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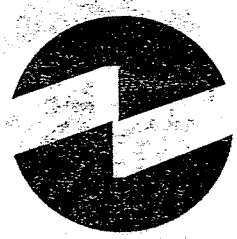
PHASE II INVESTIGATION REPORT
BUFFALO AVENUE SITE

INACTIVE HAZARDOUS WASTE SITE
REGISTRY NO. 932080



New York Power Authority

PREPARED FOR:

NEW YORK POWER AUTHORITY

WHITE PLAINS, NEW YORK

DECEMBER, 1988

PREPARED BY:

DAMES & MOORE

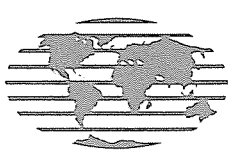
PEARL RIVER, NEW YORK

NEW YORK POWER AUTHORITY
BUFFALO AVENUE SITE
INACTIVE HAZARDOUS WASTE DISPOSAL
SITE NO. 932080
PHASE II INVESTIGATION REPORT

DECEMBER 20, 1988

NYPA CONTRACT NUMBER 02-5807-85

Dames & Moore



COVER LETTER

123 Main Street
White Plains, New York 10601
914 681.6200

New York Power Authority

December 20, 1988

Mr. John L. Krajewski
New York State Department of
Environmental Conservation
600 Delaware Avenue
Buffalo, NY 14202

Re: Buffalo Avenue Inactive
Waste Site #932080B

Dear Mr. Krajewski:

Please find herewith four copies of the Final Phase II Investigation Report prepared by Dames & Moore for the New York Power Authority's Buffalo Avenue Site located in Niagara Falls, New York. As you requested, a fifth copy of the report has been sent to Mr. Edward Perkins in DEC's Albany office. Dames & Moore is also forwarding the Quality Assurance/Quality Control material to Mr. Perkins.

Should you wish to discuss the report, please call me at 914/ 681-6384, or Mr. Edward Holman at 914/ 681-6408.

Very truly yours,

John W. Blake, Ph.D.
Director
Environmental Division

cc: E. Perkins (DEC, Albany) w/attach.
J. Fitzgerald "
J. Malinchock "
J. Lyons "
W. Slade "
R. Smith "
P. Pulgrano "
J. Carlson "

bafrcvlt

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EXECUTIVE SUMMARY

The Buffalo Avenue site is located in Niagara County, Niagara Falls, New York (Figure 1), bounded to the north by Buffalo Avenue, the south and east by the Robert Moses Parkway, and to the west by the City of Niagara Falls drinking water treatment plant (Figure 2). The site is currently owned by the New York Power Authority (NYPA).

Originally the Buffalo Avenue site was assembled from residential subparcels in the mid-1950's. Several areas of the site had been occupied by small businesses. Portions of the site were wetlands before filling with various types of material. Between 1930 and the 1950's, the Buffalo Avenue site was filled with incinerator residue and non-combustibles by the City of Niagara Falls. NYPA also used the site for the disposal of clean fill produced as a result of construction of the Niagara River Ice Canal. Between 1958 and 1963 NYPA used the site for storage of excavated soils from conduit construction for the Niagara Power Project.

As part of a foundation related soil investigation in mid-1981, trichlorobenzene, tetrachlorobenzene, and hexachlorobutadiene were detected in soil samples taken from test borings on the Buffalo Avenue site. In the summer of 1982 and the spring of 1983, the United States Geological Survey (USGS) undertook a sampling program of inactive hazardous waste disposal sites adjacent to the Niagara River. From soil borings taken during their investigation, detectable amounts of inorganic constituents and organic compounds were found on the Buffalo Avenue site.

In early 1983, a potential hazardous waste site preliminary assessment was carried out as part of a cooperative program between the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (DEC). The preliminary assessment recommended that EPA take no further action, but that DEC continue its sampling and monitoring program.

In 1985 a consent order from the DEC to NYPA regarding the initiation process of a Phase II Investigation of the Buffalo Avenue site was finalized. In late 1987, Dames &

Moore began and completed the field work involved in this investigation. The Phase II investigation consisted of seven discrete tasks:

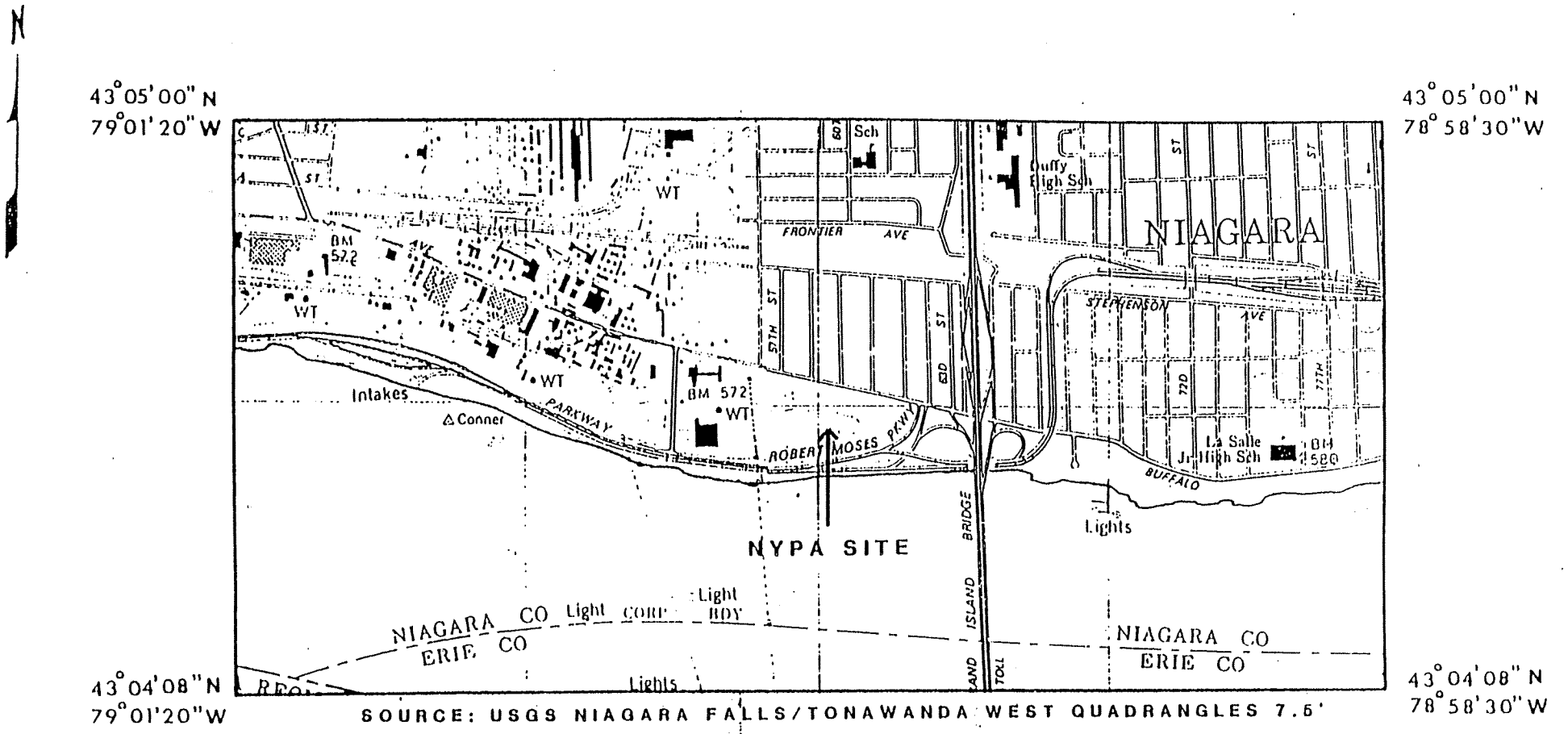
- A geophysical survey to characterize subsurface stratigraphic conditions;
- An air monitoring program to evaluate the air quality on-site;
- Initiation of a shallow soil sampling program to define near surface conditions;
- Installation of a two aquifer groundwater monitoring program to collect soil and groundwater samples; and
- Development of monitoring wells to help ensure collection of representative water quality samples;
- Slug testing of monitoring wells to measure aquifer response characteristics.
- Sampling and analysis of soil and groundwater samples according to NYSDEC protocols to delineate and identify the amount and extent of potential subsurface contamination.

The results of field and laboratory testing of surficial soils and fill material found that the EP Toxicity Limits for metals were occassionally exceeded. Low levels (10 µg/kg to 1000 µg/kg range) of organic compounds are also present in surficial soils, fill material and lake bed clay and till. These include primarily methylene chloride, acetone, polynuclear aromatic hydrocarbons (PAHs) and insecticides. Methylene chloride and acetone are common laboratory reagents and are present as a result of analytical procedures. PAHs may be associated with the incinerator residues disposed of at the site. Pesticides may be present due to on-site use or off-site migration.

Ground water from the overburden aquifer contains metal concentrations in excess of ambient water quality standards, solvents (methylene chloride and acetone) and other organic compounds (phthalates and insecticides). In the bedrock aquifer,

metals exceeding ambient water quality standards have also been detected along with methylene chloride, acetone and phthalates. The source for these constituents in the overburden and bedrock aquifer is apparently not located at the site.

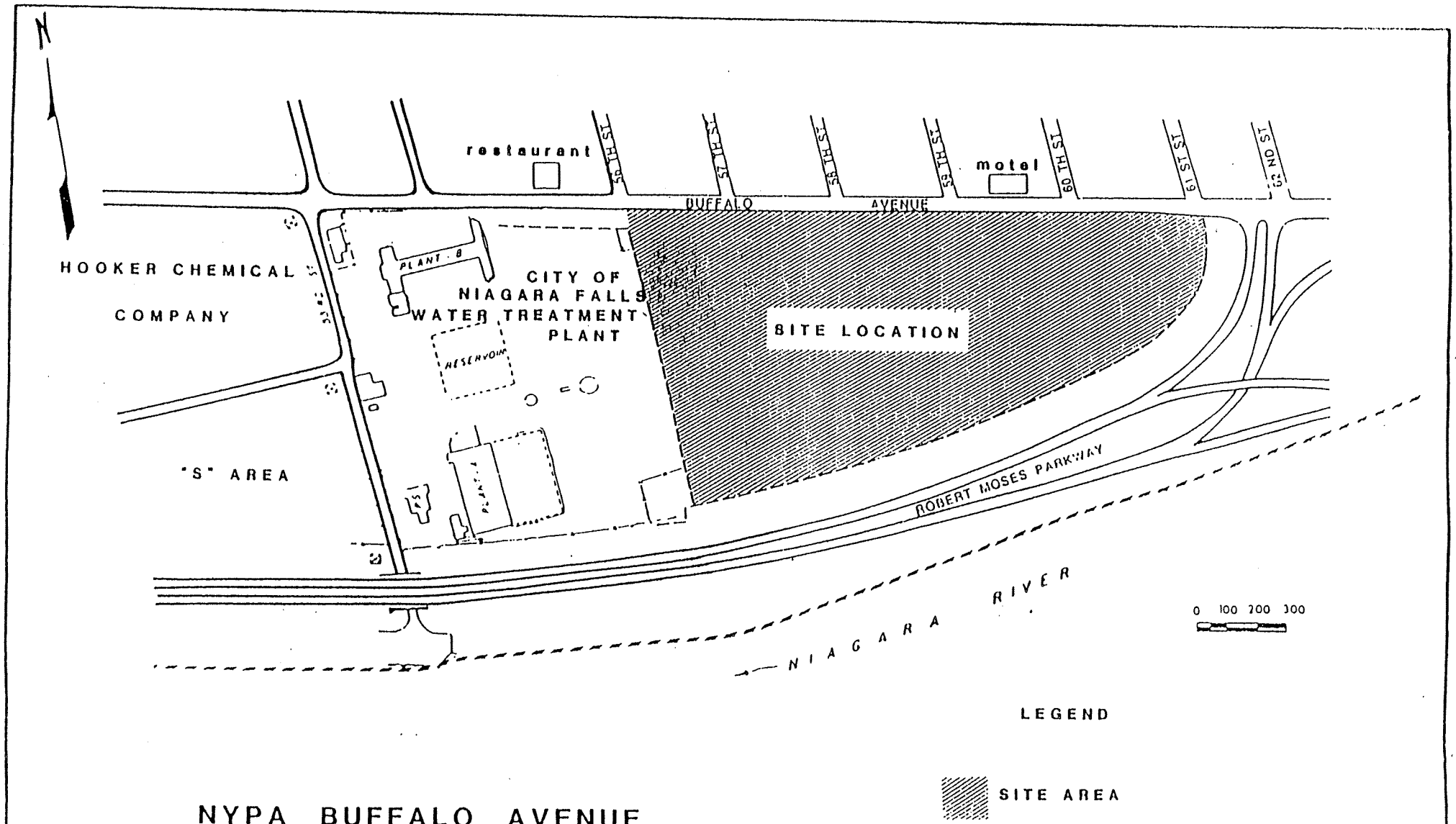
However, as described in Section 4.0, based on the results of EPA's Hazard Ranking System calculation, this study concludes there is no demonstration that this site presents an immediate hazard to the public or the environment.



NYPA BUFFALO AVENUE SITE

REGIONAL LOCATION MAP

FIGURE 1
DAMES & MOORE



NYPA BUFFALO AVENUE
SITE MAP

FIGURE 2
DAMES & MOORE

1.0 Purpose

The overall purpose of this Phase II investigation is to provide NYPA with a report which includes the site assessment, a Hazard Ranking System score, and a listing of remedial action alternatives with associated cost information. The evaluation of the site and its subsurface geology and hydrology was conducted through the installation and sampling of a groundwater monitoring system. This system provided ground water and soil data which was analyzed in order to assess potential on-site contamination. Through interpretation of these data, a Hazardous Ranking System (HRS) score was developed. The HRS score classified the site in terms of the potential level of hazardous contamination. From these assessments, suggestions for remedial actions and their estimated costs are reported to NYPA.

2.0 Scope of Work

A Phase I investigation of the Buffalo avenue site was carried out in early 1983 by NUS Corporation for the EPA. The intent of the investigation was to characterize the potential for hazardous wastes on-site and to make recommendations for further EPA action.

As reported in the Phase I investigation, (Reference 1) incinerator residue and non-combustible wastes are present on the Buffalo Avenue site along with the potential for unknown hazardous wastes. In response to these findings, a study plan was developed by NYPA and approved by the New York State Department of Environmental Conservation (DEC) which was divided into seven discrete tasks. The following tasks are listed and described below as they occurred during the Phase II investigation.

2.1 Geophysical Survey and Studies

A geophysical survey was performed to provide a preliminarily characterization of subsurface stratigraphy and to help select the arrangement of actual boring locations. The geophysical survey data (Appendix A) shows the thickness of the various sedimentary units across the site and the depth to bedrock. The existing boring logs from previous investigations were used to help correlate survey data to actual field conditions.

A 12-channel seismograph was used to conduct a seismic refraction survey at the Buffalo Avenue site. The seismic refraction method utilizes an induced shock wave to evaluate subsurface conditions. The shock waves move through the ground and are affected by the medium through which they pass. Geophones laid out at pre-arranged intervals on the surface detect the ground motion caused by the resultant wave. The seismograph is linked up with each geophone and it measures the time (in milliseconds) it takes for the resultant wave to reach each geophone. Analysis of the travel times and distances collected at each seismic station provides seismic velocities and depth to velocity interfaces.

This seismic technique was employed at twelve station locations selected in the field. On average, one seismic station was located within a 300 foot by 300 foot area. The information gathered from this spacing allowed a general mapping of subsurface

conditions (thickness of fill and depth to rock). Results of seismic surveys are discussed in Section 3.

2.2 Air Sampling

An air sampling program was implemented prior to and during the field program. Before drilling, ambient air quality on and adjacent to the site was monitored. The program included a total of twenty-one photoionization detector (HNu) readings along the perimeter and interior of the site. Two upwind and five downwind offsite measurements were also taken.

Before the start of drilling at each well location, photoionization detector and explosimeter readings were taken at upwind and downwind locations, approximately fifty feet from the wells. Additionally, during drilling, split spoon samples and ambient borehole air measurements were periodically taken. The results of all measurements, including the date, time, and approximate location were recorded and the results are discussed in Section 3.

2.3 Drilling and Monitoring Well Installation

A total of sixteen monitoring wells were installed at the Buffalo Avenue site. Eight of the wells were installed to monitor shallow ground water in the fill and permeable materials overlaying the clay and till (labeled "S" on Figure 6). The other eight wells were installed to monitor water quality in the bedrock or sand below the clay and till (labeled "D" on Figure 6).

The sixteen monitoring wells were drilled with hollow stem augers. The drill rig and downhole drilling equipment were steam cleaned prior to entering the site. Between each pair of monitoring wells and prior to leaving the site, the drill rig and downhole drilling equipment were subsequently steam cleaned.

The shallow and deep wells were installed in pairs, with each well installed within thirty feet of the other. The location of each well pair or cluster was selected following completion of the geophysical survey. The wells were positioned to monitor possible ground water flow from adjacent properties, ground water discharge at the site boundaries and in locations where significantly different subsurface conditions exist.

Soil samples taken were classified based on the Unified Soils Classification System by a Dames & Moore geologist in the field.

2.3.1 Shallow Wells (Type A)

Eight shallow wells were installed on the Buffalo Avenue site. A typical general construction schematic for the wells is shown in Figure 3. The shallow borings ranged between nine and twenty-seven feet in depth, terminating approximately one foot into a silty clay layer. A 4.25 inch inside diameter hollow stem auger was used to drill the shallow boreholes.

The wells in each borehole were constructed of 2" P.V.C. riser pipe, with 0.010" slotted screened. Each section of pipe was threaded, and no glue was used to join adjacent segments of the pipe. The well screens were approximately 10 feet in length extending from the top of the silty clay layer upwards to approximately one foot above the water table. The length of the screened interval was modified according to field conditions.

A silica sand pack was placed around the screened interval. Sand (#2 size) was poured into the borehole to one foot above the top of the screen. The screens rest on up to 1.5 feet of sand. Above this, a bentonite pellet seal up to 2.5 feet in length was installed. A cement-bentonite (7:1 ratio) grout seal was slowly poured into the borehole to the surface. A 5 foot steel protective casing was pushed into the borehole until 2-3 feet remained above ground level.

During drilling, continuous split spoon (2" I.D.) samples were taken in accordance with ASTM Specification D-1586 and monitored for the presence of volatile compounds with a photoionization detector. Representative samples not used for laboratory testing have been retained and are available for inspection. A geotechnical analysis of a composite soil sample at the proposed screened interval to measure grain size, Atterburg limits and moisture content was performed for each well. Between samples, the split spoons were cleaned with a phosphate free detergent followed by a tap water rinse.

After drilling, water level measurements were taken. Each well was then labeled with its identification number welded to the top of the protective stand pipe. The wells

were secured with padlocks. The elevation of each monitoring well was surveyed relative to a local USGS benchmark.

2.3.2 Deep Wells (Type B)

The eight deep monitoring wells were installed in fractured bedrock, in the sandy/gravelly material immediately above the bedrock, if present, or in a combination of these two zones. A general construction schematic for the wells is shown in Figure 4. The wells are monitoring ground water in the zone from the sandy layer through the fractured bedrock, to eight to ten feet below the top of bedrock. This fractured bedrock zone is the first aquifer below the till.

A 4.25 inch inside diameter hollow stem auger was used to advance the boring from ground surface to the top of bedrock, while continuous split spoon samples were taken. The continuous split spoon samples were taken from the surface to the top of bedrock in accordance with ASTM specifications.

Representative samples were retained from each split spoon, with selected samples being sent to the subcontracted lab for analysis. Representative samples not used in testing were retained and are available for inspection. Between sampling, the split spoons were cleaned with a phosphate free detergent followed by a tap water rinse between sampling.

The bedrock-soil interface was defined by auger refusal or blow counts greater than or equal to 100 blows per six inch advance of the split spoon. When bedrock was encountered, an NX bit and core barrel was used to advance the boring approximately 10 feet into bedrock. A pit was dug around the borehole to collect the coring and reaming water which was flushed out of the borehole. This water was removed with a bucket and placed in a 55 gallon drum. The borehole in the bedrock was then enlarged to approximately 3-7/8 inches using a roller cone bit.

The wells were installed in general accordance with the following procedures and as shown on Figure 4. A 2" PVC well was inserted into the borehole. The well included a 10 foot PVC well screen (0.010" slot) with threaded joints. The area surrounding the screen was backfilled by pouring silicon (#2 size) sand to a depth approximately one foot above the top of the screen. Then, a 1.5-2.5 foot layer of bentonite pellets was

poured into the boring, as the augers were removed. Above the bentonite, a cement-bentonite grout was poured into the borehole to seal the boring to ground surface. A 5 foot steel protective casing was pushed into the borehole unit 2-3 feet extended above ground level.

After drilling, water level measurements were taken. Each well was then labeled with its identification number welded to the top of the protective stand pipe. The wells were secured with padlocks. The elevation of each monitoring well was surveyed, based on a local USGS benchmark.

2.4 Well Development

After installation of the monitoring wells, water level measurements to the nearest 0.10 ft. were made and recorded, and each well was developed by removing five well volumes of water. Monitoring well pairs one through three were developed manually by the surge blocking method. Well pairs four through eight were overpumped using a 3/4 horsepower surface pump. During the process of development, the wells were surged rapidly for approximately one minute to agitate fines out of the well.

The discharged well water was retained in 55 gallon drums, monitored for pH, temperature, and specific conductance, and a visual inspection of turbidity was made. When these parameters stabilized in the well, it was considered developed. These procedures were consistent with the DEC approved plan. A listing of drummed material collected during the site work is provided in Appendix E.

2.5 Slug Testing

Following well development, a slug/recovery test was performed on each of the 16 monitoring wells. Based on the results of these tests, the hydraulic conductivity (permeability) of the screened geologic unit was calculated.

Before the test began, a water level measurement was made at each well. A slug with a known volume was lowered into the well causing the water level to rise. Water level measurements were made at selected intervals until the water level returned to 80-90% recovery. Then the slug was removed from the well and again water level

measurements were made at selected intervals until the well recovered to its prior water level.

2.6 Soil Sampling

A soil sampling program was implemented prior to the start of drilling. A total of 13 shallow (1-6 inches in depth) soil samples were collected at various locations on-site.

Before a sample was collected, a 1' x 1' square grid was laid out on the surface and the top 1" of the soil was removed. A representative soil sample from 1-6" below grade was collected and placed in a jar provided by the subcontracted lab. The location was marked with a stake and labeled with an identification number.

The soil samples were sent to Nanco Laboratories for analytical testing. Results are discussed in Section 3.

2.7 Ground Water Sampling

Sixteen ground water samples, one from each well, were taken and analyzed for the constituents listed in Appendix C. Ground water samples were taken within one week after well development.

Prior to ground water sampling, each well was purged with an electrical pump or bailer until 5 well volumes of water were removed. The pH, specific conductance, temperature and turbidity of the water were monitored to show if these parameters had stabilized before sampling. If, due to low hydraulic conductivity (and well yield), a well was bailed dry, the well was allowed to recover to approximately 80% of its original water level before sampling.

For each well, a bailer, dedicated disposable polypropylene line, and dedicated hoses were used for sampling. If bailers were reused, they were cleaned in accordance with procedures described in the DEC approved work plan. Purge or waste water generated during sampling was collected in 55 gallon drums for later disposal by NYPA.

2.8 Analytical Testing Program

2.8.1 Soil Testing

An analytical testing program was implemented for both the shallow soil and the split spoon samples. Both samples were tested for the same parameters: 26 priority pollutant metals, extraction procedure toxicity (including organics), and GC/MS scan of extractables. A list of the individual parameters and their detection limits is provided in Appendix C. The methodologies used to perform these tests are referenced in the Nanco Laboratories QA/QC Report, which is available for review upon request.

Additional soil testing was performed on two replicates, matrix spike and spike duplicates. Soil samples for possible analyses of 2,3,7,8 TCD were retained by Dames & Moore. These tests were performed to meet Quality Control/ Quality Assurance protocol requirements and DEC Superfund and Contract Laboratory Protocols. Nanco Laboratories, subcontractor, is a New York DEC and EPA contract laboratory.

Chain-of-custody procedures were implemented on all soil samples taken. These procedures were initiated when a soil sample was taken from the split spoon or hand sample and placed in a laboratory cleaned jar. The jar was then labeled to show the date, sample type, sample location, sample number and depth, and the sampler's name. At such time, corresponding field documentation was also completed. The samples were then placed in a sealed container under the control of the Dames & Moore field geologist. When the geologist relinquished control of the samples, the person receiving the samples signed the chain-of custody forms, along with each person handling the samples. Additional forms were used to follow the progress of the samples through the laboratory.

2.8.2 Groundwater Testing

A separate analytical testing program was carried out for the groundwater samples. Each groundwater sample was tested for the same parameters, priority pollutant metals, extraction procedure toxicity, and GC/MS scan of extractables. A list of the individual parameters and their detection limits is provided in Appendix C. The methodologies used to perform these tests are referenced in the Nanco Laboratories QA/QC Report, which is available for review upon request.

Additional groundwater testing was preformed on two trip blanks (one for each day's sampling), one duplicate sample and two samples for matrix spike and spike duplicates. Additional samples were also taken and retained for possible subsequent analysis of 2,3,7,8 tetrachlorodibenzo-p-dioxin. These tests are performed to meet Quality Control/Quality Assurance protocol requirements and DEC Superfund and Contract Laboratory Protocols.

Chain-of-custody procedures were implemented on groundwater samples taken. These procedures were initiated when a sample was taken from the bailer and placed in a laboratory cleaned jar. The jar was then labeled to show the date, sample type, location, sample number, and the sampler's name. At such time, Corresponding field documentation was completed. The samples were then placed in sealed containers, under the personal control of the Dames & Moore field geologist. When the geologist relinquished control of the samples, the person receiving the samples signed the chain-of-custody forms, along with each person handling the samples. Additional forms were used to follow the progress of the samples through the laboratory.

2.9 Disposal of Wastes and Residues

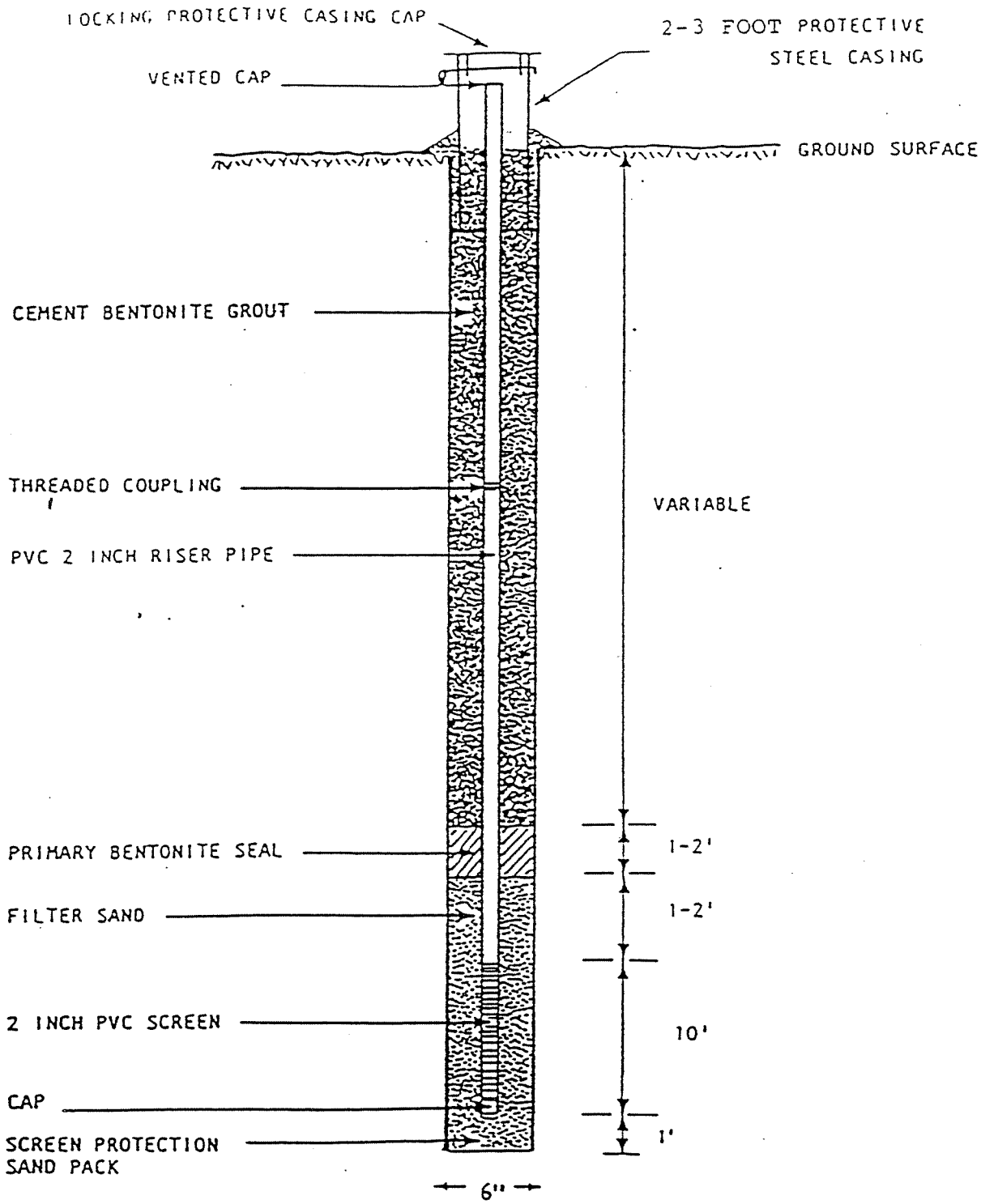
2.9.1 Solids

The soil and downhole cuttings removed during the drilling program were temporarily placed in 55 gallon drums. Each drum was labeled with the project name and number, identification number, the monitoring well location, the drum's contents, and the date. The drums were transported by truck to an NYPA holding facility pending results of the soil analyses. A listing of the drums and their contents is provided in Appendix E.

2.9.2 Liquids

Development water, purge water and water from the bedrock coring were temporarily placed in 55 gallon drums. Each drum was labeled with the project name and number, an identification number, the monitoring well location, the drum's contents, and the date. The water quality was monitored with a photoionization meter and observed visually for contamination. The drums were transported to a NYPA holding facility by truck. The decision on how to dispose of the contaminated water will be based

on the analytical results from the laboratory, the identification of its hazard and subsequent discussions with the DEC. A listing of drums and their contents is provided in Appendix E.



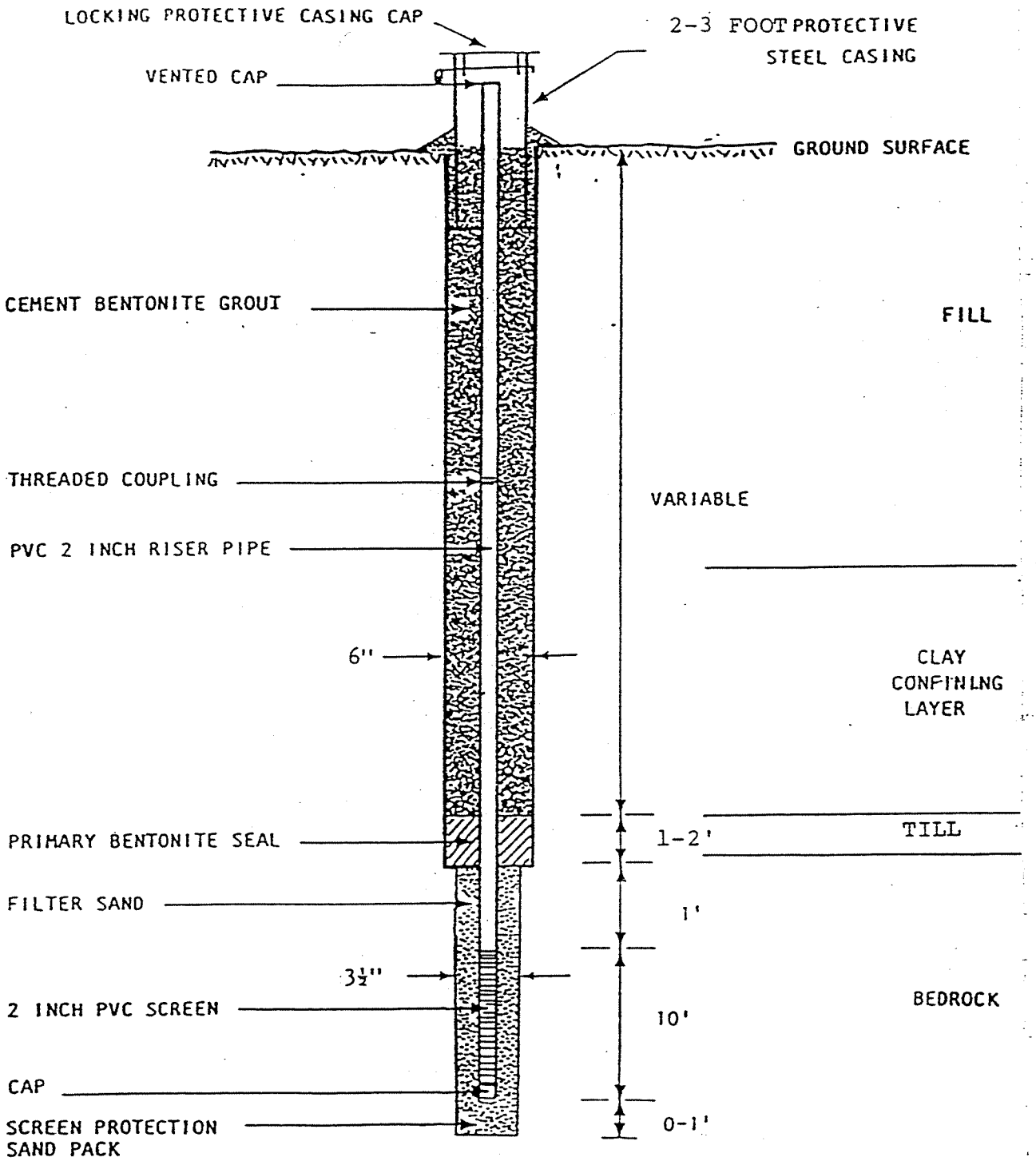
TYPICAL SHALLOW WELL

(TYPE A)

(NOT TO SCALE)

Dames & Moore

FIGURE 3



TYPICAL BEDROCK WELL

(TYPE B)

(NOT TO SCALE)

Dames & Moore

FIGURE 4

3.0 Site Assessment

3.1 Site Surroundings

The area surrounding the Buffalo Ave site contains a mix of commercial, industrial and residential properties. To the north and east of the site is an area composed mainly of 1 and 2 family houses and some retail businesses. Adjacent to the site's southern boundary is the Robert Moses Parkway, an elevated four lane highway. Approximately 500 feet south of the Parkway is the Niagara River which flows westward parallel to the site's southern boundary. Adjacent to the site on the west is the City of Niagara Falls Water Treatment Plant and to its west, the Hooker Chemical Company "S-area". The "S-area" is a EPA designated Superfund site.

In the mid-1950's, residential houses were present on the site lining Buffalo Avenue. Also during this period, the site was used by other retail businesses (marina, hotel, motel, bowling alley, etc.). Presently, the site is devoid of buildings or structures.

No known drinking water wells exist within a 5 mile radius of the site (Reference 2). The nearest industrial well is present 1.5 miles downstream (west) at a chemical company. (Reference 2).

3.2 Site Topography

The site covers approximately 30 acres and is flat with some slight (2-5%) slopes (Reference 1). An elevated mound is present in roughly the center of the site and Figure 5 illustrates site topography as compiled from recent limited surveying activities. A few trees are clustered along the northern boundary of the site across from 58th Street on Buffalo Avenue. Some small scattered mounds and depressions were observed on the grass-covered surface which might be the result of differential settlement of site soils. A low lying area is present along the southwestern margin of the site. This depression corresponds to an old river inlet which has been filled.

3.3 Hydrology

A two aquifer system exists beneath the Buffalo Avenue site. A monitoring well program consisting of 8 shallow and deep wells (see Figure 6) was implemented to monitor these systems. A shallow aquifer is present in the overburden, while a second deeper water bearing zone is present in both the bedrock (the Lockport dolomite) and the permeable material overlying the bedrock. The aquifers are apparently not hydraulically connected due to the existence of a lake bed clay layer between the two units. A discussion on each aquifer follows.

3.3.1 Overburden Aquifer

Soil borings and monitor well testing were used to define this aquifer and its hydrologic characteristics. Cross sections have been prepared (Figures 7 and 8) to provide a 2-dimensional view of the site.

Eight shallow monitoring wells were installed to evaluate the overburden aquifer. A boring log and corresponding well construction diagram for each shallow well are attached in Appendix B. A summary of well construction specifications is provided in Table 1. Water yields from the shallow wells are variable and range from less than 1 gpm to over 15 gpm. A summary of water table measurements is listed on Table 2.

The shallow wells were installed in fill material, natural soils or both. The lithology of the fill material consists of a mixture of cinders, silty-gravel, gravelly-sand and a silt and clay combination. Natural soils consist of sand, silty-sand and a combination of silt and clay. The thickness of the fill material/natural soil in which the wells were installed varies from approximately 5 to 30 feet. Figure 9 illustrates the distribution of the fill material/natural soil across the site. As might be expected, fill material/natural soil thickness increases southward towards the Niagara River. Natural soils were probably laid down as result of recent fluvial activities of the Niagara River. Fill materials were deposited in wetlands adjacent to the River during land reclamation efforts by the City of Niagara Falls and NYPA.

Shallow monitoring wells were installed and depth to water measurements were made. These data were the basis for constructing a water table map (Figure 10) for the

overburden aquifer. This map illustrates that the direction of shallow ground water flows in the overburden aquifer is generally southward towards the Niagara River.

The rate of flow in the overburden aquifer is governed by the permeability (hydraulic conductivity) of the materials, hydraulic gradient, and other factors. Dynamic aquifer tests (slug tests and recovery tests) evaluated the hydraulic characteristics of the overburden aquifer. Additionally, laboratory tests of grain size and Atterburg limits for selected soils samples within each well's screened interval (Table 3) were performed. The results of both tests indicate that:

- Hydraulic conductivities of overburden materials range from between 0.09 ft/min. and 0.2 ft/min. These ranges are consistent with the types of soil materials known to be present within this aquifer. Hydraulic conductivity calculations are presented in Appendix D; and

- Materials comprising the overburden aquifer range in size from silt to coarse sand and have low to no plasticity. This is also consistent with the soil classifications and indicates that these soils would not be suitable for use as line or cap materials.

Recharge of the overburden aquifer is by precipitation and surface runoff onto and adjacent to the site. Mean annual precipitation in the general area averaged approximately 32 inches (Reference 3). Average precipitation runoff for the area is approximately 15-20" or 50-60 percent of the annual precipitation (Reference 3). Given the site's relatively low relief (about 2-4 feet on average), and the presence of small depressions and other local low areas on-site, surface waters tend to collect and infiltrate into the overburden aquifer. If recharge rates are assumed to be 40 to 50 percent of the annual precipitation, then approximately ten million gallons of water are available to recharge the overburden aquifer every year or approximately 300,000 gallons per year per acre.

By utilizing hydraulic conductivity data, average aquifer discharges towards the Niagara River can be calculated. Assuming an average water table gradient of 0.016 and an average transmissivity of 3 ft^2/min (see Appendix D), approximately 3.3 E9 gallons of water flow from the overburden aquifer towards the Niagara River.

3.3.2 Lake Bed Clay

Underlying the fill material/natural soil at the site is an approximately 5 to 15 foot thick layer of red-brown silty clay. This clay layer probably formed during a quiet water interglacial period and apparently acts as an effective barrier between the overburden aquifer and the underlying bedrock aquifer. The soil borings for the monitoring wells were terminated approximately 1 foot into this confining lake bed clay layer.

Figure 11 is a contour map of the surface of the lake bed clay layer. This map indicates that the top of the clay layer occurs closer to the surface along Buffalo Avenue and is deeper along the site's southern boundary near the Robert Moses Parkway. Therefore, the slope of the clay surface is southward towards the Niagara River. This is consistent with the distribution of the fill materials/natural soils shown on Figure 9.

3.3.3 Bedrock Aquifer

Underlying the lake bed clay is a layer of glacial till. This till was deposited during Pleistocene glaciation (approximately 18,000 years ago) and consists of a dense, light brown silty clay containing between 10-25 percent gravel. The thickness of the till layer ranges between 10 to 15 feet and was a factor in interpreting the geophysical data.

In areas of the site (especially along the western boundary) where the till layer is thin (4 to 6 feet), the depth to bedrock identified by the geophysical survey agreed (within a few feet) with the depth to bedrock observed during drilling. Under the central and eastern sections of the site where the till layer is thicker (10-15 feet), the difference between calculated depth to bedrock and observed depth to bedrock was greater (8 feet or more).

At five locations underlying the till was a thin (0 to 3 foot) layer of flowing sand and coarse gravel. The gravel often contained pieces (up to 2 inches in diameter) of the underlying dolomitic bedrock. This layer was saturated and the upper portion of the deeper monitoring wells are screened (up to 3 feet) in this layer when it is present.

Eight deep monitoring wells were installed to evaluate the bedrock aquifer. A boring log and as-built well diagram for each well are attached in Appendix B. A summary of monitoring well specifications is provided in Table 1. The deep wells were screened in the bedrock or in a combination of bedrock and the overlying sand and gravel layer. Yields from the deep wells are high, averaging over 20 gpm.

The bedrock underlying the site is the Lockport Dolomite. The dolomite, a type of sedimentary rock similar to limestone but containing more magnesium than calcium, is light to medium grey with thin interbedded dark grey to black shale layers. During drilling of the deep wells, NX cores of the bedrock were taken. An examination of these cores indicates that fractures, both horizontal and, less frequently, vertical are present in the bedrock. Additionally, vuggy zones (small cavities or holes) and solution pits are present in almost all sections of the cores. Mineralization (gypsum and calcite) was observed filling the vuggy zones and present in some of the fractures.

The top of the bedrock was first identified by auger refusal and confirmed by NX coring. These refusal data and results of NX coring were used to construct a bedrock surface map (Figure 12). This map shows the top of the bedrock surface to be highest in the northeast section of the site and sloping generally south-southwest towards the Niagara River. The bedrock trough defined by the 535.5 ft contour interval (located near MW-4D) corresponds to an old channel of the Niagara River which has been filled. The bedrock low present in the southwestern corner of the site (near MW-7D and MW-8D) is representative of an old river inlet which has also been filled.

Deep monitoring wells were installed and depth to water measurements were made. This data was used to construct a water table map (Figure 13) for the bedrock aquifer. Flow contours shown on this water table map closely follow those shown on the bedrock surface map and indicate that groundwater flow in this aquifer is generally southwestward.

The rate of flow in this aquifer is governed by the spacing and orientation of the fractures and vugs, the permeability (hydraulic conductivity) of the overlying material, the hydraulic gradients and other factors. The predominant flow of groundwater in the bedrock will be via secondary permeability i.e. through the fractures and vugs. Ground water flow through the overlying material will be via interstitial pore spaces present in the sand and gravel. Dynamic aquifer tests (slug tests and recovery

tests) were performed to evaluate the characteristics of this water bearing zone. The results of these tests are summarized in Appendix D .

Significant recharge of the bedrock aquifer probably does not occur from the overlying overburden aquifer on the site. The lake bed clay layer probably acts as an effective barrier to downward migration of shallow ground water. This can be confirmed indirectly by reviewing the water quality data for both aquifers (see Section 3.4).

3.4 SITE CONTAMINATION

A major part of this section of the Phase II Report is the presentation, through a series of summary tables, of the laboratory analytical data. These data have been analyzed and reported in accordance with DEC Contract Laboratory Protocol (CLP) requirements. The CLP requires that specific analytical procedures be used to test the sample and the resulting data be reported in a certain format. However, CLP testing procedures cannot be uniformly applied to all samples with 100% efficiency. Often the nature of the sample is such that the testing procedure, no matter how correctly applied at the laboratory, will not yield unambiguous results. The CLP recognizes this limitation and has developed a series of data qualifiers or flags to be used when such conditions occur. These flags do not invalidate these data, but rather they serve to warn the user that the testing procedure (specified by the CLP) has not been completely effective in analyzing the sample.

Table 16 provides a listing of flags used in these data tables of this Phase II Report. In reviewing these data tables, there are two types of flags which will most likely catch the readers attention.

- 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 these data users to take appropriate action. The CLP recognizes the potential for this type of blank contamination and allows method blanks to contain up to 5-10x the required detection limits for several types of compounds (e.g., acetone and methylene chloride). Therefore, analytical results with a "B" flag need to be evaluated in light of the fact that the compound detected in the sample was also present in the method blank and that some or all of the reported concentration may be an artifact of

laboratory analysis. This type of flag is used only in the analysis of organic compounds;

- E, N, S, *, + -: These flags are most often used in the analyses of inorganic compounds. They are indicative of analytical problems resulting from sample matrix interference. That is, an unambiguous quantification of a certain analyte (e.g. Mn) cannot be given because there is too much interference from the analytes in the sample (e.g. Fe). To compensate for this interference, the CLP allows for some flexibility in determining the concentrations (standard addition method or value estimating). The CLP does require, however, that when this sample matrix inference occurs, these data users be alerted.

3.4.1 Review of Past Data

In mid 1981, seven test borings were completed on the Buffalo Avenue site as part of a soil investigation. The borings (Figure 14) were located primarily between 56th and 58th Streets. Nineteen soil samples were taken for laboratory analysis for trichlorobenzene, tetrachlorobenzene, C-56 (hexachlorocyclopentadiene) and C-46 (hexachlorobutadiene). Laboratory results are listed in Table 4. Detectable amounts of three of the four compounds, with the exception of C-56, were found in the soil samples, and a trend was established between concentration and depth. Generally, the samples with high concentrations of these compounds were found at the surface with concentrations decreasing with depth. However, in one boring this trend was reversed with the highest concentration observed at the greatest depth.

In the Summer of 1982 and the Spring of 1983, the USGS undertook a sampling program of inactive hazardous waste sites adjacent to the Niagara River to investigate potential toxic contaminant entry into the river. Nine test borings (Figure 15) were made on-site. Six were taken along the Robert Moses Parkway and three were drilled along Buffalo Avenue between 57th and 59th Streets. Substrate samples from each boring location were analyzed for various inorganic constituents and organic compounds. The results of these analyses are listed in Table 5. Concentrations of organic compounds which had exceeded the detection limit were observed in samples from test boring #1. A small amount of 4,4-DDT was noted in a second round of sampling at location #2. In the analysis for the inorganic constituents, high iron concentrations were observed in the

samples and soil splits. A possible explanation for the high concentrations of organic compounds was not given in the report.

The USGS report did conclude that insufficient data was available to make an assessment of the site on the Niagara River. The report also states that groundwater data is needed and that monitoring of the property be continued until these data shows no evidence of toxic material.

3.4.2 Review of Shallow Soil Data

Shallow (1-6" below surface) soil samples were collected prior to the start of the drilling program. Thirteen samples were taken at various locations on-site (Figure 16). Each sample was analyzed for the inorganic and organic constituents listed in Appendix C. Analytical detection limits for these and all laboratory data are provided on the original data sheets, a copy of which has been included as a separate attachment to this Phase II Report.

The chemical composition of soil is controlled by many interrelated factors: source area, weathering, mineral and clay content, etc.. As such, metal concentrations in soil can vary widely. In order to identify and evaluate potential contamination, data from soil analyses were compared to both typical published soil values (Reference 5) and Maximum Concentration Levels (MCL). Typical values were taken from a recent study which analyzed a wide range of soil types. MCLs are used in identifying materials as hazardous waste. If liquid, after leaching through a material (in this case, soil) contains more of a substance than the MCL, then that material (soil) is considered a hazardous waste (Reference 9). A listing of MCLs is provided in Table 6.

Table 7 summarizes the inorganic analytical results (24 total metals, 8 EP Toxicity metals and pesticides/herbicides) of the shallow soil samples. All but one of the extractable metal concentrations (selenium) were less than the MCL. The selenium concentrations ranged from 0.654-1.305 mg/Kg and were highest in those samples collected from the center of the site. Selenium can be added to the soil artificially by use of fertilizers and by air pollution fallout from burning coal and paper (Reference 10). The selenium concentration may be related to incinerator residues which were reportedly disposed of at the site.

Analyses of shallow soil samples for metals indicated that reported metal concentrations (except zinc) were within typical ranges for natural occurring soils. Zinc concentrations ranged up to 830 µg/kg, which is almost triple the typical concentration found in soil. Samples with elevated zinc levels were collected at various locations across the site, and a clear trend or pattern of occurrence could not be established. Zinc is a naturally occurring element found in clays and soils at varying concentrations. Higher than typical levels reported for some shallow soil samples are probably due to natural variability of these elements. No pesticides/herbicides were detected as a result of EP Toxicity testing of the shallow soil samples.

Table 8 summarizes the organic compounds which were detected in the shallow soil samples. Methylene chloride (24-244 µg/kg) and acetone (ND-78 µg/kg) were found in the shallow soil samples. These compounds are commonly used laboratory reagents and were also detected in the laboratory blanks at concentrations ranging from 3.7 µg/L to 22 µg/L and 5.2 µg/L to 48 µg/L, respectively. Therefore, some of the methylene chloride and acetone detected in these samples is probably present due to laboratory analytical procedures. However, concentrations of greater than 50 µg/kg methylene chloride and acetone reported in samples S5 through S-13 and sample S-11 respectively are too high to be related to laboratory procedures and are indicative of soil contamination at those locations. The source of these solvents cannot be identified from the existing data.

Trace (<5 µg/kg) concentrations of benzene (1.4-3.9 µg/kg) were detected in 6 of the 13 soil samples. Benzene was also detected in the laboratory blanks at similar trace concentrations ranging from 1.1 to 1.8 µg/L. Amounts detected in these soil samples are not indicative of widespread benzene contamination at the site.

2 - butanone was detected in sample S-2 at 6.2 µg/kg and vinyl acetate was detected in samples S-2 at 13 µg/kg and S-7 at 6 µg/kg concentrations. Also detected in S-7 were trace (<5 µg/kg) concentrations of 1,1 dichloroethane, 1,1,1 trichloroethane and trichloroethene. The presence of these parameters at trace concentrations in only one or two samples suggests that they are not indicative of widespread or significant surficial soil contamination at the site.

Phenanthrene (400 µg/kg), fluoranthene (700 µg/kg) and pyrene (490 µg/kg) were found in the soil samples collected at locations S-2 and S-13. These compounds are

derivatives of coal tar. These locations are close to Buffalo Avenue, and may be related to asphalt fragments from that road or from incinerator residues reportedly disposed of at the site.

3.4.3 Air Monitoring Data

An air monitoring plan was put into effect prior to and during the drilling program. This plan monitored the air quality on and adjacent to the site.

Prior to the drilling, program twenty-one photoionization detector (HNu) readings were made along the perimeter and interior of the site. Measurements were also made off-site at two upwind and five downwind locations. The locations where the measurements were taken are shown in Figure 17.

The results of this air monitoring program are listed in Table 9. The values at each location ranged between 0-0.3 ppm. This range in photonization detector readings is considered "normal" background. Therefore, these values were used as the standard background readings during the field investigation.

During drilling, above background HNu readings were recorded in shallow borings (MW-1,2,3,4,6,and 7) and deep borings (MW-3,4,6,7, and 8). These readings ranged between 0.4-15 ppm. Elevated HNu readings correspond closely with laboratory analytical results from these same borings.

3.4.4 Overburden Contamination

3.4.4.1 Soil (Fill) Data

Continuous soil samples were collected within each borehole. A representative sample from each deep boring was taken at each change in stratigraphy for laboratory analysis. Additional samples were also analyzed upon request by NYPA. Each sample was analyzed for the inorganic and organic constituents listed in Appendix C. Analytical detection limits for these and all laboratory data are provided on the original data sheets, copies of which have been included as a separate attachment to this Phase II Report.

The inorganic analytical results (24 total metals, 8 E.P. toxicity metals and pesticides/herbicides) for samples collected in the fill are summarized in Table 10. The extractable metals (except arsenic) were under the MCLS. An arsenic value of 5.341 mg/kg/, was present in sample MW-2D S1-4. This sample was taken over the range 0-8 feet below surface. Other arsenic values were up to 2 orders magnitude below allowable EP toxicity concentration. Arsenic is a naturally occurring element in soil and the value reported for sample MW-2D S1-4 is probably reflective of a natural variation in soil concentration.

