U
118-74-1	Hexachlorobenzene	10.0 U
87-86-5	Pentachlorophenol	50.0 U
85-01-8	Phenanthrene	10.0 U
120-12-7	Anthracene	10.0 U
84-74-2	Di-n-Butylphthalate	10.0 U
206-44-0	Fluoranthene	10.0 U
129-00-0	Pyrene	10.0 U
85-68-7	Butylbenzylphthalate	10.0 U
91-94-1	3,3'-Dichlorobenzidine	20.0 U
56-55-3	Benzo(a)Anthracene	10.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	880.0
218-01-9	Chrysene	10.0 U
117-84-0	Di-n-Octyl Phthalate	10.0 U
205-99-2	Benzo(b)Fluoranthene	10.0 U
207-08-9	Benzo(k)Fluoranthene	10.0 U
50-32-8	Benzo(a)Pyrene	10.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U
53-70-3	Dibenz(a,h)Anthracene	10.0 U
191-24-2	Benzo(g,h,i)Perylene	10.0 U

(1) - Cannot be separated from diphenylamine

①

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
GW-17.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0240
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/25/88
Date Analyzed:2/25/88
Conc/Dil Factor: 1 pH: 6.9
Percent Moisture: N/A

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	1.9 JB
7-64-1	Acetone	8.5 JB
5-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

①

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-17.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/01/88
Conc/Dil Factor:------------> 1
Percent Moisture: N/A

GPC Cleanup: Yes____ No__XX__
Separatory Funnel Extraction: Yes_X_
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	10.0 U
111-44-4	bis(-2-Chloroethyl)Ether	10.0 U
95-57-8	2-Chlorophenol	10.0 U
541-73-1	1,3-Dichlorobenzene	10.0 U
106-46-7	1,4-Dichlorobenzene	10.0 U
100-51-6	Benzyl Alcohol	10.0 U
95-50-1	1,2-Dichlorobenzene	10.0 U
95-48-7	2-Methylphenol	10.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	10.0 U
106-44-5	4-Methylphenol	10.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U
67-72-1	Hexachloroethane	10.0 U
98-95-3	Nitrobenzene	10.0 U
78-59-1	Isophorone	10.0 U
88-75-5	2-Nitrophenol	10.0 U
105-67-9	2,4-Dimethylphenol	10.0 U
65-85-0	Benzoic Acid	50.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	10.0 U
120-83-2	2,4-Dichlorophenol	10.0 U
120-82-1	1,2,4-Trichlorobenzene	10.0 U
91-20-3	Naphthalene	10.0 U
106-47-8	4-Chloroaniline	10.0 U
87-68-3	Hexachlorobutadiene	10.0 U
59-50-7	4-Chloro-3-Methylphenol	10.0 U
91-57-6	2-Methylnaphthalene	10.0 U
77-47-4	Hexachlorocyclopentadiene	10.0 U
88-06-2	2,4,6-Trichlorophenol	10.0 U
95-95-4	2,4,5-Trichlorophenol	50.0 U
91-58-7	2-Chloronaphthalene	10.0 U
88-74-4	2-Nitroaniline	50.0 U
131-11-3	Dimethyl Phthalate	10.0 U
208-96-8	Acenaphthylene	10.0 U
99-09-2	3-Nitroaniline	50.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	10.0 U
51-28-5	2,4-Dinitrophenol	50.0 U
100-02-7	4-Nitrophenol	50.0 U
132-64-9	Dibenzofuran	10.0 U
121-14-2	2,4-Dinitrotoluene	10.0 U
606-20-2	2,6-Dinitrotoluene	10.0 U
84-66-2	Diethylphthalate	10.0 U
7005-72-3	4-Chlorophenyl-phenylether	10.0 U
86-73-7	Fluorene	10.0 U
100-01-6	4-Nitroaniline	50.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	50.0 U
86-30-6	N-Nitrosodiphenylamine (1)	10.0 U
101-55-3	4-Bromophenyl-phenylether	10.0 U
118-74-1	Hexachlorobenzene	10.0 U
87-86-5	Pentachlorophenol	50.0 U
85-01-8	Phenanthrene	10.0 U
120-12-7	Anthracene	10.0 U
84-74-2	Di-n-Butylphthalate	10.0 U
206-44-0	Fluoranthene	10.0 U
129-00-0	Pyrene	10.0 U
85-68-7	Butylbenzylphthalate	10.0 U
91-94-1	3,3'-Dichlorobenzidine	20.0 U
56-55-3	Benzo(a)Anthracene	10.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	110.0
218-01-9	Chrysene	10.0 U
117-84-0	Di-n-Octyl Phthalate	12.0
205-99-2	Benzo(b)Fluoranthene	10.0 U
207-08-9	Benzo(k)Fluoranthene	10.0 U
50-32-8	Benzo(a)Pyrene	10.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U
53-70-3	Dibenz(a,h)Anthracene	10.0 U
191-24-2	Benzo(g,h,i)Perylene	10.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
GW-19.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0242
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/25/88
Date Analyzed:2/25/88
Conc/Dil Factor: 1 pH: 7.2
Percent Moisture: N/A

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	7.1 B
67-64-1	Acetone	8.7 JB
-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	2.5 J
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
the result is a value greater than or equal to the detection mit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

①

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-19.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/01/88
Conc/Dil Factor:------------> 2
Percent Moisture: N/A

GPC Cleanup: Yes_____ No__XX__
Separatory Funnel Extraction: Yes_X_
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	20.0 U
111-44-4	bis(-2-Chloroethyl)Ether	20.0 U
95-57-8	2-Chlorophenol	20.0 U
541-73-1	1,3-Dichlorobenzene	20.0 U
106-46-7	1,4-Dichlorobenzene	20.0 U
100-51-6	Benzyl Alcohol	20.0 U
95-50-1	1,2-Dichlorobenzene	20.0 U
95-48-7	2-Methylphenol	20.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	20.0 U
106-44-5	4-Methylphenol	20.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U
67-72-1	Hexachloroethane	20.0 U
98-95-3	Nitrobenzene	20.0 U
78-59-1	Isophorone	20.0 U
88-75-5	2-Nitrophenol	20.0 U
105-67-9	2,4-Dimethylphenol	20.0 U
65-85-0	Benzoic Acid	100.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	20.0 U
120-83-2	2,4-Dichlorophenol	20.0 U
120-82-1	1,2,4-Trichlorobenzene	20.0 U
91-20-3	Naphthalene	20.0 U
106-47-8	4-Chloroaniline	20.0 U
87-68-3	Hexachlorobutadiene	20.0 U
59-50-7	4-Chloro-3-Methylphenol	20.0 U
91-57-6	2-Methylnaphthalene	20.0 U
77-47-4	Hexachlorocyclopentadiene	20.0 U
88-06-2	2,4,6-Trichlorophenol	20.0 U
95-95-4	2,4,5-Trichlorophenol	100.0 U
91-58-7	2-Chloronaphthalene	20.0 U
88-74-4	2-Nitroaniline	100.0 U
131-11-3	Dimethyl Phthalate	20.0 U
208-96-8	Acenaphthylene	20.0 U
99-09-2	3-Nitroaniline	100.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	20.0 U
51-28-5	2,4-Dinitrophenol	100.0 U
100-02-7	4-Nitrophenol	100.0 U
132-64-9	Dibenzofuran	20.0 U
121-14-2	2,4-Dinitrotoluene	20.0 U
606-20-2	2,6-Dinitrotoluene	20.0 U
84-66-2	Diethylphthalate	20.0 U
7005-72-3	4-Chlorophenyl-phenylether	20.0 U
86-73-7	Fluorene	20.0 U
100-01-6	4-Nitroaniline	100.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	100.0 U
86-30-6	N-Nitrosodiphenylamine (1)	20.0 U
101-55-3	4-Bromophenyl-phenylether	20.0 U
118-74-1	Hexachlorobenzene	20.0 U
87-86-5	Pentachlorophenol	100.0 U
85-01-8	Phenanthrene	20.0 U
120-12-7	Anthracene	20.0 U
84-74-2	Di-n-Butylphthalate	20.0 U
206-44-0	Fluoranthene	20.0 U
129-00-0	Pyrene	20.0 U
85-68-7	Butylbenzylphthalate	20.0 U
91-94-1	3,3'-Dichlorobenzidine	40.0 U
56-55-3	Benzo(a)Anthracene	20.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	110.0
218-01-9	Chrysene	20.0 U
117-84-0	Di-n-Octyl Phthalate	20.0 U
205-99-2	Benzo(b)Fluoranthene	20.0 U
207-08-9	Benzo(k)Fluoranthene	20.0 U
50-32-8	Benzo(a)Pyrene	20.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U
53-70-3	Dibenz(a,h)Anthracene	20.0 U
191-24-2	Benzo(g,h,i)Perylene	20.0 U

(1) - Cannot be separated from diphenylamine

FORM I

7

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5694

Client Sample ID: SW-1.13

PARAMETERS	RESULTS
GROSS ALPHA	< 2
GROSS BETA	< 3
GAMMA SPECTRALANALYSIS	ND
RADIUM-226	< 2*
THORIUM-232	< 1
URANIUM-238	1.88+/-0.90

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

* = HIGH SOLID SAMPLE LOWER DETECTION LIMIT CANNOT BE ACHIEVED.

I

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5715

Client Sample ID: SW-2.13

PARAMETERS	RESULTS
GROSS ALPHA	30+/-8
GROSS BETA	33+/-8
GAMMA SPECTRALANALYSIS	ND
RADIUM-226	1.6+/-1.0
THORIUM-232	4.64+/-0.90
URANIUM-238	29.97+/-7.65

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

②

DRILLING CONTRACTOR:
Driller: Dick Miller RDC.
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4¼" ID HSA
Nx Core

ENGINEERING-SCIENCE
DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY0 12 13

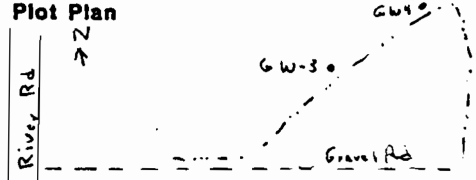
BORING NO. GW-3
Sheet 1 **of** 3
Location North of Site along stream between the road and GW-4

GROUND WATER OBSERVATIONS

Water Level	24.2'		
Time	11:00		
Date	12/3		
Casing Depth	111'		

Weather Clear
Date/Time Start 1/29/88 – 9:00 am
Date/Time Finish 2/2/88 – 5:00 pm

Plot Plan



Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	0 - 2	S-1	3/2	Red Brown Silt and Fine Sand (moist)	Cement / Bentonite Grout 2" PVC Riser	
	SS		4/7	2.0		
	Rec 4"					
0	10 - 12	S-2	9/11	Red Brown Silt, some Clay, Trace Fine Sand, Trace Fine Gravel (stiff) (moist)		
	SS		20/23			
	Rec 22					
0	20 - 22	S-3	8/9			
	SS		11/12			
	Rec 20"					
0	30 - 32	S-4	1/1			
	SS		4/5			
	Rec 24"					
0	40-42	S-5	↓			
	SS		3/6			
	Rec 24'					

SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary Red Brown Sandy Silt topsoil to 2' over Clayey Silt lacustrine deposits to 5' over Glacial till to 85' over Camillus Shale

②

DRILLING CONTRACTOR:
Driller: Dick Miller RDC
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4¼" ID HSA + NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY01213

BORING NO. GW-3
Sheet 2 **of** 3
Location

GROUND WATER OBSERVATIONS

Water Level		
Time		
Date		
Casing Depth		

Weather
Date/Time Start
Date/Time Finish

Plot Plan

See Sheet No. 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	50-52		Push	Red Brown Silt & Clay, Trace Fine Gravel (soft) (wet)		
	Shelby					
	Tube					
0	60-62	S-6	6/6	61.5'		
	SS		9/17			
	Rec 24					
0	65-67	S-7		Gray-Brown-Red Silt, Fine Sand and Clay (wet) (soft)		Rods Fell to get simple
	SS					
	Rec 24					
0	70-72	S-8	7/10		Cement / Bentonite Grout 2" PVC Riser	
	SS		7/11	Trace Fine Gravel		
	Rec 24					
				75'		
0	75-77	S-9	7/10	Gray Brown sand and Gravel Some silt, little Clay (wet)		
	SS		15/57			
	Rec 24'					
0	80-82	S-10	1/26			
	SS		44/52			
	Rec 24"					
				85'		
	87-97			Weathered shale		Boulder Auger Refusal 85' Rocked out to 87' Resume Augering To 99'
	Cored	10'				
	Rec 7	10.1'				
	RQD	0%				

SPT-STANDARD PENETRATION TEST

D = DRY W = WASHED C = CORED
U = UNDISTURBED SS = SPLIT SPOON
P = PIT A = AUGER CUTTINGS

Soil Stratigraphy Summary

②

DRILLING CONTRACTOR:
Driller: Dick Miller RDC
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4 1/4" ID HSA + Nx Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY01213

BORING NO. GW-3
Sheet 3 **of** 3
Location

GROUND WATER OBSERVATIONS

Water Level		
Time		
Date		
Casing Depth		

Weather
Date/Time Start
Date/Time Finish

Plot Plan

See Sheet No 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT
	101-111		
	Cored	10'	
	Rec	8.9'	
	Rec	36%	

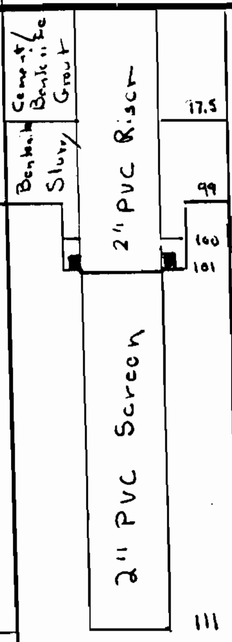
FIELD IDENTIFICATION OF MATERIAL

99' Auger Refusal

Gray and Green Shale, layers of calcite, gypsum and siltstone Weathered zones at 1', 2.5', 4.5' + 6.5'

111 Boring terminated

WELL SCHEMATIC



Comments

Rocked out 49 - 101'
Sand filled 100 - 101

SPT- STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary

②

DRILLING CONTRACTOR:
Driller: Dick Miller RDC
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4 ¼" ID HSA + NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY01213

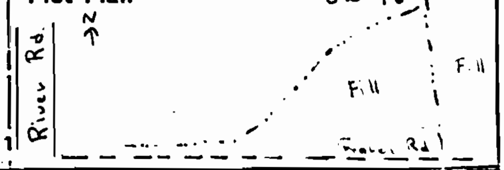
BORING NO. GW - 4
Sheet 1 **of** 3
Location Northeast of Site near marsh and western stream

GROUND WATER OBSERVATIONS

Water Level	10.0		
Time	9:00		
Date	1/26		
Casing Depth	80'		

Weather Fair
Date/Time Start 1/22/88 9:30 am
Date/Time Finish 1/26/88 2:00 pm

Plot Plan



Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	0-2	S-1	3/2	Dark Brown Fine Sand and Silt (Topsoil)		
	SS		3/5	2.0		
	Rec 14			Red Brown Silt, Trace fine Sand,		
				Clay, medium fine Gravel (moist) (stiff)		
0	5-7	S-2	8/13			
	SS		20/27			
	Rec 24					
0	10-12	S-3	4/8			
	SS		7/15			
	Rec 24					
				15.0'		
0	15-17	S-4	2/3	Red Brown Silt, some Clay (moist)		
	SS		3/4	(soft)		
	Rec 24					
				19'		
0	20-22	S-5	2/2	Red and Gray Silt and Clay (moist)	Cement/Bentonite Grout 2" PVC Riser	
	SS		2/4	(varved) (soft)		
	Rec 24"					
0	25-27	S-6	2/2			
	SS		3/4	(very soft)		
	Rec 24'					
0	30-32	S-7	3/3			
	SS		4/5	Trace fine Gravel		
	Rec 24"					
	35-37	S-8	push			
	Shelby					
	Tube					

SPT - STANDARD PENETRATION TEST
D - DRY   W - WASHED   C - CORED
U - UNDISTURBED   SS - SPLIT SPOON
P - PIT   A - AUGER CUTTINGS

Soil Stratigraphy Summary Dark Brown Silty Sand topsoil to 2' over Clayey Silt lacustrine deposits to 60' over Glacial till to 81' over Camillus Shale

②

DRILLING CONTRACTOR:
Driller: Dick Miller
Inspector: Wm Lilley
Rig Type Mobile 61
Drilling Method 4¼" ID HSA & NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY01213

BORING NO. GW-4
Sheet 2 of 3
Location

GROUND WATER OBSERVATIONS

Water Level		
Time		
Date		
Casing Depth		

Weather
Date/Time Start
Date/Time Finish

Plot Plan
See Sheet No. 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	40-42 SS Rec 24"	S-9	. ↓	Gray Brown Silt and Clay, Trace Fine Gravel, sand (wet) (soft) 45		Waight of Rods for Sample.
0	45-47 SS Rec 24"	S-10	5/5 8/12	Gray Brown Silt and Clay, little medium Fine Gravel (wet) (soft)		
0	50-52 SS Rec 8	S-11	3/3 6/9			
0	55-57 SS Rec 24"	S-12	↓	little medium Fine Gravel, Sand 60	Cement / Bentonite Grout 2" PVC Riser	Dropped rods to get sample
0	60-62 SS Rec 24	S-13	16/41 20/15	Gray Brown Fine sand and silt little medium Fine gravel trace Clay (wet) (sand in layers) (till)		
0	65-67 SS Rec 24"	S-14	27/27 40/48			
0	70-72 SS Rec 16	S-15	12/32 35/60	Gray Brown medium Fine sand, some silt, some medium Fine gravel trace Clay (till) (wet)		
0	75-77 SS Rec 9"	S-16	17/38 68/57			

SPT- STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary

②

ENGINEERING-SCIENCE
DRILLING RECORD

DRILLING CONTRACTOR:
Driller: Dick Miller
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4 1/4" ID HSA + NX core

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY0 12 13

BORING NO. GW-4
Sheet 3 of 3
Location

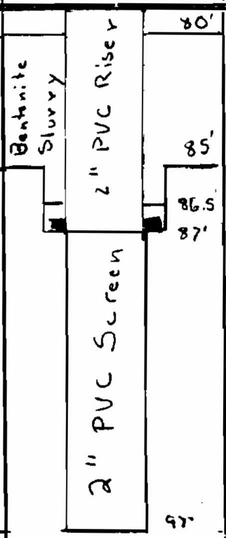
GROUND WATER OBSERVATIONS

Water Level		
Time		
Date		
Casing Depth		

Weather
Date/Time Start
Date/Time Finish

Plot Plan

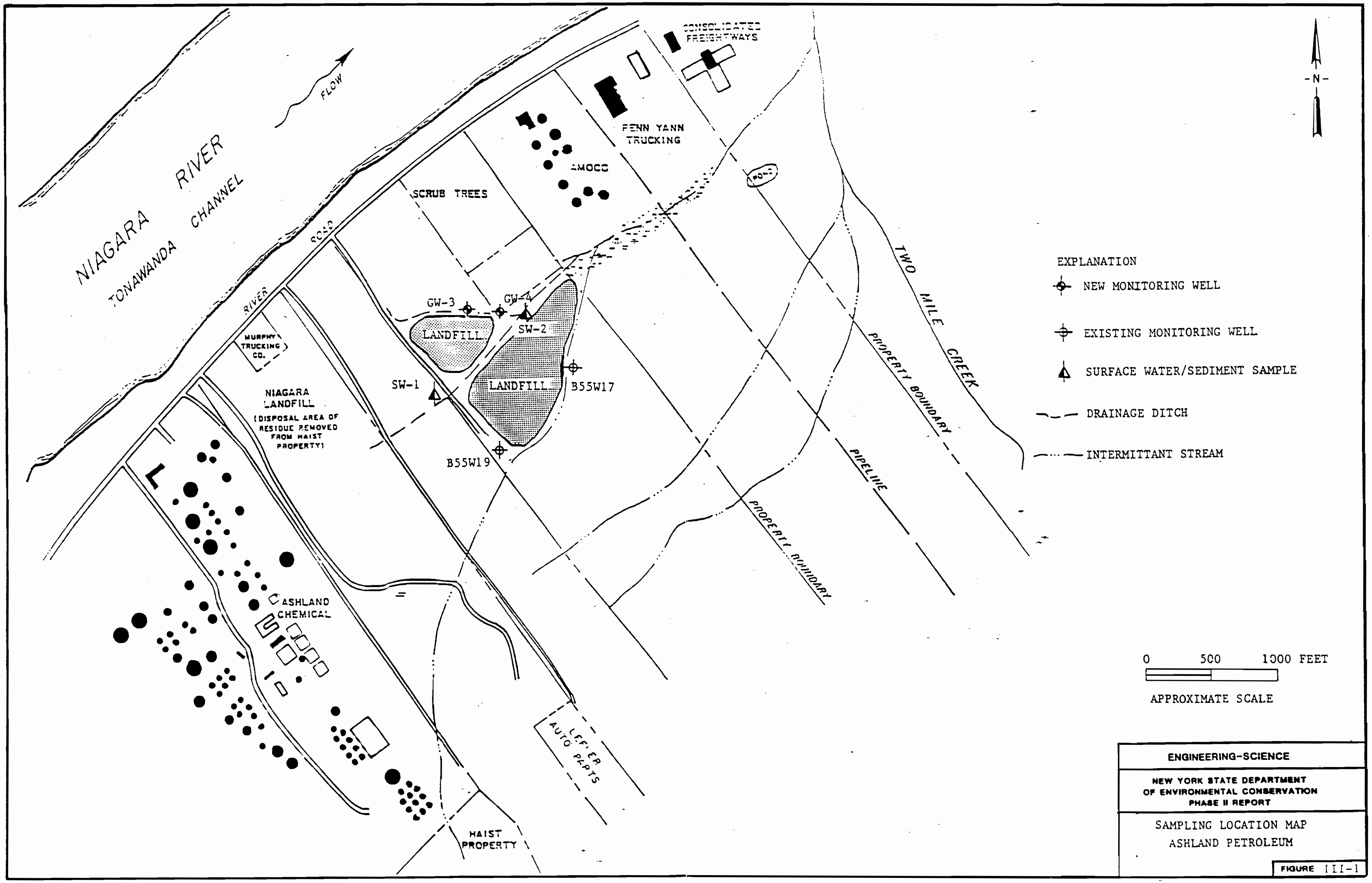
See Sheet No. 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	80-81	S-17	14/100-5"	81'		
	SS		/	Weathered Shale		
	Rec 9"					
				Auger Refusal 85'		
						Rockout 2'
						Collar on top
	87-97					of Screen
	C=1	10'		Gray and Green Shale, layers of calcite,		Sand 86.5'-87'
	Rec	8.5'		Gypsum and siltstone Weathered in		
	RQD	29%		upper layers.		
				Boring terminated at 97'		

SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary

②



ENGINEERING-SCIENCE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE II REPORT

SAMPLING LOCATION MAP
ASHLAND PETROLEUM

FIGURE III-1

3

DOE/OR/20722-181

PRELIMINARY GEOLOGICAL AND HYDROGEOLOGICAL CHARACTERIZATION REPORT FOR THE SOUTHERN PORTION OF THE ASHLAND 2 SITE TONAWANDA, NEW YORK

DECEMBER 1987

Prepared for
UNITED STATES DEPARTMENT OF ENERGY
OAK RIDGE OPERATIONS OFFICE
Under Contract No. DE-AC05-81OR20722

By
J.P. Lord, J.A. Blanke, and A.M. Feldman
Bechtel National, Inc.
Oak Ridge, Tennessee

Bechtel Job No. 14501

③

3.4 SITE HYDROGEOLOGY

3.4.1 Bedrock

The only aquifer encountered in the site investigation was the fractured Camillus shale formation, with the hydraulically connected basal silty sand and clayey gravel units. The possibility exists for silty sand lenses within the glacio-lacustrine clay overburden to be perched ground-water bodies, or even independent aquifers, but none were encountered in the boreholes. Some samples described in the borehole logs were termed "moist," but these samples did not appear to contain free water.

Permeability tests were conducted in the upper portion of the Camillus shale only. Permeability testing was not performed at the overburden/bedrock interface or in the overburden clay because difficulties in establishing a seal around the outside of the hollow-stem auger prevented testing in these regions. A falling head test was attempted at hole B55W19 within the basal clayey gravel, but the water level remained unchanged, and after 1 hour the test was abandoned.

Table 3-3 contains a summary of permeability test data. The results of the permeability testing program indicate that the upper portion of the Camillus shale has a variable permeability in the horizontal plane, and that the permeability of the shale is lower when the overburden above the shale is a clayey gravel rather than silt or sand (Fig. 3-9). This would indicate a hydraulic connection through fractures and joints between the upper portion of the Camillus shale and the basal glacial silty sand and clayey gravel units.

3.4.2 Overburden

Desiccation cracking at the surface is typical across the site. These cracks extend to depths of as much as 12 ft below ground

③

TABLE 3-3

SUMMARY OF FIELD PERMEABILITY TEST RESULTS[a]

Borehole Number[b]	Depth to Bedrock (ft)	Testing Interval (ft)	Permeability (k)		
			cm/sec[c]	ft/yr	gpd/ft^2
B55G16	85.0	87.1 - 94.7	7.4×10^{-4}	766	15.7
B55G18	73.8	76.0 - 84.0	1.1×10^{-3}	1062	21.8
B55W19 ←	72.5	74.0 - 81.9	1.1×10^{-4}	114	2.3
B55G20	91.5	93.2 - 101.5	8.1×10^{-4}	836	17.1
B55G21	88.6	90.3 - 98.5	3.8×10^{-4}	402	8.3
B55G22	87.3	89.3 - 97.3	6.4×10^{-4}	661	13.5
B55W23	85.5	86.5 - 93.1	1.8×10^{-5}	19	0.4
B55G24	84.8	88.1 - 96.2	3.5×10^{-4}	362	7.4
B55G25	84.7	87.7 - 95.5	4.4×10^{-5}	48	1.0
B55W27	75.8	78.8 - 86.0	1.1×10^{-5}	11	0.2
B55W28	86.0	87.0 - 90.3	1.2×10^{-4}	122	2.5
B55G29	78.6	82.3 - 88.4	1.5×10^{-4}	151	3.1

[a] The single packer, constant head (SPCH) type test was used. Permeability tests were conducted in the upper portion of the Camillus shale (the only aquifer encountered). Geologic and permeability test results suggest that the Camillus shale is hydraulically connected to the basal silty sands and clayey gravels immediately above the top of the shale.

[b] The prefix "B55W" is used to identify monitoring wells; "the B55G" prefix denotes geologic boreholes. No field tests were performed for holes B55W17, B55G26, and B55W30.

[c] The value in the table represents the average permeability for each borehole.

③

surface and are filled with gray clay and/or silt. Previous investigators surmised that the presence of the now-filled cracks had not appreciably altered the permeability of the surface deposits (Ref. 2). However, new cracks that may form during long periods of low precipitation would greatly increase the surface permeability to the depth of the openings. The overburden was not field tested for permeability due to the difficulty of establishing a seal around the outside of the auger.

3.4.3 Monitoring Wells

Six ground-water monitoring wells were installed to monitor the quality and level of the ground water at the site. The wells were installed with type 316 stainless steel, 2-in.-diameter screens and stainless steel riser pipes. The monitoring wells are identified with the prefix "B55W" to differentiate them from the boreholes, which are identified with the prefix "B55G." As-built well construction details are presented in Appendix D, and the well locations are shown in Figure 3-1. Table 3-4 is a summary of the monitoring well installation data.

3.4.4 Ground-Water Movement

To provide a valid basis for describing ground-water movement in the region, data on ground-water in the Camillus shale must be collected for at least one year. Since initial measurements were obtained in August 1987, insufficient data are available to support a description of ground-water movement. Data on flow direction, gradient, and velocity will be obtained on a weekly basis for the first year and will be contained in the report on Phase II geological and hydrogeological characterization of the area. Measurements will be obtained on a biweekly basis during the second year, and on a monthly basis thereafter.

③

TABLE 3-4

MONITORING WELL INSTALLATION DATA

Borehole Number	Elevation (m.s.l.)			Depth to Bottom of Well
	Ground Surface	Riser Pipe	Screened Interval	
B55W17 ←	594.12	594.50	510.0-499.0	90.0
B55W19 ←	590.02	591.09	524.4-509.1	81.9
B55W23	596.65	597.96	518.5-503.4	93.1
B55W27	604.37	605.92	532.1-516.5	86.0
B55W28	602.33	603.73	518.1-505.8	95.3
B55W30	603.90	606.23	584.0-574.0	32.0

*Borehole B55W30 was drilled to a depth of 55 ft. The segment of the borehole beneath the well (the 32- to 55-ft portion) was grouted.

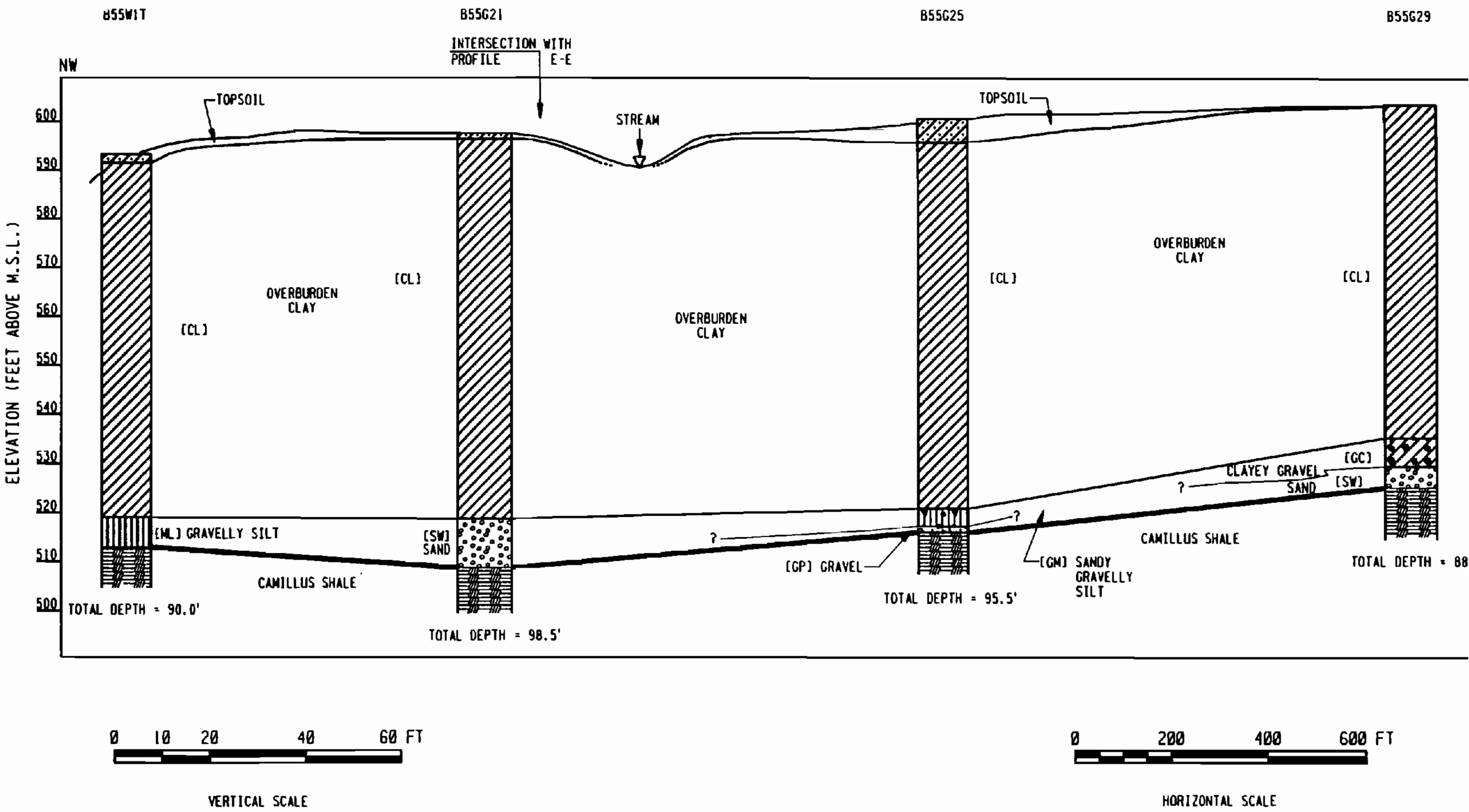


FIGURE 3-4 GEOLOGIC CROSS SECTION B-B

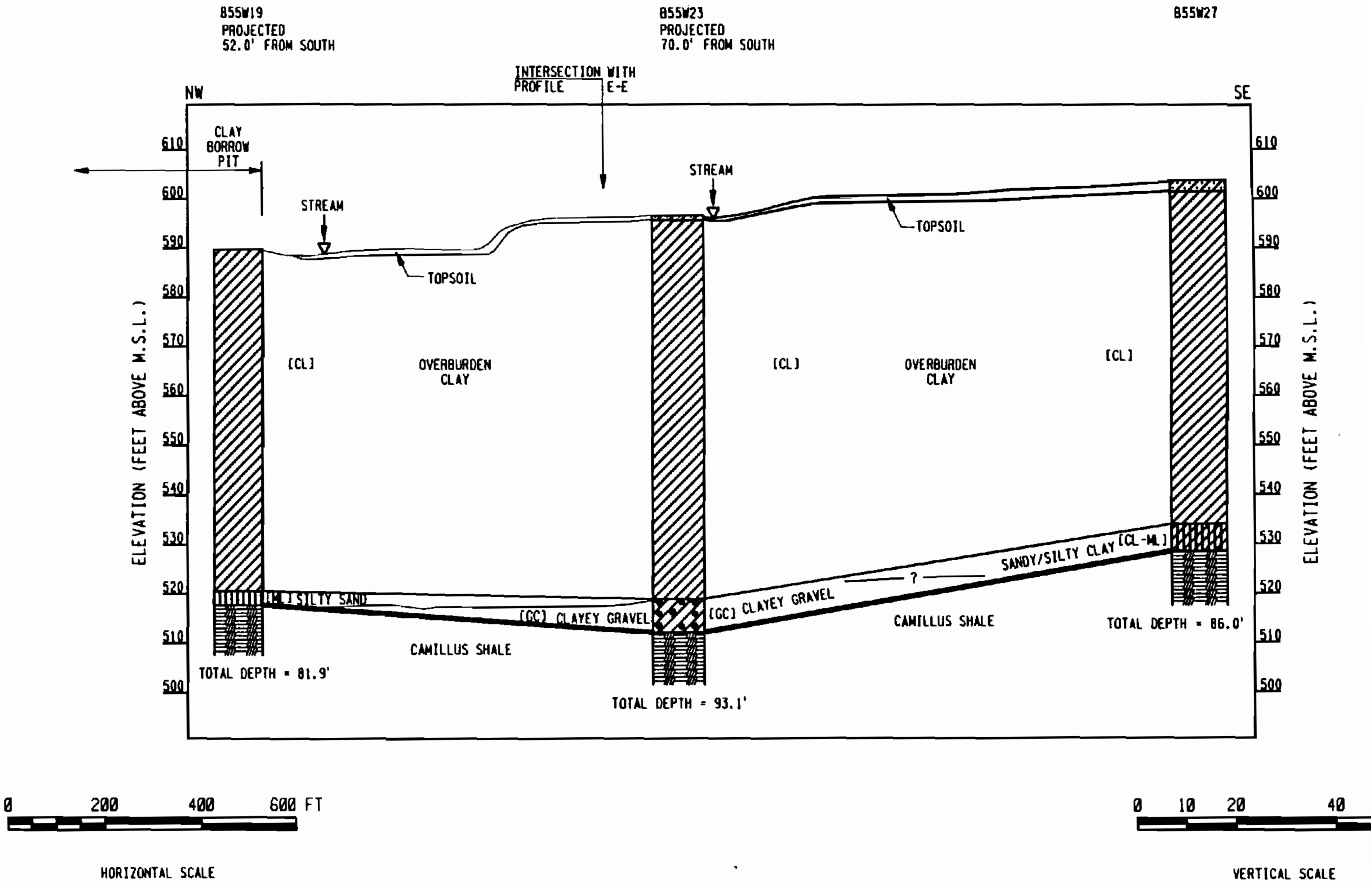


FIGURE 3-6 GEOLOGIC CROSS SECTION D-D

③

BECHTEL

③

GEOLOGIC DRILL LOG

PROJECT FUSRAP		JOB NO. 14501-155	SHEET NO. 1 OF 3	HOLE NO. B55W17
SITE Ashland	COORDINATES N2750.1 E3003.8		ANGLE FROM HORIZ. 90°	BEARING N/A

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
5/19/87	6/3/87	EARTH DIMENSIONS	MOBILE B-61	12	80.0	10.0	90.0

CORE RECOVERY (FT./%)	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
10.0 /100	1 BOX	16		594.12	10.1 / 584.02	80.0 / 514.12

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
140 LBS /30 IN.	2 /89.45	G. CHERRY

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M. 1ST 6"	WATER PRESSURE TESTS: PRESSURE P.S.I. 2ND 6"	WATER PRESSURE TESTS: TIME IN MINUTES 3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							594.12	0				
SS 2	24	18	5	1	2	3/3			▨	1	0.0-73.0 FT <u>SILTY CLAY (CL)</u>: REDDISH BROWN ROCK FRAGMENTS (2-5%) Z 5 MM. 0.0-4.0 FT SAMPLES FOR RADIOLOGICAL TESTING, BY EBERLINE - TMA. 3.7-4.0 FT LIGHT GRAY DESICCATION CRACKS.	HOLE DRILLED WITH HOLLOW STEM AUGERS 4.75 IN. ID 7.5 IN. OD TO 80'. 3" DIAMOND CORE TO 90'. SAMPLES 1 & 2 TAKEN BY EBERLINE-TMA.
SS 2	24	20	20	2	8	12/16			▨	2		
SS 2	24	17	25	1	12	13/12		5	▨	3		
									▨			
SS 2	24	19.5	26	6	12	14/17		10	▨	4		▽ 5/19/87
									▨			
SS 2	24	13.5	9	4	4	5/7		15	▨	5		WELL WAS INSTALLED BY REAMING SOIL WITH 12" AUGER TO 80', AND 8" ROLLER CONE TO 90'.
									▨			
SS 2	24	17	8	2	3	5/6		20	▨	6		
									▨			
SS 2	24	24	5	2	2	3/4		25	▨	7	25.0-73.0 FT MODERATE BROWN TO GRAY BROWN WITH RED BROWN SILT LENSES. ROCK FRAGMENTS 5-10 MM (2%).	
									▨			
SS 2	24	14	7	3	3	4/6		30	▨	8		
									▨			
SS 2	24	20	8	2	4	4/4	559.12	35	▨	9		

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER	SITE Ashland	HOLE NO. B55W17

③

GEOLOGIC DRILL LOG

PROJECT: FUSRAP

JOB NO.: 14501-155

SHEET NO.: 2 OF 3

HOLE NO.: B55W17

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH OF CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS OR PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							559.12	35	▨		SILTY CLAY (CL): MODERATE BROWN TO GRAY BROWN WITH THIN LAYERS OF ROCK FRAGMENTS 5-10 MM (2-5%).	
SS 2	24	18.5	9	2	4	5/5			▨	10		
								40	▨			
SS 2	24	22.5	8	3	3	5/6			▨	11		
								45	▨			
SS 2	24	20.5	9	3	4	5/6			▨	12		
								50	▨			
SS 2	24	22.5	12	4	5	7/7			▨	13		
								55	▨			
SS 2	24	24	12	3	5	7/7			▨	14		
								60	▨			
SS 2	24	20	9	3	4	5/4			▨	15		
								65	▨			
SS 2	24	22	8	3	4	4/5			▨	16		
								70	▨			
SS 2	23	22	129	17	29	100/66	521.12 519.12	75	▥	17	73.0-80.0 FT GRAVELLY SILT (ML): BROWNISH GRAY (5YR4/1).	

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER

SITE: Ashland

HOLE NO.: B55W17

③

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	H501-155	3 OF 3	B55W17

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							519.12	75				
SS 2	23	23	49	7	12	37/100				18		WATER FLOWING ON SURFACE AT 79.2 FT.
NX CORE 3	1.5	1.4	93				514.12	80		RUN 1	80.0-90.0 FT <u>SHALE</u>: (N3) MEDIUM GRAY, GYPSUM NODULES AND VEINS 00-1520 SMALL SOLUTION CAVITIES. BRITTLE, MEDIUM SOFT, SATURATED.	
	4.6	4.6	100							RUN 2		
	3.9	3.9	100					85		RUN 3		
							504.12	90			BOTTOM OF BORING AT 90.0 FT.	ALL SOIL AND ROCK COLOR DESCRIPTION FROM THE ROCK COLOR CHART PRINTED BY THE G.S.A. 1948.

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENNISON; P=PITCHER; O=OTHER

SITE	HOLE NO.
Ashland	B55W17

③

GEOLOGIC DRILL LOG

PROJECT: FUSRAP
JOB NO.: 14501-155
SHEET NO.: 1 OF 3
HOLE NO.: B55W19
SITE: Ashland
COORDINATES: N2051.0 E3001.1
ANGLE FROM HORIZ.: 90°
BEARING: N/A
BEGUN: 6/20/87
COMPLETED: 6/23/87
DRILLER: EARTH DIMENSIONS
DRILL MAKE AND MODEL: MOBILE B-61
HOLE SIZE: 6¼
OVERBURDEN (FT.): 72.5
ROCK (FT.): 9.4
TOTAL DEPTH: 81.9
CORE RECOVERY (FT./%): 8.8 - 94%
CORE BOXES: 1 BOX
SAMPLES: 11
EL. TOP OF CASING: N/A
GROUND EL.: 590.02
DEPTH/EL. GROUND WATER: ~15.0 /575.0
DEPTH/EL. TOP OF ROCK: 72.5/517.52
SAMPLE HAMMER WEIGHT/FALL: 140 LBS /30 IN.
CASING LEFT IN HOLE: DIA./LENGTH: NONE
LOGGED BY: G. CHERRY /S. BALONE

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M. 1ST 6"	WATER PRESSURE TESTS: PRESSURE P.S.I. 2ND 6"	WATER PRESSURE TESTS: TIME IN MINUTES 3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							590.02	0				
SS 2	24	18.5	34	10	12	22/22				1	0.0-70.0 FT SILTY CLAY (CL): PALE BROWN (5YR5/2), DRY WITH DESSICATION CRACK SAND 2% ROCK FRAGMENTS.	BORING ADVANCED WITH 4 1/4 IN. X 6 IN. DIA HOLLOW STEM AUGER FROM 0-72.5'. 3" DIAMOND CORE FROM 72.5' TO 81.9'.
SS 2	24	14	28	7	11	17/18				2	SIMILAR TO ABOVE, MODERATE BROWN (5YR4/4).	
SS 2	24	18	23	4	9	14/14		5		3	SIMILAR TO SS #2, SLIGHTLY SOFTER WITH 1/2 IN. ROCK FRAGMENTS.	
SS 2	24	15	16	5	8	8/8		10		4	SIMILAR TO SS #3 WITH LOCALIZED SAND POCKETS AND 5-10% ROCK FRAGMENTS.	
								15				▽ 6/19/87
SS 2	24	16	12	2	4	8/5				5		SAMPLES 1 AND 2 TAKEN BY EBERLINE-TMA.
SS 2	24	18	5	1	2	3/3		20		6	SIMILAR TO BOTTOM OF SS #5, MOIST.	
								25				
SS 2	24	24	5	1	2	3/3		30		7	PALE BROWN (5YR4/2) SILTY CLAY WITH 2-4% ROCK FRAGMENTS.	
							555.02	35				

SS-SAMPLE SPOON; ST-SHELBY TUBE; D-DENISON; P-PITCHER; O-OTHER

SITE: Ashland
HOLE NO.: B55W19

GEOLOGIC DRILL LOG	PROJECT FUSRAP	JOB NO. 14501-155	SHEET NO. 2 OF 3	HOLE NO. B55W19

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS OR PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							555.02	35				
SS 2	24	24	4	1	2	2/3		40		8		
								45				
SS 2	24	24	W.O.R.	W.O.R.				50		9		WOR = WEIGHT OF RODS
								55				
SS 2	24	24	4	1	2	2/5		60		10	SIMILAR TO SS #9.	
								65				
											70.0-72.5 FT SILTY SAND (ML): OLIVE GRAY (5Y4/1) WITH 10-15% GRAVEL, SATURATED.	
SS 2	13	6	85/7	34	35	50/1"	520.02	70		11		
NX CORE 3	60	54	90				517.52	72.5		RUN 1	72.5-81.9 FT SHALE: SATURATED, DARK GRAY (N3) MEDIUM SOFT TO MEDIUM HARD, UP TO 50% GYPSUM AS THIN BEDS BETWEEN SHALE AND SECONDARY DEPOSIT IN FRACTURES AND SOLUTION CAVITIES.	CAMILLUS SHALE AUGER REFUSAL AT 72.5 FT.
							515.02	75				

SS=SPLIT SPOON, ST=SHELBY TUBE, D=DENISON, P=PITCHER, O=OTHER	SITE Ashland	HOLE NO. B55W19

③

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-155	3 OF 3	B55W19

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS 6" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							515.02	75			
	60	54	90								
NX CORE 3	53	52	98					80	RUN 2	80.3-80.6 FT LARGE SOLUTION CAVITIES.	
							508.12	81.9		BOTTOM OF BORING AT 81.9 FT. PERMEABILITY TEST PERFORMED. AP= AVERAGE LENGTH OF CORE PIECES RECOVERED. LP= LONGEST PIECE OF CORE RECOVERED. RQD= ROCK QUALITY DESIGNATION.	ALL SOIL AND ROCK COLOR DESCRIPTIONS ARE FROM THE *ROCK COLOR CHART*, PRINTED BY THE G.S.A. 1948.

RUN	AP FT	LP FT	RQD (%)
1	0.2	0.5	30
2	0.3	0.9	48

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER

SITE	HOLE NO.
Ashland	B55W19

4

Table IV-3

Water Level Data
Ashland Petroleum Company Site

Well ID	Ground Surface Elevation (Feet*)	Top of PVC Well Pipe Elevation (Feet*)	Well Screen Interval Elevation (Feet*)	Depth to Water Level (Feet**)	Water Level Elevation (Feet*)
GW-17	594.1	594.5	513.5-508.5	26.0	568.5
GW-19	590.0	591.1	518.2-513.2	22.6	568.5
GW-3	596.3	598.3	495.3-485.3	30.6	567.7
GW-4	589.3	591.5	502.3-492.3	23.4	568.1

Note: Water Levels measured on February 23, 1988.

* - Above mean sea level.

