HYDROGEOLOGIC REPORT
1990 FIELD INVESTIGATION UPDATE
AC ROCHESTER
LEXINGTON AVENUE FACILITY
ROCHESTER, NEW YORK
VOLUME I OF III

by

H&A of New York
Rochester, New York

for

AC Rochester
Rochester, New York

File No. 70014-42

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H & A of New York

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8 May 1991
File No. 70014-42

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Attention: Mr. Frank Ciriello
Superintendent, Environmental Engineering

Subject: Hydrogeologic Report
1990 Field Investigations Update
AC Rochester
Lexington Avenue Facility
Rochester, New York

Gentlemen:

This report discusses hydrogeologic characterization activities performed by H&A of New York personnel during the 1990 calendar year at the AC Rochester Lexington Avenue Facility. The report updates H&A's previous report entitled "Hydrogeologic Report, AC Rochester, Lexington Avenue Facility, Rochester, New York", dated 9 February 1990. Data derived from other on-site investigations conducted by H&A of New York has been included in summary form for interpretational purposes.

Former degreaser locations within the interior of the AC Rochester's Lexington Avenue facility manufacturing complex have been identified as the source(s) of groundwater contamination by chlorinated solvents previously detected in the hydraulically downgradient groundwater monitoring well network. Contamination by a floating oil-like product, (believed to be Stoddard Solvent or a similar product) locally containing chlorinated solvents, has also been observed.

In view of the apparent extent and degree of contamination, H&A recommends that AC Rochester attempt to further identify and characterize source(s) and pathways of migration of the

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chlorinated solvents and/or floating oil-like product found beneath the plant so that the need for controlling or removing these sources can be assessed.

In view of the observed presence of chlorinated solvent contamination in some of the monitoring wells near Driving Park Avenue, H&A recommends the AC Rochester install and operate a groundwater migration control system along the northeast side of the plant as soon as is practicable to minimize the potential for offsite migration of the contaminants.

Furthermore, it is recommended that limited characterization be performed in the exterior areas of the facility, downgradient of the plant, in support of the design and installation of a migration control system. The migration control system should include the installation of an engineered blasted-bedrock trench, recovery wells and associated collection appurtenances and a suitable groundwater treatment system.

It has been a pleasure working with AC Rochester on this continued investigation. Please feel free to call if you have any questions or require further information.

Sincerely yours,
H&A OF NEW YORK

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EXECUTIVE SUMMARY

AC Rochester's Lexington Avenue Facility is located in the City of Rochester, New York as shown on Figure 1, Project Locus. Various chlorinated organic solvents including trichloroethylene (TCE), tetrachloroethylene (PERC), 1,1,1-trichloroethane (1,1,1-TCA) and associated degradation products have been detected in the shallow groundwater hydraulically upgradient and/or downgradient of AC Rochester's Lexington Avenue Facility. Groundwater flow in the near-surface aquifers underlying the Lexington Avenue Facility is in a northerly to northeasterly direction.

Investigations to identify the areal and vertical extent and source(s) of the soil and groundwater contamination by chlorinated solvents at the Lexington Avenue Facility have been conducted by H&A of New York during the period of July 1988 to present.

Groundwater containing less than 1.0 parts-per-million (ppm) total volatile organic compounds (VOCs) enters the site from the southerly side (hydraulically upgradient) of the AC Rochester plant. The suite of compounds identified at the R-11 well cluster, located in the south westerly corner of AC Rochester's South Parking Lot, consists largely of 1,1,1-trichloroethane (1,1,1-TCA). The location of the well cluster and contaminants detected indicate an offsite source, unrelated to AC Rochester's manufacturing operations.

Investigative activities conducted to date by H&A of New York at the AC Rochester Lexington Avenue Facility have not identified areas of soil, soil-vapor and/or groundwater contamination outside the plant building that could be identified as a source area(s) of the chlorinated organic solvents detected in the on-site groundwater-monitoring well network.

Investigations conducted by H&A of New York within the interior of the plant have identified areas of significant chlorinated solvent contamination in the vicinity of several former degreaser locations. For instance, soil contaminant levels at Study Area 5 (Figure 2), ranged from 0.006 ppm to 5900 ppm total VOCs. Groundwater contaminant levels ranged from 5.4 ppm to 650 ppm total VOCs. A floating oil-like product containing up to 13 percent chlorinated solvents was locally present on top of the water table, within the upper few feet of bedrock.

A groundwater contaminant plume believed to be emanating from former degreaser locations within the interior of AC Rochester's Lexington Avenue Facility appears to be migrating in a northerly, downgradient direction toward the AC Rochester/ Driving Park Avenue property boundary. The vertical extent of

the contaminant plume, based on limited well data, appears to be restricted, by decreasing permeability occurring with increasing depth in the bedrock, to an approximate depth of 25 to 30 feet below the top of bedrock (40 to 55 feet below ground surface). Groundwater quality in the intermediate-bedrock groundwater monitoring zone, 15 feet to 25 feet below the top of bedrock, along the Driving Park Avenue property boundary during the November 1990 sampling event, ranged from non-detect in well R-107 to 5.2 ppm and 2.9 ppm total VOC's observed in wells R-108 and R-109, respectively.

Contaminant concentration levels observed in R-108 are R-109 appear to be gradually increasing over time. This is interpreted as reflecting a downgradient migration of the contaminant plume.

Investigative activities to attempt to confirm the vertical extent of the chlorinated solvent contaminant plume hydraulically downgradient of the plant are recommended. Further investigations to identify and characterize the source(s) of chlorinated solvents and/or floating oil-like product entering the groundwater flow regime from within the interior of the plant are warranted to allow an assessment of the need and/or opportunity to control or mitigate their continued impact on the quality of the groundwater passing beneath the plant.

H&A of New York recommends that AC Rochester install a migration control system hydraulically downgradient of the Lexington Avenue Facility to minimize the potential for off-site migration of the chlorinated solvent contaminant plume. The migration control system should include the installation of an engineered blasted-bedrock trench, recovery wells and associated collection appurtenances and a suitable groundwater treatment system. Once installed, controlled groundwater extraction from the trench should limit future off-site migration of the contaminant plume.