In the inorganic analyses, seven of the twenty-four (24) total metals were above typical concentration in soils (Table 6) at various sampling locations. Three of the metals (aluminum [2889.1-98800 µg/kg], iron [7760.4-60500 µg/kg] and potassium [652.2-1903.5 µg/kg]) are found naturally occuring in clays, which are common in the fill. This would explain their high concentrations.

Copper (1741.6 µg/kg), sodium (620-16658.6 µg/kg) and zinc (430-1300 µg/kg) were observed in the fill at MW-7S and D. The high copper and sodium values correspond to the depth at which an orange incinerator residue was found during drilling. The elevated zinc values, which were found at MW-8, are probably also due to a slag-cinder layer associated at this location. No pesticides/herbicides were detected in the fill during the extraction procedures.

A summary of the organic results from analysis of soil samples collected from the fill is provided in Table 11. Acetone (13-380 µg/kg) and methylene chloride (ND-160 µg/kg) were found in the soil samples. The laboratory blanks also contained concentrations of methylene chloride (between 2.2 µg/l and 24 µg/l). Some of the concentrations detected in these samples are probably related to laboratory testing procedures.

A variety of other organic compounds were also detected in these soil samples. Concentrations ranged from just a trace (<5 µg/kg) to low (<50 µg/kg) and include:

- Benzene (up to 9 µg/kg) in 11 samples. Benzene was also detected in the laboratory blanks at a concentration of 1.4 µg/l.

- 2-Butanone (8.6-55 µg/kg) in 2 samples.

Vinyl acetate (17 µg/kg) was found in 2 samples from MW-4D (S5 and S11) and in the laboratory blank. Vinyl acetate was also found in S11 (72.2 µg/kg) which was collected from the native soil below the fill.

Trichloroethene (1.3-1.8 µg/kg), 1,1,1 trichloroethane (1-2.1 µg/kg), tetrachloroethene (2.8-11 µg/kg), toluene (1.2-5.9 µg/kg), phenol (79 µg/kg), total xylene (3.3-12.5 µg/kg), and styrene (up to 5.4 µg/kg) were detected in samples from various boreholes. Phthalate compounds (plasticizers) were reported at varying concentrations in some samples and laboratory blanks.

No pattern of occurrence is apparent for the above described constituents and reported concentrations are generally low (<50 µg/kg). The presence of these constituents is not thought to be indicative of widespread or significant soil contamination at this site.

Polynuclear aromatic hydrocarbons (PAH) were found in soil samples collected at six locations (MW-1D, MW-2D, MW-7S and D, MW-8D and B-3). The PAHs reported at these localities and their concentrations are listed in Table 12. The highest concentrations of PAHs were detected near the surface and the concentrations decreased with depth. These compounds are generally associated with coal tars, asphalts and can also be a product of incomplete combustion. Their presence is probably related to incinerator residues reportedly disposed of at this site.

Five insecticide compounds (aldrin, 4,4'-DDD, dieldrin, endrin and heptachlor) were detected in soil samples from B-3, MW-7D and MW-8D. These insecticides present at the site are probably due to atmospheric fallout or actual on-site disposal. Insecticides are manufactured a few blocks west of the site.

3.4.4.2 Overburden Aquifer

Ground water samples from the monitoring wells (MW1S-8S) screened in overburden were collected and sent to the laboratory for analysis. Samples were analyzed for the inorganic and organic constituents listed in Appendix C. Analytical detection limits for these and all laboratory data are provided on the original data sheets, copies of which have been included as a separate attachment to this Phase II Report.

The ambient water quality standards used to compare the ground water results are shown in Table 13. Table 14 lists the inorganic results of the overburden ground water analyses.

Thallium, selenium and copper were not reported in the ground water at concentrations above ambient water quality standards. Zinc (MW-1S, MW-7S), mercury MW-1S, 7S, 8S), antimony (MW-7S) and beryllium (MW-3S, MW-4S, MW-7S) were reported in ground water from some wells at concentrations higher than ambient water quality standards. But not in a manner (i.e. individual, widely spaced wells at concentrations usually within the same order of magnitude as the ambient water quality standard) which indicates that they are cause for significant concern.

Iron, magnesium and manganese exceed ambient water quality standards in all ground water samples. However, these are naturally occurring constituents and their presence at these concentrations may be reflective of regional water quality rather than site specific conditions.

Lead, silver, cadmium and chromium concentrations exceeded ambient water quality standards in all or most of the overburden aquifer ground water samples. Cadmium and chromium concentrations are shown in the form of isopleth maps in Figures 18 and 19, respectively. Arsenic and barium concentrations in ground water from 7 wells and 5 wells respectively also exceeded ambient water quality standards. Barium distribution in the overburden aquifer is illustrated in Figure 20. However, EP toxicity testing and total metals analyses for these constituents (Section 3.4.4.1) did not report the presence of high concentrations of these metals in on-site soils from these same locations. This is an indication that the source or sources for these

concentrations are not present on the site, but are located to the north-northwest in the upgradient direction of ground water flow (Figure 10).

Table 15 lists the organic results of the overburden aquifer ground water samples. A variety of chemical compounds were detected in the samples. Methylene chloride (13-400. µg/l) and acetone (1.1-130 µg/l) were found. In approximately half of the samples, acetone was also detected in the laboratory blank. Some of the amounts of acetone and methylene chloride are therefore present in these samples due to laboratory analytical procedures.

Traces (<5 µg/L) of benzene (MW-1S, MW-7S) and trichloroethene, (MW-2S) were found in three samples but these concentrations are not indicative of widespread or significant ground water contamination.

One PAH compound (napthalene) was detected in the ground water sample at MW-3S. The concentration of napthalene was 29 µg/l. PAHs were detected in the soil samples at several localities, but they were not found in the fill at MW-3S. No other PAH compounds were detected in the overburden aquifer. This single occurrence indicates that PAH compounds have not significantly impacted overburden aquifer ground water.

Two phthalate compounds (di-n-octyl phthalate and bis [2-ethylhexyl] phthalate) were found in the overburden ground water samples. At MW-4S, 33 µg/l of di-n-octyl phthalate was detected. In each ground water sample taken from the overburden aquifer (except MW-5S) bis (2-ethylhexyl) phthalate was detected. The concentrations ranged from 29-2700 µg/l. Phthalate compounds were also found in the laboratory blanks. Some of the phthalate concentrations are probably present due to laboratory analytical procedures.

Four compounds (aldrin, delta-BHC, endosulfan I, and heptachlor epoxide) which are insecticides were detected in the overburden ground water at MW-3S, MW-6S, and MW-7S. These insecticides probably leached out of the soils because detectable concentrations were found in the fill. Insecticides are manufactured at a chemical company a few blocks west of the site.

were what Background?

Benzoic acid was detected in ground water from MW-7S at 1200 µg/l in the overburden aquifer. It was not detected in the soil analyses, but benzoic acid is associated with toluene, which was found at trace (<5 µg/kg) concentrations in several soil samples. This benzoic acid occurrence is not indicative of significant contamination of the overburden aquifer.

3.4.5 Bedrock Contamination

3.4.5.1 Lake Bed Clay and Underlying Till Data

Split spoon soil samples were taken of the lake bed clay and underlying till layer present at the Buffalo Avenue site. These samples were analyzed for the inorganic and organic constituents listed in Appendix C. Analytical detection limits for these and all laboratory data are provided on the original data sheets, copies of which have been included as a separate attachment to this Phase II Report.

Inorganic analytical results (24 metals, 8 EP toxicity metals and pesticides/herbicides) for samples collected from the lake bed clay and underlying fill are summarized in Table 10. In all cases but two (arsenic-MW-2D and barium MW-5D) extractable metals were under the EP toxicity MCLs. These samples were taken at depths of about 20-25 feet below grade. All other arsenic and barium concentrations were well within MCLs.

No pesticides/herbicides were detected in these soils during extraction procedure testing. However, four metals of the twenty-four tested were above average soil concentrations at various sampling locations. Three of these metals (aluminum, iron and potassium) are common naturally occurring constituents of clay minerals present in the soil. Elevated zinc levels were reported at locations MW-7D and MW-8D at depths of between 15-25 feet. In both cases these are the upper portion of lake bed clay soils. Zinc is also a naturally occurring element common in clay soils and its presence is not indicative of widespread or significant soil contamination.

Organic results of soil samples collected from the lake bed clay and underlying till are summarized in Table 11. Methylene chloride and acetone were detected in almost all the samples including the blanks. Some of the amounts of acetone and methylene chloride are therefore present in these samples due to laboratory analytical procedures.

Trace concentrations (<5 µg/l) of benzene were detected in about half the samples, including some laboratory blanks, and various phthalates were detected in two boreholes. Neither of these constituents occurs in concentrations or in a distribution that would indicate significant soil contamination present at the site.

Polynuclear aromatic hydrocarbons (PAH) were found in soil samples from one borehole (MW-7D). Concentrations ranged from 130 to 7800 µg/l and were consistent with those reported for the overburden materials. These compounds are generally associated with coal tars, asphalts and can also be a product of incomplete combustion. They may be present as a result of incinerator residues reportedly disposed of at the site. Phenol and 1,4 dichlorobenzene were also detected in this same borehole.

Trace concentrations (<5 µg/l) of various solvents (toluene, trichloroethene, 1,1,1 trichloroethane, tetrachloroethene, chloroform) were reported in samples from 3 boreholes. They do not occur in concentrations or in a distribution that indicates their presence on a widespread basis in this soil layer. Low concentrations (< 10 µg/l) of 2 butanone, benzo (a) pyrene, total xylenes, 2 hexonone and vinyl acetate were reported in samples from 5 boreholes. These also do not occur in either concentrations or patterns that would be indicative of significant soil contamination.

3.4.5.2 Bedrock Aquifer Data

Ground water samples were collected from the monitoring wells which were screened in the bedrock and overlying permeable layer. The samples were sent to the laboratory and analyzed for the inorganic and organic constituents listed in Appendix C. Analytical detection limits for these and all laboratory data are provided on the original data sheets, copies of which have been included as a separate attachment to this Phase II Report.

The inorganic results of the ground water sampled in the bedrock aquifer are listed in Table 14.

Antimony, beryllium, copper, mercury, selenium, thallium and zinc all reported concentrations below ambient water quality standards. Arsenic and barium concentrations were also below ambient water quality standards except for samples

taken from MW-8D and MW-D, respectively. Barium distribution in the ground water is illustrated in Figure 21. The results of these two analyses are not indicative of significant water quality migration to the bedrock aquifer.

Iron, magnesium and maganese concentrations exceed ambient water quality standards in almost all wells. However, these are naturally occurring in ground water constituents and may be reflective of regional water quality conditions.

Cadmium, chromium, lead and silver concentrations were higher than ambient water quality standards. The distribution of cadmium and chromium in the bedrock aquifer is illustrated in Figures 22 and 23, respectively. EP toxicity and total metals analyses did not detect high concentrations of these same constituents in on-site soils. This is an indication that the source or sources of these concentrations in the bedrock aquifer ground water are not present on the site but are located to the north and northwest, in the upgradient direction of ground water flow.

The organic results from the ground water analyses are listed in Table 15. Methylene chloride (15-87 µg/l) and acetone (11-46 µg/l) were detected in the ground water samples as well as in the laboratory blank. Some of the reported concentrations are probably present due to laboratory analytical procedures.

Estimated trace (<5 µg/L) concentrations of benzene (1.2-2.8 µg/l) were found in the ground water. Similar levels of benzene were reported in the soil samples. Trace amounts of trichloroethene (1.2 µg/l) and 1,1,1 trichoroethane (3.2 µg/l) were also detected in the ground water at MW-7D and MW-2D respectively. Toluene was detected in ground water from MW-6D (1.8 µg/L). All these values were estimated. Similar concentrations were also found in the lake bed clay and underlying till, but are not indicative of significant bedrock aquifer contamination.

Phthalates were detected in analysis of the ground water. Di-n-butylphthalate (16-33 µg/l) was detected at MW-1D, MW-5D, and MW-6D. Di-n-octylphthalate (20 µg/l) was reported at MW-1D. Bis (2-ethylhexyl) phthalate (15-95 µg/l) was detected at each location except MW-1D. This compound was also found in the laboratory blank and soil samples. Some of the reported concentrations are probably due to laboratory analytical procedures.

Two compounds (endosulfan II and endosulfan sulfate) which are manufactured insecticides were found in the bedrock aquifer at MW-3D. They were not found in the deep soil samples. The concentrations ranged from 0.03-0.05 µg/l and are estimated values. Insecticides are manufactured at a chemical plant west of the site.

TABLE 1
MONITORING WELL SPECIFICATIONS

Monitoring Well	Ground Surface (Ft.)	Screened Unit	Well Screen Setting (Ft.)	Total Depth of Well (Ft.)
MW-1S	574.14	Fill/Cinder	6.5-12.5	13.5
MW-1D	574.12	Bedrock	33.5-43.5	44.5
MW-2S	573.38	Sand/Under/Fill	11-211	22
MW-2D	573.24	Bedrock/Gravelly-Sand	32-42	43.4
MW-3S	576.44	Fill/Cinder	5-12	13
MW-3D	576.17	Bedrock	35-42	43
MW-4S	579.95	Sand/Fill	16-26	27
MW-4D	580.15	Bedrock/Gravel	45-55	56
MW-5S	574.76	Silty Sand	4-9	10
MW-5D	574.52	Gravel Bedrock	31-41	42
MW-6S	573.41	Silt/Sand	4-8	9
MW-6D	573.76	Gravel/Bedrock	32-42	43.5
MW-7S	573.52	Cinder/Fill	5-12	113.5
MW-7D	573.03	Gravel/Bedrock	34-44	45
MW-8S	570.16	Silty Sand	11-21	22
MW-8D	570..21	Bedrock	35-45	45.5

Table 2

Water Level and Monitoring Well Data

Monitoring Well	Elevation of Ground Surface (FT)	Elevation of Top of Casing (Measuring Point) (FT)	Depth to Water Level (FT) 12/1/87 & 12/2/87 11/10/87 & 11/12/87*	Water Level Elevation (FT)	Depth to Water Level (FT) 12-8-87-12-9-87	Water Level Elevation (FT)
MW-15	574.14	576.56	9.83**	566.73	11.79	564.77
MW-1D	574.12	576.20	12.5**	563.70	14.25	561.95
MW-2S	573.38	575.42	14.42**	561.00	11.88	563.54
MW-2D	573.24	575.19	11.75**	563.44	13.56	561.63
MW-3S	576.44	578.43	ND	ND	8.49	569.94
MW-3D	576.17	578.08	ND	ND	16.61	561.47
MW-4S	579.95	582.48	20.75*	561.73	19.67	562.81
MW-4D	580.15	582.94	20.75*	561.73	21.30	561.64
MW-5S	574.76	577.55	7.00*	570.55	7.08	570.47
MW-5D	574.52	576.90	15.50*	561.40	15.35	561.55
MW-6S	573.41	575.79	3.50*	572.29	4.17	571.62
MW-6D	573.76	575.74	13.80*	561.94	14.75	560.99
MW-7S	573.52	575.86	10.50*	565.36	10.67	565.19
MW-7D	573.03	575.18	14.00*	561.18	14.16	561.02
MW-8S	570.16	572.23	6.00*	566.23	8.81	563.42
MW-8D	570.21	572.45	10.80*	561.65	11.00	561.45

ND - No Data, well not installed at time measurements were made

* Measurement taken on 12/1/87 and 12/2/87

** Measurement taken on 11/10/87 and 11/12/87

TABLE 3

SUMMARY OF GEOTECHNICAL ANALYSIS

NYPA BUFFALO AVENUE SITE

at what elevations?

Location	Moisture Content	Soil Class	Atterberg Limits
MW-1S	23.8	Course-Medium Sand	Non-Plastic on soil passing # 40 sieve
MW-2S	28.7	Fine Sand/Silty Clay .	Non-Plastic on soil passing #40 sieve
MW-3S	16.6	Fine Sand	Soil is of some plasticity but not enough passing #40 to do sieve to do A.L.
MW-4S	24.5	Fine Sand	Non-plastic on soil passing #40 sieve
MW-5S	22.7	Silty Clay	Non-plastic on soil passing #40 sieve
MW-6S			?
MW-7S	34.0	Fine-Medium Sand	Non-plastic on soil passing #40 sieve.
MW-8S	23.8	Fine Sand/Silty Clay	Non-plastic on soil passing #40 sieve.

Table 4

Results from 1981 Sampling at NYPA Buffalo Avenue Site

	Sample No.	Trichlorobenzenes			C-46	C-56	Tetrachlorobenzene	
		1, 3, 5	1, 2, 4	1, 2, 3			1, 2, 3, 5, & 1, 2, 4, 5	1, 2, 3
Boring 1	1	ND	114.1	ND	69.5	ND	25.6	205.7
	3	181.1	216.7	ND	24.1	ND	32.0	75.6
	6	ND	18.8	ND	ND	ND	ND	13.9
Boring 2	1	ND	81.6	ND	26.2	ND	39.6	150.6
	3	ND	10.2	ND	ND	ND	ND	ND
	5	ND	ND	ND	ND	ND	ND	ND
Boring 3	1	ND	589.2	ND	18.9	ND	23.4	119.6
	4	48.6	22	ND	76.7	ND	ND	ND
	5	ND	ND	ND	ND	ND	ND	ND
Boring 4	1	ND	74.7	15.8	44.5	ND	45.3	198.6
	3	34.8	ND	ND	3.5	ND	ND	ND
Boring 6	1	ND	898.5	227.6	3.0	ND	253.0	1000
	3	ND	ND	ND	ND	ND	ND	ND
Boring 9	1	ND	13.4	ND	46.1	ND	ND	11.7
	4	ND	82.3	ND	8.7	ND	16.9	29.1
	6	168.9	320.3	ND	35.8	ND	62.2	233.9
Boring 10	1	9.3	32.5	1.7	2.5	--	6.4	24.8
	3	6.2	110	17.8	1.1	--	17.1	36.4
	6	ND	ND	ND	ND	--	ND	ND
	6 (Duplicate)	ND	ND	ND	ND	--	ND	ND
Detection Limit		<8.0	<8.0	<5.0	<2.0	<4.0	<8.0	<3.0

Results Reported ng/gm or ppb
ND - Not Detected
--Not analyzed

Table 5
Results of 1982-1983
USGS Sampling Program at NYPA Buffalo Avenue Site

Sample number and depth below land surface (ft)	First sampling (6-25-82)					Sampled 6-30-82							Sampled 5-25-83					
	26.5	(Split)	2	3	4	5	6	7	Split	8	Split	9	2A	3A	4A	7A	8A	9A
			2.0	3.0	6.7	4.0	6.0	6.5		4.0		4.0	2.0	2.0	1.5	5.0	4.0	5.0
Inorganic constituents																		
Iron	3,800,000	3,500,000	1,400,000	4,800,000	9,900,000	1,100,000	11,000,000	6,700,000	2,900,000	6,800,000	1,300,000							
Mercury	--	--	--	--	--	--	--	--	--	--								
Organic compounds		***	***	***	***			--	--	--	--	--						
Priority pollutants																		
Phenanthrene	4,200																	
Flouranthene	3,800																	
Pyrene	3,500																	
Benzo (a) anthracene	1,600																	
Chrysene	2,600																	
Benzo (b) fluoranthene	750																	
Benzo (k) fluoranthene	LT																	
Benzo (a) pyrene	1,400																	
Napthalene																		
4,4-DDT						--	LT	--	(--)									
Hexachlorobenzene													25	--	--			
Hexachlorobenzene													LT	--	--			
Hexachlorobutadioene													LT	--	--			
Nonpriority pollutants																		
5-Methyl-3-hexen-2-one	LT	(--)	--	--	--													
2,6-Dimethyl-2,5-heptadien-4-one	3,100	12,000	--	--	--													
4,5,7-Trimethylindan	360	(--)	--	--	--													
(E)-4-(2-Butenyl)-1,2-dimethyl-benzene	--	1,400	--	--	--													
2,3,8-Trimethyldecane	--	3,400	--	--	--													
2,7-Dimethylundecane	--	2,000	--	--	--													
Nonadecane	--	2,100	--	--	--													
7-Hexyldocosane	--	1,600	--	--	--													
Heptacosane	--	1,800	--	--	--													
2,4-Dimethyl-4-heptanol	--	1,800	--	--	--													

Concentration in mg/kg
-- Compound not found
LT Compound found but below Quantifiable Detection Limit

TABLE 6

TYPICAL METAL RANGES AND MAXIMUM CONCENTRATION LEVELS IN SOIL

Element	Range (µg/kg)[1]
Aluminum	10,000
Antiimony	N/A
Beryllium	N/A
Calcium	172,000
Cobalt	1-40
Copper	2-100
Iron	10,000
Magnesium	600-75,000
Manganese	100-4,000
Nickel	10-1,000
Potassium	10-620
Sodiiium	10-450
Thallium	N/A
Vanadium	20-500
Zinc	10-300

Element	Maximum Concentration Level (mg/l)[2]
Arsenic	5.0
Barium	100
Cadmium	1.0
Chromium	5.0
Lead	5.0
Mercury	0.2
Selenium	1.0
Silver	5.0

(1) Source: Reference 5

(2) Source: Reference 6

TABLE 7
Inorganic Results for Shallow Soil Samples
Results in µg/kg

Parameter	S-1 Value	Flag	S-2 Value	Flag	S-3 Value	Flag	S-4 Value	Flag
Aluminum	7345.6	P	10795.7	P	6844.8	P	11700	P
Antimony	178.9	PN	213.5	PN	158.5	PN	13.9	UP
Arsenic	7.9	SFN	4.4	+SFN	3.5	FN	8.3	UF
Barium	173	P	113	P	72.6	P	80	P
Beryllium	1	PN	0.9	PN	0.6	PM	0.3	P
Cadmium	25.9	P	27.8	P	24.4	P	1.1	UP
Calcium	168617	P	217739.6	PE	179070.7	P	68500	P
Chromium	53.7	P	53.9	P	37.4	P	700	P
Cobalt	34.8	P	40.9	P	31.1	P	18.1	P
Copper	40.7	P	39.1	P	28.1	P	24.4	P
Iron	15356.3	PE	22345.2	PE	14418.1	PE	22100	P
Lead	61.9	F	47.4	F	53.7	SF	40	SF
Magnesium	75884.4	P	97953	P	77500.7	P	24400	P
Manganese	878.1	PE	1160.9	PE	865.6	PE	660	P
Mercury	0.9	CV*	0.3	CV*	0.2	UCV*	0.1	UCV
Nickel	42.6	P	53	P	35.2	P	6.1	UP
Potassium	1466.7	P	2217.4	P	1421.5	P	2261.7	P
Selenium	11.1	UFN	13.	UFN	11.1	UFN	0.8	UF
Silver	67.4	P	79.1	P	66.7	P	20	P
Sodium	363.3	UP	426.5	UP	363.3	UP	37.5	P
Thallium	3.7	UFN	4.3	UFN	3.7	UFN	0.6	UF
Tin	NA		NA		NA		NA	
Vanadium	33.7	PEN	43	P	29.6	P	11.7	P
Zinc	281.1		437.8	PEN	309.6	PEN	830	P
Cyanide	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
%Solids	54		46		54		72	
E.P. TOXICITY: (Results in mg/l):								
Arsenic	1.022		0.895		1.108		NA	
Barium	0.816		0.445		0.511		NA	
Cadmium	0.045		0.037		0.046		NA	
Chromium	<0.01		<0.01		<0.01		NA	
Lead	0.208		0.223		0.267		NA	
Mercury	<0.0002		<0.0002		<0.0002		NA	
Selenium	1.048		0.914		1.208		NA	
Silver	0.169		0.154		0.175		NA	
Herbicides/ Pesticides	ND		ND		ND		ND	

TABLE 7 (continued)
Inorganic Results for Shallow Soil Samples
Results in µg/kg

Parameter	S-5 Value	Flag	S-6 Value	Flag	S-7 Value	Flag	S-8 Value	Flag
Aluminum	9478.5	P	8901.5	P	14893	P	11949.6	P
Antimony	110.9	PN	138.9	PN	130.7	PN	125.8	PN
Arsenic	5.1	FN	7.2	+SFN	3.6	+SFN	7.5	+SFN
Barium	80.6	P	71.1	P	124.7	P	120	P
Beryllium	0.7	PN	0.7	PN	1	PN	1	PN
Cadmium	13.8	P	16.3	P	18.3	P	17.3	P
Calcium	77870.3	P	96956.3	P	107413	P	91290.8	F
Chromium	31.8	P	37.8	P	43.3	P	39.2	P
Cobalt	23.2	P	29.3	P	36.3	P	30	P
Copper	25.6	P	27.4	P	33.7	P	31.5	P
Iron	20229.4	PE	19747.8	PE	29622	PE	24985.4	PE
Lead	77.6	+SF	67.6	SF	38.7	+SF	26.7	F
Magnesium	29429.7	P	41423	P	40719.7	P	29294.2	P
Manganese	648.2	PE	670.7	PE	919	PE	836.2	PE
Mercury	0.1	UCV*	0.2	CV*	0.2	UCV*	0.2	UCV*
Nickel	35.3	P	38.1	P	34.3	P	48.8	P
Potassium	1904.1	P	1758.5	P	2770.7	P	2181.9	P
Selenium	8.8	UFN	11.1	UFN	10	UFN	11.5	UFN
Silver	42.4	P	51.9	P	52.7	P	51.2	P
Sodium	288.5	UP	363.3	UP	327	UP	377.3	UP
Thallium	2.9	UFN	3.7	UFN	3.3	UFN	3.8	UFN
Tin	NA		NA		NA		NA	
Vanadium	29.4	P	31.9	P	43	P	44.6	P
Zinc	169.4	PEN	2017	PEN	238.3	PEN	163.8	PEN
Cyanide	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
%Solids	68		54		60		52	
E.P. TOXICITY:								
Arsenic	1.111		1.089		1.139		0.907	
Barium	0.589		0.436		0.692		0.435	
Cadmium	0.041		0.046		0.053		0.05	
Chromium	<0.01		<0.01		<0.01		<0.01	
Lead	0.269		0.297		0.284		0.313	
Mercury	<00002		<0.0002		<0.0002		<0.0002	
Selenium	1.125		1.099		1.305		1.135	
Silver	0.179		0.177		0.177		0.181	
Herbicides/ Pesticides	ND		ND		ND		ND	

TABLE 7 (continued)
Inorganic Results for Shallow Soil Samples
Results in µg/kg

Parameter	S-9 Value	Flag	S-10 Value	Flag	S-11 Value	Flag	S-12 Value	Flag
Aluminum	13130.5	P	7430	P	6157	P	5365.8	P
Antimony	158.2	PN	150.4	PN	140.9	PN	118.1	PN
Arsenic	7.1	FN	5.2	FN	8.9	+SFN	4.6	+SFN
Barium	125	P	79.3	P	68.5	P	55.8	P
Beryllium	1.3	PN	0.7	PN	0.6	PN	0.5	PN
Cadmium	25	P	21.4	P	21.2	P	18.1	P
Calcium	123629.1	P	136748.6	P	166820	P	133036.7	P
Chromium	48.6	P	36.1	P	41.5	P	43.6	P
Cobalt	30.5	P	29.3	P	32.7	P	28.9	P
Copper	36.4	P	29.6	P	23.3	P	21.4	P
Iron	26522.3	PE	15441.4	PE	12735.5	PE	10719.2	PE
Lead	96.8	SF	98.9	SF	63.3	SF	58.3	SF
Magnesium	50408.6	P	56101.1	P	79091.2	P	64835.8	P
Manganese	916.4	PE	833.2	PE	743.9	PE	653.3	PE
Mercury	0.2	UCV*	0.2	UCV*	0.2	UCV*	0.2	CV*
Nickel	54.1	P	35.7	P	32.7	P	30	P
Potassium	2630	P	1445	P	1341.2	P	1117.8	P
Selenium	13.6	UFEN	10.7	UFEN	9.1	UFEN	8.3	UFEN
Silver	63.2	P	60.7	P	57.6	P	50.3	P
Sodium	445.9	UP	350.4	UP	297.3	UP	272.5	UP
Thallium	4.5	UPN	3.6	UFN	3	UFN	2.8	UFN
Tin	NA		NA		NA		NA	
Vanadium	49.1	P	30	P	29.7	P	26.7	P
Zinc	316.4	PEN	240	PEN	208.8	PEN	324.7	PEN
Cyanide	NA		NA		NA		NA	
Phenol	NA		NA		NA		NA	
%Solids	44		56		66		72	
E.P. TOXICITY:								
Arsenic	1.196		1.242		1.143		0.866	
Barium	0.527		0.577		0.493		0.326	
Cadmium	0.032		0.031		0.036		0.028	
Chromium	<0.01		<0.01		<0.010		<0.01	
Lead	0.179		0.196		0.221		0.146	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002	
Selenium	0.933		0.905		0.894		0.654	
Silver	0.191		0.19		0.193		0.16	
Herbicides/ Pesticides	ND		ND		ND		ND	

TABLE 7 (continued)
Inorganic Results for Shallow Soil Samples
Results in µg/kg

Parameter	S-13 Value	Flag
Aluminum	6080	P
Antimony	143.1	PN
Arsenic	8.6	+SFN
Barium	72.8	P
Beryllium	0.6	PN
Cadmium	18.4	P
Calcium	127277.2	P
Chromium	46.3	P
Cobalt	30.3	P
Copper	29.1	P
Iron	12938.8	PE
Lead	93.8	SF
Magnesium	60591.6	P
Manganese	804.1	PE
Mercury	0.3	CV*
Nickel	35.6	P
Potassium	1221.9	P
Selenium	9.4	UFEN
Silver	55	P
Sodium	306.6	UP
Thallium	3.1	UFN
Tin	NA	
Vanadium	31.3	P
Zinc	253.1	PEN
Cyanide	NA	
Phenol	NA	
%Solids	64	
E.P. TOXICITY:		
Arsenic	1.058	
Barium	0.519	
Cadmium	0.032	
Chromium	<0.01	
Lead	0.169	
Mercury	<0.0002	
Selenium	0.754	
Silver	0.191	
Herbicides/ Pesticides	ND	

Notes:

NA=Not Analyzed
ND=Not Detected

TABLE 8
ORGANIC RESULTS FOR SHALLOW SOIL SAMPLES

Results in µg/Kg

Parameter	S-1 Value	Flag	S-2 Value	Flag	S-3 Value	Flag	S-4 Value	Flag	S-5 Value	Flag	S-6 Value	Flag
Percent Moisture	46		46		46		28		32		46	
pH	7.1		7.1		6		7		7		7	
Methylene Chloride	22		24		44		37	B	88	B	107	B
Acetone	11				78		21	B	37	B	59	B
Benzene					3.9		1.4	J				
2-Butanone			6.2	J								
Vinyl Acetate			13	B								
Phenanthrene			400									
Fluoranthene			700									
Pyrene			490									
1,1-Dichloroethane												
1,1,1-Trichloroethane												
Trichloroethene												
Bromomethane												
Trans-1,2-Dichloroethene												
Unknown Aldehyde											1	
Unknown Ester							1					
Unknown Alkane							1				2	
Unknown VOA					2		1				1	
Unknown BNA	3		4				3				3	
Tentatively ID BNA					3		2		2		2	
Tentatively ID VOA												

(1) A blank space indicates parameter was tested for in the sample, but not found.

TABLE 8 (continued)
ORGANIC RESULTS FOR SHALLOW SOIL SAMPLES

Results in µg/Kg

Parameter	S-7 Value	Flag	S-8 Value	Flag	S-9 Value	Flag	S-10 Value	Flag	S-11 Value	Flag	S-12 Value	Flag
Percent Moisture	46		48		56		44		34		28	
pH	7		7		6		7		7		6	
Methylene Chloride	141	B	54	B	92		59	B	128	B	124	B
Acetone	10	B			44		22	B	75	B	40	B
Benzene	3.2	JB					2.4	J	2.1	B		
2-Butanone												
Vinyl Acetate	6	B										
Phenanthrene												
Fluoranthene												
Pyrene												
1,1-Dichloroethane	3.9	J										
1,1,1-Trichloroethane	1.8	J										
Trichloroethene	1.7	J										
Bromomethane												
Trans-1,2-Dichloroethene												
Unknown Aldehyde									1		1	
Unknown Ester												
Unknown Alkane												
Unknown VOA					2				1		1	
Unknown BNA	1		2		1		1		5		2	
Tentatively ID BNA	3		3		2		3		2			
Tentatively ID VOA			1				3					

TABLE 8 (continued)
ORGANIC RESULTS FOR SHALLOW SOIL SAMPLES

Results in µg/Kg

Parameter	S-12 Value	Flag	S-13 (Dp S12) Value	Flag	Trip Blank Value	Flag
Percent Moisture	28		36		NA	
pH	6		7		NA	
Methylene Chloride	124	B	244	B		
Acetone	40	B	28	B	21	
Benzene			1.9	J		
2-Butanone						
Vinyl Acetate						
Phenanthrene			400			
Fluoranthene			700			
Pyrene			490			
1,1-Dichloroethane						
1,1,1-Trichloroethane						
Trichloroethene						
Bromomethane					1.7	J
Trans-1,2-Dichloroethene					2.9	J
Unknown Aldehyde	1					
Unknown Ester						
Unknown Alkane			1			
Unknown VOA			1		2	
Unknown BNA			4			
Tentatively ID BNA			2			
Tentatively ID VOA			1		1	

TABLE 9

RESULTS OF AIR MONITORING PROGRAM

Location	Date	Time	Photoionization Reading (ppm)
1	10/6/87	9:15 AM	0.0
2	10/6/87	9:17 AM	0.2
3	10/6/87	9:20 AM	0.0
4	10/6/87	9:25 AM	0.2
5	10/6/87	9:27 AM	0.1
6	10/6/87	9:30 AM	0.2
7	10/6/87	9:43 AM	0.1
8	10/6/87	9:47 AM	0.1
9	10/6/87	9:52 AM	0.1
10	10/6/87	9:55 AM	0.2
11	10/6/87	9:58 AM	0.1
12	10/6/87	9:51 AM	0.2
13	10/6/87	9:48 AM	0.1
14	10/6/87	9:40 AM	0.2
15	10/6/87	9:33 AM	0.1
16	10/6/87	9:35 AM	0.1
17	10/6/87	9:38 AM	0.2
18	10/6/87	10:08 AM	0.2
19	10/6/87	10:06 AM	0.2
20	10/6/87	10:03 AM	0.2
21	10/6/87	10:00 AM	0.2
22	10/6/87	10:13 AM	0.1
23	10/6/87	10:15 AM	0.2
24	10/6/87	10:17 AM	0.2
25	10/6/87	10:19 AM	0.2
26	10/6/87	10:21 AM	0.2
27	10/6/87	10:24 AM	0.3
28	10/6/87	10:26 AM	0.2

TABLE 10
INORGANIC RESULTS FOR SOIL SAMPLES

Results in µg/Kg

Parameter	MW-1D Value	S1-4 Flag	MW-1D Value	S7-8 Flag	MW-1D Value	S12-13 Flag	MW-2D Value	S1-4 Flag	MW-2D Value	S7-8 Flag
Aluminum	8704.2	P*	11380.5	P*	3348.9	P*	9255.3	P*	4871	P*
Antimony	108	PN*	64.2	PN*	12.3	UPN*	117	P	26.6	P
Arsenic	6.7	UFN	7	UFN	6.4	UFN	5.6	SF	4.9	F
Barium	146.9	P*	116.3	P*	29.4	P*	112.3	P*	18.8	P*
Beryllium	0.1	UP	0.3	P	0.1	UP	0.1	UP	0.1	UP
Cadmium	11.8	PN*	8.6	PN*	15.3	PN*	26.3	PN*	5.4	PN*
Calcium	86033.8	P*	51985.8	P*	281225.5	P*	84793.5	P	13188.8	P
Chromium	29.3	PN	27.2	PN*	23.6	PN*	24	P*	6.3	P*
Cobalt	21.6	P*	20	P*	18.5	P*	12.6	P	3.2	UP
Copper	20.9	PN	13.5	PN	11.9	PN	12.1	N	3.9	PN
Iron	16722.4	P*	24778.8	P*	8940.9	P*	16353	P*	10729.5	SP*
Lead	46.2	PN	5.2	SF	21.9	F	22.8	FN*	19.5	F*
Magnesium	23754.2	P	10786.3	P	145346.6	P	34651.6	P	6464.6	P
Maganese	529.1	PN*	724.4	PN*	728.7	PN*	513.7	P	169.3	P
Mercury	0.2	CVN	0.2	UCVN	0.2	UCVN	0.1	UCV	0.1	UCV
Nickel	10.4	P	15.1	P	2.6	UP	19.1	P	13.7	P
Potassium	1282.7	P	1931.6	P	876.4	P	1797.4	P	722.7	P
Selenium	6.7	UFN	0.7	UFN	6.4	UFN	7	UFN	0.7	UFN
Silver	2.2	UPN	2.3	UPN	2.1	UPN	2.3	UPN	2.4	UPN
Sodium	218	UP	228.1	UP	208.7	UP	228.1	UP	239.3	UP
Thallium	4.4	UFN	4.7	UFN	4.3	UFN	0.5	UF	0.5	UF
Tin	ND		ND		ND		ND		ND	
Vanadium	10.9	P	20.7	P	16.8	P	20	P	9.8	P
Zinc	230.2	PN*	143	PN*	194.7	PN*	159.8	P*	56.8	P*
Cyanide	NA		NA		NA		0.1	UN	0.1	UN
Phenol	NA		NA		NA		NA		NA	
%solids	90		86		94		86		82	
E.P. TOXICITY (Results in µg/L)										
Arsenic	0.786		1.253		1.132		5.341		1.043	
Barium	0.592		0.467		0.611		<0.2		0.488	
Cadmium	0.026		0.075		0.038		0.024		0.058	
Chromium	<0.010		<0.010		<0.010		0.034		0.348	
Lead	<0.065		0.146		0.128		0.111		0.899	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002		<0.0002	
Selenium	0.474		0.491		0.512		0.441		0.359	
Silver	<0.010		<0.010		<0.010		<0.010		<0.019	
Herbicides/ Pesticides	NR		NR		NR		ND		ND	

TABLE 10 (continued)
INORGANIC RESULTS FOR SOIL SAMPLES

Results in µg/Kg

Parameter	MW-2D S17 Value	Flag	MW-2D S11-14 Value	Flag	MW-3D S1-5&S4 Value	Flag	MW-3D S5 & S6 Value	Flag	MW-3D S5-S7 Value	Flag
Aluminum	2118	P*	2389.1	P*	6226.7	PE	17710.7	PE	15584.8	PE
Antimony	121.6	P	142.2	P	43.5	PN	69.5	PN	56.9	PN
Arsenic	2.9	SF	4	F	2.9	F	5.3	F	9.8	F
Barium	12.4	P*	13.5	P*	52.4	P	121	P	116.4	P
Beryllium	0.1	UP	0.1	UP	0.5	P	1	P	1	P
Cadmium	23.1	PN*	30.4	P*	2.6	P*	9.8	P*	9.3	P*
Calcium	107904.1	P	170908.7	P	34615.1	PE*	73469	PE*	65650	PE*
Chromium	13.3	P*	22.2	P*	14	P	34.4	P	31.7	P
Cobalt	12.4	P	15.9	P	7	P	18.8	P	21.2	P
Copper	3.7	PN	0.7	UPN	19.5	P	29.5	P	29	P
Iron	4655.5	P*	5022.6	P*	10189.5	PE	30894.4	PE	34795	PE
Lead	14.4	SF*	16.7	F*	68.8	PN	81.2	PN	73.3	PN
Magnesium	44681.8	P	79494.8	P	15307.2	PE*	13670.5	PE*	14159.8	PE*
Maganese	490.2	P	445.9	P	238.6	PEN	682.7	PEN	856.7	PEN
Mercury	0.1	UVC	0.1	UCV	0.2	UCV	0.2	UCV	0.2	UCV
Nickel	4.7	P	8.3	P	19.5	P	41.2	P	42.4	P
Potassium	335.1	P	368.3	P	1172.1	P	3541.2	P	3055.5	P
Selenium	6.1	UFN	0.7	UFN	0.7	UFN	3.7	UFN	3.6	UFN
Silver	2	UPN	2.2	UPN	2.3	UPN	2.4	UPN	2.4	UPN
Sodium	200.2	UP	213.3	UP	228.1	UP	239.3	UP	233.6	UP
Thallium	0.4	UF	0.4	UF	0.5	UF	0.5	UF	0.5	UF
Tin	ND		ND		ND		ND		ND	
Vanadium	4.7	P	7.8	P	22.6	P	43.2	P	41.7	P
Zinc	179.4	P*	155.7	P*	77.2	PE*	92.4	PE*	94	PE*
Cyanide	0.1	UN	0.1	UN	NA		NA		NA	
Phenol	NA		NA		NA		NA		NA	
%solids	98		92		86		82		84	
E.P. TOXICITY										
Arsenic	<0.050		6.284		2.444		1.043		2.964	
Barium	0.244		0.409		<0.200		0.488		<0.200	
Cadmium	0.021		0.035		0.013		0.058		0.019	
Chromium	0.034		0.044		<0.10		0.348		<0.010	
Lead	0.084		0.119		0.143		0.899		<0.065	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002		<0.0002	
Selenium	0.136		0.528		0.354		0.359		0.351	
Silver	<0.010		<0.010		<0.010		<0.010		<0.010	
Herbicides/ Pesticides	ND		ND		ND		ND		ND	

TABLE 10 (continued)
INORGANIC RESULTS FOR SOIL SAMPLES

Results in µg/Kg

Parameter	MW-3D S14-S16 Value	Flag	MW-4D S2-S4 Value	Flag	MW-4D S5-S8 Value	Flag	MW-4D S11-13 Value	Flag	MW-4D S14-S15 Value	Flag
Aluminum	2436.3	PE	7755.6	P*	5250	P*	2889.1	P*	20035.7	P*
Antimony	60.2	PN	11.1	UPN	10.9	UPN	10.9	UPN	17.9	UPN
Arsenic	1.3	SF	2.8	F	3.2	F	3.5	F	6	F
Barium	36.1	P	94	P	49.6	P	17.6	P	158.2	P
Beryllium	0.1	UP	0.4	UPN	0.4	UPN	0.4	UPN	0.7	UPN
Cadmium	9	P*	1.1	UPN	1.1	UPN	1.1	UPN	1.8	UPN
Calcium	97469	PE*	63288.9	P	103260.9	P	12304.3	P	66285.7	P
Chromium	14.1	P	6.9	PN	2.2	UPN	2.6	PN	12.1	P
Cobalt	9	P	10.9	PN	6.5	UPN	6.5	UPN	17.1	PN
Copper	18.4	P	18.9	P	12.4	P	8.9	P	29.3	P
Iron	5978.4	PE	19000	PE	12434.8	PE	7760.4	PE	44285.7	PE
Lead	70.2	PN	20.9	F*	23.7	F*	8.9	SF*	5.4	UF*
Magnesium	40323.3	PE*	16933.3	P	51956.5	P	5260.9	P	20000	P
Maganese	555.1	PEN	655.6	P	551.5	P	153	P	970	P
Mercury	0.2	UCV	0.1	UCV	0.1	UCV	0.1	UCV	0.2	UCV
Nickel	9.4	P	16	P	11.7	P	7.4	P	36.1	P
Potassium	488.4	P	1422.2	P	891.3	P	652.2	UP	4142.9	P
Selenium	3.1	UFN	3.3	UFN	3.3	UFN	0.7	UFN	1.1	UFN
Silver	2	UPN	2.2	UPN	2.2	UPN	2.2	UPN	3.6	UPN
Sodium	200.2	UP	200	P	217.4	P	108.7	UP	321.4	P
Thallium	0.4	UF	0.4	UF	0.4	UF	0.4	UF	0.7	UF
Tin	ND		ND		ND		ND		ND	
Vanadium	10.8	P	18.4	P	13	P	9.1	P	40	P
Zinc	112	PE*	65.3	P	87	P	28.7	P	71.8	P
Cyanide	NA		NA		NA		NA		NA	
Phenol	NA		NA		NA		NA		NA	
%solids	98		90		92		88		56	
E.P. TOXICITY										
Arsenic	2.92		3.208		1.727		2.781		3.025	
Barium	0.205		<0.2		<0.2		0.283		0.388	
Cadmium	0.015		0.021		<0.005		0.017		0.019	
Chromium	<0.010		0.014		<0.010		0.016		<0.010	
Lead	0.085		0.122		<0.065		<0.065		0.087	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002		<0.0002	
Selenium	0.361		0.459		0.2		0.36		0.449	
Silver	<0.010		<0.010		<0.010		<0.010		<0.010	
Herbicides/ Pesticides	ND		ND		ND		ND		ND	

TABLE 10 (continued)
INORGANIC RESULTS FOR SOIL SAMPLES

Results in µg/Kg

Parameter	MW-4D S16-S17 Value	Flag	MW-5D S1-3 Value	Flag	MW-5D S5-6 Value	Flag	MW-5D S12-13 Value	Flag	MW-6D S1-3 Value	Flag
Aluminum	42217.4	P*	6300	P	21500	P	5900	P	6000	P
Antimony	10.9	UPN	11.4	UP	13.2	UP	11.4	UP	11.4	UPN
Arsenic	2.5	F	5.6	SF	3.9	F	3.4	SF	4.3	SFN
Barium	48.9	P	20	UP	140	P	50	P	20	UP
Beryllium	0.4	UPN	0.2	P	0.8	P	0.2	P	0.1	UPN
Cadmium	1.1	UPN	0.9	UP	1.1	UP	2.3	P	0.9	UPN
Calcium	117173.9	P	14000	P	74100	P	116800	P	10200	PVM
Chromium	2.8	PN	0	UP	40	P	30	P	0	UP
Cobalt	6.5	UPN	7.3	P	20	P	10.7	P	6.8	P
Copper	15.7	P	10.5	P	24.5	P	9.3	P	10.9	PVM
Iron	8565.2	PE	15600	P	34600	P	11300	P	13900	P
Lead	51.7	SF*	20	SF	10	FE	40	F	10	FN*
Magnesium	49956.5	P	6000	P	14900	P	49000	P	3900	P
Maganese	570.2	P	290	P	840	P	630	P	210	PNE*
Mercury	0.1	UCV	0.1	UCV	0.1	UCV	0.1	UCV	0.1	UCV
Nickel	8	P	5	UP	22.9	P	5	UP	5	UP
Potassium	652.2	UP	1087.7	UP	4279.2	P	1603.2	P	1087.7	UP
Selenium	0.7	UFN	0.7	UF	3.9	UF	0.7	UF	0.7	UFN
Silver	12.6	PN	0	UP	10	P	40	P	0	PN
Sodium	173.9	P	131.6	UP	152.4	UP	131.6	UP	131.6	UP
Thallium	0.4	UF	0.5	UF	0.5	UF	0.5	UF	0.5	UF
Tin	ND		ND		ND		ND		ND	
Vanadium	8.3	P	3.2	UP	26.1	P	3.2	UP	3.2	UP
Zinc	148.3	P	50	P	80	P	180	P	70	P
Cyanide	NA		NA		NA		NA		NA	
Phenol	NA		NA		NA		NA		NA	
%solids	92		88		76		88		88	
E.P. TOXICITY										
Arsenic	2.205.		<0.05		<0.05		<0.05		<0.05	
Barium	<0.2		<0.2		<0.2		0.477		0.477	
Cadmium	<0.005		<0.005		<0.005		<0.005		<0.005	
Chromium	<0.010		<0.01		<0.01		0.01		0.01	
Lead	<0.065		<0.065		<0.065		<0.065		<0.065	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002		<0.0002	
Selenium	0.332		<0.075		<0.075		<0.075		<0.075	
Silver	<0.010		<0.01		<0.01		<0.01		<0.01	
Herbicides/ Pesticides	ND		ND		ND		ND		ND	

TABLE 10 (continued)
INORGANIC RESULTS FOR SOIL SAMPLES

Results in µg/Kg

Parameter	MW-6D Value	S5-6 Flag	MW-6D Value	S15-16 Flag	MW-7 Value	S#5 Flag	MW-7 Value	S#6 Flag	MW-7D Value	S1-3 Flag
Aluminum	18100	P	4300	P	7500	P	39600	P	7800	P
Antimony	12.8	UPN	12.5	UPN	62.1	PN	13.5	UPN	10	UPN
Arsenic	4.4	FN	1.1	FN	191	+SFN	10.3	SFN	6	UFN
Barium	140	P	50	P	500	P	820	P	70	P
Beryllium	0.1	UPN	0.1	UPN	0.7	PN	10	PN	0.3	PN
Cadmium	2.1	PN	25.3	PN	1	UPN	4.6	PN	3.4	P
Calcium	55900	PVM	148800	PVM	18700	P *	75900	PVM	781000	P
Chromium	30	P	40	P	80	P	2900	P	670	PE
Cobalt	22.6	P	24	P	7.9	P	20.5	P	9.6	P
Copper	29.5	PVM	20.5	P	60	P	1741.6	PVM	30	P
Iron	33500	P	9200	P	21400	P	60500	P	14900	P
Lead	10	FSN*	50	FSN	2460	PN	630	PN	40	FN*
Magnesium	13500	P	68300	P	1100	P	2500	P	19300	P
Maganese	750	PNE*	720	PNE*	90	PNE*	180	PNE*	380	P
Mercury	0.1	UCV	0.1	UCV	8.8	C.V.	5.6	C.V.	2.4	CVN
Nickel	5.6	UP	5.5	UP	5.6	UP	5.9	UP	4.4	UP
Potassium	3500	P	1196.5	UP	1227.2	UP	1903.5	P	1000	P
Selenium	7.7	UFN	7.5	UFN	7.7	UFN	8.1	UFN	6	UFN
Silver	20	PN	70	PN	10	PN	20	PN	30	P
Sodium	148.5	UP	144.8	UP	3623.3	P	16658.6	P	115.8	UP
Thallium	0.5	UF	0.5	UF	0.5	UF	0.5	UF	0.4	UF
Tin	ND		ND		ND		ND		ND	
Vanadium	23.3	P	5	P	3.6	UP	10	P	2.8	UP
Zinc	100	P	210	P	720	P	640	P	860	P
Cyanide	NA		NA		NA		NA		NA	
Phenol	NA		NA		NA		NA		NA	
%solids	78		80		78		74		100	
E.P. TOXICITY										
Arsenic	<0.05		<0.05		<0.05		<0.05		<0.05	
Barium	2.02		0.518		0.411		0.467		<0.2	
Cadmium	<0.005		<0.005		0.023		0.022		<0.005	
Chromium	0.013		<0.01		<0.01		0.043		<0.01	
Lead	<0.065		<0.065		0.141		<0.065		<0.065	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002		<0.0002	
Selenium	<0.075		<0.075		<0.075		<0.075		<0.075	
Silver	<0.01		<0.01		<0.01		0.073		<0.01	
Herbicides/ Pesticides	ND		ND		ND		ND		ND	

TABLE 10 (continued)
INORGANIC RESULTS FOR SOIL SAMPLES

Results in µg/Kg

Parameter	MW-7D S7-8 Value	Flag	MW-7D S15-17 Value	Flag	MW-8D#1 S0-6 Value	Flag	MW-8D#2 S9-16 Value	Flag	MW-8D#3 S22-26 Value	Flag
Aluminum	16300	P	4100	P	5100	P	3700	P	14700	P
Antimony	11.9	UPN	10.9	UPN	10	UPN	10.6	UPN	11.1	UPN
Arsenic	7.1	UFN	1.3	FN	3.5	SFN	3	SFN	6.7	UFN
Barium	100	P	40	P	40	P	21.3	UP	100	P
Beryllium	0.8	PN	0.1	PN	0.2	PN	0.1	UPN	0.6	PN
Cadmium	1	UP	10	P	5.6	P	0.9	UP	0.9	UP
Calcium	58200	P	126800	P	87500	P	21900	P	383000	P
Chromium	680	PE	890	PE	690	PE	230	PE	520	PE
Cobalt	20	P	10	P	11	P	6.2	UP	10	P
Copper	30	P	10	P	11	P	7.2	P	20	P
Iron	27700	P	8700	P	9000	P	9500	P	25800	P
Lead	8.7	SFN*	40	FN*	30	FN*	10	FN*	10	FN*
Magnesium	12300	P	587000	P	35700	P	7300	P	12700	P
Maganese	680	P	560	P	430	P	180	P	570	P
Mercury	0.1	U	0.1	U	0.1	U	0.6	CVN	0.1	U
Nickel	5.2	UP	4.8	UP	4.4	UP	4.7	UP	4 9	UP
Potassium	3200	P	1040.4	UP	957.2	UP	1018.3	UP	2900	P
Selenium	7.1	UFN	6.5	UFN	6	UFEN	0.6	UFN	6.7	UFN
Silver	10	P	50	P	30	P	6.8	P	7.8	P
Sodium	620	P	125.9	UP	115.8	UP	123.2	UP	128.7	UP
Thallium	0.5	UF	0.4	UF	0.4	UF	0.4	UF	0.4	UF
Tin	ND		ND		ND		ND		ND	
Vanadium	20	P	3	UP	2.8	UP	3	UP	10	P
Zinc	680	P	1300	P	970	P	160	P	430	P
Cyanide	NA		NA		NA		NA		NA	
Phenol	NA		NA		NA		NA		NA	
%solids	84		92		100		94		90	
E.P. TOXICITY										
Arsenic	<0.05		<0.05		<0.05		<0.05		0.053	
Barium	<0.2		<0.2		<0.2		<0.2		<0.2	
Cadmium	<0.005		<0.005		<0.005		<0.005		<0.005	
Chromium	<0.01		<0.01		0.115		<0.01		<0.01	
Lead	<0.065		<0.065		<0.065		<0.065		<0.065	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002		<0.0002	
Selenium	<0.075		<0.075		<0.075		<0.075		<0.075	
Silver	<0.01		<0.01		0.25		<0.01		<0.01	
Herbicides/ Pesticides	ND		ND		ND		ND		ND	