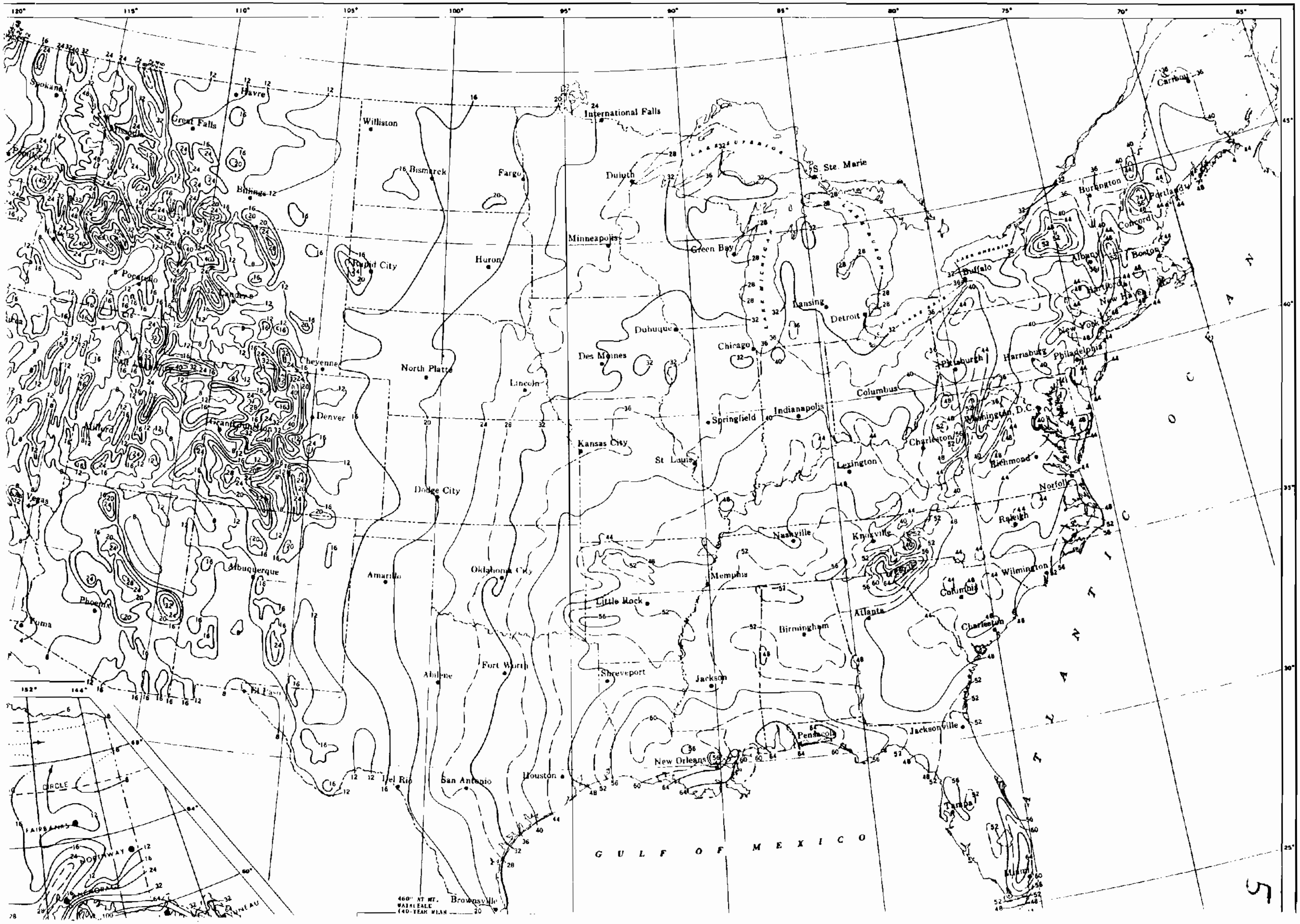
** - Water level depth from top of PVC

CLIMATIC ATLAS OF THE UNITED STATES

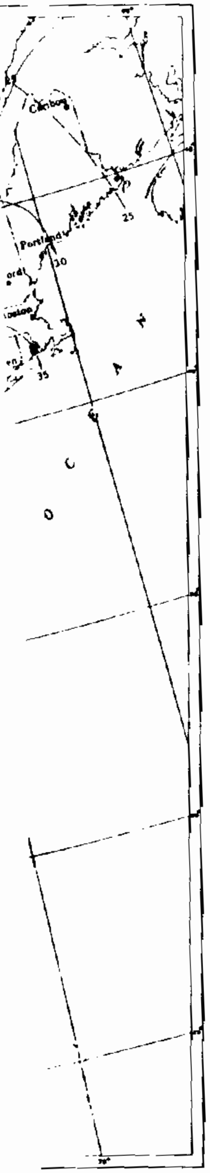
U.S. DEPARTMENT OF COMMERCE . Environmental Science Services Administration . Environmental Data Service

(5)

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)



AN AND LAKE EVAPORATION



MEAN ANNUAL LAKE EVAPORATION
(In Inches)

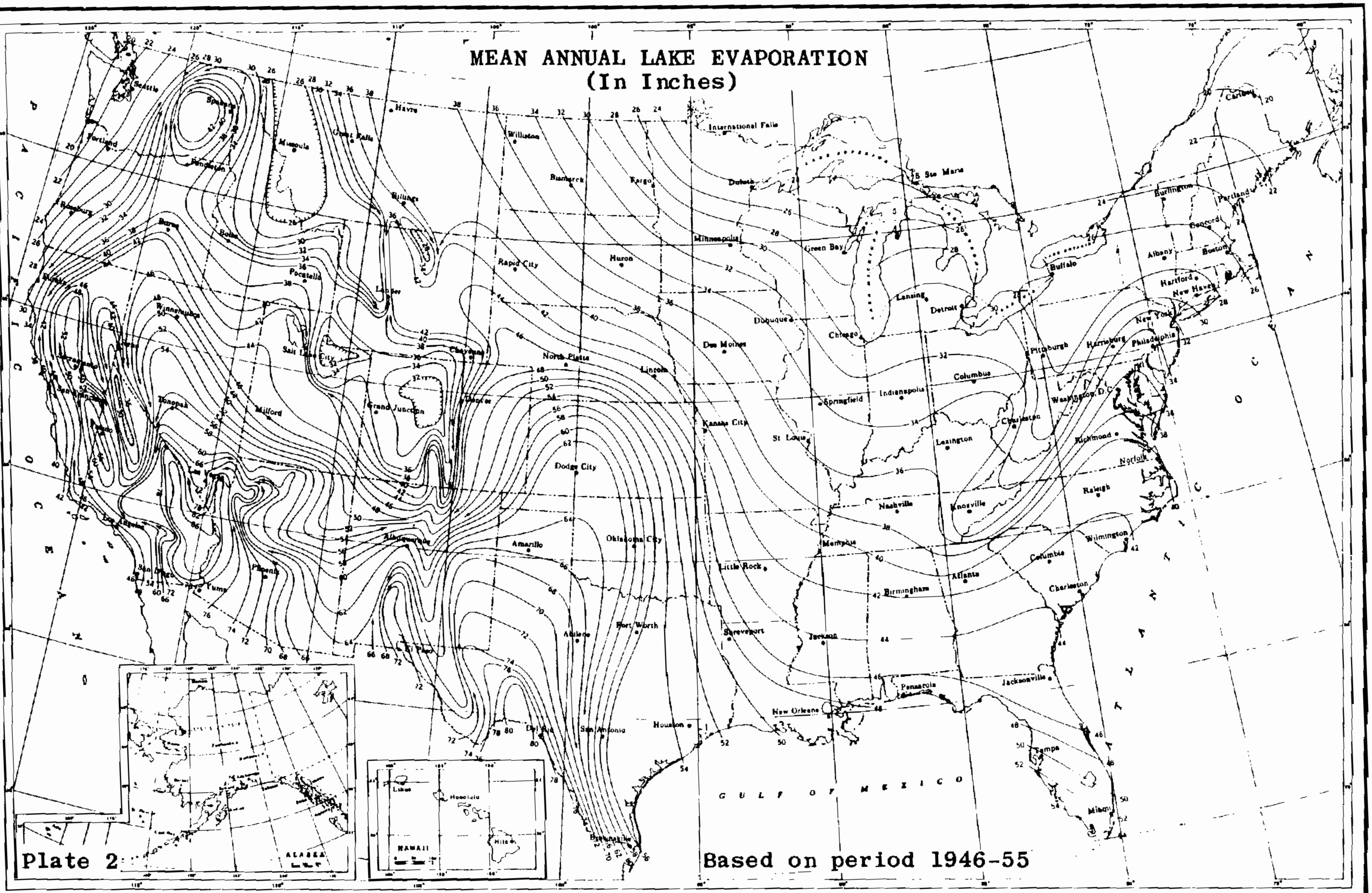
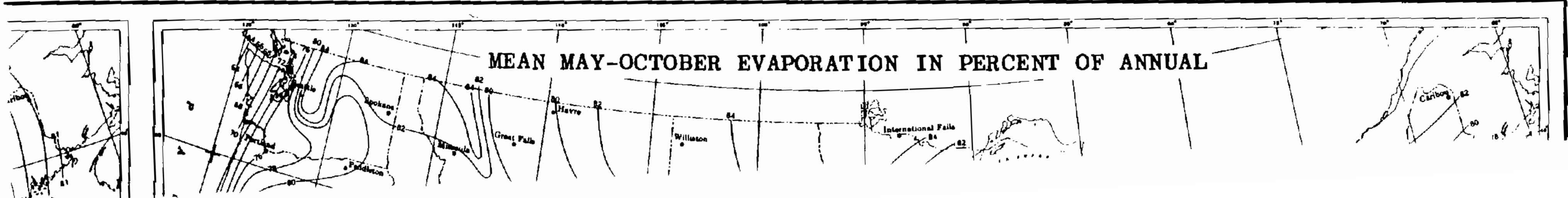


Plate 2

Based on period 1946-55

MEAN MAY-OCTOBER EVAPORATION IN PERCENT OF ANNUAL



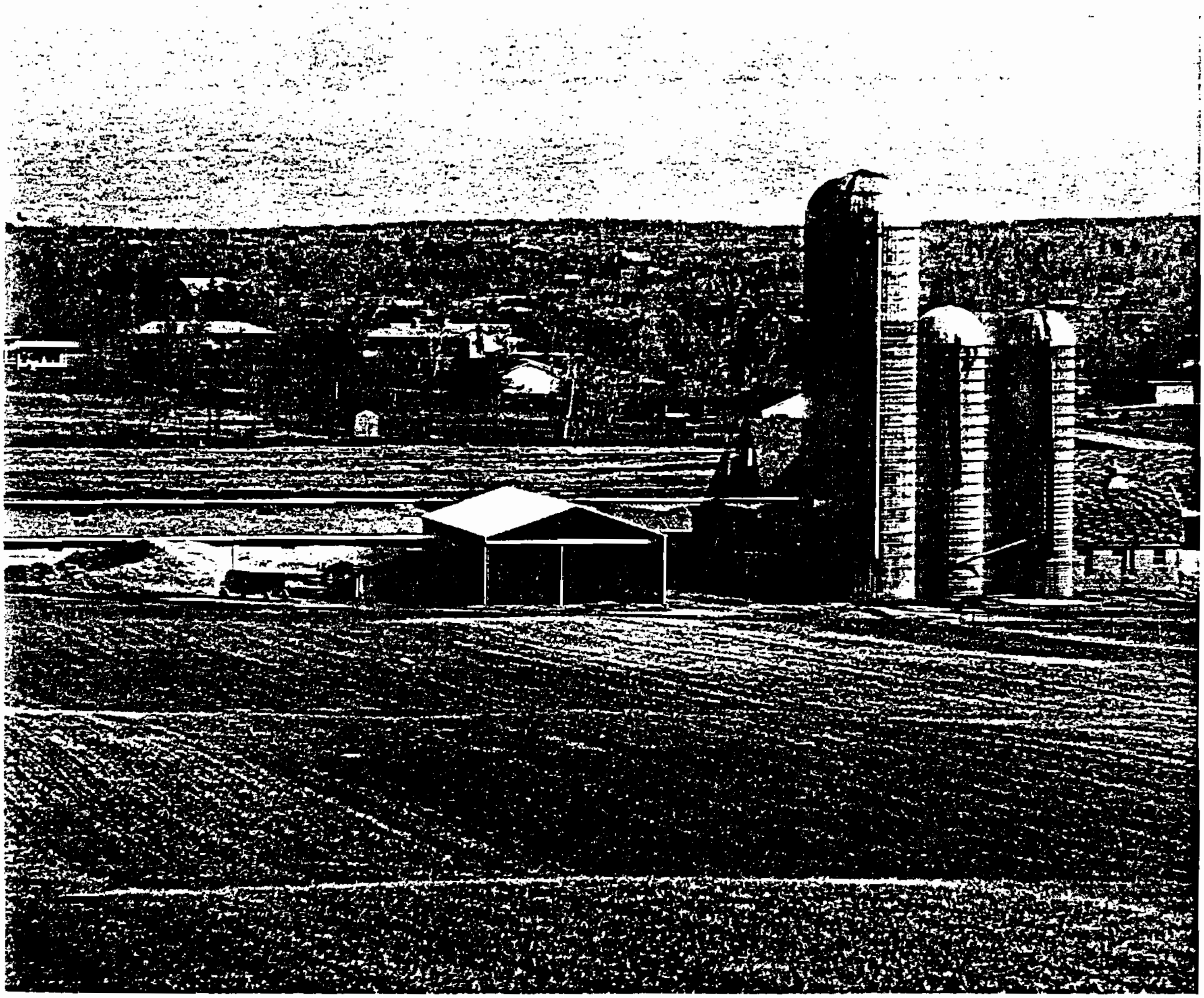
United States
Department of
Agriculture

Soil
Conservation
Service

In Cooperation with
the Cornell University
Agricultural
Experiment Station

Soil Survey of Erie County, New York

6

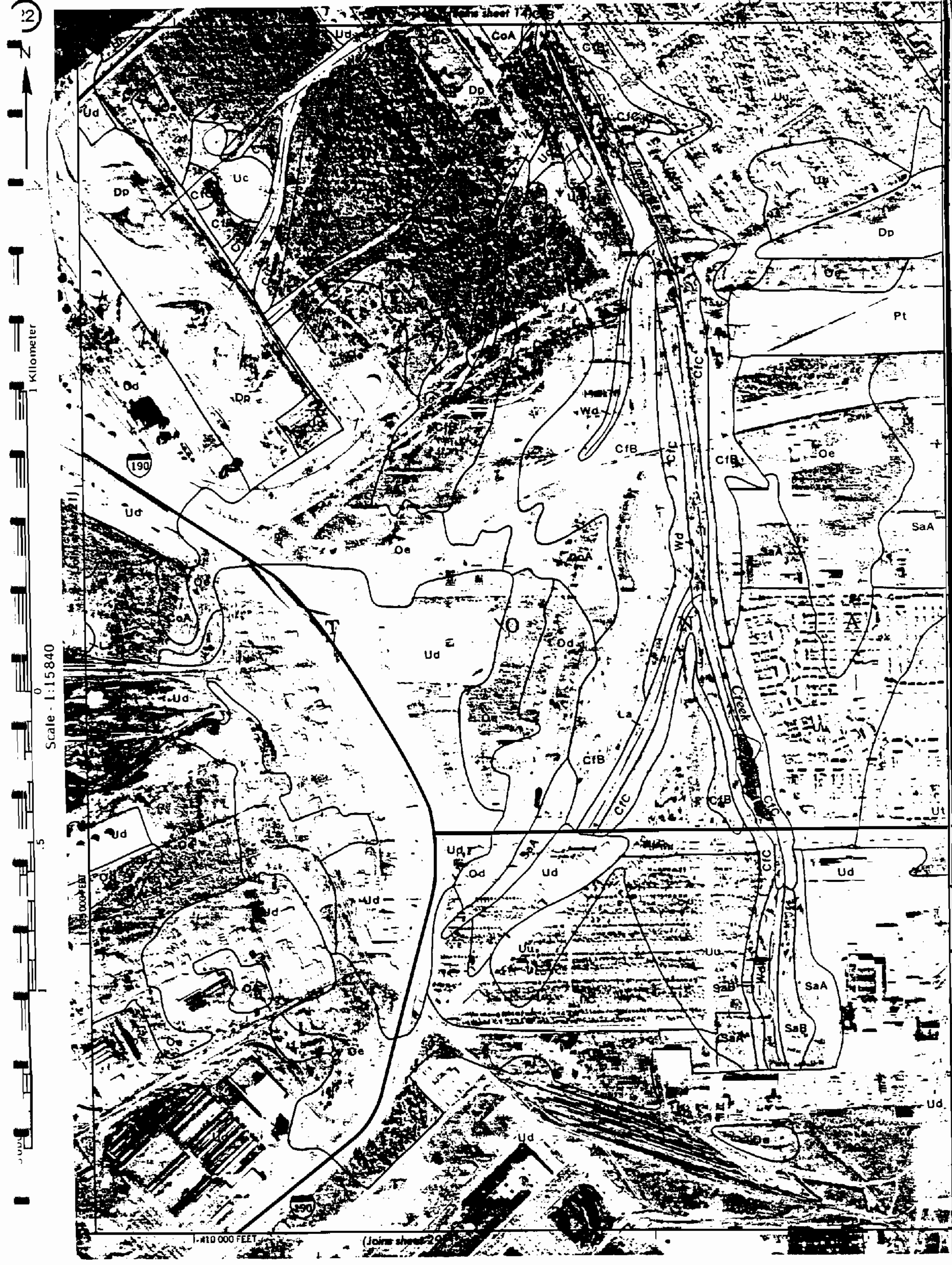


6

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay <0.002mm	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
Cc, Cd	0-9	18-35	1.00-1.25	0.6-2.0	0.20-0.35	5.6-7.8	Low	0.49	3	4-15
Canandaigua	9-37	18-35	1.20-1.40	0.2-0.6	0.19-0.20	6.1-7.8	Low	0.49		
	37-60	18-35	1.15-1.40	0.2-0.6	0.19-0.20	6.6-8.4	Low	0.49		
CeA, CeB	0-8	6-18	1.10-1.40	0.6-6.0	0.09-0.16	4.5-6.0	Low	0.24	3	4-10
Castile	8-31	4-15	1.25-1.55	2.0-6.0	0.05-0.13	4.5-6.0	Low	0.20		
	31-65	2-10	1.45-1.65	>6.0	0.01-0.02	5.1-7.3	Very low	0.17		
CfB, CfC	0-10	10-35	1.00-1.25	0.6-2.0	0.15-0.21	5.6-7.3	Low	0.49	3	2-6
Cayuga	10-26	28-40	1.20-1.40	0.06-0.2	0.11-0.17	5.6-7.8	Low	0.28		
	26-60	5-40	1.60-1.85	0.06-0.2	0.08-0.18	6.6-8.4	Low	0.28		
CgB, CgC	0-11	15-35	1.00-1.25	0.6-2.0	0.13-0.21	5.6-7.3	Low	0.37	3	3-8
Cazenovia	11-32	28-35	1.20-1.40	0.2-0.6	0.09-0.16	5.6-7.3	Moderate	0.37		
	32-60	20-35	1.60-1.85	0.06-0.2	0.11-0.17	6.6-8.4	Low	0.28		
Ch	0-9	5-15	1.20-1.50	6.0-20	0.08-0.15	5.6-7.3	Very low	0.28	3	3-9
Cheektowaga	9-22	1-9	1.20-1.50	6.0-20	0.05-0.07	5.6-7.3	Very low	0.17		
	22-26	1-9	1.20-1.50	6.0-20	0.05-0.07	5.6-8.4	Very low	0.17		
	26-60	28-60	1.10-1.40	<0.2	0.12-0.17	6.6-8.4	Moderate	0.28		
CkA, CkB, CkC,										
CkD	0-8	6-18	.85-1.40	0.6-6.0	0.08-0.15	4.5-5.5	Low	0.24	3	3-6
Chenango	8-30	6-18	1.00-1.55	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.20		
	30-60	1-8	1.45-1.65	6.0-20.0	0.01-0.03	5.1-7.8	Low	0.17		
ClA, ClB	0-8	6-18	.85-1.4	0.6-6.0	0.08-0.15	4.5-5.5	Low	0.24	3	3-6
Chenango	8-30	6-18	1.01-.155	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.20		
	30-72	1-8	1.45-1.65	6.0-20	0.01-0.03	5.1-7.8	Low	0.17		
CmE*:										
Chenango	0-8	6-18	.85-1.40	0.6-6.0	0.08-0.15	4.5-5.5	Low	0.24	3	3-6
	8-30	6-18	1.00-1.55	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.20		
	30-60	1-8	1.45-1.65	6.0-20.0	0.01-0.03	5.1-7.8	Low	0.17		
Palmyra	0-9	10-27	1.10-1.40	0.6-2.0	0.10-0.16	5.6-7.3	Low	0.24	3	3-7
	9-28	10-35	1.25-1.55	0.6-2.0	0.07-0.15	6.1-7.8	Low	0.28		
	28-60	0-5	1.45-1.65	>20	0.01-0.02	7.4-8.4	Low	0.17		
Cn	0-13	10-27	1.10-1.40	0.6-2.0	0.14-0.21	4.5-6.5	Low	0.32	3	3-10
Chippewa	13-36	10-35	1.70-2.00	<0.2	0.01-0.02	5.1-7.3	Low	0.28		
	36-60	10-35	1.65-1.95	<0.2	0.01-0.02	5.6-8.4	Low	0.28		
CoA, CoB	0-11	15-35	1.00-1.25	0.6-2.0	0.16-0.21	5.6-7.3	Low	0.49	3	2-6
Churchville	11-26	40-60	1.20-1.40	<0.2	0.13-0.17	6.1-7.8	Moderate	0.28		
	26-60	15-40	1.50-1.80	<0.2	0.07-0.17	7.4-8.4	Low	0.28		
CrA, CrB	0-10	1-3	1.20-1.50	6.0-20	0.08-0.09	5.1-7.3	Very low	0.17	3	2-6
Claverack	10-35	1-3	1.20-1.50	6.0-20	0.05-0.07	5.1-7.3	Very low	0.17		
	35-60	30-50	1.15-1.40	<0.2	0.12-0.17	6.6-8.4	Moderate	0.28		
CsA, CsB, CsC	0-10	15-27	1.20-1.50	0.6-2.0	0.14-0.21	5.1-7.3	Low	0.49	3	2-5
Collamer	10-15	15-27	1.20-1.50	0.6-2.0	0.14-0.20	5.1-7.3	Low	0.43		
	15-32	18-35	1.20-1.50	0.2-0.6	0.16-0.20	5.6-7.8	Low	0.43		
	32-60	4-27	1.45-1.65	0.06-0.6	0.12-0.20	6.1-8.4	Low	0.64		
CtB	0-8	15-27	1.2-1.5	0.6-2.0	0.14-0.21	5.1-7.3	Low	0.49	3	2-5
Collamer	8-15	15-27	1.2-1.5	0.6-2.0	0.14-0.20	5.1-7.3	Low	0.43		
	15-48	18-35	1.2-1.5	0.2-0.6	0.16-0.20	5.6-7.8	Low	0.43		
	48-60	10-35	1.7-1.95	0.6-0.06	0.08-0.13	6.1-8.4	Low	0.28		
CuB, CuC	0-7	.5-2	1.20-1.50	2.0-20	0.09-0.10	5.1-6.5	Low	0.24	4	1-2
Colonie	7-60	.5-2	1.20-1.50	2.0-20	0.06-0.08	5.1-6.5	Low	0.24		
	60-70	.5-2	1.45-1.65	2.0-20	0.02-0.06	5.6-7.3	Low	0.24		

See footnote at end of table.


32
N
1 Kilometer
0
Scale - 1:15 840
.5
1
(Joins sheet 14)
Ud
Ud
CoA
CfB
Dp
Ud
Uc
CfC
Ud
Dp
CfB
CfB
Uu
Uu
Dp
Oe
Pt
Od
Dp
Ud
Wd
CfB
CfC
CfB
Oe
190
Ud
Oe
CoA
SaA
SaA
CoA
T
O
Ud
Od
N
A
Ud
Oe
La
CfB
CfC
Creek
CfB
CfC
Ut
Ud
Ud
SaA
Od
Ud
Oe
Ud
Ud
CfC
Ud
Oe
Uu
Uu
Od
SaB
Wd
SaA
SaB
SaA
Oe
Oe
Ud
Ud
Ud
Oe
190
1 410 000 FEET
(Joins sheet 29)

SOIL LEGEND

The publication symbol consists of letters. The first letter, always a capital, is the initial letter of the map unit name. The second letter is a small letter. The third letter, always a capital, A, B, C, D, E, or F, indicates the slope. Symbols without a slope letter are those of nearly level soils. A final number, 3, shows that the soil is severely eroded.

SYMBOL	NAME
AlA	Allard silt loam, 0 to 3 percent slopes
AlB	Allard silt loam, 3 to 8 percent slopes
AmA	Alton fine gravelly loam, 0 to 3 percent slopes
AmB	Alton fine gravelly loam, 3 to 8 percent slopes
AmC	Alton fine gravelly loam, 8 to 15 percent slopes
AnB	Alton gravelly loam, silty substratum, 3 to 8 percent slopes
AnC	Alton gravelly loam, silty substratum, 8 to 15 percent slopes
AoA	Angola silt loam, 0 to 3 percent slopes
AoB	Angola silt loam, 3 to 8 percent slopes
ApA	Appleton silt loam, 0 to 3 percent slopes
ApB	Appleton silt loam, 3 to 8 percent slopes
ArB	Arkport very fine sandy loam, 3 to 8 percent slopes
ArC	Arkport very fine sandy loam, 8 to 15 percent slopes
ArD	Arkport very fine sandy loam, 15 to 25 percent slopes
ArE	Arkport very fine sandy loam, 25 to 40 percent slopes
AuC	Aurora shaly silt loam, 8 to 15 percent slopes
Ba	Beaches
BkA	Benson very cherty loam, 0 to 3 percent slopes
BkB	Benson very cherty loam, 3 to 8 percent slopes
BkC	Benson very cherty loam, very rocky, 8 to 15 percent slopes
BnB	Benson-Rock outcrop complex, 3 to 8 percent slopes
BlA	Blasdell shaly silt loam, 0 to 3 percent slopes
BlB	Blasdell shaly silt loam, 3 to 8 percent slopes
BlC	Blasdell shaly silt loam, 8 to 15 percent slopes
BlD	Blasdell shaly silt loam, 15 to 25 percent slopes
BrA	Brockport silty clay loam, 0 to 3 percent slopes
BrB	Brockport silty clay loam, 3 to 8 percent slopes
Ca	Canadice silt loam
Cb	Canadice silt loam, shale till substratum
Cn	Canandaigua silt loam
Cd	Canandaigua mucky silt loam
CeA	Castile gravelly loam, 0 to 3 percent slopes
CeB	Castile gravelly loam, 3 to 8 percent slopes
CfB	Cayuga silt loam, 3 to 8 percent slopes
CfC	Cayuga silt loam, 8 to 15 percent slopes
CgB	Cazenovia silt loam, 3 to 8 percent slopes
CgC	Cazenovia silt loam, 8 to 15 percent slopes
Ch	Cheektowaga fine sandy loam
CkA	Chenango gravelly loam, 0 to 3 percent slopes
CkB	Chenango gravelly loam, 3 to 8 percent slopes
CkC	Chenango gravelly loam, 8 to 15 percent slopes
CkD	Chenango gravelly loam, 15 to 25 percent slopes
ClA	Chenango channery silt loam, fan, 0 to 3 percent slopes
ClB	Chenango channery silt loam, fan, 3 to 8 percent slopes
CmE	Chenango and Palmyra soils, 25 to 40 percent slopes
Cu	Chippewa silt loam
CwA	Churchville silt loam, 0 to 3 percent slopes
CwB	Churchville silt loam, 3 to 8 percent slopes
CrA	Claverack loamy fine sand, 0 to 3 percent slopes
CrB	Claverack loamy fine sand, 3 to 8 percent slopes
CsA	Collamer silt loam, 0 to 3 percent slopes
CsB	Collamer silt loam, 3 to 8 percent slopes
CsC	Collamer silt loam, 8 to 15 percent slopes
CtB	Collamer silt loam, silt substratum, 3 to 8 percent slopes
CuB	Colonie loamy fine sand, 3 to 8 percent slopes
CuC	Colonie loamy fine sand, 8 to 15 percent slopes
Cv	Cosad loamy fine sand
DaB	Danley silt loam, 3 to 8 percent slopes
DaC	Danley silt loam, 8 to 15 percent slopes
DaD	Danley silt loam, 15 to 25 percent slopes
DbA	Darien silt loam, 0 to 3 percent slopes
DbB	Darien silt loam, 3 to 8 percent slopes
DbC	Darien silt loam, 8 to 15 percent slopes
DcB	Darien silt loam, silty substratum, 3 to 8 percent slopes
DdA	Derb silt loam, 0 to 3 percent slopes
DdB	Derb silt loam, 3 to 8 percent slopes
DdC	Derb silt loam, 8 to 15 percent slopes
Dm	Dumps
Du	Dumps, slag
Ed	Edwards muck
ElA	Elnora loamy fine sand, 0 to 3 percent slopes
ElB	Elnora loamy fine sand, 3 to 8 percent slopes
ErA	Erie channery silt loam, 0 to 3 percent slopes
ErB	Erie channery silt loam, 3 to 8 percent slopes
ErC	Erie channery silt loam, 8 to 15 percent slopes

SYMBOL	NAME
FaA	Farmington cherty loam, 0 to 3 percent slopes
FaB	Farmington cherty loam, 3 to 8 percent slopes
FbA	Farnham shaly silt loam, 0 to 3 percent slopes
FbB	Farnham shaly silt loam, 3 to 8 percent slopes
FcA	Farnham shaly silt loam, fan, 0 to 3 percent slopes
FcB	Farnham shaly silt loam, fan, 3 to 8 percent slopes
Fu	Fluvaquents and Udifluvents, frequently flooded
GaA	Galen very fine sandy loam, 0 to 3 percent slopes
GaB	Galen very fine sandy loam, 3 to 8 percent slopes
GbB	Galen fine sandy loam, silt substratum, 3 to 8 percent slopes
Ge	Getzville silt loam
Ha	Halsey silt loam
Hn	Haplaquolls, ponded
Hm	Hamlin silt loam
HoA	Honeoye loam, 0 to 3 percent slopes
HoB	Honeoye loam, 3 to 8 percent slopes
HrA	Hornell silt loam, 0 to 3 percent slopes
HrB	Hornell silt loam, 3 to 8 percent slopes
HsC	Hornell silty clay loam, 8 to 15 percent slopes
HuB	Hudson silt loam, 3 to 8 percent slopes
HuC	Hudson silt loam, 8 to 15 percent slopes
HvD	Hudson silty clay loam, 15 to 25 percent slopes
HvE	Hudson silty clay loam, 25 to 40 percent slopes
HwD	Hudson gravelly loam, hilly
In	Ilion silt loam
Ke	Kendaia silt loam
La	Lakemont silt loam
Lb	Lakemont mucky silt loam
Lc	Lamson very fine sandy loam
Ld	Lamson mucky very fine sandy loam
LfB	Langford channery silt loam, 3 to 8 percent slopes
LfC	Langford channery silt loam, 8 to 15 percent slopes
LfD	Langford channery silt loam, 15 to 25 percent slopes
LgC	Langford channery silt loam, silty substratum, 8 to 15 percent slopes
LgD	Langford channery silt loam, silty substratum, 15 to 25 percent slopes
LmA	Lima loam, 0 to 3 percent slopes
LmB	Lima loam, 3 to 8 percent slopes
Ly	Lyons silt loam
Lz	Lyons mucky silt loam
MaA	Manlius shaly silt loam, 0 to 3 percent slopes
MaB	Manlius shaly silt loam, 3 to 8 percent slopes
MaC	Manlius shaly silt loam, 8 to 15 percent slopes
MaD	Manlius shaly silt loam, 15 to 25 percent slopes
MbE	Manlius very shaly silt loam, 25 to 35 percent slopes
MbF	Manlius very shaly silt loam, 35 to 50 percent slopes
McB	Mardin silt loam, 3 to 8 percent slopes
McC	Mardin silt loam, 8 to 15 percent slopes
MdB	Mardin channery silt loam, 3 to 8 percent slopes
MdC	Mardin channery silt loam, 8 to 15 percent slopes
MdD	Mardin channery silt loam, 15 to 25 percent slopes
MeF	Mardin-Valois complex, 25 to 50 percent slopes
MfA	Marilla shaly silt loam, 0 to 3 percent slopes
MfB	Marilla shaly silt loam, 3 to 8 percent slopes
MfC	Marilla shaly silt loam, 8 to 15 percent slopes
Mg	Middlebury silt loam
Mn	Minoa very fine sandy loam
Ne	Newstead loam
NfA	Niagara silt loam, 0 to 3 percent slopes
NfB	Niagara silt loam, 3 to 8 percent slopes
Ng	Niagara silt loam, fan
Nh	Niagara silt loam, till substratum
Od	Odessa silt loam
Oe	Odessa-Lakemont silt loams
OrA	Orpark silty clay loam, 0 to 3 percent slopes
OrB	Orpark silty clay loam, 3 to 8 percent slopes
OrC	Orpark silty clay loam, 8 to 15 percent slopes
OvA	Ovid silt loam, 0 to 3 percent slopes
OvB	Ovid silt loam, 3 to 8 percent slopes
Pa	Palms muck
PlA	Palmyra gravelly loam, 0 to 3 percent slopes
PlB	Palmyra gravelly loam, 3 to 8 percent slopes

SYMBOL	NAME
Pc	Patchin silt loam
PhA	Phelps gravelly loam, 0 to 3 percent slopes
PhB	Phelps gravelly loam, 3 to 8 percent slopes
Pt	Pits, quarry
Pu	Pits, gravel
Qu	Quarries
RaA	Raynham silt loam, 0 to 3 percent slopes
RaB	Raynham silt loam, 3 to 8 percent slopes
Re	Red Hook silt loam
RfA	Remsen silty clay loam, 0 to 3 percent slopes
RfB	Remsen silty clay loam, 3 to 8 percent slopes
RfC	Remsen silty clay loam, 8 to 15 percent slopes
RgA	Rhinebeck silt loam, 0 to 3 percent slopes
RgB	Rhinebeck silt loam, 3 to 8 percent slopes
RhC3	Rhinebeck silty clay loam, 8 to 15 percent slopes, severely eroded
RkA	Rhinebeck gravelly loam, 0 to 3 percent slopes
RkB	Rhinebeck gravelly loam, 3 to 8 percent slopes
RmA	Rhinebeck silty clay loam, stratified substratum, 0 to 3 percent slopes
RmB	Rhinebeck silty clay loam, stratified substratum, 3 to 8 percent slopes
Ro	Rock outcrop
SaA	Schoharie silt loam, 0 to 3 percent slopes
SaB	Schoharie silt loam, 3 to 8 percent slopes
SbC3	Schoharie silty clay loam, 8 to 15 percent slopes, severely eroded
ScD	Schuyler silt loam, 15 to 25 percent slopes
ScE	Schuyler silt loam, 25 to 40 percent slopes
Sd	Scio silt loam
Sw	Swormville clay loam
Te	Teel silt loam
To	Tioga silt loam
Uc	Udorthents, smoothed
Ud	Urban land
UeB	Urban land-Benson complex, 3 to 6 percent slopes
Uf	Urban land-Canandaigua complex
Ug	Urban land-Cayuga complex
Uh	Urban land-Churchville complex
Uk	Urban land-Claverack complex
UmA	Urban land-Collamer complex, 1 to 6 percent slopes
UnB	Urban land-Colonie complex, 3 to 8 percent slopes
Uo	Urban land-Cosad complex
Up	Urban land-Galen complex
UrA	Urban land-Lima complex, 1 to 6 percent slopes
Us	Urban land-Niagara complex
Ut	Urban land-Odessa complex
Uu	Urban land-Schoharie complex
Uv	Urban land-Swormville complex
Uw	Urban land-Teel complex
Ux	Urban land-Wassaic complex
VaB	Valois gravelly silt loam, 3 to 8 percent slopes
VaC	Valois gravelly silt loam, 8 to 15 percent slopes
VaD	Valois gravelly silt loam, 15 to 25 percent slopes
VbA	Varysburg gravelly loam, 0 to 3 percent slopes
VbB	Varysburg gravelly loam, 3 to 8 percent slopes
VbC	Varysburg gravelly loam, 8 to 15 percent slopes
VbD	Varysburg gravelly loam, 15 to 25 percent slopes
VbE	Varysburg gravelly loam, 25 to 40 percent slopes
VoA	Volusia silt loam, 0 to 3 percent slopes
VoB	Volusia silt loam, 3 to 8 percent slopes
VpA	Volusia channery silt loam, 0 to 3 percent slopes
VpB	Volusia channery silt loam, 3 to 8 percent slopes
WaA	Wassaic silt loam, 0 to 3 percent slopes
WaB	Wassaic silt loam, 3 to 8 percent slopes
WbB	Wassaic very stony loam, 3 to 8 percent slopes
WcE	Wassaic-Rock outcrop complex, 25 to 40 percent slopes
Wd	Wayland silt loam
WeB	Williamson silt loam, 3 to 8 percent slopes
WeC	Williamson silt loam, 8 to 15 percent slopes

7

INTERVIEW FORM

INTERVIEWEE/CODE Mr Donald Scalise /
TITLE – POSITION Ashland Petroleum Company
ADDRESS 4545 River Road
CITY Tonawanda STATE NY ZIP 14150
PHONE (716) 879-8600 RESIDENCE PERIOD TO
LOCATION Telephone Interview INTERVIEWER S. Robert STEELE, II
DATE/TIME 4/15/85 1 200 pm
SUBJECT: Phase I Investigation of landfill site

REMARKS: Wastes disposed in the Ashland Petroleum Co. landfill site include spent lime, clay, phosphoric acid polymerization catalyst and general plant refuse. Some radioactive wastes removed from the Ashland Petroleum Plant site was also placed in the landfill. The spent lime material was generated during treatment of [illegible] ~~process~~ water. The clay material was used for color control for jet fuel. The clay was scrubbed (steam) to drive off hydrocarbons prior to landfilling. The polymerization catalyst was used to React with [illegible] to [illegible] ~~absorb~~ impurities (~~coke material~~) during petroleum refining. The landfill operated from 1957 to 1982. Approximately two feet of clay-bentonite soil was place over the landfill as cover. Small quantities of radioactive material from the "Haist property" was placed in the Asland landfill.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE: Donald Scalise

COMMENTS: I have made two minor changes

8

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

CLASSIFICATION CODE: 2a REGION: 9 SITE CODE: 915061
EPA ID:

NAME OF SITE : Ashland Petroleum Co.
STREET ADDRESS: 4545 River Rd.
TOWN/CITY: Tonawanda
COUNTY: Erie
ZIP:

SITE TYPE: Open Dump- Structure- Lagoon- Landfill-X Treatment Pond-
ESTIMATED SIZE: Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Ashland Petroleum Co.
CURRENT OWNER ADDRESS.: 4545 River Rd., Tonawanda, NY
OWNER(S) DURING USE...: Ashland Petroleum Co.
OPERATOR DURING USE...: Ashland Petroleum Co.
OPERATOR ADDRESS......: 4545 River Rd., Tonawanda, NY
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From 1957 To June, 1982

SITE DESCRIPTION:
Area for disposal of lime, phosphoric acid polymerization catalyst sludge and demolition material. Refinery currently not operating. This landfill is presently closed.
A Phase I was conducted in 1985. A Phase II investigation is ongoing. The Department of Energy is also investigating this site.

HAZARDOUS WASTE DISPOSED: Confirmed-X Suspected-

TYPE	QUANTITY (units)
Phosphoric acid polymerization Catalyst sludge	5T/yr
Spent Clay	50 T/yr
Lime	72 T/yr

8

SITE CODE: 915061

ANALYTICAL DATA AVAILABLE:
ir- Surface Water- Groundwater- Soil- Sediment- None-X

CONTRAVENTION OF STANDARDS:
roundwater- Drinking Water- Surface Water- Air-

LEGAL ACTION:

YPE..: None State- Federal-
STATUS: Negotiation in Progress- Order Signed-

EMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-
ATURE OF ACTION:

GEOTECHNICAL INFORMATION:
SOIL TYPE: Clay
ROUNDWATER DEPTH: 15+ ft.

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

nadequate data to assess environmental problems.

SSESSMENT OF HEALTH PROBLEMS:

edium	Contaminants Available	Migration Potential	Potentially Exposed Population	Need for Investigation
Air	Unlikely	Unlikely	Yes	Low
Surface Soil	Likely	Unlikely	Yes	Medium
roundwater	Likely	Unlikely	No	Low
Surface Water	Likely	Highly Likely	Yes	High

Health Department Site Inspection Date : 5/85

MUNICIPAL WASTE ID: 15-S-52

Contact
Mr. Patton

Don Scalise

⑨

Site Inspection Checklist

Site Name Ashland Petroleum Company

Site Location (Directions)

Date/time 2/19/95 / 2^00 pm   Weather Cold, Cloudy

Inspection Team Bob STEELE   Eileen Gilligan

Site Representatives Mr Patton

Other Parties

SITE DESCRIPTION

____ 1. Prepare a site location sketch and site map (Figure 1) noting approximate area of site, site boundary, surface water features, streets, north arrow, access roads, containment or storage areas, impoundments, areas of contamination, odor and leachate or seepage areas, vegetative stress areas, monitoring well locations, areas of past waste surface water, sediment or soil sampling:

____ 2. Take 35mm photographs of significant site features. Provide a description and reference for each photo.

a. ________
b. ________
c. ________
d. ________
e. ________
f. ________
g. ________
h. ________
i. ________
j. ________

⑨

Site Map (Figure 1)

- 1954-82 years of operation - site owned by ashland

FRONTIER oil - original owner of ~~[illegible]~~ plant site
- were own disposal site

- no samples collected - Lab - process control

Lime pit & landfill trench - adjacent to area

landfill ~~[illegible]~~ trench - naturally occurring ~~[illegible]~~ ravine that was filled in

⑨

OBSERVATIONS

Site Status - Site is currently closed w/ clean fill material (clay cap)

Accessibility - Describe potential for direct contact at site (i.e. are there any fences, gates, security guard, natural barriers, etc.)
Site doesn't have a fence ~~[illegible]~~ located [illegible] [illegible] edge of road [illegible] [illegible] site

Waste types - Describe type quantity, and physical state of wastes present — Same waste as on summary sheet

Storage of wastes - Record number, condition and location of drums, tanks, surface impoundments, etc. no other wastes other than those listed

Contamination - record any visual evidence of contamination

a. HNU Meter readings upwind and downwind Less than 1 ppm
b. Odor NONE
c. Vegetative stress no vegetation noted
d. Drum/Tank leakage none
e. Visible leachate, seepage none
f. Surface discoloration none
g. Surface water none

Containment - Record presence and characteristic features of natural or manmade containment measures such as dikes, barriers, pits, slurry walls, etc. landfill has a clay & synthetic cover at closed disposal area

⑨

Facility Management Practices - Describe based on personnel interviews and site visit Site is not used at the present time

Remedial Actions - Record status and extent of any remedial activity such as:

a. Liners, dike, barrier walls N/A

b. Monitoring wells none observed

c. Access restrictions ~~[illegible]~~ none

d. Leachate/waste treatment none

e. Drum/soil/waste removal none - no drums

f. Covers, Surface water diversions clay cap

Area land use - Note proximity of residental areas, industrial commercial entities and any environmentally sensitive areas

South - BFI Landfill

All other directions are undeveloped

Signature S Robert Steele

Date 3/19/85

10

Dangerous Properties of Industrial Materials

Sixth Edition

N. IRVING SAX

Assisted by:
Benjamin Feiner/Joseph J. Fitzgerald/Thomas J. Haley/Elizabeth K. Weisburger

VNR VAN NOSTRAND REINHOLD COMPANY
New York

10

TOXICITY DATA: 1	CODEN:
orl-rat LD50:17 gm/kg	AIHAAP 23,95,62
skn-rbt LD50:7940 mg/kg	AIHAAP 23,95,62

Reported in EPA TSCA Inventory, 1980.
THR: LOW orl, skn.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

BIS(2-ETHYLHEXYL)MALEATE

CAS RN: 142165 NIOSH #: ON 0160000
mf: $C_{20}H_{36}O_4$; mw: 340.56

Liquid. mp: −60°, bp: 164° @ 10 mm, flash p: 365°F, d: 0.9436 @ 20°/20°, vap. d: 11.7.

SYNS:
DI-(2-ETHYLHEXYL)MALEATE
"DIOCTYL" MALEATE

TOXICITY DATA: 1	CODEN:
skn-rbt 10 mg/24H MLD	JIHTAB 31,60,49
eye-rbt 500 mg	JIHTAB 31,60,49
orl-rat LD50:14 gm/kg	JIHTAB 31,60,49
skn-rbt LD50:15 gm/kg	JIHTAB 31,60,49

Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.
THR: LOW orl, skn. A skn, eye irr. See also esters.
Fire Hazard: Slight, when exposed to heat or flame; can react with oxidizing materials.
To Fight Fire: Alcohol foam, dry chemical, mist or spray.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

BIS((2-(ETHYL)HEXYLOXY)MALEOYLOXY)DI(n-BUTYL)STANNANE

NIOSH #: WH 6717000
mf: $C_{32}H_{56}O_8Sn$; mw: 687.57

SYN: 2-ETHYLHEXYLMALEINAN DI-N-BUTYLCINICITY (CZECH)

TOXICITY DATA: 3	CODEN:
skn-rbt 500 mg/24H MOD	28ZPAK -,230,72
eye-rbt 100 mg/24H SEV	28ZPAK -,230,72
orl-rat LD50:284 mg/kg	28ZPAK -,230,72

Occupational Exposure to Organotin Compounds recm std: Air: TWA 0.1 mg(Sn)/m3 NTIS**.
THR: HIGH orl. A skn, eye irr. See also tin compounds.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

BIS(2-ETHYLHEXYL)AZELATE

CAS RN: 103242 NIOSH #: CM 2000000
mf: $C_{25}H_{48}O_4$; mw: 412.73

SYNS:
AZELAIC ACID, DI(2-ETHYLHEXYL)ESTER
DIOCTYL AZELATE

TOXICITY DATA: 2	CODEN:
[illegible] 10 mg/24H open MLD	AIHAAP 23,95,62
[illegible] LD50:1060 mg/kg	MRLR** No.256,54
[illegible] LD50:640 mg/kg	MRLR** No.256,54

Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.
THR: MOD ivn; A skn irr. See also esters.
Disaster Hazard: When heated to decomp it emits acrid smoke and irr fumes.

BIS(2-ETHYLHEXYL)PHOSPHATE

CAS RN: 298077 NIOSH #: TB 7875000
mf: $C_{16}H_{35}O_4P$; mw: 322.48

SYNS:
BIS(2-ETHYLHEXYL)HYDROGEN PHOSPHATE
BIS(2-ETHYLHEXYL)ORTHOPHOSPHORIC ACID
BIS(2-ETHYLHEXYL)PHOSPHORIC ACID
DI(2-ETHYLHEXYL)PHOSPHATE
2-ETHYL-1-HEXANOL HYDROGEN PHOSPHATE

TOXICITY DATA: 3-2-1	CODEN:
skn-rbt 500 mg open MOD	UCDS** 5/18/72
eye-rbt 5 mg MOD	UCDS** 5/18/72
orl-rat LD50:4940 mg/kg	UCDS** 5/18/42
ipr-mus LDLo:63 mg/kg	CBCCT* 9,132,57
skn-rbt LD50:1250 mg/kg	UCDS** 5/18/72

DOT: Corrosive Material, Label: Corrosive FEREAC 41,57018,76. Reported in EPA TSCA Inventory, 1980.
THR: HIGH ipr; MOD skn; LOW orl. MOD skn, eye irr.
Disaster Hazard: When heated to decomp it emits tox fumes of PO_x.