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I. INTRODUCTION

The AC Rochester Division of General Motors Corporation's Lexington Avenue Facility is located in the City of Rochester, New York as shown on Figure 1, Project Locus. H&A of New York (H&A) has been involved under the direction of AC Rochester personnel, in a proactive program to identify and mitigate potential on-site environmental problems, since July 1988. This program has included on-site investigations of the exterior areas of the Facility, to identify the areal and vertical extent and sources of soil, soil-vapor and groundwater contamination by chlorinated solvents including trichloroethylene (TCE), tetrachloroethylene (PERC) and associated break-down products.

The results of H&A's previous investigations relating to contamination by chlorinated solvents in the exterior areas of the Lexington Avenue Facility are summarized in reports dated October 1988 and February 1990.

Investigations of other related on-site matters of environmental concern performed by H&A have included the Degreaser Investigation conducted within the plant interior.

The results of these investigations have been discussed in various reports prepared by H&A of New York as identified in Section VIII. Details of these investigations are not discussed within this report, although certain data generated by these projects are briefly discussed further herein to augment interpretation of geologic, hydrogeologic and chemical data.

Recommendation for further investigative activities incorporated in H&A's February 1990 report included the following:

- Installation of on-site monitoring wells to expand the areal and vertical monitoring capacity of the groundwater monitoring well network.
- Hydraulic conductivity testing of newly installed monitoring wells.
- Continuation of on-going groundwater level monitoring of on-site wells.
- Continuation of routine on-going groundwater quality sampling of the on-site monitoring well network.
- Groundwater quality sampling of selected monitoring wells with analysis for RCRA Appendix IX listed compounds.

- Implementation of field scale testing of potential groundwater remedial technologies utilizing Well Z as a groundwater extraction source. (The location of Well Z and other on-site wells is shown on Figure 2, Monitoring Well Location Plan.)

- Preliminary investigation of the feasibility of utilizing controlled blasting of bedrock in construction of a contaminant migration control system to control potential off-site migration of the groundwater contaminant plume.

- Establishment of a computerized database management system for groundwater quality and hydrogeologic data from the entire monitoring well network.

AC Rochester contracted with H&A of New York in May of 1990 to implement the recommended scope of work, as discussed further herein.

II. FIELD INVESTIGATIONS

H&A of New York (H&A) personnel performed the following field activities at AC Rochester's Lexington Avenue facility site during 1990:

- Groundwater level monitoring
- Groundwater sampling and monitoring of groundwater sampling performed by Free-Col Laboratories, Inc. (Free-Col)
- Oversight of the installation of new groundwater monitoring wells and piezometers
- Hydrogeologic testing of new wells

These activities and their results are described below.

2-01. GROUNDWATER LEVEL MONITORING

Periodic groundwater level monitoring was performed during 1990 by H&A of New York personnel. Groundwater levels were measured in all wells on site at the beginning of each of three groundwater sampling events performed by H&A/Free-Col personnel. Additional groundwater level measurements were made in conjunction with other on-site projects conducted by H&A of New York at various times during the year. Groundwater level measurements are recorded on Groundwater Level Monitoring Reports located in Appendix B. Well locations are shown on Figure 2, Monitoring Well Location Plan.

2-02. GROUNDWATER SAMPLING

Free-Col Laboratories, Inc. (Free-Col) of Meadville, Pennsylvania performed groundwater sampling of wells on the Lexington Avenue facility site on three occasions during the year. These sampling events continue the periodic sampling of site wells by Free-Col begun in 1989. H&A personnel provided guidance and assistance to Free-Col during each event. Sampling was performed on 12-13 March, 16-18 June, and 5-8 November 1990. The November sampling event included those wells installed after the June event and also included existing wells not previously sampled by Free-Col. Sampling was performed in accordance with the Groundwater Sampling and Analysis Plan developed by H&A and Free-Col in 1989 for the Lexington Avenue facility site, as discussed in H&A's February 1990 report. Groundwater samples collected during each sampling event were

transported to their laboratory facility from the site by Free-Col. Free-Col analyzed samples for volatile organic compounds (VOCs) by EPA Method 8240, and total selected metals content by appropriate methods. Analytical results are reported in Appendix C and summarized on Tables 1 through 6.

H&A personnel performed a limited sampling event on 5 July 1990 in accordance with the site Sampling and Analysis Plan. Four wells were sampled and samples were shipped to Enseco-Erco Laboratory (Enseco) of Cambridge, Massachusetts for analysis. Samples from wells SR-103 and R-103, where the highest on-site levels of volatile compound contamination had been found in previous sampling events, were analyzed for all compounds listed in Appendix IX of RCRA regulations. Samples from wells SR-110 and R-110, which had previously exhibited the highest metals contents of on-site groundwater, were analyzed for total and dissolved Appendix IX listed metals.

Laboratory instrument problems at Enseco resulted in delays in analyzing the volatile organic compounds (VOCs) in the 5 July samples and consequently these analyses were completed after expiration of the Standard Contract Laboratory Protocol (CLP) holding time for VOCs. Wells SR-103 and R-103 were re-sampled by H&A on 7 November 1990 and these samples were analyzed for Appendix IX VOCs by Enseco within the required CLP holding times.

Enseco Appendix IX compound analyses are reported in abbreviated form in Appendix D of this report. A copy of the full report by Enseco has been provided to AC Rochester under separate cover and H&A of New York maintains a copy of the full report in our files. The Enseco Appendix IX analyses are summarized on Table 7 of this report.

2-03. MONITORING WELL INSTALLATIONS

Twelve new monitoring wells were installed by Nothnagle Drilling, Scottsville, New York during the period from 30 July through 2 October 1990. Six intermediate bedrock zone wells were installed. Three of these, R-2, R-3 and R-11 were installed at locations next to existing shallow bedrock zone wells, hydraulically upgradient of the Lexington Avenue facility site. A fourth intermediate-bedrock zone well, R-106, was installed next to overburden observation well, OW-6, on the northwest side of the ACR plant. The remaining two intermediate bedrock zone wells, R-131 and R-132, were installed at new well cluster locations adjacent to plant buildings in the northeast part of the site. Shallow bedrock zone wells were installed at each of the two new well clusters (wells SR-131 and SR-132). A deep bedrock zone well, DR-105, was installed at the existing

well cluster located at the north end of the Die Cast building. Finally, three piezometers (P2-129, 130, and 132) were installed at locations where floating oil-like product has been observed in other wells and/or test borings. Details of the well installations are described below. Well locations are shown on Figure 2, Test Boring Reports are located in Appendix A and Monitoring Well Installation Reports and Groundwater Level Monitoring Reports are located are Appendix B. A summary of the locations, as referenced to ACR's site coordinate grid, and elevations, as referenced to the national geodetic vertical datum (NGVD), of all on-site monitoring wells is presented in Table 8.