TABLE 10 (continued)
INORGANIC RESULTS FOR SOIL SAMPLES

Results in µg/Kg

Parameter	MW-8D#4 S29-33 Value	Flag	B-3 #6 Value	Flag	B-3 #8 Value	Flag
Aluminum	2400	P	7600	P	98800	P
Antimony	10.9	UPN	11.9	UP	11.6	UP
Arsenic	2.3	+SFN	4.2	F	6.6	SF
Barium	22	P	80	P	220	P
Beryllium	0.1	UPN	0.2	P	0.4	P
Cadmium	10	P	1	UP	8.1	UP
Calcium	123000	P	27500	P	66200	P
Chromium	830	PE	0	UP	40	P
Cobalt	10	P	11.4	P	21.6	P
Copper	10	P	16	P	55.6	P
Iron	5300	P	16300	P	20600	P
Lead	20	FN*	10	F	150	F
Magnesium	60600	P	9400	P	21500	P
Maganese	490	P	310	P	600	P
Mercury	0.1	U	0.1	UCV	1.6	CV
Nickel	4.8	UP	5.2	UP	5.1	UP
Potassium	1040.4	UP	1814.3	P	1826	P
Selenium	6.5	UFN	0.7	UF	0.7	UF
Silver	50	P	10	P	30	P
Sodium	125.9	UP	137.9	UP	156.3	P
Thallium	0.4	UF	4.8	UFEN	4.7	UFEN
Tin	ND		ND		ND	
Vanadium	3	UP	4.3	P	13	P
Zinc	1300	P	100	P	250	P
Cyanide	NA		NA		NA	
Phenol	NA		NA		NA	
%solids	92		84		86	
E.P. TOXICITY						
Arsenic	<0.05		<0.05		0.15	
Barium	0.281		2.02		0.961	
Cadmium	<0.005		<0.005		<0.005	
Chromium	<0.01		0.013		<0.01	
Lead	<0.065		<0.065		0.16	
Mercury	<0.0002		<0.0002		<0.0002	
Selenium	<0.075		<0.075		<0.075	
Silver	<0.01		<0.01		<0.01	
Herbicides/ Pesticides	ND		ND		ND	

TABLE 11

Organic Results in Soil Samples
Results in µg/kg

PARAMETER	MW-1D S1-4 Value	Flag	MW-1D S7-8 Value	Flag	MW-1D S12-13 Value	Flag	MW-2D S1-4 Value	Flag	MW-2D S7-8 Value	Flag	MW-2D S14 Value	Flag	MW-2D S11-14 Value	Flag
Percent Moisture	10		14		6		14		18		NA		8	
pH	7.9		6.5		8.1		7.9		7.8		NA		7	
Methylene Chloride	96	B	84	B	63	B			17				22	
Acetone	157	B	130	B	55	B	54	B	80				93	
Benzene	3	JB	7.2	B	1.4	JB								
2-Butanone	55	B	48	B	38	B								
Vinyl Acetate														
Phenanthrene	3800								3900					
Anthracene	580								1800					
Fluoranthene	18000								6800					
Pyrene	26000								5300					
Benzo(a)Anthracene	18000								2300					
Chrysene	41000								2400					
Benzo(b)Fluoranthene	38000								2000					
Benzo(k)Fluoranthene	44000								1300					
Benzo(a)Pyrene	19000				163	J			1700				890	
Indeno(1,2,3-cd)Pyrene	3000								870					
Dibenz(a,h)Anthracene	1800								260					
Benzo(g,h,i)Perylene	4000								820					
2-Methylnaphthalene									130					
Naphthalene	190	J							430					
Acenaphthene									590					
Dibenzofuran									280					
Fluorene									510					
Trichloroethene			4.2	J			1.3	J						
1,1,1-Trichloroethane	2.1	JB	4.7	JB										
Tetrachloroethene							2.8	J						
Toluene														
bis(2-Ethylhexyl)Phthalate														
Dieldrin														
Endrin														
4,4'-DDD														
Alpha-BHC														
Total Xylenes														
2-Hexanone														
Di-n-Butylphthalate														
Styrene														
Chloroform														
Carbon Disulfide														
Chlorobenzene														
Phenol														
1,4-Dichlorobenzene														
Di-n-Octyl Phthalate														
Aldrin														
4,4'-DDT														
Heptachlor														
Unknown Carboxylic Acid														
Unknown Alcohol														
Unknown Aldehyde														
Unknown Ester														
Unknown Alkane	1		1		4		3							
[redacted]														
Unknown Alkene	1													
Unknown Ketone			1											
Unknown Phthalate														
Unknown Cyclic Compound														
Unknown VOA	4		1				1		3				1	
Unknown BNA	6		1		6				12				4	
Tentatively ID BNA	1		1		11				1					
Tentatively ID VOA	1		2		1									

TABLE 11

Organic Results in Soil Samples
Results in µg/kg

PARAMETER	MW-2D S17 Value	Flag	MW-3D S1 Value	Flag	MW-3D S5 Value	Flag	MW-3D S14 Value	Flag	TRIP BLANK Value	Flag	MW3D S1-5 S4 Value	Flag	MW-3D S5-S6 Value	Flag	MW-3D S5-S7 Value	Flag
Percent Moisture	2		8		10		0		NA		14		18		16	
pH	8.1		NA		NA		NA		NA		NA		NA		NA	
Methylene Chloride	14		51.7	B	22.4	B	27.1	B	3.8	JB						
Acetone	124		28.8	B	42	B	60.1	B	7	JB						
Benzene			1.1													
2-Butanone																
Vinyl Acetate																
Phenanthrene																
Anthracene																
Fluoranthene																
Pyrene																
Benzo(a)Anthracene																
Chrysene																
Benzo(b)Fluoranthene																
Benzo(k)Fluoranthene																
Benzo(a)Pyrene																
Indeno(1,2,3-cd)Pyrene																
Dibenz(a,h)Anthracene																
Benzo(g,h,i)Perylene																
2-Methylnaphthalene																
Naphthalene																
Acenaphthene																
Dibenzofuran																
Fluorene																
Trichloroethene																
1,1,1-Trichloroethane																
Tetrachloroethene																
Toluene			1.2													
bis(2-Ethylhexyl)Phthalate													1200			
Dieldrin													1.7	J		
Endrin													2.1	J		
4,4'-DDD															0.61	J
Alpha-BHC																
Total Xylenes																
2-Hexanone																
Di-n-Butylphthalate																
Styrene																
Chloroform																
Carbon Disulfide																
Chlorobenzene																
Phenol																
1,4-Dichlorobenzene																
Di-n-Octyl Phthalate																
Aldrin																
4,4'-DDT																
Heptachlor																
Unknown Carboxylic Acid																
Unknown Alcohol																
Unknown Aldehyde																
Unknown Ester																
Unknown Alkane											1		1			
Unknown Aromatic																
Unknown Alkene																
Unknown Ketone																
Unknown Phthalate																
Unknown Cyclic Compound																
Unknown VOA	6															
Unknown BNA	18										2		15		18	
Tentatively ID BNA											2		4		2	
Tentatively ID VOA																

TABLE 11

Organic Results in Soil Samples
Results in µg/kg

PARAMETER	MW3DS14-16 Value	Flag	MW4D S1-S2 Value	Flag	MW4D S5 DpS1-2 Value	Flag	MW-4D S11 Value	Flag	MW-4D S14 Value	Flag	MW-4D S16 Value	Flag	MW-4D S2-4 Value	Flag	MW4D DpS2-4 Value	Flag
Percent Moisture	2		20		18		26		36		14		NA		NA	
pH	NA		8		8		8		8		8		NA		NA	
Methylene Chloride			39.6	B	32.9	B	21.7	B	47.2	B	18	B				
Acetone			60.3	B	131.3	B	69.4	B	40	B	63.7	B				
Benzene			2.1		1.7		2.8		1.1		1.8					
2-Butanone																
Vinyl Acetate					17.4	B	72.2		22.6		90.3					
Phenanthrene																
Anthracene																
Fluoranthene																
Pyrene																
Benzo(a)Anthracene																
Chrysene																
Benzo(b)Fluoranthene																
Benzo(k)Fluoranthene																
Benzo(a)Pyrene																
Indeno(1,2,3-cd)Pyrene																
Dibenz(a,h)Anthracene																
Benzo(g,h,i)Perylene																
2-Methylnaphthalene																
Naphthalene																
Acenaphthene																
Dibenzofuran																
Fluorene																
Trichloroethene			1.8													
1,1,1-Trichloroethane			1	J												
Tetrachloroethene																
Toluene																
bis(2-Ethylhexyl)Phthalate																
Dieldrin																
Endrin																
4,4'-DDD	0.61	J														
Alpha-BHC	8.6															
Total Xylenes					12.5		4									
2-Hexanone									8.4							
Di-n-Butylphthalate													1025			
Styrene																
Chloroform																
Carbon Disulfide																
Chlorobenzene																
Phenol																
1,4-Dichlorobenzene																
Di-n-Octyl Phthalate																
Aldrin																
4,4'-DDT																
Heptachlor																
Unknown Carboxylic Acid																
Unknown Alcohol																
Unknown Aldehyde																
Unknown Ester																
Unknown Alkane	1		1				1								1	
Unknown Aromatic																
Unknown Alkene					1											
Unknown Ketone																
Unknown Phthalate																
Unknown Cyclic Compound																
Unknown VOA			4		1						2					
Unknown BNA	16												2		15	
Tentatively ID BNA	3												1			
Tentatively ID VOA			1		3											

TABLE 11

Organic Results in Soil Samples
Results in µg/kg

PARAMETER	MW-4D S11-13 Value	Flag	MW-4D S14-15 Value	Flag	MW-4D S16-17 Value	Flag	TRIP BLANK Value	Flag	MW-5D S1 Value	Flag	MW-5D S5 Value	Flag	MW-5D S12 Value	Flag	MW-5D S1-3 Value	Flag
Percent Moisture	NA		NA		NA		NA		18		20		NA		12	
pH	NA		NA		NA		6.9		7.7		9		NA		8.3	
Methylene Chloride									160	B	9	B	14	B		
Acetone									380	B	28	B	22	B		
Benzene									9		1.4	J	5			
2-Butanone																
Vinyl Acetate																
Phenanthrene																
Anthracene																
Fluoranthene																
Pyrene																
Benzo(a)Anthracene																
Chrysene																
Benzo(b)Fluoranthene																
Benzo(k)Fluoranthene																
Benzo(a)Pyrene																
Indeno(1,2,3-cd)Pyrene																
Dibenz(a,h)Anthracene																
Benzo(g,h,i)Perylene																
2-Methylnaphthalene																
Naphthalene																
Acenaphthene																
Dibenzofuran																
Fluorene																
Trichloroethene																
1,1,1-Trichloroethane													5	J		
Tetrachloroethene									11				11			
Toluene																
bis(2-Ethylhexyl)Phthalate																
Dieldrin																
Endrin																
4,4'-DDD																
Alpha-BHC																
Total Xylenes																
2-Hexanone																
Di-n-Butylphthalate	1300															
Styrene																
Chloroform																
Carbon Disulfide																
Chlorobenzene																
Phenol																
1,4-Dichlorobenzene																
Di-n-Octyl Phthalate																
Aldrin																
4,4'-DDT																
Heptachlor																
Unknown Carboxylic Acid																
Unknown Alcohol																
Unknown Aldehyde																
Unknown Ester																
Unknown Alkane									2		1				1	
Unknown Aromatic																
Unknown Alkene	1															
Unknown Ketone																
Unknown Phthalate																
Unknown Cyclic Compound																
Unknown VOA											1					
Unknown BNA	3		11		8										6	
Tentatively ID BNA			1		2											
Tentatively ID VOA																

TABLE 11

Organic Results in Soil Samples
Results in µg/kg

PARAMETER	MW-5D S5-6 Value	Flag	MW-5D S12-13 Value	Flag	MW-6D S1 Value	Flag	MW-6D S5 Value	Flag	MW-6D S14-15 Value	Flag	MW-6D S1-3 Value	Flag	MW-6D S5-6 Value	Flag	MW-6D S15-16 Value	Flag
Percent Moisture	24		12		8		22		8		NA		NA		NA	
pH	8.4		8.6		7		8		8		NA		NA		NA	
Methylene Chloride					49	B			13	B						
Acetone					137	B			26	B						
Benzene					1.9	J										
2-Butanone					8.6	J			1.8	J						
Vinyl Acetate																
Phenanthrene																
Anthracene																
Fluoranthene																
Pyrene																
Benzo(a)Anthracene																
Chrysene																
Benzo(b)Fluoranthene																
Benzo(k)Fluoranthene																
Benzo(a)Pyrene																
Indeno(1,2,3-cd)Pyrene																
Dibenz(a,h)Anthracene																
Benzo(g,h,i)Perylene																
2-Methylnaphthalene																
Naphthalene																
Acenaphthene																
Dibenzofuran																
Fluorene																
Trichloroethene																
1,1,1-Trichloroethane																
Tetrachloroethene					8.6											
Toluene					5.9											
bis(2-Ethylhexyl)Phthalate											300	J				
Dieldrin																
Endrin																
4,4'-DDD																
Alpha-BHC																
Total Xylenes					3.3	J										
2-Hexanone																
Di-n-Butylphthalate																
Styrene					5.4											
Chloroform									4.8	J						
Carbon Disulfide																
Chlorobenzene																
Phenol																
1,4-Dichlorobenzene																
Di-n-Octyl Phthalate																
Aldrin																
4,4'-DDT																
Heptachlor																
Unknown Carboxylic Acid																
Unknown Alcohol	1															
Unknown Aldehyde																
Unknown Ester																
Unknown Alkane	6		2						1							
Unknown Aromatic																
Unknown Alkene																
Unknown Ketone																
Unknown Phthalate																
Unknown Cyclic Compound																
Unknown VOA							1		1							
Unknown BNA	5		4								1		18		13	
Tentatively ID BNA	3		1										1		2	
Tentatively ID VOA																

TABLE 11

Organic Results in Soil Samples
Results in µg/kg

PARAMETER	MW-7S #5 Value	Flag	MW-7S #6 Value	Flag	MW-7D S1 Value	Flag	MW-7D S7 Value	Flag	MW-7D S15 Value	Flag	MW-7D S1-3 Value	Flag	MW-7D S7-8 Value	Flag	MW-7D S15-17 Value	Flag
Percent Moisture	22		26		8		22		8		NA		NA		NA	
pH	7.3		7.8		7		8		6.5		NA		NA		NA	
Methylene Chloride	76	B	60	B	89	B	108	B	85	B						
Acetone	62	B			7.6	JB	31	B	23	B						
Benzene					1.3	J	1.6	J	1.4	J						
2-Butanone																
Vinyl Acetate									9.4	J						
Phenanthrene											9400		7800		390	J
Anthracene	3300	J									4200		2800			
Fluoranthene											6800		5400		280	J
Pyrene											7600		5600		310	J
Benzo(a)Anthracene											6100		3000			
Chrysene											5800		3100		138	J
Benzo(b)Fluoranthene											4300		2800		116	J
Benzo(k)Fluoranthene											2000		1200			
Benzo(a)Pyrene											4400	B	2400	B		
Indeno(1,2,3-cd)Pyrene											2800		1500			
Dibenz(a,h)Anthracene											1100		450	J		
Benzo(g,h,i)Perylene											2700		1600			
2-Methylnaphthalene											510	J	260	J		
Naphthalene											1800		690			
Acenaphthene											1600		980			
Dibenzofuran											1300		900			
Fluorene											1500		1200			
Trichloroethene																
1,1,1-Trichloroethane																
Tetrachloroethene																
Toluene	3.6	J							1.8	J						
bis(2-Ethylhexyl)Phthalate											350	J	800		900	
Dieldrin																
Endrin																
4,4'-DDD																
Alpha-BHC																
Total Xylenes																
2-Hexanone																
Di-n-Butylphthalate											870	B	110	JB		
Styrene																
Chloroform	1.4	J														
Carbon Disulfide	6.1	J														
Chlorobenzene	81															
Phenol											79	J				
1,4-Dichlorobenzene											101	J				
Di-n-Octyl Phthalate											100	J	270	J		
Aldrin																
4,4'-DDT																
Heptachlor																
Unknown Carboxylic Acid																
Unknown Alcohol													2		2	
Unknown Aldehyde																
Unknown Ester															1	
Unknown Alkane	3		1								10		7		3	
Unknown Aromatic																
Unknown Alkene	4															
Unknown Ketone																
Unknown Phthalate											1					
Unknown Cyclic Compound																
Unknown VOA																
Unknown BNA	11		1								1		5		4	
Tentatively ID BNA	2										9		6		6	
Tentatively ID VOA	3		2													

TABLE 11

Organic Results for Soil Samples
Results in µg/kg

PARAMETER	MW-8D S1 0-6 Value	Flag	MW-8D S2 9-16 Value	Flag	MW-8D S3 22-26 Value	Flag	MW-8D S4 29-33 Value	Flag	MW-8D #1 S0-6 Value	Flag	MW8D#2 S9-16 Value	Flag	MW8D 3 S22-26 Value	Flag	MW8D#4 S29-33 Value	Flag
Percent Moisture	8		20		8		8		NA		NA		NA		NA	
pH	7.2		7		8		7.5		NA		NA		NA		NA	
Methylene Chloride	126	B	110	B	140	B	97	B								
Acetone	9.8	JB	13	B	29	B	18	B								
Benzene	1.4	J	2.4	J	1.7	J	1.4	J								
2-Butanone																
Vinyl Acetate					3.7	J	4.9	J								
Phenanthrene											170	J				
Anthracene																
Fluoranthene											320	J				
Pyrene											68	J				
Benzo(a)Anthracene											141	J				
Chrysene											180	J				
Benzo(b)Fluoranthene											140	J				
Benzo(k)Fluoranthene																
Benzo(a)Pyrene											91	JB				
Indeno(1,2,3-cd)Pyrene																
Dibenz(a,h)Anthracene																
Benzo(g,h,i)Perylene																
2-Methylnaphthalene																
Naphthalene																
Acenaphthene																
Dibenzofuran																
Fluorene																
Trichloroethene																
1,1,1-Trichloroethane																
Tetrachloroethene																
Toluene																
bis(2-Ethylhexyl)Phthalate									474.5	J	440	J	680		1000	
Dieldrin													9	J		
Endrin																
4,4'-DDD									292							
Alpha-BHC																
Total Xylenes																
2-Hexanone																
Di-n-Butylphthalate									1158.1	B	41000	B			140	JB
Styrene																
Chloroform																
Carbon Disulfide																
Chlorobenzene																
Phenol																
1,4-Dichlorobenzene																
Di-n-Octyl Phthalate																
Aldrin																
4,4'-DDT																
Heptachlor																
Unknown Carboxylic Acid											1				1	
Unknown Alcohol																
Unknown Aldehyde																
Unknown Ester																
Unknown Alkane									5		3				7	
Unknown Aromatic																
Unknown Alkene																
Unknown Ketone																
Unknown Phthalate																
Unknown Cyclic Compound																
Unknown VOA																
Unknown BNA									12		8		1		2	
Tentatively ID BNA									2		8				3	
Tentatively ID VOA																

TABLE 11

Organic Results for Soil Samples
Results in µg/kg

PARAMETER	B-3 #6 Value	Flag	B-3 #8 Value	Flag
Percent Moisture	16		14	
pH	5.7		5.9	
Methylene Chloride	14		11	
Acetone	42		25	
Benzene	2.7	J		
2-Butanone				
Vinyl Acetate				
Phenanthrene			130	J
Anthracene				
Fluoranthene			120	J
Pyrene			97	J
Benzo(a)Anthracene				
Chrysene				
Benzo(b)Fluoranthene				
Benzo(k)Fluoranthene				
Benzo(a)Pyrene				
Indeno(1,2,3-cd)Pyrene				
Dibenz(a,h)Anthracene				
Benzo(g,h,i)Perylene				
2-Methylnaphthalene				
Naphthalene				
Acenaphthene				
Dibenzofuran				
Fluorene				
Trichloroethene				
1,1,1-Trichloroethane				
Tetrachloroethene				
Toluene				
bis(2-Ethylhexyl)Phthalate				
Dieldrin			64	
Endrin			110	
4,4'-DDD				
Alpha-BHC				
Total Xylenes	8.8			
2-Hexanone				
Di-n-Butylphthalate				
Styrene				
Chloroform				
Carbon Disulfide				
Chlorobenzene				
Phenol				
1,4-Dichlorobenzene				
Di-n-Octyl Phthalate				
Aldrin	10	J		
4,4'-DDT			36	J
Heptachlor			68.8	
Unknown Carboxylic Acid				
Unknown Alcohol				
Unknown Aldehyde				
Unknown Ester				
Unknown Alkane			3	
Unknown Aromatic				
Unknown Alkene				
Unknown Ketone				
Unknown Phthalate				
Unknown Cyclic Compound				
Unknown VOA	3		1	
Unknown BNA			3	
Tentatively ID BNA				
Tentatively ID VOA				

Note: A Blank space indicates the parameter was tested for but not found.

TABLE 12

Buffalo Avenue Site

POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS) DETECTED IN THE FILL

Compound	Concentration Range (ug/kg)
Phenanthrene	130-9400
Anthracene	580-4200
Fluoranthene	120-18000
Pyrene	68-26000
Benzo (a) Anthracene	141-18000
Chrysene	180-41000
Benzo (b) Fluoranthene	140-38000
Benzo (k) Fluoranthene	1300-44000
Benzo (a) Pyrene	91-19000
Indeno (1,2,3-cd) Pyrene	870-3000
Dibenzo (a,h) Anthracene	260-1800
Benzo (g,h,i) Perylene	820-4000
2-Methylnapthalene	130-510
Naphthalene	190-1800
Acenaphthene	590-1600
Dibenzofuran	280-1300
Fluorene	510-1500

TABLE 13

Ambient Water Quality Standards

Selected Inorganic Compounds

Element	Standard (ug/l)*
Aluminum	N/A
Antimony	3
Arsenic	25
Barium	1000
Beryllium	3
Cadmium	10
Calcium	N/A
Chromium	50
Cobalt	N/A
Copper	1000
Iron	300
Lead	25
Magnesium	35,000
Manganese	300
Mercury	2
Nickel	N/A
Potassium	N/A
Selenium	20
Silver	50
Sodium	N/A
Thallium	4
Tin	N/A
Vanadium	N/A
Zinc	5000

N/A Not Available
* Source is Reference 7

TABLE 14
Inorganic Results for Ground Water

Results in µg/kg

Parameter	MW-1S Value	Flag	MW-1D Value	Flag	MW-2S Value	Flag	MW-2D Value	Flag	MW-3S Value	Flag	MW-3D Value	Flag
Aluminum	45900	PE	5424	PE	44064	PE	25557	PE	229065	PE	3221	PE
Antimony	50	UPN	50	UPN	50	UPN	50	UPN	50	PN	50	UPN
Arsenic	32.6	SFN	3	UFN	42.7	SFN*	15	SFN	30	UPN	3	UFN
Barium	1492	P	110	P	383	P	272	P	2048	UF	100	UP
Beryllium	2.4	P	0.3	UP	2.2	P	1.1	P	12	UPN	0.6	PN
Cadmium	36	P	4	UP	9	P	38	P	6	P	16	P
Calcium	583789	PE	219721	PE	446292	PE	727995	PE	1166740	PE	277067	PE
Chromium	242	P	31	P	184	P	135	P	421	P	44	P
Cobalt	79	P	29	UP	87	P	71	P	287	P	37	P
Copper	395	P	86	P	144	P	104	P	477	P	50	P
Iron	130314	PE	9802	PE	107550	PE	40125	PE	566965	PE	4931	PE
Lead	2791	P	606	SF*	171	F*	173	SF*	369	F*	12.6	F*
Magnesium	120681	PE	95585	PE	146165	PE	270786	PE	238134	PE	113822	PE
Maganese	3024	PE	499	PE	2468	PE	2107	PE	11482	PE	155	PE
Mercury	5.3	CV	0.2	U	1	CV	0.2	UCV	1	CV	0.2	U
Nickel	146	P	22	UP	105	P	68	P	544	P	22	UP
Potassium	17130	P	145318	P	24202	P	13694	P	35485	P	6043	P
Selenium	30	UFN	30	UFN	30	UFMN	30	UFN	30	UFN	30	UFN
Silver	185	P	74	P	146	P	252	P	353	P	115	P
Sodium	14764	P	159215	P	23299	P	95547	P	44041	P	99120	P
Thallium	2	UFN	2	UFN	2	UFN	2	UFN	2	UFN	2	UFN
Tin	ND		ND		759		ND		ND		ND	
Vanadium	105	P	14	UP	59	P	31	P	431	P	14	UP
Zinc	8542	P	220	P	745	P	780	P	1415	P	116	P
Cyanide	NA		NA		NA		NA		NA		NA	
Phenol	NA		NA		NA		NA		NA		NA	
% solids	NA		NA		NA		NA		NA		NA	

TABLE 14 (continued)
Inorganic Results for Ground Water

Results in µg/kg

Parameter	MW-4S Value	Flag	MW-4D Value	Flag	MW-5S Value	Flag	MW-5D MS-MSD Value	Flag	MW-5D Dup Value	Flag	MW-6S Value	Flag
Aluminum	194092	PE	103845	PE	51018	PE	29852	PE	29852		93601	PE
Antimony	50	UPN	50	UPN	50	UPN	50	UPN	50	U	50	UPN
Arsenic	34	FN	15.5	FN	20.7	SFN	21.6	SFN	21.6		17.2	SFN
Barium	1518	P	1030	P	495	P	301	P	301		654	P
Beryllium	11	PN	0.6	PN	3.3	PN	1.9	PN	0.3	U	5	P
Cadmium	39	P	94	P	15	P	50	P	50		18	P
Calcium	1491400	PE	2421620	PE	442609	PE	875122	PE	8751220		675702	PE
Chromium	450	P	464	P	143	P	130	P	130		223	P
Cobalt	304	P	224	P	73	P	92	P	92		124	P
Copper	452	P	474	P	143	P	182	P	182		269	P
Iron	496590	PE	206504	PE	95126	PE	47642	PE	47462		183198	PE
Lead	388	SF*	678	SF*	30	UF*	271.6	SF*	271.6		102	SF*
Magnesium	395297	PE	972068	PE	110647	PE	388012	PE	388012		163686	PE
Maganese	10691	PE	7066	PE	1887	PE	1697	PE	1697		3767	PE
Mercury	0.8	CV	0.3	CV	0.2	U	0.2	CV	0.24		0.2	U
Nickel	620	P	384	P	122	P	119	P	119		253	P
Potassium	26212	P	29895	P	9796	P	16238	P	16238		16999	P
Selenium	30	UFN	30	UFN	30	UFN	30	UFN	30	U	30	UFN
Silver	429	P	345	P	149	P	308	P	308		207	P
Sodium	42449	P	174832	P	15302	P	81419	P	81419		24497	P
Thallium	2	UFN	2	UFN	20	UFN	2	UFN	2	U	2	UFN
Tin	ND		ND		ND		ND		NA		ND	
Vanadium	362	P	246	P	83	P	55	P	55		182	P
Zinc	3848	P	1950	P	448	P	522	P	522		755	P
Cyanide	NA		NA		NA		NA		NA		NA	
Phenol	NA		NA		NA		NA		NA		NA	
% solids	NA		NA		NA		NA		NA		NA	

TABLE 14 (continued)
Inorganic Results for Ground Water

Results in µg/kg

Parameter	MW-6D Value	Flag	MW-7S Value	Flag	MW-7D Value	Flag	MW-8S Value	Flag	MW-8D Value	Flag
Aluminum	17185	PE	57135	PE	23799	PE	34852	PE	12139	PE
Antimony	50	UPN	1141	PN	50	UPN	50	UPN	50	UPN
Arsenic	4	FN	28	FN	5.9	FN	33.8	SFN	262	SFN
Barium	470	P	5578	P	228	P	389	P	100	UP
Beryllium	1.5	PN	7	PN	1.9	PN	2.3	PN	0.4	UPN
Cadmium	25	P	16	P	42	P	4	UP	37	P
Calcium	415373	PE	376625	PE	726584	PE	302639	PE	854793	PE
Chromium	100	P	7060	P	109	P	131	P	69	P
Cobalt	61	P	82	P	70	P	66	P	57	P
Copper	138	P	838	P	110	P	563	P	68	P
Iron	31906	PE	123669	PE	37791	PE	107545	PE	17206	PE
Lead	68.5	SF*	8861	P	170	SF*	1359	SF*	1116	F*
Magnesium	75995	PE	47036	PE	263656	PE	147588	PE	174062	PE
Maganese	904	PE	1466	PE	1749	PE	2063	PE	680	PE
Mercury	0.2	U	50.6	CV	0.2	CV	2.1	CV	0.3	CV
Nickel	82	P	148	P	46	P	75	P	22	UP
Potassium	136749	P	10734	P	24883	P	13919	P	23027	P
Selenium	30	UFN	30	UFN	30	UFN	30	UFN	30	UFN
Silver	156	P	115	P	258	P	65	P	343	P
Sodium	160047	P	34053	P	210421	P	1877480	P	285645	P
Thallium	2	UFN	2	UFN	2	UFN	2.4	FN	2	UFN
Tin	630		ND		934		369		1124	
Vanadium	17	P	84	P	22	P	75	P	14	UP
Zinc	318	P	9246	P	529	P	516	P	246	P
Cyanide	NA		NA		NA		NA		NA	
Phenol	NA		NA		NA		NA		NA	
% solids	NA		NA		NA		NA		NA	

Notes:

NR=Not Reported
NA=Not Analyzed
ND=Not Detected

Table 15
Organic Results for Ground Water
Results in µg/l

Parameter	MW-1S Value	Flag	MW-1D Value	Flag	MW-2S Value	Flag	MW-2D Value	Flag	MW-3S Value	Flag	MW-3D Value	Flag
Percent Moisture	NA		NA		NA		NA		NA		NA	
pH	7.9		8.7		7.9		7.9		7.4		7.9	
Methylene Chloride	26		20	B	26				400	B	87	B
Acetone	12	B	11		15	B	21	B				
Benzene	1.1	JB	2.8	J			1.5	JB				
2-Butanone												
Vinyl Acetate												
Phenanthrene									14			
1,1,1-Trichloroethane							3.2	J				
Trichloroethene					1.4	J						
bis(2-Ethylhexyl) Phthalate	150	B			270	B	26	B	1300	B	16	B
Di-n-Butylphthalate			16									
Di-n-Octyl Phthalate			20									
Naphthalene									29			
Aldrin									0.01	J		
Endosulfan I												
Endosulfan II												
Endosulfan Sulfate											0.05	J
Delta-BHC											0.03	J
Heptachlor Epoxide												
Toluene												
Benzoic Acid												
Unknown Benzene												
Unknown Aldehyde												
Unknown Ester												
Unknown Alkane	1		1									
[redacted]			1									
Unknown Alkene			2		2							
Unknown Ketone					1		1					
Unknown Phthalate												
Unknown Cyclic Compound									4		2	
Unknown VOA	1		1				1		5		5	
Unknown BNA	14		14		3		2		1			
Tentatively ID BNA			1				1					
Tentatively ID VOA							1					

Table 15 (continued)
Organic Results for Ground Water
Results in µg/l

Parameter	MW-4S Value	Flag	MW-4D Value	Flag	MW-5S Value	Flag	MW-5D Value	Flag	MW-6S Value	Flag	MW-6D Value	Flag
Percent Moisture	NA		NA		NA		NA		NA		NA	
pH	7.9		8		7.4		8		7.5		12	
Methylene Chloride	78	B	77	B	92	B	15		44	B		
Acetone	59				130						11	B
Benzene											1.5	BJ
2-Butanone												
Vinyl Acetate												
Phenanthrene												
1,1,1-Trichloroethane												
Trichloroethene												
bis(2-Ethylhexyl) Phthalate	29	B	54	B			15		2700	B	65	B
Di-n-Butylphthalate							33				25	
Di-n-Octyl Phthalate	33											
Naphthalene												
Aldrin												
Endosulfan I									0.01	J		
Endosulfan II												
Endosulfan Sulfate												
Delta-BHC												
Heptachlor Epoxide											1.8	J
Toluene												
Benzoic Acid												
Unknown Benzene												
Unknown Aldehyde												
Unknown Ester												
Unknown Alkane												
Unknown Aromatic												
Unknown Alkene					1							
Unknown Ketone			1		1							
Unknown Phthalate	8											
Unknown Cyclic Compound												
Unknown VOA	1								3			
Unknown BNA	5		8		11		7		2		6	
Tentatively ID BNA	1				1		1					
Tentatively ID VOA											1	

Table 15 (continued)
Organic Results for Ground Water
Results in µg/l

Parameter	MW-7S Value	Flag	MW-7D Value	Flag	MW-8S Value	Flag	MW-8D Value	Flag	TRIP BLANK Value	Flag
Percent Moisture	NA		NA		NA		NA		NA	
pH	7.9		8		7.7		8.8		7.9	
Methylene Chloride	13				22	B	25	B	16	
Acetone	9.3	JB	46		10		22			
Benzene	1.7	JB	1.5	J			1.2	J		
2-Butanone										
Vinyl Acetate										
Phenanthrene										
1,1,1-Trichloroethane										
Trichloroethene			1.2	J						
bis(2-Ethylhexyl) Phthalate	2200	B	95	B	410	B	74	B	20	B
Di-n-Butylphthalate									16	
Di-n-Octyl Phthalate										
Naphthalene										
Aldrin	1.67									
Endosulfan I	4.38									
Endosulfan II										
Endosulfan Sulfate										
Delta-BHC	2.76									
Heptachlor Epoxide	0.12									
Toluene										
Benzoic Acid	1200									
Unknown Benzene	2									
Unknown Aldehyde										
Unknown Ester										
Unknown Alkane							1			
Unknown Aromatic										
Unknown Alkene										
Unknown Ketone										
Unknown Phthalate			1							
Unknown Cyclic Compound			1							
Unknown VOA	2		2		1					
Unknown BNA	3		6		4		3		4	
Tentatively ID BNA			2							
Tentatively ID VOA			3							

TABLE 16

Explanation of Laboratory Flags

VALUE	If the result is a value greater than or equal to the instrument detection limit but less than the contract-required detection limit, the value is reported in brackets (i.e., [10]).
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.
C	This flag applies to pesticide parameters where the indentification has been confirmed by GS/MS.
E	Indicates a value estimated or not reported due to the presence of interference. This interference is caused by the sample matrix.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1 to 1 response is assumed or when th mass spectral data indicates the presence of a compound that meets the indentification criteria but the result is less than the specified detection limit but greater than zero (e.g. 10J).
M	Indicates duplicate injection results exceeded control limits.
N	Indicates spike sample recovery is not within control limits, usually due to sample matrix interference.
S	Indicates a value determined by method of standard addition because of sample matrix interferences.
U	Indicates compound was analyzed but not not detected. Report the minimum detection limit for the sample with U (e.g. 10 U based upon necessary concentration dilution actions). NOTE: this is not necessarily the instrument detection limit. The footnote should read U - compound was analyzed but not detected. The number is the minimum attainable detection limit for the sample.
[]	Indicates sample value is between IDL and CRDL.
*	Indicates duplicate analysis is not within control, limits, due to sample matrix interference.
+	Indicates the correlation coefficient for method of standard addition is less than 0.995, due to sample matrix interference.

4.0 FINAL APPLICATION OF THE HAZARD RANKING SYSTEM (HRS)

The Buffalo Avenue site (Figure 1) is an approximately 30 acre tract of land located in the City of Niagara Falls, Niagara County, N.Y. It was operated as a landfill for the disposal of materials by the City of Niagara Falls and New York Power Authority (NYPA) between the late 1930's and early 1950's. Municipal incinerator residues, slags and other wastes were apparently used during fill operations. The site has not operated since the early 1950s and has been investigated by the EPA, the USGS and the DEC. Currently, NYPA is conducting a Phase II Investigation for the DEC.

The site is located in a former wetlands adjacent to the Niagara River which has been used as a drinking water supply. PAH's, solvents and heavy metals were detected in shallow ground water samples and both shallow and deep soil samples collected from the recently drilled monitor wells.

The site is located in an urban area with approximately 80,000 people living within a 5 mile radius. However, the likelihood of exposure to site constituents is low since waste materials are not present on the surface and that Aquifers underlying the site are not used for drinking water. Neither EPA nor DEC consider this site an imminent threat to the public or the environment and no remedial actions have taken place.

This section of The Phase II Report presents the results of the Hazard Ranking Score (HRS) for the site. The HRS calculation forms have been taken from 40 CFR Part 300, Appendix A. The Potential Hazardous Waste Site Inspection Report (EPA Form 2070-13 (7-81)) that follows HRS work sheets was provided by EPA Region II. This form, developed by EPA in response to regulatory requirements described in 40 CFR Part 300.64, is used to evaluate releases or a threat of a releases, from potential hazardous waste sites.

4.1 Discussion of the HRS

The scores calculated for the Buffalo Avenue site find a set of conditions which, according to EPA and DEC criteria, do not pose a significant threat to the public health or the environment.

In considering inactive hazardous waste disposal sites for inclusion on the National Priorities List (NPL), both agencies use the following ranking procedure:

- If the SM score is close to or greater than 28.5, the site may become a candidate for inclusion on the NPL;

- If the score is not close to 28.5, it may be evaluated as part of the DEC State Superfund Program and, if considered a significant problem, the DEC will require additional investigatory measures (e.g., a Remedial Investigation).

The SDC and SFE scores are not included in NPL decisions. They are used by both DEC and the New York State Department of Health in evaluating the need for immediate remedial actions. Site-specific characteristics such as accessibility to, and toxicity of the waste rather than numerical values, determine these scores.

As illustrated by the HRS cover sheet, the site specific SM score is well below (less than one quarter) that used by EPA and DEC to consider sites for inclusion in the NPL or State Superfund List. SDC and SFE scores and the characteristics of the Buffalo Ave. inactive waste site, are not indicative of a significant threat to the public health or environment.

HRS COVER SHEET

Facility name: BUFFALO AVE SITE

Location: BUFFALO AVE BETWEEN 57TH & 60TH ST - NIAGARA FALLS, NY

EPA Region: 2

Person(s) in charge of the facility: INACTIVE SITE - OPEN FIELD

Name of Reviewer: R. P BLANCHETT Date: 9-15-87

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

SEE SECTIONS 1.0 AND 4.0 OF THE PHASE II REPORT FOR A GENERAL DESCRIPTION OF THE FACILITY.

Scores: S_M = 7.0 (S_{gw} = 3.8 S_{sw} = 11.3 S_a = 0)

S_{FE} = 16.7

S_{DC} = 0

HRS COVER SHEET

Facility Name: BUFFALO AVE SITE Date: 9-15-88

Worksheet for Computing S_M

	S	S^2
Groundwater Route Score (S_{gw})	4.2	18.0
Surface Water Route Score (S_{sw})	11.3	127.7
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		145.7
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		12.1
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M$		7.0

WORK SHEET FOR COMPUTING S_M

Facility Name: BUFFALO AVE SITE Date: 7-15-88

Ground 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	3.1
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					3.2
Depth to Aquifer of Concern	0 1 2 3	2		6	
Net Precipitation	0 1 2 3	1		3	
Permeability of the Unsaturated Zone	0 1 2 3	1		3	
Physical State	0 1 2 3	1		3	
Total Route Characteristics Score			— —	15	
3 Containment	0 1 2 3	1	— —	3	3.3
4 Waste Characteristics					3.4
Toxicity/Persistence	0 3 6 9 (12) 15 18	1	12	18	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	8	
Total Waste Characteristics Score			18	26	
5 Targets					3.5
Ground Water Use	0 (1) 2 3	3		9	
Distance to Nearest Well/Population Served	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1		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			2430	57,330	
7 Divide line 6 by 57,330 and multiply by 100			S_{gw} = 4.2		

GROUND WATER ROUTE WORK SHEET

EXPLANATORY DATA

GROUND WATER ROUTE WORK SHEET

(1) Observed Release

There is evidence of the release into groundwater of priority pollutant substances possibly from either the site or from an upstream source. These releases are described in Section 3.0 of the Phase II Report.

(2) Route Characteristics

N/A - This factor is not calculated because an observed release (Item 1 - Ground water Work Sheet) was reported for the site.

(3) Containment

N/A - This factor is not calculated because an observed release (Item 1 - Ground water Work Sheet) was reported for the site.

(4) Waste Characteristics

To compute waste characteristic values, a persistence value of 2 was used (Table 5: Persistence of Some Organic Compounds - methylene chloride), along with a toxicity value of 2 (Table 4 - chlorinated solvents). This yielded a matrix score of 12.

To compute waste quantity, approximate cinder fill thickness from each boring was plotted in Figure HR-1. The aerial distribution of the cinder fill was then developed and, assuming an average cinder fill thickness of 3 feet, a volume was calculated:

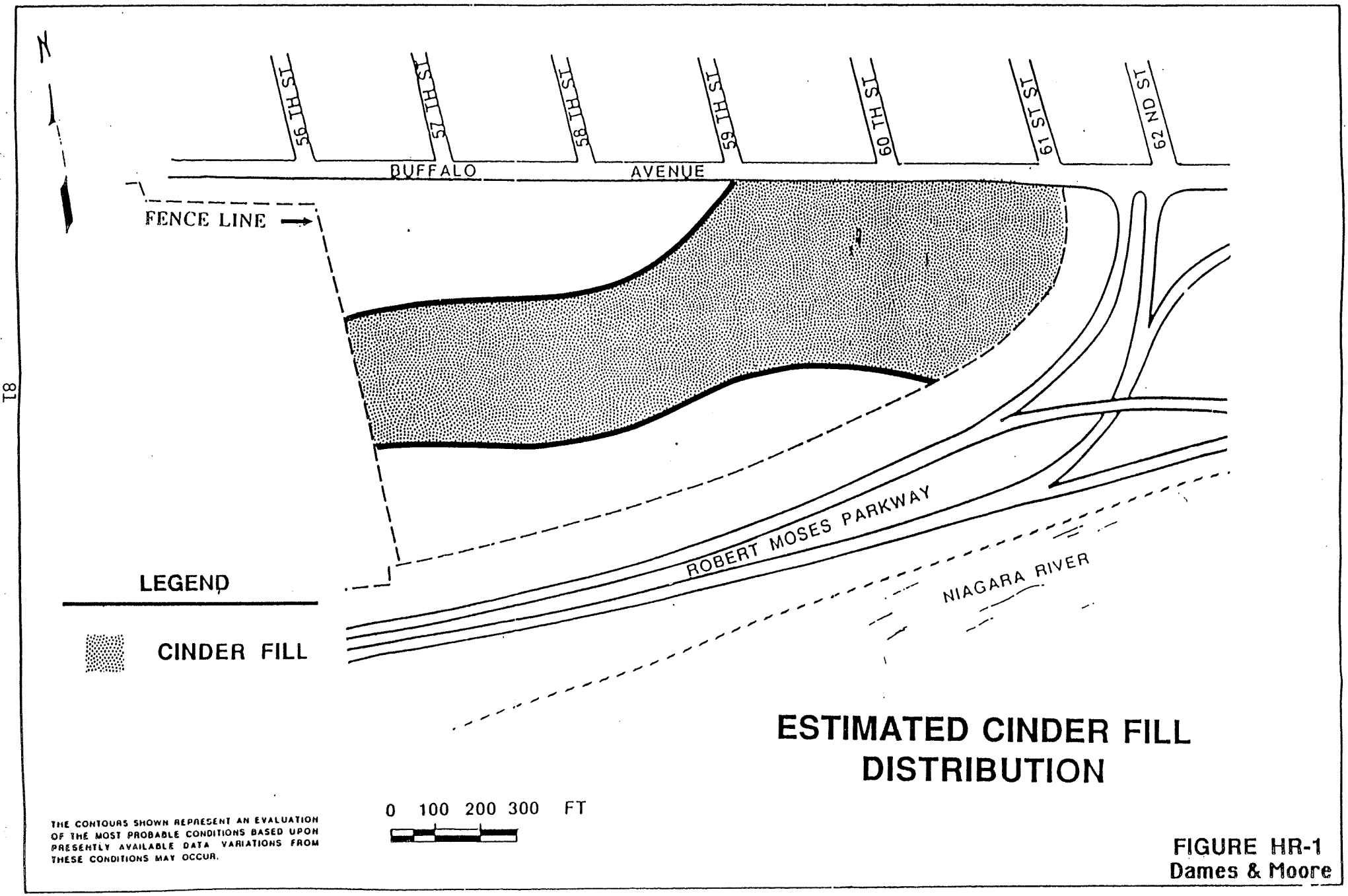
Area of cinder fill distribution = 7000 $ft.^3$
Assumed cinder fill thickness = 3 ft.
Total estimated cinder fill volume = 21,000 $ft.^3$ or 780 $yrd.^3$

To be conservative, the total volume of the cinder fill was assumed to be hazardous. This leads to an assigned value of 6 from the Hazardous Waste Quantity table in 40 CFR Part 300, Appendix A.

(5) Targets

To develop the Targets value, ground water usage was characterized as a 1 (commercial, industrial or irrigation and another water source presently available; not used, but useable).

The nearest known well is an industrial supply well about 1.5 miles west of the site. No drinking water supply wells are known to be present within a 5 mile radius of the site. This leads to a Distance to Nearest Well/Population Served value of 0.



ESTIMATED CINDER FILL DISTRIBUTION

FIGURE HR-1
Dames & Moore

Facility Name: DUHMCO HVR SITE Date: 7-15-88

Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
[1] Observed Release	(0) 45	1	Ø	45	4.1
If observed release is given a value of 45, proceed to line [4]. If observed release is given a value of 0, proceed to line [2].					
[2] Route Characteristics					4.2
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	3	
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3	
Distance to Nearest Surface Water	0 1 2 (3)	2	6	6	
Physical State	0 (1) 2 3	1	1	3	
Total Route Characteristics Score			9	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	72	18	
Hazardous Waste Quantity	0 1 2 3 4 5 (6) 7 8	1	6	8	
Total Waste Characteristics Score			18	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	6	6	
*Population Served/ Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40	
Total Targets Score			15	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]			7290	64,350	
[7] Divide line [6] by 64,350 and multiply by 100			S_{SW} = 11.3		

SURFACE WATER ROUTE WORK SHEET

* SINCE THERE IS NO OBSERVED RELEASES, NO POPULATION IS IMPACTED.

EXPLANATORY DATA

SURFACE WATER ROUTE WORK SHEET

(1) Observed Release

There is no quantitative evidence that the site is releasing contaminants into surface water.

(2) Route Characteristics

A facility slope and intervening terrain value of 0 (facility slope, 6.3 pct and <3 slope pct for intervening terrain) was calculated from Figure HR-2.

The one-year, 24 hour rainfall amount for this area of New York State is 2 inches. (Figure 8-40 CFR, Appendix A). This leads to an assigned value of 2.

The Niagara River is present approximately 200 feet beyond the site's southern boundary. However, between the site and the Niagara River is the Robert Moses Parkway. This 4-lane paved road is built on an earthen berm about 20 feet high which extends along the entire southern side of the site (Figure HR-2). This berm aids in preventing surface runoff from directly entering the Niagara River. In order to be conservative, an arranged value of 3 is used for Distance to Nearest Surface Water Score.

The physical state of the cinder fill at the time of disposal was assumed to be that of a unconsolidated solid.

(3) Containment

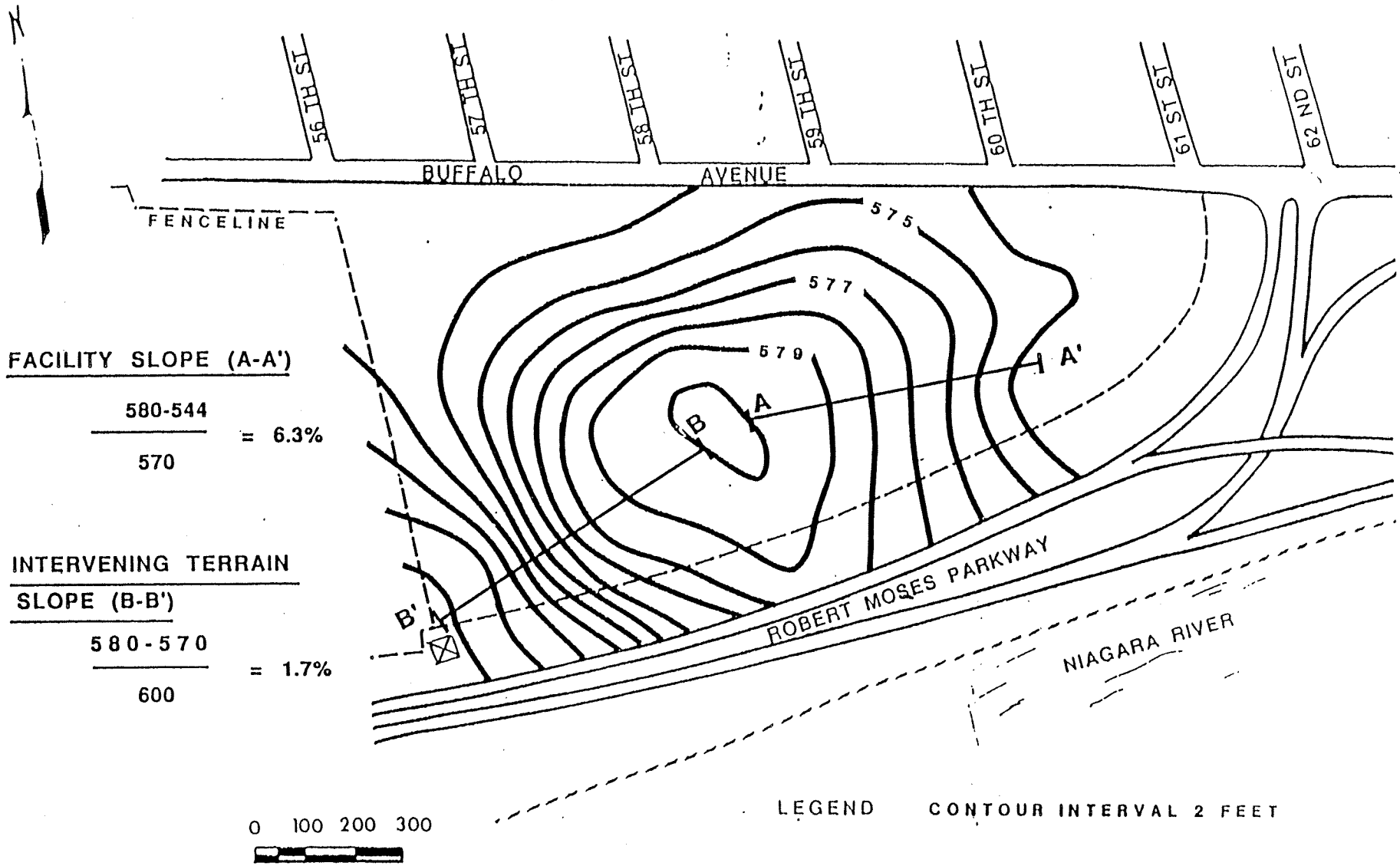
This site is a well graded and covered landfill with wastes not exposed at the surface. However, no diversion system is present at the site. This requires it to receive a Containment value of 3.

(4) Waste Characteristics

See Item 4 of the Explanatory Data - Ground Water Work Sheet.

(5) Targets

The surface water adjacent to the site is used as a drinking water source (assigned value of 3). Wetlands are present along the site's southern boundary; this gives the site a Distance to Sensitive Environment value of 3. Approximately 80,000 people live within a 3 mile radius of the site. As no observed releases have occurred, this population has not been impacted. A Population Served value of 0 has therefore been assigned to this category.