BIS(2-ETHYLHEXYL)PHTHALATE

CAS RN: 117817 NIOSH #: TI 0350000
mf: $C_{24}H_{38}O_4$; mw: 390.62

SYNS:
BIS(2-ETHYLHEXYL)-1,2-BENZENEDICARBOXYLATE
DI(2-ETHYLHEXYL)ORTHOPHTHALATE
DI(2-ETHYLHEXYL)PHTHALATE
DI-SEC-OCTYL PHTHALATE
DOP
2-ETHYLHEXYL PHTHALATE
NCI-C52733
OCTOIL

TOXICITY DATA: 3-2-1	CODEN:
skn-rbt 500 mg/24H MLD	28ZPAK -,48,72
eye-rbt 500 mg	AJOPAA 29,1363,46
eye-rbt 500 mg/24H MLD	28ZPAK -,48,72
ipr-rat TDLo:30 gm/kg/(5-15D preg):TER	JPMSAE 61,51,72
orl-mus TDLo:7500 mg/kg/(8D preg):TER	TJADAB 14,259,76
orl-man TDLo:143 mg/kg:GIT	JIHTAB 27,130,45
orl-rat LD50:31 gm/kg	UCDS** 7/20/67
ipr-rat LD50:30700 mg/kg	JIHTAB 27,130,45
ivn-rat LD50:250 mg/kg	TXAPA9 45,230,78
unk-rat LD50:37000 mg/kg	GTPZAB 24(3),25,80
orl-mus LD50:30 gm/kg	TJADAB 14,259,76
ipr-mus LD50:14 gm/kg	JPMSAE 55,158,66
unk-mus LD50:37000 mg/kg	GTPZAB 24(3),25,80
orl-rbt LD50:34 gm/kg	EVHPAZ 4,3,73
skn-rbt LD50:25 gm/kg	JIHTAB 27,130,45
skn-gpg LD50:10 gm/kg	EVHPAZ 4,3,73
unk-gpg LD50:37000 mg/kg	GTPZAB 24(3),25,80
ihl-mam LC50:30000 mg/m3	GTPZAB 24(3),25,80
orl-rat TDLo:35 mg/kg (14D male/14D pre)	FCTXAV 15,389,77

GAry Christopher

11

Uncontrolled Hazardous Waste Site Ranking System

A Users Manual

(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

TAI 5

PERSISTENCE (BIODEGRADABILITY) OF SOME ORGANIC COMPOUNDS*

VALUE = 3 HIGHLY PERSISTENT COMPOUNDS

aldrin
benzopyrene
benzothiazole
benzothiophene
benzyl butyl phthalate
bromochlorobenzene
bromoform butanal
bromophenyl phenyl ether
chlordane
chlorohydroxy benzophenone
bis-chloroisopropyl ether
m-chloronitrobenzene
DDE
DDT
dibromobenzene
dibutyl phthalate
1, 4-dichlorobenzene
dichlorodifluoromethane
dieldrin
diethyl phthalate
di(2-ethylhexyl)phthalate
dihexyl phthalate
di-isobutyl phthalate
dimethyl phthalate
4,6-dinitro-2-aminophenol
dipropyl phthalate
endrin
heptachlor
heptachlor epoxide
1,2,3,4,5,7,7-heptachloronorbornene
hexachlorobenzene
hexachloro-1,3-butadiene
hexachlorocyclohexane
hexachloroethane
methyl benzothiazole
pentachlorobiphenyl
pentachlorophenol
1,1,3,3-tetrachloroacetone
tetrachlorobiphenyl
thiomethylbenzothiazole
trichlorobenzene
trichlorobiphenyl
trichlorofluoromethane
2,4,6-trichlorophenol
triphenyl phosphate
bromodichloromethane
bromoform
carbon tetrachloride
chloroform
chlorodibromomethane
dibromodichloroethane
tetrachloroethane
1,1,2-trichloroethane

VALUE = 1 SOMEWHAT PERSISTENT COMPOUNDS

acetylene dichloride
behenic acid, methyl ester
benzene
benzene sulfonic acid
butyl benzene
butyl bromide
e-caprolactam
carbon-disulfide
o-cresol
decane
1,2-dichloroethane
1,2-dimethoxy benzene
1,3-dimethyl naphthalene
1,4-dimethyl phenol
dioctyl adipate
n-dodecane
ethyl benzene
2-ethyl-n-hexane
o-ethyltoluene
isodecane
isoprophyl benzene
limonene
methyl ester of lignoceric acid
methane
2-methyl-5-ethyl-pyridine
methyl naphthalene
methyl palmitate
methyl phenyl carbinol
methyl stearate
naphthalene
nonane
octane
octyl chloride
pentane
phenyl benzoate
phthalic anhydride
propylbenzene
1-terpineol
toluene
vinyl benzene
xylene

VALUE = 2 PERSISTENT COMPOUNDS

acenaphthylene
atrazine
(diethyl) atrazine
barbital
borneol
bromobenzene
camphor
chlorobenzene
1,2-bis-chloroethoxy ethane
b-chloroethyl methyl ether
chloromethyl ether
chloromethyl ethyl ether
3-chloropyridine
di-t-butyl-p-benzoquinone
dichloroethyl ether
dihyrocarvone
dimethyl sulfoxide
2,6-dinitrotoluene
cis-2-ethyl-4-methyl-1,3-dioxolane
trans-2-ethyl-4-methyl-1,3-dioxolane
guaiacol
2-hydroxyadiponitrile
isophorone
indene
isoborneol
isopropenyl-r-isopropyl benzene
2-methoxy biphenyl
methyl biphenyl
methyl chloride
methylindene
methylene chloride
nitroanisole
nitrobenzene
1,1,2-trichloroethylene
trimethyl-triazo-hexahydro-triazine
losmar

VALUE = 0 NONPERSISTENT COMPOUNDS

acetaldehyde
acetic acid
acetone
acetophenone
benzoic acid
di-isobutyl carbinol
docosane
eicosane
ethanol
ethylamine
hexadecane
methanol
methyl benzoate
3-methyl butanol
methyl ethyl ketone
2-methylpropanol
octadecane
pentadecane
pentanol
propanol
propylamine
tetradecane
n-tridecane
n-undecane

TABLE I

EPA Hazard Ranking System Waste Characteristics Values (Toxicity/Persistence Matrix)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Acenapthene	9	3
Acetaldehyde	6	6
Acetic Acid	6	6
Acetone	6	6
2-Acetylaminoflourene	18	9
Aldrin	18	9
Ammonia	9	9
Aniline	12	9
Anthracene	15	9
Arsenic	18	9
Arsenic Acid	18	9
Arsenic Trioxide	18	9
Asbestos	15	9
Barium	18	9
Benzene	12	9
Benzidine	18	9
Benzoapyrene	18	9
Benzopyrene, NOS	18	9
Beryllium & Compounds NOS	18	9
Beryllium Dust, NOS	18	9
Bis (2-Chloroethyl) Ether	15	9
Bis (2-Ethylhexyl Phthalate	12	3
Bromodichloromethane	15	6
Bromoform	15	6
Bromomethane	15	9
Cadmium	18	9
Carbon Tetrachloride	18	9
Chlordane	18	9
Chlorobenzene	12	6
Chloroform	18	6
3-Chlorophenol	12	6
4-Chlorophenol	15	9
2-Chlorophenol	12	6
Chromium	18	9
Chromium, Hexavalent (Cr^{+6})	18	9

Table I (cont.)

Chemical/Compound	Ground Water and Surface Water Pathway Values	Air Pathway Values
Naphthalene	9	6
Nickel & Compounds, NOS	18	9
Nitric Acid	9	9
Nitroaniline, NOS	18	9
Nitrogen Compounds, NOS	12	0
Nitroguanidine	12	9
Nitrophenol, NOS	15	9
m-Nitrophenol	15	
o-Nitrophenol	12	
p-Nitrophenol	15	
Nitrosodiphenylamine	12	6
Parathion	9	9
Pentachlorophenol (PCP)	18	9
Pesticides, NOS	18	9
Phenanthrene	15	9
Phenol	12	9
Phosgene	9	9
Polybrominated Biphenyl (PBB), NOS	18	9
Polychlorinated Biphenyls (PCB), NOS	18	9
Potassium Chromate	18	9
Radium & Compounds, NOS	18	9
Radon & Compounds, NOS	15	9
RDX (Cyclonite)	15	
2, 4-D, Salts & Esters	18	9
Selenium	15	9
Sevin (Carbaryl)	18	9
Sodium Cyanide	12	9
Styrene	9	6
Sulfate	9	0
Sulfuric Acid	9	9
2, 4, 5-T	18	9
1, 1, 2, 2-Tetrachloroethane	18	9
Tetrachloroethane, NOS	18	9
1, 1, 2, 2-Tetrachloroethene	12	6

TABLE 4
WASTE CHARACTERISTICS VALUES FOR SOME COMMON CHEMICALS

CHEMICAL/COMPOUND	TOXICITY [1]	PERSISTENCE [2]	IGNITABILITY [3]	REACTIVITY [3]
Acetaldehyde	3	0	3	2
Acetic Acid	3	0	2	1
Acetone	2	0	3	0
Aldrin	3	3	1	0
Ammonia, Anhydrous	3	0	1	0
Aniline	3	1	2	0
Benzene	3	1	3	0
Carbon Tetrachloride	3	3	0	0
Chlordane	3	3	0^{*}	0^{*}
Chlorobenzene	2	2	3	0
Chloroform	3	3	0	0
Cresol-O	3	1	2	0
Cresol-M&P	3	1	1	0
Cyclohexane	2	2	3	0
Endrin	3	3	1	0
Ethyl Benzene	2	1	3	0
Formaldehyde	3	0	2	0
Formic Acid	3	0	2	0
Hydrochloric Acid	3	0	0	0
Isopropyl Ether	3	1	3	1
Lindane	3	3	1	0
Methane	1	1	3	0
Methyl Ethyl Ketone	2	0	3	0
Methyl Parathion in Xylene Solution	3	0^{Δ}	3	2
Naphthalene	2	1	2	0
Nitric Acid	3	0	0	0
Parathion	3	0^{Δ}	1	2
PCB	3	3	0^{Δ}	0^{Δ}
Petroleum, Kerosene (Fuel Oil No. 1)	3	1	2	0
Phenol	3	1	2	0
Sulfuric Acid	3	0	0	2
Toluene	2	1	3	0
Trichlorobenzene	2	3	1	0
α-Trichloroethane	2	2	1	0
Xylene	2	1	3	0

[1] Sax, N. I., Dangerous Properties of Industrial Materials, Van Nostrand Rheinhold Co., New York, 4th ed., 1975. The highest rating listed under each chemical is used.

[2] JRB Associates, Inc., Methodology for Rating the Hazard Potential of Waste Disposal Sites, May 5, 1980.

[3] National Fire Protection Association, National Fire Codes, Vol. 13, No. 49, 1977.

* Professional judgment based on information contained in the U.S. Coast Guard CHRIS Hazardous Chemical Data, 1978.

Δ Professional judgment based on existing literature.

TABLE 5

INTERVIEW FORM

INTERVIEWEE/CODE Mr DAN Pyanowski / 1

TITLE - POSITION Dunlop Tire company, Engineering

ADDRESS P O Box 1109

CITY Buffalo STATE NY ZIP 14240

PHONE (716) 879-8274 RESIDENCE PERIOD TO

LOCATION Telephone Conversation INTERVIEWER S. Robert Steele

DATE/TIME 12/17/86 /

SUBJECT: Industrial Water USE At Dunlop Tire company

REMARKS: The Dunlop Tire Corporation facility located at Sheridan Drive and River Road in Buffalo, New york presently has three operational water withdrawal wells. The wells operate at approximately 300 gpm. Under normal operations, only 2 of the 3 wells operate at any one time. The well water is used for industrial cooling in open vaults and tanks. Workers at the Dunlop Tire facility do not have direct with the cooling water, with the exception of a line operator, three shifts per day.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW:

SIGNATURE:

COMMENTS:

RECORD OF TELEPHONE CONVERSATION

13

DATE 9/20/85 ~830am JOB NO: Phase II

RECORDED BY: E D Gilligan OWNER/CLIENT: NYSDEC

TALKED WITH: Ron Koczaja OF Erie Co DOH

NATURE OF CALL INCOMING ☐ OUTGOING ☒

ROUTE TO: INFORMATION ACTION

MAIN SUBJECT OF CALL: groundwater use at INS Allied-Hopkins and Alltift sites

ITEMS DISCUSSED:

Koczaja gave me the following information

INS - No known usage of upper aquifer
~~2~~3 very deep (1000' possibly) bedrock wells ~~are~~ may be used for cooling water supply at Dunlop (on River Rd & Sheridan), 1.2 miles S of site. When its in use, no one theoretically should come in contact with it, but, conservatively speaking, a range may be 0-20 people

Allied Chem - Hopkins St | No use for either
Alltift | shallow or deep aquifers within 2 or 3 miles of site

Donna Hanna Coke Company had an industrial well, but the factory is closed down now.

New York State Atlas of Community Water System Sources

1982

NEW YORK STATE
DEPARTMENT OF HEALTH

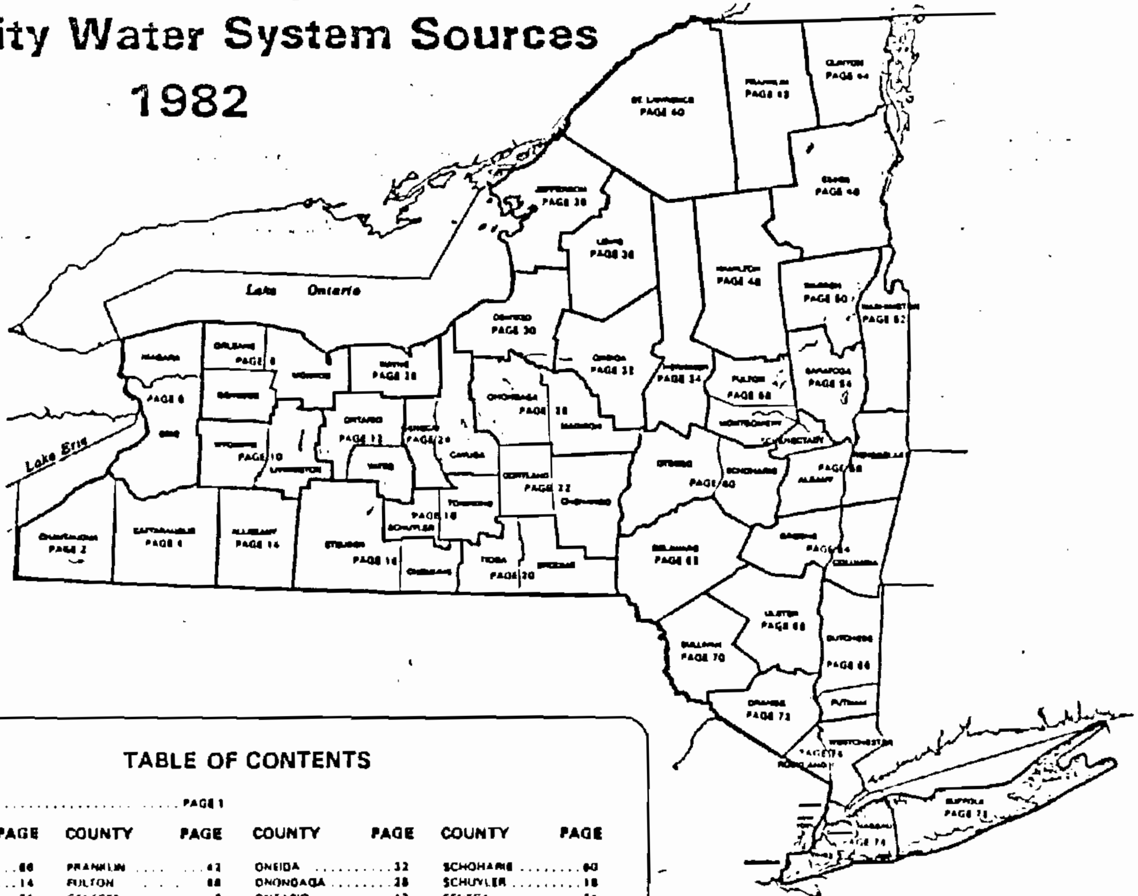


TABLE OF CONTENTS

LEGEND

BOUNDARIES AND PLACES

International ....
State ....
County ....
Town ....
Indian Reservation ....
City .... Village ....
Unincorporated Place ...... • Federal Reservation
Built-up Area (Over 25 000 population including any contiguous city or village) ....

CLASSIFICATION OF POPULATED PLACES

100 000 or more .... YONKERS
50 000 to 100 000 .... Levittown
12 500 to 50 000 .... Poughkeepsie
2 500 to 12,500 .... Hampton Bays
250 to 2 500 ....
250 or less ....

TRANSPORTATION

Highways
Divided Highways
Full Control of Access ....
Partial or No Control of Access ....
Undivided Highway ....
Interchange ....
Touring Route (State, U.S., Interstate) or State Parkway ....
Touring Route Markers
State; U.S.; Interstate ....

Railroads
Operating Line .... Service Discontinued
Operator ....
Owner (If Other than Operator) ....
Company Having Trackage Rights ....

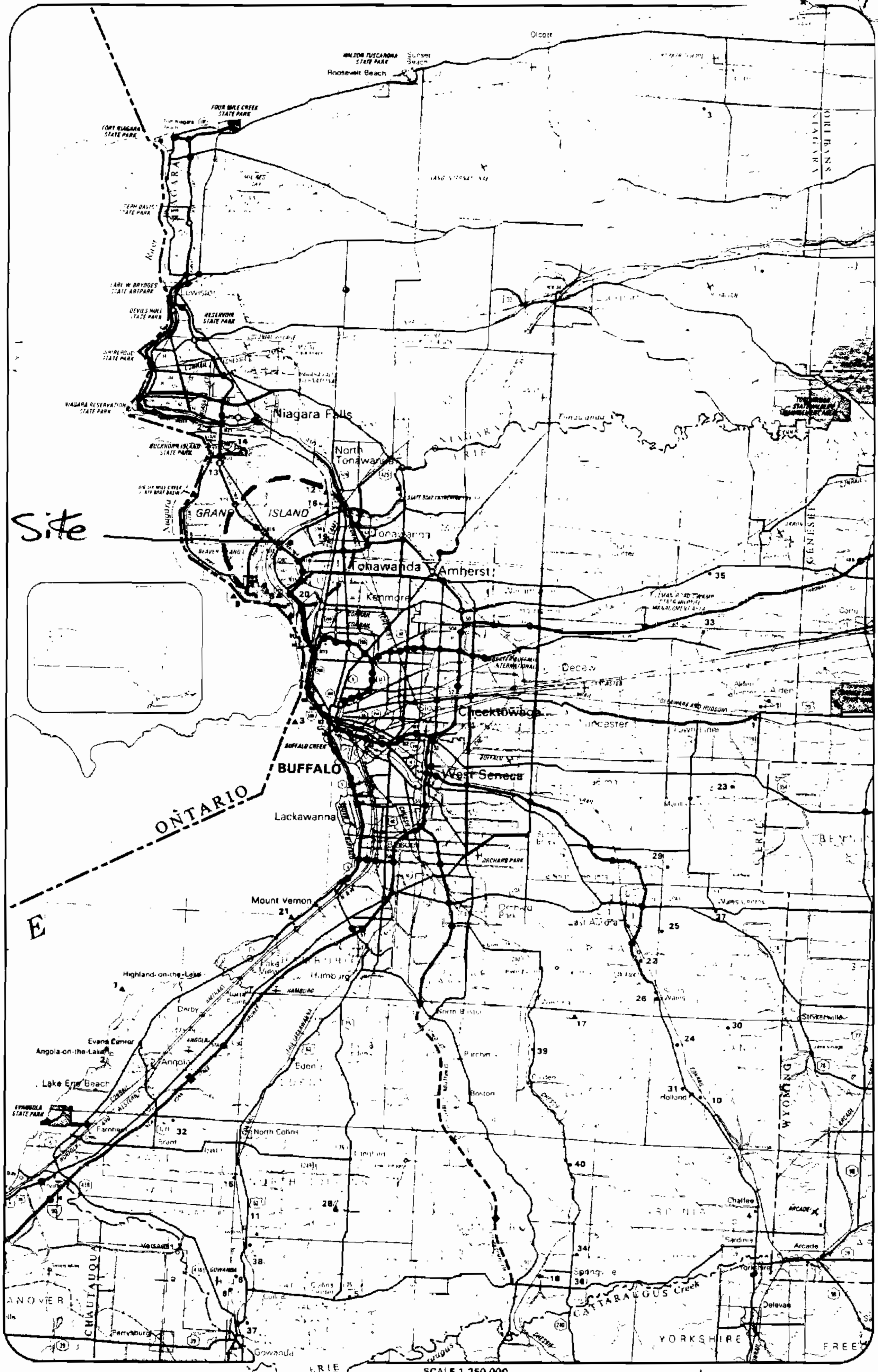
Airports (Open to the Public, Military)
Runway under 4000' ... Runway over 4000'

Rest Areas
Food, Gas, Rest Rooms ... Rest Rooms
Gas, Rest Rooms ...... Parking Only

RECREATION FACILITIES

State or National Recreation Area ....
State Campground ....
State Boat Launching Site ....
State Canal Park ....
State Fish Hatchery ....
Other State Recreation Site ....

14



LOCATION OF COMMUNITY WATER SYSTEM SOURCES-1982

BUREAU OF PUBLIC WATER SUPPLY PROTECTION

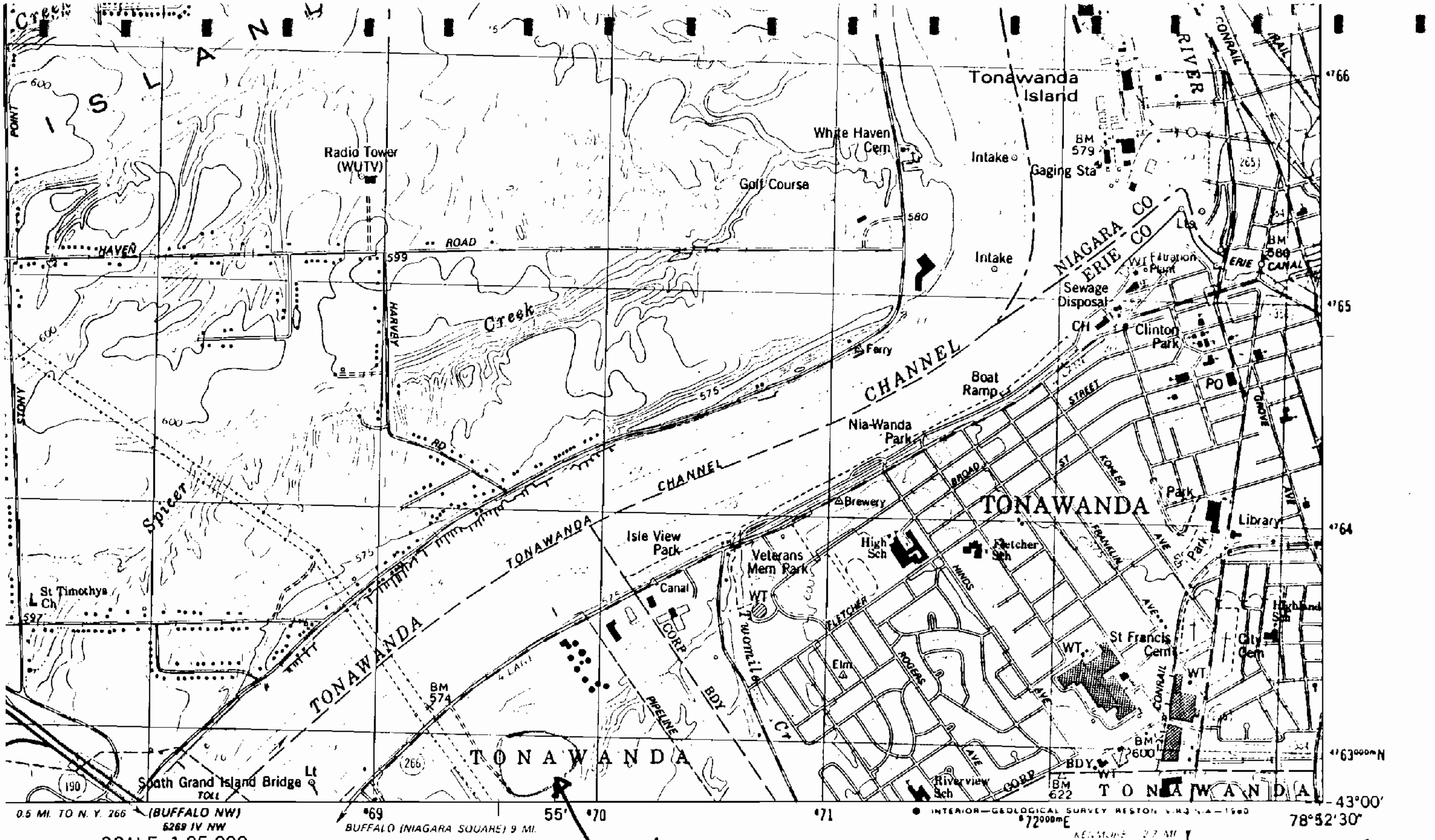
ERIE and NIAGARA COUNTIES

ERIE COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
	Akron Village (See No 1 Wyoming Co, Page 10)	3640	
1	Alden Village	3460	Wells
2	Angola Village	8500	Lake Erie
3	Buffalo City Division of Water	357870	Lake Erie
4	Caffee Water Company	210	Wells
5	Collins Water District #3	704	Wells
6	Collins Water Districts #1 and #2	1384	Wells
7	Erie County Water Authority (Sturgeon Point Intake)	375000	Lake Erie
8	Erie County Water Authority (Van DeWater Intake)	NA	Niagara River - East Branch
9	Grand Island Water District #2	9390	Niagara River
10	Holland Water District	1670	Wells
11	Lawtons Water Company	138	Wells
12	Lockport City (Niagara Co)		Niagara River - East Branch
13	Niagara County Water District (Niagara Co)		Niagara River - West Branch
14	Niagara Falls City (Niagara Co)		Niagara River - West Branch
15	North Collins Village	1500	Wells
16	North Tonawanda City (Niagara Co)		Niagara River - West Branch
17	Orchard Park Village	3671	Pipe Creek Reservoir
18	Springville Village	4169	Wells
19	Tonawanda City	18538	Niagara River - East Branch
20	Tonawanda Water District #1	91269	Niagara River
21	Wanakah Water Company	10750	Lake Erie
	Non Municipal Community		
22	Aurora Mobile Park	125	Wells
23	Bush Gardens Mobile Home Park	270	Wells
24	Circle B Trailer Court	50	Wells
25	Circle Court Mobile Park	125	Wells
26	Creekside Mobile Home Park	120	Wells
27	Donnelly's Mobile Home Court	99	Wells
28	Gowanda State Hospital	NA	Clear Lake
29	Hillside Estates	160	Wells
30	Hunters Creek Mobile Home Park	150	Wells
31	Knox Apartments	NA	Wells
32	Maple Grove Trailer Court	72	Wells
33	Millgrove Mobile Park	100	Wells
34	Perkins Trailer Park	75	Wells
35	Quarry Hill Estates	400	Wells
36	Springville Mobile Park	114	Wells
37	Springwood Mobile Village	132	Wells
38	Taylors Grove Trailer Park	39	Wells
39	Valley View Mobile Court	42	Wells
40	Villager Apartments	NA	Wells

NIAGARA COUNTY

ID NO	COMMUNITY WATER SYSTEM	POPULATION	SOURCE
	Municipal Community		
	Lockport City (See No 12, Erie Co)	25000	
1	Middleport Village	2000	Wells (Springs)
	Niagara County Water District (See No 13, Erie Co)	48	
2	Niagara Falls City (See also No 14 Erie Co)	77180	Niagara River - East Branch
	North Tonawanda City (See No 16 Erie Co)	36000	
	Non Municipal Community		
3	Country Estates Mobile Village	28	Wells



SCALE 1:25 000

0 — 1 MILE

1000 2000 3000 4000 5000 6000 7000 FEET

.5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
ATIONAL GEODETIC VERTICAL DATUM OF 1929

AND SOUNDINGS IN FEET—DATUM IS LOW WATER 568.6 FEET

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

Interstate Route

U. S. Route

State Route

TONAWANDA WEST, N. Y.

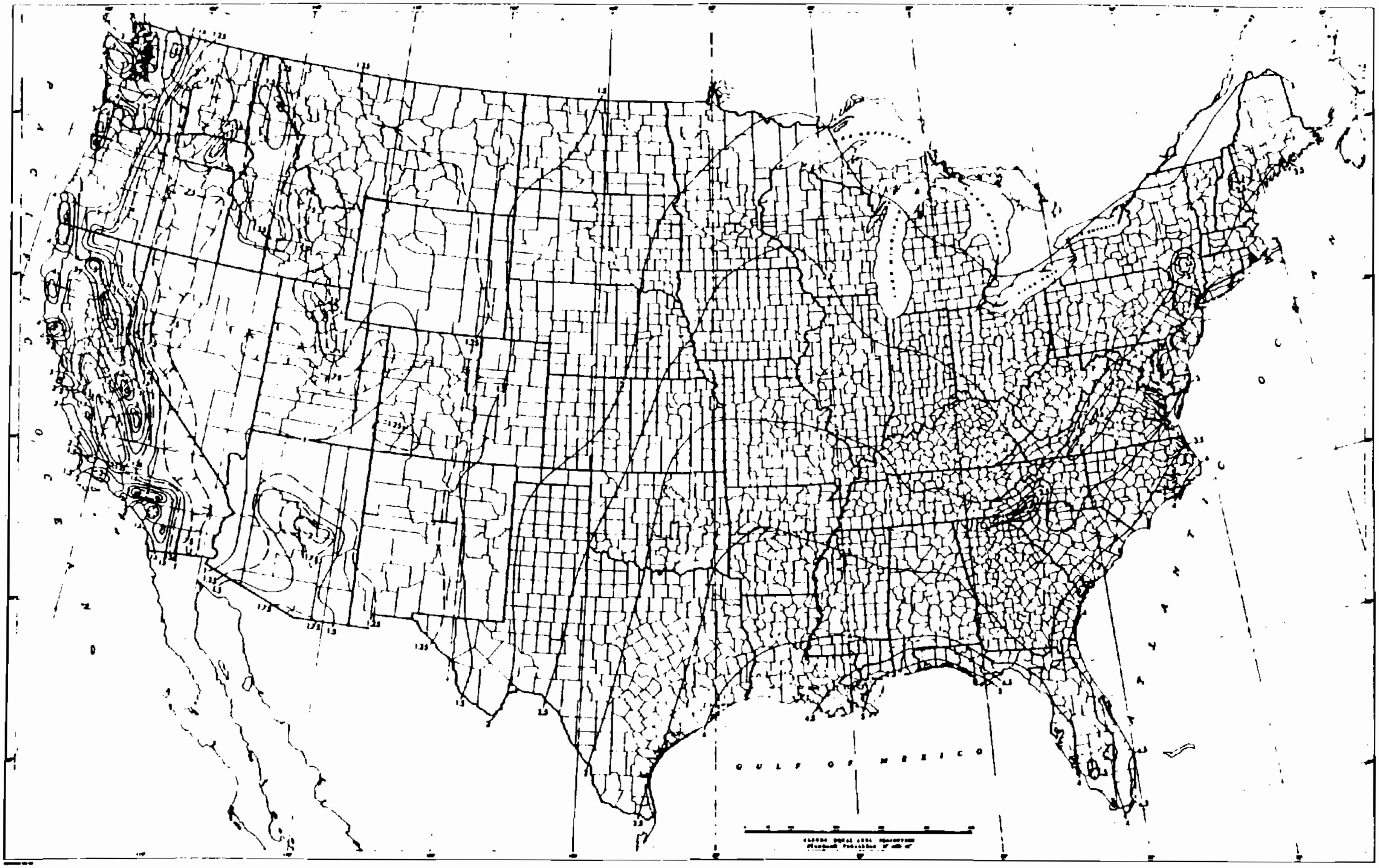
SW/4 TONAWANDA 15′ QUADRANGLE
N4300—W7852.5/7.5

1980

DMA 5270 III SW—SERIES V821

COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
ING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

15



Source: Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U.S. Department of Commerce, U.S. Government Printing Office, Washington, D.C., 1963.

FIGURE 8
1-YEAR 24-HOUR RAINFALL
(INCHES)

17

Soil

TABLE 2.5
30890-0092A
ENGINEERING SCIENCE
EPA TCL PESTICIDES/PCB's

All results reported as ug/Kg.

Sample Identification

Dilution Factor	1.90	
Method Blank I.D.	1019 -B02	
Compound	SED-2.13	Lower Limits of Detection with no Dilution
alpha BHC	U	8.0
beta BHC	U	8.0
delta BHC	U	8.0
gamma BHC	U	8.0
Heptachlor	U	8.0
Aldrin	U	8.0
Heptachlor Epoxide	U	8.0
Endosulfan I	U	8.0
Dieldrin	U	16
4,4' DDE	U	16
Endrin	U	16
Endosulfan II	U	16
4,4' DDD	U	16
Endosulfan Sulfate	U	16
4,4' DDT	U	16
Methoxychlor	U	80
Endrin Ketone	U	16
alpha Chlordane	U	80
gamma Chlordane	U	80
Toxaphene	U	160
Aroclor - 1016	U	80
Aroclor - 1221	U	80
Aroclor - 1232	U	80
Aroclor - 1242	U	80
Aroclor - 1248	U	80
Aroclor - 1254	U	160
Aroclor - 1260	120J	160

U, J - See Appendix for definition.

Original letter

(18)

New York State Department of Environmental Conservation
FISH AND WILDLIFE DIVISION - REGION 9
600 Delaware Avenue, Buffalo, New York 14202-1073
(716) 847-4550

Thomas C. Jorling
Commissioner

September 2, 1987

Ms. Elizabeth M. Dobson
Engineering-Science
290 Elwood Davis Road
Liverpool, New York 13088

Dear Ms. Dobson:

This letter will serve as verification that I traced NYS designated wetland boundaries on the accompanying maps. The boundaries shown are from official Department of Environmental Conservation Maps promulgated on September 10, 1986 (Erie County) and December 5, 1984 (Niagara County).

Very truly yours,

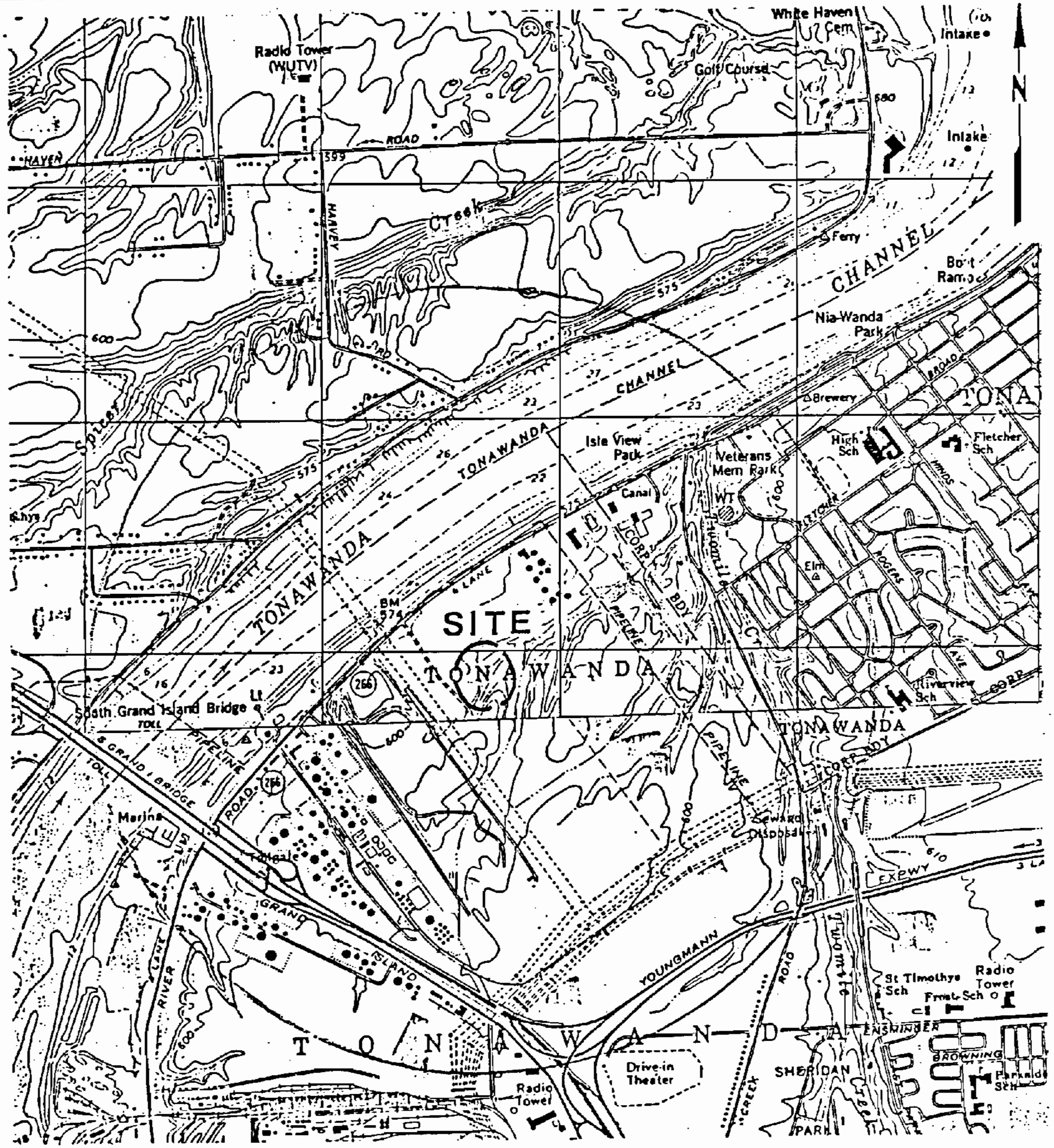
James F. Farquhar III

James F. Farquhar III
Fish and Wildlife Division

JFF:slm

cc: Mr. Gordon R. Batcheller

Enclosures



LATITUDE: 43°00'08"
LONGITUDE: 78°55'11"

Erie County

SCALE
0 1000 2000 3000 4000 FEET

ENGINEERING-SCIENCE, INC.
IN ASSOCIATION WITH
DAMES & MOORE

NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
PHASE I REPORT

SITE LOCATION MAP
ASHLAND PETROLEUM CO.

FIGURE iv-1

REFERENCE: U.S.G.S. 7.5' Topographic Map
Tonawanda West, NY (1980) and Buffalo NW,
NY-ONT. (1965) Quadrangles

INTERVIEW FORM

INTERVIEWEE/CODE John W. Ozard /

TITLE - POSITION Senior Wildlife Biologist

ADDRESS WRC New York State DEC

CITY Delmar STATE NY ZIP 12054

PHONE (518) 439-7488 RESIDENCE PERIOD TO

LOCATION phone conversation INTERVIEWER W. Bradford

DATE/TIME 4/14/88 / 11:00 AM

SUBJECT: Critical habitats in New York state.

REMARKS: There are no federally designated critical habitats of endangered species located within New York State.

I AGREE WITH THE ABOVE SUMMARY OF THE INTERVIEW: John W. Ozard

SIGNATURE: JOHN W. OZARD

COMMENTS:

20

US CENSUS DATA, 1980

US Census Data used in the HRS scoring was obtained from various County Planning Offices. This data was not obtained from a report. The raw census data combined with County Planning Maps was used to estimate the population within 1, 2, 3, and 4 miles of the Phase II site being investigated. Because of the voluminous amount of data used, the data is not provided in this Appendix.

federal register

Tuesday
March 1, 1983

21

Part III

Department of the Interior

National Park Service

National Registry of Natural Landmarks

22

ATIONAL REGISTER OF HISTORIC PLACES

ANNUAL LISTING OF PROPERTIES

ANUARY 1979 THROUGH DECEMBER 1982

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

JULY 1983

052571

(23)

Bechtel National, Inc.
Systems Engineers — Constructors

Jackson Plaza Tower
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

Mail Address: P.O. Box 350, Oak Ridge, TN 37831-0350
Telex: 3785873

JUL 18 1989

Engineering Science
290 Elwood - Davis Road
Suite 312
Liverpool, New York 13088

Attention: Mr. George Moreau

Subject: Bechtel Job No. 14501, FUSRAP Project
DOE Contract No. DE-AC05-81OR20722
Summary of Ashland 2 Well Data
Code: 7240/WBS: 132

Dear Mr. Moreau:

The following is in response to your request for additional data on the Ashland 2 site located in Tonawanda, New York. Enclosed for your use is a summary of the water level measurements taken at the site by BNI over the past two years. Also enclosed is a summary of the chemical results for groundwater samples that have been collected from the site.

In addition to taking water level measurements and collecting groundwater samples for chemical analysis, groundwater samples have also been analyzed for the radionuclides pertinent to DOE's investigation. The radionuclides of interest are radium-226, thorium-230, thorium-232, and natural uranium. None of these radionuclides have been detected at above background concentrations over the past two years.

If you have any further questions, please contact me at (615) 576-4718.

Very truly yours,

RCRobertson

R. C. Robertson
Project Manager - FUSRAP

EMM:djw:0098a
Enclosures: (1) Summary of the Water Level Measurements for the Ashland 2 Site
(2) Summary of the Chemical Results from the Groundwater Sampling Program at Ashland 2

062502 23

Monitoring Well Construction Summary
FUSRAP
ASHLAND 2 SOUTH

Well Number	Construction Date	Total Depth (Ft)	Monitored Interval From (Ft Below Ground)	To	Construction Material
B55W17D	6/3/87	90.0	80.6	85.6	316 Stainless Steel
B55W19D	7/27/87	81.9	71.8	76.8	316 Stainless Steel
B55W26D	7/17/87	93.1	85.8	90.8	316 Stainless Steel
B55W27D	7/22/87	86.0	79.4	84.4	316 Stainless Steel
B55W29D	8/11/87	95.3	88.8	93.8	316 Stainless Steel
B55W30S	8/17/87	55.0	19.9	29.9	316 Stainless Steel
B55W31S	9-22-88	31.0	25.1	29.7	316 Stainless steel
B55W32M	9-22-88	70.0	64.5	69.1	316 Stainless
B55W33M	(9/88)	82.0	74.2	78.8	316 Stainless steel
B55W34D	9-21-88	98.5	93.7	98.3	316 Stainless
B55W35S	9-20-88	45.0	39.4	44.0	316 Stainless
B55W36D	9-21-88	96.3	91.0	95.6	316 Stainless
B55W37M	9-20-88	77.0	71.7	76.3	316 Stainless steel
B55W38D	9-19-88	98.0	91.8	96.4	316 Stainless steel
B55W39S	9-20-88	47.0	38.1	42.7	316 Stainless

S= SHALLOW WELL M= MODERATE DEPTH WELL D= DEEP WELL
PVC= POLYVINYL CHLORIDE SS= STAINLESS STEEL

```
BECHTEL
Oak Ridge, Tennessee

                DATE     TIME
At printing  JUL1389  13:44
Last update  JUL1289  09:25

                                                PROJECT ID   ASH2S
                                                POINT ID     B55W17D

                      WATER LEVEL READINGS
DATUM DESCRIPTION : TOP OF RISER CASING____________       DATUM ELEV __594.50
DATUM HEIGHT ABOVE GROUND SURFACE  __0.38  (can use negative values)

      MNDY.YR   HR   MIN     DEPTH      ELEV
(001) 0203.88   12   _0..  __26.580  __567.92
(002) 0211.88   12   _0..  __25.870  __568.63
(003) 0217.88   12   _0..  __26.240  __568.26
(004) 0225.88   12   _0..  __25.100  __569.40
(005) 0302.88   12   _0..  __26.220  __568.28
(006) 0309.88   12   _0..  __26.180  __568.32
(007) 0324.88   12   _0..  __26.310  __568.19
(008) 0331.88   12   _0..  __26.150  __568.35
(009) 0407.88   12   _0..  __26.270  __568.23
(010) 0422.88   12   _0..  __25.940  __568.56
 011  0427.88   12   _0..  __26.250  __568.25
 012  0504.88   12   _0..  __26.600  __567.90
 013  0512.88   12   _0..  __26.580  __567.92
 014  0520.88   12   _0..  __26.350  __568.15
 015  0525.88   12   _0..  __26.740  __567.76
 016  0602.88   12   _0..  __26.640  __567.86
 017  0608.88   12   _0..  __26.510  __567.99
 018  0615.88   12   _0..  __26.650  __567.85
 019  0623.88   12   _0..  __26.660  __567.84
 020  0629.88   12   _0..  __26.690  __567.81
 021  0705.88   12   _0..  __26.500  __568.00
 022  0720.88   12   _0..  __27.050  __567.45
 023  0728.88   12   _0..  __26.990  __567.51
 024  0803.88   12   _0..  __26.730  __567.77
 025  0810.88   12   _0..  __26.850  __567.65
 026  0818.88   12   _0..  __26.240  __568.26
 027  0824.88   12   _0..  __27.140  __567.36
 028  0831.88   12   _0..  __27.500  __567.00
 029  0907.88   12   _0..  __27.550  __566.95
 030  0921.88   12   _0..  __27.520  __566.98
 031  0928.88   12   _0..  __27.870  __566.63
 032  1012.88   12   _0..  __27.430  __567.07
 033  1025.88   12   _0..  __27.130  __567.37
 034  1109.88   12   _0..  __27.410  __567.09
 035  1116.88   12   _0..  __27.120  __567.38
 036  1130.88   12   _0..  __26.950  __567.55
 037  1207.88   12   _0..  __27.050  __567.45
```

038	1221.88	12	_0..	__26.980	__567.52
039	0104.89	12	_0..	__26.770	__567.73
040	0111.89	12	_0..	__24.900	__569.60
041	0118.89	12	_0..	__25.980	__568.52
042	0125.89	12	_0..	__26.020	__568.48
043	0131.89	12	_0..	__25.930	__568.57
044	0209.89	12	_0..	__26.400	__568.10
045	0301.89	12	_0..	__25.700	__568.80
046	0308.89	12	_0..	__27.520	__566.98
047	0329.89	12	_0..	__26.980	__567.52
048	0419.89	12	_0..	__26.620	__567.88
049	0503.89	12	_0..	__26.000	__568.50
050	0510.89	12	_0..	__26.310	__568.19
051	0518.89	12	_0..	__26.330	__568.17
052	0524.89	12	_0..	__26.150	__568.35
053	0531.89	12	_0..	__26.000	__568.50
054	0614.89	12	_0..	__26.130	__568.37
055	0621.89	12	_0..	__26.050	__568.45

PROJECT ID ASH2S
POINT ID B55W19D

WATER LEVEL READINGS

DATUM DESCRIPTION : TOP OF RISER PIPE____________ DATUM ELEV __591.09
DATUM HEIGHT ABOVE GROUND SURFACE __1.07 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0203.88	12	_0..	__22.930	__568.16
(002)	0211.88	12	_0..	__21.650	__569.44
(003)	0217.88	12	_0..	__22.170	__568.92
(004)	0225.88	12	_0..	__21.090	__570.00
(005)	0302.88	12	_0..	__22.290	__568.80
(006)	0309.88	12	_0..	__22.200	__568.89
(007)	0324.88	12	_0..	__22.940	__568.15
(008)	0331.88	12	_0..	__22.960	__568.13
(009)	0407.88	12	_0..	__22.570	__568.52
(010)	0422.88	12	_0..	__22.270	__568.82
011	0427.88	12	_0..	__22.350	__568.74
012	0504.88	12	_0..	__22.940	__568.15
013	0512.88	12	_0..	__22.710	__568.38
014	0520.88	12	_0..	__23.310	__567.78
015	0525.88	12	_0..	__23.000	__568.09
016	0602.88	12	_0..	__23.220	__567.87
017	0608.88	12	_0..	__23.070	__568.02
018	0615.88	12	_0..	__23.190	__567.90
019	0623.88	12	_0..	__22.980	__568.11
020	0629.88	12	_0..	__23.090	__568.00
021	0705.88	12	_0..	__23.630	__567.46
022	0720.88	12	_0..	__22.940	__568.15
023	0728.88	12	_0..	__23.220	__567.87

23

024	0803.88	12	_0..	__23.420	__567.67
025	0810.88	12	_0..	__23.400	__567.69
026	0818.88	12	_0..	__23.650	__567.44
027	0824.88	12	_0..	__23.670	__567.42
028	0831.88	12	_0..	__24.050	__567.04
029	0907.88	12	_0..	__24.130	__566.96
030	0921.88	12	_0..	__24.000	__567.09
031	0928.88	12	_0..	__24.020	__567.07
032	1012.88	12	_0..	__23.780	__567.31
033	1025.88	12	_0..	__23.820	__567.27
034	1109.88	12	_0..	__24.090	__567.00
035	1116.88	12	_0..	__23.690	__567.40
036	1130.88	12	_0..	__23.530	__567.56
037	1207.88	12	_0..	__23.630	__567.46
038	1221.88	12	_0..	__23.550	__567.54
039	1228.88	12	_0..	__23.540	__567.55
040	0104.89	12	_0..	__23.700	__567.39
041	0111.89	12	_0..	__23.770	__567.32
042	0118.89	12	_0..	__23.600	__567.49
043	0125.89	12	_0..	__23.650	__567.44
044	0131.89	12	_0..	__23.630	__567.46
045	0209.89	12	_0..	__23.250	__567.84
046	0301.89	12	_0..	__22.980	__568.11
047	0308.89	12	_0..	__23.990	__567.10
048	0329.89	12	_0..	__23.680	__567.41
049	0419.89	12	_0..	__23.000	__568.09
050	0503.89	12	_0..	__22.910	__568.18
051	0510.89	12	_0..	__22.940	__568.15
052	0518.89	12	_0..	__22.770	__568.32
053	0524.89	12	_0..	__22.700	__568.39
054	0531.89	12	_0..	__22.790	__568.30
055	0614.89	12	_0..	__22.390	__568.70
056	0621.89	12	_0..	__21.610	__569.48

PROJECT ID ASH2S
POINT ID B55W23D

WATER LEVEL READINGS

DATUM DESCRIPTION : TOP OF RISER PIPE____________ DATUM ELEV __598.00
DATUM HEIGHT ABOVE GROUND SURFACE __1.35 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0203.88	12	_0..	__29.770	__568.23
(002)	0211.88	12	_0..	__29.460	__568.54
(003)	0217.88	12	_0..	__27.400	__570.60
(004)	0225.88	12	_0..	__28.860	__569.14
(005)	0302.88	12	_0..	__28.050	__569.95
(006)	0309.88	12	_0..	__29.160	__568.84
(007)	0324.88	12	_0..	__29.690	__568.31
(008)	0331.88	12	_0..	__28.690	__569.31
(009)	0407.88	12	_0..	__27.100	__570.90