Two shallow-bedrock-zone wells, SR-216 and SR-230, were installed inside plant buildings during the same period. These wells were installed as part of the Study Area 5 Degreaser Investigation as discussed further in a report prepared by H&A, dated 12 April 1991. Geological, hydrogeological and analytical data from these wells are included in this report for interpretative purposes. Locations of these wells are shown on Figure 2 and other information is reported in the appropriate appendices and tables.

Well installations were accomplished under modified Level D and C Health and Safety Protocols. These included the use of personnel protective equipment consisting of a hard hat, chemical resistant boots, inner and outer gloves and tyvek suit, safety glasses, and when required, a full face respirator. H&A of New York personnel performed air-quality monitoring during the well installation process using a Foxboro Model 128 GC OVA flame ionization detector to monitor the presence of organic vapors.

H&A also used the Foxboro OVA to screen soil specimens from each test boring for the potential presence of VOC's. Samples showing the highest level of potential contamination, based on OVA response or obvious visual evidence of solvent presence where no OVA response was indicated, were selected for EPA Method 8240 analysis. Samples were tightly packed into VOA vials by H&A personnel, refrigerated and sent to Free-Col for analysis. Analytical reports are contained in Appendix E, and results are summarized on Table 9.

The drilling rig and associated equipment was decontaminated by steam cleaning before beginning the drilling program, between each well cluster location and when drilling was completed. Augers, split-spoon samplers and other drilling tools were steam cleaned after each well installation or test boring. Split-spoon samplers were decontaminated between each successive sampling event with an Alconox detergent wash and potable water rinses. All steam cleaning was performed at a permanent pad where waste water is collected and pumped to the ACR waste-water treatment facility.

Liquid drilling wastes, including drilling wash water and spoon rinse solutions, were collected in drums for transport by ACR personnel to ACR waste-water treatment facility. All soil and rock cuttings were collected in industrial tubs for disposal by AC Rochester.

After well installations were completed, each well was developed by Nothnagle Drilling personnel by hand bailing the well until the well discharge was relatively free of sediment. Additional development of selected wells was later performed by H&A personnel to remove volumes of water equivalent to the volumes introduced during the well installation process at each well or well cluster. This development was performed with a Bennett Sample Pump. Well development details are reported in Groundwater Level Monitoring Reports contained in Appendix B. All development water was drummed for transport or pumped directly to the ACR waste-water treatment facility.

Specific well installation procedures are described below:

2.3.1 Deep Bedrock Zone Well DR-105

A deep bedrock zone well was installed at the R-105 well cluster location to provide a capability for monitoring groundwater quality below the R-105 intermediate-bedrock monitoring zone, approximately 15 to 25 feet below the top of bedrock, where contamination by VOC's had been previously observed. The contractor advanced a 14-in. diameter boring to the top of bedrock utilizing an air-rotary drilling rig. Nominal 12-in. I.D. black iron pipe casing was installed in the borehole and a 10-in. diameter rotary boring was advanced to approximately twenty feet below the top of bedrock. An NX core-boring was then advanced to approximately thirty feet below the top of bedrock, and the borehole was then reamed to a nominal 11-in. diameter to this depth. An 8-in. nominal I.D. black iron pipe casing, equipped with centralizers, was installed in the borehole and pressure grouted in place. The grout used was a mixture consisting of Portland Cement with 3 to 5 pounds of powered bentonite and 2 pounds of calcium chloride per sack, mixed with 6.5 gallons of potable water per sack of cement. The grout was displaced from the inside of the casing with a volume of water equal to 85% of the empty volume of the casing.

After allowing the grout to set (for a minimum of twelve hours), an NX core-boring was advanced to approximately ten feet below the bottom of the 8-in. I.D. casing.

H&A personnel used a Bennett Sample Pump to purge the boring of a volume of water equivalent to one and one-half times the volume of water used in the core boring, and then sampled the water from the cored interval. The contractor advanced the NX core boring an additional ten feet, and the boring was then purged of twice the volume of drilling water used and resampled by H&A.

H&A personnel monitored the rate of recovery after the purging events for subsequent calculation of the estimated hydraulic conductivity of the respective zone(s) as discussed in Section IV.

Water samples from the cored intervals were screened for VOCs in the field by H&A personnel using a portable Photovac model 10s55 gas chromatograph (GC). This screening was performed in order to provide timely information to assist in assessing the relative levels of VOC contamination present in groundwater from the zone below the monitoring interval in the adjacent R-105 well. The GC screening did not indicate detectable levels of VOCs in the groundwater. Duplicate ground water samples and a drilling water blank sample were sent to Free-Col Laboratories for VOC analysis by EPA method 8240. Results of analyses are reported in Appendix E and summarized on Table 9. These laboratory analyses also indicated no detectable VOC contamination in this zone.

After sampling and field screening was completed, the borehole was reamed to the bottom of the NX core-boring, approximately 50 feet below the top of rock, with an 8-in. nominal rotary bit, and a 4-in. I.D. black iron pipe casing, equipped with centralizers, was installed and pressure grouted in place. After the grout had set, an NX core boring was advanced to approximately fifteen feet below the bottom of the 4-in. casing. This interval, from approximately fifty to sixty-five feet below the top of bedrock, was left open to serve as the monitoring interval in the well. The well was completed at the surface with a 6-in. diameter steel protective casing with locking cap.