NYPA BUFFALO AVENUE SITE
SLOPE CALCULATION

FIGURE HR-2
DAMES & MOORI

Facility Name: [illegible] Date: 1 10 00

Air Route Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
[1] Observed Release	(0) 45	1	0	45	5.1
Date and Location: SITE BOUNDARY - 10/6/97					
Sampling Protocol: P.I.D. Measurements (see Table 7: Phase II Report)					
If line [1] is 0, the S_a = 0. Enter on line [5]. If line [1] is 45, then proceed to line [2].					
[2] Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste	0 1 2 3 4 5 6 7 8	1		8	
Total Waste Characteristics Score				20	
[3] Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
Total Targets Score				39	
[4] Multiply [1] x [2] x [3]				35,100	
[5] Divide line [4] by 35,100 and multiply by 100		S_a =	0		

AIR ROUTE WORK SHEET

EXPLANATORY DATA

AIR ROUTE WORK SHEET

(1) Observed Release

There is no evidence indicating the site is releasing contaminants into the air that significantly exceed background levels. See Section 2.2 and Table 7 of the Phase II Report for a discussion of air monitoring conducted at the site.

(2) Waste Characteristics

N/A - This factor was not calculated because an observed release (Item 1 - Air Route Work Sheet) was not reported for the site.

(3) Targets

N/A - This factor was not calculated because an observed release (Item 1 - Air Route Work Sheet) was not reported for the site.

Facility Name: [illegible]

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	6	8	
Total Waste Characteristics Score			16	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	2	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	4	5	
Buildings Within 2-Mile Radius	0 1 2 3 (4) 5	1	4	5	
Total Targets Score			16	24	
[4] Multiply [1] x [2] x [3]			96	1,440	
[5] Divide line [4] by 1,440 and multiply by 100			S_{FE} =	6.7	

FIRE AND EXPLOSION WORK SHEET

EXPLANATORY DATA

FIRE AND EXPLOSION WORK SHEET

(1) Containment

No potential for fire or explosion exists at the site as any ignitable or explosive hazardous substances are segregated and isolated to prevent the formation of incompatible mixtures. This leads to an assigned factor of 1.

(2) Waste Characteristics

No direct evidence of ignitability or explosion potential is apparent from available site data. The waste is contained (landfilled) at the site in such a manner so as to preclude the potential for ignitable, reactive or incompatible reactions. All of these four categories have been assigned 0 values.

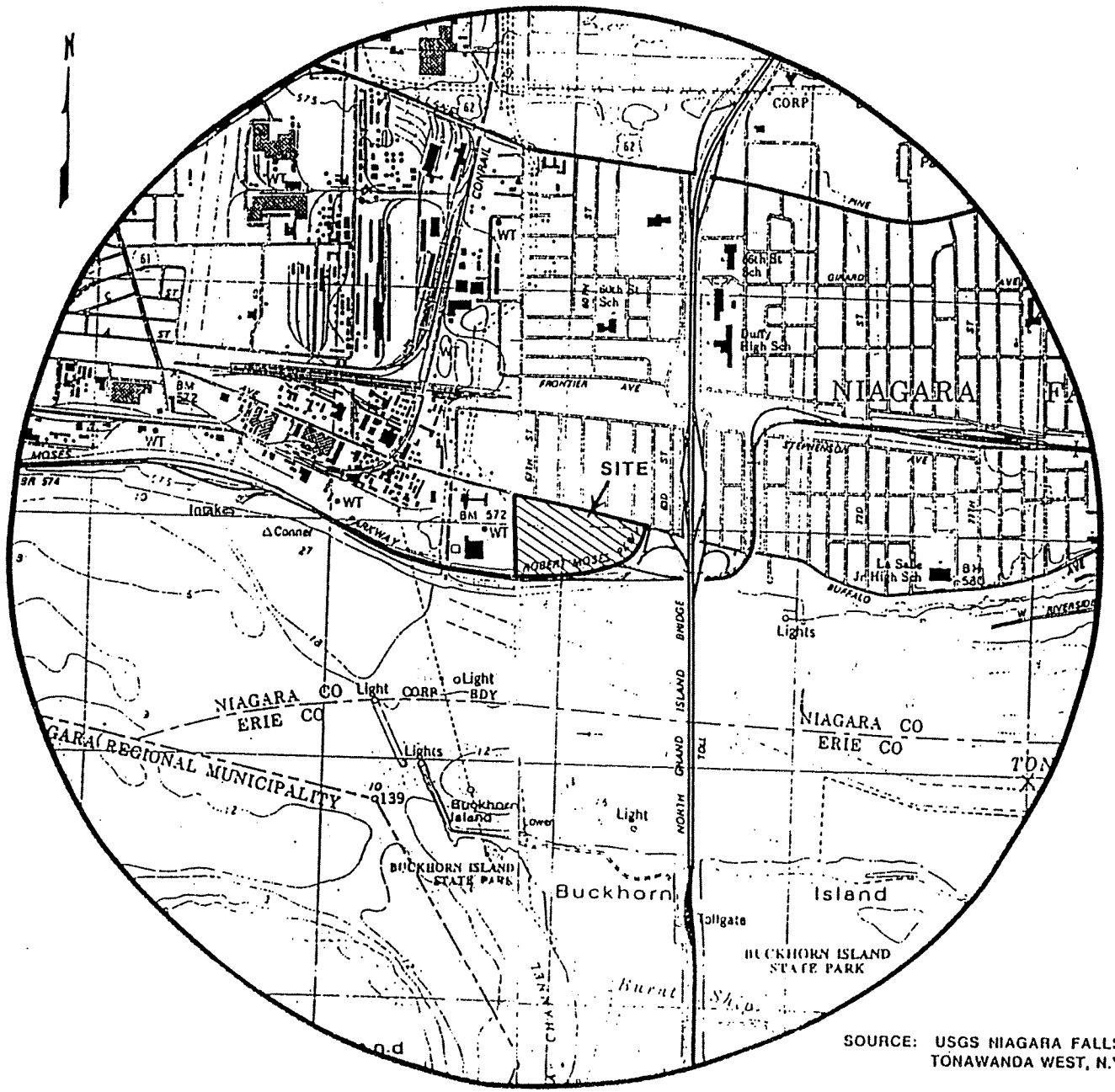
The quantity of hazardous waste present at the site was estimated in Item 4 of the Explanatory Data - Ground Water Route Work Sheet.

(3) Targets

The nearest population and occupied building are within 500 feet of the site. This leads to an assigned value of 3 for these two categories. Wetlands are present within 1000 feet of the boundary, assigning it a value of 0 in this category.

The distance to the nearest commercial or industrial activity from the site is less than 0.25 miles. This category receives an assigned value of 3.

The existing population and buildings within a 2 mile radius of the facility estimated from the USGS topographic map are between 3000 to 10,000 and 791 to 2600 respectively (Figure HR-3). This leads to assigned value of 4 for this category.



TWO MILE RADIUS FROM BUFFALO AVENUE SITE

0 2000 FT

SCALE

SOURCE: USGS NIAGARA FALLS, NY-ONT. 1980 AND TONAWANDA WEST, N.Y. 1980 TOPOGRAPHIC MAPS

FIGURE HR-3

Dames & Moore

06

Facility Name: BUFFALO Ave SITE Date: 9-15-88

Direct Contact Work Sheet					
Rating Factor	Assigned Value (Circle One)	Multiplier	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	0		8.3
[4] Waste Characteristics Toxicity	0 1 (2) 3	5	10	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]			0	21,600	
[7] Divide line [6] by 21,600 and multiply by 100			S_{DC} = 0		

DIRECT CONTACT WORK SHEET

EXPLANATORY DATA

DIRECT CONTACT WORK SHEET

(1) Observed Incident

There is no confirmed instance in which contact with hazardous waste at the facilities has caused injury, illness or death to humans or domestic/wild animals. This category has been assigned a 0 value.

(2) The facility is fenced on 3 sides and the wastes are buried 5-20 feet below grade. However, since barriers do not completely surround the site, an accessibility value of 3 is required to be assigned.

(3) Containment

A value of 0 has been assigned to this category, as wastes are buried 5 to 20 feet below grade.

(4) Waste Characteristics - Toxicity

A value of 2 has been assigned as explained in Item 4 of the Explanatory Data for the Ground Water Route Work Sheet.

(5) Targets

Population within a one mile radius has been estimated at between 3000-10,000. This leads to an assigned value of 4.

There are no critical habitats within the site area. Therefore a value of 0 has been assigned to this category.

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 0980507784

II. SITE NAME AND LOCATION

01 SITE NAME	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Buffalo Ave.	Buffalo Ave between 57th & 60th St.

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Niagara Falls	NY	14304	Niagara	63	32

09 COORDINATES: LATITUDE 43° 04' 24.N | LONGITUDE 79° 00' 00.W

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: 10-12, -87 (MONTH DAY YEAR)

02 SITE STATUS
☐ ACTIVE
☒ INACTIVE

03 YEARS OF OPERATION: 1930's (BEGINNING YEAR) | 1950 (ENDING YEAR) ___ UNKNOWN

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

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Greg DeLMastro	Geologist	Dames & Moore	(914) 735-1200
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Robert Blauvelt	Geologist	Dames & Moore	(914) 735-1200
Andre Ivanciv	Geologist	Dames & Moore	(914) 735-1200
John Szalkowski	Sampling technician	Dames & Moore	(914) 735-1200
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
			( )
John Malinchock		NYPA - Lewiston Rd Lewiston, NY	(716) 285-3211
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	Oct - Dec, 1987	Variable

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Robert P Blauvelt	Dames & Moore 1 Blue Hill Plaza Pearl River, NY	(914) 735-1200

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Robert P Blauvelt	NUS	Dames & Moore	914-735-1200	2, 1, 88 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

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

EPA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	NY980507784

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: UNKNOWN

CUBIC YARDS: UNKNOWN

NO. OF DRUMS: _____

03 WASTE CHARACTERISTICS (Check all that apply)

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

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	UNKNOWN		OLD LANDFILL SITE. WASTES
OLW	OILY WASTE			CONSIST OF NON-COMBUSTIBLES
SOL	SOLVENTS			AND INCINERATOR RESIDUES.
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			WASTES DEPOSITED ACROSS
IOC	INORGANIC CHEMICALS			SITE IN VARYING LOCATIONS
ACD	ACIDS			AND DEPTHS
BAS	BASES			
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	SEE D-M REPORT				
	FOR DISCUSSION OF				
	MATERIALS DETECTED				
	IN SITE SOILS				
	AND GROUND WATER				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	N/A		FDS		
FDS			FDS		
FDS			FDS		
FDS					

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

(1) RESULTS OF SITE INVESTIGATION

(2) NYPA

(3) PUBLISHED REPORTS

EPA FORM 2070-13(7-81)

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 009 6507784

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 80,000
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
CONTAMINATED SHALLOW GROUND WATER IS DISCHARGING INTO NIAGARA RIVER - WHICH IS A WATER SUPPLY FOR THE AREA

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: 80,000
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
See note ABOVE

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO. potential exists

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO potential exists - no wastes present on surface of site

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO potential exists - no wastes present on surface of site

01 ☐ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: VARIES (Acres)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
CONTAMINATION OCCURS AT VARIOUS LEVELS THROUGHOUT SITE. CANNOT be estimated AT THIS TIME.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO potential exists - no water supply wells on-site

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO potential exists - site INACTIVE

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NO potential exists - no wastes present on surface of site

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: ND9 0507784

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN - NOT LIKELY GIVEN NATURE/LOCATION OF SITE

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Including species of concern)
UNKNOWN - NOT LIKELY GIVEN NATURE/LOCATION OF SITE

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
UNKNOWN - NOT LIKELY GIVEN NATURE/LOCATION OF SITE (NO FARMING/GARDENING BEING DONE ON SITE)

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☒ OBSERVED (DATE: ~~_____~~ See DEM Report) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION
CONTAMINATED GROUND WATER IS MIGRATING TOWARDS NIAGARA RIVER.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NONE OBSERVED DURING FIELD ACTIVITIES

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NONE OBSERVED DURING FIELD ACTIVITIES

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
NONE OBSERVED DURING FIELD ACTIVITIES

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

III. TOTAL POPULATION POTENTIALLY AFFECTED: 90,000

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)
(1) RESULTS OF SITE INVESTIGATION
(1) NYPA
(3) PUBLISHED REPORTS

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D09 0507784

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. INCINERATION
- ☐ 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

Ø

06 AREA OF SITE

≈ 30 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

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

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

OLD LANDFILL, not lined or graded. SURFACE IS GRASS COVERED AND CONSISTS OF SILTY SAND WITH some GRAVEL.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO BURIED Between 5 AND 20 Ft Below grade

02 COMMENTS

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

(1) RESULTS OF SITE INVESTIGATION
(2) NYDA
(3) PUBLISHED REPORTS

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	0090507784

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)

	SURFACE	WELL
COMMUNITY	A. [X]	B. [ ]
NON-COMMUNITY	C. [ ]	D. [ ]

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. [ ]	B. [ ]	C. [ ]
D. [ ]	E. [ ]	F. [ ]

03 DISTANCE TO SITE

A. 5 (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)
[X] C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)
[ ] D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER NONE

03 DISTANCE TO NEAREST DRINKING WATER WELL ≈ 5 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
5-10 (ft)	SOUTH to SOUTHWEST	30-40 (ft)	1500 (gpd)	[ ] YES [X] NO

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

16 MONITOR WELLS ON-SITE - See ORM Report.

10 RECHARGE AREA		11 DISCHARGE AREA	
[X] YES [ ] NO	COMMENTS: Site receives run-on from adjacent areas. Water ponds on-site	[X] YES [ ] NO	COMMENTS: Shallow ground water will discharge to Niagara River

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

[X] 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	[ ]	ADJACENT (mi)
LAKE ONTARIO	[ ]	10 (mi)
	[ ]	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 16,000 NO. OF PERSONS	B. 30,000 NO. OF PERSONS	C. 80,000 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

0.1 (mi)

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

APPROXIMATELY 5000

04 DISTANCE TO NEAREST OFF-SITE BUILDING

0.1 (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)

Residential with a high population density north and east of the site. Industrial area to northwest and west

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: 0090507784

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one): UNKNOWN
☐ 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)
☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☒ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
30-40 (ft)	VARIABLE (ft)	6.0-8.0

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
32 (in)	5 (in)	5 %	NORTH TO SOUTH	2 %

09 FLOOD POTENTIAL
SITE IS IN 5 YEAR FLOODPLAIN

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

11 DISTANCE TO WETLANDS (5 acre minimum)
ESTUARINE: A. NOT APPLICABLE (mi)
OTHER: B. 5 (mi)

12 DISTANCE TO CRITICAL HABITAT (for endangered species)
_____ (mi)
ENDANGERED SPECIES: N/A

13 LAND USE IN VICINITY

DISTANCE TO: COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AG LAND
A. ADJACENT (mi)	B. 0.1 (mi)	C. 5 (mi)	D. 5 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

See Attached D&M Report - Section 3.0

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

(1) Results of site investigation
(2) NYPA
(3) Published Reports

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	1009 6507184

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER		See D+M Report 2-88	
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
	See D&M Report 2-88

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☐ AERIAL

02 IN CUSTODY OF DAMES & MOORE
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS DAMES & MOORE

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

See D&M Report 2-88

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

(1) Results of site investigation
(2) NYPA
(3) Published Reports

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D090507784

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
NY Power Authority	14304	5777 Lewiston Rd	4911	Niagara Falls	NY	14300

PARENT COMPANY

08 NAME	09 D+B NUMBER	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	12 CITY	13 STATE	14 ZIP CODE
N/A						

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	05 CITY	06 STATE	07 ZIP CODE
Not Applicable						

IV. REALTY OWNER(S) (If applicable; list most recent first)

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, sampling analysis, reports)

(1) Results of Site Investigation
(2) NYPA
(3) Published Reports

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	0905077784

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
Site INACTIVE	

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

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER
N/A	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

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

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

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

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 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

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

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, sampling results, reports)

(1) Results of Site Investigation
(2) NYSA
(3) Published Reports

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	NO90507784

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
NONE - SITE INACTIVE	

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

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

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

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

IV. TRANSPORTER(S)

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

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

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

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

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

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

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

(1) Results of site Investigation
(2) NYPA
(3) Published Reports

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NY	009C507784

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ D. SPILLED MATERIAL REMOVED 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ F. WASTE REPACKAGED 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ H. ON SITE BURIAL 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ L. ENCAPSULATION 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ N. CUTOFF WALLS 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION NONE	02 DATE	03 AGENCY
01 ☐ Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION NONE	02 DATE	03 AGENCY

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION
01 STATE: NY | 02 SITE NUMBER: D090507784

II PAST RESPONSE ACTIVITIES

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: NONE

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION: Phase II Study for NYSDEC

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

(1) Results of site investigation
(2) Published Reports
(3) NYPA

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NY	D090507784

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION [X] YES [ ] NO

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

Site placed on NYSDEC SUPERFUND LIST. PHASE II INVESTIGATION CURRENTLY IN PROGRESS

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

(1) Results of site investigation
(2) NYPA
(3) Published Reports

EPA FORM 2070-13 (7-81)

SECTION 5.0

5.0 DISCUSSION OF REMEDIAL ALTERNATIVES

The objectives of a Phase II Investigation are to determine if contaminants are present at Buffalo Avenue IHWS No. 932080, and, if so, they are leaving the site with a resulting impact on human population and/or the environment (Reference 8). The field program, laboratory data and HRS presented in the Buffalo Ave. Phase II Report were designed and implemented to meet these objectives.

The calculated HRS demonstrates that this site would not qualify for inclusion in the NPL. However, laboratory data do indicate that levels of PAH's in the 1000 ppb range are present in cinder fill material and that both shallow and deep ground water contain concentrations of organic solvents and heavy metals in the range of 10-100 ppb. This ground water is probably discharging into the Niagara River which is a source of drinking water.

Mitigating these conditions are the fact that the cinder fill is not present at the surface (i.e. little or no chance of exposure to the public) and ground water is not used as a potable water source in the site area. In addition, the Niagara River has high flow volumes year round and would significantly dilute contaminated ground water seepage from the site.

Therefore, based upon the results of this study, as discussed herein, there is no demonstration that the site presents an immediate hazard to the public or the environment.

The physiographic, geologic and hydrogeologic characteristics of NYPA's Buffalo Avenue site would lend themselves, if required, to a variety of remedial alternatives. A general, preliminary discussion of available alternatives is provided below. Final selection and implementation of a long term, remedial solution, if required, needs to be based on results of a detailed feasibility study of critical site features (e.g., contaminant pathways and public health risks) evaluated against various decision making criteria (e.g. cost, schedule, maintenance).

The remedial alternative(s) judged most effective would be implemented at the site. Unit costs provided in the following discussions have been updated from an EPA publication (Reference 4), and are intended only for illustrative purposes.

5.1 Continued Site Maintenance

This type of remedial action involves the regrading of the site to promote runoff and reduce surface water infiltration. In this approach, less water is available to mobilize contaminants in the soil and leachate production is therefore significantly reduced. Continued long-term monitoring of the ground water and surface water would be needed as part of this remedial action.

Costs related to this type of action would include the following:

- Regrading @ \$1.50 - \$3.00/yd^2 (assume on-site materials are used in cut/fill activities)

- Hydraulic seeding and fertilization of site, with wood fiber mulch at \$0.33 - \$1.25/yd^2

- Semiannual ground water and surface water sampling for priority pollutable \$70,000/year, which includes lab analysis of 20 samples, at the following rates:

Labor - 2 technicians, 2 days at \$50/hour = \$2,000

Analyses - TCL testing and reporting of 20 samples at \$3,400 = \$68,000

Total = \$70,000

5.2 Regrading and Capping

Another remedial alternative would be to cover the site with a low permeability cap (either clay or synthetic material) after regrading to significantly reduce the amount of surface water available to mobilize hazardous waste constituents present in on-site soils.

Costs associated with this type of activity would include the following:

- Regrading at \$1.50 - \$3.00/yd^2 (assumes on-site materials are used in cut/fill activities).
- Hauling, spreading and compaction of clay \$8.50 - \$12.00/yd^3 (assumes local source, within 2 miles of site).
- Hydraulic seeding and fertilization of site with wood fiber mulch at \$0.33 - \$1.25/yd^2.
- Semiannual ground water and surface water sampling for priority pollutants at \$70,000/year (includes lab analysis of 20 samples).

In some cases, this system can be supplemented by a slurry wall or cut-off trench. At the Buffalo Avenue site, such a wall might be completed (keyed) in the lake bed clay. Unit costs would include:

- Excavation of soils using a backhoe at \$5.00 - \$10.00/yd^3
- Installation of bentonite slurry wall at \$15.00 - \$20.00/ft^3

These unit costs represent estimated capital expenditures required for construction. Maintenance or repair costs are not included.

5.3 Ground Water Recovery

The recovery, treatment and discharge of contaminated ground water is another remedial alternative to be considered. In this case, a series of withdrawal wells are installed and pumped to intercept on-site contaminated ground water. This water is treated to meet appropriate water quality standards and then either discharged at the surface or re-injected into the aquifer. In some cases, interceptors or trenches (e.g., French drains) can be used in place of the withdrawal wells.

Estimated unit prices for such a system are as follows:

- Regrading at \$1.50 - \$3.00/yd^2(assumes on-site materials are used in cut/fill activities).
- Hydraulic seeding and fertilization of site with wood mulch fiber at \$0.33 - \$1.25/yd^2.
- 2-inch well points at \$2000-\$3500 each.
- Header pipes to connect system at \$35.00-\$65.00/foot.
- Centrifugal suction pumps at \$280-\$360/each.
- Semiannual ground water and surface waste sampling for priority pollutants at \$70,000/year (includes lab analyses of 20 samples).

Unit prices listed here do not include design, operation, maintenance or repair costs. In addition, ground water collected as part of this alternative will be discharged, so permits from the appropriate regulatory agencies will be needed. Costs for permitting activities have not been included. If waters are discharged to a POTW, additional costs may also be incurred (e.g. sewer connections, disposal fees).

5.4 Waste Removal

In this type of remedial approach, the contaminated materials would be excavated and transported to an approved disposal facility. The site would then be restored to an engineered grade and leased for unrestricted use. Waste excavation and removal is usually the most expensive remedial alternative.

Implementation costs would include:

- Excavation of waste using a dragline at \$1.40 - \$3.50/yd^3 (assumes that no respiratory protection for on-site operators will be required)

- Transport and disposal of excavated material at an approved hazardous waste landfill at \$250.00 - \$300.00/yd^3 (assume landfill within a 1 hour drive).

- Backfilling of site with clean material at \$10.00 - \$15.00/yd^3 (assumes source within 2 miles).

- One round of confirmatory ground and surface water sampling at \$35,000 (assumes priority pollutant analyses of 20 samples).

- Hydraulic seeding and fertilization of site with wood fiber mulch at \$0.33 - \$1.25/yd^2.

Costs related to permitting, supervision, and laboratory testing have not been included as part of these estimates.

5.5 No Action

At this site, the No Action remedial alternative could consist of the following items:

- A continued program of ground and surface water monitoring to help detect changes in water quality or flow direction; and

- Continued site maintenance to help restrict access to the general public, maintain cover materials and prevent exposure of the waste by erosion or inadvertent intruders.

Costs for this program, assuming a semi-annual sampling and inspection program would include:

Sampling (labor to collect ground water from existing wells) - $350-$500/Location

Sampling (lab) - $700-$1800/Analyses of TCL volatile organic compounds and metals.

General Site Maintenance - $500-$2000 depending upon time and materials used.

Regardless of the remedial alternative, its impact on public health and the environment would be assessed prior to its implementation.

REFERENCES CITED

References Cited

1. NUS, "Buffalo Avenue Potential Hazardous Waste Site, Phase I Study", Prepared for Region II, EPA, April 29, 1983.

2. NYSDEC letter to NYPA Transmittal of 1982-83 USGS sampling results in the vicinity of the Buffalo Avenue Site, October 15, 1984.

3. Advanced Environmental Systems Inc., "Analysis of Soil Samples, Parcel 14, Buffalo Avenue" 1981.

4. U.S. Environmental Protection Agency, "Remedial Action at Waste Disposal Sites", PB 82-239054, 1982.

5. Booz-Allen & Hamilton, Typical Metal Ranges and Maximum Concentrations in Soil as Reported in "Overview of the Contaminants of Concern in the Disposal and Utilization of Municipal Sewage Sludge", 1983. This response provides information of typical metal concentrations in soil.

6. 40 CRF Part 261 Subpart C - "Characteristics of Hazardous Waste" Section, 261-24 "Characteristic of EP Toxicity", Table 1 - Maximum Concentration of Contaminants for Characteristic of EP Toxicity.

7. New York State Department of Environmental Conservation Division of Water, 1987, "Ambient Water Quality Standards and Guidance Values", Technical and Operational Guidance Series (1.1.1), April 1, 1987.

8. New York State Department of Environmental Conservation. Division of Solid and Hazardous Waste, "Generic Work Plan, State Superfund Program, Phase II Investigations".

9. 40 CFR Part 261 Subpart C - "Characteristics of Hazardous Waste", Section 261.24 "Characteristics of EP Toxicity".

10. Felter Jr, C.W., "Applied Hydrogeology", Columbus, Ohio, Charles E. Merril Publishing Co., 1980.

11. Faleze, Allan R., and John A. Cherry, "Groundwater", N.J., Prentice Hall, 1979.

ABBREVIATIONS

CFR:	Code of Federal Regulations.
D:	A designation used in association with monitor well (MW). It indicates that the well is screened in the bedrock aquifer.
DEC:	New York State Department of Environmental Conservation.
EPA:	United States Environmental Protection Agency.
EP TOXICITY:	Extraction Procedure Toxicity Test. Used to determined if a substance is a hazardous waste.
HRS:	Hazard Ranking System. Used by DEC and EPA to evaluate potential hazardous waste sites for inclusion in the NPL.
µg/kg:	Milligrams per Kilogram. A measure of concentration. Often used interchangeably with ppm (parts per million).
MCL:	Maximum Concentration Level. The point at which a substance is classified as a hazardous waste.
MW:	Monitor Well. Used to gather representative water quality samples from an aquifer.
NPL:	National Priorities List. A listing of all inactive hazardous waste disposal sites with HRS scores high enough to warrant investigation and eventual remediation.
ND:	Not detected during laboratory analysis.
NA:	Not analyzed (or tested for) during sample analysis.
NYPA:	New York Power Authority.

POTW: Publically Owned Treatment Works. A municipal or city sewage treatment plant.

PAH: Polynuclear Aromatic Hydrocarbon.

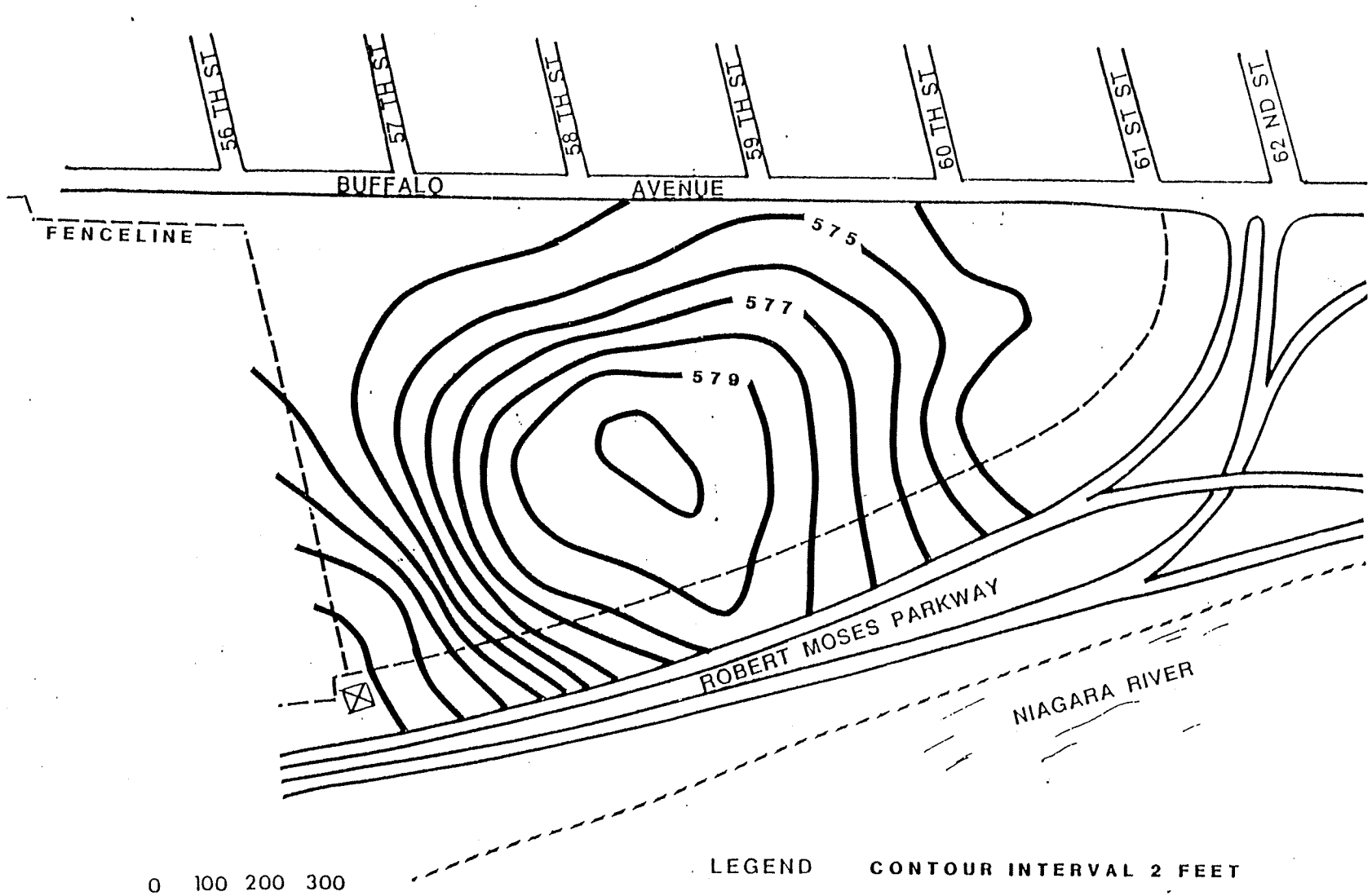
S: A designation used in association with monitor well (MW). It indicates that the well is screened in the overburden aquifer.

TCL Target Compound List. A list of contaminants typically found at Hazardous Waste disposal sites.

mg/l: Milligrams per Liter. A measure of concentration. Often used interchangeably with ppm (parts per million).

µg/kg: Micrograms per kilogram. A measure of concentration. Often used interchangeably with ppb (parts per billion).

USGS: United States Geological Survey.

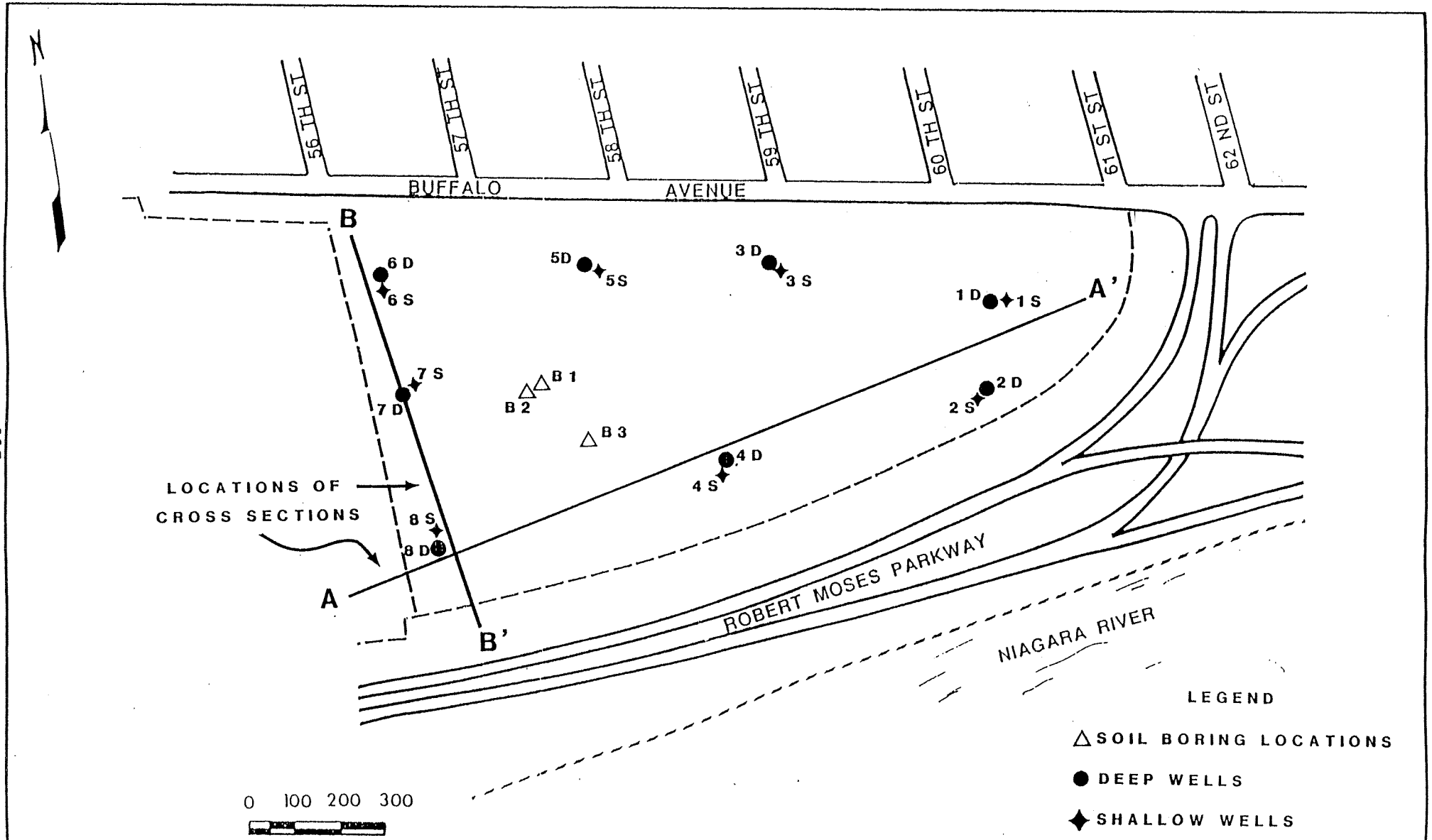


NYPA BUFFALO AVENUE SITE

APPROXIMATE TOPOGRAPHY

DAMES & MOORE

FIGURE 5

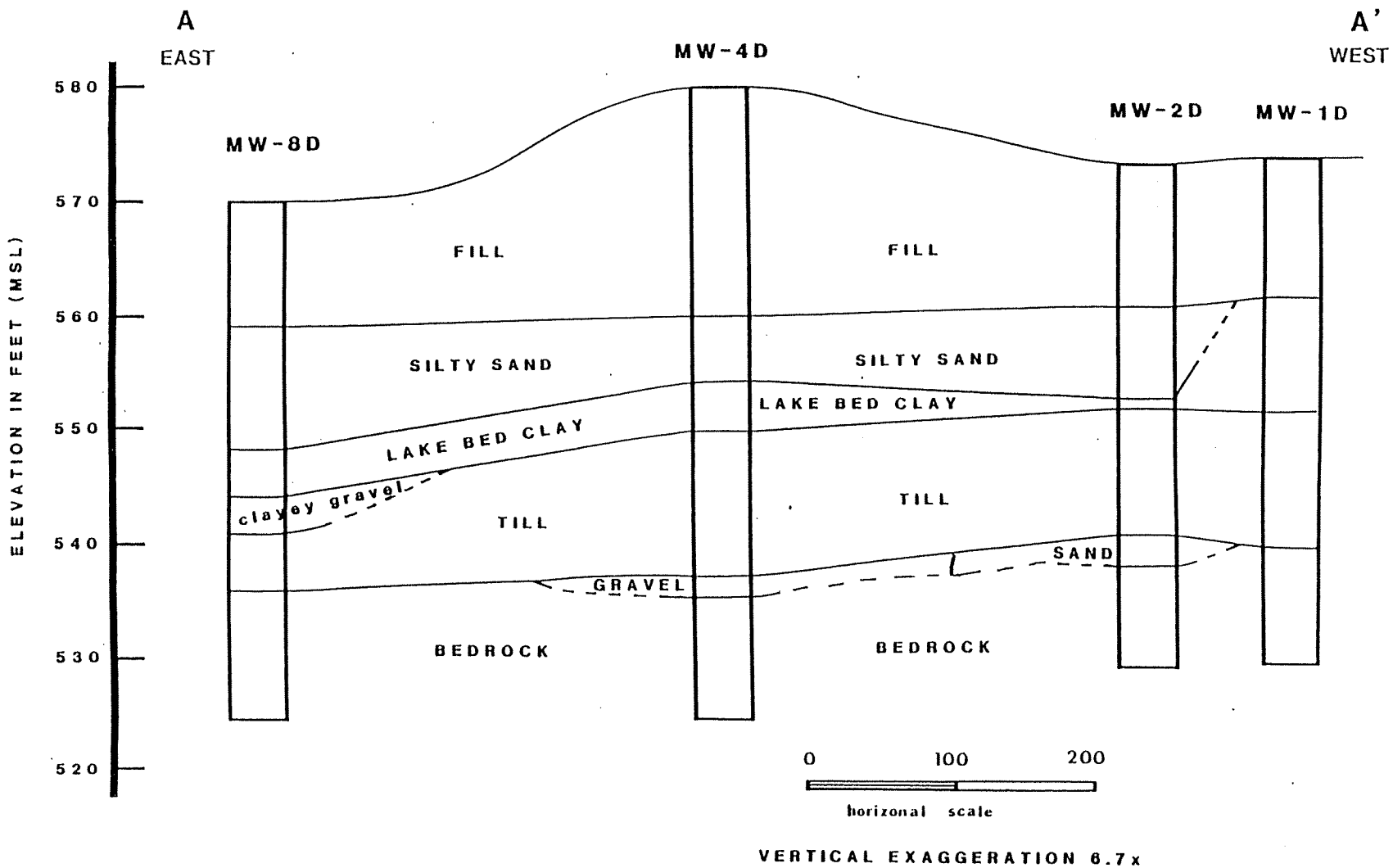


115

NYPA BUFFALO AVENUE SITE

MONITORING WELLS(Shallow&Deep) AND SOIL BORING LOCATIONS

FIGURE 6
DAMES & MOORE



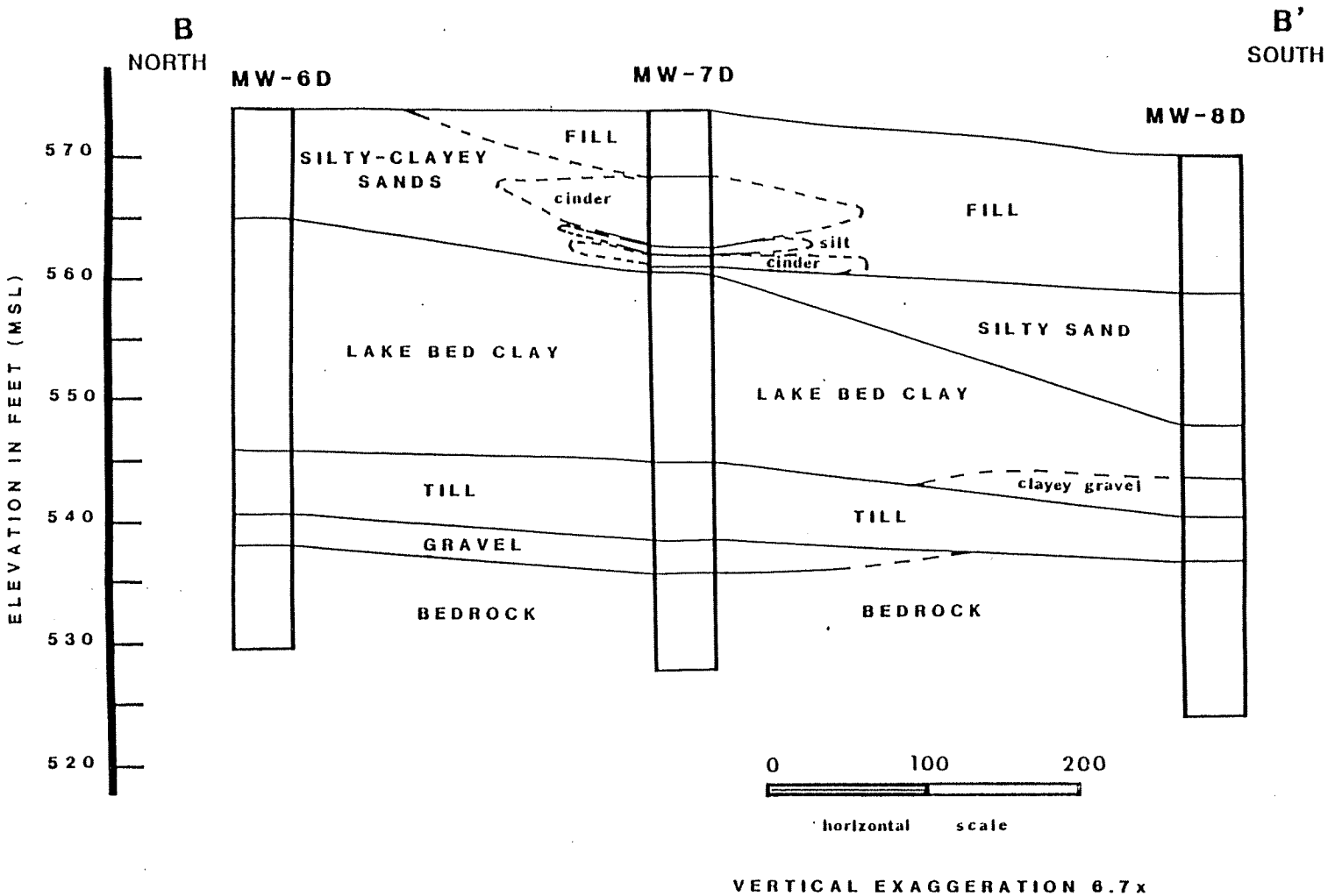
NYPA BUFFALO AVENUE SITE
CROSS SECTION A-A'
(EAST-WEST)

NOTE: CONTACTS DASHED WHERE INFERRED

THE SUBSECTIONS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

FIGURE 7

DAMES & MOORE



NYPA BUFFALO AVENUE SITE

CROSS SECTION B-B'

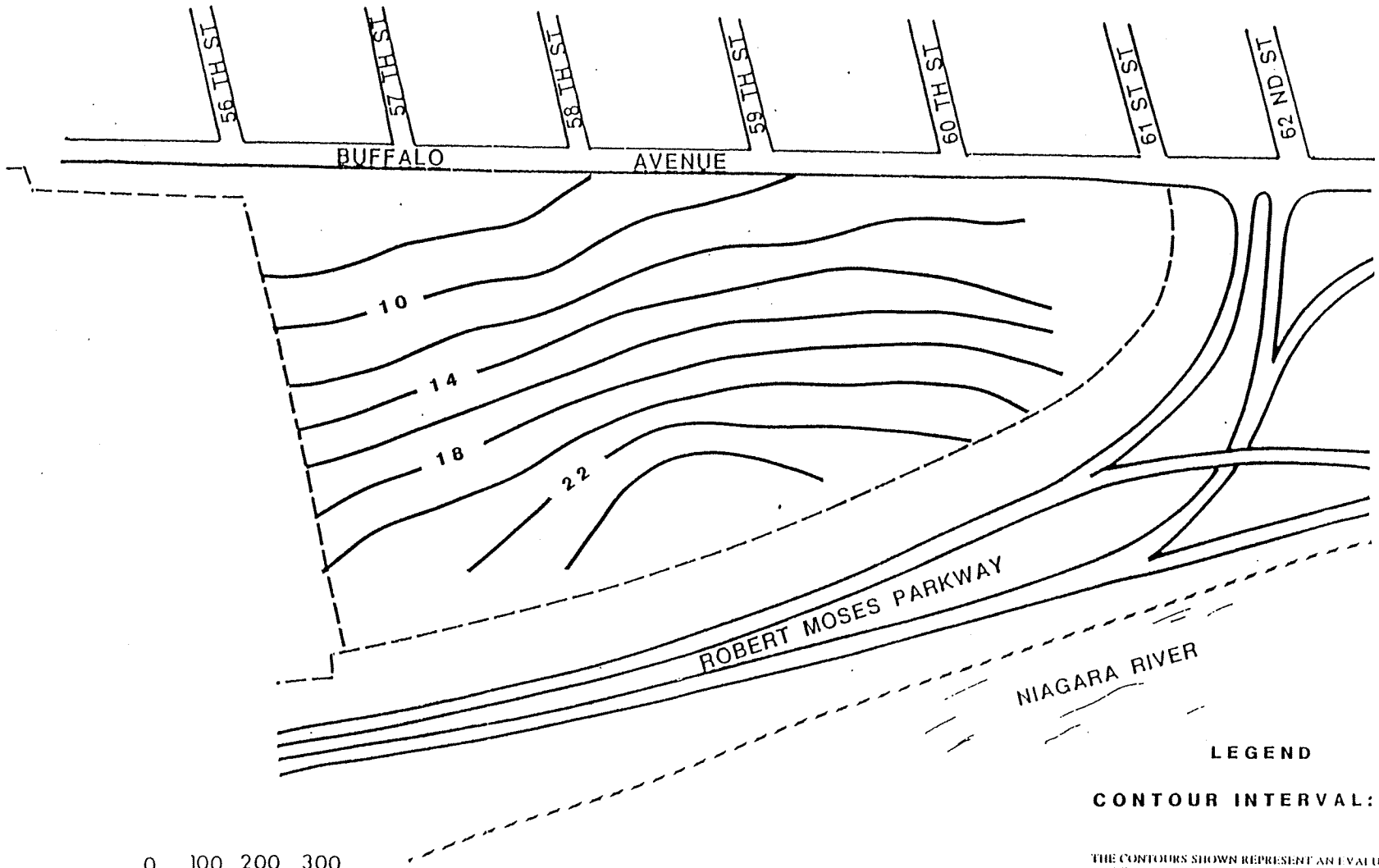
(NORTH-SOUTH)

NOTE: CONTACTS DASHED WHERE INFERRED

THE SUBSECTIONS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

FIGURE 8

DAMES & MOORE



LEGEND

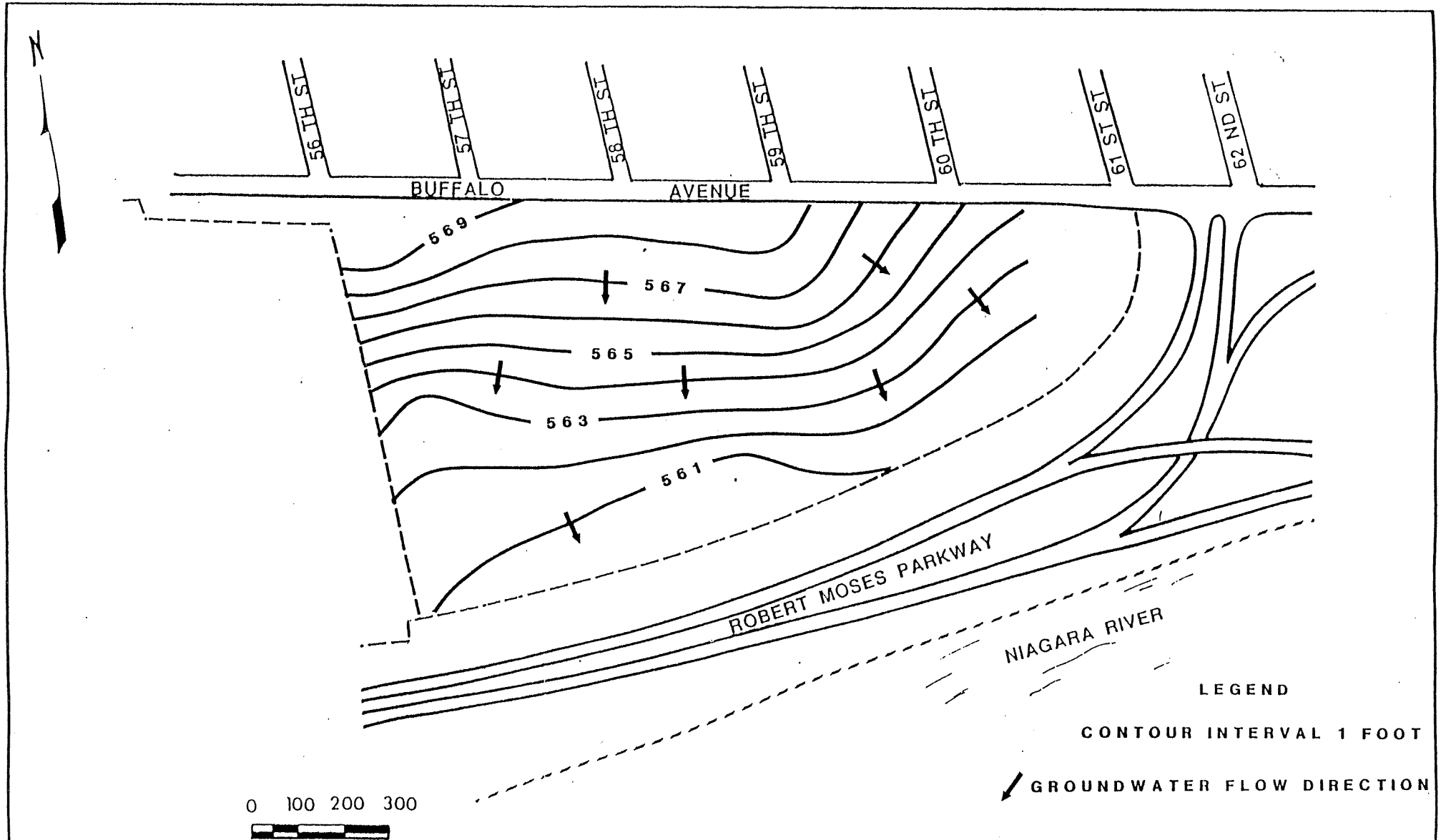
CONTOUR INTERVAL: 2 FEET

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

NYPA BUFFALO AVENUE SITE

ISOPACH (thickness) MAP OF FILL/NATURAL MATERIAL

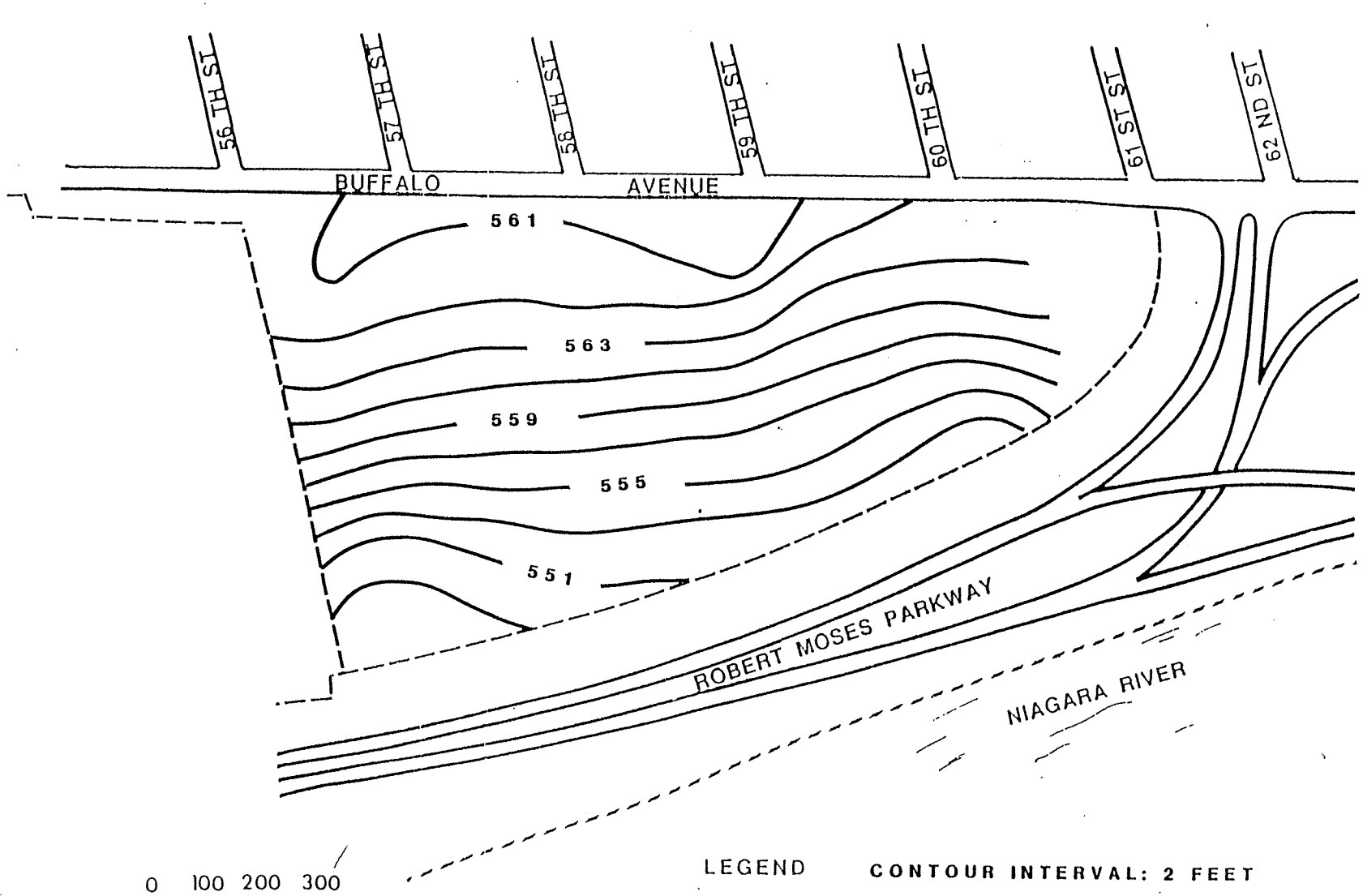
FIGURE 9
DAMES & MOORE



NYPA BUFFALO AVENUE SITE
OVERBURDEN WATER TABLE MAP

THE CONTOURS AND FLOW DIRECTIONS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