(010)	0422.88	12	_0..	__29.200	__568.80
011	0427.88	12	_0..	__29.100	__568.90
012	0504.88	12	_0..	__28.990	__569.01
013	0512.88	12	_0..	__30.190	__567.81
014	0520.88	12	_0..	__30.060	__567.94
015	0525.88	12	_0..	__30.100	__567.90
016	0602.88	12	_0..	__29.840	__568.16
017	0608.88	12	_0..	__29.800	__568.20
018	0615.88	12	_0..	__29.800	__568.20
019	0623.88	12	_0..	__29.890	__568.11
020	0629.88	12	_0..	__29.970	__568.03
021	0705.88	12	_0..	__30.190	__567.81
022	0720.88	12	_0..	__30.360	__567.64
023	0728.88	12	_0..	__30.310	__567.69
024	0803.88	12	_0..	__30.190	__567.81
025	0810.88	12	_0..	__30.140	__567.86
026	0818.88	12	_0..	__30.580	__567.42
027	0824.88	12	_0..	__30.220	__567.78
028	0831.88	12	_0..	__30.880	__567.12
029	0907.88	12	_0..	__30.860	__567.14
030	0921.88	12	_0..	__30.890	__567.11
031	0928.88	12	_0..	__31.130	__566.87
032	1012.88	12	_0..	__30.890	__567.11
033	1025.88	12	_0..	__30.590	__567.41
034	1109.88	12	_0..	__30.810	__567.19
035	1116.88	12	_0..	__30.510	__567.49
036	1130.88	12	_0..	__30.340	__567.66
037	1207.88	12	_0..	__30.350	__567.65
038	1221.88	12	_0..	__30.330	__567.67
039	1228.88	12	_0..	__30.240	__567.76
040	0104.89	12	_0..	__30.530	__567.47
041	0111.89	12	_0..	__30.360	__567.64
042	0118.89	12	_0..	__29.870	__568.13
043	0125.89	12	_0..	__30.040	__567.96
044	0131.89	12	_0..	__29.970	__568.03
045	0209.89	12	_0..	__29.430	__568.57
046	0301.89	12	_0..	__29.120	__568.88
047	0308.89	12	_0..	__30.670	__567.33
048	0329.89	12	_0..	__30.160	__567.84
049	0419.89	12	_0..	__29.920	__568.08
050	0503.89	12	_0..	__29.810	__568.19
051	0510.89	12	_0..	__29.610	__568.39
052	0518.89	12	_0..	__29.670	__568.33
053	0524.89	12	_0..	__29.610	__568.39
054	0531.89	12	_0..	__29.650	__568.35
055	0614.89	12	_0..	__29.250	__568.75
056	0621.89	12	_0..	__28.930	__569.07

PROJECT ID ASH2S
POINT ID B55W27D

WATER LEVEL READINGS

DATUM DESCRIPTION : TOP OF RISER PIPE____________ DATUM ELEV __605.92

DATUM HEIGHT ABOVE GROUND SURFACE __1.55 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0203.88	12	_0..	__35.960	__569.96
(002)	0211.88	12	_0..	__36.000	__569.92
(003)	0217.88	12	_0..	__35.640	__570.28
(004)	0225.88	12	_0..	__36.950	__568.97
(005)	0302.88	12	_0..	__36.390	__569.53
(006)	0309.88	12	_0..	__36.220	__569.70
(007)	0324.88	12	_0..	__35.720	__570.20
(008)	0331.88	12	_0..	__37.380	__568.54
(009)	0407.88	12	_0..	__37.490	__568.43
(010)	0422.88	12	_0..	__36.820	__569.10
011	0427.88	12	_0..	__37.390	__568.53
012	0504.88	12	_0..	__37.520	__568.40
013	0512.88	12	_0..	__38.280	__567.64
014	0520.88	12	_0..	__38.120	__567.80
015	0525.88	12	_0..	__38.090	__567.83
016	0602.88	12	_0..	__37.740	__568.18
017	0608.88	12	_0..	__37.590	__568.33
018	0615.88	12	_0..	__37.680	__568.24
019	0623.88	12	_0..	__37.760	__568.16
020	0629.88	12	_0..	__38.000	__567.92
021	0705.88	12	_0..	__38.120	__567.80
022	0720.88	12	_0..	__38.050	__567.87
023	0728.88	12	_0..	__37.000	__568.92
024	0803.88	12	_0..	__38.050	__567.87
025	0810.88	12	_0..	__38.180	__567.74
026	0818.88	12	_0..	__38.690	__567.23
027	0824.88	12	_0..	__38.850	__567.07
028	0831.88	12	_0..	__39.290	__566.63
029	0907.88	12	_0..	__39.000	__566.92
030	0921.88	12	_0..	__39.240	__566.68
031	0928.88	12	_0..	__39.390	__566.53
032	1012.88	12	_0..	__39.050	__566.87
033	1025.88	12	_0..	__38.700	__567.22
034	1109.88	12	_0..	__38.650	__567.27
035	1116.88	12	_0..	__38.190	__567.73
036	1130.88	12	_0..	__38.080	__567.84
037	1207.88	12	_0..	__38.130	__567.79
038	1221.88	12	_0..	__38.100	__567.82
039	0104.89	12	_0..	__38.230	__567.69
040	0111.89	12	_0..	__38.290	__567.63
041	0118.89	12	_0..	__37.870	__568.05
042	0125.89	12	_0..	__37.850	__568.07
043	0131.89	12	_0..	__37.610	__568.31
044	0209.89	12	_0..	__37.770	__568.15
045	0301.89	12	_0..	__34.230	__571.69
046	0308.89	12	_0..	__38.300	__567.62
047	0329.89	12	_0..	__38.310	__567.61

048	0419.89	12	_0..	__37.530	__568.39
049	0503.89	12	_0..	__37.410	__568.51
050	0510.89	12	_0..	__37.350	__568.57
051	0518.89	12	_0..	__37.390	__568.53
052	0524.89	12	_0..	__37.330	__568.59
053	0531.89	12	_0..	__37.170	__568.75
054	0614.89	12	_0..	__36.930	__568.99
055	0621.89	12	_0..	__36.830	__569.09

PROJECT ID ASH2S
POINT ID B55W28D

WATER LEVEL READINGS

DATUM DESCRIPTION : TOP OF RISER PIPE______________ DATUM ELEV __603.83
DATUM HEIGHT ABOVE GROUND SURFACE __1.50 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0203.88	12	_0..	__29.930	__573.90
(002)	0211.88	12	_0..	__35.150	__568.68
(003)	0217.88	12	_0..	__33.040	__570.79
(004)	0225.88	12	_0..	__34.880	__568.95
(005)	0302.88	12	_0..	__35.060	__568.77
(006)	0309.88	12	_0..	__35.000	__568.83
(007)	0324.88	12	_0..	__35.120	__568.71
(008)	0331.88	12	_0..	__35.620	__568.21
(009)	0407.88	12	_0..	__34.830	__569.00
(010)	0422.88	12	_0..	__33.000	__570.83
011	0427.88	12	_0..	__35.200	__568.63
012	0504.88	12	_0..	__35.940	__567.89
013	0512.88	12	_0..	__36.390	__567.44
014	0520.88	12	_0..	__35.890	__567.94
015	0525.88	12	_0..	__35.860	__567.97
016	0602.88	12	_0..	__35.530	__568.30
017	0608.88	12	_0..	__35.420	__568.41
018	0615.88	12	_0..	__35.620	__568.21
019	0623.88	12	_0..	__35.730	__568.10
020	0629.88	12	_0..	__35.860	__567.97
021	0705.88	12	_0..	__36.360	__567.47
022	0720.88	12	_0..	__38.250	__565.58
023	0728.88	12	_0..	__36.000	__567.83
024	0803.88	12	_0..	__35.830	__568.00
025	0810.88	12	_0..	__36.000	__567.83
026	0818.88	12	_0..	__36.430	__567.40
027	0824.88	12	_0..	__36.640	__567.19
028	0831.88	12	_0..	__36.930	__566.90
029	0907.88	12	_0..	__36.760	__567.07
030	0921.88	12	_0..	__36.890	__566.94
031	0928.88	12	_0..	__37.200	__566.63
032	1012.88	12	_0..	__36.780	__567.05
033	1025.88	12	_0..	__36.590	__567.24

034	1109.88	12	_0..	__36.490	__567.34
035	1116.88	12	_0..	__36.090	__567.74
036	1130.88	12	_0..	__35.970	__567.86
037	1207.88	12	_0..	__35.970	__567.86
038	1221.88	12	_0..	__35.980	__567.85
039	0104.89	12	_0..	__36.000	__567.83
040	0111.89	12	_0..	__36.130	__567.70
041	0118.89	12	_0..	__35.790	__568.04
042	0125.89	12	_0..	__37.850	__565.98
043	0131.89	12	_0..	__34.990	__568.84
044	0209.89	12	_0..	__35.560	__568.27
045	0301.89	12	_0..	__35.210	__568.62
046	0308.89	12	_0..	__36.310	__567.52
047	0329.89	12	_0..	__35.920	__567.91
048	0419.89	12	_0..	__35.360	__568.47
049	0503.89	12	_0..	__35.380	__568.45
050	0510.89	12	_0..	__35.150	__568.68
051	0518.89	12	_0..	__35.270	__568.56
052	0524.89	12	_0..	__35.070	__568.76
053	0531.89	12	_0..	__35.160	__568.67
054	0614.89	12	_0..	__34.210	__569.62
055	0621.89	12	_0..	__34.690	__569.14

PROJECT ID ASH2S
POINT ID B55W30S

WATER LEVEL READINGS

DATUM DESCRIPTION : TOP OF RISER PIPE_____________ DATUM ELEV __606.19
DATUM HEIGHT ABOVE GROUND SURFACE __2.29 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0203.88	12	_0..	___3.190	__603.00
(002)	0211.88	12	_0..	___3.170	__603.02
(003)	0217.88	12	_0..	___3.120	__603.07
(004)	0225.88	12	_0..	___2.900	__603.29
(005)	0302.88	12	_0..	___2.810	__603.38
(006)	0309.88	12	_0..	___2.970	__603.22
(007)	0324.88	12	_0..	___2.670	__603.52
(008)	0331.88	12	_0..	___2.660	__603.53
(009)	0407.88	12	_0..	___2.530	__603.66
(010)	0422.88	12	_0..	___3.800	__602.39
011	0427.88	12	_0..	___3.780	__602.41
012	0504.88	12	_0..	___3.490	__602.70
013	0512.88	12	_0..	___3.860	__602.33
014	0520.88	12	_0..	___3.410	__602.78
015	0525.88	12	_0..	___3.500	__602.69
016	0602.88	12	_0..	___4.050	__602.14
017	0608.88	12	_0..	___4.460	__601.73
018	0615.88	12	_0..	___4.980	__601.21
019	0623.88	12	_0..	___5.500	__600.69

020	0629.88	12	_0..	___5.940	__600.25
021	0705.88	12	_0..	___6.460	__599.73
022	0720.88	12	_0..	___7.450	__598.74
023	0728.88	12	_0..	___7.260	__598.93
024	0803.88	12	_0..	___7.630	__598.56
025	0810.88	12	_0..	___7.640	__598.55
026	0818.88	12	_0..	___8.050	__598.14
027	0824.88	12	_0..	___8.300	__597.89
028	0831.88	12	_0..	___8.790	__597.40
029	0907.88	12	_0..	___9.120	__597.07
030	0921.88	12	_0..	___9.610	__596.58
031	0928.88	12	_0..	__10.000	__596.19
032	1012.88	12	_0..	__10.480	__595.71
033	1025.88	12	_0..	__10.750	__595.44
034	1109.88	12	_0..	__10.090	__596.10
035	1116.88	12	_0..	___8.380	__597.81
036	1130.88	12	_0..	___6.820	__599.37
037	1207.88	12	_0..	___6.560	__599.63
038	1221.88	12	_0..	___6.610	__599.58
039	1228.88	12	_0..	___5.100	__601.09
040	0104.89	12	_0..	___4.450	__601.74
041	0111.89	12	_0..	___4.500	__601.69
042	0118.89	12	_0..	___4.100	__602.09
043	0125.89	12	_0..	___4.110	__602.08
044	0131.89	12	_0..	___4.000	__602.19
045	0209.89	12	_0..	___3.850	__602.34
046	0305.89	12	_0..	___2.610	__603.58
047	0510.89	12	_0..	___2.870	__603.32
048	0518.89	12	_0..	___2.790	__603.40
049	0524.89	12	_0..	___2.980	__603.21
050	0531.89	12	_0..	___3.290	__602.90
051	0614.89	12	_0..	___2.880	__603.31
052	0621.89	12	_0..	___2.840	__603.35

PROJECT ID ASH2S
POINT ID B55W31S

WATER LEVEL READINGS

DATUM DESCRIPTION : Top of Riser Casing___________ DATUM ELEV __588.51

DATUM HEIGHT ABOVE GROUND SURFACE __3.67 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0419.89	12	_0..	__25.490	__563.02
(002)	0503.89	12	_0..	__18.560	__569.95
(003)	0510.89	12	_0..	__16.520	__571.99
(004)	0518.89	12	_0..	__14.870	__573.64
(005)	0524.89	12	_0..	__13.940	__574.57
(006)	0531.89	12	_0..	__13.150	__575.36
(007)	0614.89	12	_0..	__11.700	__576.81
(008)	0621.89	12	_0..	__11.710	__576.80

PROJECT ID ASH2S
POINT ID B55W32M

WATER LEVEL READINGS

DATUM DESCRIPTION : Top of Riser Casing_______________DATUM ELEV __596.26
DATUM HEIGHT ABOVE GROUND SURFACE __2.24 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0419.89	12	_0..	__23.520	__572.74
(002)	0503.89	12	_0..	__20.760	__575.50
(003)	0510.89	12	_0..	__20.000	__576.26
(004)	0518.89	12	_0..	__23.000	__573.26
(005)	0524.89	12	_0..	__22.220	__574.04
(006)	0531.89	12	_0..	__21.450	__574.81
(007)	0614.89	12	_0..	__21.490	__574.77
(008)	0621.89	12	_0..	__21.440	__574.82

PROJECT ID ASH2S
POINT ID B55W33M

WATER LEVEL READINGS

DATUM DESCRIPTION Top of Riser Casing___________ DATUM ELEV __600.87
DATUM HEIGHT ABOVE GROUND SURFACE __2.97 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0419.89	12	_0..	__32.700	__568.17
(002)	0503.89	12	_0..	__27.270	__573.60
(003)	0510.89	12	_0..	__28.350	__572.52
(004)	0518.89	12	_0..	__27.680	__573.19
(005)	0524.89	12	_0..	__27.820	__573.05
(006)	0531.89	12	_0..	__27.770	__573.10
(007)	0614.89	12	_0..	__27.490	__573.38
(008)	0621.89	12	_0..	__27.550	__573.32

PROJECT ID ASH2S
POINT ID B55W34D

WATER LEVEL READINGS

DATUM DESCRIPTION : Top of Riser Casing__________ DATUM ELEV __600.71
DATUM HEIGHT ABOVE GROUND SURFACE __2.59 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0419.89	12	_0..	__32.600	__568.11
(002)	0503.89	12	_0..	__32.050	__568.66
(003)	0510.89	12	_0..	__32.310	__568.40
(004)	0518.89	12	_0..	__31.770	__568.94
(005)	0524.89	12	_0..	__32.300	__568.41
(006)	0531.89	12	_0..	__32.400	__568.31
(007)	0614.89	12	_0..	__31.430	__569.28
(008)	0621.89	12	_0..	__31.210	__569.50

```
                                                        PROJECT ID   ASH2S
                                                        POINT ID     B55W35S

                               WATER LEVEL READINGS
DATUM DESCRIPTION : Top of Riser Casing_________          DATUM ELEV __604.10
DATUM HEIGHT ABOVE GROUND SURFACE  __2.66  (can use negative values)

      MNDY.YR   HR   MIN      DEPTH       ELEV
(001) 0419.89   12   _0..   __23.940   __580.16
(002) 0503.89   12   _0..   __22.040   __582.06
(003) 0510.89   12   _0..   __14.420   __589.68
(004) 0518.89   12   _0..   __13.440   __590.66
(005) 0524.89   12   _0..   __12.540   __591.56
(006) 0531.89   12   _0..   __12.610   __591.49
(007) 0614.89   12   _0..   __12.200   __591.90
(008) 0621.89   12   _0..   __12.120   __591.98
```

```
                                                        PROJECT ID   ASH2S
                                                        POINT ID     B55W36D

                               WATER LEVEL READINGS
DATUM DESCRIPTION : Top of Riser Casing____________          DATUM ELEV __603.53
DATUM HEIGHT ABOVE GROUND SURFACE  __2.42  (can use negative values)

      MNDY.YR   HR   MIN      DEPTH       ELEV
(001) 0419.89   12   _0..   __35.350   __568.18
(002) 0503.89   12   _0..   __35.150   __568.38
(003) 0510.89   12   _0..   __35.160   __568.37
(004) 0518.89   12   _0..   __35.570   __567.96
(005) 0524.89   12   _0..   __34.990   __568.54
(006) 0531.89   12   _0..   __35.120   __568.41
(007) 0614.89   12   _0..   __34.810   __568.72
(008) 0621.89   12   _0..   __34.740   __568.79
```

```
                                                        PROJECT ID   ASH2S
                                                        POINT ID     B55W37M

                               WATER LEVEL READINGS
DATUM DESCRIPTION : Top of Riser Casing_______________DATUM ELEV __604.82
DATUM HEIGHT ABOVE GROUND SURFACE  __2.74  (can use negative values)

      MNDY.YR   HR   MIN      DEPTH       ELEV
(001) 0419.89   12   _0..   __36.220   __568.60
(002) 0503.89   12   _0..   __35.110   __569.71
(003) 0510.89   12   _0..   __35.900   __568.92
(004) 0518.89   12   _0..   __35.990   __568.83
(005) 0524.89   12   _0..   __35.830   __568.99
(006) 0531.89   12   _0..   __35.900   __568.92
(007) 0614.89   12   _0..   __35.700   __569.12
(008) 0621.89   12   _0..   __35.630   __569.19
```

PROJECT ID ASH2S
POINT ID B55W38D

WATER LEVEL READINGS

DATUM DESCRIPTION : Top of Riser Casing__________ DATUM ELEV __606.16
DATUM HEIGHT ABOVE GROUND SURFACE __2.75 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0419.89	12	_0..	__37.880	__568.28
(002)	0503.89	12	_0..	__37.130	__569.03
(003)	0510.89	12	_0..	__37.750	__568.41
(004)	0518.89	12	_0..	__37.710	__568.45
(005)	0524.89	12	_0..	__37.580	__568.58
(006)	0531.89	12	_0..	__37.680	__568.48
(007)	0614.89	12	_0..	__37.370	__568.79
(008)	0621.89	12	_0..	__37.230	__568.93

PROJECT ID ASH2S
POINT ID B55W39S

WATER LEVEL READINGS

DATUM DESCRIPTION : Top of Riser Casing_______________DATUM ELEV __603.64
DATUM HEIGHT ABOVE GROUND SURFACE __2.23 (can use negative values)

	MNDY.YR	HR	MIN	DEPTH	ELEV
(001)	0419.89	12	_0..	__21.420	__582.22
(002)	0503.89	12	_0..	__21.010	__582.63
(003)	0510.89	12	_0..	__12.640	__591.00
(004)	0518.89	12	_0..	__11.400	__592.24
(005)	0524.89	12	_0..	__10.840	__592.80
(006)	0531.89	12	_0..	__10.410	__593.23
(007)	0614.89	12	_0..	___9.870	__593.77
(008)	0621.89	12	_0..	___9.670	__593.97

Summary of Ashland Data From Sept. 1987 to April 1989

Below are tables summarizing the chemical results by quarter. Each table is catagorized by the group of analyses.

September 1987

The data package for this quarter has samples marked as well 26. The samples were mislabeled. The well that the samples were collected from is well 30.

Analyses requested were BNAEs, VOAs and ICP metals.

BNAEs

Well	Compound	Conc. ug/l	Detection Limit ug/l
B55W17	Bis (2-ethylhexyl) Phthalate	34	10
B55W30	"	12	10
B55W27	"	18	10
B55W28	"	14	10

VOA

Well	Compound	Conc. ug/l	Detection Limit ug/l
B55W19	Acetone	38*	10
B55W30	"	31*	10
B55W23	"	23*	10
B55W28	"	18*	10
B55W23	Toluene	37	5
B55W23	Total Xylenes	36	5

*Present in laboratory blanks.

Metals

Well	Metal	Conc. ug/l	Detection Limit ug/l
B55W17	Al	324	200
	B	1410	100
	Ca	437000	5000
	Cd	16.2	5.0
	K	5740	5000
	Mg	11500	5000
	Mn	74.3	15.0
	Na	141000	5000
	Sb	140	60.0
	Tl	853	100
	Zn	23.5	20.0

Metals Cont.

Well	Metal	Conc. ug/l	Detection Limit ug/l
B55W19	Al	331	200
	B	1760	100
	Ca	433000	5000
	Cd	18.4	5.0
	K	18800	5000
	Mg	133000	5000
	Na	144000	5000
	Sb	152	60.0
	Tl	970	100
	Zn	188	20.0
B55W23	Al	339	200
	B	1390	100
	Ca	441000	5000
	Cd	17.5	5.0
	K	11100	5000
	Mg	129000	5000
	Mn	18.1	15.0
	Na	156000	5000
	Sb	155	60.0
	Tl	950	100
	Zn	23.6	20.0
B55W30	B	191	100
	Ca	51600	5000
	Cd	15.7	5.0
	K	12900	5000
	Mg	111000	5000
	Mn	251	15.0
	Na	474000	5000
	Sb	128	60.0
	Tl	830	100
B55W27	Al	316	200
	B	776	100
	Ca	430000	5000
	Cd	14.0	5.0
	K	30600	5000
	Mg	95500	5000
	Na	164000	5000
	Sb	118	60.0
	Tl	742	100
B55W28	Al	228	200
	B	663	100
	Ca	45800	5000
	Cd	10.7	5.0
	K	27600	5000
	Mg	74500	5000
	Na	134000	5000

B55W28	Sb	93.0	60.0
	Tl	588	100

January 1988

Analyses requested were Appendix IX for 4 wells (B55W17, B55W19, B55W27 and B55W28), indicators (pH, TOC, TOX and specific conductance) for 6 wells and ICP metals for 6 wells.

VOA

Well	Compound	Conc. ug/l	Detection Limit ug/l
B55W17	Methylene Chloride	7	5
B55W19	"	7	5
B55W28	"	9	5
B55W27	Benzene	21	5
"	Toluene	140	5
"	Ethylbenzene	15	5
"	Total Xylenes	90	5

Indicators

Well	Indicator	Conc./Units	Detection Limit/Units
B55W17	Fluoride	1.0 mg/l	0.1 mg/l
	pH	7.9 pH units	0.1 pH units
	TOC	3.3 mg/l	0.5 mg/l
	TOX	30 ug/l	10 ug/l
	Spec. Cond.	2960 umhos/cm	0.5 umhos/cm
B55W19	Fluoride	1.1 mg/l	0.1 mg/l
	pH	8.3 pH units	0.1 pH units
	TOC	1.8 mg/l	0.5 mg/l
	TOX	18 ug/l	10 ug/l
	Spec. Cond.	2970 umhos/cm	0.5 umhos/cm
B55W23	pH	10.5 pH units	0.1 pH units
	TOC	2.7 mg/l	0.5 mg/l
	TOX	32 ug/l	10 ug/l
	Spec. Cond.	3120 umhos/cm	0.5 umhos/cm
B55W27	Cyanide	15.9 ug/l	10.0 ug/l
	Fluoride	0.77mg/l	0.1 mg/l
	pH	11.6 pH units	0.1 pH units
	TOC	2.6 mg/l	0.5 mg/l
	TOX	15 ug/l	10 ug/l
	Spec. Cond.	3520 umhos/cm	0.5 umhos/cm

Indicators Cont.

Well	Indicator	Conc./Units	Deteciton Limit/Units
B55W28	Fluoride	0.68 mg/l	0.1 mg/l
	pH	12.3 pH units	0.1 pH units
	TOC	2.6 mg/l	0.5 mg/l
	TOX	20 ug/l	10 ug/l
	Spec. Cond.	7420 umhos/cm	0.5 umhos/cm
B55W30	pH	7.6 pH units	0.1 pH units
	TOC	3.8 mg/l	0.5 mg/l
	TOC	23 ug/l	20 ug/l
	Spec. Cond.	1060 umhos/cm	0.5 umhos/cm

BNAE

Well	Compound	Conc. ug/l	Detection Limit ug/l
B55W19	Bis (2-ethylhexyl) Phthalate	31	10
B55W27	"	54	10
B55W30	"	14	10

Organophosphorous Pesticide

Well	Compound	Conc. ug/l	Detection Limit ug/l
B55W27	ethyl parathion	22	0.4

Metals

Well	Metal	Conc. ug/l	Detection Limit ug/l
B55W17	Al	339	200
	Ca	464000	5000
	Fe	114	100
	K	18000	5000
	Mg	111000	5000
	Mn	133	15.0
	Na	147000	5000
	Zn	26.9	20.0
B55W19	Al	349	200
	Ca	372000	5000
	Cu	31.6	25.0
	K	7330	5000
	Mg	115000	5000
	Mn	27.1	15.0
	Na	128000	5000

Metals Cont.

Well	Metal	Conc. ug/l	Detection Limit ug/l
B55W23	Ag	15.5	10.0
	Al	3090	200
	Be	8.9	5.0
	Ca	245000	5000
	Cr	12.2	10.0
	Cu	393	25.0
	K	114000	5000
	Mg	47800	5000
	Mn	47.5	15.0
	Na	101000	5000
	Sb	106	60.0
	V	334	50.0
	Zn	48.5	20.0
B55W27	Al	2750	200
	Be	8.0	5.0
	Ca	182000	5000
	Cu	353	25.0
	K	130000	5000
	Mn	40.8	15.0
	Na	95300	5000
	V	296	50.0
	Zn	39.2	20.0
B55W28	Al	525	200
	B	384	100
	Ca	541000	5000
	Cr	10.2	10.0
	Cu	97.2	25.0
	K	338000	5000
	Na	290000	5000
	Ni	46.2	40.0
	Sn	452	100
	V	54.1	50.0
B55W30	B	230	100
	Ca	50500	5000
	K	7280	5000
	Mg	92600	5000
	Mn	157	15.0
	Na	57000	5000
	Zn	24.0	20.0

April 1988

Analyses requested were indicators and ICP metals.

Indicators

Well	Indicator	Conc./Units	Detection Limit/Units
B55W17	pH	7.7 pH units	0.1 pH units
	TOC	5.6 mg/l	0.5 mg/l
	TOX	lost sample	10 ug/l
	Spec. Cond.	3100 umhos/cm	0.5 umhos/cm
B55W19	pH	8.6 pH units	0.1 pH units
	TOC	2.6 mg/l	0.5 mg/l
	TOX	11 ug/l	10 ug/l
	Spec. Cond.	3080 umhos/cm	0.5 umhos/cm
B55W23	pH	10.0 pH units	0.1 pH units
	TOC	2.8 mg/l	0.5 mg/l
	TOX	10 ug/l	10 ug/l
	Spec. Cond.	3000 umhos/cm	0.5 umhos/cm
B55W27	pH	10.3 pH units	0.1 pH units
	TOC	2.6 mg/l	0.5 mg/l
	TOX	42 ug/l	10 ug/l
	Spec. Cond.	3040 umhos/cm	0.5 umhos/cm
B55W28	pH	11.4 pH units	0.1 pH units
	TOC	5.8 mg/l	0.5 mg/l
	TOX	26 ug/l	10 ug/l
	Spec. Cond.	3270 umhos/cm	0.5 umhos/cm
B55W30	pH	7.6 pH units	0.1 pH units
	TOC	5.0 mg/l	0.5 mg/l
	TOX	18 ug/l	10 ug/l
	Spec. Cond.	1100 umhos/cm	0.5 umhos/cm

Metals

Well	Metal	Conc. ug/l	Detection Limit ug/l
B55W17	B	146	100
	Ca	463000	5000
	Mg	122000	5000
	Mn	83.0	15.0
	K	6250	5000
	Na	142000	5000
	Zn	21.0	20.0

Metals Cont.

Well	Metal	Conc. ug/l	Detection Limit
B55W19	B	181	100
	Ca	443000	5000
	Fe	107	100
	Mg	140000	5000
	K	12100	5000
	Na	144000	5000
B55W23	B	944	100
	Ca	446000	5000
	Mg	125000	5000
	K	10900	5000
	Na	159000	5000
B55W27	Ca	447000	5000
	Fe	111	100
	Mg	52700	5000
	K	62200	5000
	Na	21100	5000
B55W028	B	471	100
	Ca	478000	5000
	Mg	10300	5000
	K	87700	5000
	Na	190000	5000
B55W30	B	211	100
	Cd	5	5.0
	Ca	43500	5000
	Mg	88400	5000
	Mn	445	15.0

No samples were taken in July 1988 and October 1988 because of a moratorium placed on the site. January 1989 sampling was aborted because of severe weather conditions.

April 1989

Analyses requested were Appendix IX, indicators and ICP metals.

Pesticide/PCB

Well	Pesticide ug/l		Detection Limit ug/l
B55W027	alpha-BHC	0.059	0.059

BNAE

Well	Compound	Conc. ug/l	Detection Limit ug/l
B55W27	Bis (2-ethylhexyl) Phthalate	11	10
B55W34D	"	13	10
B55W35S	"	22	10
B55W36D	"	14	10
B55W39S	"	20	10

Field blanks and laboratory blanks showed abnormally high concentrations of Bis (2-ethylhexyl) Phthalate.

VOA

Well	Compound	Conc. ug/l	Detection Limit ug/l
B55W27	Toluene	17	5
	Ethylbenzene	8	5
B55W33S	Chloroform	8	5

Cyanides

Well	Conc. ug/l	Detection Limit ug/l
B55W39S	156	16.7

Metals

Well	Metal	Conc. ug/l	Detection Limit ug/l
B55W27	Cr	10.3	10.0
	Cu	26.6	25.0
	Zn	29.9	20.0
B55W34D	Ba	1580	200
	Cu	30.6	25.0
	Zn	28.2	20.0

Metals

Well	Metal	Conc. ug/l	Detection Limit ug/l
B55W35S	Ni	41.4	40.0
	Zn	28.2	20.0
B55W36D	Cu	31.1	25.0
	Sb	82.4	60.0
	Sn	157	100
	Zn	68.9	20.0
B55W39S	Zn	35.0	20.0

Indicator data have not arrived as of June 23, 1989.

057285

23

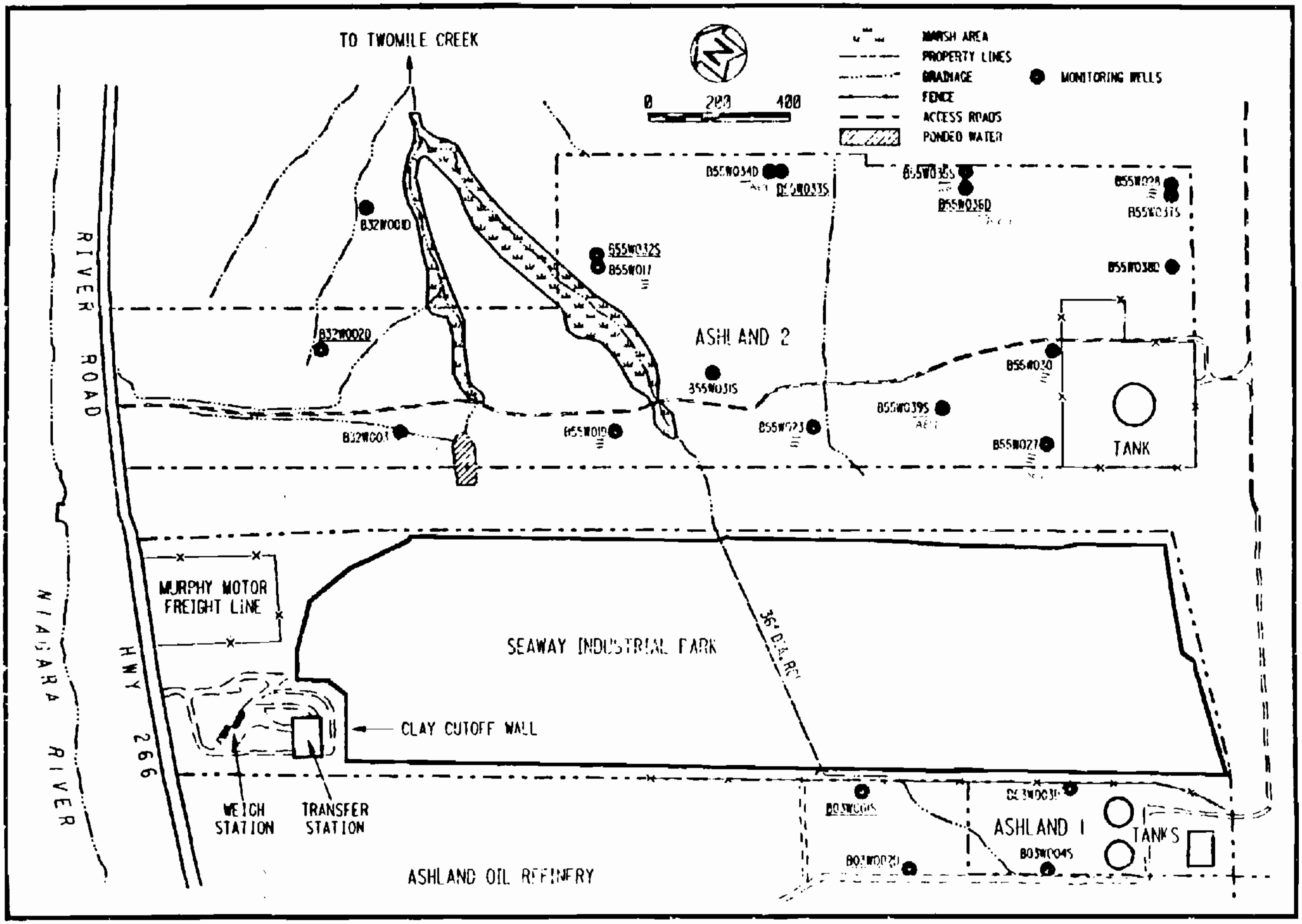


FIGURE 2 WELL LOCATIONS AT ASHLAND SITES

Ashland Petroleum Co. # 915008-c

This site, also referred to as the "Haist Property", received low level radioactive material produced during 1944-46. Approximately 8000 tons of residue containing uranium (est. 0.54 Uranium) were spread over the site to a depth of 1 to 5 feet. In 1979, possibly 30-40% of the residue was removed from the Haist property and taken to the adjacent Seaway Industrial Park (now Niagara Landfill). The Haist site first appeared in a 1951 aerial photograph and has remained virtually unchanged since that time. A 1962 photo showed some activity immediately to the northwest of the disposal site. It could not be determined if the activity was landfilling of wastes or site grading. Surface runoff from the Haist property would be tributary to Two Mile Creek via drainage ditches and culverts.

On June 17, 1981, the DEP sampled the drainage downstream of the site and evidence of radioactivity was found in the water.

The results of analyses of the June 17, 1981 water samples were evaluated. The following observations were made.

1. Iron concentrations increased from 2.06 to 18.5 mg/l from upstream of the Niagara Landfill to downstream of the Ashland Landfill. This suggests leaching of iron from the area in between. The levels exceed the NYS Water Quality Standard of 0.3 mg/l.

2. Lead concentrations ranged from 0.03 to 0.10 mg/l. These values exceed the NYS Water Quality Standard of 0.025 mg/l.

3. Magnesium levels decreased from 138 to 86 mg/l. There was no evident reason for this decrease. The levels reported are not considered to be significant.

4. Manganese [illegible]trations increased from 0.32 to 4.1 mg/l which is indicative of leaching of materials from the area between the upstream and downstream samples. The values exceed the NYS Water Quality Standard of 0.3 mg/l.

5. Mercury was not reported at a detection level of 0.0004 mg/l in any of the samples.

6. Selenium levels reported were at low levels ranging from 0.002-0.004 mg/l. These were not considered significant.

7. No silver was reported at a detection level of 0.01 mg/l.

8. Sodium levels increased from 246 to 322 mg/l suggesting leaching of this material to the drainage dtich.

9. Zinc levels reported were very low ranging from 0.05 - 0.2 mg/l. These were not considered significant.

10. Sulfide was reported in concentrations ranging from 0.2 - 1.0 mg/l.

11. Total organic carbon levels reported ranged from 84.0 - 123 mg/l also suggesting leaching of materials.

12. Benzene was only detected at the furthest downstream site at a concentration of 0.043 ug/l. This suggests leaching of this material from the area downstream of sampling point # 3.

13. Toluene likewise was only detected at the furthest downstream site. The reported level was 0.295 ug/l and also points to possible leaching from the same area.

14. Xylene was not reported in any of the samples at a detection level of 0.035 ug/l.

15. Arsenic was only detected in the furthest downstream sample at a level of 0.07 mg/l. This exceeded the NYS Water Quality Standard of 0.05 mg/l.

16. Barium was reported in all but the furthest downstream sample at low levels. All 3 samples had concentrations of 0.2 mg/l which was also the detection limit of the test. This was below the NYS Water Quality Standard of 1.0 mg/l.

17. Cadmium was reported in all samples and ranged from 0.005 - 0.007 mg/l considered to be very low levels.

18. Calcium levels were highest in the furthest upstream sample with a level of 936 mg/l. Other samples had values ranging from 136 - 216 mg/l. The reason for the high result is not known.

19. Chromium was reported in 2 of the 4 samples at a low level of 0.02 mg/l and is not considered significant.

20. Copper was also reported at low levels (0.02 - 0.15 mg/l) and is not considered significant.

21. Phenol concentrations increased from 0.003 to 0.258 mg/l from upstream to downstream sampling locations. The greatest increase coming up and downstream of the Ashland Landfill. This suggests leaching of the material from the area below sampling point # 3.

22. PCB's also increased up to downstream from 0.06 - 0.14 ug/l. A level of 0.13 ug/l was reported downstream of the Niagara Landfill suggesting possible leaching of this material from this site.

23. No organic pesticide concentrations were reported in any of the samples.

24. Alpha radiation increased through the 1st three sampling sites from 2.0 to 4.3 picocuries per liter (pc/l) and then decreased to 2.2 pc/l. These were all below the NYS Drinking Water Standard of 5.0 pc/l.

25. Beta radiation increased from 127 to 140 pc/l through the first two sites and decreased to 121 pc/l for the last two sites. These levels are greater than the NYS Drinking Water Standard of 50 pc/l.

26. Gamma Radiation was only reported at the furthest upstream site at a level of 5700 pc/l. It was not reported at the other sites to a detection limit of 50 pc/l.

The results of 1976 water and sediment sampling by the United States Energy Research and Development Administration were also reviewed. These showed increasing values of Radium 226, and Uranium 234, 235 and 238 from the Haist property to the downstream sampling sites in the water samples. The levels reported were low with the following ranges:

Radium 226 - 0.4 to 1.6 pc/l
Uranium 234 - 2.8 to 40 pc/l
" 235 - 0.15 to 13 pc/l
" 238 - 28 to 53 pc/l

Levels of Thorium 228 were relatively constant through all sampling points at a range of 0.30 to 0.39 pc/l. Thorium 230 and 232 were also reported in low levels of less than 0.2 pc/l.

Radium 226, Uranium and Thorium all emit alpha, beta and gamma radiation during decay.

The levels reported are low when compared to the maximum permissible concentrations (MPC) allowed by the AEC in water discharged to sewers.

Radionuclide	MPC (pc/l)
Radium 226	10
Thorium 232	2000
Uranium 238	40,000

The levels reported are also below the MCL level for Radium 226 of 5 pc/l for public water supplies (NYS Standards).

This site has been under the supervision of the federal government for a number of years. A 1976 survey of the property by ERDA found the presence of low level radiation and contamination of soils in the area. They have indicated that the site, in its present setting, poses no hazard. The ERDA Report also pointed out however that potential health hazards could result from some future uses of the site. The DEP sampling has confirmed the ERDA's finding that Radiation is leaving the disposal area in the drainage flow. For this reason we recommend that ERDA reevaluate the hazard potential of this site and the Niagara Landfill disposal area and subm their conclusions, with any recommendation for remedial work, to the DEC.

Site: 915008-C Uranium tailing disposal.

Owner:
Ashland Petroelum Company
River Road
Tonawanda, New York

Surrounding Land Use: Heavy industrial - nearest residential approximately 1¼ mile to the East, 1¼ mile to the West, 1 mile to the North, and 1 mile to the South.

Anticipated Effect of Disposal Site On:

Groundwater Supplies: None-area served by surface source public water supply.

Surrounding Area: Low Level Radiation has been documentec leaving the site via surface drainage and could affect the Two Mile Creek and Niagara River. Two Mile Creek flow past a residential area along Two Mile Creek Road and through a recreation are (Isle View Park) and enters the Niagara River.

Airborne Transport of Pollutants: None- site is inactive. Vegetative cover will preclude dust problems.

Need for Immediate Action: None. Federal Government has concluded site poses no threat given present usag

Need for Future Action: ERDA Re-evaluation of site.

Responsible Agency: NYSDEC and E.R.D.A.

DEP sampling of Two Mile Creek in June/ July 1982.

DEP resampling of four (4) sites previously sampled for parameters of conce [illegible] 008-c

24

"Haist" property - A tributary of Two Mile Creek was sampled by DEP on June 17, 1981 at four sites.

South of Niagara Landfill - Ashland Petroleum Company Property

Parameter		Value	Units of Measure
pH		8.6	Standard units
Iron		2.06	mg/l
Lead		0.03	mg/l
Magnesium		138	mg/l
Manganese		0.32	mg/l
Mercury	L.T.	0.0004	mg/l
Selenium		0.004	mg/l
Silver	L.T.	0.01	mg/l
Sodium		246	mg/l
Zinc		0.20	mg/l
Sulfide		0.2	mg/l
T.O.C.		104.2	mg/l
Benzene	L.T.	0.035	ug/l
Toluene	L.T.	0.035	ug/l
Xylene	L.T.	0.035	ug/l
Arsenic	L.T.	0.02	mg/l
Barium		0.2	mg/l
Cadmium		0.006	mg/l
Calcium		986	mg/l
Chromium		0.02	mg/l
Copper		0.02	mg/l
Phenol		0.003	mg/l
PCB		0.06	ug/l
Pesticide		neg.	
Alpha Radiation		2.0	pc/l
Beta Radiation		127	pc/l
Gamma Radiation		5700	pc/l

This is S

24

North of Lefler Road

Parameter	Value	Unit of Measure
pH	7.9	Standard Unit
Iron	3.28	mg/l
Lead	0.04	mg/l
Magnesium	113	mg/l
Manganese	0.50	mg/l
Mercury	L.T. 0.0004	mg/l
Selenium	0.003	mg/l
Silver	L.T. 0.01	mg/l
Sodium	320	mg/l
Zinc	0.05	mg/l
Sulfide	L.T. 0.02	mg/l
T.O.C.	97.3	mg/l
Benzene	L.T. 0.035	ug/l
Toluene	L.T. 0.035	ug/l
Xylene	L.T. 0.035	ug/l
Arsenic	L.T. 0.02	mg/l
Barium	0.2	mg/l
Cadmium	0.007	mg/l
Calcium	157	mg/l
Chromium	L.T. 0.01	mg/l
Copper	0.15	mg/l
Phenol	0.004	mg/l
PCB	0.13	ug/l
Pesticides	neg.	
Alpha Radiation	3.1	pc/l
Beta Radiation	140	pc/l
Gamma Radiation	L.T. 50	pc/l

South of Ashland Petroleum Company Landfill

Parameter	Value	Units of Measure
pH	7.9	Standard Units
Iron	8.51	mg/l
Lead	0.10	mg/l
Magnesium	96	mg/l
Manganese	0.84	mg/l
Mercury	L.T. 0.0004	mg/l
Selenium	0.002	mg/l
Silver	L.T. 0.01	mg/l
Sodium	261	mg/l
Zinc	0.14	mg/l
Sulfide	1.0	mg/l
T.O.C.	84.1	mg/l
Benzene	L.T. 0.035	ug/l
Toluene	L.T. 0.035	ug/l
Xylene	L.T. 0.035	ug/l
Arsenic	L.T. 0.02	mg/l
Barium	0.2	mg/l
Cadmium	0.005	mg/l
Calcium	216	mg/l
Chromium	0.02	mg/l
Copper	0.05	mg/l
PCB	L.T. 0.05	ug/l
Pesticides	neg.	
Phenol	0.013	mg/l
Alpha Radiation	4.3	pc/l
Beta Radiation	121	pc/l
Gamma Radiation	L.T. 50	

3000 feet north of Ashland Petroleum Corporation Landfill

Parameter	Value	Unit of Measure
pH	7.7	Standard unit
Iron	18.51	mg/l
Lead	0.03	mg/l
Magnesium	86	mg/l
Manganese	4.1	mg/l
Mercury	L.T. 0.0004	mg/l
Selenium	0.002	mg/l
Silver	L.T. 0.01	mg/l
Sodium	322	mg/l
Zinc	0.05	mg/l
Sulfide	0.4	mg/l
T.O.C.	123.0	mg/l
Benzene	0.043	ug/l
Toluene	0.295	ug/l
Xylene	L.T. 0.035	ug/l
Arsenic	0.07	mg/l
Barium	L.T. 0.2	mg/l
Cadmium	0.005	mg/l
Calcium	136	mg/l
Chromium	L.T. 0.01	mg/l
Copper	L.T. 0.02	mg/l
Phenol	0.258	mg/l
PCB	0.14	ug/l
Pesticides	neg.	
Alpha Radiation	2.2	pc/l
Beta Radiation	121	pc/l
Gamma Radiation	L.T. 50	pc/l

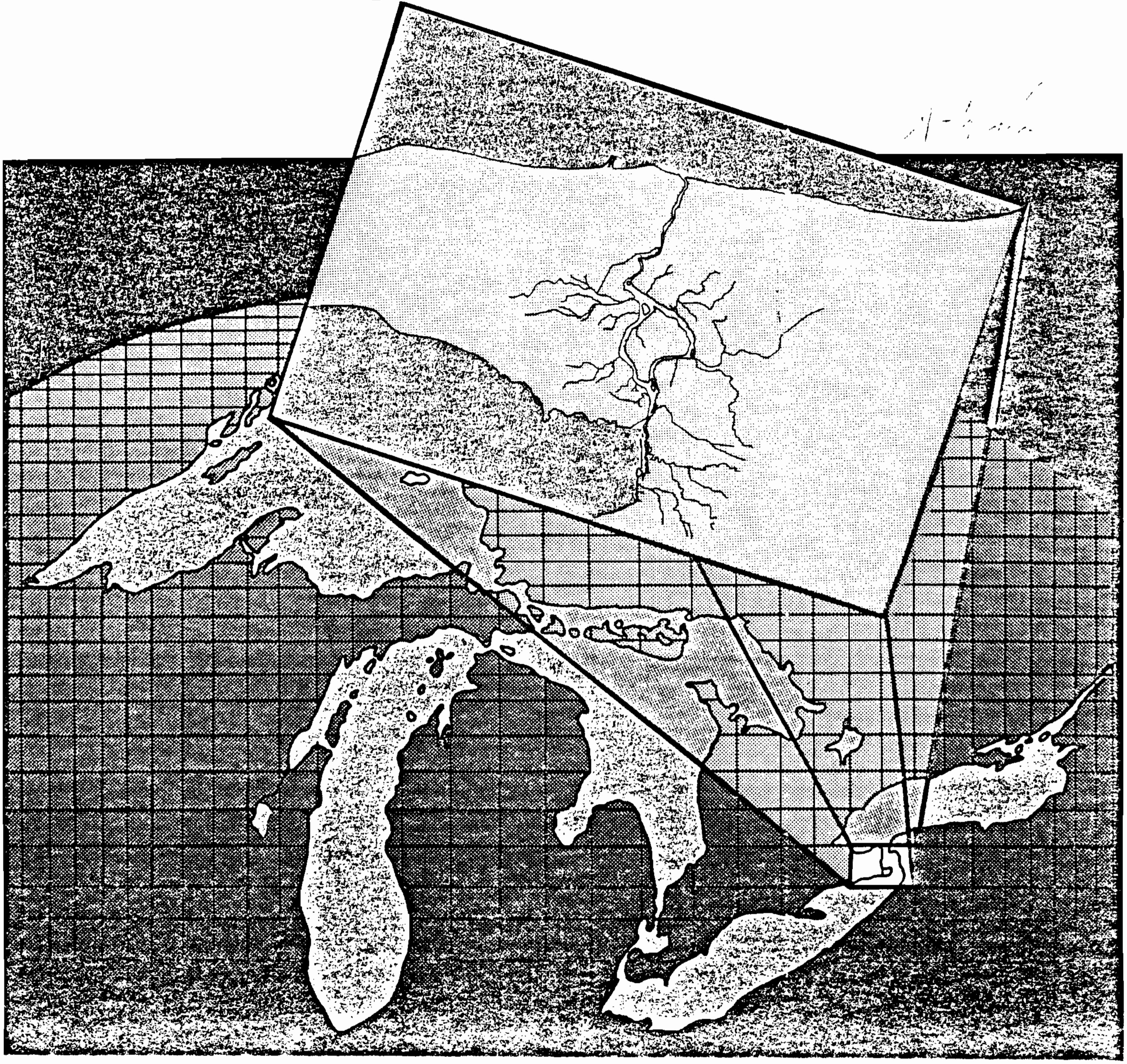
United States
Environmental Protection
Agency

Great Lakes National
Program Office
536 South Clark Street
Chicago, Illinois 60605

EPA-905/4-85-001
March 1985

25

Preliminary Evaluation Of Chemical Migration To Groundwater and The Niagara River from Selected Waste-Disposal Sites



25

Table B-16.--Analyses of substrate samples from Aluminum Match Plate, site 111, Tonawanda, N.Y., July 20, 1982.
[Locations shown in fig. B-16. Concentrations are in μg/kg; dashes indicate that constituent or compound was not found, LT indicates it was found but below the quantifiable detection limit.]