2.3.2 Intermediate Bedrock Zone Wells

Six new intermediate bedrock zone wells were installed during 1990 field investigations. At each well location the contractor advanced a standard test boring utilizing 6-1/4-in. ID augers with continuous split-spoon sampling

in accordance with ASTM D 1586 methodologies to the top of bedrock. The augers were removed and a nominal 8-in. I.D. steel temporary casing was installed. The upper 15 feet of bedrock was cored with an NX core barrel in accordance with ASTM D 2113-70 (1976) specifications. The NX core hole was reamed with a 7-7/8-in. diameter tri-cone roller bit utilizing potable water as the circulating medium. A nominal 4-in. steel casing was installed to the bottom of the borehole and grouted in place to ground surface with a cement/bentonite grout as described above. During the grouting process, the 8-in. temporary casing was removed. After the grout had set, an NX core barrel was advanced from the 4-in. casing seat to an approximate depth of 25 feet below the top of rock. The open NX corehole serves as the monitoring interval. A 6-in. diameter protective casing was set in a grout surface seal to complete the wells.

2.3.3 Shallow Bedrock Zone Wells

Two shallow bedrock wells, SR-131 and SR-132, were installed at new well cluster locations during the 1990 field investigation. At both locations the contractor advanced a nominal 6-in. diameter boring to a depth approximately 7 feet below the top of rock utilizing a combination of augers and a tri-cone roller bit. No soil sampling was required, as sampling was conducted during the installation of the adjacent intermediate bedrock well. A 1-foot seal of bentonite pellets was installed in the bottom of the borehole followed by 1-foot of quartz sand. A 5-foot length of stainless steel, 0.01-in. slot, continuously wound well screen, equipped with a bottom cap, threaded to a sufficient length of stainless steel riser to complete the well with a final stickup approximately 2 ft. above ground level was installed in the borehole. The annular space was sand-packed with 3Q sand to a depth 2-feet above the top of the screen. A 2-foot seal of bentonite pellets was installed above the sand pack and subsequently hydrated. The remaining annular space was grouted to ground surface with the cement/bentonite grout previously specified and a locking, 4-in. diameter protective steel casing was installed.

2.3.4 Piezometers

Three piezometers were installed during the field investigation to provide capacity for additional monitoring of the apparent extent of floating oil-like product observed in pre-existing wells and/or test borings.

Piezometers PZ-129 and PZ-130 were installed in the vicinity of the R-102 well cluster to monitor the apparent areal extent of the floating oil-like product observed in SR-102 and OW-102. These two piezometers were installed in borings advanced with either 6-1/4-in. augers or augers in combination with an 8-in. rotary bit to depths 5 to 7 feet below the top of bedrock. Continuous split-spoon sampling of the overburden soil was performed in both borings. Bentonite pellet seals 1-foot thick were installed in the bottom of each borehole, and 20-foot lengths of 2-in. diameter 0.01-in. slot, PVC well screen threaded to PVC riser pipe were installed. The annular space of each borehole was backfilled with 3Q quartz sand to 1 to 2 feet above the well screen, followed by a bentonite pellet seal and a cement/bentonite grout surface seal in which a 4-in. diameter protective casing with locking cap was installed.

PZ-132 was installed at the new R-132 well cluster location to monitor the apparent presence of floating oil-like product observed during the installation of Boring B-132. This piezometer was installed by advancing 6-1/4-in. I.D. augers through overburden, without sampling, to a depth approximately 7 feet below the water table. A 1 foot bentonite pellet seal was installed in the bottom of the borehole, followed by 1 foot of quartz sand. A 10-foot length of 2-in. diameter, 0.01-in. slot, PVC well screen was then installed and threaded to PVC riser pipe. The annular space of the borehole was backfilled with 3Q quartz sand to the top of the wellscreen, followed by a bentonite pellet seal and a grout surface seal in which a 4-in. diameter protective casing with locking cap was installed.

2-04. HYDROGEOLOGIC TESTING

After the newly installed monitoring wells and piezometers were developed, H&A personnel performed rising head tests, and a calculation of hydraulic conductivity of the screened interval at each well was made. Wells PZ-130 and PZ-132, which had floating product layers on the water column, were not tested.

Testing was performed by bailing each well with as large a bailer as was practicable and monitoring the water-level recovery using a hand-held electronic water level indicator. Calculations of estimated hydraulic conductivity from the test data were made according to the Hvorslev method described in Lambe and Whitman (1961). Estimated hydraulic conductivity (permeability) values for site wells, including those tested with similar methods by H&A in 1988 and 1989, are summarized on Table 10.

III. GEOLOGIC CONDITIONS

Geologic conditions observed during 1990 field investigations reaffirmed H&A of New York's interpretation of site geologic conditions as discussed in its 1988 Summary of Hydrogeologic Conditions and 1990 Hydrogeologic Investigation Report. The site is underlain by the Upper Silurian-aged Rochester Shale, which dips to the south at 40 to 60 feet per mile. The Rochester Shale is overlain by a complex network of interfingered glacial till, glacio-lacustrine and lacustrine sediments and fill deposits. The till was deposited over the bedrock surface as a result of glacial processes. The formation of lakes in front of the glacial ice sheets resulted in local reworking of the till and deposition of the thinly layered silts and clays associated with glacio-lacustrine (lake bed) depositional processes. More recent lacustrine deposition left sand, silt and clay sediments and swamp deposits with a high content of organic matter. Subsequent man-made excavations and episodic backfilling have added to the complexities of the subsurface environment of the site.

The following deposits have been found to underlie the site as determined from information obtained from Dames & Moore (1981), AC Rochester Division foundation boring records, and observations made by H&A of New York personnel throughout the Hydrogeologic Investigation and other on-site projects.

3-01. OVERBURDEN DEPOSITS:

Thickness of man-placed fill and native soil deposits varies across the site, ranging from less than 5 feet in Test Boring B-3 to approximately 25 feet in B-105-C. The deposits described below, listed in descending stratigraphic order, were rarely all present at the exploration locations. Detailed descriptions of the overburden deposits encountered in the 1990 well installation borings are presented in Test Boring Reports located in Appendix A.

Soil Type	Description
Fill	Silt, sand, gravel, and miscellaneous materials including construction and demolition debris, riprap, asphalt, flyash, cinders, and railroad ties, etc.
Swamp Deposits	Soft, dark brown to black clayey SILT to loose sandy SILT with organic matter and shell fragments.