FIGURE 10
DAMES & MOORE

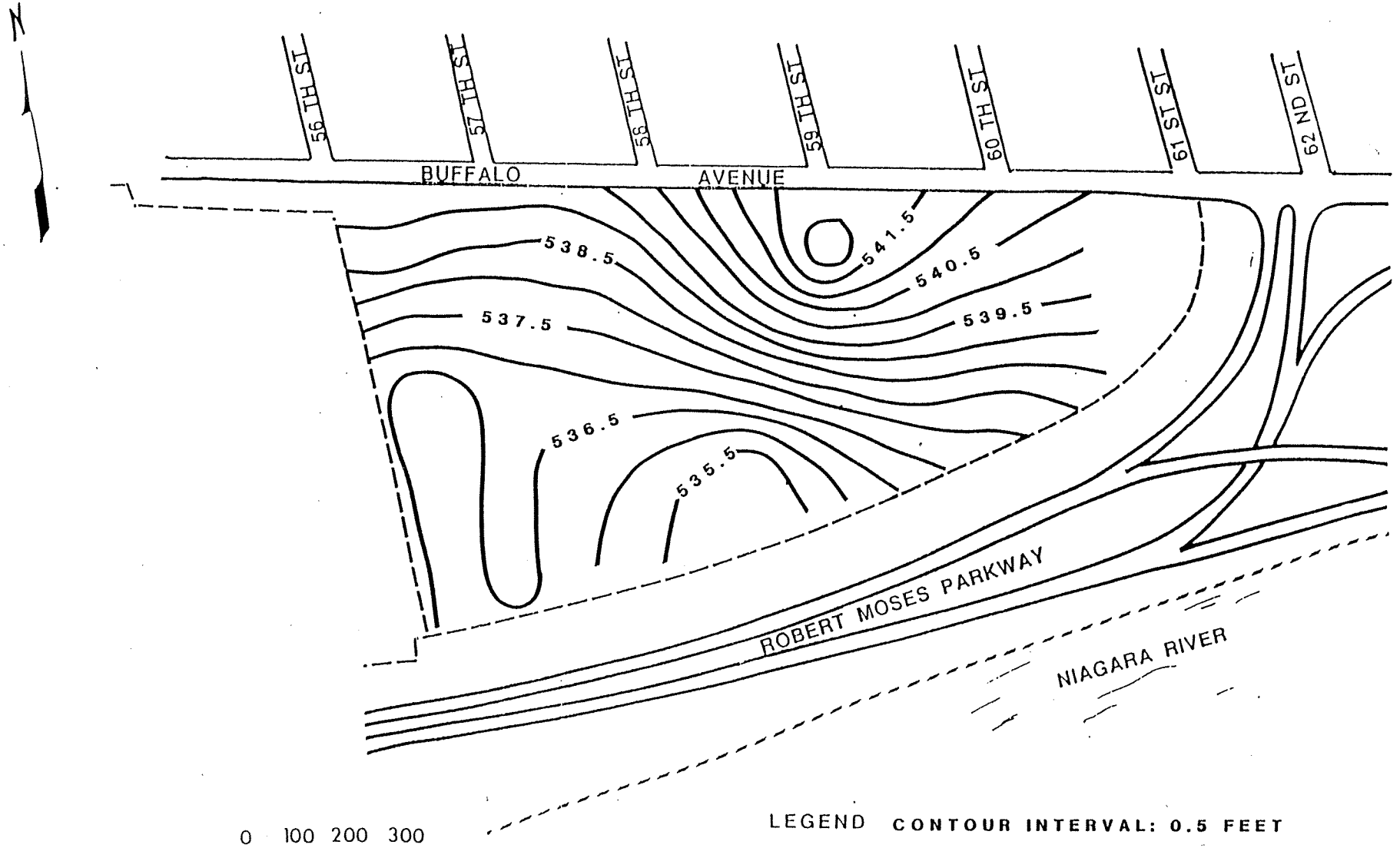


NYPA BUFFALO AVENUE SITE

ELEVATION OF TOP OF LAKE BED CLAY

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

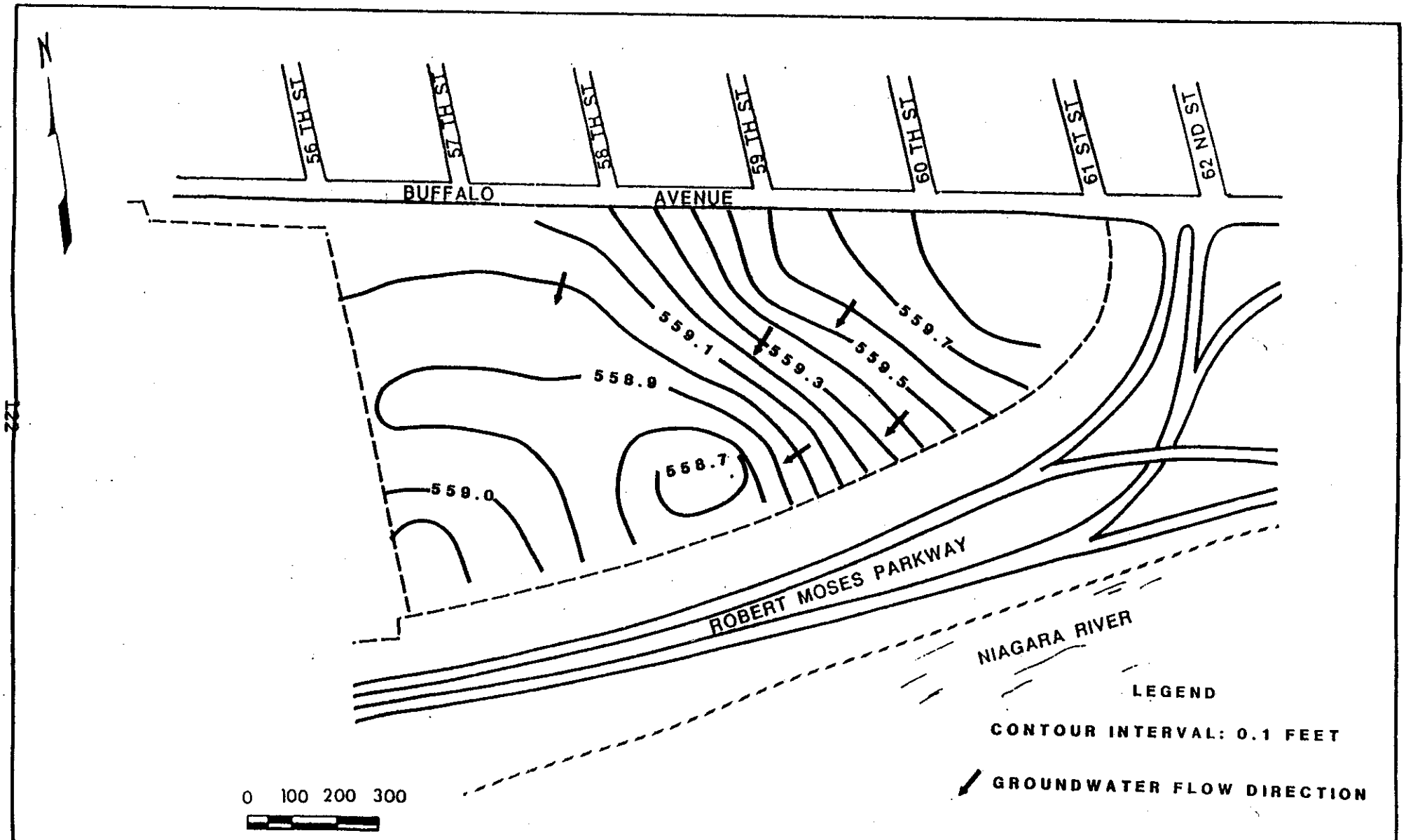
FIGURE 11
DAMES & MOORE



NYPA BUFFALO AVENUE SITE
ELEVATION OF TOP OF BEDROCK

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

FIGURE 12
DAMES & MOORE

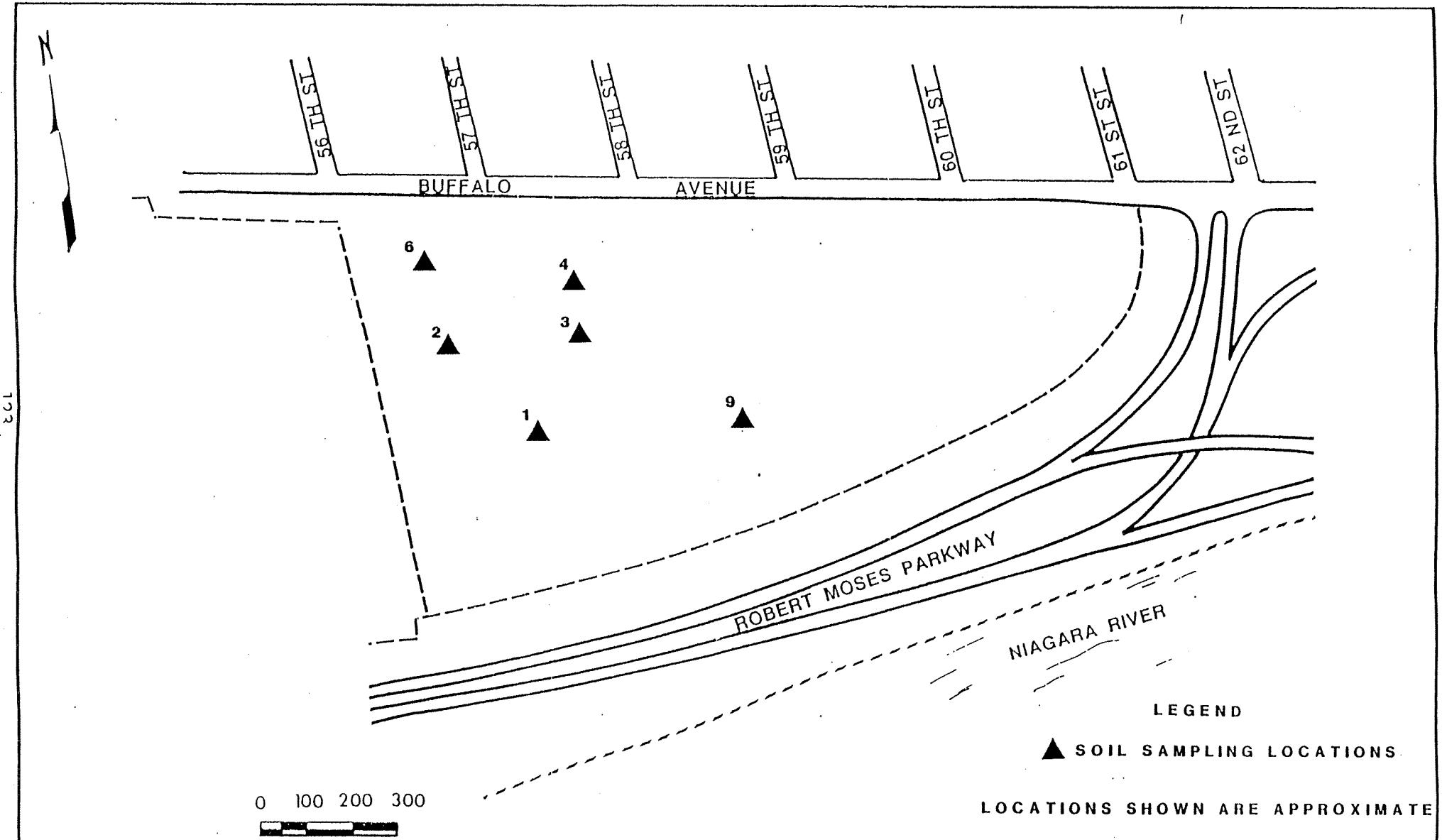


THE CONTOURS AND FLOW DIRECTIONS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

NYPA BUFFALO AVENUE SITE

BEDROCK WATER TABLE MAP (upper 10ft)

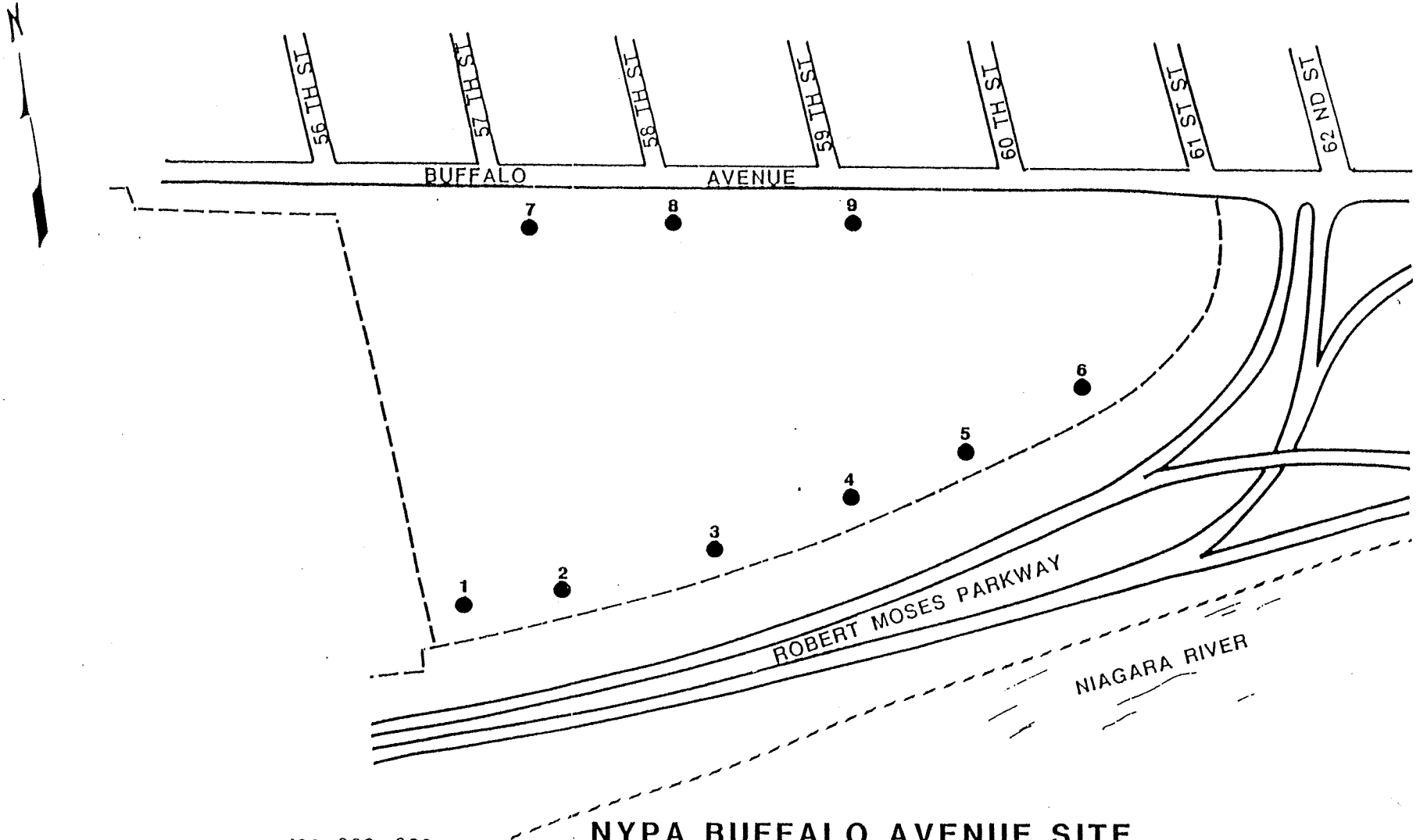
FIGURE 13
DAMES & MOORE



NYPA BUFFALO AVENUE SITE

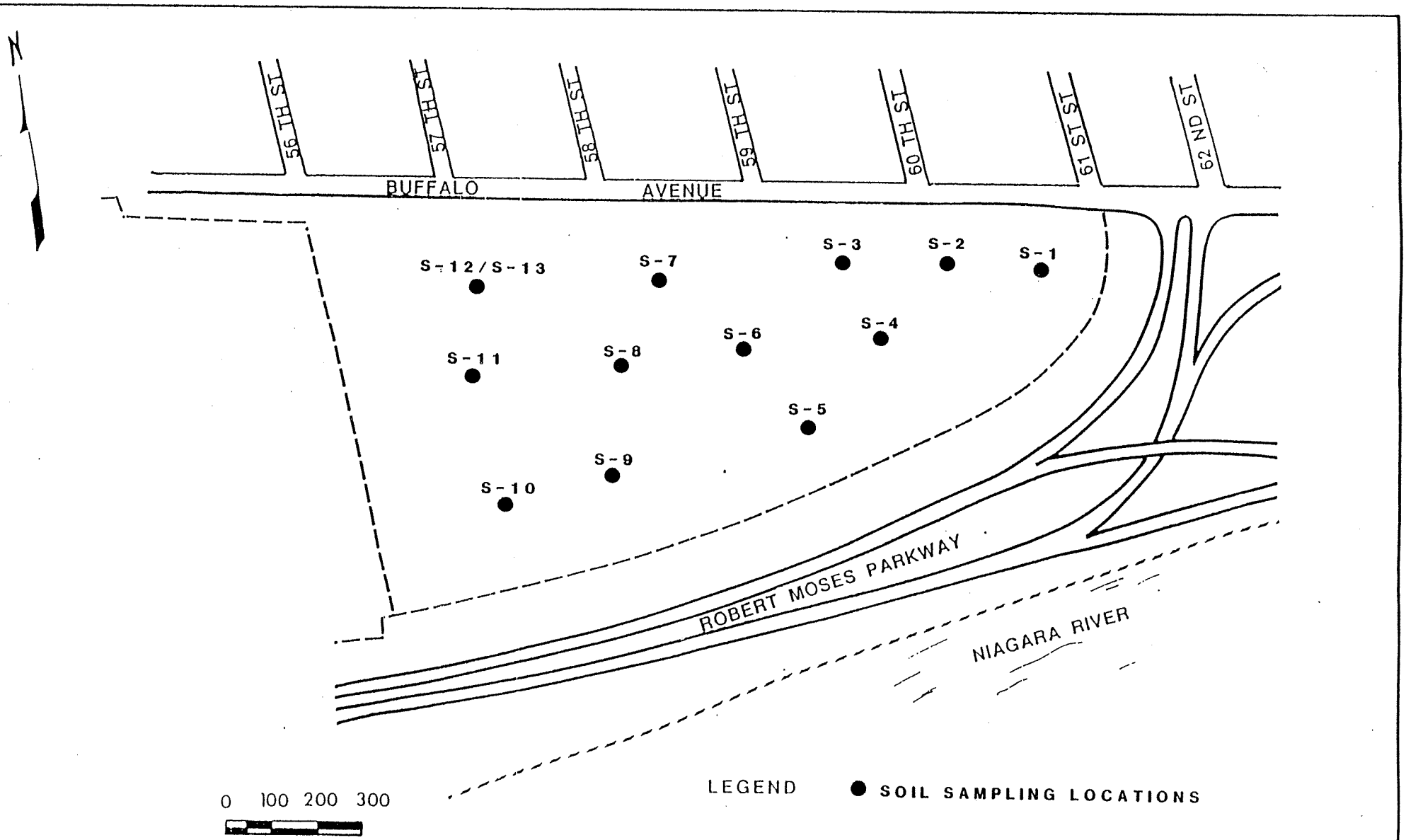
TEST BORING LOCATIONS FROM 1981 SOIL INVESTIGATIONS

FIGURE 14
DAMES & MOORE



NYPA BUFFALO AVENUE SITE
TEST BORING LOCATION FROM 1982-1983
USGS SAMPLING PROGRAM

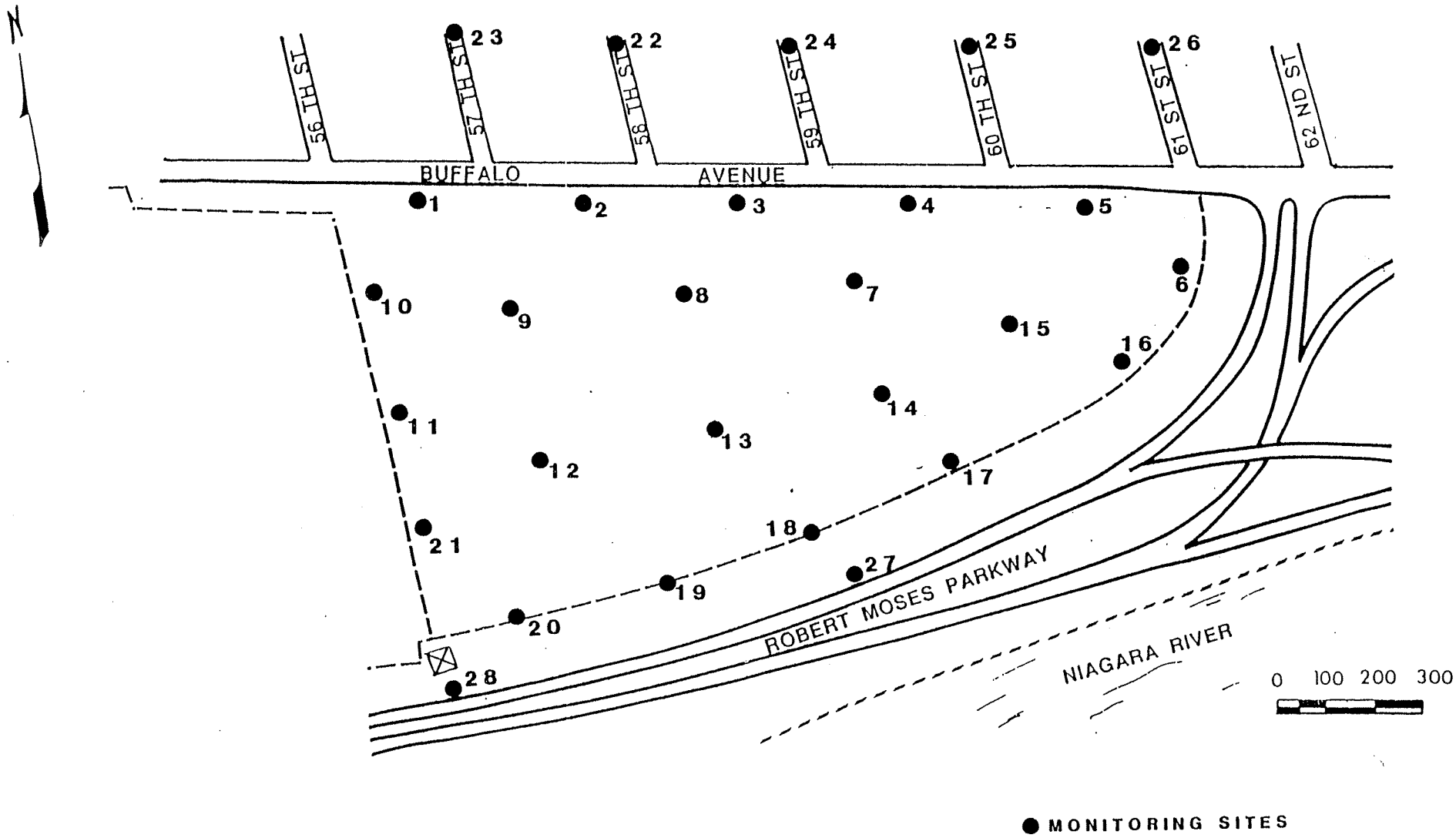
FIGURE 15
DAMES & MOORE



NYPA BUFFALO AVENUE SITE

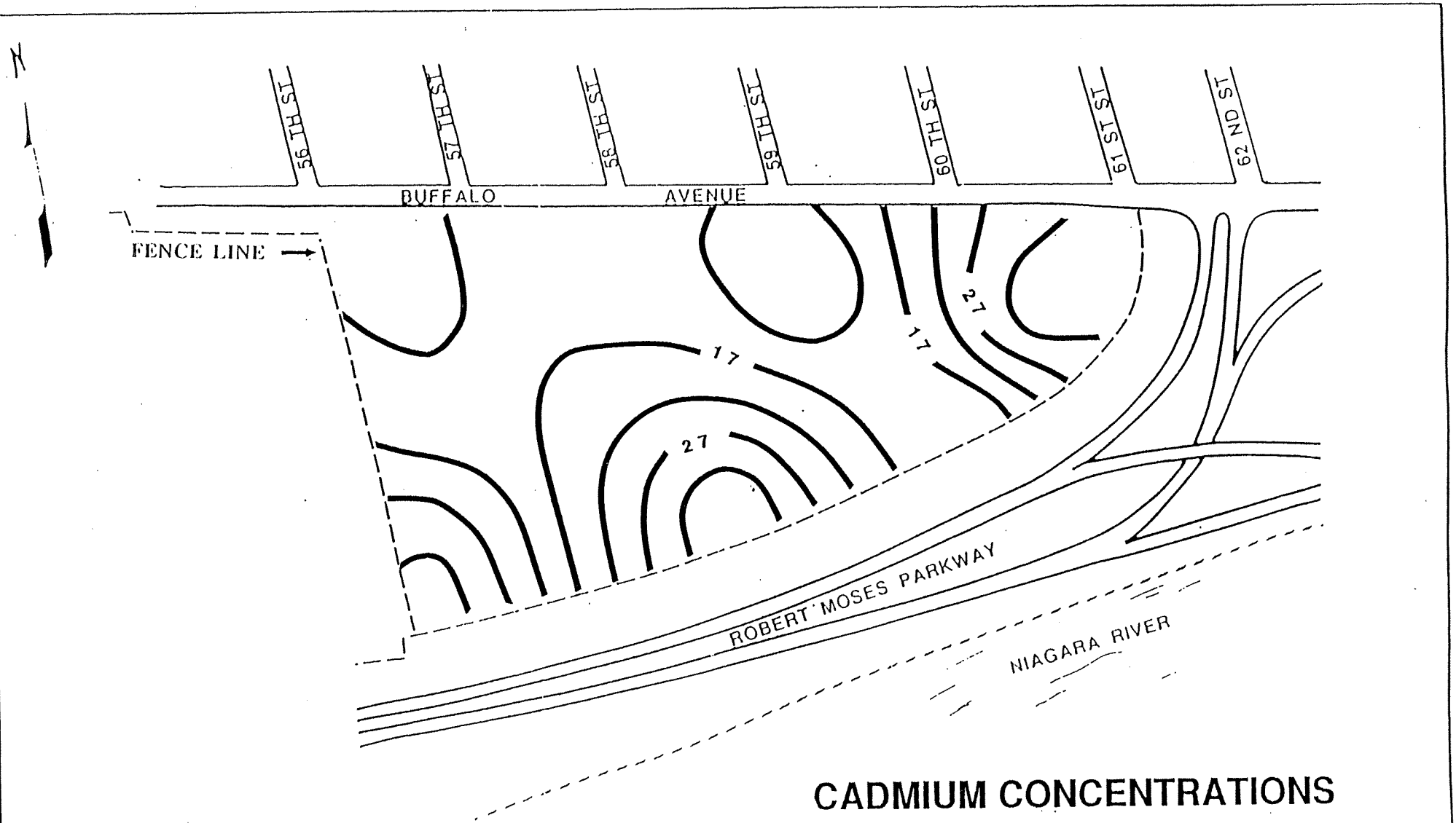
SHALLOW SOIL SAMPLING LOCATIONS

FIGURE 16
DAMES & MOORE



NYPA BUFFALO AVENUE SITE
AIR MONITORING LOCATIONS

FIGURE 17
DAMES & MOORE



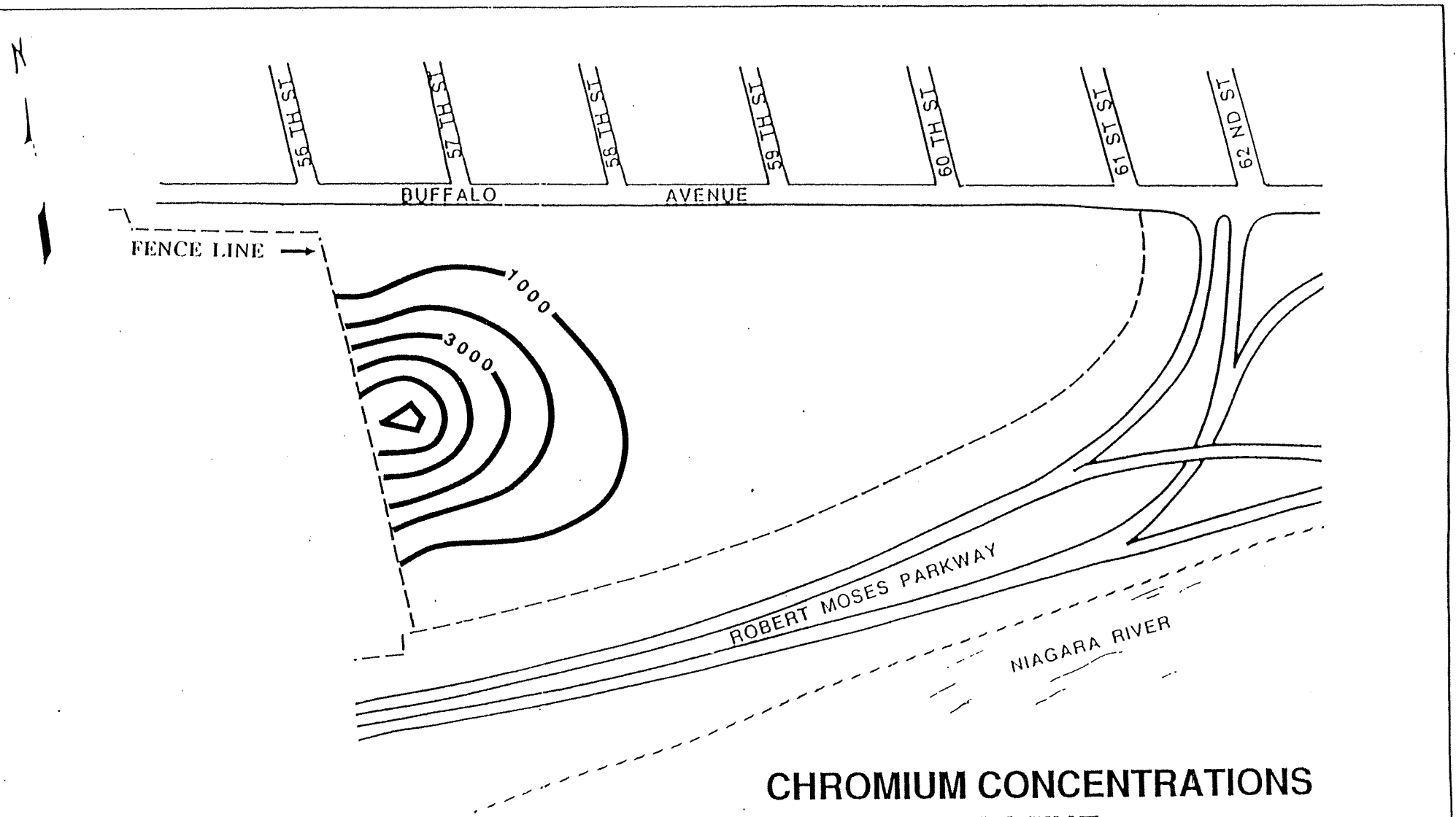
CADMIUM CONCENTRATIONS IN THE OVERBURDEN AQUIFER

CONTOUR INTERVAL = 5 ug/l

0 100 200 300 FT

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

FIGURE 18
DAMES & MOORE



CHROMIUM CONCENTRATIONS IN THE OVERBURDEN AQUIFER

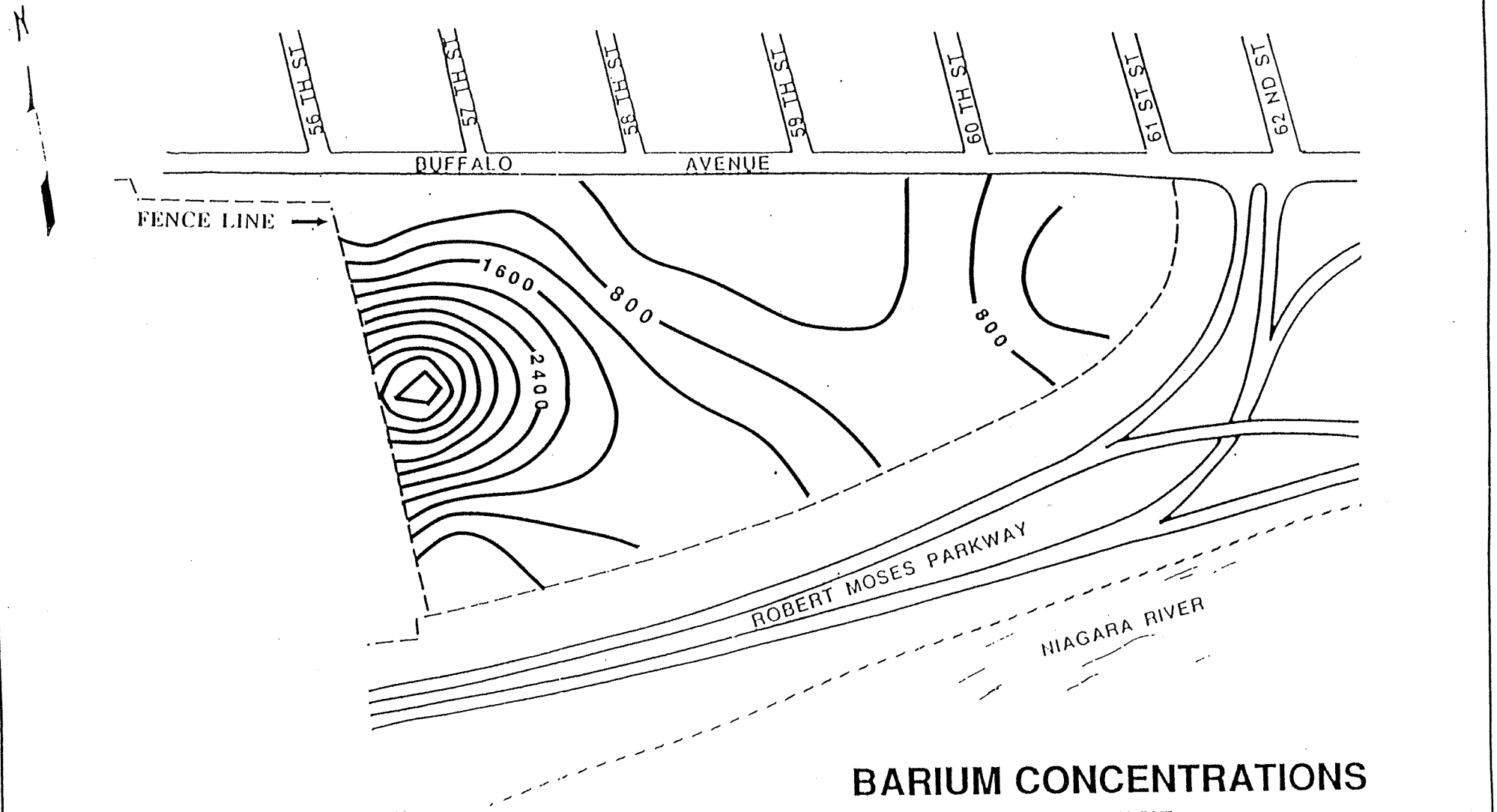
CONTOUR INTERVAL = 1000 ug/l

0 100 200 300 FT

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

FIGURE 19

DAMES & MOORE



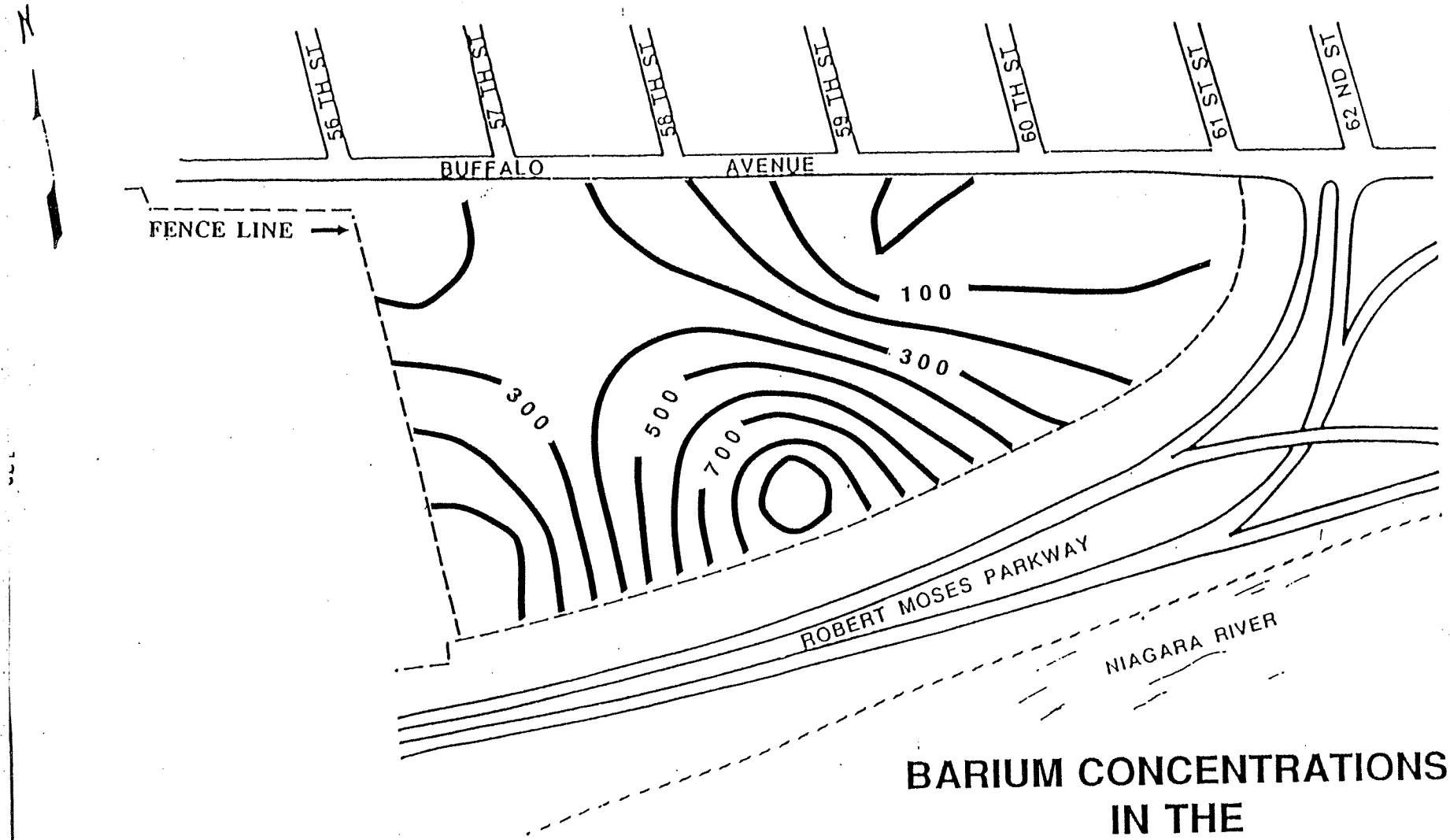
BARIUM CONCENTRATIONS IN THE OVERBURDEN AQUIFER

CONTOUR INTERVAL = 400 ug/l

0 100 200 300 FT

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA VARIATIONS FROM THESE CONDITIONS MAY OCCUR

FIGURE 20
DAMES & MOORE



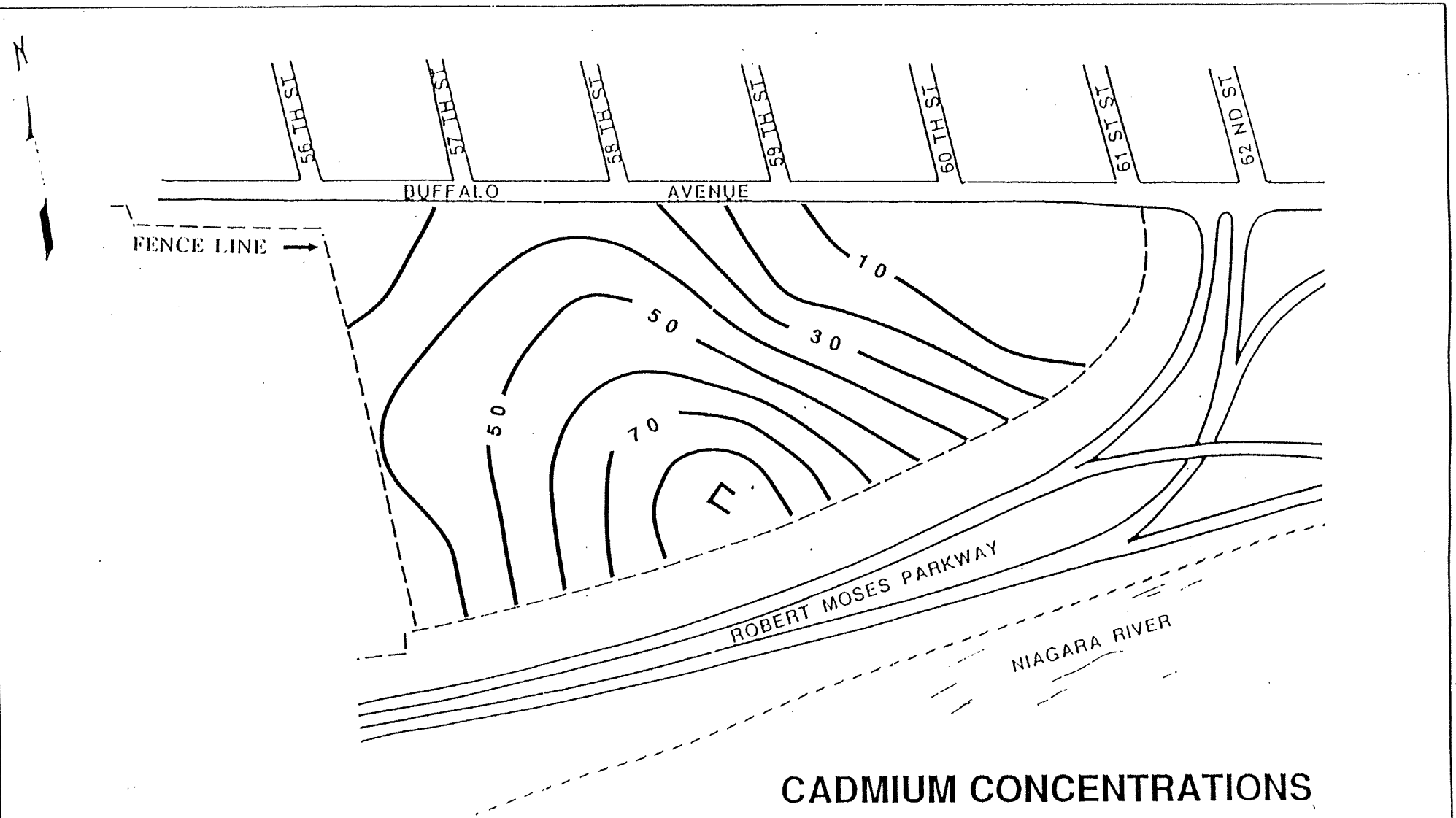
BARIUM CONCENTRATIONS IN THE BEDROCK AQUIFER

CONTOUR INTERVAL = 100 ug/l

0 100 200 300 FT

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

FIGURE 21
DAMES & MOORE



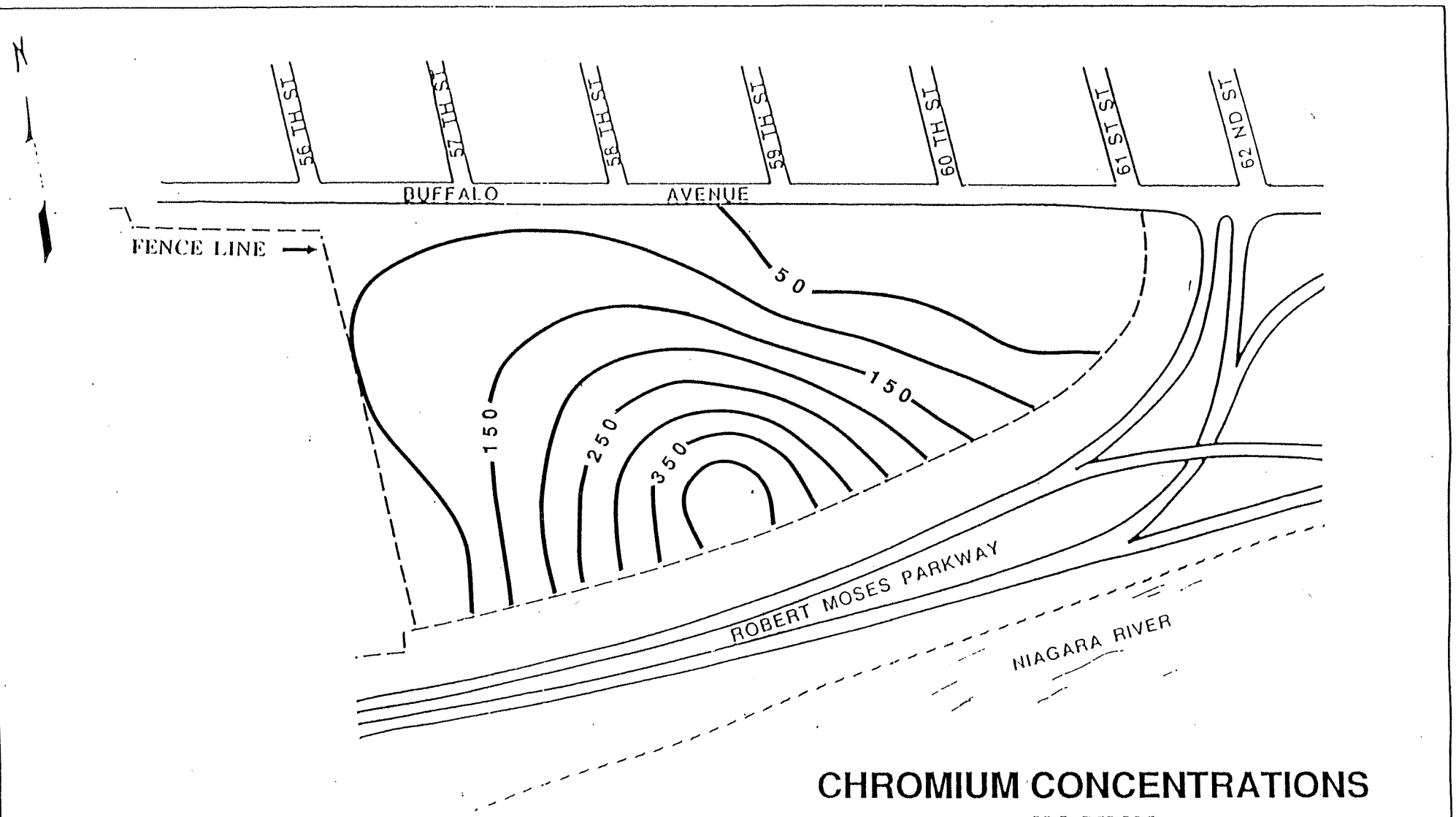
CADMIUM CONCENTRATIONS IN THE BEDROCK AQUIFER

CONTOUR INTERVAL = 10 ug/l

0 100 200 300 FT

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR

FIGURE 22
DAMES & MOORE



CHROMIUM CONCENTRATIONS IN THE BEDROCK AQUIFER

CONTOUR INTERVAL = 50 ug/l

0 100 200 300 FT

THE CONTOURS SHOWN REPRESENT AN EVALUATION OF THE MOST PROBABLE CONDITIONS BASED UPON PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR

FIGURE 23
DAMES & MOORE

APPENDIX A

Appendix A

Geophysical Survey

This appendix presents the field procedures and results of a geophysical survey performed by Delta Geophysical as part of the Phase II investigation.

Prior to the installation of monitoring wells, a seismic refraction survey was conducted to evaluate subsurface conditions. Maps, tables, and graphs are presented in this report.

SEISMIC REFRACTION SURVEY

NIAGARA FALLS SITE

NIAGARA FALLS, NEW YORK

FOR

DAMES AND MOORE

PEARL RIVER, NEW YORK

OCTOBER 1987

DELTA

GEOPHYSICAL SERVICES

October 21, 1987

DELTA
GEOPHYSICAL SERVICES
A GEONICS COMPANY

Mr. Rodger Pennifill
Dames & Moore
One Blue Hill Plaza, Suite 530
Pearl River, New York 10965

Report: SEISMIC REFRACTION SURVEY
NIAGARA FALLS SITE
NIAGARA FALLS, NEW YORK

Dear Mr. Pennifill:

It is our pleasure to submit our final report for the seismic refraction survey.

INTRODUCTION

We completed a seismic refraction survey at the Niagara Falls Site in Niagara Falls, New York. The site is a maintained grass field situated between Buffalo Avenue and Robert Moses Parkway. Site conditions were good for seismic data collection.

GEOPHYSICAL METHODOLOGY

We used the seismic refraction method to evaluate subsurface conditions. Data were collected at twelve seismic stations. Data interpretation allowed us to determine the thickness of subsurface material present above a dense till or rock.

The seismic refraction method uses an induced shock wave. As the shock wave propagates through the earth, it is affected by the materials through which it passes. Geophones placed on the ground surface record the ground motion caused by the resultant wave. A seismograph measures the time required for the resultant wave to arrive at each geophone. These geophones are located at selected distances from the wave source. Analysis of the data (travel times and distances) provides seismic velocities of subsurface material and depths to significant velocity interfaces.

Geologic conditions yielding higher seismic velocities include increased amounts of water, clay, cobbles, and rock fragments, greater compaction or lower degree of weathering.

116 WEST MAIN ST., CLINTON, NEW JERSEY 08809, TELEPHONE 201·735·9390

GEOPHYSICAL SURVEY

We located the the seismic stations relative to site conditions (topography, cultural interferences) and a map of approximate seismic line locations given to us by Dames and Moore. We established a reference grid over the site to accurately locate our seismic stations.

We used an EG&G Geometrics seismograph (ES-1225), geophones, and a sledge hammer source to collect data at twelve seismic stations. At each seismic station, we used a twelve geophone array extending 180 feet with a hammer source-geophone array offset ranging from 2 - 50 feet. Four seismic stations (5,7,10, and 12) were completed with the hammer source located at both ends of the array, termed forward and reverse. This allowed us to check the true seismic velocities of subsurface materials.

INTERPRETATION

We calculated seismic velocities and depths to seismic velocity interfaces from the data collected at each seismic station. The calculated seismic velocity ranges were interpreted to represent the following subsurface materials:

1) Soil / Fill having a velocity range of 1,100 - 1,700 ft/sec;

2) Material type A (fill, sands, gravel, and clay) having a velocity range of 2,000 - 3,000 ft/sec;

3) Material type B (fill, sands, gravel, and clay) having a velocity range of 3,400 - 4,700 ft/sec; and

4) Dense till or Rock (dolomite) having a velocity range of 8,000 - 22,000 ft/sec.