	Sample number and depth below land surface (ft)			
	1 3.0	2 1.5	3 1.5	4 1.5
Inorganic constituents				
Iron	11,000,000	13,000,000	11,000,000	8,200,000
Mercury	--	--	--	--
Organic compounds				
Phenol	--	--	--	--

114. ASHLAND PETROLEUM COMPANY (Literature review) NYSDEC 915061

General information and chemical-migration potential.--This site, in the northern part of the town of Tonawanda, is a solid-waste landfill containing spent lime, clay, wood, concrete, metal, and phosphoric acid catalysts. The potential for contaminant migration is indeterminable because data are lacking.

Geologic information.--The U.S. Geological Survey drilled four test borings on the site in 1975. The geologic logs indicated bedrock (Camillus Shale) at approximately 80 ft below grade. Overlying the bedrock is a sequence of silt and clay layers with occasional embedded gravel.

Hydrologic information.--No hydrologic information is available.

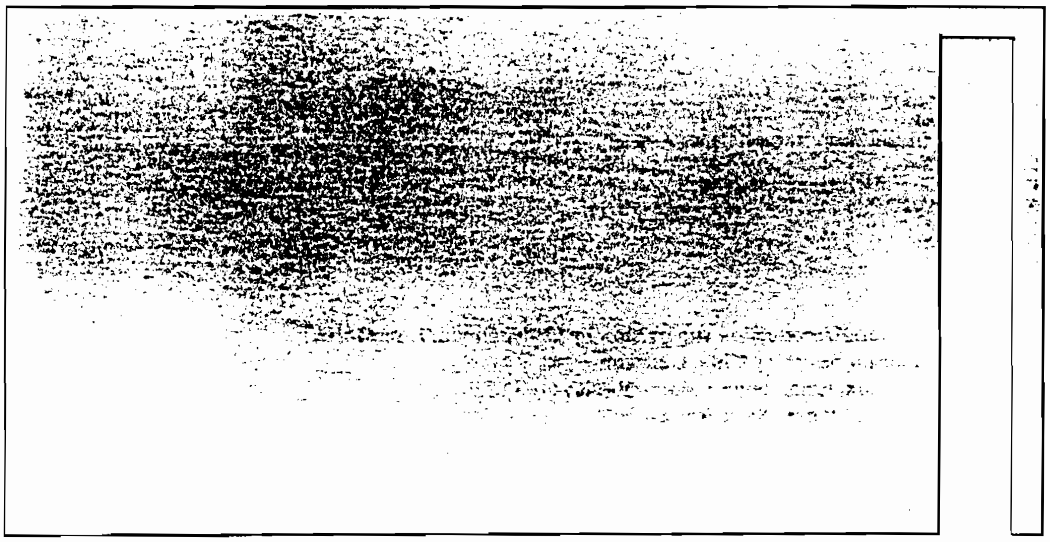
Chemical information.--No chemical data are available, and no monitoring has been proposed.

115. ASHLAND PETROLEUM COMPANY (Literature review) NYSDEC 915008c

General information and chemical-migration potential.--This site, received low-level radioactive material during 1944-46. Approximately 8,000 tons of uranium ore tailings containing 0.54 percent uranium was spread over the area to a depth of 2 ft.

No data are available to determine contaminant migration by ground-water movement. However, the chemical analyses of water from adjacent drainage ditches indicate the presence of some heavy metals and low-level radiation, which indicates possible offsite migration by surface runoff. The potential for contaminant migration in ground water is indeterminable.

26



R. Allan Freeze

Department of Geological Sciences
University of British Columbia
Vancouver, British Columbia

John A. Cherry

Department of Earth Sciences
University of Waterloo
Waterloo, Ontario

GROUNDWATER

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

luid-free conductance
y small, so petroleum
Eq 2.28) is substituted

(2.29)

ty that will lead to
under a hydraulic
One darcy is approxi-

used for hydraulic
ned in terms of Eq.

ve with regard to this
d efficient. However,
s discarded this formal
en erature of measure-
ir ment can influence
Eq. (2.28). The effect is
d. It still makes good
ner have been carried
of measurement are very
y be dependent on the
ac al rather than con-

conductivity and perme-
of eological materials.
(1969) review. The
t hydraulic conductivity
parameters that take on
is roperty implies that
ity can be very useful.
ivity value probably has

ious common units
cm² can be converted to
conversion from ft² to

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

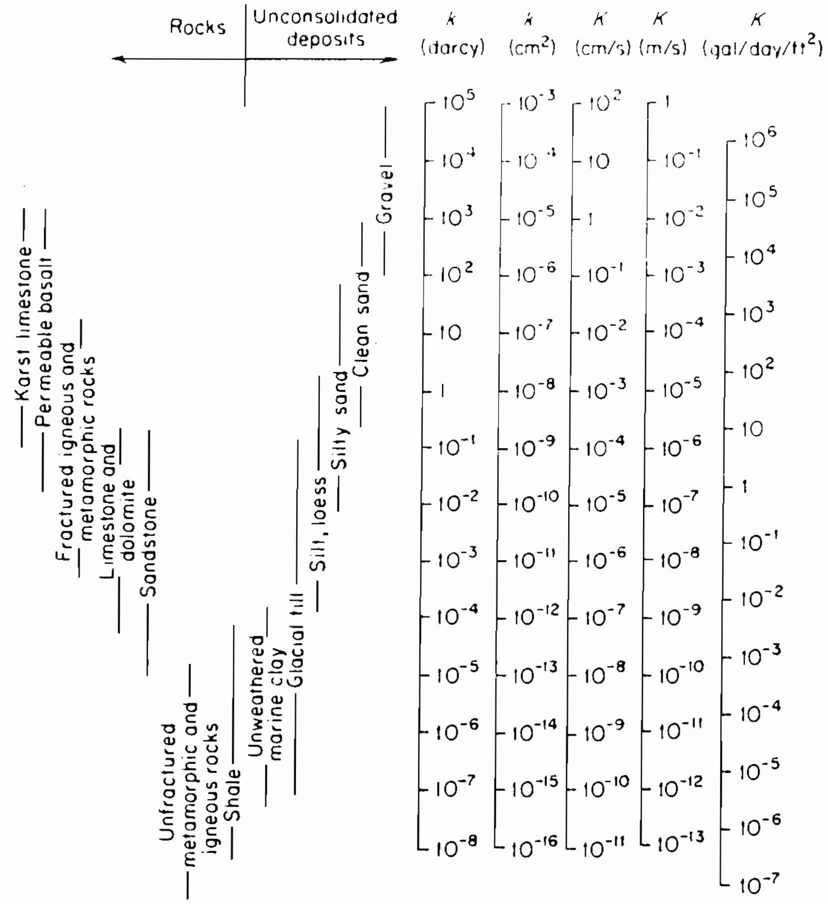


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, *k**			Hydraulic conductivity, *K*		
	cm²	ft²	darcy	m/s	ft/s	U.S. gal/day/ft²
cm²	1	1.08×10^{-3}	1.01×10^{8}	9.80×10^{2}	3.22×10^{3}	1.85×10^{9}
ft²	9.29×10^{2}	1	9.42×10^{10}	9.11×10^{5}	2.99×10^{6}	1.71×10^{12}
darcy	9.87×10^{-9}	1.06×10^{-11}	1	9.66×10^{-6}	3.17×10^{-5}	1.82×10^{1}
m s	1.02×10^{-3}	1.10×10^{-6}	1.04×10^{5}	1	3.28	2.12×10^{6}
ft s	3.11×10^{-4}	3.35×10^{-7}	3.15×10^{4}	3.05×10^{-1}	1	6.46×10^{5}
U.S. gal day ft²	5.42×10^{-10}	5.83×10^{-13}	5.49×10^{-2}	4.72×10^{-7}	1.55×10^{-6}	1

*To obtain *k* in ft², multiply *k* in cm² by 1.08×10^{-3}.

27

GROUND-WATER RESOURCES OF THE ERIE-NIAGARA BASIN, NEW YORK

Prepared for the
Erie-Niagara Basin Regional Water Resources
Planning Board

by

A. M. La Sala, Jr.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
in cooperation with
THE NEW YORK STATE CONSERVATION DEPARTMENT
DIVISION OF WATER RESOURCES

STATE OF NEW YORK
CONSERVATION DEPARTMENT
WATER RESOURCES COMMISSION

Basin Planning Report ENB-3
1968

Copy not provided

29

Copy not provided

Stream Classification
6 NYCRR Volume E

te Name	Stream	Classif	Standards		Reference	
				Article	Part #	Map*
Lordville	Delaware R	A	A(T) TROUT	4	815	N-19
Carl Krom	Fall Kill	C	C	10	862	N-24
Vorton	Mettawee R	C	C(T)	7	830	6·26
Copeland	Valatie Kill Trib.	D	D	10	863	K-25 SE
an Buren	Waterbase Creek	D	D	14	897	6·14[illegible]
	Oswego River	C	C	14	897	6·14c[illegible]
Le Roy	Mud River	D	D	5	821	J-8 NW
	Trib to Oatka Creek	D	D			
Ontario Knife	Ishua Creek	C	C(T)	1	801	1
Wolfe Pumps	Niagara River	A*	A*	8	837	2
Pratt-Letchworth	Scajaquada Creek	B	B	8	837	6
MacNaughton-Brooks	Buffalo River	D	D	8	837	6
hisholm Ryder	Niagara River	A*	A*	8	837	1
Nash Rd	Sawyer Creek	D	D	8	837	2
ncaster Res.	N. Branch Plum Bottom Creek	D	D	8	837	7
Mina	French Creek Trib.	D	D	1	800	2
Fox Rd-Erie Co	Jennings Creek	B	B	8	837	10
Gillied	Buffalo R.	D	D	8	837	6
[redacted]	Niagara R	A*	A*	8	837	6
	Two Mile Creek	B	B	8	837	2
Split Rock						
Onondaga L.						
IWOCO						

800· French Creek D. Basin / 801· Olean Creek / 837 L. Erie-N. River D. Basin / 897 Oswego River [illegible]

* -SPECIAL international boundary waters 862· Lower Hudson 815· Delaware R / 830· Champlain-Mettawee S.b. basin

Copy not provided.

32

World Atlas

CENSUS EDITION

RAND McNALLY & COMPANY
Chicago / New York / San Francisco

Colonie A-S-T	8,869
Colton	450 ○
Commack N.Y.	24,300 ○
Congers N.Y.	5,000 ○
Conklin BING	1,900 ○
Constantia SYR	900 ○
Cooperstown	2,342
Copake	700 ○
Copenhagen	656
Copiague N.Y.	21,000 ○
Coram N.Y.	5,400 ○
Corfu BUF-	689
Corinth	2,702
Corning ELM-	12,953
Cornwall on the Hudson NWBG	3,164
Cortland	20,138
Coxsackie	2,786
Croghan	703
Croton-on-Hudson N.Y.	6,889
Crown Point	900 ○
Cuba	1,739
Cutchogue	1,000 ○
Dalton	500 ○
Dannemora	3,770
Dansville	4,979
Deer Park N.Y.	33,400 ○
Delanson A-S-T	448
Delevan	1,113
Delhi	3,374
Delmar A-S-T	9,900 ○
Depew BUF-	19,819
Deposit	1,897
Derby BUF-	1,200 ○
De Ruyter	542
De Witt SYR	10,032 ○
Dexter WATN	1,053
Dix Hills N.Y.	10,500 ○
Dobbs Ferry N.Y.	10,053
Downsville	950 ○
Dryden ITH	1,761
Dundee	1,556
Dunkirk	15,310
Earlville	985
East Aurora BUF-	6,803
Eastchester N.Y.	22,600 ○
East Glenville A-S-T	11,800 ○
East Half Hollow Hills N.Y.	9,691 ○
East Hampton	1,886
East Hills N.Y.	7,160
East Islip N.Y.	13,700 ○
East Marion	900 ○
East Meadow N.Y.	47,300 ○
East Northport N.Y.	22,200 ○
East Patchogue N.Y.	8,300 ○
Eastport N.Y.	1,308 ○
East Randolph	655
East Rochester ROCH	7,596
East Rockaway N.Y.	10,917
East Vestal BING	5,300 ○
Eden BUF-	3,000 ○
Edmeston	900 ○
Edwards	561
Elba	750
Elizabethtown	659
Ellenville	4,405
Ellicottville	713
ELMIRA ELM-	35,327
Elmira Heights ELM-	4,279
Elmont N.Y.	30,000 ○
Elsmere A-S-T	5,500 ○
Elwood N.Y.	15,400 ○
Endicott BING	14,457
Endwell BING	15,999 ○
Etna ITH	500 ○
Evans Mills	651
Fair Haven	976
Fairmount SYR	8,700 ○
Fairport ROCH	5,970
Fairview POK	8,517 ○
Falconer JMST	2,778
Farmingdale N.Y.	7,946
Farmingville N.Y.	5,700 ○
Fillmore	563
Fishkill POK	1,555
Floral Park N.Y.	16,805
Florida MIDO	1,947
Flower Hill N.Y.	4,558
Fonda A-S-T	1,006
Forestville	804
Fort Ann GLFLS	509
Fort Covington	1,200
Fort Edward GLFLS	3,561
Fort Plain	2,555
Frankfort UT-R	2,995
Franklin	440
Franklin Square N.Y.	32,800
Franklinville	1,887
Fredonia	11,126
Freeport N.Y.	38,272
Freeville ITH	449
Frewsburg JMST	2,000
Friendship	1,285
Fulton SYR	13,312
Galeville SYR	8,900
Gang Mills ELM-	1,258
Garden City N.Y.	22,927
Garden City Park N.Y.	5,200
Garrison N.Y.	650
Gasport LOCK	950
Gates ROCH	29,756
Geneseo	6,746
Geneva	16,133
Ghent	600
Gilbertsville	486
Glasco KNGST	1,100
Glen Cove N.Y.	24,618
Glenham POK	2,720
Glen Head N.Y.	8,800
GLENS FALLS GLFLS	15,897
Gloversville	17,836
Gorham	800
Goshen MIDO	4,874
Gouverneur	4,285
Gowanda	2,713
Grand Gorge	900
Granville	2,696
Great Neck (P.O.) N.Y.	5,604
Great Neck N.Y.	9,168
Great Neck Estates N.Y.	2,936
Greece ROCH	63,700 ○
Greene	1,747
Green Island A-S-T	2,696
Greenlawn N.Y.	8,600 ○
Greenport	2,273
Greenville N.Y.	5,500 ○
Greenwich	1,955
Greenwood	450 ○
Greenwood Lake N.Y.	2,809
Groton	2,313
Hadley	500 ○
Haines Falls	700 ○
Half Hollow Hills N.Y.	12,800 ○
Hamburg BUF-	10,582
Hamilton	3,725
Hammondsport	1,065
Hampton Bays	3,550 ○
Hannibal SYR	680
Harrison N.Y.	23,046
Harrisville	937
Hartsdale N.Y.	12,226 ○
Hartwick	600 ○
Hastings-on-Hudson N.Y.	8,573
Hauppauge N.Y.	14,200 ○
Haverstraw N.Y.	9,800
Hawthorne N.Y.	4,900 ○
Hemlock ROCH	500 ○
Hempstead N.Y.	40,404
Henrietta ROCH	1,200 ○
Herkimer UT-R	8,383
Hermon	490
Heuvelton	777
Hewlett N.Y.	6,880 ○
Hicksville N.Y.	50,000 ○
Highland POK	2,164 ○
Highland Falls	4,187
Hillcrest N.Y.	5,357 ○
Hilton ROCH	4,151
Hobart	473
Holbrook N.Y.	12,900 ○
Holland BUF-	1,000 ○
Holland Patent UT-R	534
Holley ROCH	1,882
Homer	3,635
Honeoye Falls ROCH	2,410
Hoosick Falls	3,609
Hopewell Junction POK	2,055 ○
Hornell	10,234
Horseheads ELM-	7,348
Houghton	1,620 ○
Hudson	7,986
Hudson Falls GLFLS	7,419
Huntington N.Y.	12,601 ○
Huntington Bay N.Y.	3,943
Huntington Station N.Y.	30,300 ○
Hurley KNGST	4,081 ○
Hurleyville	500 ○
Hyde Park POK	2,805 ○
Ilion UT-R	9,190
Indian Lake	450 ○
Interlaken	685
Inwood N.Y.	8,200 ○
Irondequoit ROCH	57,648 ○
Irvington N.Y.	5,774
Island Park N.Y.	4,847
Islip N.Y.	12,100 ○
Islip Terrace N.Y.	5,200 ○
ITHACA ITH	28,732
JAMESTOWN JMST	35,775
Jasper	450 ○
Jay	500 ○
Jeffersonville	554
Jericho N.Y.	14,200 ○
Johnson City BING	17,126
Johnstown	9,360
Jordan SYR	1,371
Keene	450 ○
Keeseville	2,025
Kenmore BUF-	18,474
Kennedy	500 ○
Kerhonkson	1,243 ○
Kinderhook A-S-T	1,377
Kings Point N.Y.	5,234
KINGSTON KNGST	24,481
Lackawanna BUF-	22,701
Lacona	582
LaFargeville	500 ○
Lake Delta UT-R	2,400 ○
Lake Erie Beach BUF-	3,500
Lake George	1,047
Lake Grove N.Y.	9,692
Lake Katrine KNGST	1,092
Lake Luzerne	1,000 ○
Lake Placid	2,490
Lake Ronkonkoma N.Y.	9,800
Lake View BUF-	4,800
Lakeville ROCH	950 ○
Lakewood JMST	3,941
Lancaster BUF-	13,056
Larchmont N.Y.	6,308
Larchmont North N.Y.	11,500
Latham A-S-T	8,000
Lawrence N.Y.	6,175
Leicester	482
Leonardsville	600
Le Roy	4,900
Levittown N.Y.	65,400 ○
Lewiston BUF-	3,326
Liberty	4,293
Lima ROCH	2,025
Limestone	466
Lindenhurst N.Y.	26,919
Little Falls	6,156
Little Valley	1,203
Livingston Manor	1,522 ○
Livonia ROCH	1,238
Lloyd Harbor N.Y.	3,405
Locke	900 ○
LOCKPORT LOCK	24,844
Locust Grove N.Y.	11,848
Long Beach N.Y.	34,073
Long Lake	900
Loudonville A-S-T	8,000
Lowville	3,364
Lyndonville	916
Lyon Mountain	960
Lyons	4,160
Lyons Falls	755
Macedon ROCH	1,400
McGraw	1,188
Machias	700 ○
Madrid	800 ○
Mahopac N.Y.	5,265 ○
Maine BING	700 ○
Malone	7,668
Malverne N.Y.	9,262
Mamaroneck N.Y.	17,616
Manchester ROCH	1,698
Manhasset N.Y.	8,530 ○
Manlius SYR	5,241
Mannsville	431
Manorhaven N.Y.	5,384
Marathon	1,046
Margaretville	755
Marion ROCH	950 ○
Marlboro NWBG	1,580 ○
Massapequa N.Y.	27,500 ○
Massapequa Park N.Y.	19,779
Massena	12,851
Mastic N.Y.	5,200 ○
Mastic Beach N.Y.	5,200 ○
Mattituck N.Y.	1,200 ○
Mattydale SYR	8,292 ○
Mayfield	944
Mayville	1,626
Mechanicville A-S-T	5,500
Medford N.Y.	5,000 ○
Medina	6,392
Melville N.Y.	8,550 ○
Menands A-S-T	4,012
Merrick N.Y.	26,400 ○
Mexico	1,821
Middleburg	1,358
Middle Granville	600 ○
Middleport LOCK	1,995
MIDDLETOWN MIDO	21,454
Middleville	647
Milford	514
Millbrook POK	1,343
Millerton	1,013
Mineola N.Y.	20,757
Minetto	800 ○
Mineville	1,000 ○
Mohawk UT-R	2,956
Monroe N.Y.	5,996
Monsey N.Y.	7,400 ○
Montauk	1,300 ○
Montgomery NWBG	2,316
Monticello	6,306
Montour Falls	1,791
Mooers	549
Moravia	1,582
Moriah	500 ○
Morris	681
Morrisonville	1,500 ○
Morristown	461
Morrisville	2,707
Mountain Dale	1,200 ○
Mount Kisco N.Y.	8,025
Mount Morris	3,039
Mount Upton	500 ○
Mount Vernon N.Y.	66,713
Munnsville	499
Nanuet N.Y.	6,300 ○
Napanoch	900 ○
Naples	1,225
Narrowsburg	700 ○
Nassau A-S-T	1,285
Nassau Shores N.Y.	5,500 ○
Natural Bridge	650 ○
Nedrow SYR	3,000 ○
Nesconset N.Y.	8,300 ○
Newark	10,017
Newark Valley BING	1,190
New Baltimore	700 ○
New Berlin	1,392
NEWBURGH NWBG	23,438
New Cassel N.Y.	8,817 ○
New City N.Y.	30,800 ○
Newcomb	600
Newfane LOCK	2,700 ○
New Hyde Park N.Y.	9,801
New Lebanon	600 ○
New Paltz	4,941
Newport	746
New Rochelle N.Y.	70,794
Newton Falls	560
New Windsor NWBG	8,803 ○
New Woodstock SYR	450
NEW YORK N.Y.	7,071,030
Niagara Falls BUF-	71,384
Nichols BING	613
Niskayuna A-S-T	17,471
Norfolk	1,379
North Amityville N.Y.	11,936
North Babylon N.Y.	23,000 ○
North Bellmore N.Y.	23,600 ○
North Collins BUF-	1,496
North Creek	950 ○
Northeast Henrietta ROCH	12,000
North Great River N.Y.	12,400 ○
North Lindenhurst N.Y.	11,400 ○
North Massapequa N.Y.	23,100 ○
North Merrick N.Y.	13,650 ○
North New Hyde Park N.Y.	16,100 ○
North Norwich	900 ○
North Patchogue N.Y.	8,800 ○
Northport N.Y.	7,651
North Rose	700 ○
North Syracuse SYR	7,970
North Tarrytown N.Y.	7,994
North Tonawanda BUF-	35,760
North Valley Stream N.Y.	14,881 ○
Northville	1,304
North Wantagh N.Y.	16,117 ○
Norwich	8,082
Norwood	1,902
Nunda	1,169
Nyack N.Y.	6,428
Oakdale N.Y.	7,800
Oakfield	1,791
Oceanside N.Y.	36,400
Odessa	613
Ogdensburg	12,375
Olcott LOCK	1,660
Old Bethpage N.Y.	7,160
Old Forge	960
Olean	18,207
Oneida	10,810
Oneonta	14,933
Ontario ROCH	750 ○
Orchard Park BUF-	3,671
Orient	800 ○
Oriskany UT-R	1,680
Oriskany Falls UT-R	802
Ossining N.Y.	20,196
Oswego	19,793
Otego	1,089
Ovid	666
Owego BING	4,364
Oxford	1,765
Oyster Bay N.Y.	7,200 ○
Painted Post ELM-	2,196
Palmyra ROCH	3,729
Panama	511
Parish SYR	535
Parksville	500 ○
Patchogue N.Y.	11,291
Patterson N.Y.	950 ○
Pavilion	550 ○
Pawling POK	1,996
Pearl River N.Y.	17,146 ○
Peconic	800 ○
Peekskill N.Y.	18,236
Pelham N.Y.	6,848
Pelham Manor N.Y.	6,130
Penfield ROCH	9,600 ○
Penn Yan	5,242
Perry	4,198
Peru	1,300 ○
Petersburg	500 ○
Phelps	2,004
Philadelphia	855
Philmont	1,539
Phoenicia	700 ○
Phoenix SYR	2,357
Pine Bush NWBG	1,200 ○
Pine Island MIDO	950 ○
Plainview N.Y.	32,300 ○
Plattsburgh	21,057
Pleasant Valley POK	1,372 ○
Pleasantville N.Y.	6,749
Poland	553
Port Byron AUB	1,400
Port Chester N.Y.	23,565
Port Dickinson BING	1,974
Port Ewen KNGST	2,600 ○
Port Henry	1,450
Port Jefferson N.Y.	6,731
Port Jefferson Station N.Y.	7,500 ○
Port Jervis	8,699
Portland	600 ○
Port Leyden	740
Portville	1,136
Port Washington N.Y.	15,823 ○
Potsdam	10,635
Pottersville	600 ○
POUGHKEEPSIE POK	29,757
Prattsburg	750 ○
Prattsville	500 ○
Pulaski	2,415
Randolph	1,398
Ransomville BUF-	1,500 ○
Ravena A-S-T	3,091
Raymondville	600 ○
Red Creek	645
Red Hook	1,692
Redwood	600 ○
Remsen UT-R	621
Rensselaer A-S-T	9,047
Rhinebeck POK	2,542
Richburg	494
Richfield Springs	1,561
Richmondville	792
Ridgemont ROCH	6,500 ○
Ripley	1,000 ○
Riverhead	7,400 ○
ROCHESTER ROCH	241,741
Rockville Centre N.Y.	25,405
Roessleville A-S-T	5,476
Rome UT-R	43,826
Ronkonkoma N.Y.	20,200
Roosevelt N.Y.	15,000
Roslyn Heights N.Y.	7,270
Rotterdam A-S-T	24,800
Round Lake A-S-T	791
Rouses Point	2,266
Roxbury	700
Rushford	500
Rushville	546
Rye N.Y.	15,083
Sackets Harbor	1,017
Sag Harbor	2,581
St. James N.Y.	11,000
St. Johnsville	2,019
St. Regis Falls	950 ○
Salamanca	6,890
Salem	959
Sandy Creek	785
San Remo N.Y.	6,700 ○
Saranac Lake	5,578
Saratoga Springs A-S-T	23,906
Saugerties KNGST	3,882
Savannah	636
Savona ELM-	832
Sayville N.Y.	16,300
Scarsdale N.Y.	17,650
Schaghticoke A-S-T	677
Schenectady A-S-T	67,972
Schenevus	625
Schoharie	1,016
Schroon Lake	1,000 ○
Schuylerville	1,256
Scotia A-S-T	7,280
Scottsville ROCH	1,789
Sea Cliff N.Y.	5,364
Seaford N.Y.	17,150
Selden N.Y.	24,100
Seneca Falls	7,466
Shandaken	800
Shelter Island	1,000
Sherburne	1,561
Sherman	775
Sherrill	2,830
Shirley N.Y.	6,200
Shortsville ROCH	1,669
Sidney	4,861
Sidney Center	600 ○
Silver Creek BUF-	3,088
Silver Springs	801
Sinclairville	772
Skaneateles SYR	2,789
Sloan BUF-	4,529
Sloatsburg N.Y.	3,154
Smithtown N.Y.	23,000 ○
Sodus ROCH	1,790
Sodus Point	1,334
Solvay SYR	7,140
Sound Beach N.Y.	5,400 ○
Southampton	4,000
South Bethlehem A-S-T	500 ○
South Corning ELM-	1,195
South Dayton	661
South Fallsburg	1,590 ○
South Farmingdale N.Y.	20,500 ○
South Glens Falls GLFLS	3,714
South Huntington N.Y.	9,115 ○
South New Berlin	450 ○
South Nyack N.Y.	3,602
Southold	2,030 ○
South Otselic	450 ○
Southport ELM-	6,700 ○
South Stony Brook N.Y.	15,329 ○
South Valley Stream N.Y.	6,600 ○
South Westbury N.Y.	10,700 ○
Spencer	863
Spencerport ROCH	3,424
Spring Valley N.Y.	20,537
Springville	4,285
Springwater	500 ○
Staatsburg POK	950 ○
Stamford	1,240
Stillwater A-S-T	1,572
Stony Brook N.Y.	6,600 ○
Stony Creek	450 ○
Stony Point N.Y.	8,270 ○
Stottville	1,300 ○
Suffern N.Y.	10,794
Sylvan Beach UT-R	1,243
Syosset N.Y.	10,200 ○
SYRACUSE SYR	170,105
Tappan N.Y.	6,100 ○
Tarrytown N.Y.	10,648
Terryville N.Y.	5,900 ○
Theresa	827
Thornwood N.Y.	5,400 ○
Three Mile Bay	600 ○
Ticonderoga	2,938
Tillson KNGST	1,300 ○
Tivoli KNGST	711
Tomkins Cove N.Y.	700 ○
Tonawanda BUF-	18,693
Town of Tonawanda BUF-	78,100 ○
Troy A-S-T	56,638
Trumansburg ITH	1,722
Tuckahoe N.Y.	6,076
Tully SYR	1,049
Tupper Lake	4,478
Unadilla	1,367
Uniondale N.Y.	24,500 ○
Union Springs AUB	1,201
University Gardens N.Y.	5,400 ○
UTICA UT-R	75,632
Valatie A-S-T	1,492
Valhalla N.Y.	8,600 ○
Valley Cottage N.Y.	6,007 ○
Valley Stream N.Y.	35,769
Van Etten	559
Vestal BING	6,000 ○
Vestal Center BING	900 ○
Victor ROCH	2,370
Waddington	980
Wading River	2,500 ○
Walden NWBG	5,659
Wallkill NWBG	1,849 ○
Walton	3,329
Wampsville	569
Wantagh N.Y.	22,300
Wappingers Falls POK	5,110
Warrensburg	2,743
Warsaw	3,619
Warwick N.Y.	4,320
Waterford A-S-T	2,405
Waterloo	5,303
WATERTOWN WATN	27,861
Waterville UT-R	1,872
Watervliet A-S-T	11,354
Watkins Glen	2,440
Waverly	4,738
Wayland	1,846
Webster ROCH	5,499
Weedsport SYR	1,952
Wellsburg ELM-	647
Wellsville	5,769
West Amityville N.Y.	6,470
West Babylon N.Y.	32,500 ○
West Bay Shore N.Y.	8,900
Westbury N.Y.	13,871
West Carthage	1,824
West Chazy	700
West Elmira ELM-	5,901
Westfield	3,446
West Haverstraw N.Y.	9,181
West Hempstead N.Y.	26,500
West Huntington N.Y.	8,170
West Islip N.Y.	21,500
Westmere A-S-T	5,500
West Point	8,000 ○
Westport	613
West Sayville N.Y.	8,000
West Seneca BUF-	51,210 ○
Westvale SYR	7,300
West Webster ROCH	10,900 ○
West Winfield	979
Whitehall	3,241
White Plains N.Y.	46,999
Whitesboro UT-R	4,460
Whitesville	600
Whitney Point BING	1,093
Willard	700
Williamson ROCH	1,991
Williamsville BUF-	6,017
Williston Park N.Y.	8,216
Willsboro	950
Wilmington	500
Wilson LOCK	1,259

○ Rand McNally estimate [illegible] census

▲ Population of entire township [illegible]

● [illegible]

[illegible]

WALKOVER SCAN

OF

SEAWAY, ASHLAND 1, ASHLAND 2

TONAWANDA, NY

July 28 - August 12, 1986

WORK PERFORMED BY:

483-[illegible]7
716-695-3215

TMA/EBERLINE
800 OAK RIDGE TURNPIKE
OAK RIDGE, TENNESSEE 37830

UNDER SUBCONTRACT 14501-SC-1
FOR BECHTEL NATIONAL, INC.
OAK RIDGE, TENNESSEE

LIST OF FIGURES

TABLE OF CONTENTS

SEAWAY

GRID SYSTEM

A baseline was established along the eastern property line of SEAWAY and numbered starting at 0+00 to 45+00. A station was measured on the ground every 100' and marked with surveyors orange ribbon, red paint or pin flag for reference during the scan. One property corner was located at the intersection with River Road right-of-way. The baseline was established east of this point until its intersection with turning point at 11+48. This turning point was found as a hub and iron pipe on the ground. Measurement error at this point was less than 5 feet. The baseline continues at this point (11+48) to the end of the property (45+00±) as baseline and property line being the same line. The property line is also the center of a wood pole power line with telephone underbuild. Conversation with surveyors on site confirmed this to be the property line.

A small amount of additional grid was established due to the time allotted for scanning and the difficulty in establishing a grid in the high grass.

For the purpose of establishing a control for areas "A" and "B", a line was extended 400' to the right from 17+00 to 20+00. For establishing control for area "C", a line was extended 800' to the right from 17+00 to 21+00. Accuracy in these extensions is believed to be ±30 feet.

SCAN METHOD

Areas were scanned using Eberline ratemeter/scaler models PRS-1 and NAI scintillation probe model SPA-3. Paths of scan were 10'-15' apart with the probe being passed about 2-6" above ground level.

RESULTS OF SURFACE SCAN WALKOVER

The 1976 ORNL Survey indicated three areas of contamination designated areas "A", "B", and "C" as presented in Figure 1. Figure 1 also presents the area of Seaway, Ashland 1, and Ashland 2 that were included in the scan survey. Areas of external gamma radiation levels based on the survey conducted by Oak Ridge National Lab in 1978 are presented in Figure 2. Radiation levels based on the 1986 survey are presented in Figure 3.

The walkover results indicated:

> Area "A" in the SE and SW area appears to have been disturbed by the placement of overburden and/or grading and shaping. In the NE section sloping towards Niagara-Mohawk property, migration of material down the bank appears to have occured. This migration was present in 1978 as evidenced by the small area of elevated external gamma radiation levels northeast of area A (see Figure 2). Dozer tracks were noted at various places in this area and appear to be created in the past year.
>
> Area "B" could not be found by surface scanning. Comparison of the 1976 with the 1986 topo map indicated that this area is now under the fill material to an undetermined depth. The presence or absence of the original contaminated material could not be verified.
>
> Area "C" could not be found by surface scanning. Comparison of the 1976 with the 1986 topo map indicates that this area is now under the fill material, possibly up to 40' in some areas. The presence or absence of the original contaminated material could not be verified.
>
> Area of Drainage onto Niagara-Mohawk property as indicated on ORNL survey still exists on the NE side in the drainage ditch. Evidence of road work and bank shaping appears to have distrubed some of this area. Possible migration of this area may have extended farther onto the Niagara-Mohawk property.
>
> Area Adjacent to Ashland #1 property in the SW corner has been disturbed due to installation of a 4' bentonite wall around the SEAWAY property and by shaping of a drainage ditch in this area. Much of this area could not be located. Some contamination was observed in the bottom of the ditch. Most of this area is now clay covered.

TOPO MAPS AVAILABLE

Two copies each of three topo maps showing contour intervals for SEAWAY were obtained from Dave Wansen of BFI. These maps are:

1) EXTENT OF RADIOACTIVE RESIDUE DESPOSITION, September 7, 1976 by Wehran Engineering.

2) OPERATIONAL SEQUENCE PLAN, Sheet 14 of 22 August 17, 1982 by Wehran Engineering.

3) Untitled Map dated 4/18/86 by Dewberry and Davis One.

INTERFACE WITH OWNER/OPERATORS

A meeting was held between Reg Smith (TMA/Eberline), James Sandonato (property owner) and Sean Irwin (Assistant Manager, BFI) at the SEAWAY Site on August 8, 1986. It was indicated to Mr. Sandonato and Mr. Irwin the following:

1) We preformed a walk over scan only and not a characterization.

2) We were able to determine contamination levels at or near the surface only and could not determine if contaminated materials existed beneath the surface.

3) We were unable to locate areas "B" and "C" and our interpretation of topo maps provided by Dave Hansen (BFI) indicated that those areas were possibly under the landfill.

4) We noted some additional migration of materials into the stream across Niagara-Mohawk.

5) We could not make decisions or recommendations concerning the site but could present data from the scan only.

OTHER COMMENTS

The landfill has had a 4' bentonite wall placed around the perimeter and connects the base clay with the clay cap that has been installed. This cap is said to be 1' to 2' thick maximum per Sean Irwin. This clay contains much gravel and may not pass permeability standards for radioactive materials. The clay cap placed over area "B" was installed in 1985 per BFI site supervisor Gary Schenk.

ASHLAND #1

GRID SYSTEM

The ORNL grid used in 1976 was used as a base for the 1986 walkover scan. The grid was not completely re-established but was referenced to existing landmarks on the site. This grid is designated N & S as 1-13 and E & W as A-E grid points.

SCAN METHOD

Areas were scanned using Eberline ratemeter/scaler models PRS-1 and NAI scintillation probe model SPA-3. Paths of scan were 10'-15' apart with the probe being about 2-6" above ground level.

RESULTS OF SURFACE SCAN WALKOVER

The ORNL survey divided the area into three sections: Section NW, Section M, and Section SE as presented in Figure 4. External gamma radiation profiles based on the 1976 ORNL survey are presented in Figure 5. Profiles based on the 1986 scan survey are presented in Figure 6.

Section SE appears to have had 2"-4" gravel placed over some of the area. Some areas were not found as indicated on the original, while several new areas were located.

Section M has a large area in the "tank dike bottom" that was not located. Operators at the site say no gravel or work has been done since 1976. A new area in the bank of the south dike was located. This appears to be a layer 1'-2' thick.

Section NW has had some concrete and gravel dumped from the asphalt road along the western edge of the survey, and gravel has been placed in the northern end of this section for the purpose of storing scrap materials.

Area NW of Section NW along the east property line shows some indication of road work and has disturbed some contaminated area. The water flow from the NW Section flows in a ditch adjacent to the east property line and turns east to a concrete pipeline and then flows under SEAWAY to the Niagara-Mohawk property. A contaminated area was noted at the turning point and along the ditch prior to the turning point.

ASHLAND #2

GRID SYSTEM

A baseline was established along the western property line border with Niagara-Mohawk. This line was actually measured down the gravel road from River Road and projected to the baseline. A grid line was also established across 19+00 to the left to 700' left of the baseline.

SCAN METHOD

Areas were scanned using Eberline ratemeter/scaler models PRS-1 and NAI scintillation probe model SPA-3. Paths of scan were 10'-15' apart with the probe being passed about 2-6" above the ground level. Some areas of high, thick brush were scanned as was accessible.

RESULTS OF SURFACE SCAN WALKOVER

The original area designated Ashland #2 is outlined on a copy of an aerial photograph (scale 1"=600'), and measures 1600' by 800'. The entire area was not accessible to scanning due to heavy brush, and swamp. One portion is designated by Ashland Oil as "Fill Area" on their property maps. Although other areas have obviously had some dumping, only the designated "Fill Area" showed evidence of contamination.

Fill Area is noted as 600' x 500' on the Ashland Oil maps. A clay cap has been placed on the Western portion of the Fill. The Eastern portion has not been capped and exhibits gamma reading up to 140 μR/hr. This contaminated area extends down the slopes of the "Fill Area" running into water/swamp at two locations:

1) to the Northwest with readings to 90+ μR/hr.
2) to the East of unknown extent into swamp with readings to 55 μR/hr.

Estimated area of known contamination is at least 2 acres as presented in Figure 1. Two soil samples were taken by ORNL in January of 1980. These indicated Radium concentrations of 30 and 70 pCi/gm and uranium concentrations of 160 and 1100 pCi/gm.

33

This area of contamination appears to extend onto an adjacent property owned by Benson Development Co. (owner James Sandonato).

INTERFACE WITH ASHLAND OIL REPRESENTATIVES

On August 12, 1986 a meeting was held between Reg Smith (TMA/Eberline), Don Scalize and Jack Patton (Ashland Oil on-site personnel). It was indicated to Mr. Scalize and Mr. Patton the following:

1) We preformed a walk over scan only and not a characterization.

2) We were able to determine contamination levels at or near the surface only and could not determine if contaminated materials existed beneath the surface.

3) We found some differences in the Ashland #1 property from the 1976 ORNL characterization.

4) We noted a large contaminated area to the east of their clay cap on the Ashland #2 "Fill Area".

5) We believe it is possible that the contaminated area may extend onto property owned by James Sondonato.

Mr. Scalize indicated to Mr. Smith the following:

1) The clay cap was installed in two sections - the SE area in 1980, the NW area in 1984,

2) the clay is 2' thick,

3) all fill material was taken by the gravel haul road out the rear gate on the former Haist property.