Lacustrine sediments	Soft gray to brown silty CLAY to loose to medium dense silty SAND, little gravel, bedded.
Glacio-lacustrine sediments	Same as lacustrine, except often red-brown, often underlying glacial till.
Glacial Till	Medium dense brown to red-brown silty SAND, with trace to little gravel, trace clay.
Residual Soil	Loose to medium dense brown sandy SILT to silty SAND with organics and root fibers (formed from weathered bedrock material).
Completely Weathered Bedrock	Medium dense to very dense gray-brown SILT, little to some fine sand, with the visible pattern of the structural fabric of the parent bedrock material that has been completely altered to soil.

The occurrence of a weathered zone at the top of bedrock appears to be fairly consistent across the site. Its thickness ranges from less than 1 foot (Test Boring B-3) to 15 feet in B-11 (Well Number R-11). In general, completely weathered bedrock material described above grades down into highly weathered bedrock, comprised of more than 50% soil material with pieces and seams of Rochester Shale rock material. The top of bedrock generally appears to be marked by a change to 80% or more rock material within a vertical distance of a few feet. A Top-of-Bedrock Contour Map is presented as Figure 3.

3-02. BEDROCK:

The Rochester Shale member of the Upper Silurian Aged Clinton Group is the uppermost bedrock unit encountered in all on-site test borings installed by H&A and others. The Rochester Shale is a light to dark gray fine grained fossiliferous dolomitic MUDSTONE with interbedded dolomite and limestone stringers and traces of pits, vugs, and secondary gypsum seams and nodules along partings. Investigations by H&A of New York indicate that a vertical section of approximately 55 to 70 feet of Rochester Shale is present at the site area.

The basal contact of the Rochester Shale was penetrated in Boring B-105-C, in which well number DR-105 was installed. The contact occurred at a depth of 86.8 feet (elevation of 424.2 feet), 62 feet below the top of bedrock. Below the contact, the boring encountered green-gray fine to medium grained fossiliferous LIMESTONE of the Irondequoit Limestone formation. The boring was terminated in this formation. Core boring reports for this and other 1990 well installation borings are contained in Appendix A.

Information from the Monroe County Combined Sewer Overflow Abatement Program (CSOAP) project performed by H&A of New York in the vicinity of the Lexington Avenue facility (H&A of New York, 1981 and 1982) indicates that the approximate thickness of the Irondequoit Limestone in the site area is 18 feet. A general stratigraphic profile of the bedrock units present in the Rochester area is presented in Figure 4. It provides information on other near-surface bedrock units which underlie the Irondequoit Limestone.

The frequency of fractures and joints observed in rock cores from 1990 well installation borings exhibit a similar pattern to that observed by H&A in earlier work (H&A of New York, 1982 and 1990). The incidence of near vertical, inclined and horizontal joints and fractures appears concentrated within the top few feet of the bedrock. This phenomenon is interpreted to be largely a result of stress relief associated with off-loading of the glacial ice sheet(s). These fractures and joints near the top of bedrock are believed to be a primary pathway for groundwater migration and/or contaminant transport through the rock matrix.

H&A's experience in the CSOAP tunnel project indicates that the lower portion of the Rochester Shale and the contact with the underlying Irondequoit Limestone is generally competent, with few joints and bedding plane features. This corresponds with observations made of the core from B-105-C, and is corroborated by the very low hydraulic conductivity measured in the Well DR-105 monitoring interval, which includes the lower 12 feet of the Rochester Shale and the upper 3 feet of the Irondequoit Limestone.

IV. HYDROGEOLOGIC CONDITIONS

Hydrogeologic conditions observed during the 1990 field investigations are consistent with those previously reported by H&A (October 1988 and February 1990). Updated items are described below.

Groundwater level monitoring during the year indicated that the generally northerly groundwater flow direction in the shallow-bedrock zone and the intermediate-bedrock zone does not shift significantly with the seasonal fluctuations in groundwater elevations. Groundwater contour maps for the shallow and intermediate zones during each of the three 1990 sampling events, showing the interpreted direction of the horizontal component of groundwater flow, are presented in Figures 5 through 10.

Interpretative hydrogeologic profiles are presented on Figures 11 and 12. Locations of the profiles are shown on Figure 2.

The profiles represent H&A of New York's interpretation of the hydrogeologic conditions observed during the November 1990 sampling event. They also indicate the apparent direction of groundwater flow within the overburden, shallow bedrock and intermediate bedrock zones in the vertical plane of the individual profiles. Groundwater flow directions below the intermediate zone cannot be determined from presently available data.

Hydrogeologic conditions shown on the profiles presented in Figures 11 and 12 reflect the strong downward flow gradient observed in the on-site monitoring well clusters, which is indicated by decreasing head elevations (water levels) evidenced in monitoring well clusters with wells installed at successively greater depths. This downward flow gradient is exaggerated when dense contaminants, such as trichloroethylene (TCE) and/or tetrachloroethylene (PERC) enter the groundwater-flow regime. When introduced into fractured bedrock, these types of contaminants disperse by density contrast in a largely vertical direction until restricted by a decrease in the incidence of fractures. Movement, thereafter, is by advection through the bedrock fractures with gradual dilution of the contaminant plume through the processes of hydrodynamic dispersion.

The anticipated local influence of the 7-foot diameter, City of Rochester sewer tunnel and its associated backfill is also indicated on the profiles. The sewer tunnel, which consists of a concrete-lined brick conduit, appears to locally depress the water table in the area immediately adjacent to the structure.

It should be noted that this interpretation of conditions along the sewer tunnel is based on limited data, and at present there are no groundwater data observation points immediately adjacent to the sewer tunnel.

Hydraulic conductivity testing of the newly installed wells indicates that the range of calculated permeabilities of the respective monitoring zones is as follows:

Zone	Range of hydraulic conductivity ($x10^{-6}$ cm/sec)
Overburden	12-540
Shallow Bedrock	1-1800
Intermediate Bedrock	3.1-5300
Deep Bedrock	0.2

A summary of measured hydraulic conductivities for the monitoring intervals in the groundwater monitoring well network is presented in Table 10.