A distinction was made between materials type A and type B to aid in the evaluation of the type of subsurface material present above rock. Material type B may be more compacted and/or saturated than material type A. Material type A is above material type B beneath seismic station 6. Material type A is beneath seismic stations 3, 6, 7F, 7R, 8, 10R, 12F, and 12R. Material type B is beneath the remaining seismic stations.

It was difficult to differentiate between dense till and rock based on recorded seismic velocities. However, boring logs allowed us to interpret whether our deepest seismic velocity layer represented dense till or rock. The wide range of velocities was attributed primarily to the inconsistent structure and composition of the glacial till layer.

Our interpretation of the seismic data is presented on a map, two cross-sections, and in a table of results. The map shows the

seismic station numbers and depths to rock or dense till. The cross-sections show seismic velocity interfaces and layers. The table of results lists the specific depths, seismic velocities, and interpreted material types of subsurface layers beneath each seismic station. The Appendix contains the field data sheets.

CONCLUSION

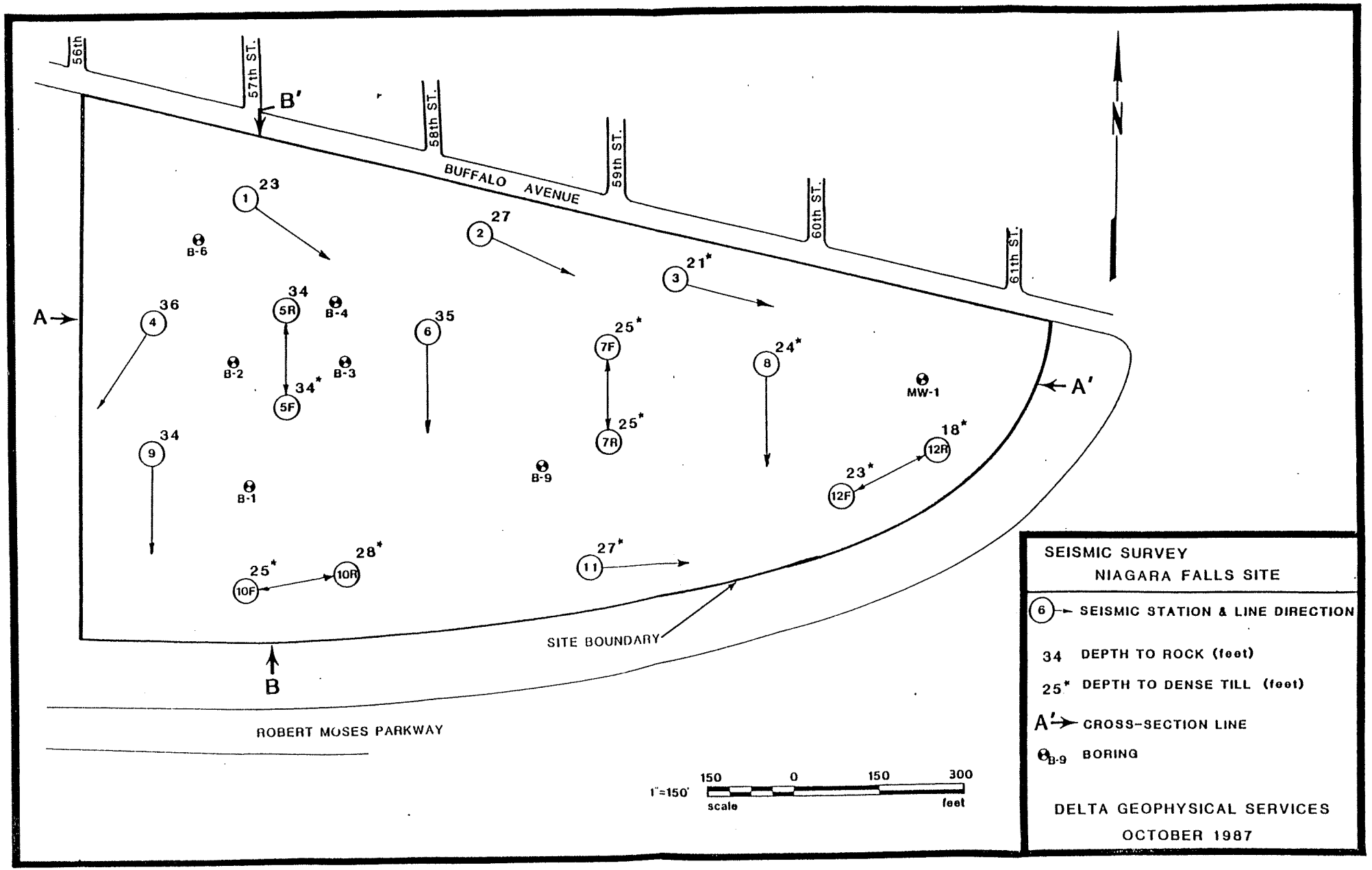
The thickness of subsurface materials above dense till or rock ranged from 18 feet at the eastern end of the site to 36 feet at the western end of the site. The dense till has the same representative seismic velocity range as the rock. The depths to the deepest layer indicate either depth to dense till or depth to rock, as shown on the map and cross-sections.

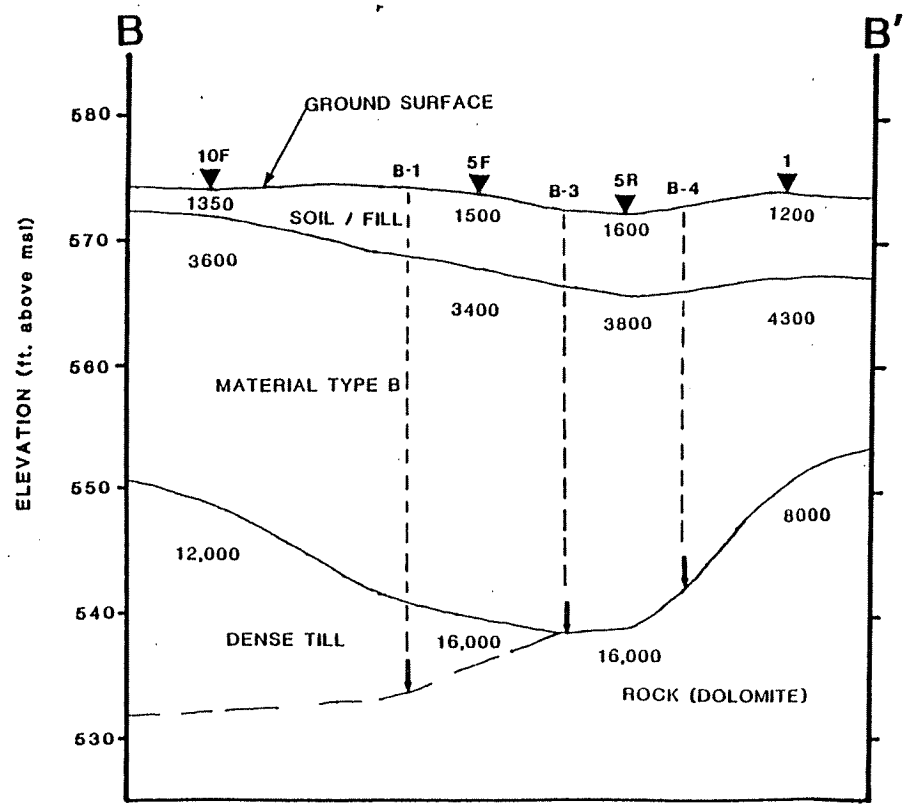
If there are any questions concerning this report, please contact us. It was a pleasure to have worked with you on this project.

Very truly yours,
Delta Geophysical Services

Steven T. Marts
Geophysical Engineer

STM/DAG:ts


56th
57th ST.
B'
58th ST.
59th ST.
60th ST.
61th ST.
BUFFALO AVENUE
N
1 23
2 27
3 21*
4 36
5R 34
5F 34*
6 35
7F 25*
7R 25*
8 24*
9 34
10F 25*
10R 28*
11 27*
12F 23*
12R 18*
B-1
B-2
B-3
B-4
B-6
B-9
MW-1
A
A'
B
SITE BOUNDARY
ROBERT MOSES PARKWAY
1"=150'
150 0 150 300
scale feet
SEISMIC SURVEY
NIAGARA FALLS SITE
6 SEISMIC STATION & LINE DIRECTION
34 DEPTH TO ROCK (feet)
25* DEPTH TO DENSE TILL (feet)
A' CROSS-SECTION LINE
B-9 BORING
DELTA GEOPHYSICAL SERVICES
OCTOBER 1987



SCALE

H: 1" = 150'

V: 1" = 10'

CROSS-SECTION B-B'

NIAGARA FALLS SITE

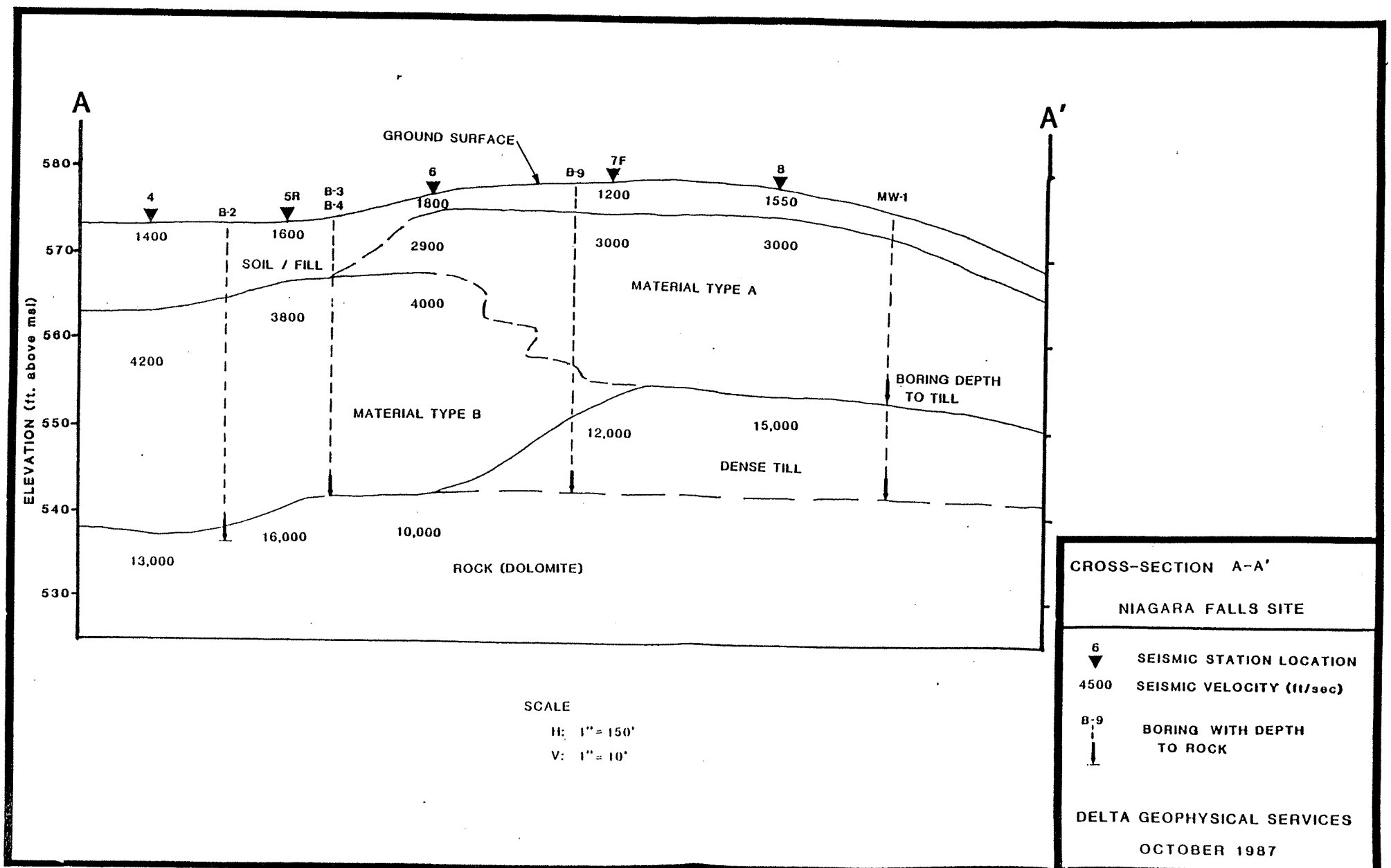
5R ▼ SEISMIC STATION LOCATION

4500 SEISMIC VELOCITY (ft/sec)

B-3 | BORING WITH DEPTH TO ROCK

DELTA GEOPHYSICAL SERVICES

OCTOBER 1987


A
A'
GROUND SURFACE
ELEVATION (ft. above msl)
580
570
560
550
540
530
4
B-2
5R
B-3
B-4
6
B-9
7F
8
MW-1
1400
1600
1800
1200
1550
2900
3000
3000
SOIL / FILL
MATERIAL TYPE A
3800
4000
4200
MATERIAL TYPE B
BORING DEPTH
TO TILL
12,000
15,000
DENSE TILL
16,000
10,000
13,000
ROCK (DOLOMITE)
SCALE
H: 1" = 150'
V: 1" = 10'
CROSS-SECTION A-A'
NIAGARA FALLS SITE
6
SEISMIC STATION LOCATION
4500
SEISMIC VELOCITY (ft/sec)
B-9
BORING WITH DEPTH
TO ROCK
DELTA GEOPHYSICAL SERVICES
OCTOBER 1987

SEISMIC REFRACTION RESULTS
NIAGRA FALLS SITE

STATION	DEPTH (ft)	VELOCITY (ft/sec)	INTERPRETED MATERIAL
1	0 - 7	1,200	SOIL / FILL
	7 - 23	4,300	TYPE B
	23 - *	8,000	ROCK (DOLOMITE)
2	0 - 9	1,450	SOIL / FILL
	9 - 27	4,700	TYPE B
	27 - *	10,000	ROCK (DOLOMITE)
3	0 - 2	1,250	SOIL / FILL
	2 - 21	2,800	TYPE A
	21 - *	10,000	DENSE TILL
4	0 - 10	1,400	SOIL / FILL
	10 - 36	4,200	TYPE B
	36 - *	13,000	ROCK (DOLOMITE)
5F	0 - 6	1.500	SOIL / FILL
	6 - 34	3,400	TYPE B
	34 - *	16,000	DENSE TILL
5R	0 - 7	1,600	SOIL / FILL
	7 - 34	3,800	TYPE B
	34 - *	16,000	ROCK (DOLOMITE)
6	0 - 2	1,800	SOIL / FILL
	2 - 9	2,900	TYPE A
	9 - 35	4,000	TYPE B
	35 - *	10,000	ROCK (DOLOMITE)
7F	0 - 4	1,200	SOIL / FILL
	4 - 25	3,000	TYPE A
	25 - *	12,000	DENSE TILL
7R	0 - 3	1,200	SOIL / FILL
	3 - 25	2,000	TYPE A
	25 - *	22,000	DENSE TILL
8	0 - 3	1,550	SOIL / FILL
	3 - 24	3,000	TYPE A
	24 - *	15,000	DENSE TILL
9	0 - 8	1,800	SOIL / FILL
	8 - 34	4,100	TYPE B
	34 - *	22,000	ROCK (DOLOMITE)

10F	0 - 2	1,350	SOIL / FILL
	2 - 25	3,600	TYPE B
	25 - *	12,000	DENSE TILL
10R	0 - 4	1,450	SOIL / FILL
	4 - 28	2,500	TYPE A
	28 - *	19,000	DENSE TILL
11	0 - 6	1,100	SOIL / FILL
	6 - 27	4,000	TYPE B
	27 - *	20,000	DENSE TILL
12F	0 - 5	1,450	SOIL / FILL
	5 - 23	2,400	TYPE A
	23 - *	17,000	DENSE TILL
12R	0 - 3	1,200	SOIL / FILL
	3 - 18	2,000	TYPE A
	18 - *	15,000	DENSE TILL

* THICKNESS OF DEEPEST LAYER NOT DETERMINED

APPENDIX

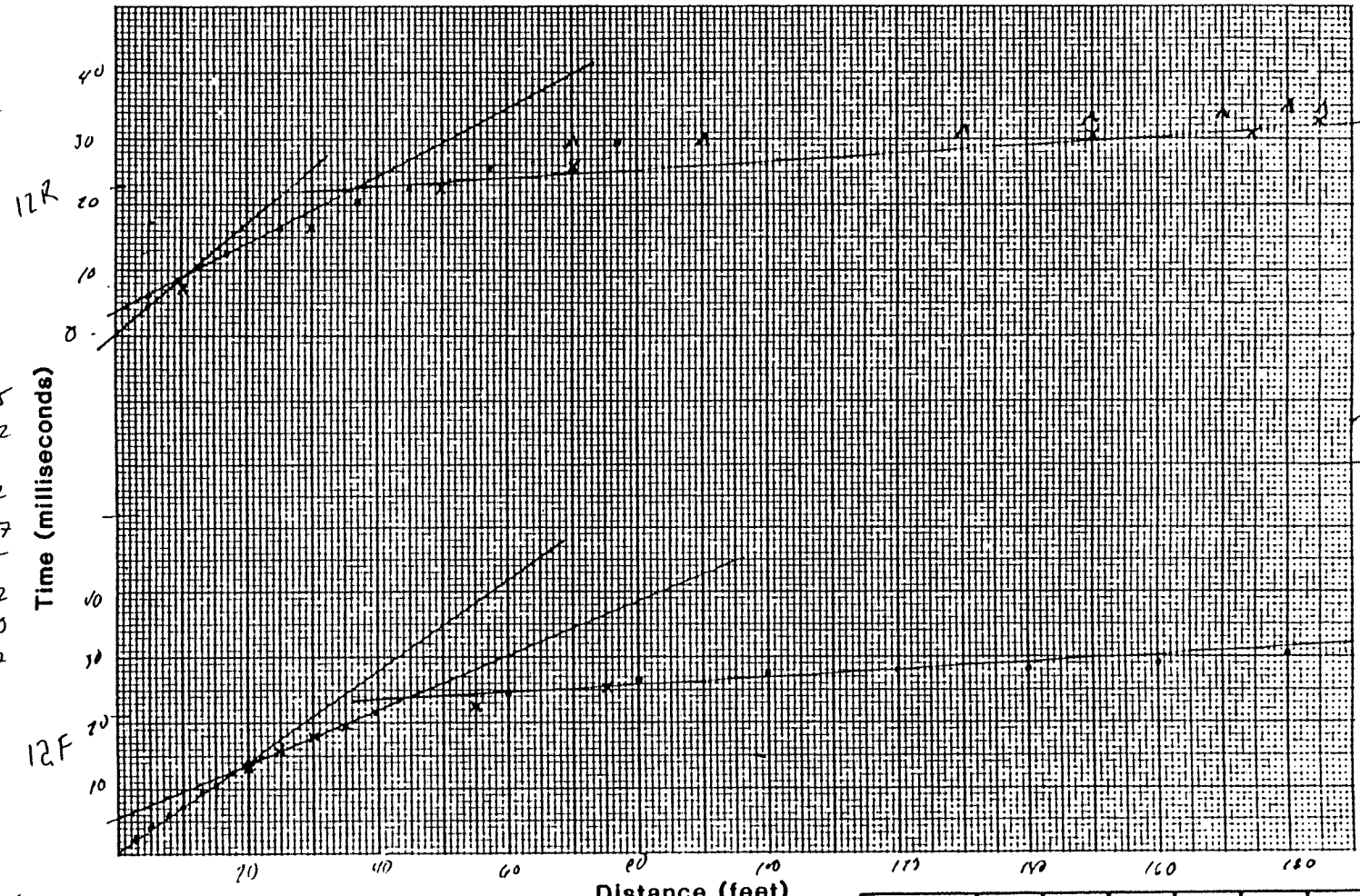
Seismic Refraction Worksheet

12 F 12 R

DATA

x	ms	x	ms
0	,	0	A
5	4.0	5	42/60
10	7.2	25	16.2
15	10.5	45	22.2
20	14.2	65	26.2
40	21.7	10	30.2
60	24.7	0	x
80	26.7	10	7.7
8100	27.2	30	16.2
120	28.2	50	22.5
140	28.2	70	26.0
160	29.2	90	
180	30.5	110	
0	A o	130	
2.5	2.2	150	30.5
7.5	6.2	170	
12.5	9.5	175	30.2
0	A x	180	
20	13.2	185	32.0
25	15.7	0	A0
30	18.0	17	12.7
35	19.5	37	26.5
55	27.5	57	25.7
75		77	29.0
95		97	
115		117	
135		137	
			30.4
			32.2

7500 8
15000 13



29.5
30.2
NR
31.2
32.7
33.5
33.2
35.0
34.7

28.5

32.5

F: 5.3 / 1400 / 2800 / 10,000 / 16.1
R: 5.1 / 21.8

Project: NJG **Date:** 10/6

Line Description: #12 F → 4N 80 E spacing 4.11 5.5'
7 R

Layer F						
Velocity	1450	2400	17000			
X_c	19	44				
Depth	4.7	23				

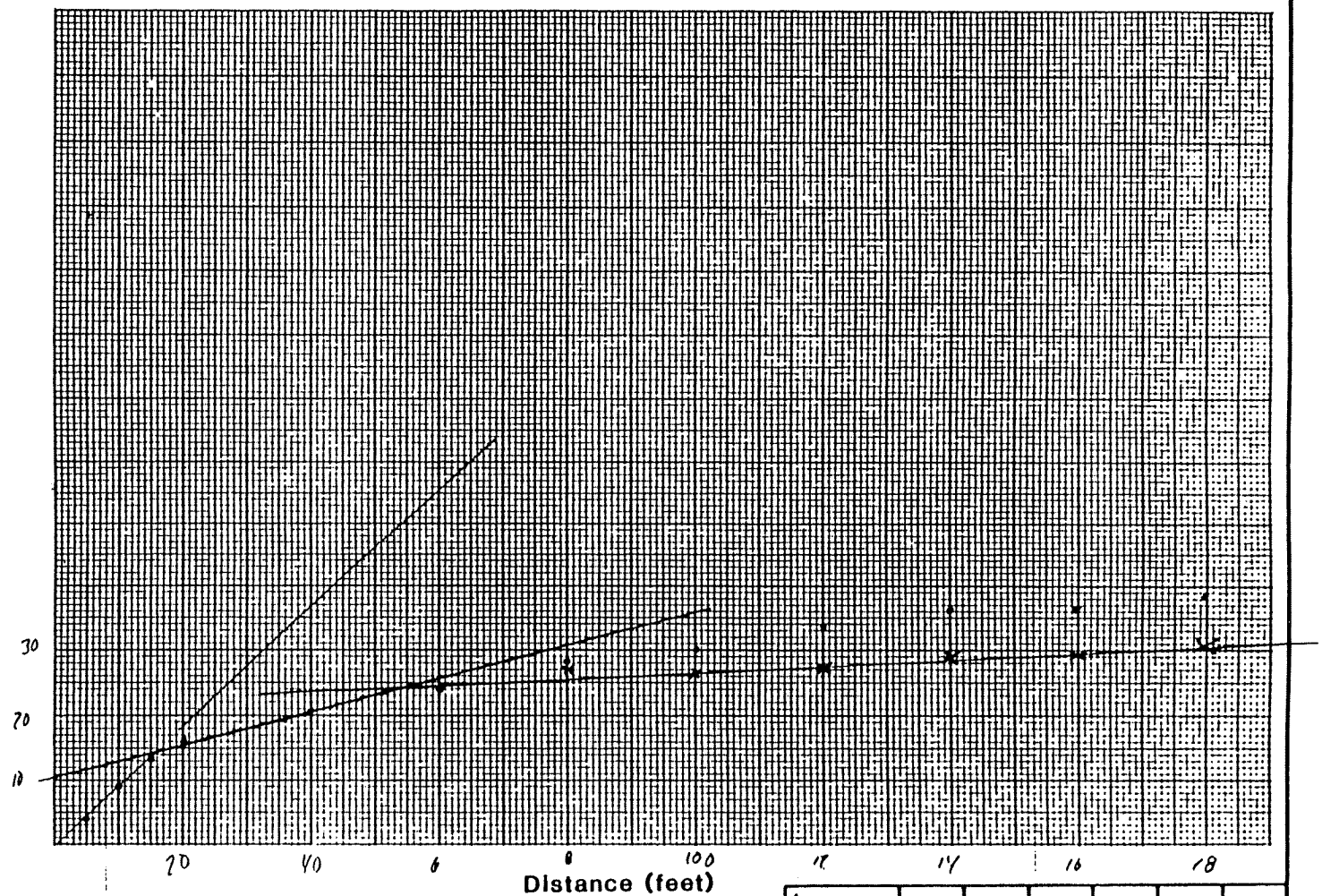
Layer R				1	2	3
Velocity				1200	2000	15000
X_c				10	37	
Depth				2.5	18	

DELTA GEOPHYSICAL Clinton, NJ GEONICS

Seismic Refraction Worksheet

DATA

x	ms	x	ms
		M.11F2	
5	4.2		
10 2	9.0		
15	13.5		
20'	16.2		
40	20.7	x	
60'	24.2	11F	
80	28.2	27.0	
100'	29.7'	26.5	
120	33.7'	27.2	
140''	36.2	29.0	
160	36.7	29.5	
180''	38.7	30.5	



Project: NK Date: 10/6

Line Description: 11F → NW 38°E

Layer						
Velocity						
X_c						
Depth						
Layer	1	2	3			
Velocity	1100	4000	20000			
X_c	16	55				
Depth	6	27				

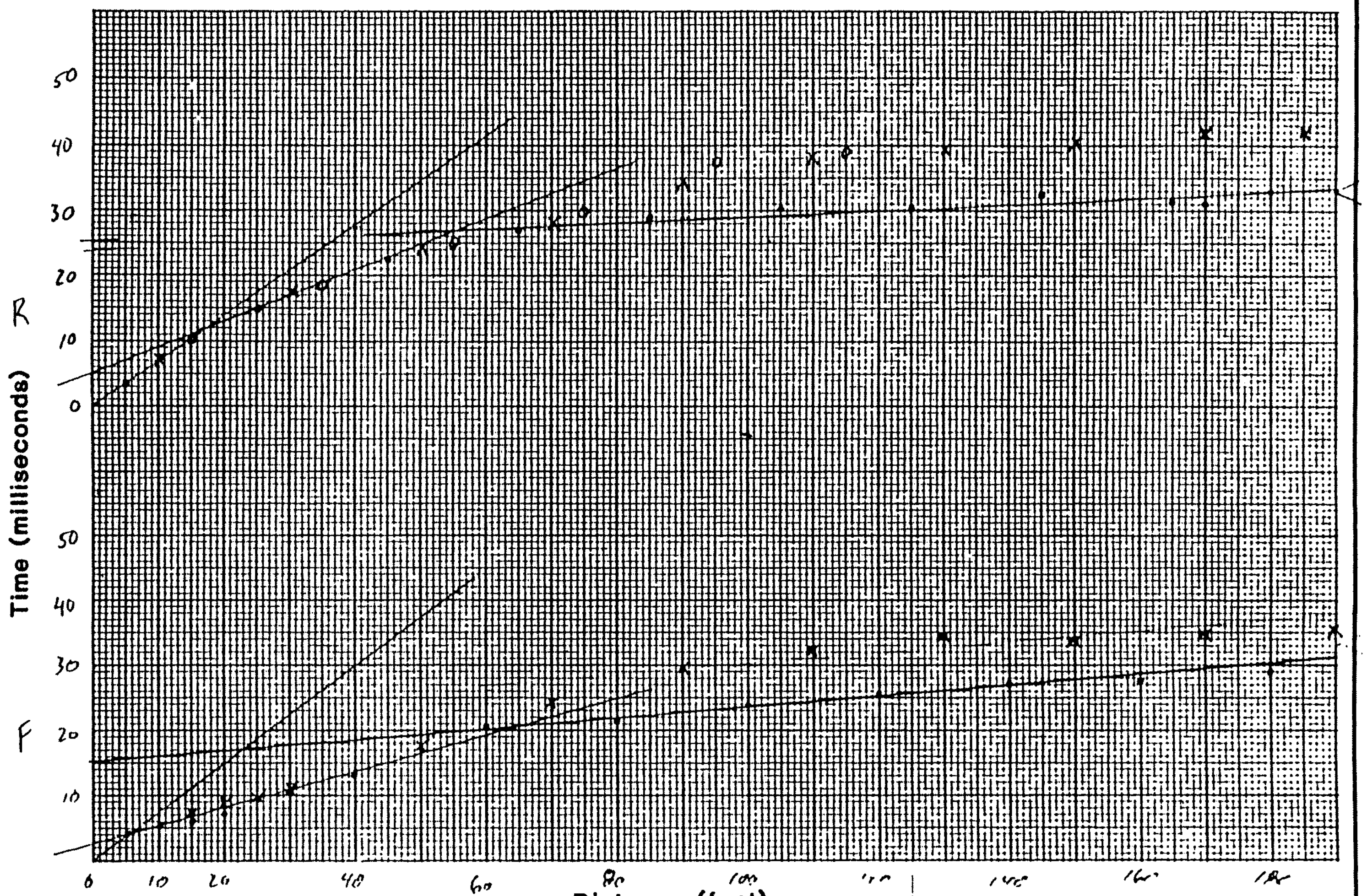
Seismic Refraction Worksheet

DATA

x (f)	ms	x (R)	ms
0	Ø	R	Ø
5	4.2	5	3.7
10	5.5	25	15.0
15	6.2	45	22.5
20	7.2	65	27.2
40	13.7	85	29.2
60	20.7	105	30.2
80	31.5	125	30.7
100	34.0	145	32.5
120	35.7	165	31.7
140	37.2	170	31.2
160	37.7	175	NR
180	39.2	180	33.0
0	Ø	0	Ø
15	7.7	10	7.7
20	9.0	30	17.5
25	9.7	50	24.5
30	11.2	70	28.0
50	17.5	90	34.7
70	24.0	110	38.5
90	29.7	130	39.5
110	32.5	150	40.7
130	34.2	170	42.0
150	33.7	175	41.5
170	34.7	180	42.2
190	35.2	185	42.0
		15	10.5
		35	18.7
		55	25.2
		75	30.0
		95	37.7
		6	39.2
		12	43.2

ALL DOWN

DOWN



Project: NG

Date: 10/5

Line Description: # 10F (11 hp) N NOE
rock surface, below (2") crest of ishpy

F VRMS R
1400
1.7 3400 6.4
25 15,000 25

r VRMS R
1400
1.5 3000 4.9
15000
25 21

Layer F	1	2	3			
Velocity	1350	3600	12000			
X_c	5	65				
Depth	1.7	25				
Layer R	1	2	3			
Velocity	1450	2500	19000			
X_c	17	55				
Depth	9.4	28				

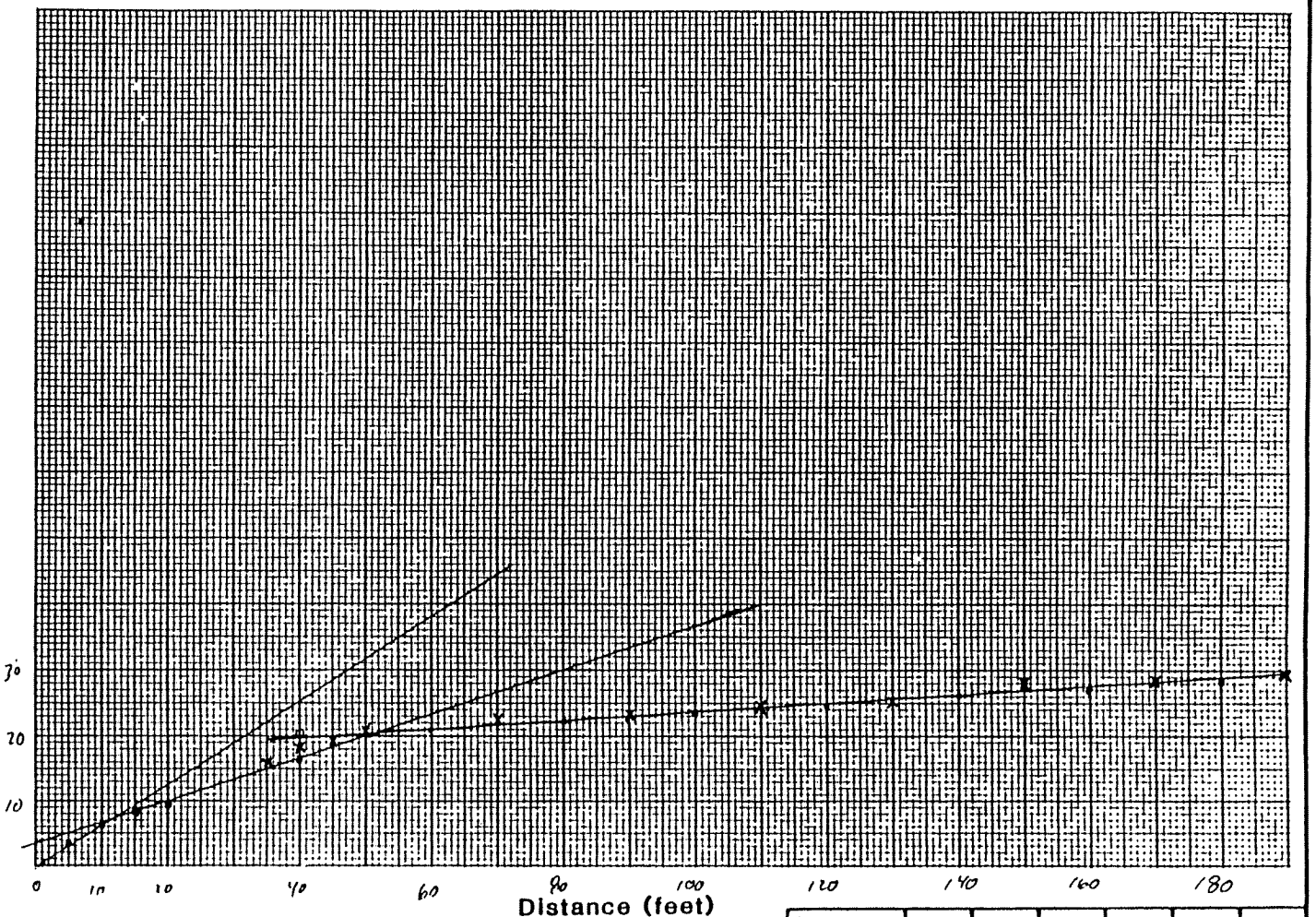
DELTA GEOPHYSICAL Clinton, NJ GEONICS

Seismic Refraction Worksheet

8F DATA

x	ms	x	ms
0	↑		
5	3.5		
10	6.2		
15	8.2		
20	3.5		
40	16.2/20.2		
60	21.0		
80	22.2		
100	23.5		
120	24.7		
140	26.2		
160	27.0		
180	28.2		
0	↑		
35	16.2		
40	18.2		
45	19.5		
50	20.7		
70	22.7	?1	
90	23.2		
110	24.7		
130	25.7		
150	28.0		
170	28.5		
190	29.5		
210	30.2		

NG8F2



Project: NG Date: 10/6

Line Description: 8F → to river (up 5° hill) fairly flat
SP1 rocky going slightly up
SP2 not rocky

Layer						
Velocity	1550	3000	15000			
X_c	12	51				
Depth	3.4	24				
Layer						
Velocity						
X_c						
Depth						

DELTA GEOPHYSICAL Clinton, NJ GEONICS

Seismic Refraction Worksheet

7F

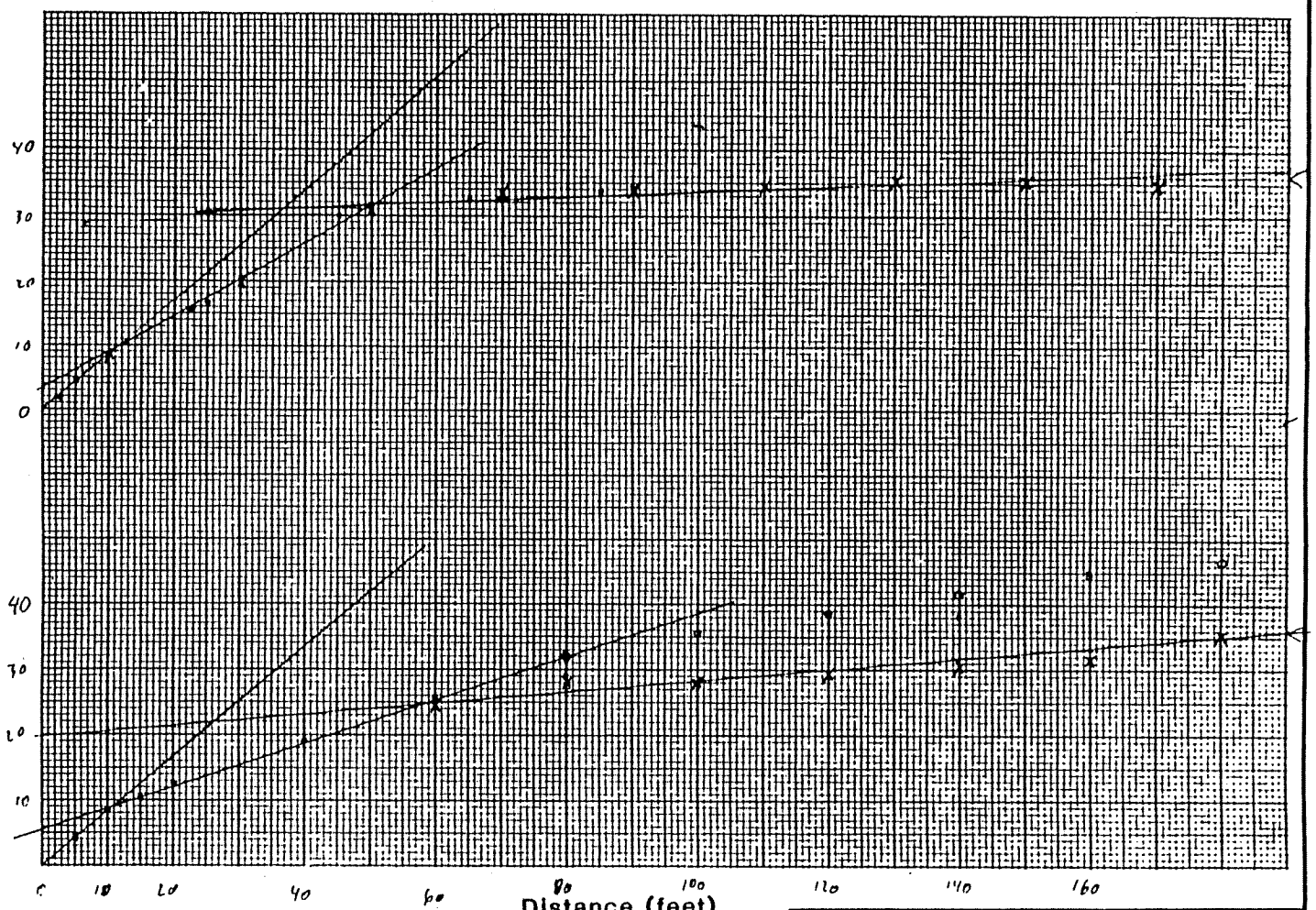
DATA

x	ms	NEW X'S	ms
0	F		
5	4.7		
10	8.5		
15	10.5		
20	12.7		
40	19.0	X	
60	26.0	25,0	
80	29.24	28.2	
100		28.0	
120		29.5	
140	38.24	30.7	
160		31.7	
180		35.54	
7R			
0	R	0	R
5	4.5	2.5	2.0/c
25	16.7	22.5	
45	30.0		
65	32.5		
85	33.7		
12	35.5		
0	F		
10	8.7		
30	20.0		
50	31.2		
70	33.7		
90	34.0		
110	34.7		
130	35.5		
150	35.5		
170	35.0		
175	35.0		
180	36.2		
185	35.5		

down

↑ 32.2
↑ 35.7
↑ 38.7
↑ 41.5
↑ 44.7
↑ 47.3

1.5 2nd arrival 4.7 - 4.0



Project: NG **Date:** 10/6

Line Description: 7F → to river 11th 59
Gr ↑ 1-5 going ↑ steeper than last
F 6' higher than R, not as rocky as #3, Trees are in depressions - 1'-2'.

Layer F	1	2	3			
Velocity	1200	3000	12000			
X_c	11	58			47	
Depth	3.6	25				
Layer R	1	2	3			
Velocity	1200	2000	12000			
X_c	11	50			39	
Depth	2.5	25				

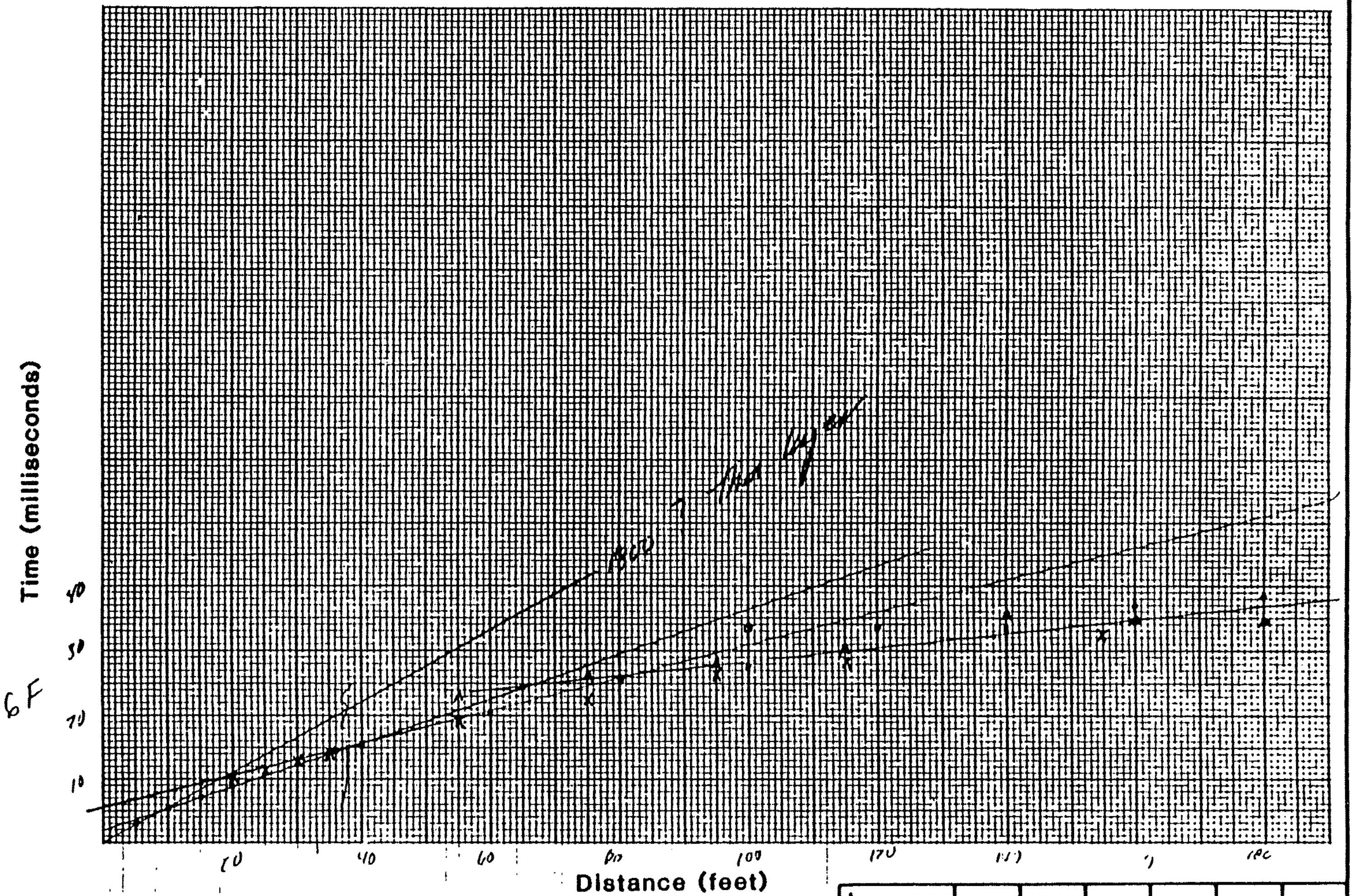
	F	VMPS	R
1	3.0	1200	3.0
77		7700	70

DELTA GEOPHYSICAL — Clinton, NJ — GEONICS

Seismic Refraction Worksheet

6F DATA

x	ms	x	ms
0	[illegible]		
5	3.0		
10	5.7		
15	7.5		
20	8.7		
40	15.2		
60	20.2		
80	25.5		
100	27.5		
120	33.5		
140	33.2		
160	37.0		
180	38.5		
0	[illegible]		
20	10.0		
25	11.5		
30	13.0		
35	14.7		
55	19.5	23.2	
75	22.2	26.7	
95	26.5	28.0	
115	28.2	30.2	
135	NR	NR	
155	32.7	35.2	
175		34.2	
195		34.2	



Project: [illegible] Date: 10/5

Line Description: #6 in line 138th N5°E
F→ upslope 4' (flattens out @ Gr #8

Layer						
Velocity						
X_C						
Depth						

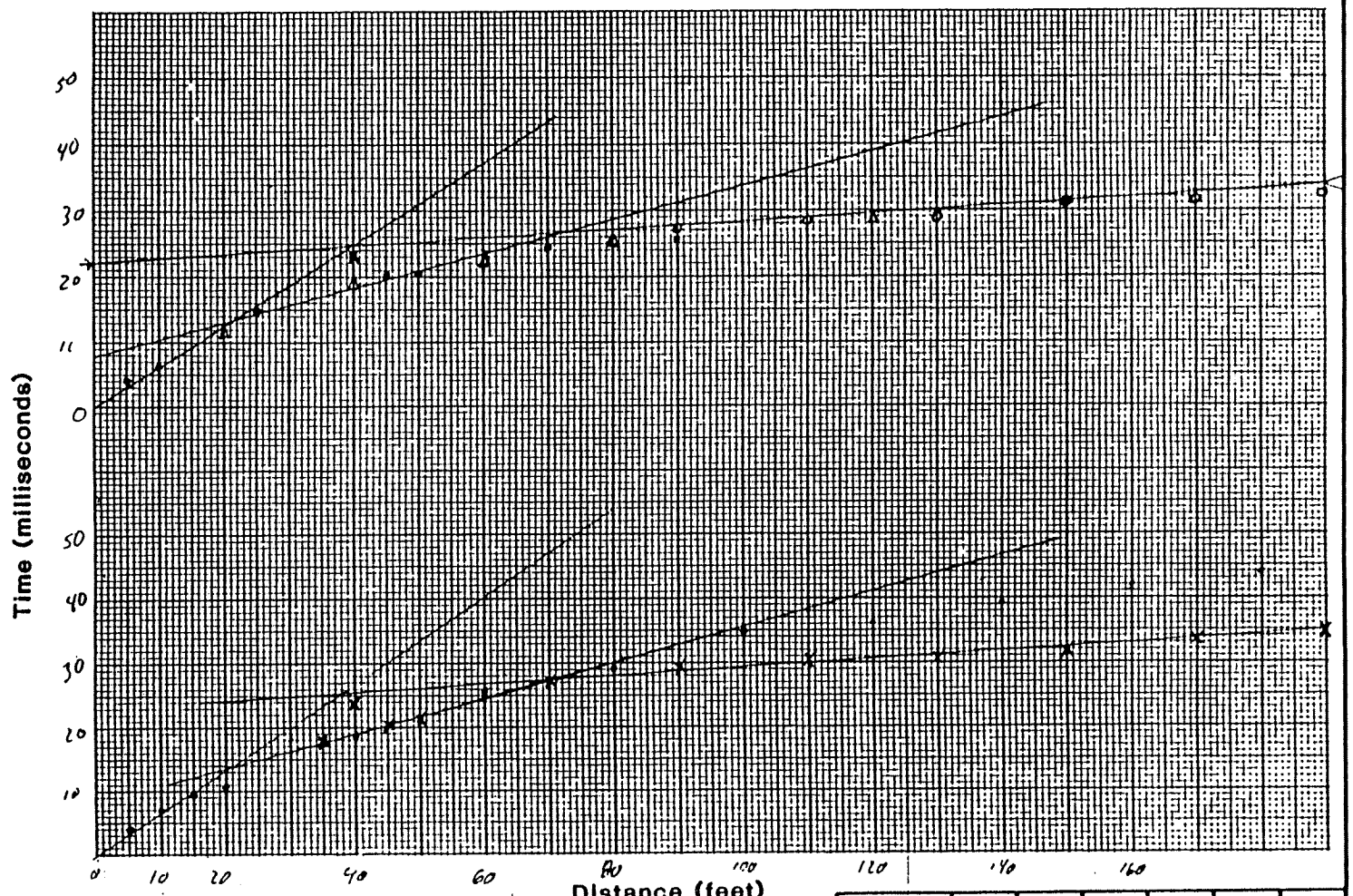
Layer	1	2	3	4		
Velocity	1800	2900	4000	10000		
X_C	8	38	81			
Depth	1.9	9.1	≈35			

Seismic Refraction Worksheet

DATA

F x	F ms	R x	R ms
0	↑	0	↑
5	4.0	5	4.2
10	7.0	25	14.5
15	9.7	~~45~~	20
20	10.7	65	24.0
40	185/615	10	6.2
60	25.5	30	15.7
80	29.2	50	20.2
100	35.0	70	24.5
120	36.2	90	25.5
140	39.2	110	28.5
160	42.0	130	29.2
180	44.0	150	31.5
0	~~44~~	170	31.5
35	18.0	175	32.5
40	18.5	100	33.7
45	20.5	185	34.0
50	21.2	20	11.5
70	27.7	40	19.5
90	29.2	60	22.5
110	30.2	80	25.5
130	30.7	100	—
150	32.0	120	28.2
170	33.2		
190	34.5		
210	35.0		

27.2 ↑ to



Project: NG **Date:** 10/5

Line Description: 5F → to round, flt to GP #7, then drops gradually (44.?) to 57

GP #1 in brk

	V (kms)	D
1	1500	6.7
6.6	3500	19.6
20.4		
27.0	16,000	26.3

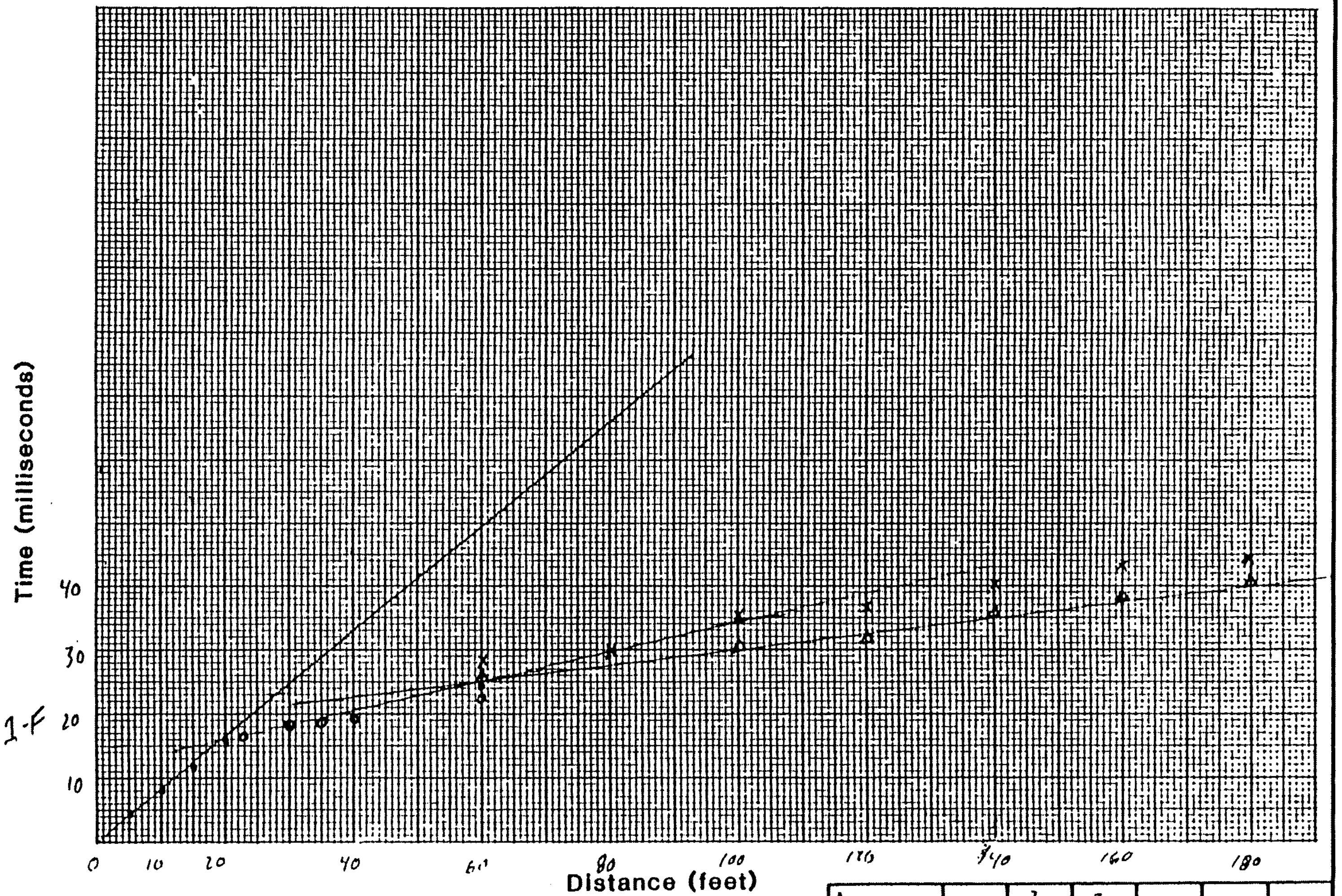
Layer F	1	2	3			
Velocity	1500	3400	16,000			
X_c	21	71		50		
Depth	4.3'	34				
Layer R	1					
Velocity	1600	3800	16000			
X_c	22	72		50		
Depth	7.0	34				

Seismic Refraction Worksheet

1-F **DATA**

x	ms	x	ms
0	0		
5	4.5		
10	8.0		
15	12.0		
20	16.2		
40	19.7		
60	24.5		
80	30.0		
100	35.5		
120	36.5		
140	40.2		
160	43.0		
180	44.2		
0	0		
25	16.5		
30	18.2		
35	18.5		
40	19.0		
60	22.0		
80	29.0		
100	30.2		
120	32.0		
140	36.0		
160	38.5		
180	40.7		
200	41.5		

28.29
26.21



Project: NG Date: 10/5/87

Line Description: # 1 F (Heads MN 126°E), 6V 115/12
S. of pad.