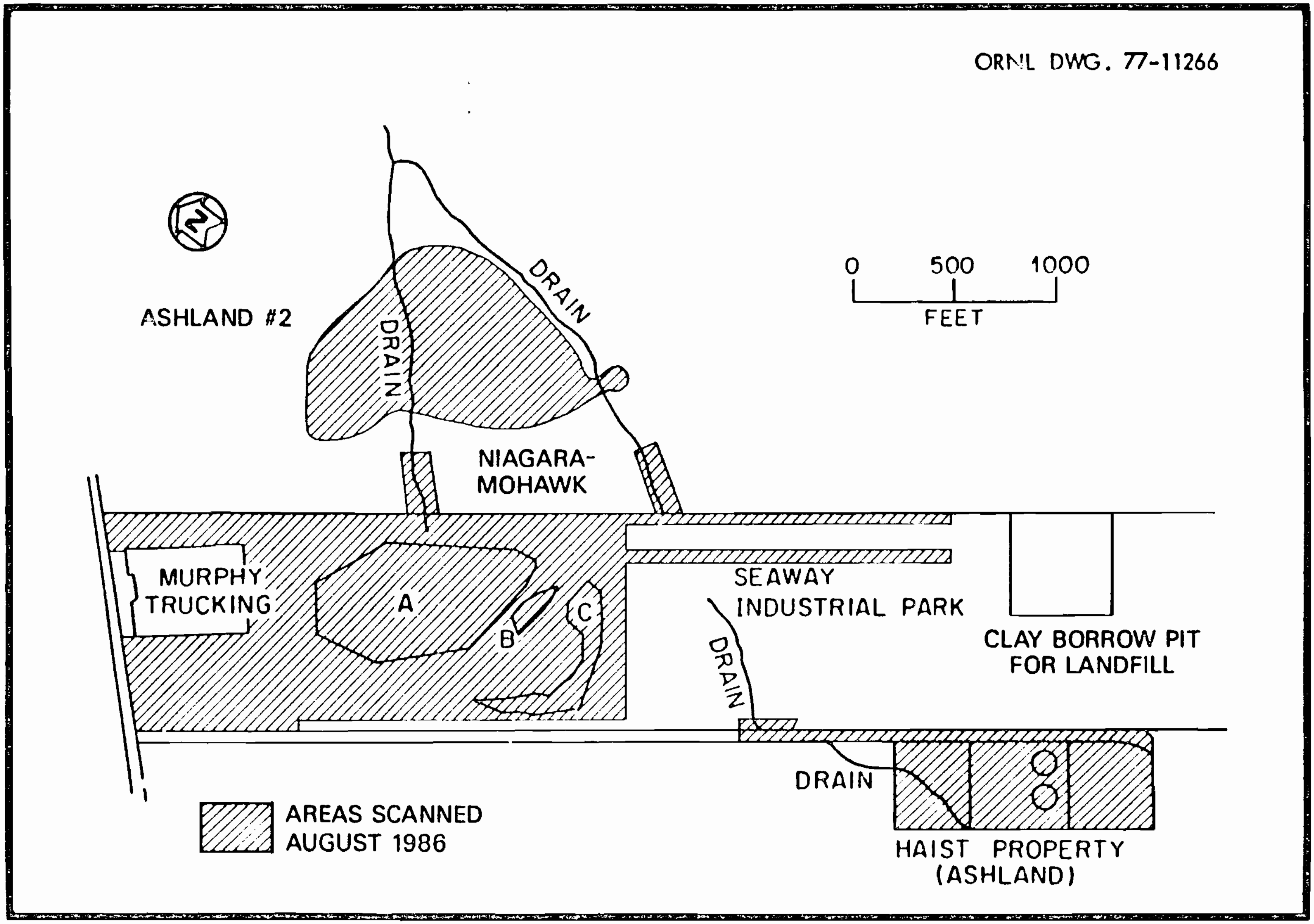


FIGURE 1 SURFACE AREAS OF SEAWAY, ASHLAND 1 AND 2, AND NIAGARA-MOHAWK PROPERTIES SURVEYED IN 1986

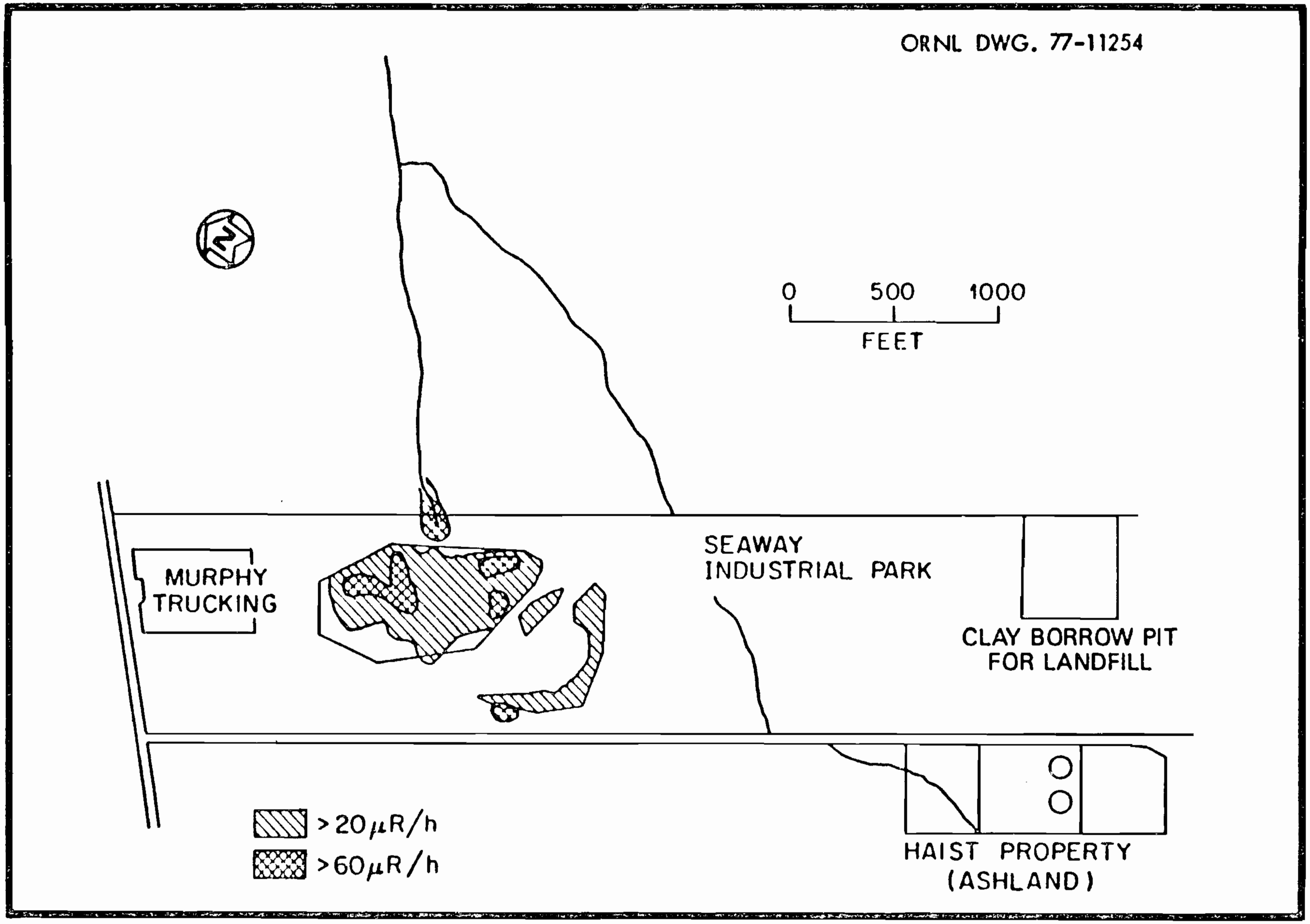


FIGURE 2 AREAS OF ELEVATED EXTERNAL RADIATION ON SEAWAY BASED ON 1976 ORNL SURVEY

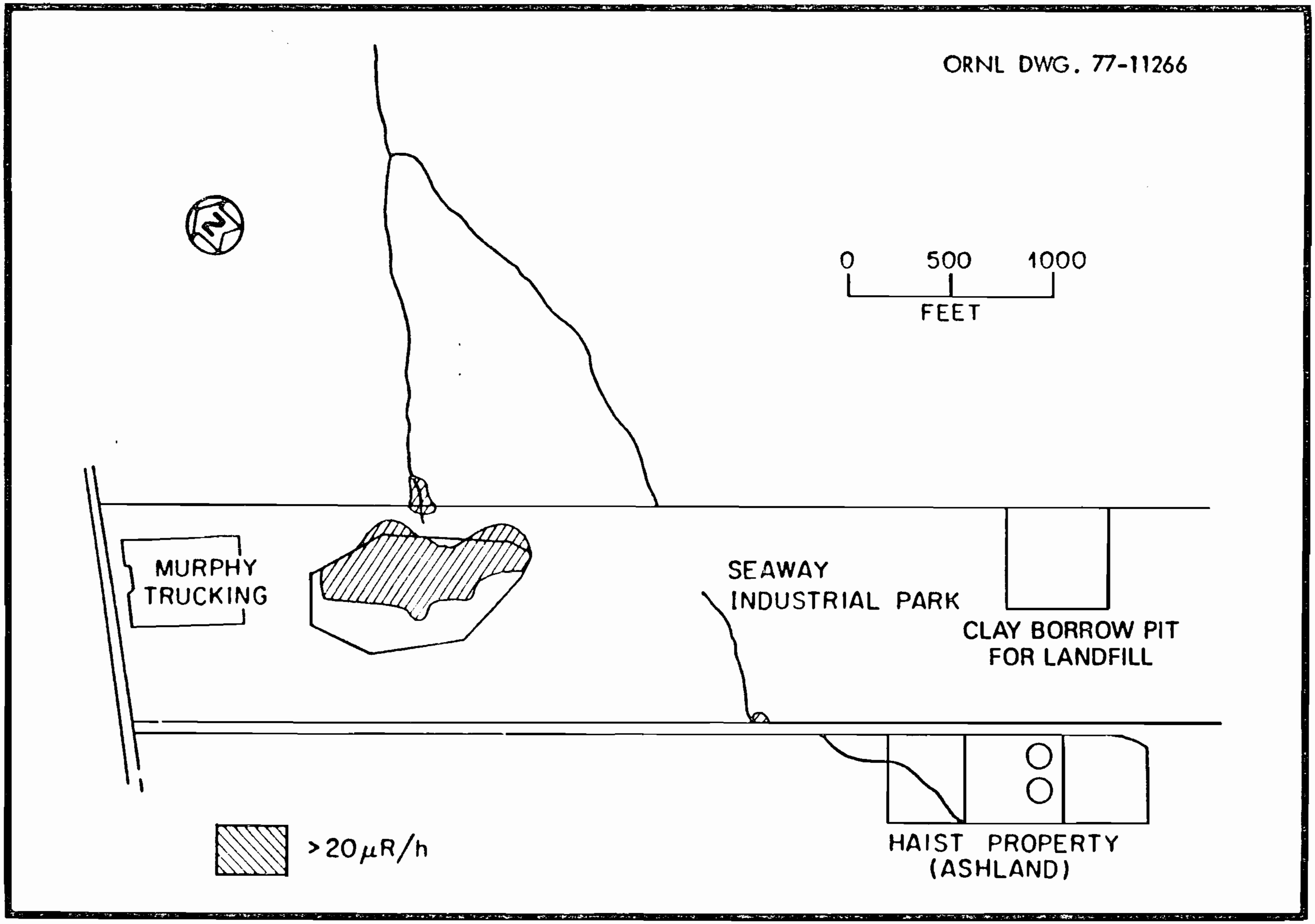


FIGURE 3 AREAS OF ELEVATED EXTERNAL RADIATION ON SEAWAY BASED ON 1986 SURVEY

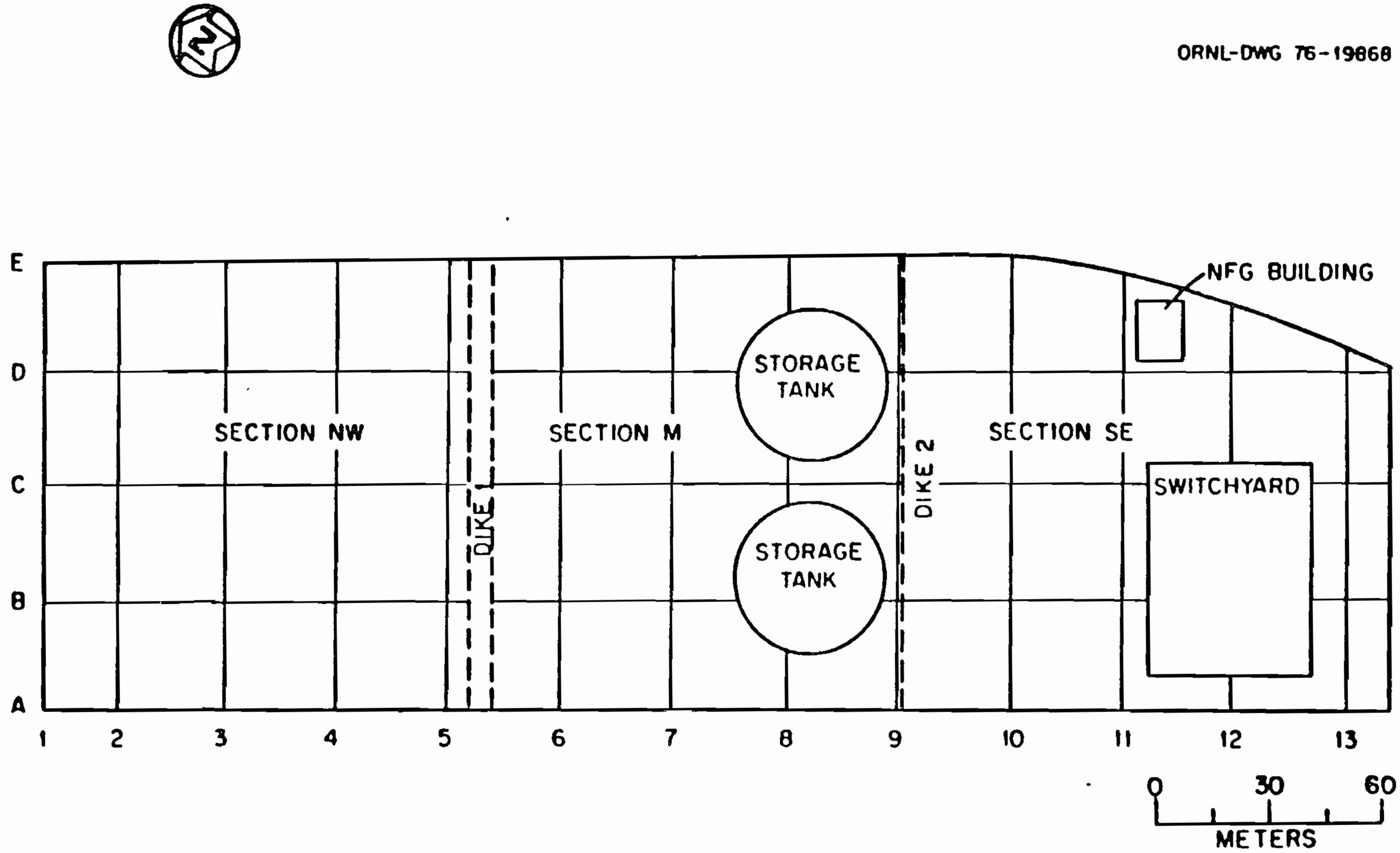


FIGURE 4 PLOT PLAN OF ASHLAND 1

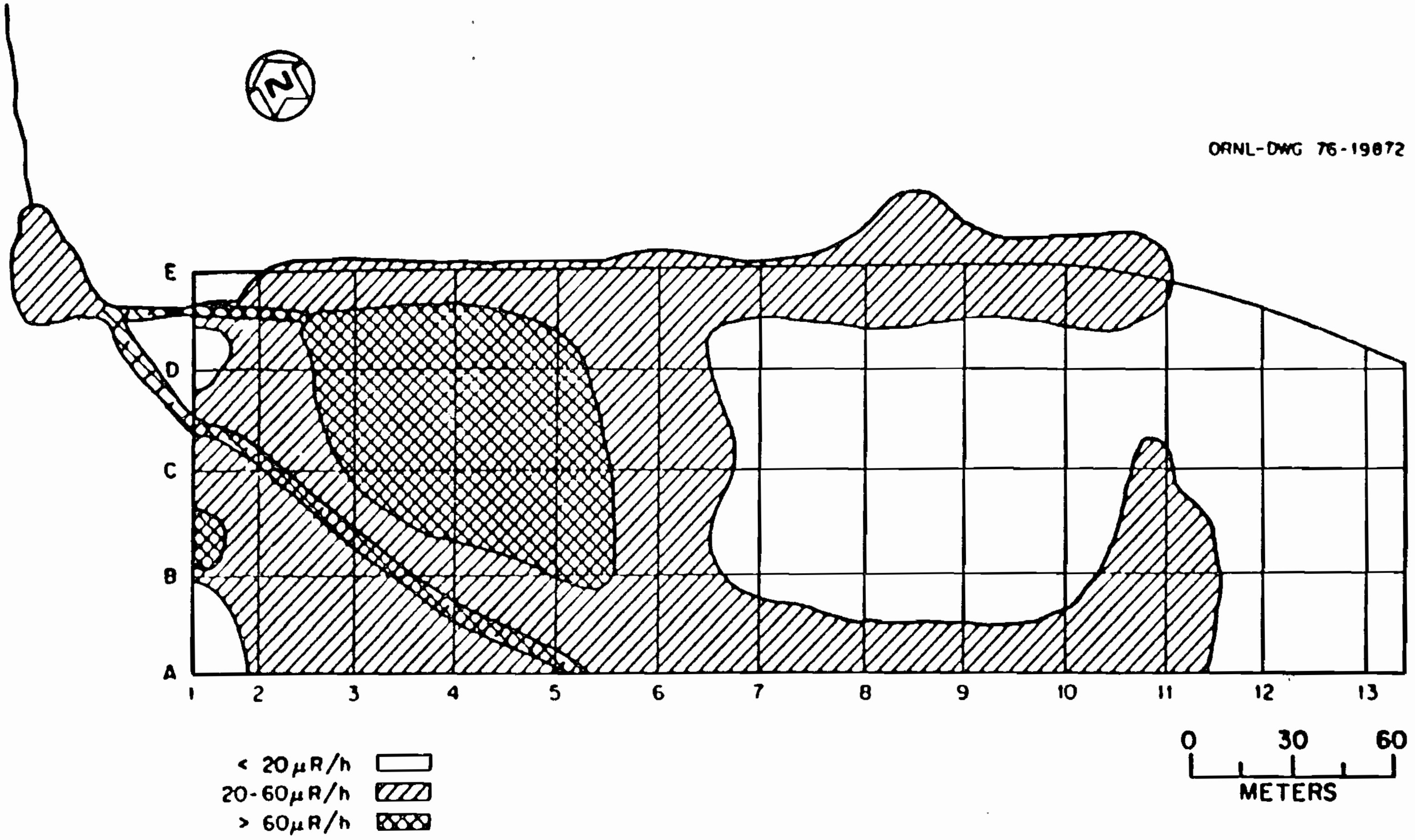


FIGURE 5 EXTERNAL RADIATION PROFILE OF ASHLAND 1 BASED ON 1976 ORNL SURVEY

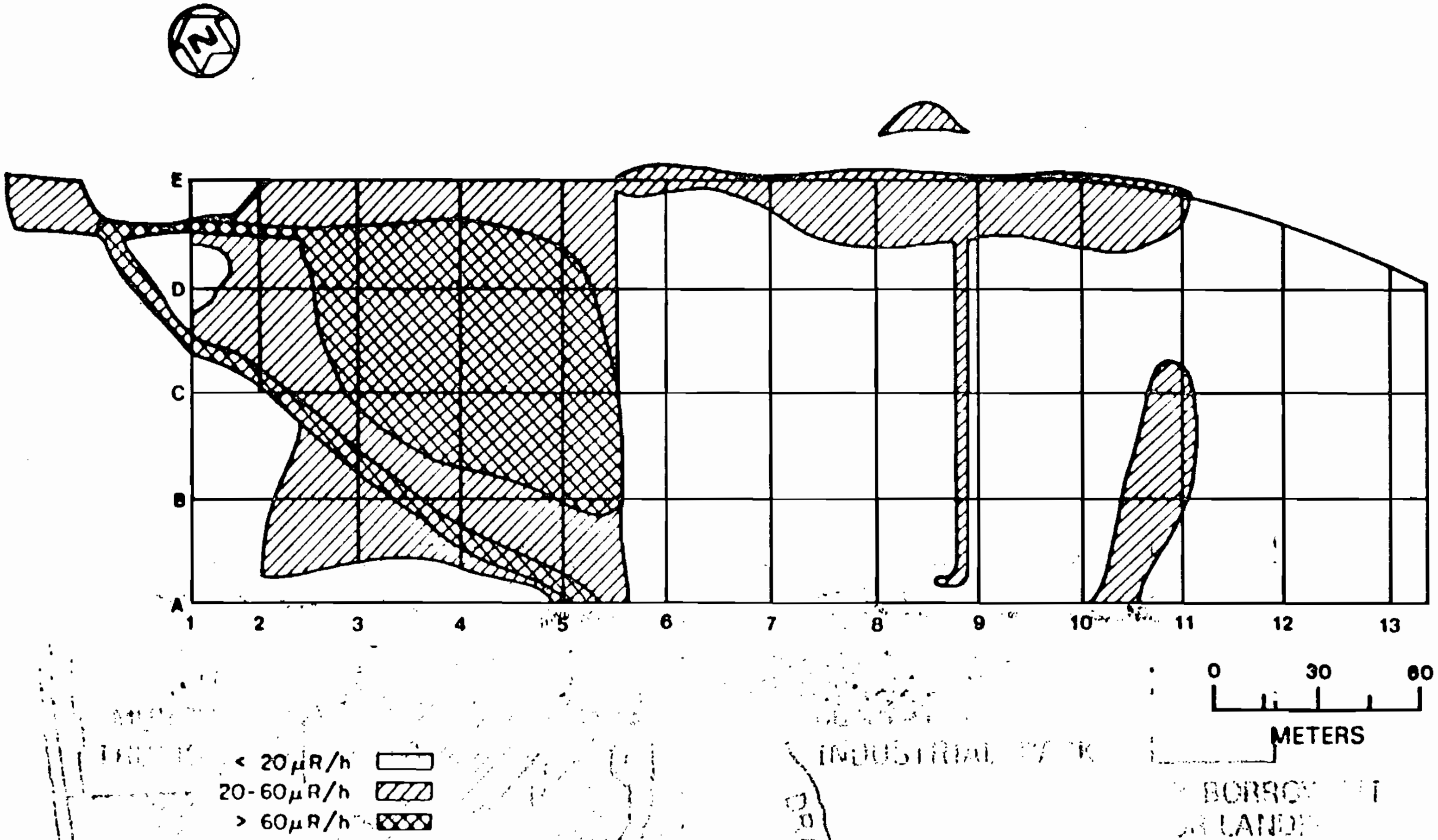


FIGURE 6 EXTERNAL RADIATION PROFILE OF ASHLAND 1 BASED ON 1986 SURVEY

33

34

DOE/EV-0005/4
UC-70

Formerly Utilized MED/AEC Sites Remedial Action Program

Radiological Survey of the Ashland Oil Company (Former Haist Property), Tonawanda, New York

May 1978

Final Report

Prepared for

U.S. Department of Energy
Assistant Secretary for Environment
Division of Environmental Control Technology
Washington, D.C. 20545

Under
Contract No. W-7405-ENG-26

By
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

34

Available from:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161

Price:	Printed Copy:	$ 5.25
	Microfiche:	$ 3.00

34

PREFACE

This series of reports results from a program initiated in 1974 by the Atomic Energy Commission (AEC) for determination of the condition of sites formerly utilized by the Manhattan Engineering District (MED) and the AEC for work involving the handling of radioactive materials. Since the early 1940's, the control of over 100 sites that were no longer required for nuclear programs has been returned to private industry or the public for unrestricted use. A search of MED and AEC records indicated that for some of these sites, documentation was insufficient to determine whether or not the decontamination work done at the time nuclear activities ceased is adequate by current guidelines.

This report contains the results of a radiological survey of the former Haist Property, now owned by the Ashland Oil Company, Tonawanda, New York. The survey was conducted in 1976 by the Energy Research and Development Administration (ERDA) a forerunner of the Department of Energy. Specific findings indicate the presence of low levels of radiation and contamination in soils on the property. Under current usage of the site there is no hazard to people working in this area. However, certain use conditions could arise in the future that would likely represent an unacceptable situation, hence, the DOE plans to conduct further engineering assessments of this site to identify the necessity and possible options for remedial action.

The work reported in this document was conducted by the following members of the Health and Safety Research Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee:

R. W. Leggett
F. F. Haywood
H. W. Dickson
D. L. Anderson
C. A. Golden
W. D. Cottrell
W. F. Fox

34

CONTENTS

34

LIST OF FIGURES

LIST OF TABLES

RADIOLOGICAL SURVEY OF THE ASHLAND OIL COMPANY
(FORMERLY HAIST PROPERTY)
TONAWANDA, NEW YORK

ABSTRACT

The results of a radiological survey of the former Haist property, Tonawanda, New York, are presented in this report. The property served as a repository for uranium ore tailings during the period 1944-46.

It was released for unrestricted use following a survey conducted in 1958 by the Health and Safety Laboratory (HASL), operated then by the Atomic Energy Commission. The property is now owned by Ashland Oil, Inc., and is used for oil refining operations. The survey was undertaken to determine whether the present radiological status of the property is consistent with current radiation protection guidelines and to determine the extent of movement of radioactive residues from the property via natural means such as surface run-off. The survey included measurement of external gamma and surface beta-gamma radiation levels on and near the site; radium and uranium concentrations in the soil on the site; concentrations of radium, uranium, and thorium in water samples collected on the site and in the drainage paths between the site and the

34

Niagara River; radium concentrations in mud samples taken from the drainage areas; and radon daughter levels in the only building on the site. The results indicate that the residues on the site do not pose an immediate health hazard, assuming that residues remain in place (except for normal drainage) and that the site continues to be used in the manner in which it is presently used. However, potential health hazards could result from some uses of the site. In particular, if buildings were to be constructed in certain areas on the site, significant concentrations of radon daughters could develop in these structures.

INTRODUCTION

At the request of the Department of Energy (DOE), (then Energy Research and Development Administration), a radiological survey was conducted in Tonawanda, New York, at the former Haist property. This 10-acre tract served as a disposal site for refinery residues generated by Linde Air Products (a Division of Union Carbide Corporation) in Tonawanda, New York, during their period of participation in the ore refinery operations program of the Manhattan Engineering District. The site, now owned by Ashland Oil, Inc., occupies a corner of the total Ashland property, the site of a large oil refining operation.

Residues comprised essentially of low-grade uranium-ore tailings were deposited on the Haist property during the period 1944-46. Records indicate that about 8000 tons of residues containing approximately 0.54% uranium were spread out over roughly two-thirds of the site to a depth of 1 to 5 ft. The approximate distribution of the residues as documented[1] in 1958 by the Department of Energy Environmental Measurements Laboratory (then Health and Safety Laboratory), is shown in Fig. 1.

In 1974, some of the residues (perhaps 30-40%) were moved to the adjacent Seaway Industrial Park in order to prepare the site for construction of two storage tanks. Some of the remaining residue has been relocated by earth-moving equipment and by natural run-off; and a large amount of clean fill dirt has been placed on the site.

The former Haist property is located in a large industrial area. Residences are found close by on two sides of the property. West of the site along the east bank of Grand Island, residences are found at a distance of approximately 0.5 mile. Residences in the city of Tonawanda also begin at a distance of 0.5 mile. In both cases, the dwellings are predominantly single family units comprising a low density population of approximately 2500 persons per square mile. The location of the Haist site with respect to the total Ashland property and the surrounding industrial area is shown in Fig. 2. There is one building, a fuel gas distribution center, on the site; it is occupied only a few hours each month. The only other active use being made of the property is as an electrical switch yard and oil storage area (see Fig. 3). A small area on the north end is being encroached upon by a storage yard located on adjoining property owned by Ashland Oil Company. Communications with Ashland management indicate no change in the usage of this property is anticipated for the foreseeable future.

Surface water drains from the property in small streams which merge and run off onto the Seaway Industrial Park, which borders the Haist property on the northeastern side. Normally the water drains through Seaway, continues north for nearly a mile through an industrial zone, and then drains into the Niagara River. However, at present the run-off accumulates in a low part of the Seaway Industrial Park because drainage is impeded by incomplete culvert construction.

The last radiological survey of the site was conducted in 1958 by the Environmental Measurements Laboratory, which recommended that the property be released for unrestricted use without removal of the residues.[1] In 1960, the property was transferred to Ashland Oil, Inc., by the General Services Administration, which had control of the site since 1949.

The present survey was undertaken to characterize the existing radiological status of the property. It was conducted by five members of the Health and Safety Research Division, Oak Ridge National Laboratory (ORNL), during the period July 27-August 6, 1976. The survey consisted of: (1) measurement of external gamma radiation at the surface and at 1 m above the surface at the intersection of mutually perpendicular grid lines spaced 100 ft apart covering the property, and measurement of beta-gamma radiation 1 cm above the surface on the same grid; (2) collection of soil samples from the site for the determination of ^{226}Ra, ^{238}U, ^{232}Th, and ^{227}Ac concentrations; (3) collection of water and mud samples along the drainage paths between the site and the Niagara River; (4) measurement of gamma radiation at various depths in core holes dug throughout the site to determine the depth of the contamination in the soil; and (5) measurements of radon daughter concentrations in the National Fuel Gas (NFG) building on the site.

RADIOLOGICAL SURVEY TECHNIQUES

The entire site was divided into subsections by a 100-ft grid. The grid and several landmarks are shown in Fig. 3. Grid points are identified via lines A through E (running southeast to northwest) and lines 1 through 13 (running northeast to southwest). The former Haist property is represented in Fig. 3 by the area to the right of line 2. For convenience in reporting, the three sections of the site separated by two dikes (labelled dike 1 and dike 2) are referred to as section NW (for northwest), section M (for middle), and section SE (for southeast); dike 1 will be considered as part of section M, and section SE will include dike 2.

Measurement of External Gamma and Beta-Gamma Radiation Levels

External gamma radiation levels were measured at the surface and at 1 m above the surface with scintillation survey meters; these instruments are described in Appendix I. Measurements were taken at each point on a 100-ft grid (Fig. 3) covering the entire site and at additional points along drainage ditches, fences, and tailings piles. Readings at 1 m above the surface were also taken at several nearby offsite locations. Geiger-Muller survey meters, described in Appendix I, were used to measure beta-gamma radiation levels at the surface at each of the grid points.

Scintillation and Geiger-Muller (G-M) survey meter measurements are indicative of the instantaneous exposure rate at the point of measurement. Individual readings may be in error by ±30% or more due to the low radiation fields encountered over large areas and due to differences in

itial Contact 11/1/76 by JEI
ointment Made 11/5/76 by JEI
te or Phone Visit 11/9/76 by JEI
llow-up 11/18/76 by JEI
rm Completed 12/2/76 by JEI
mments:

Company Name Ashland Oil & Refining Co. 35
Address Frontier Division - 2680 Elmwood Ave
Kenmore, N.Y. 14217
County Erie Phone (716)-877-7177
SIC Codes 1. 2911 3.
2. 4.

3

CONFIDENTIAL

New York State Hazardous Waste Survey
Department of Environmental Conservation
Division of Solid Waste Management
50 Wolf Road, Albany, N.Y. 12233 Telephone: (518) 457-6605

CONFIDENTIAL

I. General Information

1. Company Name Ashland Petroleum Company

Mailing Address 4545 River Road, Tonawanda, N.Y. 14150
Street City State Zip

Plant Location ☑ Same as above

Street City State Zip

2. If Subsidiary, Name of Parent Company Ashland Oil, Inc.

3. Individual Responsible for Plant Operations A. V. Peppard
Name

Plant Superintendent (716)-877-7177 EXT. 300
Title Phone

4. Individual Providing Information Joseph D. Scalise
Name

Environmental Supervisor (716)-877-7177 EXT. 229
Title Phone

5. Department of Environmental Conservation Interviewer John E. Iannotti

6. Standard Industrial Classification (SIC) Codes for Principal Products

Group Name	SIC Code (4 Digit)	Approximate % of ☑ Production ☐ Value Added
a. Petroleum Refining	2911	100
b.		
c.		
d.		

7. Processes Used at Plant
a. crude distillation
b. catalytic cracking
c. platinum reforming
d. light ends treating
e. asphalt blowing

8. Products
a. gasoline
b. L.P.G.
c. distillates
d. aromatics
e. asphalt
S.N.G. - Synthetic Natural Gas

APPENDIX A

PHASE II FIELD PROCEDURES

APPENDIX A

PHASE II FIELD PROCEDURES

These procedures have been utilized by Engineering-Science and the NYSDEC field personnel during the Phase II field investigations. These procedures are taken from the NYSDEC-approved "Quality Assurance Project Plan for the Phase II Engineering Investigations and Evaluations at Inactive Hazardous Waste Disposal Sites", dated June, 1987.

The following procedures are contained in this appendix: drilling overburden and bedrock, monitoring well installations, well development, and sampling program, including groundwater sampling, surface water sampling, sediment sampling, and air monitoring.

DRILLING OVERBURDEN AND BEDROCK

The procedures utilized in drilling overburden and bedrock were taken from "Guidelines for Exploratory Boring, Monitoring Wells Installation, and Documentation of these Activities", as promulgated by NYSDEC. These procedures, as found in the project Work Plan and Quality Assurance Plan, were modified in the field with NYSDEC approval, in response to site-specific conditions encountered.

Prior to beginning each well boring, the downhole drilling equipment and tools were steam cleaned. During the progress of the work, the downhole equipment and tools were generally placed on wooden pallets or on sheets of plastic to limit cross contamination.

Drilling was accomplished with a Mobile B-61 truck-mounted drilling rig. Generally, the overburden was drilled with 4-1/4 inch inside diameter hollow stem augers. In general, soil samples were collected at intervals of five feet and visually classified in terms of moisture content, color, texture, density and structure. The soil samples were screened with a Photovac Tip-II to determine the presence of volatile organic compounds. The soil cuttings were also monitored with the Photovac. Since no readings in excess of 5 ppm above background were recorded, the soil materials were left on the ground surface.

Bedrock was cored and sampled utilizing an Nx core barrel and clean water from a municipal supply. The core was placed in wooden boxes and classified in terms of lithology, color, structure, and competence.

MONITORING WELL INSTALLATION

All wells were constructed of two-inch inside diameter PVC riser pipe and .010 inch slotted screen. Depending on the location, well screens were 10 feet in length. All well materials were steam cleaned prior to insertion in the borehole.

Once the PVC well materials were set in place through the augers, quartz sand backfill was placed around the well screen to the top of the screen. A two-foot thick bentonite seal was placed above the sand pack to isolate the screened zone. Above the bentonite seal, a cement/bentonite grout was placed up to ground surface.

A vented PVC cap was placed on the well pipe, and the well was secured with the installation of a locking 4-inch inside diameter steel protective casing.

WELL DEVELOPMENT

Once the well installation was complete, the well materials were allowed to set up for a period of approximately 12 hours or more. Each well was then developed by removing water until the water was less than 100 Jackson Tubidity units, or was visually sediment-free.

Well development was by air-lift pumping. For the air-lift method, the discharge of the air line was first monitored with a Photovac to ensure readings were not above background. An oil separating device was placed on the discharge line of the compressor. The air line was steam cleaned prior to placement in the well. Once the air line was in place just above the screened section, the air pressure was increased until the water could be lifted out of the top of the well casing.

SAMPLING PROGRAM

The sampling program at the Ashland Petroleum site consisted of groundwater, surface water, and sediment sampling. Samples were collected in accordance with the Quality Assurance Project Plan. In addition to the media sampled, two types of blanks were collected. A trip blank consisting of organic-free water was prepared by the laboratory or a commercial distributor over the sampling equipment as a measure of the field decontamination procedures. The field blank was analyzed for volatile organic compounds.

Prior to sampling at each location, the sampling equipment was decontaminated by successively rinsing with detergent (Alconox) water, methanol, and distilled water. After collection of the water samples, field tests were performed on an additional sample to determine pH, temperature and specific conductivity. Field sampling records are presented in Appendix C.

Groundwater Sampling

Prior to collecting the groundwater samples, the static water level in the well was recorded from the top of the PVC casing, and at least three well volumes of water were removed with a Teflon bailer. The sample bottles were then filled using the same teflon bailer. Dedicated polypropylene or polyethylene rope was used to bail each well.

Surface Water

Surface water samples were collected by dipping a stainless steel beaker beneath the water surface and pouring the sample into the sample bottles.

Sediment Sampling

Sediment samples were collected with a long handled stainless steel spoon at the same location that the surface water samples were collected.

AIR QUALITY MONITORING

Air quality monitoring for volatile organic compounds with a Photovac Tip-II photoionization meter was implemented during the geophysical surveys, drilling and well installations and sampling events. Monitoring was generally performed as a health and safety measure. The intake of the instrument was held at head height for 30 seconds and the reading was recorded. During drilling, the split spoon soil samples were held within several inches of the intake to test for organic vapors emanating from the soil samples. The air in the completed well was monitored by placing the intake over the well opening and removing the PVC cap. The intake was then placed into the well opening and readings were noted.

APPENDIX B

GEOLOGIC DATA

Existing Monitoring Wells

(Installed by Bechtel National, Inc. in 1987)

BECHTEL

③

GEOLOGIC DRILL LOG

PROJECT: FUSRAP
JOB NO.: 14501-155
SHEET NO.: 1 OF 3
HOLE NO.: B55W17
SITE: Ashland
COORDINATES: N2750.1 E3003.8
ANGLE FROM HORIZ.: 90°
BEARING: N/A
BEGUN: 5/19/87
COMPLETED: 6/3/87
DRILLER: EARTH DIMENSIONS
DRILL MAKE AND MODEL: MOBILE B-61
HOLE SIZE: 12
OVERBURDEN (FT.): 80.0
ROCK (FT.): 10.0
TOTAL DEPTH: 90.0
CORE RECOVERY(FT./%): 10.0 /100
CORE BOXES: 1 BOX
SAMPLES: 16
EL. TOP OF CASING:
GROUND EL.: 594.12
DEPTH/EL. GROUND WATER: 10.1 / 584.02
DEPTH/EL. TOP OF ROCK: 80.0 / 514.12
SAMPLE HAMMER WEIGHT/FALL: 140 LBS /30 IN.
CASING LEFT IN HOLE; DIA./LENGTH: 2 /89.45
LOGGED BY: G. CHERRY

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS "N" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M. 1ST 6"	WATER PRESSURE TESTS: PRESSURE P.S.I 2ND 6"	WATER PRESSURE TESTS: TIME IN MINUTES 3RD 6"	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							594.12	0				
SS 2	24	18	5	1	2	3/3				1	0.0-73.0 FT SILTY CLAY (CL): REDDISH BROWN ROCK FRAGMENTS (2-5%) Z 5 MM.	HOLE DRILLED WITH HOLLOW STEM AUGERS 4.75 IN. ID 7.5 IN. OD TO 80'. 3" DIAMOND CORE TO 90'.
SS 2	24	20	20	2	8	12/16				2	0.0-4.0 FT SAMPLES FOR RADIOLOGICAL TESTING, BY EBERLINE - TMA.	
SS 2	24	17	25	1	12	13/12		5		3	3.7-4.0 FT LIGHT GRAY DESICCATION CRACKS.	SAMPLES 1 & 2 TAKEN BY EBERLINE-TMA.
SS 2	24	19.5	26	6	12	14/17				4		▽ 5/19/87
								10				
SS 2	24	13.5	9	4	4	5/7				5		WELL WAS INSTALLED BY REAMING SOIL WITH 12" AUGER TO 80', AND 8" ROLLER CONE TO 90'.
								15				
SS 2	24	17	8	2	3	5/6				6		
								20				
SS 2	24	24	5	2	2	3/4				7		
								25			25.0-73.0 FT MODERATE BROWN TO GRAY BROWN WITH RED BROWN SILT LENSES. ROCK FRAGMENTS 5-10 MM (2%).	
SS 2	24	14	7	3	3	4/6				8		
								30				
SS 2	24	20	8	2	4	4/4	559.12	35		9		

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER

SITE: Ashland

HOLE NO.: B55W17

GEOLOGIC DRILL LOG

PROJECT FUSRAP | JOB NO. 14501-155 | SHEET NO. 2 OF 3 | HOLE NO. B55W17

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS ½' / PERCENT CORE RECOVERY	WATER PRESSURE TESTS			ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
				LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	559.12	35				
									▨		SILTY CLAY (CL): MODERATE BROWN TO GRAY BROWN WITH THIN LAYERS OF ROCK FRAGMENTS 5-10 MM (2-5%).	
SS 2	24	18.5	9	2	4	5/5			▨	10		
								40	▨			
SS 2	24	22.5	8	3	3	5/6			▨	11		
								45	▨			
SS 2	24	20.5	9	3	4	5/6			▨	12		
								50	▨			
SS 2	24	22.5	12	4	5	7/7			▨	13		
								55	▨			
SS 2	24	24	12	3	5	7/7			▨	14		
								60	▨			
SS 2	24	20	9	3	4	5/4			▨	15		
								65	▨			
SS 2	24	22	8	3	4	4/5			▨	16		
								70	▨			
SS 2	23	22	129	17	29	100/66	521.12		▥	17	73.0-80.0 FT GRAVELLY SILT (ML): BROWNISH GRAY (5YR4/1).	
							519.12	75				

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER

SITE Ashland

HOLE NO. B55W17

③

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-155	3 OF 3	B55W17

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS / % / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							519.12	75				
SS 2	23	23	49	7	12	37/100				18		WATER FLOWING ON SURFACE AT 79.2 FT.
							514.12	80			RUN 1	
NX CORE 3	1.5	1.4	93								80.0-90.0 FT <u>SHALE:</u> (N3) MEDIUM GRAY, GYPSUM NODULES AND VEINS 00-152 SMALL SOLUTION CAVITIES. BRITTLE, MEDIUM SOFT, SATURATED.	
	4.6	4.6	100							RUN 2		
								85				
	3.9	3.9	100							RUN 3		
							504.12	90			BOTTOM OF BORING AT 90.0 FT.	
												ALL SOIL AND ROCK COLOR DESCRIPTION FROM THE <u>ROCK COLOR CHART</u> <u>PRINTED BY THE</u> <u>G.S.A., 1948.</u>

	SITE	HOLE NO.
SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER	Ashland	B55W17

MONITORING WELL

PROJECT: FUSRAP

WELL NO.: B55W17

JOB NO.: 14501

SITE: ASHLAND

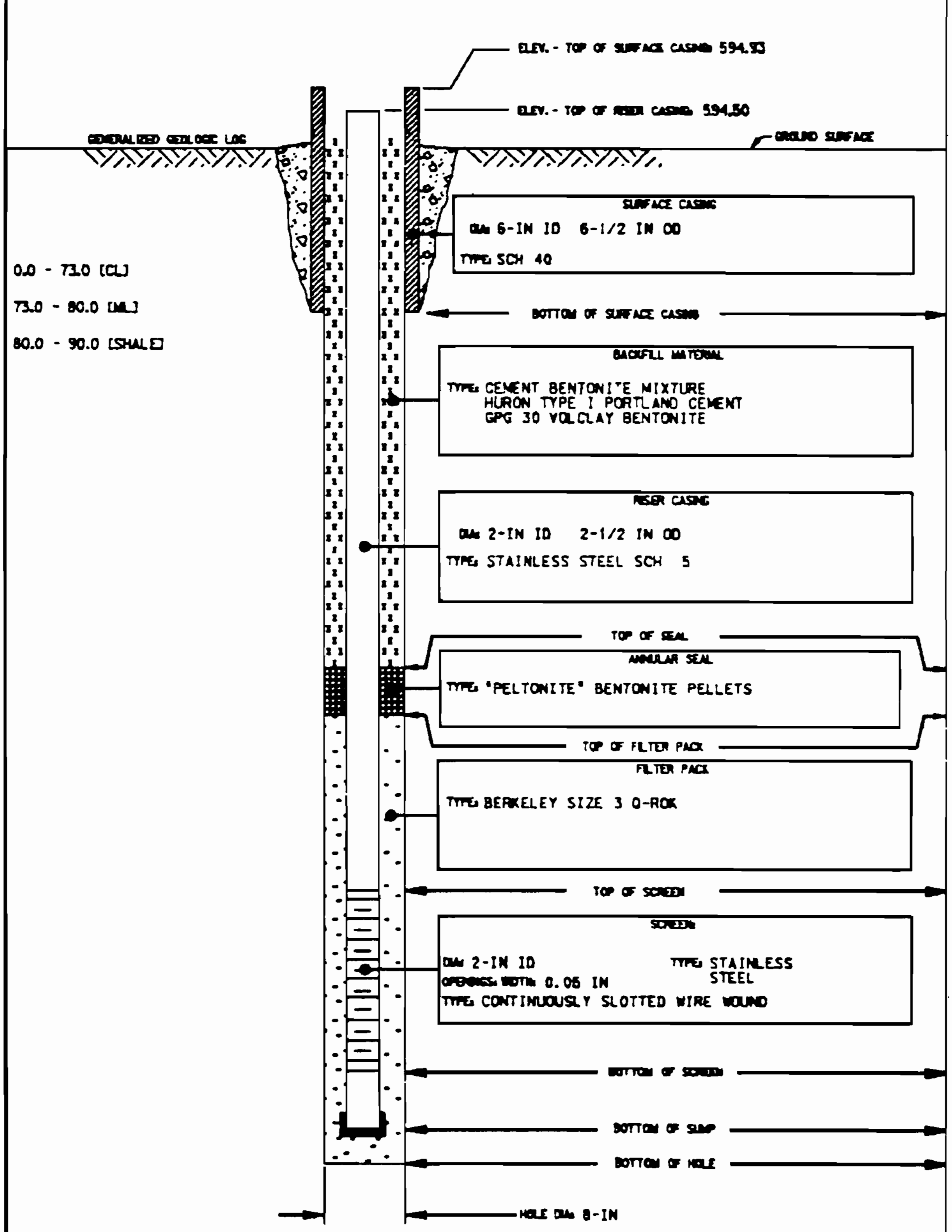
COORDINATES: N2750.1 E3003.8

BEGUN: 5/19/87

COMPLETED: 6/3/87

PREPARED BY: JEFF SIMS

REFERENCE POINT FOR MEASUREMENTS: GROUND SURFACE



GENERALIZED GEOLOGIC LOG

0.0 - 73.0 [CL]

73.0 - 80.0 [ML]

80.0 - 90.0 [SHALE]

SURFACE CASING

DIA: 6-IN ID 6-1/2 IN OD

TYPE: SCH 40

BACKFILL MATERIAL

TYPE: CEMENT BENTONITE MIXTURE
HURON TYPE I PORTLAND CEMENT
GPG 30 VOLCLAY BENTONITE

RISER CASING

DIA: 2-IN ID 2-1/2 IN OD

TYPE: STAINLESS STEEL SCH 5

ANNULAR SEAL

TYPE: "PELTONITE" BENTONITE PELLETS

FILTER PACK

TYPE: BERKELEY SIZE 3 Q-ROK

SCREEN:

DIA: 2-IN ID

TYPE: STAINLESS STEEL

OPENINGS: WIDTH: 0.06 IN

TYPE: CONTINUOUSLY SLOTTED WIRE WOUND

	DEPTH (FEET)	ELEV. (FEET)
GROUND SURFACE	0.0	594.1
BOTTOM OF SURFACE CASING	4.2	589.9
TOP OF SEAL	76.9	517.2
TOP OF FILTER PACK	79.0	515.1
TOP OF SCREEN	80.6	513.5
BOTTOM OF SCREEN	85.6	508.5
BOTTOM OF SUMP	87.0	507.1
BOTTOM OF HOLE	90.0	504.1

GRA:[46,12]B55W17M.DGN

③

GEOLOGIC DRILL LOG

PROJECT FUSRAP		JOB NO. 14501-155	SHEET NO. 1 OF 3	HOLE NO. B55W19	
SITE Ashland	COORDINATES N2051.8 E3081.1		ANGLE FROM HORIZ. 90°	BEARING N/A	
BEGUN 6/20/87	COMPLETED 6/23/87	DRILLER EARTH DIMENSIONS	DRILL MAKE AND MODEL MOBILE B-61	HOLE SIZE 6¼	OVERBURDEN (FT.) 72.5
ROCK (FT.) 9.4	TOTAL DEPTH 81.9	CORE RECOVERY(FT./%) 8.8 - 94%	CORE BOXES 1 BOX	SAMPLES 11	EL. TOP OF CASING N/A
GROUND EL. 590.02	DEPTH/EL. GROUND WATER ~15.0 /575.0	DEPTH/EL. TOP OF ROCK 72.5/517.52	SAMPLE HAMMER WEIGHT/FALL 140 LBS /30 IN.	CASING LEFT IN HOLE: DIA./LENGTH NONE	LOGGED BY: G. CHERRY /S. BALONE

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION	DEPTH	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							590.02	0			
SS 2	24	18.5	34	10	12	22 / 22			1	0.0-70.0 FT SILTY CLAY (CL): PALE BROWN (5YR5/2), DRY WITH DESSICATION CRACK SAND 2% ROCK FRAGMENTS.	BORING ADVANCED WITH 4 1/4 IN. X 6 IN. DIA HOLLOW STEM AUGER FROM 0-72.5'. 3" DIAMOND CORE FROM 72.5' TO 81.9'.
SS 2	24	14	28	7	11	17 / 18			2	SIMILAR TO ABOVE, MODERATE BROWN (5YR4/4).	
SS 2	24	18	23	4	9	14 / 14		5	3	SIMILAR TO SS #2, SLIGHTLY SOFTER WITH 1/2 IN. ROCK FRAGMENTS.	
								10			
SS 2	24	15	16	5	8	8 / 8			4	SIMILAR TO SS #3 WITH LOCALIZED SAND POCKETS AND 5-10% ROCK FRAGMENTS.	
								15			▽ 6/19/87
SS 2	24	15	12	2	4	8 / 5			5		SAMPLES 1 AND 2 TAKEN BY EBERLINE-TMA.
								20			
SS 2	24	18	5	1	2	3 / 3			6	SIMILAR TO BOTTOM OF SS #5, MOIST.	
								25			
								30			
SS 2	24	24	5	1	2	3 / 3			7	PALE BROWN (5YR4/2) SILTY CLAY WITH 2-4% ROCK FRAGMENTS.	
							555.02	35			

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DENISON; P-PITCHER; O-OTHER	SITE Ashland	HOLE NO. B55W19

③

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-155	2 OF 3	B55W19

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS 6" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS LOSS IN G.P.M.	PRESSURE P.S.I.	TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							555.02	35				
SS 2	24	24	4	1	2	2 / 3		40		8		
								45				
SS 2	24	24	W.O.R.	W.O.R.				50		9		WOR = WEIGHT OF RODS
								55				
SS 2	24	24	4	1	2	2 / 5		60		10	SIMILAR TO SS #9.	
								65				
SS 2	13	6	85/7	34	35	50 / r	520.02	70		11	70.0-72.5 FT SILTY SAND (ML): OLIVE GRAY (5Y4/1) WITH 10-15% GRAVEL, SATURATED.	
NX CORE 3	60	54	90				517.52	72.5		RUN 1	72.5-81.9 FT SHALE: SATURATED, DARK GRAY (N3) MEDIUM SOFT TO MEDIUM HARD. UP TO 50% GYPSUM AS THIN BEDS BETWEEN SHALE AND SECONDARY DEPOSIT IN FRACTURES AND SOLUTION CAVITIES.	CAMILLUS SHALE AUGER REFUSAL AT 72.5 FT.
							515.02	75				

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER

SITE	HOLE NO.
Ashland	B55W19

GEOLOGIC DRILL LOG

PROJECT	JOB NO.	SHEET NO.	HOLE NO.
FUSRAP	14501-155	3 of 3	B55W19

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE / LENGTH CORE RUN	SAMPLE RECOVERY / CORE RECOVERY	SAMPLE BLOWS / 6" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
	60	54	90				515.02	75				RUN AP FT LP FT RQD (%) 1 0.2 0.5 30 2 0.3 0.9 48
NX CORE 3	53	52	98					80		RUN 2	80.3-80.6 FT LARGE SOLUTION CAVITIES.	
							508.12	81.9			BOTTOM OF BORING AT 81.9 FT. PERMEABILITY TEST PERFORMED. AP= AVERAGE LENGTH OF CORE PIECES RECOVERED. LP= LONGEST PIECE OF CORE RECOVERED. RQD= ROCK QUALITY DESIGNATION.	ALL SOIL AND ROCK COLOR DESCRIPTIONS ARE FROM THE ROCK COLOR CHART, PRINTED BY THE G.S.A., 1948.