Permeability testing performed during the installation of Well DR-105 (B-105-C) indicate a gradual decrease in permeability (hydraulic conductivity) with increasing depth, summarized as follows:

Interval	Elevations ft. (NGVD-MSL)	Hydraulic Conductivity ($x10^{-6}$ cm/sec)
Shallow Bedrock	479-487	1800
Intermediate Bedrock	460-470	1100
---	446-456	600
---	436-456	300
Deep Bedrock	421-436	0.2

It appears from testing performed at the 105 cluster location that groundwater flow and/or contaminant transport below the intermediate-bedrock monitoring zone, approximately 25 feet below the top of bedrock, is restricted by decreasing permeability with increasing depth. This interpretation is supported by the groundwater conductivity of >20,000 umhos measured DR-105 during the 5-8 November 1990 sampling event, indicating limited groundwater circulation and influence by recharge events. The apparent interrelationship of contaminant levels, permeability and groundwater conductivity are discussed further in Section 5.3.3.

V. CONTAMINATION

The results of groundwater and soil-specimen sample analyses performed during 1990 indicate groundwater quality and soil contamination conditions similar to those observed during 1989 field investigations (H&A of New York, February 1990). Conditions observed in 1990 are discussed below. Analytical data for 1990 groundwater sampling events are summarized on Tables 1 through 7. Soil-specimen analytical data are summarized on Table 9. Figures 11 and 12, Interpretive Hydrogeologic Profiles, present the approximate limits of groundwater VOC contamination as measured during the November 1990 sampling event. Distribution of total VOC contamination of groundwater in the shallow-bedrock and intermediate-bedrock zones is presented on Figures 14 through 18. Figure 21, Contaminant Characterization Plan, shows the relative concentrations of selected individual volatile organic compounds at selected wells as measured during the November 1990 sampling event.

5-01. SOIL CONTAMINATION

Analyses of soil samples taken from the boreholes for the monitoring wells installed outside the plant buildings during 1990 indicate low to non-detectable levels of soil contamination. Total VOC's of 0.025 parts-per-million (ppm) and 0.077 ppm were detected at the B-131 boring locations respectively. The primary contaminants were the chlorinated organic solvents trichloroethylene (TCE) and its degradation products, vinyl chloride and 1,2-dichloroethylene (1,2-DCE). Visible traces of oil-like product occurred just above or at the water table in the B-131 and B-132 test borings.

Sampling performed by H&A during the Degreaser Investigation (H&A of New York, October 1990 and February 1991) has identified areas of VOC contamination of soils inside the AC Rochester plant in the vicinity of former degreaser locations. At Study Area No. 5, shown on Figure 2, the maximum total VOC concentrations in soil-specimen samples from each of the twenty individual test borings ranged from 1.4 ppm to 5900 ppm. The volatile organic compounds detected in these samples consisted primarily of the chlorinated organic solvents trichloroethylene (TCE) and tetrachloroethylene (PERC) and their degradation products 1,2-dichloroethylene (1,2-DCE), 1,1-dichloroethylene (1,1-DCE), 1,1-dichloroethane (1,1-DCA) and vinyl chloride. These VOC contaminants are present throughout the soil profile, from the surface to below the water table.

Investigations conducted to date by H&A of New York have not identified areas of elevated chlorinated solvents in the soils which would serve as source areas for groundwater contamination outside the building areas of the Lexington Avenue Facility. Source areas have been identified within the interior of the plant at Study Area 5 and other locations adjacent to former degreasing operations.

5-02. FLOATING OIL-LIKE PRODUCT

The occurrence of oil-like product floating at the water table has been observed at localized areas on the site. In July 1988 ACR personnel informed the New York State Department of Environmental Conservation (NYSDEC) of the observed presence of floating oil-like product on top of the water table adjacent to the Tank Farm area located at the eastern end of Lexington Avenue Facility (Spill No. 8801732). ACR has implemented activities to address this issue outside of the context of this report. Floating product has also been observed in the vicinity of monitoring well cluster 102, in shallow-bedrock well SR-216, and in PZ-132. These occurrences are discussed below.

Newly installed monitoring well cluster 132 is on the northern edge of the Tank Farm area oil-like product plume encompassed by the existing network of product-monitoring piezometers and recovery wells shown on Figure 2. Analysis of floating oil-like product sampled from piezometer PZ-132 in November 1990 indicates a total VOC concentration of 18.1 ppm, composed entirely of chlorinated solvents including trichloroethylene (TCE), trichloroethane (1,1,1-TCA), tetrachloroethylene (PERC) and associated degradation products. Previous limited sampling of the Tank Farm area oil-like product had indicated no detectable levels of chlorinated solvents; VOC components detected in product samples were restricted to benzene, toluene, ethyl-benzene and xylene (BTEX). The sources of the oil-like product and local presence of chlorinated solvents in the floating oil-like product detected at PZ-132 have not been identified.

Floating oil-like product had been observed during 1989 in overburden well OW-102. A floating oil-like product layer was observed for the first time in the adjacent shallow bedrock well (SR-102) in February 1990. As much as 10 feet of product was observed in SR-102 during the year. SR-102 was purged of product on several occasions prior to sampling events and hydrogeologic testing, and AC Rochester staff began purging SR-102 periodically in September 1990 for the purposes of product recovery. To date, approximately 7 gallons of oil-like product have been recovered by AC Rochester, not including approximately 3 to 4 gallons purged prior to September. The

rate of recovery of oil in SR-102 is slow, and extractive efforts appear to be recovering approximately 0.75 gallon-per-month.

The subsurface conditions and actual thickness of the floating product layer at the 102 well cluster are not currently well defined. It appears that the water table is above the top of both the well screen and the filter pack in well number SR-102, and that the bottom of the floating oil layer inside the well is at times also above the top of the well screen. Well construction of SR-102 may preclude the effective recovery of product from the existing well by restricting the rate of product influx into the well bore.

AC Rochester records indicate that a sub-grade concrete collection vault for waste oil was formerly located in proximity to the well cluster 102 locations. This former structure may be the source of the oil-like product observed in SR-102.