NGIF PXID

Layer	1	2	3			
Velocity	1200	4300	8000			
X_c	19	61				
Depth	7.1	23				

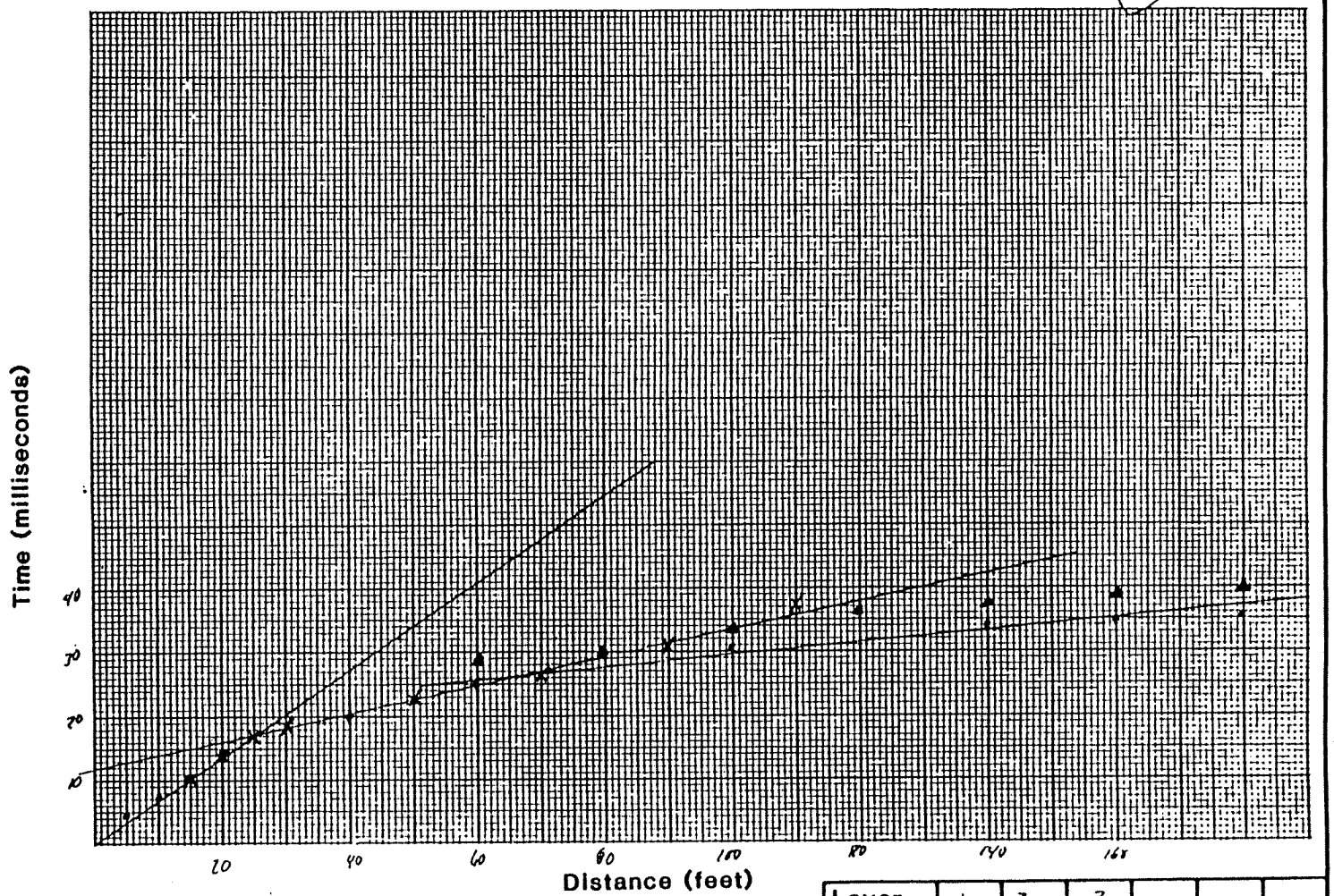
Layer						
Velocity						
X_c						
Depth						

DELTA GEOPHYSICAL Clinton, NJ GEONICS

Seismic Refraction Worksheet

DATA

x	ms	x	ms
0	0		
5	4.2		
10	7.0		
15	10.7		
20	14.5	▲	
40	19.0	21.1	
60	24.7	28.7	
80		32.0	
100	30.7	37.5	
120		36.2	
140	34.0	37.7	
160	34.5	39.0	
180	35.2	40.5	
x			
15	10.0		
20	13.7		
25	17.0		
30	18.7		
50	22.7		
70	26.2		
90	31.0		
110	33.5		
130			



Project: NG Date: 10/5

Line Description: 2F → NW 114°E (11 to 100)

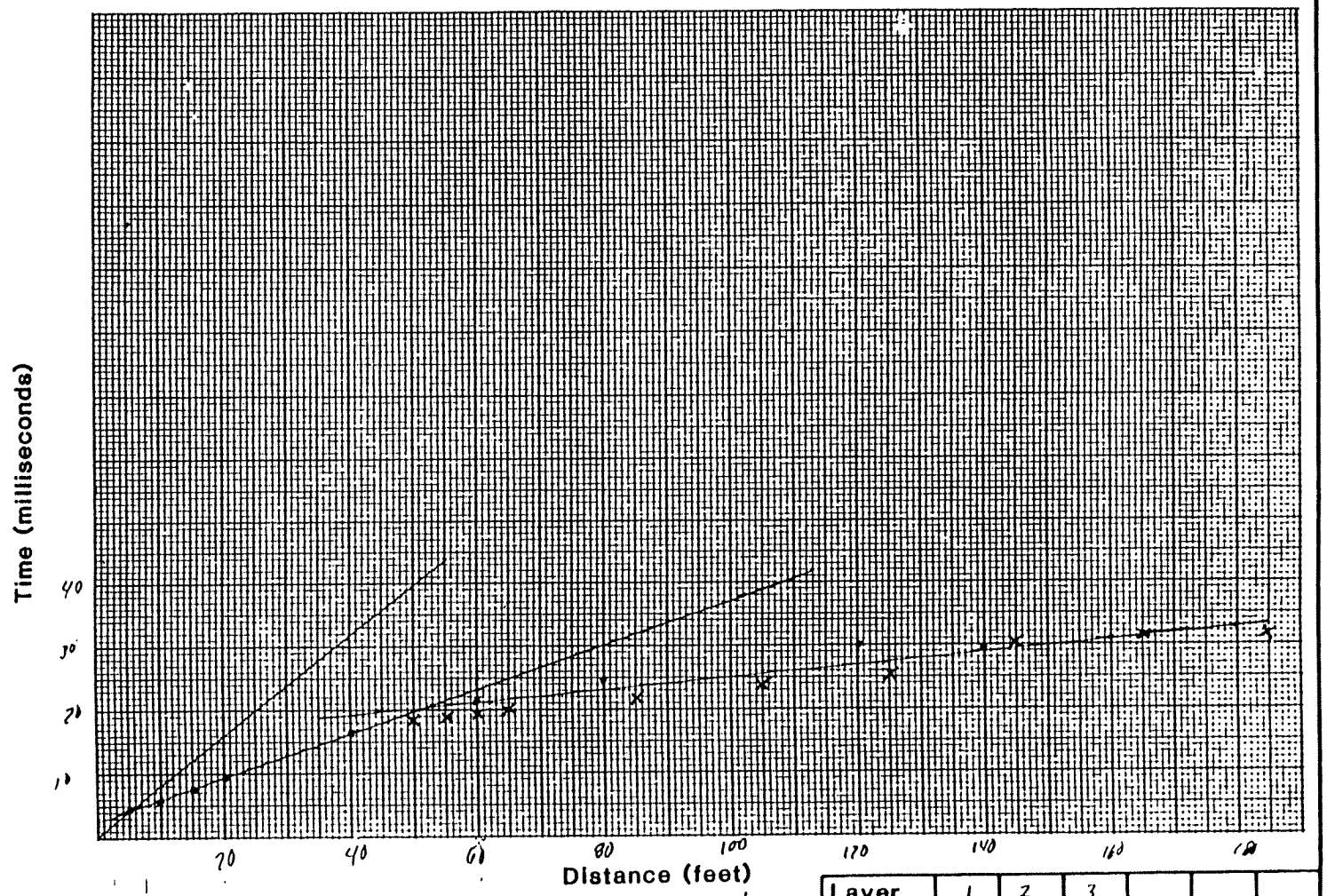
Layer	1	2	3			
Velocity	1450	4700	10,000			
X_c	25	66				
Depth	9.1	27				
Layer						
Velocity						
X_c						
Depth						

DELTA GEOPHYSICAL Clinton, NJ GEONICS

Seismic Refraction Worksheet

DATA

x	ms	x	ms
5	4.2		
10	5.7		
15	7.5		
20	9.5		
40	16.0		
60	24.2		
80	24.7		
100	NR		
120	30.0		
140	29.7		
160	31.0		
180	32.7		
200			
250	18.5		
255	19.2		
260	19.5		
265	20.0		
285	21.7		
305	23.7		
325	25.0		
345	30.6		
365	31.2		
385	31.5		
205			
225		V	



Project: NG Date: 10/6

Line Description: 3F N115E ⊥ to bulkhead

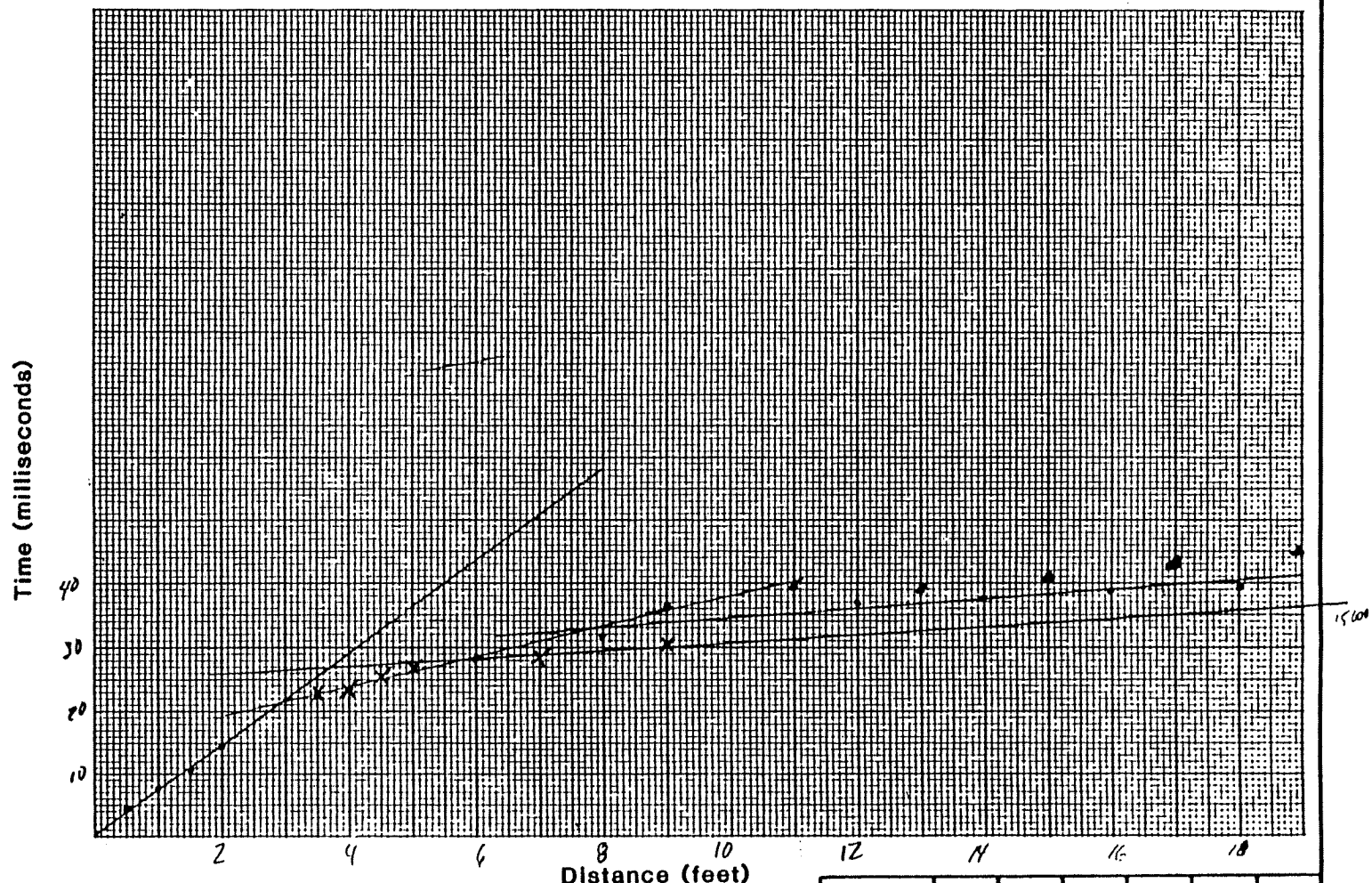
Layer	1	2	3			
Velocity	1250	2800	10,000			
X_c	5	52				
Depth	1.6	21				
Layer						
Velocity						
X_c						
Depth						

Seismic Refraction Worksheet

4-F

DATA

x	ms	x	ms
0	⊕		
5	4.5		
10	7.5		
15	10.5		
20	14.7		
40	23.5		
60	28.2		
80	32.0		
100	NK		
120	37.0		
140	37.7		
160	39.0		
180	39.5		
0	⊕ x		
35	23.0		
40	23.2		
45	25.2		
50	27.0		
70	28.5		
90	30.5		
110			
130			
150			
170			
190			
210			



Project: NC

Date: 10/5

Line Description: 4F (HEADS NW 225° E) end closest to Powerline

Layer	1	2	3			
Velocity	1400	4200	13000			
X_c	29	78				
Depth	10.3	36				
Layer						
Velocity						
X_c						
Depth						

DELTA GEOPHYSICAL Clinton, NJ GEONICS

APPENDIX B

APPENDIX B

BORING AND WELL INSTALLATION LOGS

This appendix provides copies of the boring and well installation logs which were a part of the Remedial Investigation.

CLIENT: NYPA BUFFALO AVE-JOB # 13796

BORING B-1

SURFACE ELEVATION (FT) 579.06

TOP OF CASING ELEVATION (FT) _____

DATE STARTED: 12/1/87
DATE FINISHED: 12/1/87

DEPTH TO WATER (FT)				
DATE				

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
0	1	6/19 16/24	13		DK BR-BLK TOPSOIL, LITTLE ORG MATTER, TRACE ROCK FRAGMENT	
	2	8/19 24/14	10	GM-GC	FILL RED-BR GRAVELLY SILT, TR ORGANIC MATTER, TRACE PEBBLE	
	3	5/12 26/1	7	(FILL)	TRACE CLAY, TRACE BRICK FRAGMENT, NO ORGANIC MATTER	
5	4	8/8 8/9	NR		LITTLE CLAY, NO ORGANIC MATTER	
	5	3/6 8/13	12		NO RECOVERY	
10					DK GRAY-BR CLAYEY-SILT, TR GRAVEL, TRACE CINDER, TRACE PEBBLE	
					AUGER REFUSAL AT 11.5 FEET	
15						
20						
25						
30						
35						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA BUFFALO AVE- JOB #13796

BORING B-2

SURFACE ELEVATION (FT) 578.82

TOP OF CASING ELEVATION (FT) _____

DATE STARTED: 12/1/87
DATE FINISHED: 12/1/87

DEPTH TO WATER (FT)				
DATE				

AS BUILT DIAGRAM

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0					NO SAMPLES TAKEN FOR THE FIRST 4 FT.
					ASSUMED LITHOLOGY THE SAME AS B-1
5	1	9/5 6/8	0	GC-GM	
	2	6/6 12/9	11	(FILL)	FILL DK BR-RED SILTY CLAY, LITTLE GRAVEL, TRACE SLAG, TRACE CINDER
	3	11/13 11/10	0		NO RECOVERY
10	4	2/8 7/14	15		GRAY-GREEN-RED BROWN
	5	8/8 35/33	11		RED-BROWN-GRAY, CLAY, LITTLE SILT, TRACE ROCK FGMT, TRACE CINDER GRAVEL, LITTLE SILT, TR BRICK FGMT
15	6	21/20 30/17	11		TRACE CINDER
	7	15/12 7/12	18	CL	LIGHT BR-RED BROWN CLAY, TRACE ORGANIC MATTER, TRACE FINE SAND, TRACE SHELL FRAGMENT (LAKE BED CLAY)
20					BORING TERMINATED AT 18.0 FEET
25					
30					
35					

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA BUFFALO AVE.-JOB # 13796

BORING B-3

SURFACE ELEVATION (FT) 579.90

TOP OF CASING ELEVATION (FT) _____

DATE STARTED: 12/1/87
DATE FINISHED: 12/1/87

DEPTH TO WATER (FT)				
DATE				

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
0	1	2/4 8/12	7		BR. TOPSOIL, LITTLE ORG MATTER TRACE ROCK FGMT FILL RED-BR SILT, LITTLE GRAVEL	
	2	9/13 18/8	8	GM	TRACE ORG. MATTER, TR CLAY TRACE FINE SAND, NO ORGANIC MATTER	
5	3	3/4 6/8	10	(FILL)	LITTLE FINE SAND, TRACE GRAVEL, NO ORGANIC MATTER	
	4	3/3 4/3	15		TRACE FINE SAND, TRACE GRAVEL, NO ORG MATTER	
	5	2/3 5/6	15	CINDER	BLACK CINDER, LITTLE CLAY, TR SILT, TR SHELL FGMT, TR GRAPHITE ROD	
10	6	4/7 8/8	15	ML (FILL) CIN.	BLK CINDER-CLAY, TR BRICK FGMT, TR ROCK FGMT, TR SILT RED-BR SILTY-CLAY, TR CINDER, TR ROCK FGMT (PETROLEUM ODOR)	
	7	5/7 13/10	16		BLK CINDER, TR RK FGMT, TR WHITE INDUSTRIAL WASTE	
15	8	2/6 5/12	12	ML (FILL)	RED-BR CLAYEY-SILT, LITTLE BRICK, LITTLE CINDER, TRACE SLAG	
	9	8/18 100-5"	8		TRACE BRICK, NO CINDER, TRACE GREEN INDUSTRIAL WASTE (H2S ODOR)	
	10	WR/3 6/5	12	SM	SOME CINDER, LITTLE GRAVEL, TRACE CONCRETE CHIPS, NO BRICK, NO SLAG, NO CINDER	
20					GRAY FINE-MED SAND, TR ORG. MATTER	
					BORING TERMINATED AT 20.0 FEET	
25						
30						
35						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE - JOB # 13796

BORING MW-1D

SURFACE ELEVATION (FT) 574.12

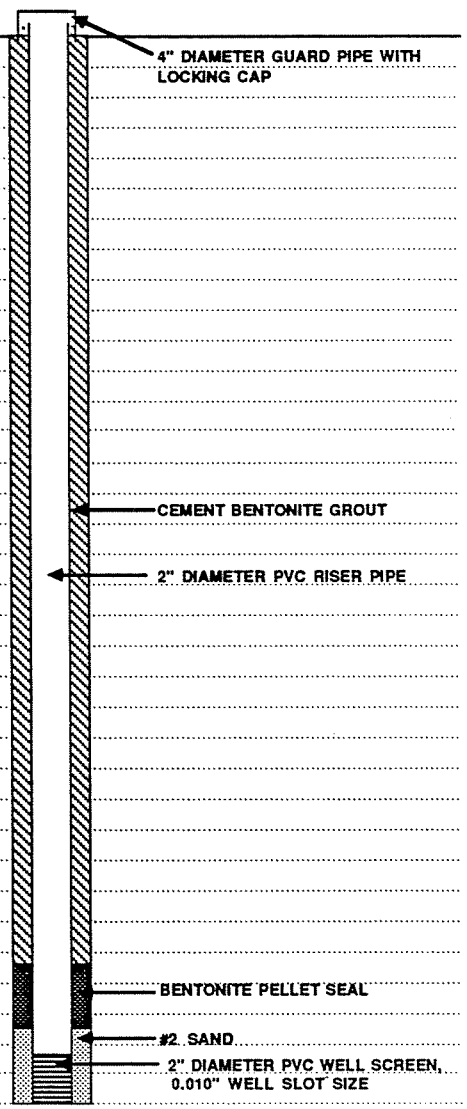
TOP OF CASING ELEVATION (FT) 576.20

DATE STARTED: 10/14/87
DATE FINISHED: 10/14/87

DEPTH TO WATER (FT)	18.40	14.44	14.25
DATE	10/14/87	12/8/87	12/9/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	6/14	9.5		BR. TOPSOIL, LITTLE ROCK FGMT, TRACE ORG. MATTER
		54/22		GM-GC (FILL)	FILL, LIGHT BR. GRAVEL, LITTLE SILT, TRACE CLAY, TRACE ORGANIC MATTER.
	2	50/5"	5		
	3	23/9	18		SILT, LITTLE GRAVEL
5		5/5			
	4	7/4	15		SILT, LITTLE CINDER
		5/4			
	5	2/3	6		CLAY, LITTLE CINDER, TRACE SILT, TRACE ROCK FRAGMENT
		3/3			
10	6	7/25	7		SILT, TRACE GRAVEL
		8/4			
	7	4/3	12	CL	RED BROWN CLAY, LITTLE SILT (LAKE BED CLAYS)
		5/6			
15	8	1/4	15		
		3/4			
	9	2/1	16		
		2/2			
	10	WH/WH	24		LITTLE SILT LENSES
		1/2			
20	11	WH/WH	4		
		2/4			
	12	17/22	9		TILL, LT BROWN DRY COMPACT SILT, TRACE (+) ROCK FRAGMENT
		23/25			
	13	21/42	9	ML	LITTLE ROCK FRAGMENT
25		91/99			
	14	26/47	14		
		46/58			
	15	15/29	14		
		63/60			
30	16	7/14	18		TRACE ROCK FRAGMENT
		22/35			
	17	24/88	14		TRACE FINE SAND
		84/95			
	18	100/3	NR		AUGER REFUSAL AT 34.5 FEET LIGHT - DARK GRAY LOCKPORT DOLOMITE
35					

AS BUILT DIAGRAM



DAMES & MOORE

BORING MW-1D CONT'D

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
					VUGGY ZONE	2" DIAMETER PVC WELL SCREEN, 0.010" WELL SLOT SIZE
					VUGGY ZONE SOLUTION PITS	
40						#2 SAND
					THIN SHALE LAYERS, ABUNDANT FRACTURES, MINERALIZATION (GYPSUM)	
45					BORING TERMINATED AT 44.50 FEET	
50						
55						
60						
65						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. - JOB # 13796

BORING MW-2D

SURFACE ELEVATION (FT) 573.24

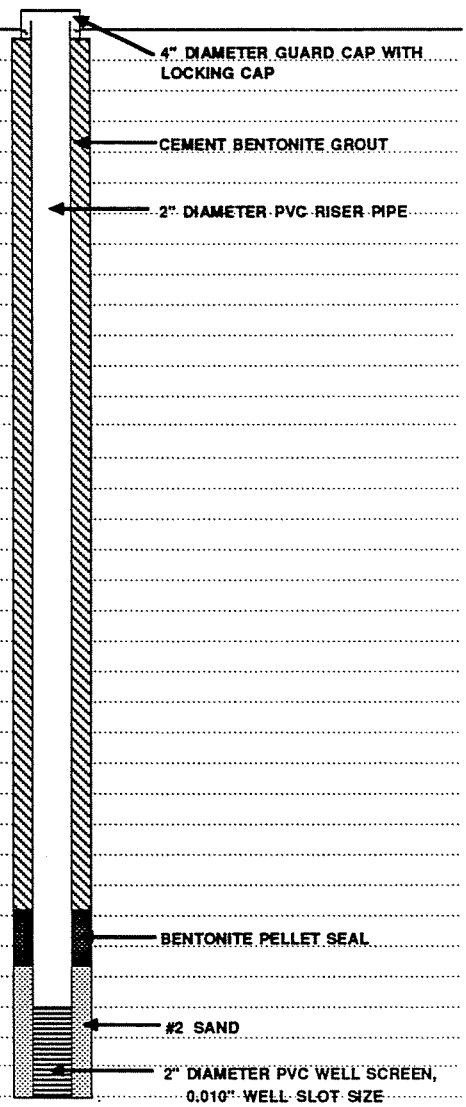
TOP OF CASING ELEVATION (FT) 575.19

DATE STARTED: 10/19/87
DATE FINISHED: 10/19/87

DEPTH TO WATER (FT)	15.50	13.56	30.42
DATE	10/19/87	12/8/87	12/9/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	5/12	21		BR. TOPSOIL, LITTLE ORG. MATTER, TRACE ROCK FRAGMENT
		9/16		GC-GM (FILL)	FILL, RED BROWN, GRAVEL AND SILT, TRACE ORG. MATTER, TRACE FINE SAND
	2	4/5	10		GRADING INTO CLAYEY SILT AT BOTTOM 4"
		5/14			
	3	10/11	9		BLACK SILT, SOME CINDER, LITTLE PEBBLE,
5		8/6			TRACE SLAG
	4	8/7	11		
		7/15			
	5	10/20	13		TRACE (+) SAND, TRACE GRAVEL, NO PEBBLE
		76/			NO SLAG
		50 - 2"			
10	6	4/4	3		TRACE GRAVEL, NO PEBBLE, NO SLAG
		2/5			
	7	3/3	18		SAND, FINE GRAY LITTLE SILT, TRACE ORG.
		5/6		SM	MATTER
15	8	2/2	15		
		4/5			
	9	WR/2	13		TRACE GRAVEL
		4/9			
	10	1/1	17		FINE - COARSE, TRACE SILT LENSES
		4/8			
20	11	WH/13	14	CL	RED BROWN CLAY (LAKE BED CLAYS)
		40/59			TILL LIGHT BR., SILT, LITTLE ROCK FRAG.
	12	9/33	12		TRACE SAND
		34/		ML	
		74 - 4"			
25	13	50/37	7		
		46/45			
	14	24/33	9		
		78/			
		75 (3")			
	15	47/	5		
30		100 (5")			
	16	22/53	13		
		77/			
		50 (3")			
	17	11/35	11		GRAVELLY FINE SAND GRADING INTO FINE
		100 (5")		SW	SAND, LT BROWN, LITTLE SILT
	18	14/44	9		AUGER REFUSAL AT 35.40 FEET
35		75 (3")			LIGHT - DARK GRAY LOCKPORT DOLOMITE
40					

AS BUILT DIAGRAM



DAMES & MOORE

BORING MW-2D CONT'D

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
					VUGGY ZONE INTERBEDDED SHALE LAYERS	2" DIAMETER PVC WELL SCREEN, 0.010" WELL SLOT SIZE
					ABUNDANT VUGS MINERALIZATION ABUNDANT (GYPSUM) SHALE LAYERS COMMON	#2 SAND
40					MINOR FRACTURES MINOR FRACTURES	
					BORING TERMINATED AT 44.50 FEET	
45						
50						
55						
60						
65						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. - JOB # 13796

BORING MW-1S

SURFACE ELEVATION (FT) 574.14

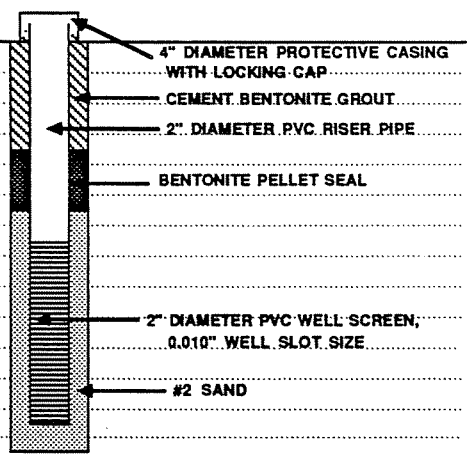
TOP OF CASING ELEVATION (FT) 576.56

DATE STARTED: 10/16/87
DATE FINISHED: 10/16/87

DEPTH TO WATER (FT)	13.3	11.75	11.79
DATE	10/16/87	12/8/87	12/9/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	4/12	14"		BR. TOPSOIL, LITTLE ORG. MATTER, TR. ROCK FGMT.
		20/29			FILL, LIGHT BROWN, SILT, LITTLE GRAVEL, TRACE ORGANIC MATTER, TRACE BLACK CINDER.
	2	10/16	7"	GM (FILL)	NO ORGANIC MATTER
		13/17			
5	3	9/9	4"		RED BROWN BRICK, LITTLE ROCK FRAGMENT, LITTLE BLACK CINDER, TRACE CLAY, TRACE SILT.
		9/8			
	4	5/6	7"	CIN. (FILL)	BLACK CINDER, SOME CLAY, TRACE SILT, TRACE ROCK FRAGMENT.
		9/10			
	5	3/4	12"	CL-ML	DARK GREY-BROWN CLAY, TRACE SILT, TRACE ORGANIC MATTER
		8/9			
10	6	3/9	8"	(FILL)	GRAVELLY SAND, LITTLE BRICK, TRACE ORGANIC MATTER
		4/10			
	7	5/7	13"	CIN. (FILL)	BLACK CINDER, TRACE SILT
		11/12		CL	RED BROWN CLAY, LITTLE SILT (LAKE BED CLAYS)
15					(BORING TERMINATED AT 14.0 FEET)
20					
25					
30					
35					

AS BUILT DIAGRAM



THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE JOB # 13796

BORING MW-3D

SURFACE ELEVATION (FT) 576.17

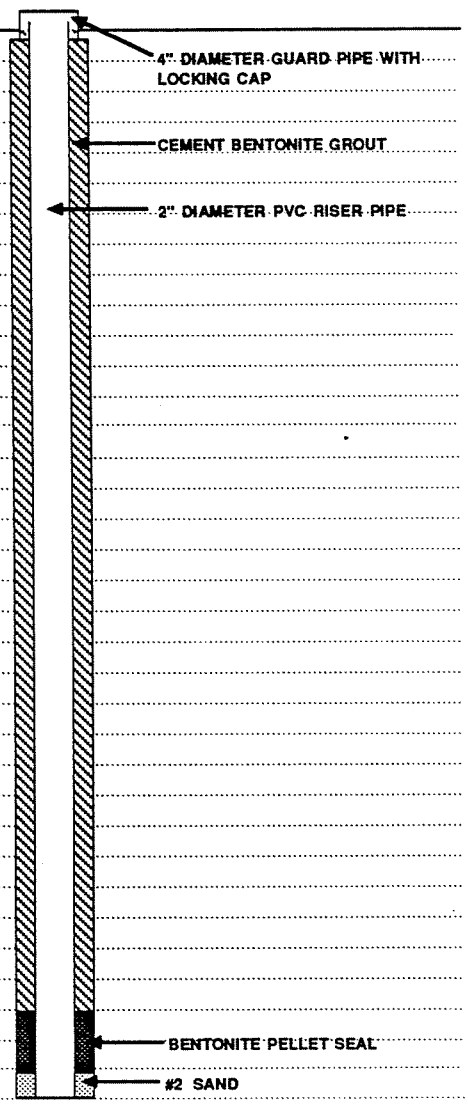
TOP OF CASING ELEVATION (FT) 578.08

DATE STARTED: 10/22/87
DATE FINISHED: 10/26/87

DEPTH TO WATER (FT)	16.75	16.61	
DATE	12/8/87	12/9/87	

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	3/25 50-4"	13	GM-GC	TOPSOIL DK. BR., LITTLE ORG. MATTER, TR. ROCK FRAGMENT FILL RED-BR, GRAVELLY-SILT, TR. ORG. MATTER
	2	21/32 11/14	12		
5	3	7/20 22/17	NR	(FILL)	BLACK CLAYEY-GRAVEL, LITTLE SILT
	4	3/3 7/7	15		BLACK SILT, TR ORG. MATTER, TRACE CLAY
	5	3/6 15/20	15	CL	LT. BR. CLAY, SOME SILT, TR. ORG. MATTER (LAKE BED CLAYS)
10	6	3/6 13/12	13		LITTLE MED. SAND LENSES (1/2")
	7	2/5 5/7	17		LITTLE SILT
15	8	2/3 5/6	18		
	9	2/1 2/3	23		TRACE SILT LENSES
	10	1/1 1/2	21		TRACE SILT LENSES
20	11	1-12" WH/1	24		
	12	WH/1 2/2	22		SILTY CLAY, SOME GRAVEL, LITTLE SAND
25	13	7/ 50-2"	1		TILL, RED-BROWN, LITTLE GRAVELLY-SILT
	14	32/46 70/30	12	CL-ML	
	15	18/44 57/60	18		SILTY GRAVEL
30	16	24/51 47/50	16		1/2" CS SAND LAYER
	17	12/ 50-3"	2		
35					AUGER REFUSAL AT 34.0 FEET LIGHT-DARK GRAY LOCKPORT DOLOMITE

AS BUILT DIAGRAM



DAMES & MOORE

BORING MW-3D CONT'D

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
					FRACTURES (VERTICAL & HORIZONTAL) FRACTURES ALONG SHALE LAYERS (FEW) VOID	2" DIAMETER PVC WELL SCREEN, 0.010" WELL SLOT SIZE #2 SAND
					ABUNDANT SHALE LAYERS	
40					MINOR SHALE LAYERS, HOR. FRACT. ALONG SHALE LAYERS MINERALIZATION (GYPSUM) VUGGY ZONE MINERALIZED (GYPSUM) HEALED FRACTURES WITH GYPSUM NUMEROUS MECHANICAL FRACTURES	
45					BORING TERMINATED AT 43.0 FEET	
50						
55						
60						
65						

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DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE JOB # 13796

BORING MW-3S

SURFACE ELEVATION (FT) 576.44

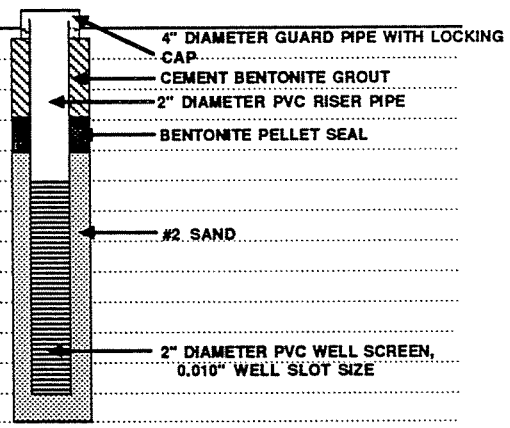
TOP OF CASING ELEVATION (FT) 578.43

DATE STARTED: 10/27/87
DATE FINISHED: 10/27/87

DEPTH TO WATER (FT)	11.0	8.60	8.49
DATE	10/27/87	12/8/87	12/9/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	3/4 10/20	13	GM	DK BR. TOPSOIL, LITTLE ORG. MATTER, TRACE CINDER, TRACE ROCK FRAGMENT
	2	24/ 75-5"		(FILL)	FILL, LT. BR., SILTY-GRAVEL, LITTLE PEBBLE TRACE CINDER, TR. ORG. MATTER
5	3	16/45 54/23	7	CIN. (FILL)	BLK-GRY CINDER, SOME RK FGMT, LITTLE SILT
	4	4/12 8/11	6	GM	FILL, LT. BR, SILTY-GRAVEL, LITTLE PEBBLE TR. CINDER,
	5	3/3 5/9	18	(FILL)	OLIVE GR. SILT, LITTLE CLAY, TRACE ORG. MATTER (BURNT), TR. SHELL FRAGMENT
10	6	3/ 75-3"	8		GRADING INTO CLAYEY-SILT (LT. BROWN) AT BASE
	7	3/8 13/17	18	CL	LIGHT BROWN CLAY, TR. SILT (LAKE BED CLAYS)
15					BORING TERMINATED AT 14.0 FEET
20					
25					
30					
35					

AS BUILT DIAGRAM



THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. JOB # 13796-002

BORING MW-4D

SURFACE ELEVATION (FT) 580.15

TOP OF CASING ELEVATION (FT) 582.94

DATE STARTED: 10/28/87
DATE FINISHED: 10/29/87

DEPTH TO WATER (FT)	20.8	21.57	21.30
DATE	10/29/87	12/8/87	12/9/87

AS BUILT DIAGRAM

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	5/13	7		TOP 5" BR TOPSOIL, LITTLE ROCK FGMT, TR ORGANIC MATTER
		25/21		GM-GC (FILL)	FILL, RED-BR SILT, SOME GRAVEL, TR ORG MATTER
	2	4/4	11		RED-BR SILTY-CLAY, LITTLE GRAVEL, TR SHELL FRAGMENT
		4/4			
5	3	2/4	10		
		4/8		GC (FILL)	RED-BR SANDY CLAY, FINE-MED, LITTLE RK FGMT, TR ORGANIC MATTER
	4	2/5	5		RED-BR CLAYEY-SILT, LITTLE FINE SAND, LITTLE ROCK FGMT, TR ORGANIC MATTER
		6/18			
	5	2/5	12		TRACE CINDER
10		11/13			
	6	5/11	4		
		10/10			
	7	2	2		
		50-3"			
15	8	2/3	11		
		7/21			
	9	27/35	7	GM (FILL)	GRAY SILTY GRAVEL AND ROCK FRAGMENT, TRACE FINE SAND
		17/15			
	10	6/9	8		
		7/12			
20	11	1/12	5	SM	GRAY FINE SAND, TRACE ORG MATTER, TR SHELL FRAGMENTS
		3/6			
	12	WR/3	16		
		4/5			
25	13	WR/3	24		
		4/6			
	14	WR/WR	11	CL	RED-BR CLAY, LITTLE SILT, (LAKE BED CLAY)
		2/1			
	15	WH/1	17		
30		1/3			
	16	WH/2	17		TILL, RED-BR SILT, SOME GRAVEL, TR FINE SAND, TR CLAY
		2/7			
	17	3/30	12	ML	
		33/68			
	18	41	7		
35		100-5"			

4" DIAMETER GUARD PIPE WITH LOCKING CAP

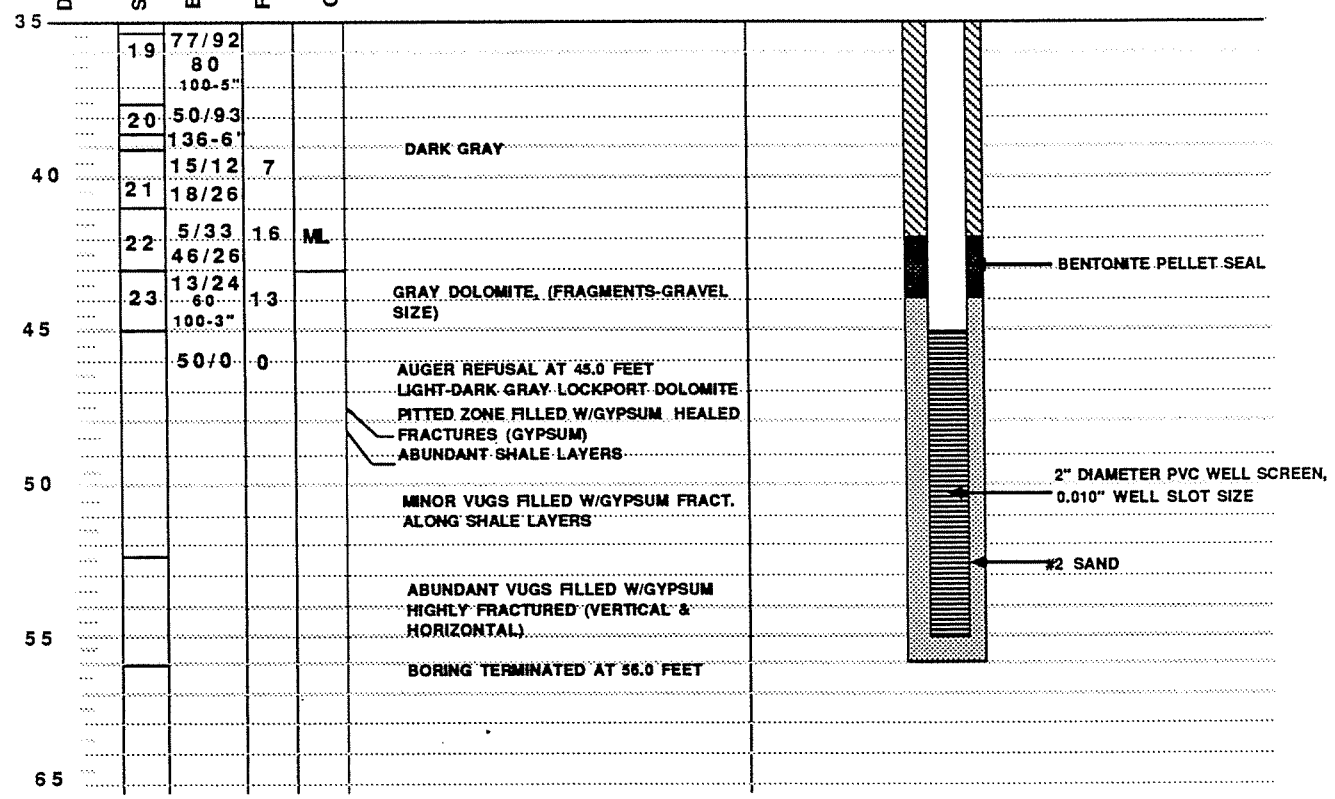
CEMENT BENTONITE GROUT

2" DIAMETER PVC RISER PIPE

(CONT'D)

DAMES & MOORE

BORING MW-4D CONT'D



THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. JOB # 13796

BORING MW-4S

SURFACE ELEVATION (FT) 579.95

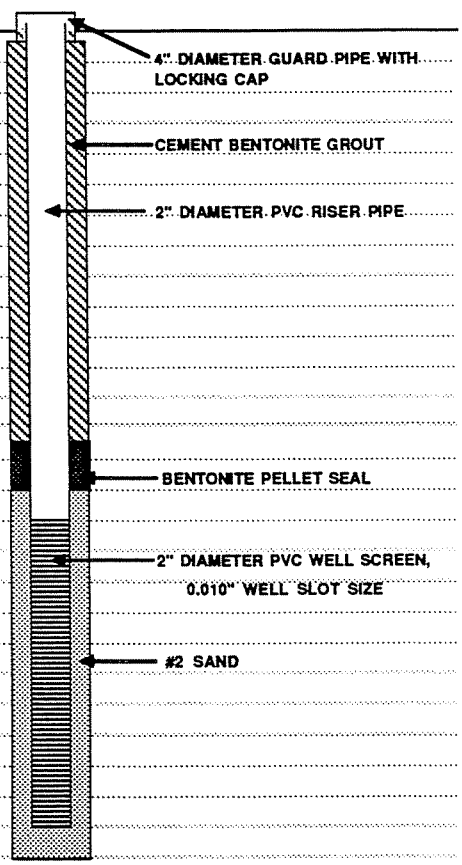
TOP OF CASING ELEVATION (FT) 582.48

DATE STARTED: 11/13/87
DATE FINISHED: 11/17/87

DEPTH TO WATER (FT)	20.0	19.8	
DATE	12/8/87	12/10/87	

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	10/19 9/11	12		TOPSOIL DK BR-BLK, LITTLE ORG. MATTER FILL RED-BR SILT, SOME GRAVEL, LITTLE SAND, TRACE ORG. MATTER
	2	6/16 26/13	7	GM-GC	LITTLE GRAVEL, NO SAND
5	3	3/3 4/5	13	(FILL)	RED-BR SILTY-CLAY, TR SAND, TR GRAVEL GRAY SANDY-SILT, TR GRAVEL, TR CLAY, TR ORG. MATTER, TR SHELL FRAGMENTS
	4	2/2 3/12	11		GRAY SAND, TR SILT, TR CLAY RED-BR SILTY-CLAY, LITTLE SAND, TRACE GRAVEL, TRACE CINDER
	5	3/3 5/11	NR		
10	6	3/3 6/7	11		TRACE ORG. MATTER, NO CINDER
	7	3/3 4/4	12		TRACE SAND, NO CINDER
15	8	1/2 5/8	9		TRACE ORG. MATTER, NO CINDER
	9	62/ 100-2"	5	GM	GRAY SILTY-GRAVEL, SOME ROCK FRAGMENT, TRACE SAND
	10	61/ 100-4"	5	(FILL)	
20	11	2/5 9/11	15	SM	GRAY FINE SAND TR SILT TR ORGANIC MATTER
	12	4/9 18/12	19		TRACE CLAY TRACE PEBBLE
25	13	4/5 7/12	15		TRACE SHELL FRAGMENT
	14	2/2 2/3	22	CL	RED BR CLAY TR SILT (LAKE BED CLAYS)
					BORING TERMINATED AT 28.0 FEET
30					
35					

AS BUILT DIAGRAM



THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. JOB # 13796-002

BORING MW-5D

SURFACE ELEVATION (FT) 574.52

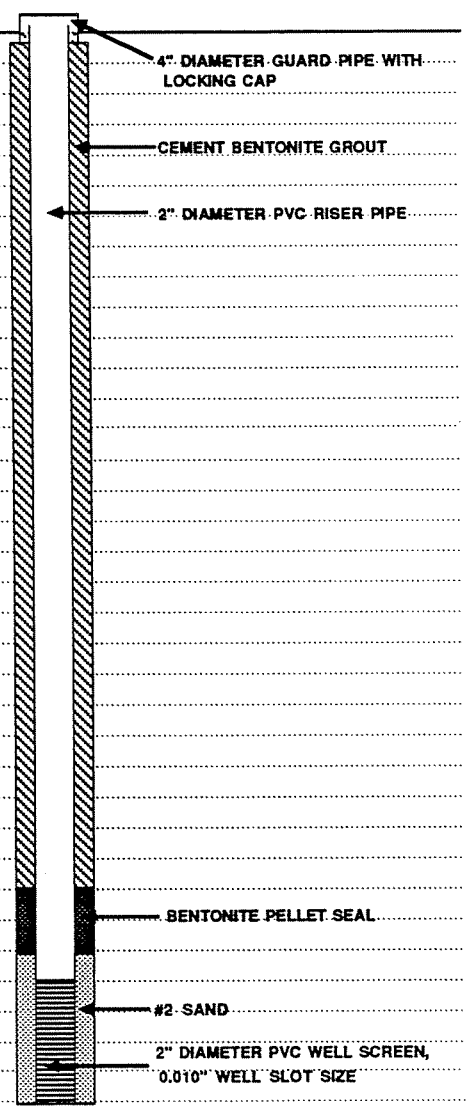
TOP OF CASING ELEVATION (FT) 576.90

DATE STARTED: 11/25/87
DATE FINISHED: 11/30/87

DEPTH TO WATER (FT)	6.5	15.5	15.51
DATE	12/1/87	12/8/87	12/10/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	2/4 6/10	15		DK BR TOPSOIL, LITTLE ROCK FGMT, TR ORG MATTER
	2	5/9 9/9	17	SM-SC	YELLOW-BR SANDY-SILT, TR CINDER/SLAG, TR ORG MATTER, TR BRICK FGMT, TR RK FGMT
					SILTY-SAND, NO BRICK
5	3	3/3 4/5	19		GRADING INTO A CLAY-SILT, TR SHELL FGMT
	4	3/5 4/7	14		
	5	2/7 12/17	15		SILTY-CLAY (LAKE BED CLAYS)
10	6	5/8 12/22	14		
	7	5/8 7/6	19	CL	
15	8	2/1 2/2	24		RED-LIGHT GRAY
	9	WH/WH WH/1	24		
	10	WH/WH WH/1	24		TRACE ROCK FRAGMENT
20	11	WR/WH 2/1	20		TRACE ROCK FRAGMENT
	12	WH/3 6/4	19		TILL, RED-BROWN GRAVELLY-SILT
25	13	3/7 9/7	19	ML	
	14	8/12 37/54	17		
	15	18/40 41/41	10		
30	16	32 100-4"	9		GRAVEL (DOLOMITE), TR SILT (WET)
	17	100-2"	0		
	18	100-2"	0		
35					
40					

AS BUILT DIAGRAM



DAMES & MOORE

BORING MW-5D CONT'D

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
35					AUGER REFUSAL @ 36.0 FT/ LT-DRK GREY LOCKPORT DOLOMITE MINOR FRACTURES ALONG SHALE LAYERS VOID VUGGY ZONE HIGHLY WEATHERED SOME FILLED W/GYPSUM FRACTURES (HORIZONTAL) COMMON GRY CLAY LAYER SOME RK FGMT MINOR SHALE LAYERS BORING TERMINATED AT 42.0 FEET	2" DIAMETER PVC WELL SCREEN, 0.010" WELL SLOT SIZE #2 SAND
40						
45						
50						
55						
60						
65						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. 13796

BORING MW-5S

SURFACE ELEVATION (FT) 574.76

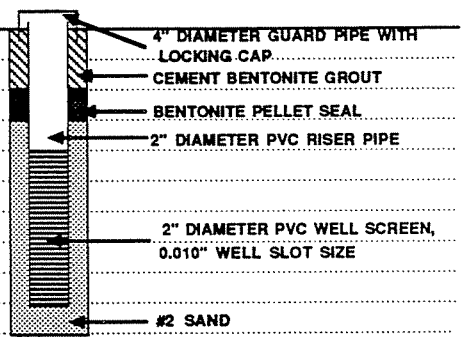
TOP OF CASING ELEVATION (FT) 577.55

DATE STARTED: 11/24/87
DATE FINISHED: 11/24/87

DEPTH TO WATER (FT)	7.0	7.52	
DATE	12/1/87	12/8/87	

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	5/6 7/9	12	GM-GC	12" OF TOPSOIL DK BRN SILTY CLAY W/PELLETS, MOIST LOOSE
	2	8/9 13/12	18	SM	DK YELLOW SILTY SAND MOIST LOOSE
5	3	4/4 5/5	20	SC ML CL	DK YELLOW SILT SOME CLAY DK YELLOW CLAY TO SILTY CLAY DK YELLOW CLAY
	4	5/5 6/6	20	SM	6" OF YELLOW SILT 12" OF YELLOW GREY 2" OF GREY SILT
	5	4/7 12/14	20	CL	PINK TO DARK TAN CLAY
10					BORING TERMINATED AT 10 FEET
15					
20					
25					
30					
35					