	SITE	HOLE NO.
SS=SPLIT SPOON, ST=SHELBY TUBE, D=DENISON, P=PITCHER, O=OTHER	Ashland	B55W19

MONITORING WELL

PROJECT FUSRAP

WELL NO. B55W19

JOB NO. 14501

SITE ASHLAND

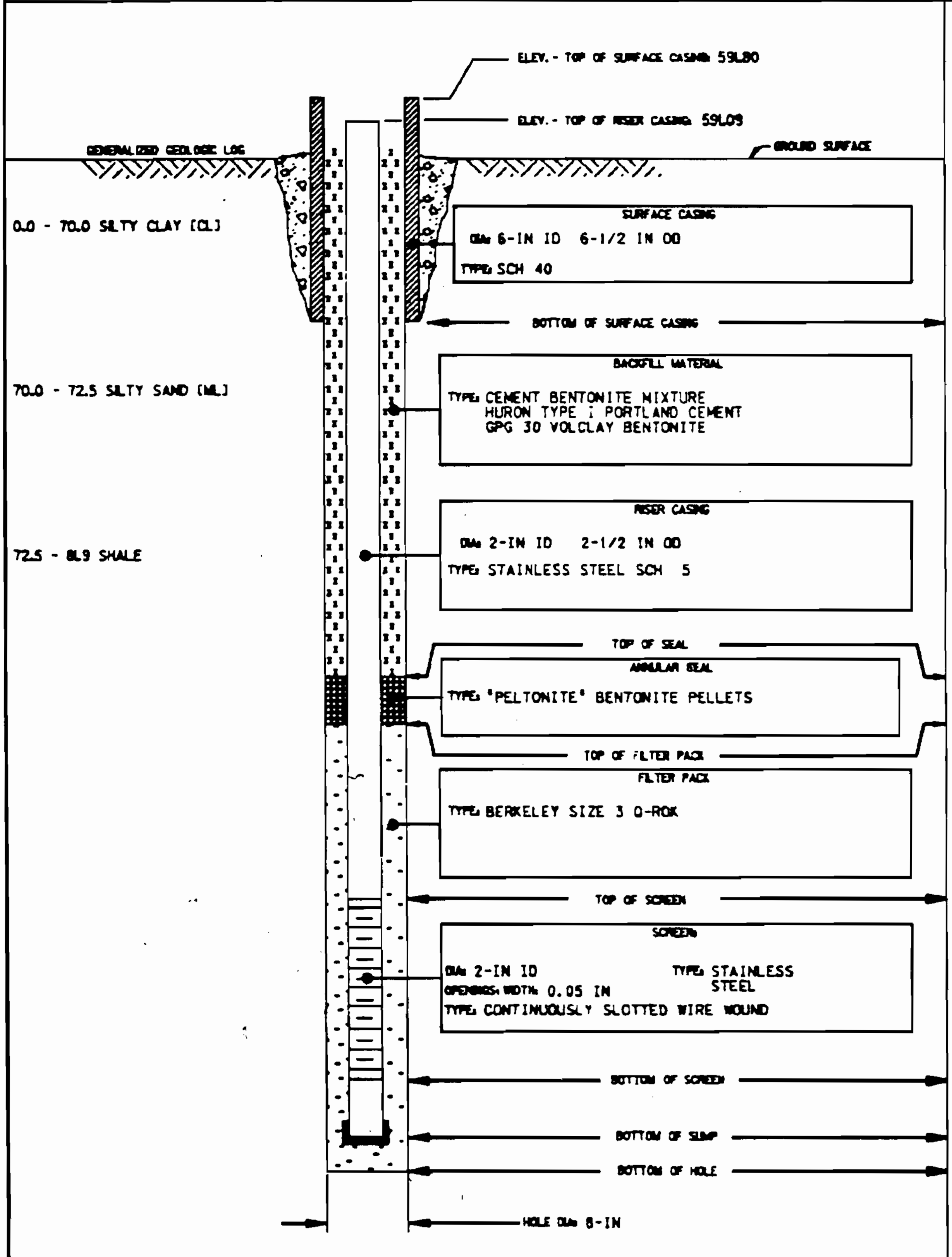
COORDINATES N2051.8 E3081.1

BEGUN 6/20/87

COMPLETED 7/27/87

PREPARED BY JEFF SIMS

REFERENCE POINT FOR MEASUREMENTS GROUND SURFACE



0.0 - 70.0 SILTY CLAY [CL]

70.0 - 72.5 SILTY SAND [ML]

72.5 - 81.9 SHALE

SURFACE CASING

DIA: 6-IN ID 6-1/2 IN OD

TYPE: SCH 40

BACKFILL MATERIAL

TYPE: CEMENT BENTONITE MIXTURE
HURON TYPE I PORTLAND CEMENT
GPG 30 VOLCLAY BENTONITE

RISER CASING

DIA: 2-IN ID 2-1/2 IN OD

TYPE: STAINLESS STEEL SCH 5

ANNULAR SEAL

TYPE: "PELTONITE" BENTONITE PELLETS

FILTER PACK

TYPE: BERKELEY SIZE 3 Q-ROK

SCREEN:

DIA: 2-IN ID

TYPE: STAINLESS STEEL

OPENINGS: WIDTH: 0.05 IN

TYPE: CONTINUOUSLY SLOTTED WIRE WOUND

	DEPTH (FEET)	ELEV. (FEET)
GROUND SURFACE	0.0	590.0
BOTTOM OF SURFACE CASING	3.4	586.6
TOP OF SEAL	62.6	527.4
TOP OF FILTER PACK	66.6	523.4
TOP OF SCREEN	71.8	518.2
BOTTOM OF SCREEN	76.8	513.2
BOTTOM OF SUMP	78.2	511.8
BOTTOM OF HOLE	81.9	508.1

GRA:[46,12]B55W19M.DGN

Phase II Monitoring Wells

DRILLING CONTRACTOR:
Driller: Dick Miller RDC.
Inspector: Wm Lilley
Rig Type: Moble 61
Drilling Method: 4 1/4" ID HSA
Nx Core

ENGINEERING-SCIENCE
DRILLING RECORD

PROJECT NAME: Ashland Petroleum Phase II
PROJECT NO.: SY0 12 13

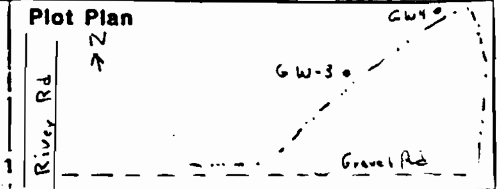
BORING NO.: GW-3
Sheet 1 of 3
Location: North of Site along stream between the road and GW-4

GROUND WATER OBSERVATIONS

Water Level	24.2'		
Time	11:00		
Date	2/3		
Casing Depth	111'		

Weather: Clear
Date/Time Start: 1/29/88 – 9:00 am
Date/Time Finish: 2/2/88 – 5:00 pm

Plot Plan



Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	0-2	S-1	3/2	Red Brown Silt and Fine Sand (moist)		
	SS		4/7	2.0 – – – – – – – – – – – – – –		
	Rec 4"					
0	10-12	S-2	9/11	Red Brown Silt, some Clay, Trace		
	SS		20/23	Fin. Sand, Trace Fine Gravel		
	Rec 22			(stiff) (moist)		
0	20-22	S-3	8/9		Cement / Bentonite Grout 2" PVC Riser	
	SS		11/12			
	Rec 20"					
0	30-32	S-4	1/1			
	SS		4/5			
	Rec 24"					
0	40-42	S-5	↓			
	SS		3/6			
	Rec 24'					

SPT- STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary: Red Brown Sandy Silt topsoil to 2' over Clayey Silt lacustrine deposits to 75' over Glacial till to 85' over Camillus Shale

DRILLING CONTRACTOR:
Driller: Dick Miller RDC
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4 1/4" ID HSA + NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY01213

BORING NO. GW-3
Sheet 2 **of** 3
Location

GROUND WATER OBSERVATIONS

Water Level		
Time		
Date		
Casing Depth		

Weather
Date/Time Start
Date/Time Finish

Plot Plan
See Sheet No. 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	50-52		Push	Red Brown Silt & Clay, Trace Fine		
	Shelby			Gravel (soft) (wet)		
	Tube					
0	60-62	S-6	6/6	61.5'		
	SS		9/17			
	Rec 24					
						Rods Fell
0	65-67	S-7		Gray-Brown-Red Silt, Fine Sand and		to get sample
	SS			Clay (wet) (soft)		
	Rec 24					
0	70-72	S-8	7/10		Cement / Bentonite Grout 2" PVC Riser	
	SS		7/11	Trace Fine Gravel		
	Rec 24					
				75'		
0	75-77	S-9	7/10	Gray Brown sand and Gravel		
	SS		15/57	Some silt, little Clay (wet)		
	Rec 24"					
0	80-82	S-10	1/26			
	SS		44/52			
	Rec 24"					
				85'		
						Boulder
	87-97			Weathered Shale		Auger Refusal
	Cored	10'				85'
	Rec 7	0.1'				Rocked out
	RQD	0%				to 87'
						Resume Augering
						To 99'

SPT-STANDARD PENETRATION TEST
D = DRY W = WASHED C = CORED
U = UNDISTURBED SS = SPLIT SPOON
P = PIT A = AUGER CUTTINGS

Soil Stratigraphy Summary

DRILLING CONTRACTOR:
Driller: Dick Miller RDC
Inspector: Wm Lilley
Rig Type: Moble 61
Drilling Method: 4 1/4" ID HSA + NX Core

ENGINEERING-SCIENCE
DRILLING RECORD

PROJECT NAME: Ashland Petroleum Phase II
PROJECT NO.: SY01213

BORING NO.: GW-3
Sheet 3 of 3
Location:

GROUND WATER OBSERVATIONS

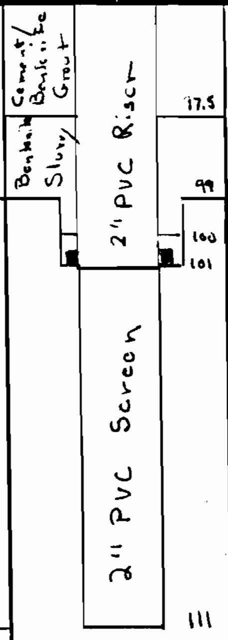
Water Level			
Time			
Date			
Casing Depth			

Weather:
Date/Time Start:
Date/Time Finish:

Plot Plan
See Sheet No 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	Comments
				99' Auger Refusal	Rocked out 49 – 101' Sand filled 100 – 101
	101 – 111'			Gray and Green Shale, layers of calcite, gypsum and siltstone Weathered zones at 1', 2.5', 4.5' + 6.5'	
	Cored	10'			
	Rec	8.9'			
	Rec	36%			
				111	
				Boring terminated	

WELL SCHEMATIC



SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary

DRILLING CONTRACTOR:
Driller: Dick Miller RDC
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4 1/4" ID HSA & NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY01213

BORING NO. GW-4
Sheet 1 of 3
Location Northeast of Site near marsh and western stream

GROUND WATER OBSERVATIONS

Water Level	10.0		
Time	9:00		
Date	1/26		
Casing Depth	80'		

Weather Fair
Date/Time Start 1/22/88 9:30 am
Date/Time Finish 1/26/88 2:00 pm

Plot Plan

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	0-2	S-1	3/2	Dark Brown Fine Sand and Silt (Topsoil)	Cement / Bentonite Grout 2" PVC Riser	
	SS		3/5	2.0		
	Rec.14			Red Brown Silt, Trace fine Sand,		
				Clay, medium Fine Gravel (moist) (stiff)		
0	5-7	S-2	8/13			
	SS		20/27			
	Rec 24					
.0	10-12	S-3	4/8			
	SS		7/15			
	Rec 24					
				15.0'		
0	15-17	S-4	2/3	Red Brown Silt, some Clay (moist)		
	SS		3/4	(soft)		
	Rec 24					
				19'		
0	20-22	S-5	2/2	Red and Gray Silt and Clay (moist)		
	SS		2/4	(varved) (soft)		
	Rec24"					
0	25-27	S-6	2/2			
	SS		3/4	(very soft)		
	Rec 24'					
0	30-32	S-7	3/3	Trace fine Gravel		
	SS		4/5			
	Rec 24"					
	35-37	S-8	push			
	Shelby					
	Tube					

SPT-STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary Dark Brown Silt, Sand top-oil to 2' over Clayey Silt lacustrine deposits to 60' over Glacial till to 81' over Camillus Shale

DRILLING CONTRACTOR:
Driller: Dick Miller
Inspector: Wm Lilley
Rig Type: Moble 61
Drilling Method: 4¼" ID HSA & NX Core

ENGINEERING-SCIENCE DRILLING RECORD

PROJECT NAME: Ashland Petroleum Phase II
PROJECT NO.: SY012 13

BORING NO.: GW-4
Sheet 2 of 3
Location:

GROUND WATER OBSERVATIONS

Water Level		
Time		
Date		
Casing Depth		

Weather:
Date/Time Start:
Date/Time Finish:

Plot Plan
See Sheet No. 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL	WELL SCHEMATIC	Comments
0	40-42 SS Rec 24"	S-9	↓	Gray Brown Silt and Clay, Trace Fine Gravel, sand (wet) (soft)		Waight of Rods for sample.
				45		
0	45-47 SS Rec 24"	S-10	5/5 8/12	Gray Brown Silt and Clay, little medium fine Gravel (wet) (soft)		
0	50-52 SS Rec 8	S-11	3/3 6/9			
0	55-57 SS Rec 24"	S-12	↓	little medium fine Gravel, Sand		Dropped rods to get sample
				60		
0	60-62 SS Rec 24"	S-13	16/41 20/15	Gray Brown Fine sand and silt little medium fine gravel trace Clay (wet) (sand in layers) (till)	Cement / Bentonite Grout 2" PVC Riser	
0	65-67 SS Rec 24"	S-14	27/27 40/48			
0	70-72 SS Rec 16	S-15	12/32 35/60	Gray Brown medium fine sand, some silt, some medium fine gravel trace clay (till) (wet)		
0	75-77 SS Rec 9"	S-16	17/38 68/57			

SPT - STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary

DRILLING CONTRACTOR:
Driller: Dick Miller
Inspector: Wm Lilley
Rig Type Moble 61
Drilling Method 4 1/4" ID HSA + NX core

ENGINEERING-SCIENCE
DRILLING RECORD

PROJECT NAME Ashland Petroleum Phase II
PROJECT NO. SY01213

BORING NO. GW-4
Sheet 3 of 3
Location

GROUND WATER OBSERVATIONS

Water Level		
Time		
Date		
Casing Depth		

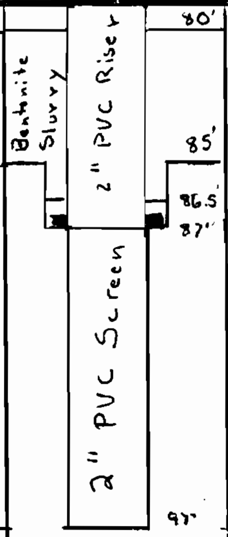
Weather
Date/Time Start
Date/Time Finish

Plot Plan

See Sheet No. 1

Photovac Reading	SAMPLE DEPTHS	SAMPLE I.D.	SPT	FIELD IDENTIFICATION OF MATERIAL
0	80-81	S-17	14/100-5"	81'
	SS			Weathered Shale
	Rec 9"			
				Auger Refusal 85'
	87-97			Gray and Green Shale, layers of calcite, Gypsum and siltstone Weathered in upper layers.
	C=1	10'		
	Rec	8.5'		
	RQD	29%		
				Boring terminated at 97'

WELL SCHEMATIC



Comments

Rockout 2'
Collar on top of Screen
Sand 86.5'-87'

SPT- STANDARD PENETRATION TEST
D - DRY W - WASHED C - CORED
U - UNDISTURBED SS - SPLIT SPOON
P - PIT A - AUGER CUTTINGS

Soil Stratigraphy Summary

Geotechnical Analyses Results

R&R
INTERNATIONAL, INC.

PROJECT: ENGINEERING SCIENCE - ASHLAND PETROLEUM   PROJECT NUMBER: 870836

MOISTURE AND GRADATION ANALYSIS

Gradation
(% Retained on Standard Sieve)

BORING NUMBER	DEPTH (FT.)	#4	#10	#40	#100	#200	SILT	CLAY (%)	CLASSIFICATION
GW-3	50-52	3.8	5.4	6.3	6.9	4.7	36.4	36.5	CL-ML
GW-3	80-82	14.7	2.5	5.1	10.4	8.7	37.1	21.5	ML
GW-4	35-37	2.7	3.9	5.1	6.0	6.2	36.5	39.6	CL
GW-4	65-67	20.8	8.8	13.3	11.6	8.4	25.3	11.8	SM

PROJECT: ENGINEERING SCIENCE - ASHLAND PETROLEUM PROJECT NUMBER: 870836

ATTERBERG LIMITS

BORING NUMBER	DEPTH (FT.)	L.L.	P.L.	P.I.
GW-3	50-52	20.2	13.3	6.9
GW-4	35-37	21.4	14.0	7.4

R&R
INTERNATIONAL,INC.

PERMEABILITY TEST DATA
ASTM PROCEDURE PENDING

DATE: 4/15/88 PROJECT NO.: 870836

CLIENT: ENGINEERING SCIENCE PROJECT: ASHLAND PETROLEOUM

LOCATION: CENTRAL/WESTERN NEW YORK TESTED BY: S. PICCOLI

Boring No.: GW-3 Sample No.: ST Depth: 50-52 ft.

Chamber No.: 1 Sample Condition : Undisturbed

PHYSICAL CONDITIONS

Initial		Final		Test Pressures (psi)	
Ht. (ins.)=	4.3	Ht. (ins.)=	4.3	Chamber=	50
Di. (ins.)=	2.8	Di. (ins.)=	2.8	Lower=	35
				Upper=	25

Duration of Test (min)= 1380.0

PERMEABILITY (CM/S) = 7.00E-09

R&R
INTERNATIONAL,INC.

PERMEABILITY TEST DATA
ASTM PROCEDURE PENDING

DATE: 4/15/88

PROJECT NO.: 870836

CLIENT: ENGINEERING SCIENCE

PROJECT: ASHLAND PETROLEOUM

LOCATION: CENTRAL/WESTERN NEW YORK

TESTED BY: S. PICCOLI

Boring No.: GW-4

Sample No.: ST

Depth: 35-37 ft.

Chamber No.: 2

Sample Condition : Undisturbed

PHYSICAL CONDITIONS

Initial	Final	Test Pressures (psi)
Ht. (ins.)= 3.8	Ht. (ins.)= 3.8	Chamber= 50
Di. (ins.)= 2.8	Di. (ins.)= 2.8	Lower= 36
		Upper= 26

Duration of Test (min)= 895.0

PERMEABILITY (CM/S) = 1.28E-08

Previous Analytical Results

Table 1. Concentrations of ^{238}U in mud samples

Samples[a]	pCi/g
M1	3.9
M2	11.0
M3	3.0
M4	19.8
M5	32.5
M6	15.4
M8	26.0
M9	24.7
M10	1.4

[a] See Fig. 6.

[illegible] 7
ERDA Sampling Sites and Data
1976

Table 2. Radionuclide concentrations in water samples
(measurements given in pCi/ml)

Sample	^{226}Ra	^{234}U	^{235}U	^{238}U	^{228}Th	^{230}Th	^{232}Th
W1	4.0×10^{-4}	2.8×10^{-2}	1.5×10^{-3}	2.8×10^{-2}	3.9×10^{-4}	1.8×10^{-4}	7.2×10
W2	1.0×10^{-3}	2.0×10^{-2}	1.0×10^{-3}	2.0×10^{-2}	3.7×10^{-4}	9.0×10^{-5}	$\leq4.0\times10$
W3	6.3×10^{-4}	4.1×10^{-3}	3.4×10^{-4}	4.2×10^{-3}	3.6×10^{-4}	7.6×10^{-5}	1.1×10
W6	1.6×10^{-3}	4.1×10^{-2}	1.3×10^{-2}	5.3×10^{-2}	3.2×10^{-4}	9.0×10^{-4}	6.8×10
W7	9.0×10^{4}	1.0×10^{-2}	4.4×10^{-4}	1.0×10^{-2}	3.0×10^{-4}	1.4×10^{-4}	$\leq3.0\times10$
W8	5.3×10^{-4}	4.0×10^{-2}	1.4×10^{-3}	3.9×10^{-2}	3.7×10^{-4}	1.1×10^{-4}	4.1×10
W9	8.0×10^{-4}	5.0×10^{-2}	2.1×10^{-3}	5.0×10^{-2}	3.2×10^{-4}	8.6×10^{-5}	$\leq3.0\times10$
W10	1.1×10^{-3}	1.4×10^{-2}	7.6×10^{-4}	1.1×10^{-2}	3.2×10^{-4}	7.2×10^{-5}	$\leq3.0\times10$
CG_w (Soluble)	3×10^{-2}	30	30	40	7	2	2

15

Ashland Petroleum Co. # [illegible]15008-c

This site, also referred to as the "Haist Property", received low level radioactive material produced during 1944-46. Approximately 8000 tons of residue containing uranium (est. 0.54 Uranium) were spread over the site to a depth of 1 to 5 feet. In 1979, possibly 30-40% of the residue was removed from the Haist property and taken to the adjacent Seaway Industrial Park (now Niagara Landfill). The Haist site first appeared in a 1951 aerial photograph and has remained virtually unchanged since that time. A 1962 photo showed some activity immediately to the northwest of the disposal site. It could not be determined if the activity was landfilling of wastes or site grading. Surface runoff from the Haist property would be tributary to Two Mile Creek via drainage ditches and culverts.

On June 17, 1981, the DEP sampled the drainage downstream of the site and evidence of radioactivity was found in the water.

The results of analyses of the June 17, 1981 water samples were evaluated. The following observations were made.

1. Iron concentrations increased from 2.06 to 18.5 mg/l from upstream of the Niagara Landfill to downstream of the Ashland Landfill. This suggests leaching of iron from the area in between. The levels exceed the NYS Water Quality Standard of 0.3 mg/l.

2. Lead concentrations ranged from 0.03 to 0.10 mg/l. These values exceed the NYS Water Quality Standard of 0.025 mg/l.

3. Magnesium levels decreased from 138 to 86 mg/l. There was no evident reason for this decrease. The levels reported are not considered to be significant.

4. Manganese concentrations increased from 0.32 to 4.1 mg/l. which is indicative of leaching of materials from the area between the upstream and downstream samples. The values exceed the NYS Water Quality Standard of 0.3 mg/l.

5. Mercury was not reported at a detection level of 0.0004 mg/l in any of the samples.

6. Selenium levels reported were at low levels ranging from 0.002-0.004 mg/l. These were not considered significant.

7. No silver was reported at a detection level of 0.01 mg/l.

8. Sodium levels increased from 246 to 322 mg/l suggesting leaching of this material to the drainage dtich.

9. Zinc levels reported were very low ranging from 0.05 - 0.2 mg/l. These were not considered significant.

10. Sulfide was reported in concentrations ranging from 0.2 - 1.0 mg/l.

11. Total organic carbon levels reported ranged from 84.0 - 123 mg/l also suggesting leaching of materials.

12. Benzene was only detected at the furthest downstream site at a concentration of 0.043 ug/l. This suggests leaching of this material from the area downstream of sampling point # 3.

13. Toluene likewise was only detected at the furthest downstream site. The reported level was 0.295 ug/l and also points to possible leaching from the same area.

14. Xylene was not reported in any of the samples at a detection level of 0.035 ug/l.

15. Arsenic was only detected in the furthest downstream sample at a level of 0.07 mg/l. This exceeded the NYS Water Quality Standard of 0.05 mg/l.

APPENDIX C

LABORATORY ANALYTICAL DATA

- Previous Analytical Results
- Groundwater Results
- Surface Water Results
- Sediment Results

Results are listed in the following order for each sample number: volatile organics, semi-volatile organics, pesticide/PCBs, and radioactivity. TOX results and trip blank results are at the back of this appendix. All samples may not have undergone all analyses. Organic data qualifiers can be found at the bottom of each Form I, page 1 (volatile compounds). Inorganic data qualifiers are listed following this cover page.

16. Barium was reported in all but the furthest downstream sample at low levels. All 3 samples had concentrations of 0.2 mg/l which was also the detection limit of the test. This was below the NYS Water Quality Standard of 1.0 mg/l.

17. Cadmium was reported in all samples and ranged from 0.005 - 0.007 mg/l considered to be very low levels.

18. Calcium levels were highest in the furthest upstream sample with a level of 936 mg/l. Other samples had values ranging from 136 - 216 mg/l. The reason for the high result is not known.

19. Chromium was reported in 2 of the 4 samples at a low level of 0.02 mg/l and is not considered significant.

20. Copper was also reported at low levels (0.02 - 0.15 mg/l) and is not considered significant.

21. Phenol concentrations increased from 0.003 to 0.258 mg/l from upstream to downstream sampling locations. The greatest increase coming up and downstream of the Ashland Landfill. This suggests leaching of the material from the area below sampling point # 3.

22. PCB's also increased up to downstream from 0.06 - 0.14 ug/l. A level of 0.13 ug/l was reported downstream of the Niagara Landfill suggesting possible leaching of this material from this site.

23. No organic pesticide concentrations were reported in any of the samples.

24. Alpha radiation increased through the 1st three sampling sites from 2.0 to 4.3 picocuries per liter (pc/l) and then decreased to 2.2 pc/l. These were all below the NYS Drinking Water Standard of 5.0 pc/l.

25. Beta radiation increased from 127 to 140 pc/l through the first two sites and decreased to 121 pc/l for the last two sites. These levels are greater than the NYS Drinking Water Standard of 50 pc/l.

26. Gamma Radiation was only reported at the furthest upstream site at a level of 5700 pc/l. It was not reported at the other sites to a detection limit of 50 pc/l.

The results of 1976 water and sediment sampling by the United States Energy Research and Development Administration were also reviewed. These showed increasing values of Radium 226, and Uranium 234, 235 and 238 from the Haist property to the downstream sampling sites in the water samples. The levels reported were low with the following ranges:

Radium 226 - 0.4 to 1.6 pc/l
Uranium 234 - 2.8 to 40 pc/l
" 235 - 0.15 to 13 pc/l
" 238 - 28 to 53 pc/l

Levels of Thorium 228 were relatively constant through all sampling points at a range of 0.30 to 0.39 pc/l. Thorium 230 and 232 were also reported in low levels of less than 0.2 pc/l.

Radium 226, Uranium and Thorium all emit alpha, beta and gamma radiation during decay.

The levels reported are low when compared to the maximum permissible concentrations (MPC) allowed by the AEC in water discharged to sewers.

Radionuclide	MPC (pc/l)
Radium 226	10
Thorium 232	2000
Uranium 238	40,000

The levels reported are also below the MCL level for Radium 226 of 5 pc/l for public water supplies (NYS Standards).

This site has been under the supervision of the federal government for a number of years. A 1976 survey of the property by ERDA found the presence of low level radiation and contamination of soils in the area. They have indicated that the site, in its present setting, poses no hazard. The ERDA Report also pointed out however that potential health hazards could result from some future uses of the site. The DEP sampling ha confirmed the ERDA's finding that Radiation is leaving the disposal area in the drainage flow. For this reason we recommend that ERDA reevaluate the hazard potential of this site and the Niagara Landfill disposal area and sub their conclusions, with any recommendation for remedial work, to the DEC.

15

Site: 915008-C	Uranium tailing disposal.
Owner:	Ashland Petroelum Company River Road Tonawanda, New York
Surrounding Land Use:	Heavy industrial - nearest residential approximately 1¼ mile to the East, 1¼ mile to the West, 1 mile to the North, and 1 mile to the South.
Anticipated Effect of Disposal Site On:	
Groundwater Supplies:	None-area served by surface source public water supply.
Surrounding Area:	Low Level Radiation has been documente leaving the site via surface drainage and could affect the Two Mile Creek and Niagara River. Two Mile Creek flo past a residential area along Two Mile Creek Road and through a recreation ar (Isle View Park) and enters the Niagar River.
Airborne Transport of Pollutants:	None- site is inactive. Vegetative cover will preclude dust problems.
Need for Immediate Action:	None. Federal Government has conclude site poses no threat given present usa
Need for Future Action:	ERDA Re-evaluation of site.
Responsible Agency:	NYSDEC and E.R.D.A.
	DEP sampling of Two Mile Creek in June, July 1982.
	DEP resampling of four (4) sites previously sampled for parameters of conc

"Haist" property - A tributary of Two Mile Creek was sampled by DEP on June 17, 1981 at four sites.

South of Niagara Landfill - Ashland Petroleum Company Property

Parameter		Value	Units of Measure
pH		8.6	Standard units
Iron		2.06	mg/1
Lead		0.03	mg/1
Magnesium		138	mg/1
Manganese		0.32	mg/1
Mercury	L.T.	0.0004	mg/1
Selenium		0.004	mg/1
Silver	L.T.	0.01	mg/1
Sodium		246	mg/1
Zinc		0.20	mg/1
Sulfide		0.2	mg/1
T.O.C.		104.2	mg/1
Benzene	L.T.	0.035	ug/1
Toluene	L.T.	0.035	ug/1
Xylene	L.T.	0.035	ug/1
Arsenic	L.T.	0.02	mg/1
Barium		0.2	mg/1
Cadmium		0.006	mg/1
Calcium		986	mg/1
Chromium		0.02	mg/1
Copper		0.02	mg/1
Phenol		0.003	mg/1
PCB		0.06	ug/1
Pesticide		neg.	
Alpha Radiation		2.0	pc/1
Beta Radiation		127	pc/1
Gamma Radiation		5700	pc/1

This is S

15

North of Lefler Road

Parameter	Value	Unit of Measure
pH	7.9	Standard Unit
Iron	3.28	mg/l
Lead	0.04	mg/l
Magnesium	113	mg/l
Manganese	0.50	mg/l
Mercury	L.T. 0.0004	mg/l
Selenium	0.003	mg/l
Silver	L.T. 0.01	mg/l
Sodium	320	mg/l
Zinc	0.05	mg/l
Sulfide	L.T. 0.02	mg/l
T.O.C.	97.3	mg/l
Benzene	L.T. 0.035	ug/l
Toluene	L.T. 0.035	ug/l
Xylene	L.T. 0.035	ug/l
Arsenic	L.T. 0.02	mg/l
Barium	0.2	mg/l
Cadmium	0.007	mg/l
Calcium	157	mg/l
Chromium	L.T. 0.01	mg/l
Copper	0.15	mg/l
Phenol	0.004	mg/l
PCB	0.13	ug/l
Pesticides	neg.	
Alpha Radiation	3.1	pc/l
Beta Radiation	140	pc/l
Gamma Radiation	L.T. 50	pc/l

South of Ashland Petroleum Company Landfill

Parameter	Value	Units of Measure
pH	7.9	Standard Units
Iron	8.51	mg/l
Lead	0.10	mg/l
Magnesium	96	mg/l
Manganese	0.84	mg/l
Mercury	L.T. 0.0004	mg/l
Selenium	0.002	mg/l
Silver	L.T. 0.01	mg/l
Sodium	261	mg/l
Zinc	0.14	mg/l
Sulfide	1.0	mg/l
T.O.C.	84.1	mg/l
Benzene	L.T. 0.035	ug/l
Toluene	L.T. 0.035	ug/l
Xylene	L.T. 0.035	ug/l
Arsenic	L.T. 0.02	mg/l
Barium	0.2	mg/l
Cadmium	0.005	mg/l
Calcium	216	mg/l
Chromium	0.02	mg/l
Copper	0.05	mg/l
PCB	L.T. 0.05	ug/l
Pesticides	neg.	
Phenol	0.013	mg/l
Alpha Radiation	4.3	pc/l
Beta Radiation	121	pc/l
Gamma Radiation	L.T. 50	

15

3000 feet north of Ashland Petroleum Corporation Landfill

Parameter	Value	Unit of Measure
pH	7.7	Standard unit
Iron	18.51	mg/l
Lead	0.03	mg/l
Magnesium	86	mg/l
Manganese	4.1	mg/l
Mercury	L.T. 0.0004	mg/l
Selenium	0.002	mg/l
Silver	L.T. 0.01	mg/l
Sodium	322	mg/l
Zinc	0.05	mg/l
Sulfide	0.4	mg/l
T.O.C.	123.0	mg/l
Benzene	0.043	ug/l
Toluene	0.295	ug/l
Xylene	L.T. 0.035	ug/l
Arsenic	0.07	mg/l
Barium	L.T. 0.2	mg/l
Cadmium	0.005	mg/l
Calcium	136	mg/l
Chromium	L.T. 0.01	mg/l
Copper	L.T. 0.02	mg/l
Phenol	0.258	mg/l
PCB	0.14	ug/l
Pesticides	neg.	
Alpha Radiation	2.2	pc/l
Beta Radiation	121	pc/l
Gamma Radiation	L.T. 50	pc/l

DOE/EV-0005/4
UC-70

Formerly Utilized MED/AEC Sites Remedial Action Program

Radiological Survey of the Ashland Oil Company (Former Haist Property), Tonawanda, New York

May 1978

Final Report

Prepared for

U.S. Department of Energy
Assistant Secretary for Environment
Division of Environmental Control Technology
Washington, D.C. 20545

Under
Contract No. W-7405-ENG-26

By
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

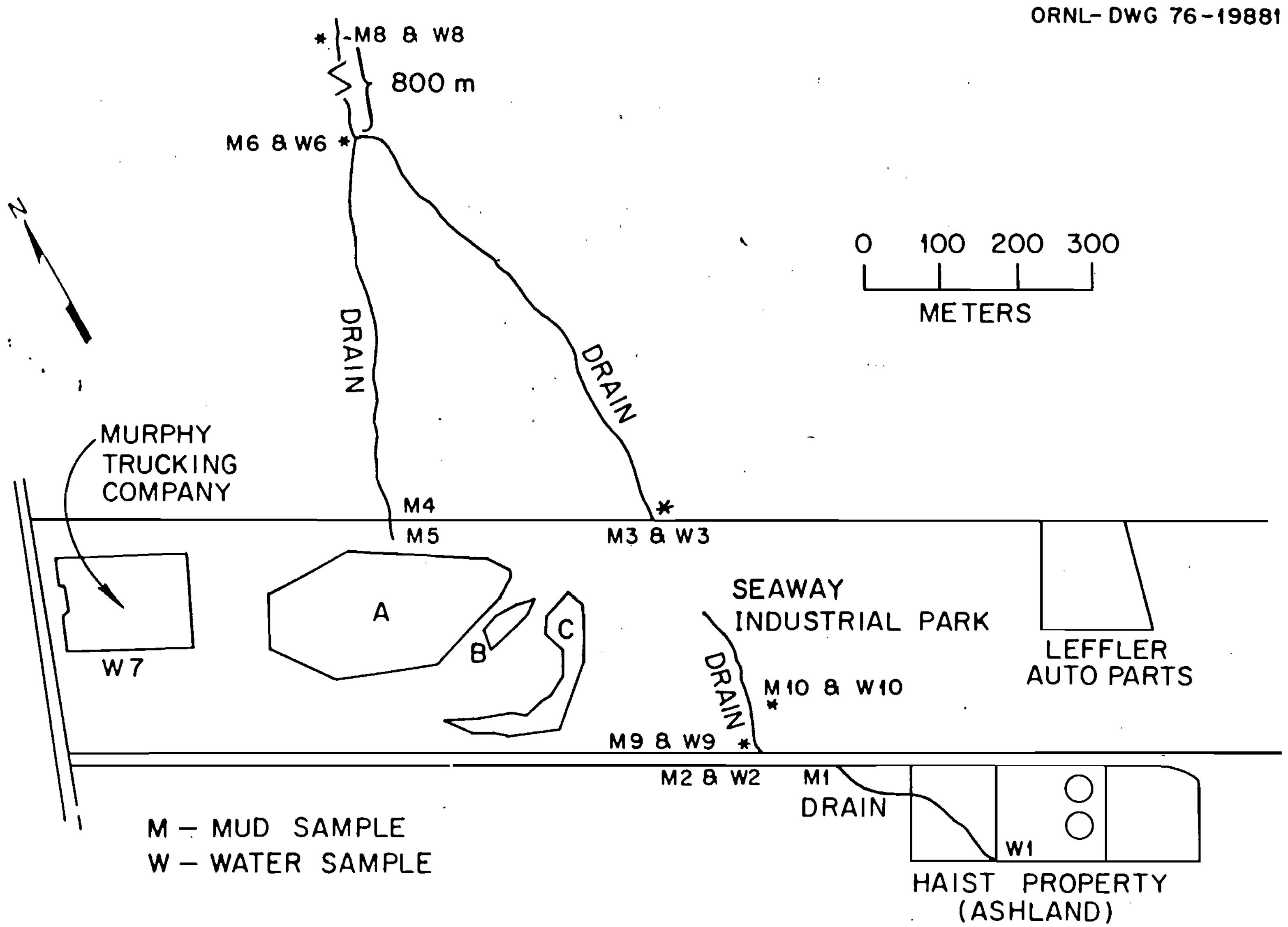


Fig. 6. Locations of water and mud samples.

GROUNDWATER RESULTS

SAMPLE DATA

GW-3.13

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
GW-3.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0252
Sample Matrix: WATER
Data Release Authorized By: P.J. Gunsch

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: N/A
Date Sample Received: 02-25-88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-26-88
Date Analyzed:02-26-88
Conc/Dil Factor: 1 pH: 7.7
Percent Moisture:

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	7.4 B
67-64-1	Acetone	25.0 B
75-15-0	Carbon Disulfide	4.1 J
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	1.8 J
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
If the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-3.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-25-88
Date Analyzed: 03-03-88
Conc/Dil Factor:------------> 2
Percent Moisture:

GPC Cleanup: Yes_____ No ✓
Separatory Funnel Extraction: Yes_XXX_
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	20.0 U
111-44-4	bis(-2-Chloroethyl)Ether	20.0 U
95-57-8	2-Chlorophenol	20.0 U
541-73-1	1,3-Dichlorobenzene	20.0 U
106-46-7	1,4-Dichlorobenzene	20.0 U
100-51-6	Benzyl Alcohol	20.0 U
95-50-1	1,2-Dichlorobenzene	20.0 U
95-48-7	2-Methylphenol	20.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	20.0 U
106-44-5	4-Methylphenol	20.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U
67-72-1	Hexachloroethane	20.0 U
98-95-3	Nitrobenzene	20.0 U
78-59-1	Isophorone	20.0 U
88-75-5	2-Nitrophenol	20.0 U
105-67-9	2,4-Dimethylphenol	20.0 U
65-85-0	Benzoic Acid	100.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	20.0 U
120-83-2	2,4-Dichlorophenol	20.0 U
120-82-1	1,2,4-Trichlorobenzene	20.0 U
91-20-3	Naphthalene	20.0 U
106-47-8	4-Chloroaniline	20.0 U
87-68-3	Hexachlorobutadiene	20.0 U
59-50-7	4-Chloro-3-Methylphenol	20.0 U
91-57-6	2-Methylnaphthalene	20.0 U
77-47-4	Hexachlorocyclopentadiene	20.0 U
88-06-2	2,4,6-Trichlorophenol	20.0 U
95-95-4	2,4,5-Trichlorophenol	100.0 U
91-58-7	2-Chloronaphthalene	20.0 U
88-74-4	2-Nitroaniline	100.0 U
131-11-3	Dimethyl Phthalate	20.0 U
208-96-8	Acenaphthylene	20.0 U
99-09-2	3-Nitroaniline	100.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	20.0 U
51-28-5	2,4-Dinitrophenol	100.0 U
100-02-7	4-Nitrophenol	100.0 U
132-64-9	Dibenzofuran	20.0 U
121-14-2	2,4-Dinitrotoluene	20.0 U
606-20-2	2,6-Dinitrotoluene	20.0 U
84-66-2	Diethylphthalate	20.0 U
7005-72-3	4-Chlorophenyl-phenylether	20.0 U
86-73-7	Fluorene	20.0 U
100-01-6	4-Nitroaniline	100.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	100.0 U
86-30-6	N-Nitrosodiphenylamine (1)	20.0 U
101-55-3	4-Bromophenyl-phenylether	20.0 U
118-74-1	Hexachlorobenzene	20.0 U
87-86-5	Pentachlorophenol	100.0 U
85-01-8	Phenanthrene	20.0 U
120-12-7	Anthracene	20.0 U
84-74-2	Di-n-Butylphthalate	20.0 U
206-44-0	Fluoranthene	20.0 U
129-00-0	Pyrene	20.0 U
85-68-7	Butylbenzylphthalate	20.0 U
91-94-1	3,3'-Dichlorobenzidine	40.0 U
56-55-3	Benzo(a)Anthracene	20.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	250.0 B
218-01-9	Chrysene	20.0 U
117-84-0	Di-n-Octyl Phthalate	20.0 U
205-99-2	Benzo(b)Fluoranthene	20.0 U
207-08-9	Benzo(k)Fluoranthene	20.0 U
50-32-8	Benzo(a)Pyrene	20.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U
53-70-3	Dibenz(a,h)Anthracene	20.0 U
191-24-2	Benzo(g,h,i)Perylene	20.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
GW-3.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration [✓ (ug/l] or ug/Kg)
1	-----	UNKNOWN	VOA	31.03	6.0 J
2					
3					
4	-----	NONE FOUND	BNA	-----	------
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

FORM I, PART B

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5714

Client Sample ID: GW-3.13

PARAMETERS	RESULTS
GROSS ALPHA	< 2
GROSS BETA	31+/-7
GAMMA SPECTRALANALYSIS	ND

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

NANCO LABS, INC.

Reporting Date: 3/1/88

TOX

Results of analysis on ~~Drinking Water~~ sample received

SAMPLE ID :

NANCO ID: 88- EW5714

PARAMETERS	RESULTS	UNITS
TOX	47	ug/L

QC Data
Spiked EW5635
invoice # 24963

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SAMPLE DATA

GW-4.13

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
GW-4.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>F2214
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 3/03/88
Date Analyzed:3/03/88
Conc/Dil Factor: 1 pH: 7.0
Percent Moisture: N/A

CAS Number		[✓ ug/L] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	9.5
67-64-1	Acetone	130.0 B
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/L] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM I

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-4.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/01/88
Conc/Dil Factor:------------> 1
Percent Moisture: N/A

GPC Cleanup: Yes____ No__XX__
Separatory Funnel Extraction: Yes_X_
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	10.0 U
111-44-4	bis(-2-Chloroethyl)Ether	10.0 U
95-57-8	2-Chlorophenol	10.0 U
541-73-1	1,3-Dichlorobenzene	10.0 U
106-46-7	1,4-Dichlorobenzene	10.0 U
100-51-6	Benzyl Alcohol	10.0 U
95-50-1	1,2-Dichlorobenzene	10.0 U
95-48-7	2-Methylphenol	10.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	10.0 U
106-44-5	4-Methylphenol	10.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U
67-72-1	Hexachloroethane	10.0 U
98-95-3	Nitrobenzene	10.0 U
78-59-1	Isophorone	10.0 U
88-75-5	2-Nitrophenol	10.0 U
105-67-9	2,4-Dimethylphenol	10.0 U
65-85-0	Benzoic Acid	50.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	10.0 U
120-83-2	2,4-Dichlorophenol	10.0 U
120-82-1	1,2,4-Trichlorobenzene	10.0 U
91-20-3	Naphthalene	10.0 U
106-47-8	4-Chloroaniline	10.0 U
87-68-3	Hexachlorobutadiene	10.0 U
59-50-7	4-Chloro-3-Methylphenol	10.0 U
91-57-6	2-Methylnaphthalene	10.0 U
77-47-4	Hexachlorocyclopentadiene	10.0 U
88-06-2	2,4,6-Trichlorophenol	10.0 U
95-95-4	2,4,5-Trichlorophenol	50.0 U
91-58-7	2-Chloronaphthalene	10.0 U
88-74-4	2-Nitroaniline	50.0 U
131-11-3	Dimethyl Phthalate	10.0 U
208-96-8	Acenaphthylene	10.0 U
99-09-2	3-Nitroaniline	50.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	10.0 U
51-28-5	2,4-Dinitrophenol	50.0 U
100-02-7	4-Nitrophenol	50.0 U
132-64-9	Dibenzofuran	10.0 U
121-14-2	2,4-Dinitrotoluene	10.0 U
606-20-2	2,6-Dinitrotoluene	10.0 U
84-66-2	Diethylphthalate	10.0 U
7005-72-3	4-Chlorophenyl-phenylether	10.0 U
86-73-7	Fluorene	10.0 U
100-01-6	4-Nitroaniline	50.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	50.0 U
86-30-6	N-Nitrosodiphenylamine (1)	10.0 U
101-55-3	4-Bromophenyl-phenylether	10.0 U
118-74-1	Hexachlorobenzene	10.0 U
87-86-5	Pentachlorophenol	50.0 U
85-01-8	Phenanthrene	10.0 U
120-12-7	Anthracene	10.0 U
84-74-2	Di-n-Butylphthalate	10.0 U
206-44-0	Fluoranthene	10.0 U
129-00-0	Pyrene	10.0 U
85-68-7	Butylbenzylphthalate	10.0 U
91-94-1	3,3'-Dichlorobenzidine	20.0 U
56-55-3	Benzo(a)Anthracene	10.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	880.0
218-01-9	Chrysene	10.0 U
117-84-0	Di-n-Octyl Phthalate	10.0 U
205-99-2	Benzo(b)Fluoranthene	10.0 U
207-08-9	Benzo(k)Fluoranthene	10.0 U
50-32-8	Benzo(a)Pyrene	10.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U
53-70-3	Dibenz(a,h)Anthracene	10.0 U
191-24-2	Benzo(g,h,i)Perylene	10.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
GW-4.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration ([✓ ug/l] or ug/Kg)
1	-----	NONE FOUND	VOA	-----	----------------
2					
3					
4					
5	-----	UNKNOWN	BNA	6.31	39.0 J
6	-----	UNKNOWN	BNA	33.81	16.0 JB
7	-----	UNKNOWN	BNA	35.56	45.0 JB
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5695

Client Sample ID: GW-4.13

PARAMETERS	RESULTS
GROSS ALPHA	< 2
GROSS BETA	18+/-13
GAMMA SPECTRALANALYSIS	ND

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

NYTCO LABS, INC.

Reporting Date: 2/29/88

TOX

Results of analysis on ~~Drinking Water~~ sample received

SAMPLE ID :

NYTCO ID: 88- EW 5695

PARAMETERS	RESULTS	UNITS
TOX	12	ug/l

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE N. GAINO
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SAMPLE DATA

GW-17.13

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
GW-17.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0240
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/25/88
Date Analyzed:2/25/88
Conc/Dil Factor: 1 pH: 6.9
Percent Moisture: N/A

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	1.9 JB
7-64-1	Acetone	8.5 JB
5-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM I

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-17.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/01/88
Conc/Dil Factor:------------> 1
Percent Moisture: N/A

GPC Cleanup: Yes____ No__XX__
Separatory Funnel Extraction: Yes X
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	10.0 U
111-44-4	bis(-2-Chloroethyl)Ether	10.0 U
95-57-8	2-Chlorophenol	10.0 U
541-73-1	1,3-Dichlorobenzene	10.0 U
106-46-7	1,4-Dichlorobenzene	10.0 U
100-51-6	Benzyl Alcohol	10.0 U
95-50-1	1,2-Dichlorobenzene	10.0 U
95-48-7	2-Methylphenol	10.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	10.0 U
106-44-5	4-Methylphenol	10.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U
67-72-1	Hexachloroethane	10.0 U
98-95-3	Nitrobenzene	10.0 U
78-59-1	Isophorone	10.0 U
88-75-5	2-Nitrophenol	10.0 U
105-67-9	2,4-Dimethylphenol	10.0 U
65-85-0	Benzoic Acid	50.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	10.0 U
120-83-2	2,4-Dichlorophenol	10.0 U
120-82-1	1,2,4-Trichlorobenzene	10.0 U
91-20-3	Naphthalene	10.0 U
106-47-8	4-Chloroaniline	10.0 U
87-68-3	Hexachlorobutadiene	10.0 U
59-50-7	4-Chloro-3-Methylphenol	10.0 U
91-57-6	2-Methylnaphthalene	10.0 U
77-47-4	Hexachlorocyclopentadiene	10.0 U
88-06-2	2,4,6-Trichlorophenol	10.0 U
95-95-4	2,4,5-Trichlorophenol	50.0 U
91-58-7	2-Chloronaphthalene	10.0 U
88-74-4	2-Nitroaniline	50.0 U
131-11-3	Dimethyl Phthalate	10.0 U
208-96-8	Acenaphthylene	10.0 U
99-09-2	3-Nitroaniline	50.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	10.0 U
51-28-5	2,4-Dinitrophenol	50.0 U
100-02-7	4-Nitrophenol	50.0 U
132-64-9	Dibenzofuran	10.0 U
121-14-2	2,4-Dinitrotoluene	10.0 U
606-20-2	2,6-Dinitrotoluene	10.0 U
84-66-2	Diethylphthalate	10.0 U
7005-72-3	4-Chlorophenyl-phenylether	10.0 U
86-73-7	Fluorene	10.0 U
100-01-6	4-Nitroaniline	50.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	50.0 U
86-30-6	N-Nitrosodiphenylamine (1)	10.0 U
101-55-3	4-Bromophenyl-phenylether	10.0 U
118-74-1	Hexachlorobenzene	10.0 U
87-86-5	Pentachlorophenol	50.0 U
85-01-8	Phenanthrene	10.0 U
120-12-7	Anthracene	10.0 U
84-74-2	Di-n-Butylphthalate	10.0 U
206-44-0	Fluoranthene	10.0 U
129-00-0	Pyrene	10.0 U
85-68-7	Butylbenzylphthalate	10.0 U
91-94-1	3,3'-Dichlorobenzidine	20.0 U
56-55-3	Benzo(a)Anthracene	10.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	110.0
218-01-9	Chrysene	10.0 U
117-84-0	Di-n-Octyl Phthalate	12.0
205-99-2	Benzo(b)Fluoranthene	10.0 U
207-08-9	Benzo(k)Fluoranthene	10.0 U
50-32-8	Benzo(a)Pyrene	10.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U
53-70-3	Dibenz(a,h)Anthracene	10.0 U
191-24-2	Benzo(g,h,i)Perylene	10.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
GW-17.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration ([✓ ug/l] or ug/Kg)
1	-----	NONE FOUND	VOA	-----	----------------
2					
3					
4					
5	-----	UNKNOWN	BNA	6.33	44.0 J
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5692

Client Sample ID: GW-17.13

PARAMETERS	RESULTS
GROSS ALPHA	< 2
GROSS BETA	28+/-5
GAMMA SPECTRALANALYSIS	ND

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

NANCO LABS, INC.