Total VOC concentrations in SR-102 floating oil-like product samples have ranged from 500 ppm to 2500 ppm, with trichloroethylene (TCE), 1,2-dichloroethylene (1,2-DCE) and tetrachloroethylene (PERC) being the primary constituents. Vinyl chloride, 1,1-dichloroethane (1,1-DCA), 1,1,1-trichloroethane (1,1,1-TCA), ethyl-benzene and xylene were also present.

Piezometers PZ-129 and PZ-130 were installed during the 1990 field investigations to assess the lateral extent of the oil-like product layer observed in the 102 cluster wells. The screened interval in these piezometers extends across both the overburden and shallow-bedrock zones. To date, no floating oil-like product has been observed in PZ-129. A floating product layer has been observed and sampled in PZ-130; to date the maximum product layer thickness observed in PZ-130 has been 0.22-feet. Total VOC concentration in the PZ-130 product sample during the November 1990 sampling event was 0.008 ppm of 1,1-dichloroethane (1,1-DCA).

As indicated above, floating oil-like product has been observed and sampled in shallow bedrock well SR-216, which was installed inside the plant during the Degreaser Investigation. Samples of the product from this well have contained as much as 13% total VOCs (H&A of New York, February 1991), composed primarily of trichloroethene (TCE), tetrachloroethene (PERC), and 1,2-dichloroethene (1,2-DCE).

The lateral extent of the floating product in the Well 216 area appears to be controlled in part by localized irregularities of the water table which fluctuates seasonally in the upper few feet of bedrock. No floating oil-like product has been observed in Well SR-230, which is located approximately 90 feet north (hydraulically downgradient) of SR-216 and in which the water table is roughly 1-1/2 feet above the elevation of the product layer in SR-216. The source(s) of oil-like floating product are, as yet, undetermined but are likely related to the floor-trench network, sub-grade piping and/or sub-grade concrete containment structures and/or tankage located throughout the plant for the containment and re-circulation of various cutting oils. The oils may have become contaminated with chlorinated solvents while migrating through the largely unsaturated overburden soils adjacent to former degreaser locations. The floating oil-like product ultimately reaches the water table and serves as a source of groundwater contamination by dissolution of the respective chemical components of the oil-like product.

Floating oil-like products have been observed at various site locations during investigations conducted by H&A of New York. It appears that the areal extent of these occurrences is restricted and that the oil-like product observed in wells SR-102, PZ-130 and SR-216 and the oil-like product observed adjacent to the Tank Farm area may be derived from different source areas located within the interior of the plant.

5-03. GROUNDWATER CONTAMINATION

Groundwater quality conditions indicated by groundwater sampling and analysis conducted during 1990 are similar to those previously reported by H&A of New York. Chlorinated organic solvents and related break-down products were identified in groundwater samples from overburden, shallow-bedrock and intermediate bedrock wells located hydraulically downgradient from the AC Rochester manufacturing buildings. Analysis of groundwater samples from DR-105, the only deep bedrock well installed on the site, did not indicate detectable levels of chlorinated solvents or related VOCs below approximately 30 ft. below the top of bedrock.

Monitoring wells located hydraulically upgradient of the AC Rochester plant continue to evidence contamination at total VOC levels below 0.5 ppm with a different suite of contaminant constituents than that observed in on-site downgradient wells.

Analysis of site groundwater samples for selected metals indicated most levels of total metals below standards for groundwater and drinking water established by the New York State Department of Environmental Conservation (NYSDEC). Occasional analytical results indicating metal concentrations above NYSDEC

standards fall within the range of metals concentrations typically encountered in native Rochester area groundwaters and may not be indicative of contamination by on-site activities.

Appendix IX compound analyses performed in July and November 1990 on samples from well clusters 103 and 110 did not detect the presence of any contaminant compounds other than those VOC and metals previously indicated by routine monitoring well sampling. Levels of VOC contaminants and both total and dissolved metals detected in the Appendix IX analyses were in the same range as levels previously and later observed in these well clusters. Antimony was detected at levels above EPA groundwater quality guidance values in the field-filtered samples from all four wells sampled, but not detected in unfiltered duplicate samples. The cause of this apparent aberration in the data is anticipated to be related to the digestion process utilized in processing samples for total metals (unfiltered) analyses in accordance with CLP protocols. The concentration levels of antimony detected, ranging from 0.03 ppm to 0.06 ppm, may be indicative of natural occurring groundwater conditions based on review of limited available groundwater quality data for antimony in the Rochester, New York area.

5.3.1 Overburden Wells

Groundwater from the three (3) overburden monitoring wells sampled routinely in 1989 and 1990 have exhibited relatively low levels of VOC contamination. Total VOCs detected in 1990 ranged from below detection limits at OW-7 to 0.259 ppm at OW-6. VOCs detected include vinyl chloride, trichloroethylene (TCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethylene (1,2-DCE) and tetrachloroethylene (PERC); ethyl-benzene and xylene were detected at OW-102 where floating product is present.

Overburden zone groundwater sampled from vapor-extraction wells installed in Study Area 5 of the Degreaser Investigation exhibited concentrations of total VOCs ranging from 5 to 650 ppm. H&A believes (H&A of New York, February 1991) that the water present in the overburden soils in Study Area 5 may originate from nearby leaking sub-floor utilities, becoming contaminated as it migrates down through contaminated soils to the water table at or near the top of bedrock.

The piezometers installed during the Tank Farm Oil Recovery project have not been routinely sampled. However, piezometer PZ-132 groundwater sample analysis in November 1990 indicated VOCs totaling 0.070 ppm and

including vinyl chloride, 1,2-dichloroethylene (1,2-DCE) and trichloroethylene (TCE). Piezometers PZ-129 and PZ-130, which are screened across both the overburden and shallow-bedrock groundwater monitoring zones, had total VOC concentrations of 24.6 ppm and 0.015 ppm, respectively, when sampled for the first time in November 1990. Individual VOC components in PZ-129 included primarily 1,2-dichloroethylene (1,2-DCE) and trichloroethylene (TCE), with lesser amounts of related chlorinated compounds.