AS BUILT DIAGRAM



THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. JOB # 13796-002

BORING MW-6D

SURFACE ELEVATION (FT) 573.76

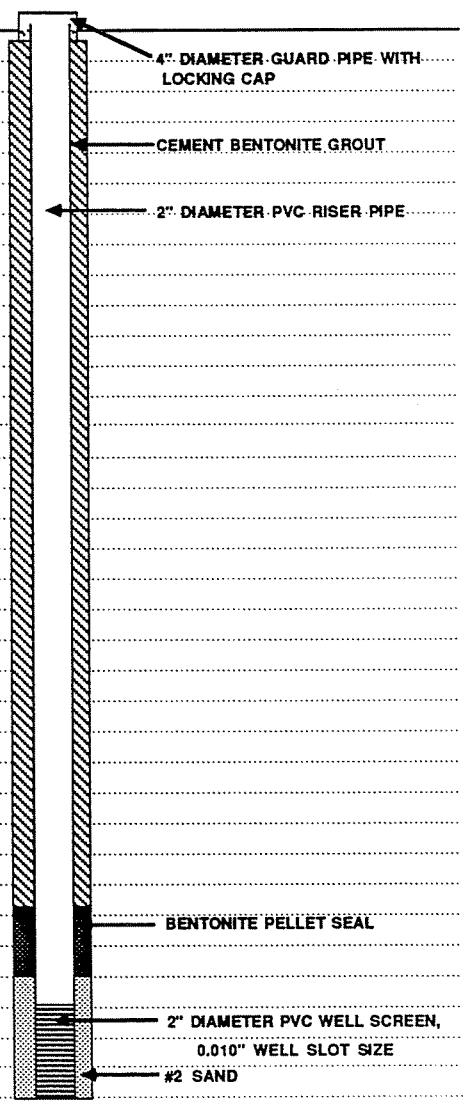
TOP OF CASING ELEVATION (FT) 575.74

DATE STARTED: 11/20/87
DATE FINISHED: 11/24/87

DEPTH TO WATER (FT)	13.8	14.81	14.9
DATE	12/1/87	12/8/87	12/10/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	8/5	14		DK BR TOPSOIL, LITTLE RK FGMT, TR ORG MATTER
		10/11		SM-SC	BR-TAN/ORANGE FINE, SAND, LITTLE SILT, TRACE ORGANIC MATTER
	2	6/15	18		
		15/7			TRACE CLAY
5	3	2/3	19		GRADING INTO GRAY-LT TAN CLAYEY-SILT, TR SAND, TR SHELL FGMT, TR ORG MATTER
		4/6			
	4	1/3	20		GRAY-LT BR SAND, LITTLE SILT, TR ORG MATTER
		4/5			
	5	3/6	24		GRAY-RED BR CLAY, LITTLE SILT LENSES, TR ROCK FRAGMENT (LAKE BED CLAYS)
		9/12			
10	6	5/9	20		
		13/14			
	7	2/3	20	CL	
		4/5			
15	8	2-18"	24		TRACE SILT, NO ROCK FRAGMENTS
		2			
	9	WR	24		NO ROCK FGMT, NO SILT
		1-12"			
		1			
	10	WR/WR	24		
		WH/WH			
20	11	WRWR	24		NO ROCK FRAGMENT
		WH/WH			
	12	WR/WR	24		TRACE ROCK FRAGMENT
		WH/WH			
25	13	WR/WR	24		
		WH/WH			
	14	WR/WH	20		
		2/2			
	15	31/70	14		TILL, RED-BR GRAVELLY-SILT, LITTLE CLAY
		87/50			
30	16	8/26	12	ML	
		100-5"			
	17	23/38	15		GRAY GRAVEL (DOLOMITE), LITTLE SILT, TRACE SAND
		37/43			
	18	100-6"	3		
35		100-1"			AUGER REFUSAL AT 35.1 FEET LIGHT-DARK GRAY LOCKPORT DOLOMITE

AS BUILT DIAGRAM



DAMES & MOORE

BORING MW-6D CONT'D

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
40					DOLOMITE CHIPS MINOR FRACT. (HORIZONTAL-MECHANICAL) VUGGY ZONE MINERALIZATION (GYPSUM) VERTICAL & HORIZONTAL FRACT. ALONG SHALE LAYERS MINOR MINERALIZATION (GYPSUM) FRACT. (HORIZONTAL) ALONG SHALE LAYERS MINOR VUGS SOME MINERALIZED (GYPSUM) FRACT. COMMON ALONG SHALE LAYERS	2" DIAMETER PVC WELL SCREEN, 0.010" WELL SLOT SIZE #2 SAND
45					VUGGY MINOR MINERALIZATION BORING TERMINATED AT 43.5 FEET	
50						
55						
60						
65						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE JOB # 13796-002

BORING MW-6S

SURFACE ELEVATION (FT) 573.41

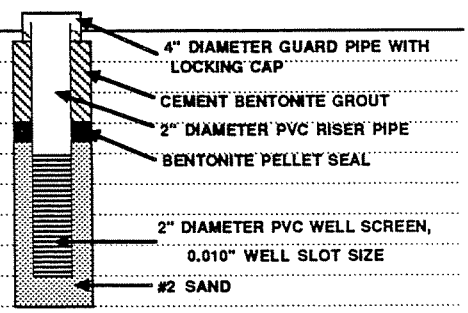
TOP OF CASING ELEVATION (FT) 575.79

DATE STARTED: 11/20/87
DATE FINISHED: 11/20/87

DEPTH TO WATER (FT)	7.50	4.73	4.17
DATE	11/20/87	12/8/87	12/10/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	9/8 9/10	12		DK BR TOPSOIL, SOME GRAVEL, LITTLE SAND, TR ORG. MATTER
					ORANGE-TAN FINE SAND, LITTLE SILT, TR ROCK FGMT
	2	7/8 11/6	18	SM-SC	ORANGE-TAN SILT, TR SHELL FGMT
5	3	2/3 6/7	17		GRADING INTO SILTY-CLAY. LITTLE ROCK FGMT
					ORANGE-TAN FINE SAND, TR SILT
	4	4/5 7/6	19		
	5	5/7 14/13	20		RED-BR CLAY, TR ROCK FGMT, TR SILT (LAKE BED CLAYS)
10	6	2/1 8/9	9	CL	GRADING TO GRAY
					BORING TERMINATED AT 12.0 FEET
15					
20					
25					
30					
35					

AS BUILT DIAGRAM



THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. JOB # 13796-002

BORING MW-7D

SURFACE ELEVATION (FT) 573.03

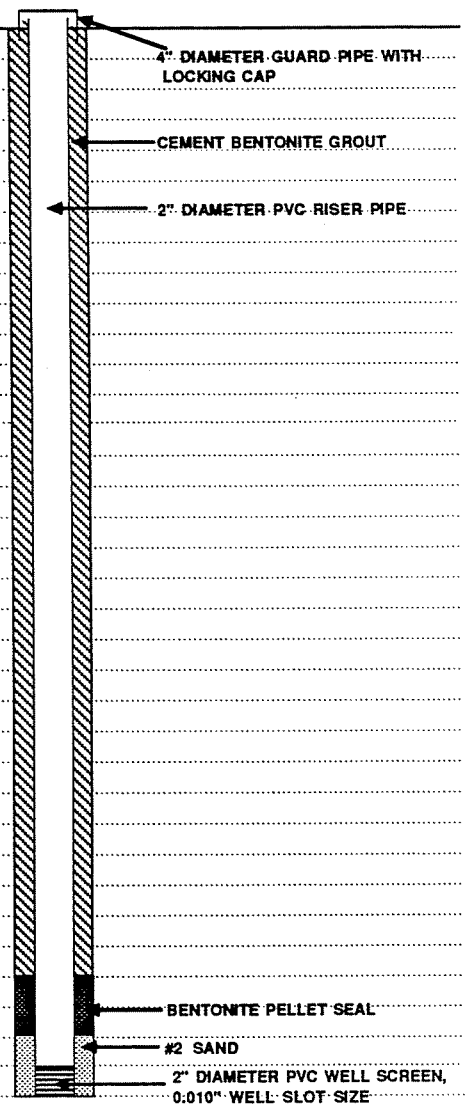
TOP OF CASING ELEVATION (FT) 575.18

DATE STARTED: 11/17/87
DATE FINISHED: 11/19/87

DEPTH TO WATER (FT)	14.0	14.2	14.15
DATE	12/2/87	12/8/87	12/10/87

AS BUILT DIAGRAM

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	3/11	17	GM (FILL)	DK BR-GRAY TOPSOIL, LITTLE ORG MATTER TRACE PEBBLE
		14/16			FILL, LT BR-BR RED SILTY-GRAVEL, LITTLE ROCK FGMT, TR CLAY, TR ORG MATTER
	2	7/5	11		LITTLE CLAY
		7/8			
	3	6/7	13		
5		17/16			DK BLK-GRAY CINDER, TRACE ASH
	4	23/9	13		LITTLE GRAVEL, TRACE SLAG
		5/3			
	5	3/4	14	CINDER	
		54/6			
10	6	3/3	19	ML CINDER SM	GRN-GRY SILT, TR ORG MATTER, TR ROCK FGMT, TRACE CLAY
		4/6			DK BLK CINDER, LITTLE ORG MATTER, TRACE SLAG
	7	3/7	16		GRY FINE SAND, TRACE SILT
		8/12			RED-BR CLAY, TR ORG MATTER (LAKE BED CLAY)
15	8	2/4	24		
		6/6		CL	
	9	WR	24		
		WR			
	10	WR/WH	24		
		WH/1			
20	11	WR/WR	24		
		WH/WH			
	12	WR/WR	24		
		WH/WH			
	13	WR/WR	24		
25		WH/WH			
	14	WR/WR	24		
		WH/WH			
	15	1/18	12		TILL, RED-BR SILTY-GRAVEL, LITTLE ROCK FRAGMENT
		19/37			
30	16	16/26	12	ML	
		32/46			
	17	7/40	12		
		42/66			
	18	31/55	9		
35		100-5"			GRY GRAVEL (DOLOMITE), SOME SILT, TRACE CLAY



BORING MW-7D CONT'D

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
	19	4 100-4"	2		AUGER REFUSAL AT 37.0 FEET LIGHT-DARK GRAY LOCKPORT DOLOMITE	
					ABUNDANT VUGS MINERALIZATION (GYPSUM)	
					FRACTURES (HORIZONTAL) ALONG SHALE LAYERS	2" DIAMETER PVC WELL SCREEN, 0.010" WELL SLOT SIZE
40						#2 SAND
					FRACTURES (HORIZONTAL) ALONG SHALE LAYERS	
					MINERALIZED VUGS (GYPSUM)	
45					BORING TERMINATED AT 45.0 FEET	
50						
55						
60						
65						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA, BUFFALO AVE. 13796-002

BORING MW-7S

SURFACE ELEVATION (FT) 573.52

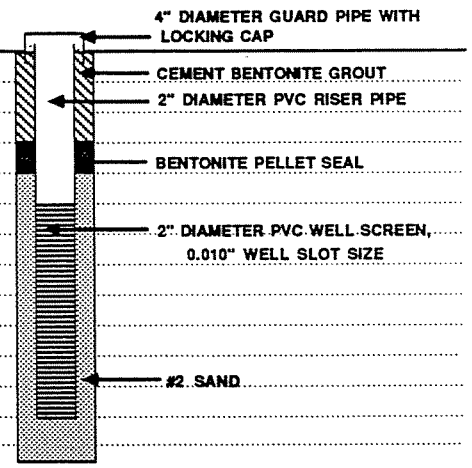
TOP OF CASING ELEVATION (FT) 575.86

DATE STARTED: 11/18/87
DATE FINISHED: 11/18/87

DEPTH TO WATER (FT)	10.5	10.63	10.8
DATE	12/2/87	12/8/87	12/10/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	17/19 16/8	16		DK BR-BLK TOPSOIL, LITTLE ORG MATTER, TRACE FINE SAND, TRACE ROCK FGMT
	2	6/17 28 75-3"	13	GM (FILL)	FILL, RED-BR GRAVELLY SILT, LITTLE ROCK FGMT, TR ORG MATTER, TR CLAY
5	3	12/5 7/11	13		LIGHT BROWN
	4	5/22 27/21	2		BLK CINDER, TR GRAPHITE RODS, TR SLAG
	5	3/3 9/9	12	CINDER	RED BR-BR SLAG, TR WHITE FUSED PEBBLES, TR GLASS, ORANGE RESIDUE (INCINERATOR WASTE)
10	6	4/6 4/4	14		BLK CINDER, LITTLE SILT, TR PAPER
				ML	DK GRY SILT, LITTLE CLAY, TR CINDER
	7	3/6 9/12	24	CL	CLAY, BLK-BR, LITTLE SILT, (LAKE BED CLAY)
15					BORING TERMINATED AT 14.0 FEET
20					
25					
30					
35					

AS BUILT DIAGRAM



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DAMES & MOORE

CLIENT: NYPA BUFFALO AVE-JOB #13796

BORING MW-8D

SURFACE ELEVATION (FT) 570.21

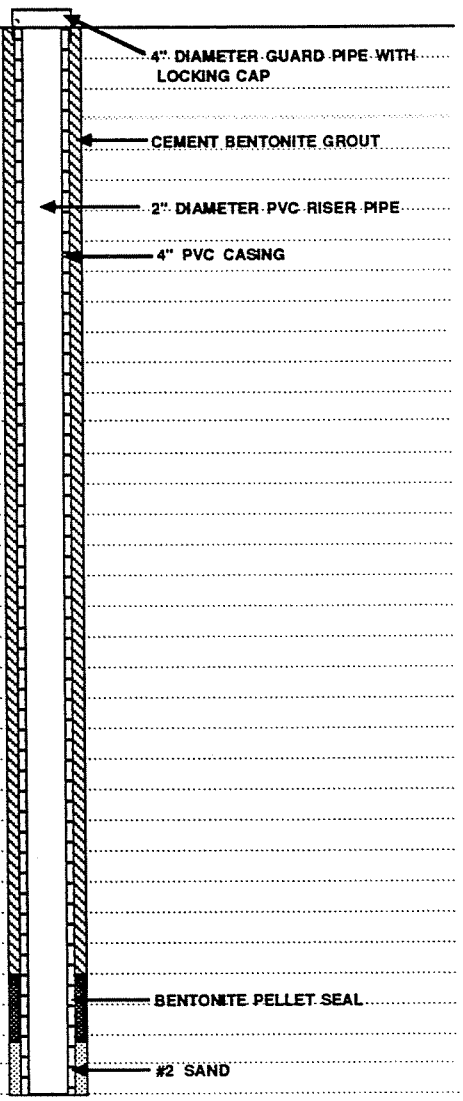
TOP OF CASING ELEVATION (FT) 572.45

DATE STARTED: 11/16/87
DATE FINISHED: 11/23/87

DEPTH TO WATER (FT)	9.0	10.8	11.17	11.0
DATE	11/16/87	12/2/87	12/10/87	12/10/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	12/13 20/7	12	GM (FILL)	GRAY SILTY SAND WITH RK FGMT
	2	8/10 7/7	14		LT RED TO BRN SILTY CLAY WITH RK FGMT
5	3	4/6 4/4	14	GM-GC	REDISH GRAY TILL TYPE CLAY
	4	11/13 15/35	16	(FILL)	DK BRN TO DK GRAY SILTY CLAY W/RK FGMT
	5	13/36 9/4			DK BLK SILTY CLAY TO SILT, SWAMP SMELL
10	6	4/4 9/10	8		DK BLACK SILT, STRONG SWAMP ODOR
	7	3/5 8/9	8		
15	8	3/5 7/8	14	SM	NO ODOR
	9	2/3 4/6	18		
	10	1/2 2/4	18		
20	11	2/5 7/2	12		
	12	0/0 1/2	24	CL	TAN TO DK TAN TO REDISH CLAY (LAKE BED CLAY)
25	13	0/1 2/2	24		
	14	0/2 2/9	24	GC	CLAY, LITTLE ROCK FGMT
	15	0/2 29/24	14		TILL, DK GRAY SILTY GRAVEL, LITTLE RK FGMT, TRACE CLAY
30	16	44/54 43/35	14	ML	
	17	22/87 100-2"	8		GASOLINE SMELL
35					AUGER REFUSAL AT 33.0 FEET LIGHT-DARK GRAY LOCKPORT DOLOMITE

AS BUILT DIAGRAM



DAMES & MOORE

BORING MW-8D CONT'D

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS	AS BUILT DIAGRAM
40						2" DIAMETER PVC WELL SCREEN, 0.010" WELL SLOT SIZE
45						#2 SAND
50						
55						
60						
65						

THE BORING LOG SHOWN REPRESENTS THE MOST PROBABLE CONDITIONS BASED UPON INTERPRETATION OF PRESENTLY AVAILABLE DATA. VARIATIONS FROM THESE CONDITIONS MAY OCCUR.

DAMES & MOORE

CLIENT: NYPA BUFFALO AVE, JOB # 13796

BORING MW-8S

SURFACE ELEVATION (FT) 570.16

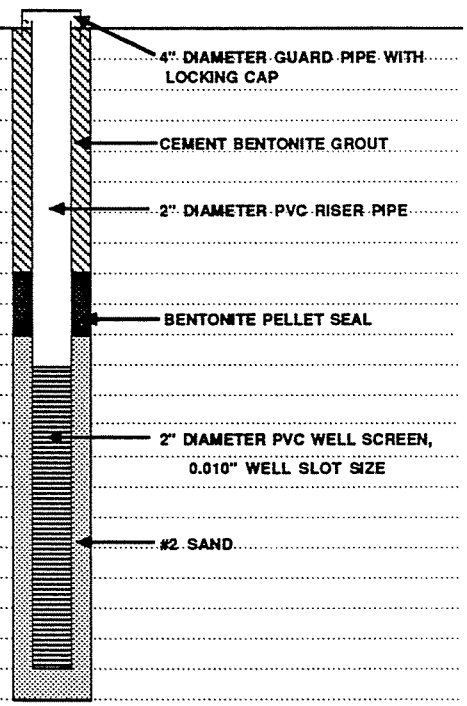
TOP OF CASING ELEVATION (FT) 572.23

DATE STARTED: 11/23/87
DATE FINISHED: 11/24/87

DEPTH TO WATER (FT)	6.0	8.86	8.81
DATE	12/2/87	12/8/87	12/9/87

DEPTH (FT)	SAMPLE NUMBER	BLOW COUNT (PER 6")	RECOVERY (INCHES)	SOIL CLASSIFICATION	DESCRIPTIONS
0	1	15/15 12/7	12		FILL DK BRN SILTY CLAY W/RK FRAGMENTS, ORGANIC MATTER
	2	6/9 8/3	6	GM	
	3	6/5 4/3	6		
5	4	5-100" 3			
	5	14/15 5/6	6		DK GRAY SILT TO FINE SAND, RK FGMT
10	6	2/8 14/9	18		SILT TO FINE SAND, SWAMP SMELL
	7	4/8 5/7	18	SM	
15	8	3/3 3/2	24		
	9	2/1 2/3	24		
	10	6/1 2/3	24		
20	11	1/1 1/2	24		
				CL	DARK TAN TO BROWN CLAY (LAKE BED CLAY)
25					BORING TERMINATED AT 22 FEET
30					
35					

AS BUILT DIAGRAM



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DAMES & MOORE

APPENDIX C

APPENDIX C

SUMMARY OF ANALYTICAL TESTING

This appendix summarizes the inorganic and organic constituents which will be analyzed. Schedule A lists the analytical parameters for which the soil samples will be tested. Schedule B lists the analytical parameters for which the groundwater samples will be tested. Table A lists the 130 hazardous substances and their detection limits which will be used for the soil and groundwater sampling analysis. A list of data reporting qualifiers is provided to explain the analytical flags.

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 CR equal to the instrument detection limit but less than the contract-required detection limit, the value is reported in brackets (i.e., [10]. The analytical Method used is indicate with P (for ICP), A (for flame AA) or F (for furnace AA).

U
Indicates compound was analyzed for but not detected. Report the minimum detection limit fo for the sample with the U (e.g. 10UY 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 amass 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 type 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 [redacted] 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.

E - Indicates a value estimated or not reported due to the presence of interference.

S - Indicates a value determined by method of standard addition.

N - Indicates spike sample recovery is not within control limits.

* - Indicates duplicate analysis is not within control limits.

+ - Indicates the correlation coefficient for method of standard addition is less than 0.995.

M - Indicates duplicate injection results exceeded control limits.

P - Indicates ICP analysis.

F - Indicates furnace analysis

[]- Indicates sample value is between IDL and ORDL

SCHEDULE A

ANALYTICAL TESTING OF SOIL SAMPLES

ESTIMATE: 30 Samples

The consultant shall perform chemical analyses of soil samples including identification and quantitation (where possible) of chemical substances. The Consultant shall specify appropriate methods of sub-sampling, digestion and/extraction of soil samples to perform the testing indicated below. The consultant shall achieve detection limits as listed.

I. SUBSTANCE	DETECTION LIMIT(ug/l) 1,2.
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	5
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Tin	40
Vanadium	50
Zinc	20

II. Extraction Procedure Toxicity

III. GC/MS Scan of extracts prepared in accordance with methodologies EPA 624, EPA 625 and where applicable 626 (for confirmation of certain substances) with identification of all major peaks i.e., those peaks whose area are 10% or greater than that of the calibrating standard for substances listed in Table A attached.

1. Higher detection levels may only be used only in the following circumstance. If the sample concentration exceeds two times the detection limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the contract required detection level. The instrument or method detection limit must be documented.

2. These detection levels are the instrument detection limits obtained in pure water that must be met using the procedure in Section I of the NYSDEC's Superfund and Contract Lab Protocol. The detection limits for samples may be considerably higher depending on the sample matrix.

SCHEDULE B

ANALYTICAL TESTING OF GROUNWATER SAMPLES

Estimate: 16 Samples

The Contractor shall perform chemical analyses of water samples including identification and quantitation (where possible) of chemical substances. The Contractor shall use the methodologies and achieve the detection limits indicated.

I. SUBSTANCE	DETECTION LIMIT(ug/l) 1,2.
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	5
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selemium	5
Silver	10
Sodium	5000
Thallium	10
Tin	40
Vanadium	50
Zinc	20

II. GC/MS Scan of extracts prepared in accordance with methodologies EPA 624, EPA 625, and, where applicable 626 (for confirmation of certain substances), with identification of all major peaks whose areas are 10% or greater than that of the calibrating standards for substances listed in Table A attached.

1. Higher detection levels may only be used only in the following circumstance, if the sample concentraction exceeds two times the detection limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the contract required detection level. The instrument a method detection limit must be documented.

2. These detection leveles are the instrument detection limits obtained in pure water that must be met using the procedure in Section I of the NYSDEC's Superfund and Contract Lab Protocol. The detection limits for samples may be considerably higher depending on the sample matrix.

TABLE A

Hazardous Substance List (HSL) and
Contract Required Detection Limits (CRDL)**

	Volatiles	CAS Number	Detection Limits* Low Water ug/L	Low Soil/Sediment ug/Kg
1.	Chloromethane	74-87-3	10	10
2.	Brromomethane	74-83-9	10	10
3.	Vinyl Chloride	75-01-4	10	10
4.	Chloroethane	75-00-3	10	10
5.	Methylene Chloride	75-09-2	5	5
6.	Acetone	67-64-1	10	10
7.	Carbon Disulfide	75-15-0	5	5
8.	1,1-Dichloroethene	75-35-4	5	5
9.	1,1-Dichloroethane	75-35-3	5	5
10.	trans-1,2-Dichloroethene	156-60-5	5	5
11.	Chloroform	67-66-3	5	5
12.	1,2-Dichloroethane	107-06-2	5	5
13.	2-Butanone	78-93-3	10	10
14.	1,1,1-Trichloroethane	71-55-6	5	5
15.	Carbon Tetrachloride	56-23-5	5	5
16.	Vinyl Acetate	108-05-4	10	10
17.	Bromodichloromethane	75-27-4	5	5
18.	1,1,2,2-Tetrachloroethane	79-34-5	5	5
19.	1,2-Dichloropropane	78-87-5	5	5
20.	trans-1,3-Dichloropropene	10061-02-6	5	5
21.	Trichloroethene	79-01-6	5	5
22.	Dibromochloremethane	124-48-1	5	5
23.	1,1,2-Trichloroethane	79-00-5	5	5
24.	Benzene	71-43-2	5	5
25.	cis-1,3-Dichloropropene	10061-01-5	5	5
26.	2-Chloroethyl Vinyl Ether	110-75-8	10	10
27.	Bromoform	75-25-2	5	5
28.	2-Hexanone	591-78-6	10	10
29.	4-Methyl-2-pentanone	108-10-1	10	10
30.	Tetrachloroethene	127-18-4	5	5
31.	Toluene	108-88-3	5	5
32.	Chlorobenzene	108-90-7	5	5
33.	Ethyl Benzene	100-41-4	5	5
34.	Styrene	100-42-5	5	5
35.	Total Xylenes		5	5

TABLE A Cont'd

	Volatiles	CAS Number	Detection Limits* Low Water ug/L	Low Soil/Sediment ug/Kg
36.	N-Nitrosodimethylamine	62-75-9	10	330
37.	Phenol	108-95-2	10	330
38.	Aniline	62-53-3	10	330
39.	bis(2-Chloroethyl) ether	111-44-4	10	330
40.	2-Chlorophenol	95-57-8	10	330
41.	1,3-Dichlorobenzene	541-73-1	10	330
42.	1,4-Dichlorobenzene	106-46-7	10	330
43.	Benzyl Alcohol	100-51-6	10	330
44.	1,2-Dichlorobenzene	95-50-1	10	330
45.	2-Methylphenol	95-48-7	10	330
46.	bis(2-Chloroisopropyl) ether	39638-32-9	10	330
47.	4-Methylphenol	106-44-5	10	330
48.	N-Nitroso-Dipropylamine	621-64-77	10	330
49.	Hexachloroethane	67-72-1	10	330
50.	Nitrobenzene	98-95-3	10	330
51.	Isophorone	78-59-1	10	330
52.	2-Nitrophenol	88-75-5	10	330
53.	2,4-Dimethylphenol	105-67-9	10	330
54.	Benzoic Acid	65-85-0	50	1600
55.	bis(2-Chloroethoxy) methane	111-91-1	10	330
56.	2,4-Dichlorophenol	120-83-2	10	330
57.	1,2,4-Trichlorobenzene	120-82-1	10	330
58.	Naphthalene	91-20-3	10	330
59.	4-Chloroaniline	106-47-8	10	330
60.	Hexachlorobutadiene	87-68-3	10	330
61.	4-Chloro-3-methylphenol (para-chloro-meta-cresol	59-50-7	10	330
62.	2-Methylnaphthalene	91-57-6	10	330
63.	Hexachlorocyclopentadiene	77-47-4	10	330
64.	2,4,6-Trichlorophenol	88-06-2	10	330
65.	2,4,5-Trichlorophenol	95-95-4	50	1600
66.	2-Chloronaphthalene	91-58-7	10	330
67.	2-Nitroaniline	88-74-4	50	1600
68.	Dimethyl Phthalate	131-11-3	10	330
69.	Acenaphthylene	208-96-8	10	330
70.	3-Nitroaniline	99-09-2	50	1600

TABLE A Cont'd

	Volatiles	CAS Number	Detection Limits* Low Water ug/L	Low Soil/Sediment ug/Kg
71.	Acenaphthene	83-32-9	10	330
72.	2,4-Dinitrophenol	51-28-5	50	1600
73.	4-Nitrophenol	100-02-7	50	1600
74.	Dibenzofuran	132-64-9	10	330
75.	2,4-Dinitrotoluene	121-14-2	10	330
76.	2,6-Dinitrotoluene	606-20-2	10	330
77.	Diethylphthalate	84-66-7	10	330
78.	4-Chlorophenyl Phenyl	7005-72-3	10	330
79.	Fluorene	86-73-7	10	330
80.	4-Nitroaniline	100-01-6	50	1600
81.	4,6-Dinitro-2-methylphenol	534-52-1	50	1600
82.	N-nitrosodiphenylamine	86-30-6	10	330
83.	4-Bromophenyl Phenyl ether	101-55-3	10	330
84.	Hexachlorobenzene	118-74-1	10	330
85.	Pentachlorophenol	87-86-5	50	1600
86.	Phenanthrene	85-01-8	10	330
87.	Anthracene	120-12-7	10	330
88.	Di-n-butylphthalate	84-74-2	10	330
89.	Fluoranthene	206-44-0	10	330
90.	Benzidine	92-87-5	50	1600
91.	Pyrene	129-00-0	10	330
92.	Butyl Benzyl Phthalate	85-68-7	10	330
93.	3,3'-Dichlorobenzidine	91-94-1	20	660
94.	Benzo (a) anthracene	56-55-3	10	330
95.	bis(2-ethylhexyl)phthalate	117-81-7	10	330
96.	Chrysene	218-01-9	10	330
97.	Di-n-octyl Phthalate	117-84-0	10	330
98.	Benzo(b)fluoranthene	205-99-2	10	330
99.	Benzo(k)fluoranthene	207-08-9	10	330
100.	Benzo(a)pyrene	50-32-8	10	330
101.	Indeno(1,2,3-cd)pyrene	193-39-5	10	330
102.	Dibenz(a,h)anthracene	53-70-3	10	330
103.	Benzo(g,h,i)perylene	191-24-2	10	330
104.	alpha-BHC	319-84-6	0.05	2.0
105.	beta-BHC	319-85-7	0.05	2.0

TABLE A Cont'd

Volatiles	CAS Number	Detection Limits* Low Water ug/L	Low Soil/Sediment ug/Kg
106. delta-BHC	319-86-8	0.05	2.0
107. gamma-BHC (Lindane)	58-89-9	0.05	2.0
108. Heptachlor	76-44-8	0.05	2.0
109. Aldrin	309-00-2	0.05	2.0
110. Heptachlor Epoxide	1024-57-3	0.05	2.0
111. Endosulfan I	959-98-8	0.05	2.0
112. Dieldrin	60-57-1	0.10	4.0
113. 4,4'-DDE	72-55-9	0.10	4.0
114. Endrin	72-20-8	0.10	4.0
115. Endosulfan II	33213-65-9	0.10	4.0
116. 4,4'DDD	72-54-8	0.10	4.0
117. Endrin Aldehyde	7421-93-4	0.10	4.0
118. Endosulfan Sulfate	1031-07-8	0.10	4.0
119. 4,4'DDT	50-29-3	0.10	4.0
120. Endrin Ketone	53494-70-5	0.10	4.0
121. Methoxychlor	72-43-5	0.5	20.0
122. Chlordane	57-74-9	0.5	20.0
123. Toxaphene	8001-35-2	1.0	40.0
124. AROCLOR-1016	12674-11-2	0.5	20.0
125. AROCLOR-1221	11104-28-2	0.5	20.0
126. AROCLOR-1232	11141-16-5	0.5	20.0
127. AROCLOR-1242	53469-21-9	0.5	20.0
128. AROCLOR-1248	12672-29-6	0.5	20.0
129. AROCLOR-1254	11097-69-1	1.0	40.0
130. AROCLOR-1260	11096-82-5	1.0	40.0

* Detection limits listed for soil/sediment are based on wet weight. The detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the contract, will be higher.

** Specific detection limits are highly matrix dependent. The detection limits listed herein are provided for guidance and may not always be achievable.

APPENDIX D

APPENDIX D
HYDROLOGIC TEST DATA

This appendix presents the results of the slug and recovery tests conducted on the shallow and deep monitoring wells installed at the NYPA Buffalo Avenue site.

APPENDIX D

D.1 INTRODUCTION

Slug and recovery tests were conducted on shallow and deep monitoring wells after their installation and development to evaluate aquifer characteristics. The results of these tests are described in this appendix.

In general, most wells responded quickly (in some cases within 30 seconds) to slug injection and withdrawal. Therefore, test data must be considered to be only representative of general aquifer characteristics and not specific to individual wells.

D.2 EXPLANATION OF ANALYSES

It is possible to characterize in situ hydraulic conductivity by means of tests carried out in a single well (Reference 11). This is done by causing an instantaneous change in the water level of a well by the sudden introduction or removal of a known volume. The response of the water level with time is then observed. When a volume is added, it is known as a slug test; when it is removed, it is known as a recovery test.

The method of interpreting water level versus time data used in this report is adopted from Reference 11. The assumptions in this method include:

- Aquifer tested is a homogeneous, isotropic, infinite medium, and
- Soil and water are incompressible.

The method is based on the premise that the rate of inflow into the well at any time is proportional to the hydraulic conductivity of the soil and the unrecovered lead difference.

To interpret a set of field recovery data, these data are plotted in the form of Figure A-1. The value to To is measured graphically and hydraulic conductivity is calculated by the following formula:

$$K = \frac{r^2 \ln (L/R)}{2 L To}$$ where:

K = Hydraulic conductivity

r = radius of the well screen

L = length of well screen

To = Basic time lag (time required for complete normalization of the head difference if the original rate of inflow were maintained)

Results of slug/recovery tests are provided in the following pages.

NYPA
13796-002

Well Test DATA FOR MW-3d

- STATIC WATER Level (H_0) = 16.75
- DATE of TEST = 12-8-87
- TYPE of TEST = SLUG

time, sec (t)	H. (Ft)	$H - H_0$ (Ft)
15	18.25	1.50
30		
45	18.04	1.29
60	17.81	1.06
75	17.59	0.84
90	17.41	0.66
105	17.22	0.47

- SEE Figure A-1 FOR PLOT of DATA

T_0 = Inv (ln of slope of $H_0 - H_0$ vs Δt)
= 0.988 sec

- $K = \frac{r^2 \ln(L/R)}{2 L T_0}$

$= \frac{(0.0064\ Ft^2)(\ln 10\ Ft / 0.08\ Ft)}{2(10\ Ft)(0.988\ sec)}$

$= 0.002\ Ft/sec * 0.09\ Ft/min$

- $T = (K)(SAT\ THICK)$

$= (0.09)(20\ Ft) = 2\ Ft^2/min$

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PLATE

NYPA
13796-002

WELL TEST DATA FOR MW-4d

- STATIC WATER LEVEL (H_o) = 21.57 Ft
- DATE OF TEST = 12-8-87
- TYPE OF TEST = SLUG

time, sec (t)	H (Ft)	H - H_o (Ft)
15	22.69	1.12
30	22.44	0.87
45	22.14	0.57
60	21.96	0.39
75	21.81	0.24
90	21.67	0.10
105	21.67	0.10

- See Figure A-1 FOR PLOT OF DATA
- T_o = INV (ln of slope of H-H_o vs Δt)
- T_o = 0.98 sec

$$K = \frac{r^2 \ln(L/R)}{2 L T_o} = \frac{0.031}{19.6}$$

$$= 1.6 \times 10^{-3} \text{ Ft/sec or } 0.09 \text{ Ft/day}$$

T = KM where m = SATURATED THICKNESS

$$= (0.09 \text{ Ft/day})(20 \text{ Ft})$$

$$= 2.0 \text{ Ft}^2/\text{day}$$

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BY _____ DATE _____
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NYPA
13796-002

WELL TEST DATA FOR MW-5S

- STATIC WATER LEVEL (H) = 7.52 ft
- DATE OF TEST = 12-8-87
- TYPE OF TEST = SLUG

TIME, sec (t)	H (Ft)	$H_o - H$ ft
15	6.58	0.94
30	6.66	0.86
45	6.75	0.77
60	6.80	0.72
75	6.84	0.68
90	6.88	0.64
105	6.92	0.60

- See FIGURE A-1 for Plot of DATA

T_o = INV (ln of slope of $H_o - H$ vs Δt)

$\doteq$ 0.46 sec

- $K = \dfrac{r^2 \ln (L/R)}{2 L T_o}$

$T = (K)(\text{SAT THICK})$
$= (0.2)(20) = 4 \text{ Ft}^2/\text{MIN}$

$= \dfrac{(0.0064 \text{ Ft}^2) \ln (10 \text{ Ft} / 0.08 \text{ Ft})}{2 (10 \text{ Ft}) (0.46 \text{ sec})}$

$= 3 \times 10^{-3}$ Ft/sec or 0.2 Ft/min

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B. _____ L. _____
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NYPA

13796-002

WELL TEST DATA FOR MW-6S

- STATIC WATER LEVEL (H_o) = 4.73
- DATE OF TEST : 12-8-87
- TYPE OF TEST = SLUG

TIME t (sec)	H (ft)	H - H_o (ft)
15	—	—
30	6.00	1.27
45	6.00	1.27
60	5.92	1.19
75	5.86	1.13
90	5.83	1.10
105	5.79	1.06

- SEE FIGURE A-1 FOR PLOT OF DATA

T_o = INV (ln of slope of H - H_o vs Δt)

T_o = .997 sec

$$K = \frac{r^2 \ln(L/R)}{2 L T_o} = \frac{(.0006 \text{ ft}^2) \ln(10 \text{ Ft}/.08 \text{ Ft})}{2 (10 \text{ Ft}) (.997 \text{ sec})}$$

$$= .0015 = 1.5 \times 10^{-3} \text{ ft/sec} \text{ or } .09 \text{ ft/min}$$

$T = K M$ where M = Saturated Thickness

$T = (.09 \text{ ft/min})(20 \text{ Ft}) = 1.86 \text{ Ft}^2/\text{min}$

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946.1 (REV. 6-61)

NYPA
13796-002

WELL TEST DATA FOR MW-7d

- STATIC WATER LEVEL (H_o) = 14.17
- DATE OF TEST = 12-8-87
- TYPE OF TEST = SLUG

TIME, sec (t)	H (Ft)	$H - H_o$ (Ft)
15	15.65	1.48
30	15.35	1.18
45	15.11	0.94
60	14.85	0.68
75	14.63	0.46
90	14.36	0.19
105	14.17	0

- See Figure A-1 for PLOT OF DATA
- T_o = INV (ln of Slope of $H - H_o$ vs Δt)
- T_o = 0.98 sec

$$K = \frac{r^2 \ln(L/R)}{2 L T_o} = \frac{0.031}{19.7}$$

$$= 0.002 \text{ Ft/sec} \approx 0.09 \text{ Ft/Day}$$

$T = Km$ where m: SATURATED THICKNESS

$$= (0.09 \text{ Ft/Day})(20 \text{ Ft})$$

$$= 1.8 \text{ Ft}^2/\text{day}$$

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NYPA
13796-002

WELL TEST DATA FOR MW-8S

- STATIC WATER LEVEL (H_o) = 8.86
- DATE OF TEST = 12-8-87
- TYPE OF TEST = SLUG

TIME t(SEC)	H (Ft)	H-H_o (Ft)
15	9.25	0.39
30	9.27	0.41
45	9.19	0.33
60	9.15	0.29
75	9.14	0.28
90	9.13	0.27
105	9.10	0.24

- SEE FIGURE A-1 FOR PLOT OF DATA

T_o = INV (ln of SLOPE OF H-H_o VS. Δt)

T_o = .997 sec

$$K = \frac{r^2 \ln(L/R)}{2LT_o} = \frac{(.0064\ ft^2)\ \ln(10\ Ft / 0.08\ Ft)}{2(10\ Ft)(.997\ sec)}$$

$K = .0015 = 1.5 \times 10^{-3}$ ft/sec or .09 ft/min

$T = KM$ where M = Saturated Thickness

$T = (.09\ ft/min)(20\ ft)^2 = 1.86\ Ft^2/min$

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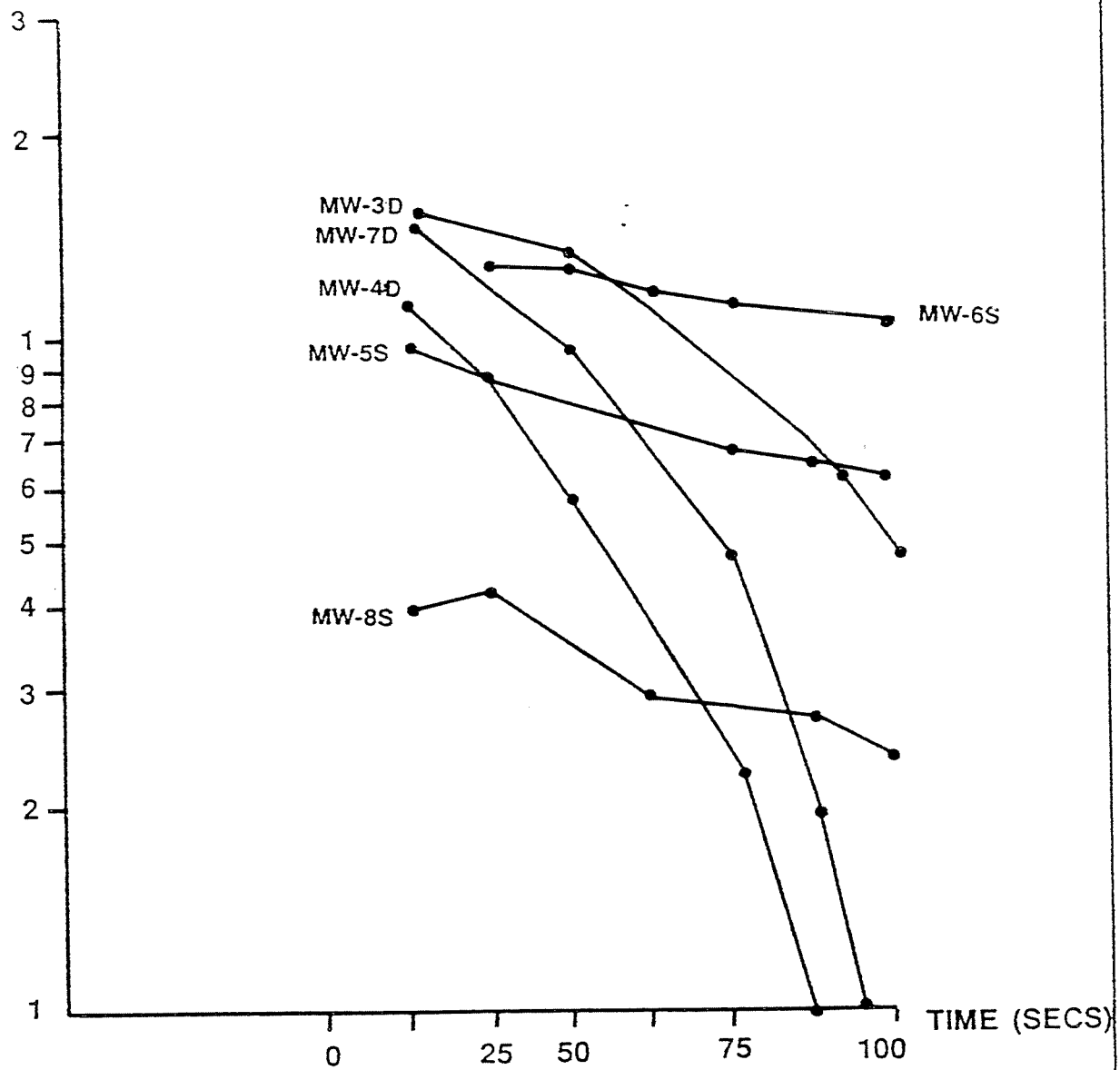

PLOT OF HYDROLOGIC TEST DATA

FIGURE A-1

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APPENDIX E

APPENDIX E

DRUM INVENTORY

Drum #	Location	Date	Contents	Comments
1	MW-1D	10-14-87	Soil, tyvex	Table 10 - contains metals; Table 11- contains PAHs
2	MW-1D	10-15-87	Development Water	Table 14 - contains metals; Table 15- contains Di-n-butylphthalate
3	MW-1D	10-15-87	Development Water	Table 14 - contains metals; Table 15- contains Di-n-butylphthalate
4	MW-1S	10-16-87	Soil	Table 10-contains metals; Table 11-contains solvents
5	MW-2D	10-19-87	Soil, tyvex	Table 10- contains metals; Table 11-contains PAHs
6	MW-2S	10-21-87	Soil, tyvex	Table 10-contains metals; Table 11-contains solvents
7	MW-3D	10-22-87	Soil	Table 10 - contains; Table 11-contains bis-phthalate
8	MW-3D	10-22-87	Soil, tyvex	Table 10 - contains; Table 11-contains bis-phthalate
9	MW-3D	10-23-87	Coring, ream water, tyvex, soil	Table 14 - contains metals; Table 15- contains i insecticides
10	MW-3D	10-26-87	Coring water	Table 14 - contains metals; Table 15- contains i insecticides
11	MW-3D	10-26-87	Coring water	Table 14-contains metals; Table 15- contains insecticides
12	MW-3S	10-27-87	Soil, tyvex, water	Table 10-contains metals; Table 11-contains solvents
13	MW-4D	10-29-87	Soil	Table 10-contains metals; Table 11-contains Di-n-Butylphthalate
14	MW-1D	11-10-87	Development water	Table 10- contains metals; Table 11- contains PAHs
15	MW-1D	11-10-87	Development water	Table 10- contains metals; Table 11- contains PAHs
16	MW-1D	11-10-87	Development water	Table 10- contains metals; Table 11- contains PAHs
17	MW-1D	11-10-87	Development water	Table 10- contains metals; Table 11- contains PAHs
18	MW-1D	11-10-87	Development water	Table 10- contains metals; Table 11- contains PAHs
19	MW-1D	11-10-87	Development water	Table 10- contains metals; Table 11- contains PAHs
20	MW-1D	11-10-87	Development water	Table 10- contains metals; Table 11- contains PAHs
21	MW-1S	11-11-87	Development water	Table 14-contains metals; Table 15-contains bis-phthalate
22	MW-1S	11-11-87	Development water	Table 14-contains metals; Table 15-contains bis-phthalate
23	MW-1S	11-11-87	Development water	Table 14-contains metals; Table 15-contains bis-phthalate
24	MW-1S	11-11-87	Development water	Table 14-contains metals; Table 15-contains bis-phthalate
25	MW-1S	11-11-87	Development water	Table 14-contains metals; Table 15-contains bis-phthalate
26	MW-1S	11-11-87	Development water	Table 14-contains metals; Table 15-contains bis-phthalate
27	MW-1S	11-11-87	Development water	Table 14-contains metals; Table 15-contains bis-phthalate
28	MW-2D	11-11-87	Development water	Table 14-contains metals; Table 15-Trichloroethene

APPENDIX E (continued)

DRUM INVENTORY

Drum #	Location	Date	Contents	Comments
29	MW-2D	11-11-87	Development water	Table 10-contains metals; Table 11-contains PAHs
30	MW-4D	11-12-87	Ream/Coring water	Table 14-contains metals
31	MW-4D	11-12-87	Soil	Table 10-contains metals; Table 11-contains Di-n-Butylphthalate
32	MW-4D	11-12-87	Ream/Coring Water	Table 14-contains metals
33	MW-4D	11-12-87	Ream/Coring Water	Table 14-contains metals
34	MW-2S	11-12-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
35	MW-2S	11-12-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
36	MW-3D	11-13-87	Development Water	Table 14-contains metals; Table 15- contains insecticides
37	MW-3D	11-13-87	Development Water	Table 14-contains metals; Table 15- contains insecticides
38	MW-3D	11-13-87	Development Water	Table 14-contains metals; Table 15- contains insecticides
39	MW-3D	11-13-87	Development Water	Table 14-contains metals; Table 15- contains insecticides
40	MW-3D	11-13-87	Development Water	Table 14-contains metals; Table 15- contains insecticides
41	MW-4D	11-13-87	Reaming Water	Table 14-contains metals
42	MW-4D	11-13-87	Reaming Water	Table 14-contains metals
43	MW-4D	11-13-87	Reaming Water	Table 14-contains metals
44	MW-4D	11-13-87	Reaming Water	Table 14-contains metals
45	MW-4D	11-13-87	Reaming Water	Table 14-contains metals
46	MW-4S	11-13-87	Soil	Table 10-contains metals; Table 11-contains Di-n-Butylphthalate
47	MW-4D	11-14-87	Coring Water	Table 14-contains metals
48	MW-4D	11-14-87	Coring Water	Table 14-contains metals
49	MW-4D	11-14-87	Coring Water	Table 14-contains metals
50	MW-4D	11-14-87	Coring Water	Table 14-contains metals
51	MW-4D	11-14-87	Coring Water	Table 14-contains metals
52	MW-4D	11-14-87	Coring Water	Table 14-contains metals
53	MW-4D	11-14-87	Coring Water	Table 14-contains metals
54	MW-4D	11-14-87	Coring Water	Table 14-contains metals
55	MW-3D	11-13-87	Development Water	Table 14-contains metals; Table 15- contains insecticides
56	MW-6S	11-20-87	Soil	Table 10-contains metals; Table 11-contains Di-n-Butylphthalate
57	MW-6D	11-20-87	Soil	Table 10-contains metals
58	MW-7S	11-19-87	Soil	Table 10-contains metals; Table 11-contains Di-n-Butylphthalate
59	MW-7D	11-19-87	Coring Water	Table 14-contain metals; Table 15-contains PAHs

APPENDIX E (continued)

DRUM INVENTORY

Drum #	Location	Date	Contents	Comments
60	MW-7D	11-19-87	Coring	Table 14-contain metals; Table 15-contains PAHs
61	MW-7D	11-19-87	Soil	Table 10-contains metals; Table 11-contains PAHs
62	MW-8D	11-16-87	Soil	Table 10-contains metals; Table 11-contains phthalates
63	MW-8D	11-17-87	Soil	Table 10-contains metals; Table 11-contains phthalates
64	MW-8D	11-18-87	Ream Water	Table 14-contain metals
65	MW-8D	11-19-87	Ream Water	Table 14-contains metals
66	MW-8D	11-20-87	Ream Water	Table 14-contain metals
67	MW-8D	11-20-87	Soil	Table 10-contains metals; Table 11-contains phthalates
68	MW-6D	11-24-87	Soil	Table 10-contains metals; Table 11-contains phthalates
69	MW-6D	11-24-87	Coring Water	Table 14-contains metals; Table 15-contains Di-n-butylphthalate
70	MW-6D	11-24-87	Ream/Coring Water	Table 14-contains metals; Table 15-contains Di-n-butylphthalate
71	MW-8S	11-23-87	Soil	Table 10-contains metals; Table 11-contains phthalates
72	MW-8S	11-23-87	Coring/Ream Water	Table 14-contains metals; Table 15-contains bis-phthalate
73	MW-8S	11-23-87	Coring/Ream Water	Table 14-contains metals; Table 15-contains bis-phthalate
74	MW-5S	11-24-87	Soil	Table 10-contains metals; Table 11-contains phthalates
75	MW-5D	11-30-87	Soil	Table 10-contains metals; Table 11- contains Di-n-butylphthalate
76	MW-5D	11-30-87	Coring/Ream Water	Table 14-contains metals
77	MW-5D	11-30-87	Coring/Ream Water	Table 14-contains metals
78	MW-5D	12-01-87	Development Water	Table 14-contains metals
79	MW-5D	12-01-87	Development Water	Table 14-contains metals
80	MW-5D	12-01-87	Development Water	Table 14-contains metals
81	MW-5D	12-01-87	Development Water	Table 14-contains metals
82	MW-6D	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
83	MW-6D	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
84	MW-6D	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
85	MW-6D	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
86	MW-6D	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
87	MW-6D	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
88	MW-7D	12-01-87	Development Water	Table 14-contain metals; Table 15-contains PAHs
89	MW-7D	12-01-87	Development Water	Table 14-contain metals; Table 15-contains PAHs

APPENDIX E (continued)

DRUM INVENTORY

Drum #	Location	Date	Contents	Comments
90	MW-7D	12-01-87	Development Water	Table 14-contain metals; Table 15-contains PAHs
91	MW-7D	12-01-87	Development Water	Table 14-contain metals; Table 15-contains PAHs
92	MW-8D	12-01-87	Development Water	Table 14-contains metals
93	MW-8D	12-01-87	Development Water	Table 14-contains metals
94	MW-8S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
95	MW-8S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
96	MW-8S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
97	MW-8S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains bis-phthalate
98	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
99	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
100	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
101	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
102	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
103	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
104	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
105	MW-4S	12-01-87	Development Water	Table 14-contains metals; Table 15-contains phthalates
106	MW-4D	12-01-87	Development Water	Table 14-contains metals
107	MW-4D	12-01-87	Development Water	Table 14-contains metals
108	MW-4D	12-01-87	Development Water	Table 14-contains metals
109	MW-4D	12-01-87	Development Water	Table 14-contains metals
110	MW-1S, MW-1D, MW-2S, MW-2D	12-01-87	Purge Water	Table 14-contains metals; Table 15-contains phthalates
111	MW-4S, MW-4D	12-01-87	Purge Water	Table 14-contains metals; Table 15-contains phthalates
112	MW-3S, MW-3D	12-01-87	Purge Water	Table 14-contains metals; Table 15-contains phthalates
113	MW-5S, MW-5D	12-01-87	Purge Water	Table 14-contains metals; Table 15-contains phthalates
114	B-3	12-01-87	Soil	Table 10 -contains metals; Table 11 -contains PAHs
115	MW-8S, MW-8D	12-01-87	Purge Water	Table 14-contains metals; Table 15-contains phthalates
116	MW-7S, MW-8D	12-01-87	Purge Water	Table 14-contains metals; Table 15-contains phthalates
117	MW-6S, MW-6D	12-01-87	Purge Water	Table 14-contains metals; Table 15-contains phthalates