Reporting Date: 2/29/88

Results of analysis on ~~Drinking Water~~ TOX sample received

SAMPLE ID :

NANCO ID: 88-EW5692

PARAMETERS	RESULTS	UNITS
TOX	18	ug/l

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SAMPLE DATA

GW-19.13

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
GW-19.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0242
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/25/88
Date Analyzed:2/25/88
Conc/Dil Factor: 1 pH: 7.2
Percent Moisture: N/A

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	7.1 B
67-64-1	Acetone	8.7 JB
-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	2.5 J
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
GW-19.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/01/88
Conc/Dil Factor:------------> 2
Percent Moisture: N/A

GPC Cleanup: Yes_____ No__XX__
Separatory Funnel Extraction: Yes X
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	20.0 U
111-44-4	bis(-2-Chloroethyl)Ether	20.0 U
95-57-8	2-Chlorophenol	20.0 U
541-73-1	1,3-Dichlorobenzene	20.0 U
106-46-7	1,4-Dichlorobenzene	20.0 U
100-51-6	Benzyl Alcohol	20.0 U
95-50-1	1,2-Dichlorobenzene	20.0 U
95-48-7	2-Methylphenol	20.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	20.0 U
106-44-5	4-Methylphenol	20.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	20.0 U
67-72-1	Hexachloroethane	20.0 U
98-95-3	Nitrobenzene	20.0 U
78-59-1	Isophorone	20.0 U
88-75-5	2-Nitrophenol	20.0 U
105-67-9	2,4-Dimethylphenol	20.0 U
65-85-0	Benzoic Acid	100.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	20.0 U
120-83-2	2,4-Dichlorophenol	20.0 U
120-82-1	1,2,4-Trichlorobenzene	20.0 U
91-20-3	Naphthalene	20.0 U
106-47-8	4-Chloroaniline	20.0 U
87-68-3	Hexachlorobutadiene	20.0 U
59-50-7	4-Chloro-3-Methylphenol	20.0 U
91-57-6	2-Methylnaphthalene	20.0 U
77-47-4	Hexachlorocyclopentadiene	20.0 U
88-06-2	2,4,6-Trichlorophenol	20.0 U
95-95-4	2,4,5-Trichlorophenol	100.0 U
91-58-7	2-Chloronaphthalene	20.0 U
88-74-4	2-Nitroaniline	100.0 U
131-11-3	Dimethyl Phthalate	20.0 U
208-96-8	Acenaphthylene	20.0 U
99-09-2	3-Nitroaniline	100.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	20.0 U
51-28-5	2,4-Dinitrophenol	100.0 U
100-02-7	4-Nitrophenol	100.0 U
132-64-9	Dibenzofuran	20.0 U
121-14-2	2,4-Dinitrotoluene	20.0 U
606-20-2	2,6-Dinitrotoluene	20.0 U
84-66-2	Diethylphthalate	20.0 U
7005-72-3	4-Chlorophenyl-phenylether	20.0 U
86-73-7	Fluorene	20.0 U
100-01-6	4-Nitroaniline	100.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	100.0 U
86-30-6	N-Nitrosodiphenylamine (1)	20.0 U
101-55-3	4-Bromophenyl-phenylether	20.0 U
118-74-1	Hexachlorobenzene	20.0 U
87-86-5	Pentachlorophenol	100.0 U
85-01-8	Phenanthrene	20.0 U
120-12-7	Anthracene	20.0 U
84-74-2	Di-n-Butylphthalate	20.0 U
206-44-0	Fluoranthene	20.0 U
129-00-0	Pyrene	20.0 U
85-68-7	Butylbenzylphthalate	20.0 U
91-94-1	3,3'-Dichlorobenzidine	40.0 U
56-55-3	Benzo(a)Anthracene	20.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	110.0
218-01-9	Chrysene	20.0 U
117-84-0	Di-n-Octyl Phthalate	20.0 U
205-99-2	Benzo(b)Fluoranthene	20.0 U
207-08-9	Benzo(k)Fluoranthene	20.0 U
50-32-8	Benzo(a)Pyrene	20.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	20.0 U
53-70-3	Dibenz(a,h)Anthracene	20.0 U
191-24-2	Benzo(g,h,i)Perylene	20.0 U

(1) - Cannot be separated from diphenylamine

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
GW-19.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RI] or Scan Number	Estimated Concentration ([✓ ug/L] or ug/Kg)
1	-----	UNKNOWN ALKANE	VOA	11.58	6.0 J
2					
3					
4					
5	-----	UNKNOWN	BNA	6.33	500.0 J
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

FORM I, PART B

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5691

Client Sample ID: GW-19.13

PARAMETERS	RESULTS
GROSS ALPHA	< 2
GROSS BETA	< 3
GAMMA SPECTRALANALYSIS	ND

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

NANCO LABS, INC.

Reporting Date: 2/29/88

Results of analysis on TOX ~~Drinking Water~~ sample received

SAMPLE ID :

NANCO ID: 88- EW5691 GW-1[illegible]

PARAMETERS	RESULTS	UNITS
TOX	*ND	ug/l

* min det level = 5ug/l

* QC. Date
spiked EW5635
invoice # 24963

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SURFACE WATER RESULTS

SAMPLE DATA

SW-1.13

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
SW-1.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0234
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/25/88
Date Analyzed:2/25/88
Conc/Dil Factor: 1 pH: 7.1
Percent Moisture: N/A

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	11.0 B
67-64-1	Acetone	11.0
5-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	2.1 JB
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
SW-1.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/01/88
Conc/Dil Factor:------------> 1
Percent Moisture: N/A

GPC Cleanup: Yes_____ No__XX__
Separatory Funnel Extraction: Yes X
Continuous Liquid - Liquid Extraction: Yes__

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	10.0 U
111-44-4	bis(-2-Chloroethyl)Ether	10.0 U
95-57-8	2-Chlorophenol	10.0 U
541-73-1	1,3-Dichlorobenzene	10.0 U
106-46-7	1,4-Dichlorobenzene	10.0 U
100-51-6	Benzyl Alcohol	10.0 U
95-50-1	1,2-Dichlorobenzene	10.0 U
95-48-7	2-Methylphenol	10.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	10.0 U
106-44-5	4-Methylphenol	10.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U
67-72-1	Hexachloroethane	10.0 U
98-95-3	Nitrobenzene	10.0 U
78-59-1	Isophorone	10.0 U
88-75-5	2-Nitrophenol	10.0 U
105-67-9	2,4-Dimethylphenol	10.0 U
65-85-0	Benzoic Acid	50.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	10.0 U
120-83-2	2,4-Dichlorophenol	10.0 U
120-82-1	1,2,4-Trichlorobenzene	10.0 U
91-20-3	Naphthalene	10.0 U
106-47-8	4-Chloroaniline	10.0 U
87-68-3	Hexachlorobutadiene	10.0 U
59-50-7	4-Chloro-3-Methylphenol	10.0 U
91-57-6	2-Methylnaphthalene	10.0 U
77-47-4	Hexachlorocyclopentadiene	10.0 U
88-06-2	2,4,6-Trichlorophenol	10.0 U
95-95-4	2,4,5-Trichlorophenol	50.0 U
91-58-7	2-Chloronaphthalene	10.0 U
88-74-4	2-Nitroaniline	50.0 U
131-11-3	Dimethyl Phthalate	10.0 U
208-96-8	Acenaphthylene	10.0 U
99-09-2	3-Nitroaniline	50.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	10.0 U
51-28-5	2,4-Dinitrophenol	50.0 U
100-02-7	4-Nitrophenol	50.0 U
132-64-9	Dibenzofuran	10.0 U
121-14-2	2,4-Dinitrotoluene	10.0 U
606-20-2	2,6-Dinitrotoluene	10.0 U
84-66-2	Diethylphthalate	10.0 U
7005-72-3	4-Chlorophenyl-phenylether	10.0 U
86-73-7	Fluorene	10.0 U
100-01-6	4-Nitroaniline	50.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	50.0 U
86-30-6	N-Nitrosodiphenylamine (1)	10.0 U
101-55-3	4-Bromophenyl-phenylether	10.0 U
118-74-1	Hexachlorobenzene	10.0 U
87-86-5	Pentachlorophenol	50.0 U
85-01-8	Phenanthrene	10.0 U
120-12-7	Anthracene	10.0 U
84-74-2	Di-n-Butylphthalate	10.0 U
206-44-0	Fluoranthene	10.0 U
129-00-0	Pyrene	10.0 U
85-68-7	Butylbenzylphthalate	10.0 U
91-94-1	3,3'-Dichlorobenzidine	20.0 U
56-55-3	Benzo(a)Anthracene	10.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	4.7 J
218-01-9	Chrysene	10.0 U
117-84-0	Di-n-Octyl Phthalate	10.0 U
205-99-2	Benzo(b)Fluoranthene	10.0 U
207-08-9	Benzo(k)Fluoranthene	10.0 U
50-32-8	Benzo(a)Pyrene	10.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U
53-70-3	Dibenz(a,h)Anthracene	10.0 U
191-24-2	Benzo(g,h,i)Perylene	10.0 U

(1) - Cannot be separated from diphenylamine

FORM I

ORGANICS ANALYSIS DATA SHEET

(PAGE 4)

SAMPLE NUMBER
SW-1.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration ([✓ ug/l] or ug/Kg)
1	-----	NONE FOUND	VOA	-----	--------------
2					
3					
4					
5	-----	UNKNOWN	BNA	6.34	76.0 J
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

FORM I, PART B

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5694

Client Sample ID: SW-1.13

PARAMETERS	RESULTS
GROSS ALPHA	< 2
GROSS BETA	< 3
GAMMA SPECTRALANALYSIS	ND
RADIUM-226	< 2*
THORIUM-232	< 1
URANIUM-238	1.88+/-0.90

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

* = HIGH SOLID SAMPLE LOWER DETECTION LIMIT CANNOT BE ACHIEVED.

oooooooooooooooooooooooooooooooooooo

NANCO LABS, INC.

oooooooooooooooooooooooooooooooooooo

Reporting Date: 2/29/88

TOX

Results of analysis on ~~Drinking Water~~ sample received

SAMPLE ID :

NANCO ID: 88- EW5694

PARAMETERS	RESULTS	UNITS
TOX	26	ug/l

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE N. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SAMPLE DATA

SW-2.13

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
SW-2.13

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0248
Sample Matrix: WATER
Data Release Authorized By:

ASHLAND PETROLEUM
Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: N/A
Date Sample Received: 02-25-88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-25-88
Date Analyzed:02-25-88
Conc/Dil Factor: 1 ph: 7.2
Percent Moisture:

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	15.0 B
67-64-1	Acetone	22.0 B
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
7-06-2	1,2-Dichloroethane	5.0 U
[illegible]-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	1.7 J
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
If the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not ssarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM I

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
SW-2.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-29-88
Date Analyzed: 03-03-88
Conc/Dil Factor:------------> 1
Percent Moisture:

GPC Cleanup: Yes____ No ✓
Separatory Funnel Extraction: Yes X
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
108-95-2	Phenol	10.0 U
111-44-4	bis(-2-Chloroethyl)Ether	10.0 U
95-57-8	2-Chlorophenol	10.0 U
541-73-1	1,3-Dichlorobenzene	10.0 U
106-46-7	1,4-Dichlorobenzene	10.0 U
100-51-6	Benzyl Alcohol	10.0 U
95-50-1	1,2-Dichlorobenzene	10.0 U
95-48-7	2-Methylphenol	10.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	10.0 U
106-44-5	4-Methylphenol	10.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	10.0 U
67-72-1	Hexachloroethane	10.0 U
98-95-3	Nitrobenzene	10.0 U
78-59-1	Isophorone	10.0 U
88-75-5	2-Nitrophenol	10.0 U
105-67-9	2,4-Dimethylphenol	10.0 U
65-85-0	Benzoic Acid	50.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	10.0 U
120-83-2	2,4-Dichlorophenol	10.0 U
120-82-1	1,2,4-Trichlorobenzene	10.0 U
91-20-3	Naphthalene	10.0 U
106-47-8	4-Chloroaniline	10.0 U
87-68-3	Hexachlorobutadiene	10.0 U
59-50-7	4-Chloro-3-Methylphenol	10.0 U
91-57-6	2-Methylnaphthalene	10.0 U
77-47-4	Hexachlorocyclopentadiene	10.0 U
88-06-2	2,4,6-Trichlorophenol	10.0 U
95-95-4	2,4,5-Trichlorophenol	50.0 U
91-58-7	2-Chloronaphthalene	10.0 U
88-74-4	2-Nitroaniline	50.0 U
131-11-3	Dimethyl Phthalate	10.0 U
208-96-8	Acenaphthylene	10.0 U
99-09-2	3-Nitroaniline	50.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
83-32-9	Acenaphthene	10.0 U
51-28-5	2,4-Dinitrophenol	50.0 U
100-02-7	4-Nitrophenol	50.0 U
132-64-9	Dibenzofuran	10.0 U
121-14-2	2,4-Dinitrotoluene	10.0 U
606-20-2	2,6-Dinitrotoluene	10.0 U
84-66-2	Diethylphthalate	10.0 U
7005-72-3	4-Chlorophenyl-phenylether	10.0 U
86-73-7	Fluorene	10.0 U
100-01-6	4-Nitroaniline	50.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	50.0 U
86-30-6	N-Nitrosodiphenylamine (1)	10.0 U
101-55-3	4-Bromophenyl-phenylether	10.0 U
118-74-1	Hexachlorobenzene	10.0 U
87-86-5	Pentachlorophenol	50.0 U
85-01-8	Phenanthrene	10.0 U
120-12-7	Anthracene	10.0 U
84-74-2	Di-n-Butylphthalate	10.0 U
206-44-0	Fluoranthene	10.0 U
129-00-0	Pyrene	10.0 U
85-68-7	Butylbenzylphthalate	10.0 U
91-94-1	3,3'-Dichlorobenzidine	20.0 U
56-55-3	Benzo(a)Anthracene	10.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	590.0 B
218-01-9	Chrysene	10.0 U
117-84-0	Di-n-Octyl Phthalate	10.0 U
205-99-2	Benzo(b)Fluoranthene	10.0 U
207-08-9	Benzo(k)Fluoranthene	10.0 U
50-32-8	Benzo(a)Pyrene	10.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	10.0 U
53-70-3	Dibenz(a,h)Anthracene	10.0 U
191-24-2	Benzo(g,h,i)Perylene	10.0 U

(1) - Cannot be separated from diphenylamine

FORM I

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
SW-2.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration ([✓ ug/l] or ug/Kg)
1	-----	NONE FOUND	VOA	-----	------
2					
3					
4	-----	UNKNOWN	BNA	5.56	4.0 J
5	-----	UNKNOWN	BNA	13.35	7.0 J
6	-----	UNKNOWN	BNA	25.75	8.0 J
7	-----	UNKNOWN ALKANE	BNA	33.51	16.0 J
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

FORM I, PART B

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-EW-5715

Client Sample ID: SW-2.13

PARAMETERS	RESULTS
GROSS ALPHA	30+/-8
GROSS BETA	33+/-8
GAMMA SPECTRALANALYSIS	ND
RADIUM-226	1.6+/-1.0
THORIUM-232	4.64+/-0.90
URANIUM-238	29.97+/-7.65

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

NANCO LABS, INC.

000007

Reporting Date: 3/1/88

TOX

Results of analysis on ~~Drinking Water~~ sample received

SAMPLE ID :

NANCO ID: 88- EW5715

PARAMETERS	RESULTS	UNITS
TOX	35	ug/l

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SEDIMENT RESULTS

SAMPLE DATA

SED.-1.13

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
SED-1.13
NOT APPLICABLE
FOR VOA

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>N/A
Sample Matrix: SOIL
Data Release Authorized By: P. J. Wunsch

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: N/A
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: N/A
Date Analyzed:N/A
Conc/Dil Factor: 1 pH: N/A
Percent Moisture: N/A

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	5.0 U
7-64-1	Acetone	10.0 U
-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

S

This flage denotes that the compound is a spike compound and was added to the sample prior to analysis.

FORM I

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
SED-1.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/24/88
Date Analyzed: 3/02/88
Conc/Dil Factor:------------> 2
Percent Moisture: 50

GPC Cleanup: Yes_XXX_ No_____
Separatory Funnel Extraction: Yes_____
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
108-95-2	Phenol	1320.0 U
111-44-4	bis(-2-Chloroethyl)Ether	1320.0 U
95-57-8	2-Chlorophenol	1320.0 U
541-73-1	1,3-Dichlorobenzene	1320.0 U
106-46-7	1,4-Dichlorobenzene	1320.0 U
100-51-6	Benzyl Alcohol	1320.0 U
95-50-1	1,2-Dichlorobenzene	1320.0 U
95-48-7	2-Methylphenol	1320.0 U
39638-32-9	bis(2-chloroisopropyl)Ether	1320.0 U
106-44-5	4-Methylphenol	1320.0 U
621-64-7	N-Nitroso-Di-n-Propylamine	1320.0 U
67-72-1	Hexachloroethane	1320.0 U
98-95-3	Nitrobenzene	1320.0 U
78-59-1	Isophorone	1320.0 U
88-75-5	2-Nitrophenol	1320.0 U
105-67-9	2,4-Dimethylphenol	1320.0 U
65-85-0	Benzoic Acid	6400.0 U
111-91-1	bis(-2-Chloroethoxy)Methane	1320.0 U
120-83-2	2,4-Dichlorophenol	1320.0 U
120-82-1	1,2,4-Trichlorobenzene	1320.0 U
91-20-3	Naphthalene	1320.0 U
106-47-8	4-Chloroaniline	1320.0 U
87-68-3	Hexachlorobutadiene	1320.0 U
59-50-7	4-Chloro-3-Methylphenol	1320.0 U
91-57-6	2-Methylnaphthalene	1320.0 U
77-47-4	Hexachlorocyclopentadiene	1320.0 U
88-06-2	2,4,6-Trichlorophenol	1320.0 U
95-95-4	2,4,5-Trichlorophenol	6400.0 U
91-58-7	2-Chloronaphthalene	1320.0 U
88-74-4	2-Nitroaniline	6400.0 U
131-11-3	Dimethyl Phthalate	1320.0 U
208-96-8	Acenaphthylene	1320.0 U
99-09-2	3-Nitroaniline	6400.0 U

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
83-32-9	Acenaphthene	1320.0 U
51-28-5	2,4-Dinitrophenol	6400.0 U
100-02-7	4-Nitrophenol	6400.0 U
132-64-9	Dibenzofuran	1320.0 U
121-14-2	2,4-Dinitrotoluene	1320.0 U
606-20-2	2,6-Dinitrotoluene	1320.0 U
84-66-2	Diethylphthalate	1320.0 U
7005-72-3	4-Chlorophenyl-phenylether	1320.0 U
86-73-7	Fluorene	1320.0 U
100-01-6	4-Nitroaniline	6400.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	6400.0 U
86-30-6	N-Nitrosodiphenylamine (1)	1320.0 U
101-55-3	4-Bromophenyl-phenylether	1320.0 U
118-74-1	Hexachlorobenzene	1320.0 U
87-86-5	Pentachlorophenol	6400.0 U
85-01-8	Phenanthrene	1320.0 U
120-12-7	Anthracene	1320.0 U
84-74-2	Di-n-Butylphthalate	1320.0 U
206-44-0	Fluoranthene	1320.0 U
129-00-0	Pyrene	1320.0 U
85-68-7	Butylbenzylphthalate	1320.0 U
91-94-1	3,3'-Dichlorobenzidine	2640.0 U
56-55-3	Benzo(a)Anthracene	1320.0 U
117-81-7	bis(2-Ethylhexyl)Phthalate	1900.0 B
218-01-9	Chrysene	1320.0 U
117-84-0	Di-n-Octyl Phthalate	1320.0 U
205-99-2	Benzo(b)Fluoranthene	1320.0 U
207-08-9	Benzo(k)Fluoranthene	1320.0 U
50-32-8	Benzo(a)Pyrene	1320.0 U
193-39-5	Indeno(1,2,3-cd)Pyrene	1320.0 U
53-70-3	Dibenz(a,h)Anthracene	1320.0 U
191-24-2	Benzo(g,h,i)Perylene	1320.0 U

(1) - Cannot be separated from diphenylamine

Soil

TABLE 2.5
30890-0092A
ENGINEERING SCIENCE
EPA TCL PESTICIDES/PCB's

All results reported as ug/Kg.

	Sample Identification	
Dilution Factor	1.50	
Method Blank I.D.	1019 -B02	
Compound	SED- 1.13	Lower Limits of Detection with no Dilution
alpha BHC	U	8.0
beta BHC	U	8.0
delta BHC	U	8.0
gamma BHC	U	8.0
Heptachlor	U	8.0
Aldrin	U	8.0
Heptachlor Epoxide	U	8.0
Endosulfan I	U	8.0
Dieldrin	U	16
4,4' DDE	U	16
Endrin	U	16
Endosulfan II	U	16
4,4' DDD	U	16
Endosulfan Sulfate	U	16
4,4' DDT	U	16
Methoxychlor	U	80
Endrin Ketone	U	16
alpha Chlordane	U	80
gamma Chlordane	U	80
Toxaphene	U	160
Aroclor - 1016	U	80
Aroclor - 1221	U	80
Aroclor - 1232	U	80
Aroclor - 1242	U	80
Aroclor - 1248	U	80
Aroclor - 1254	U	160
Aroclor - 1260	U	160

U, J - See Appendix for definition.

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
SED-1.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration (ug/l or [✓ ug/Kg])
1	-----	NOT APPLICABLE	VOA	-----	----------------
2					
3					
4					
5	-----	UNKNOWN ALKANE	BNA	5.47	1600.0 JB
6	-----	UNKNOWN	BNA	6.40	50000.0 JB
7	-----	UNKNOWN ALKENE	BNA	6.95	1100.0 JB
8	2216333	3-METHYL OCTANE	BNA	7.13	1400.0 JB
9	-----	UNKNOWN	BNA	9.86	1400.0 JB
10	-----	UNKNOWN ISOMER OF HEXADIOIC ACID	BNA	31.95	43000.0 J
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

FORM I, PART B

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-ES-5693

Client Sample ID: SED.-1.13

PARAMETERS	RESULTS
GROSS ALPHA	< 2
GROSS BETA	297+/-37
GAMMA SPECTRALANALYSIS	ND
RADIUM-226	< 2*
THORIUM-232	188+/-28
URANIUM-238	8.03+/-4.36

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

* = HIGH SOLID SAMPLE LOWER DETECTION LIMIT CANNOT BE ACHIEVED.

Sample results are on dry sample

ENGINEERING-SCIENCE COMPANIES

57A

MEMORANDUM TO FILE

JOB NO. SY012.13
FILE DESIGNATION TELECON
DATE 4/5/88 TIME 15:30

PHONE CALL FROM Ellen LaRiviere (CEP) PHONE NO. (800) 545-2188
ONE CALL TO W. Bradford PHONE NO.

ONFERENCE WITH
PLACE

SUBJECT Ashland Petroleum sample ES 5693 (SED-1)
CEP = Controls for Environmental Pollution, Inc.,
New Mexico (via NANCO)

E.L. said they reanalyzed the sample as a dry sample and provided the data as follows (pCi/g):
↑ dry weight

gross α	4.7 ± 2.0
gross β	7.7 ± 0.9
γ-Spec	not detected
Radium-226	0.43 ± 0.15
Thorium-232	0.31 ± 0.16
Uranium-238	0.15 ± 0.02

E.L. agreed to forward a hard copy to us.

SIGNED W. Bradford

NANCO LABS, INC.

Reporting Date: 2/29/88

TOX

Results of analysis on ~~Drinking Water~~ sample received

SAMPLE ID :

NANCO ID: 88- ES5693

PARAMETERS	RESULTS	UNITS
TOX	*ND	mg/kg

* min det. level is 5mg/kg

* QC. Data
spiked ES5360
invoice # 24837

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SAMPLE DATA

SED-2.13

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
SED-2.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>F2164
Sample Matrix: SOIL
Data Release Authorized By: P. J. Gursch

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: N/A
Date Sample Received: 02-25-88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-25-88
Date Analyzed:02-25-88
Conc/Dil Factor: 1 pH: 4.2
Percent Moisture: 44

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
74-87-3	Chloromethane	17.9 U
74-83-9	Bromomethane	17.9 U
75-01-4	Vinyl Chloride	17.9 U
75-00-3	Chloroethane	17.9 U
75-09-2	Methylene Chloride	37.0 B
67-64-1	Acetone	150.0 B
75-15-0	Carbon Disulfide	8.9 U
75-35-4	1,1-Dichloroethene	8.9 U
75-34-3	1,1-Dichloroethane	8.9 U
156-60-5	Trans-1,2-Dichloroethene	8.9 U
67-66-3	Chloroform	16.0 J
06-2	1,2-Dichloroethane	8.9 U
93-3	2-Butanone	17.9 U
71-55-6	1,1,1-Trichloroethane	8.9 U
56-23-5	Carbon Tetrachloride	8.9 U
108-05-4	Vinyl Acetate	17.9 U
75-27-4	Bromodichloromethane	8.9 U

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	8.9 U
78-87-5	1,2-Dichloropropane	8.9 U
10061-02-6	Trans-1,3-Dichloropropene	8.9 U
79-01-6	Trichloroethene	8.9 U
124-48-1	Dibromochloromethane	8.9 U
79-00-5	1,1,2-Trichloroethane	8.9 U
71-43-2	Benzene	8.9 U
10061-01-5	cis-1,3-Dichloropropene	8.9 U
110-75-8	2-Chloroethylvinylether	17.9 U
75-25-2	Bromoform	8.9 U
591-78-6	2-Hexanone	17.9 U
108-10-1	4-Methyl-2-Pentanone	17.9 U
127-18-4	Tetrachloroethene	8.9 U
108-88-3	Toluene	8.9 U
108-90-7	Chlorobenzene	8.9 U
100-41-4	Ethylbenzene	8.9 U
100-42-5	Styrene	8.9 U
	Total Xylenes	8.9 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
If the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM I

ORGANIC ANALYSIS DATA SHEET
(PAGE 2)

LABORATORY NAME: NANCO LABS. INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

SAMPLE NO.
SED-2.13

SEMIVOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-25-88
Date Analyzed: 03-03-88
Conc/Dil Factor:------------> 2
Percent Moisture: 44

GPC Cleanup: Yes_XXX_ No_____
Separatory Funnel Extraction: Yes_____
Continuous Liquid - Liquid Extraction: Yes___

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
108-95-2	Phenol	1178.6 U
111-44-4	bis(-2-Chloroethyl)Ether	1178.6 U
95-57-8	2-Chlorophenol	1178.6 U
541-73-1	1,3-Dichlorobenzene	1178.6 U
106-46-7	1,4-Dichlorobenzene	1178.6 U
100-51-6	Benzyl Alcohol	1178.6 U
95-50-1	1,2-Dichlorobenzene	1178.6 U
95-48-7	2-Methylphenol	1178.6 U
39638-32-9	bis(2-chloroisopropyl)Ether	1178.6 U
106-44-5	4-Methylphenol	1178.6 U
621-64-7	N-Nitroso-Di-n-Propylamine	1178.6 U
67-72-1	Hexachloroethane	1178.6 U
98-95-3	Nitrobenzene	1178.6 U
78-59-1	Isophorone	1178.6 U
88-75-5	2-Nitrophenol	1178.6 U
105-67-9	2,4-Dimethylphenol	1178.6 U
65-85-0	Benzoic Acid	5714.3 U
111-91-1	bis(-2-Chloroethoxy)Methane	1178.6 U
120-83-2	2,4-Dichlorophenol	1178.6 U
120-82-1	1,2,4-Trichlorobenzene	1178.6 U
91-20-3	Naphthalene	1178.6 U
106-47-8	4-Chloroaniline	1178.6 U
87-68-3	Hexachlorobutadiene	1178.6 U
59-50-7	4-Chloro-3-Methylphenol	1178.6 U
91-57-6	2-Methylnaphthalene	1178.6 U
77-47-4	Hexachlorocyclopentadiene	1178.6 U
88-06-2	2,4,6-Trichlorophenol	1178.6 U
95-95-4	2,4,5-Trichlorophenol	5714.3 U
91-58-7	2-Chloronaphthalene	1178.6 U
88-74-4	2-Nitroaniline	5714.3 U
131-11-3	Dimethyl Phthalate	1178.6 U
208-96-8	Acenaphthylene	1178.6 U
99-09-2	3-Nitroaniline	5714.3 U

CAS Number		ug/l or [✓ ug/Kg] (Circle One)
83-32-9	Acenaphthene	1178.6 U
51-28-5	2,4-Dinitrophenol	5714.3 U
100-02-7	4-Nitrophenol	5714.3 U
132-64-9	Dibenzofuran	1178.6 U
121-14-2	2,4-Dinitrotoluene	1178.6 U
606-20-2	2,6-Dinitrotoluene	1178.6 U
84-66-2	Diethylphthalate	1178.6 U
7005-72-3	4-Chlorophenyl-phenylether	1178.6 U
86-73-7	Fluorene	1178.6 U
100-01-6	4-Nitroaniline	5714.3 U
534-52-1	4,6-Dinitro-2-Methylphenol	5714.3 U
86-30-6	N-Nitrosodiphenylamine (1)	1178.6 U
101-55-3	4-Bromophenyl-phenylether	1178.6 U
118-74-1	Hexachlorobenzene	1178.6 U
87-86-5	Pentachlorophenol	5714.3 U
85-01-8	Phenanthrene	1178.6 U
120-12-7	Anthracene	1178.6 U
84-74-2	Di-n-Butylphthalate	620.0 J
206-44-0	Fluoranthene	1178.6 U
129-00-0	Pyrene	1178.6 U
85-68-7	Butylbenzylphthalate	1178.6 U
91-94-1	3,3'-Dichlorobenzidine	2357.1 U
56-55-3	Benzo(a)Anthracene	1178.6 U
117-81-7	bis(2-Ethylhexyl)Phthalate	680.0 J
218-01-9	Chrysene	1178.6 U
117-84-0	Di-n-Octyl Phthalate	1178.6 U
205-99-2	Benzo(b)Fluoranthene	1178.6 U
207-08-9	Benzo(k)Fluoranthene	1178.6 U
50-32-8	Benzo(a)Pyrene	1178.6 U
193-39-5	Indeno(1,2,3-cd)Pyrene	1178.6 U
53-70-3	Dibenz(a,h)Anthracene	1178.6 U
191-24-2	Benzo(g,h,i)Perylene	1178.6 U

(1) - Cannot be separated from diphenylamine

Soil

TABLE 2.5
30890-0092A
ENGINEERING SCIENCE
EPA TCL PESTICIDES/PCB's

All results reported as ug/Kg.

Sample Identification

Dilution Factor	1.90	
Method Blank I.D.	1019 -B02	
Compound	SED-2.13	Lower Limits of Detection with no Dilution
alpha BHC	U	8.0
beta BHC	U	8.0
delta BHC	U	8.0
gamma BHC	U	8.0
Heptachlor	U	8.0
Aldrin	U	8.0
Heptachlor Epoxide	U	8.0
Endosulfan I	U	8.0
Dieldrin	U	16
4,4' DDE	U	16
Endrin	U	16
Endosulfan II	U	16
4,4' DDD	U	16
Endosulfan Sulfate	U	16
4,4' DDT	U	16
Methoxychlor	U	80
Endrin Ketone	U	16
alpha Chlordane	U	80
gamma Chlordane	U	80
Toxaphene	U	160
Aroclor - 1016	U	80
Aroclor - 1221	U	80
Aroclor - 1232	U	80
Aroclor - 1242	U	80
Aroclor - 1248	U	80
Aroclor - 1254	U	160
Aroclor - 1260	120J	160

U, J - See Appendix for definition.

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
SED-2.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration (ug/l or [✓ ug/Kg])
1	96140	PENTANE,3-METHYL	VOA	19.91	23.0 J
2					
3					
4	-----	UNKNOWN AMIDE	BNA	8.19	2800.0 JB
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

****

NANCO LABS, INC.

****

ENGINEERING SCIENCE
ATTN: DAVE JOHNSON

Date Reported: 03/22/88

RADIOACTIVITY DATA

Nanco Sample ID: 88-ES-5713

Client Sample ID: SED-2.13

PARAMETERS	RESULTS
GROSS ALPHA	11.1+/-3.3
GROSS BETA	6.0+/-0.9
GAMMA SPECTRALANALYSIS	ND
RADIUM-226	0.70+/-0.12
THORIUM-232	0.53+/-0.15
URANIUM-238	3.84+/-0.59

ALL RESULTS ARE EXPRESSED IN pCi/liter UNLESS OTHERWISE INDICATED

Units = pCi/g

See CEP Report on Analysis
(back of this report)

REPORT OF ANALYSIS

LAB # 88-02-480

SAMPLE IDENTIFICATION	DATE COLLECTED	TYPE OF ANALYSIS	pCi/gram
ES 5713	02/25/88	Gross Alpha	11.1+/-3.3
		Gross Beta	6.0+/-0.9
		Gamma Spectralanalysis	ND
		Radium-226	0.70+/-0.12
		Thorium-232	0.53+/-0.15
		Uranium-238	3.84+/-0.59

NANCO LABS, INC.

Reporting Date: 3/1/88

TOX

Results of analysis on ~~Drinking Water~~ sample received

SAMPLE ID :

NANCO ID: 88- E55713

PARAMETERS	RESULTS	UNITS
TOX	ND*	mg/kg

* min det level is 5 mg/kg

ALL RESULTS ARE EXPRESSED IN UG/L UNLESS OTHERWISE INDICATED

CONSTANCE M. GAIND
CHIEF EXECUTIVE OFFICER,
LABORATORY DIRECTOR

SAMPLE DATA

Trip Blank

F4

SAMPLE DATA

TRIP Blank

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
TRIP BLANK

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0255
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: N/A
Date Sample Received: 02-25-88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-26-88
Date Analyzed:02-26-88
Conc/Dil Factor: 2 pH: 7.2
Percent Moisture:

CAS N		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	20.0 U
74-83-9	Bromomethane	20.0 U
75-01-4	Vinyl Chloride	20.0 U
75-00-3	Chloroethane	20.0 U
75-09-2	Methylene Chloride	26.0
67-64-1	Acetone	48.0 B
75-15-0	Carbon Disulfide	10.0 U
75-35-4	1,1-Dichloroethene	10.0 U
75-34-3	1,1-Dichloroethane	10.0 U
156-60-5	Trans-1,2-Dichloroethene	10.0 U
67-66-3	Chloroform	10.0 U
107-06-2	1,2-Dichloroethane	10.0 U
78-93-3	2-Butanone	220.0
71-55-6	1,1,1-Trichloroethane	4.4 J
56-23-5	Carbon Tetrachloride	10.0 U
108-05-4	Vinyl Acetate	20.0 U
75-27-4	Bromodichloromethane	10.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	10.0 U
78-87-5	1,2-Dichloropropane	10.0 U
10061-02-6	Trans-1,3-Dichloropropene	10.0 U
79-01-6	Trichloroethene	10.0 U
124-48-1	Dibromochloromethane	10.0 U
79-00-5	1,1,2-Trichloroethane	10.0 U
71-43-2	Benzene	10.0 U
10061-01-5	cis-1,3-Dichloropropene	10.0 U
110-75-8	2-Chloroethylvinylether	20.0 U
75-25-2	Bromoform	10.0 U
591-78-6	2-Hexanone	20.0 U
108-10-1	4-Methyl-2-Pentanone	20.0 U
127-18-4	Tetrachloroethene	10.0 U
108-88-3	Toluene	10.0 U
108-90-7	Chlorobenzene	10.0 U
100-41-4	Ethylbenzene	10.0 U
100-42-5	Styrene	10.0 U
	Total Xylenes	10.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

If result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
TRIP BLANK

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration ([✓ ug/L] or ug/Kg)
1	-----	NONE FOUND	VOA	-----	----------
2					
3	-----	NOT APPLICABLE	BNA	-----	----------
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

FORM I, PART B

ORGANICS ANALYSIS DATA SHEET

(PAGE 1)

SAMPLE NUMBER
TRIP BLANK

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0232
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/25/88
Date Analyzed:2/25/88
Conc/Dil Factor: 1 pH: 6.9
Percent Moisture: N/A

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	13.0 B
67-64-1	Acetone	21.0
5-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	120.0
71-55-6	1,1,1-Trichloroethane	5.0 U
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

SAMPLE DATA

GW-3A.13

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
GW-3A.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0249
Sample Matrix: WATER
Data Release Authorized By: P.L. Gunsch

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: N/A
Date Sample Received: 02-25-88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 02-25-88
Date Analyzed:02-25-88
Conc/Dil Factor: 1 pH: 7.8
Percent Moisture:

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	18.0 B
67-64-1	Acetone	34.0 B
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	3.0JB
7-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	4.6 J
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/l] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE
If the result is a value greater than or equal to the detection limit, report the value.

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J
Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C
This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B
This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER
Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM I

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
GW-3A.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration ([✓ ug/l] or ug/Kg)
1	-----	UNKNOWN	VOA	6.84	8.0 J
2	-----	UNKNOWN ALKANE	VOA	18.95	5.0 J
3	-----	UNKNOWN	VOA	23.35	4.0 J
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

FORM I, PART B

SAMPLE DATA

GW-4A.13

ORGANICS ANALYSIS DATA SHEET
(PAGE 1)

SAMPLE NUMBER
GW-4A.13

ASHLAND PETROLEUM

Laboratory Name:NANCO LABORATORY INC.
Lab File ID No:>H0233
Sample Matrix: WATER
Data Release Authorized By:

Case No: ENGINEERING SCIENCE
QC Report No: N/A
Contract No: NA
Date Sample Received: 2/24/88

VOLATILE COMPOUNDS

Concentration: [✓ Low] Medium (Circle One)
Date Extracted/Prepared: 2/25/88
Date Analyzed:2/25/88
Conc/Dil Factor: 1 pH: 7.1
Percent Moisture: N/A

CAS Number		[✓ ug/L] or ug/Kg (Circle One)
74-87-3	Chloromethane	10.0 U
74-83-9	Bromomethane	10.0 U
75-01-4	Vinyl Chloride	10.0 U
75-00-3	Chloroethane	10.0 U
75-09-2	Methylene Chloride	10.0 B
67-64-1	Acetone	22.0
75-15-0	Carbon Disulfide	5.0 U
75-35-4	1,1-Dichloroethene	5.0 U
75-34-3	1,1-Dichloroethane	5.0 U
156-60-5	Trans-1,2-Dichloroethene	5.0 U
67-66-3	Chloroform	5.0 U
107-06-2	1,2-Dichloroethane	5.0 U
78-93-3	2-Butanone	10.0 U
71-55-6	1,1,1-Trichloroethane	10.0 B
56-23-5	Carbon Tetrachloride	5.0 U
108-05-4	Vinyl Acetate	10.0 U
75-27-4	Bromodichloromethane	5.0 U

CAS Number		[✓ ug/L] or ug/Kg (Circle One)
79-34-5	1,1,2,2-Tetrachloroethane	5.0 U
78-87-5	1,2-Dichloropropane	5.0 U
10061-02-6	Trans-1,3-Dichloropropene	5.0 U
79-01-6	Trichloroethene	5.0 U
124-48-1	Dibromochloromethane	5.0 U
79-00-5	1,1,2-Trichloroethane	5.0 U
71-43-2	Benzene	5.0 U
10061-01-5	cis-1,3-Dichloropropene	5.0 U
110-75-8	2-Chloroethylvinylether	10.0 U
75-25-2	Bromoform	5.0 U
591-78-6	2-Hexanone	10.0 U
108-10-1	4-Methyl-2-Pentanone	10.0 U
127-18-4	Tetrachloroethene	5.0 U
108-88-3	Toluene	5.0 U
108-90-7	Chlorobenzene	5.0 U
100-41-4	Ethylbenzene	5.0 U
100-42-5	Styrene	5.0 U
	Total Xylenes	5.0 U

Data Reporting Qualifiers

For reporting results to EPA, the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However, the definition of each flag must be explicit.

VALUE

the result is a value greater than or equal to the detection limit, report the value.

U

Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U(e.g.10U based on necessary concentration dilution actions. (This is not necessarily the instrument detection limit.) The footnote should read U-Compound was analyzed for but not detected.The number is the minimum attainable detection limit for the sample.

J

Indicates an estimated value.This flag is used either when estimating a concentration for tentatively identified compounds where a 1 1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).

C

This flag applies to pesticide parameters where the identification has been confirmed by GC/MS Single component pesticides greater than or equal to 10 ng/ul in the final extract should be confirmed by GC/MS

B

This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

OTHER

Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report.

FORM I

ORGANICS ANALYSIS DATA SHEET
(PAGE 4)

SAMPLE NUMBER
GW-4A.13

LABORATORY NAME :NANCO LABS.INC.
CASE NO: ENGINEERING SCIENCE
ASHLAND PETROLEUM

Tentatively Identified Compounds

	CAS Number	Compound Name	Fraction	[✓ RT] or Scan Number	Estimated Concentration ([✓ ug/L] or ug/Kg)
1	67630	2-PROPANOL	VOA	8.43	16.0 J
2	-----	UNKNOWN	VOA	10.20	10.0 J
3					
4					
5	-----	NOT APPLICABLE	BNA	-----	----------
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

Field Sampling Records

FIGURE 6.3
FIELD SAMPLING RECORD

Si.. Ashland Petroleum NYSDEC Site No. ______ Date: 2/24/88

Well GW-3

Samplers: M. Chauvin of Eng-Science

L. Dobson of "

Initial Static Water Level. 30.62
(from top of well protective casing)

Stick up = 2.05

Evacuation:

Using: Submersible ______ Centrifugal ______

Airlift ______ Positive Displacement ______

Bailed X ______ Times

Well Volume Calculation:

2" Casing: 84.43 ft. of water x .16 = 13.5 gals

3" Casing: ______ ft. of water x .36 = ______ gals

4" Casing: ______ ft. of water x .65 = ______ gal

Depth to intake from top of protective well casing 113'

Volume of Water removed 35 Gals. (> 3 Well Volumes)

3 vol = 40 gal.

Sampling: Time 0930 ~~a.m.~~ ~~p.m.~~

Bailer Type: Stainless Steel ______

Teflon X

From Pos. Dis. Pump Discharge Tube ______

Other ______ ______

	No. of Bottles Filled	I.D. No.	Analyses
Trip Blank			
Field Blank - Wash/Atmospheric. .(circle one)			
Ground-water Sample	6	GW-3.13	See below

Physical Appearance and Odor Very Strong Sulphur Odor evident about ½ way through fairly clean (sulphur + something else)

Refrigerate: Date 2/24/88 Time 1600

Field Tests:

Temperature (C°/°F)	8°C	
pH	—	
Spec. Conduc (umhos/cm)	4.1ms	

(could only calibrate to 1.7 mS

Weather ______

Comments TOX, BNA /Pest/PCB, voas, Radioactivity

water level steadily dropped

FIGURE 6.3
FIELD SAMPLING RECORD

Site: Ashland Petroleum NYSDEC Site No. ______ Date: 1/22/88

Well GW-4

Samplers: Mark Chavvin of Engineering Science

Liz Dobson of ______

Initial Static Water Level. 23.44
(from top of well protective casing)

Stick up = 2.21

Evacuation:

Using: Submersible ______ Centrifugal ______

Airlift ______ Positive Displacement ______

Bailed X ______ Times

78.77 Well Volume Calculation:

2" Casing: ~~21.23~~ ft. of water x .16 = 12.6 gals

3" Casing: ______ ft. of water x .36 = ______ gals

4" Casing: ______ ft. of water x .65 = ______ gals

3 vol = 38 gal.

Depth to intake from top of protective well casing 100'

Volume of Water removed 38 Gals. (> 3 Well Volumes)

Sampling: Time 1330 ~~a.m.~~ [✓ p.m.]

Bailer Type:

Stainless Steel ______

Teflon X

From Pos. Dis. Pump Discharge Tube ______

Other ______

	No. of Bottles Filled	I.D. No.	Analyses
Trip Blank			
Field Blank - Wash/Atmospheric. (circle one)			
Ground-water Sample	9	GW-4.13	See below

Physical Appearance and Odor Clear, Sulphur Odor

Refrigerate: Date _/_/_ Time ______

Field Tests:

Temperature (C°/°F)	10.1	
pH	–	
Spec. Conduc (umhos/cm)	2.04 mS	

Weather Sunny, 35°F

Comments Well unlocked when ES team arrived

water clear. started turning cloudy ~~wh~~ @ 15 gal. removed

TOX, VOA, Pest/PCB, BNA, U, Th, Ra, radioactivity

strong 'whiffs' of Sulphur noticed occassionally -
getting stronger [illegible] end./ high headspace - 7.0
breathing zone - 2.0

FIGURE 6.3
FIELD SAMPLING RECORD

Si Ashland NYSDEC Site No. ____ Date: 2/23/88

Well GW-17

Samplers: L. Dobson of Eng. Science

M. Chauvin of "

Initial Static Water Level. 26.03
(from top of well protective casing)

stick up = 1.4'

Evacuation:

Using: Submersible ____ Centrifugal ____

Airlift ____ Positive Displacement ____

Bailed X ____ Times

Well Volume Calculation:

2" Casing: 62.37 ft. of water x .16 = 9.98 gals

3" Casing: ____ ft. of water x .36 = ____ gals

4" Casing: ____ ft. of water x .65 = ____ gal

3 vol = 30 gal.

Depth to intake from top of protective well casing 87'

Volume of Water removed 30 Gals. (> 3 Well Volumes)

Sampling: Time 1200 ____ a.m. ____ p.m.

Bailer Type: Stainless Steel ____

Teflon X

From Pos. Dis. Pump Discharge Tube ____

Other ____

	No. of Bottles Filled	I.D. No.	Analyses
Trip Blank			
Field Blank - Wash/Atmospheric. .(circle one)			
Ground-water Sample	6	GW-17.13	See below

Physical Appearance and Odor Clear / no odor

Refrigerate: Date _/_/_ Time ____

Field Tests:

Temperature (C°/°F)	7.0°C	
pH	—	
Spec. Conduc (umhos/cm)	3.0 mS	

Weather Partly Cloudy, 30°F

Comments HSL organics, Bna/Pest/PCB, TOX, Radioactivity (alpha, beta, gamma).

FIGURE 6.3
FIELD SAMPLING RECORD

Si Ashland Petroleum NYSDEC Site No. ________ Date: 2/23/88
Well GW-19 (Bechtel)

Samplers: L. Dobson of Eng. Science
M. Chauvin of "

Initial Static Water Level. 22.59
(from top of well protective casing)
stick up = 0.85'

Evacuation:
Using: Submersible ____ Centrifugal ____
Airlift ____ Positive Displacement ____
Bailed X ____ Times

Well Volume Calculation:
2" Casing: 56.36 ft. of water x .16 = 9.02 gals
3" Casing: ____ ft. of water x .36 = ____ gals
4" Casing: ____ ft. of water x .65 = ____ gals
3vol = 27 gal.

Depth to intake from top of protective well casing 78'
Volume of Water removed 27 Gals. (> 3 Well Volumes)

Sampling: Time 0900 ____ a.m. ____ p.m.

Bailer Type: Stainless Steel ____
Teflon X
From Pos. Dis. Pump Discharge Tube ____
Other ____ ____

	No. of Bottles Filled	I.D. No.	Analyses
Trip Blank			
Field Blank - Wash/Atmospheric. .(circle one)			
Ground-water Sample			

Physical Appearance and Odor
dark silty brown - odor noticed on bailer

Refrigerate: Date / / / Time ____

Field Tests:

Temperature (C°/°F)	–	
pH	–	
Spec. Conduc (umhos/cm)	3.0 uS	

Weather Snowing, Cloudy - 25°F

Comments Background reading of 5.0
'Level C' - photovac readings > 10.0 ppm in
breathing zone at times
analysis: HSL organics, Pest/PCB, TOX, alpha, gamma, beta

FIGURE 6.4

FIELD SURFACE SAMPLING RECORD

Site: Ashland Petroleum NYSDEC Site No.______ Date: 2/22/88

Samplers: L. Dobson of Engineering Science

M. Chauvin of "

SAMPLING: SW-1.13 Time 1700 ___ ~~a.m.~~

SED-1.13 ___ p.m.

Sample Type: Surface Water

Sampling Method: Stainless Steel Beaker / Spoon

Depth of Sample: 0 - 6"

Description of Sampling Point:

Drainage Direction: South to North

Upstream From: Low level Radioactive Area

Downstream From: Landfill

Physical Appearance/Odor: Clear / no odor

Sediment:

Wildlife Observed:

Sampling Description:

Suspended Matter: None.

Color/Stain:

Odor: None

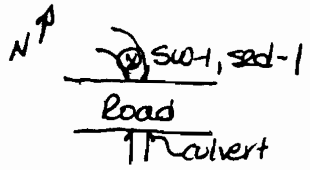
Other:

Texture: Coarse - sand & fine gravel

Analyze for: TOX, HSL organics, radioactivity, U, Th, Ra

Refrigerated: Date: 2/18/88 Time 1800 ~~a.m.~~ ___ p.m.

Location



Field Tests:

Temperature (C°/°F) —

pH —

Conductivity 562 mS

Weather Cloudy / 25°F

Comments: ~~took +~~

FIGURE 6.4
FIELD SURFACE SAMPLING RECORD

Site Ashland Petroleum NYSDEC Site No.______ Date: 2/24/88

Samplers: L. Dobson of Engineering-Science
M. Chauvin of "

SAMPLING: SW-2 Time 1100 a.m. / p.m.
SED-2

Sample Type: Surface water/sediment

Sampling Method: stainless steel beaker / spoon

Depth of Sample: water 0-4" Sed: 0-1.0'

Description of Sampling Point:
Drainage Direction: from south to north

Upstream From: ?

Downstream From: Low level radioactive area

Physical Appearance/Odor: fairly clear, no odor, some organics & suspended organic material

Wildlife Observed: –

Sampling Description:
Suspended Matter: organics (roots, leaves)

Color/Stain: none

Odor: none

Other: –

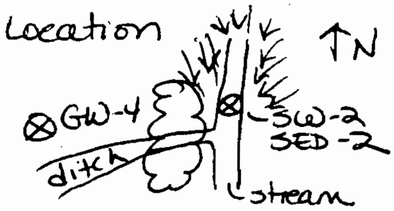
Texture: soil clayey/silty root rich

Analyze for: HSL organics, TOX, Radioactivity, U, Th, Ra

Refrigerated: Date: 2/24/88 Time 1600 a.m. / p.m.

Field Tests:
Temperature (C°/°F) ______
pH ______
Conductivity ______

Weather Cloudy, Snowing 32°F



Comments: TOOK MS/MSD sediment sample here