5.3.2 Shallow Bedrock Wells

With the exception of newly installed wells SR-216 and SR-230, located inside the plant, shallow bedrock well groundwater samples collected during 1990 exhibited a range of total VOC concentrations similar to that observed in 1989.

November 1990 samples from upgradient wells SR-2 and SR-3, which had not been sampled since 1988, showed no detectable VOCs. Newly installed downgradient wells SR-131 and SR-132 contained no detectable VOCs and 0.007 ppm total VOCs, respectively. As noted above, PZ-129 and PZ-130, which are screened across the overburden and shallow-bedrock zones, contained 24.6 ppm and 0.015 ppm total VOCs respectively. Groundwater samples from those shallow bedrock zone wells sampled in 1989 ranged in total VOC concentrations throughout 1990 from below detection limits at SR-101 to 15.2 ppm at SR-110. Groundwater from the two wells installed inside the plant during the Degreaser Investigation have exhibited the highest levels of VOC contamination observed on-site to date. Groundwater samples from SR-216 have ranged from 162 ppm to 220 ppm total VOCs, and groundwater from SR-230 contained 108 ppm total VOC's.

Groundwater from SR-11, upgradient of the Lexington Avenue facility, had total VOC's below 0.5 ppm; however the contaminant suite present in this well, consisting of primarily 1,1,1-trichloroethane (1,1,1-TCA), indicates an unidentified off-site source, unrelated to the AC Rochester Lexington Avenue facility.

VOC contaminants observed at other shallow bedrock wells included primarily trichloroethylene (TCE), 1,2-Dichloroethylene (1,2-DCE) and vinyl chloride, with relatively minor amounts of 1,1-dichloroethane (1,1-DCA), tetrachloroethylene (PERC) and 1,1,1-trichloroethane (1,1,1-TCA). Toluene, ethyl-benzene and xylene were also

detected at wells where floating product has been observed and at SR-110 where oil staining was observed in test boring soil samples in 1989.

5.3.3 Intermediate Bedrock Wells

Total VOC concentrations in 1990 intermediate-bedrock well groundwater samples ranged from below detection limits at several wells to 88.4 ppm observed at R-103 during the June 1990 sampling event. Several trends are evident in groundwater quality data.

Newly installed upgradient wells showed relatively low levels of contamination. Groundwater from R-2 contained 0.246 ppm total VOCs, including chlorinated solvent degradation products as well as ethyl-benzene and xylene. The source(s) of contamination in this upgradient well is undetermined.

Groundwater from R-11 contained 0.029 ppm total VOCs, reflecting the suite of VOCs observed in SR-11. Groundwater from R-3 contained 0.006 ppm trichloroethylene (TCE).

Groundwater from several intermediate-bedrock wells where permeability testing has indicated relatively low hydraulic conductivity continued to exhibit low to non-detectable levels of VOC contamination. These wells include R-101, R-102, R-106, R-107, R-110 and R-132.

These wells tend to exhibit elevated groundwater conductivities in field parameter measurements taken during sampling events, indicating limited groundwater circulation. This data supports H&A's interpretation that groundwater and/or contaminant transport in the bedrock underlying the site is largely controlled by the interconnection of joints and/or fractures with limited flow occurring through the unfractured rock matrix.

Total VOC concentrations in the newly installed R-131 and R-132 wells were 47.7 ppm and below the detection limit respectively, as observed during the November 1990 sampling event.

VOC concentrations in Wells R-103 and R-105 ranged from 31.5 to 88.5 ppm and 16.6 to 40.8 ppm respectively during the 1990 sampling events. These wells are located upgradient of the ACR property boundary along Driving Park Avenue.

The depth of the contaminant plume in the vicinity of the R-105 cluster appears to be restricted to 25 feet to 30 feet below the top of bedrock, as determined during the installation and groundwater sampling of Well DR-105. Analysis of groundwater samples obtained from B-105-C (DR-105) below the elevation of the R-105 monitoring zone did not detect the VOC contaminant suite observed in Well R-105.

Time series plots of Total VOC's and water elevations prepared for Wells R-108 and R-109, located along the Driving Park Avenue property line are presented on Figures 19 and 20. Review of these plots indicates a gradual elevation of contaminant concentration levels in the intermediate-bedrock zone over time. It is anticipated that this trend will continue as the contaminant plume migrates downgradient from the apparent source areas present within the interior of the ACR plant.

Figure 21 presents a Contaminant Characterization Plan for selected on-site monitoring wells utilizing Stiff Diagrams. The Stiff Diagram visually represents selected chemical constituents in a graphical manner. Review of Figure 21 reveals the apparent difference between the contaminant suite entering the site in the vicinity of the SR-11 cluster, consisting primarily of 1,1,1-trichloroethane (1,1,1-TCA), and the contaminant suite in the Degreaser Study Area 5 source area, consisting largely of trichloroethylene (TCE), tetrachloroethylene (PERC), and 1,2-dichloroethylene (1,2-DCE). Downgradient of the identified source areas, the contaminants are present at lower concentration levels with break-down products including 1,2-dichloroethylene (1,2-DCE), vinyl chloride (not shown) 1,1-dichloroethylene (1,1-DCE) and 1,1-dichloroethane (1,1-DCA) becoming more dominant.

VI. SUMMARY AND CONCLUSIONS

Volatile Organic Compounds (VOCs) including the chlorinated organic solvents trichloroethylene (TCE) and tetrachloroethylene (PERC) and associated break down products have been identified in the near-surface groundwater underlying the site. Former degreasing operations conducted within the Lexington Avenue Facility have been identified as source(s) of chlorinated solvents such as those identified in the groundwater. Other currently unidentified source areas may be present on or near the site. Data derived from investigative activities conducted to date at the Lexington Avenue Facility by H&A of New York have led to the following conclusions:

- Horizontal groundwater flow at the site in both the shallow-bedrock and intermediate-bedrock zones is in a northerly to northeasterly direction. Water level monitoring at the on-site monitoring well clusters indicates a strong downward vertical component of flow between the respective monitoring intervals.

- Groundwater and/or contaminant transport in the uppermost bedrock underlying the site are interpreted to occur largely within the interconnected fracture and/or joint system, with minimal flow occurring within the unfractured rock matrix. The distribution and transportation of contaminants in the groundwater is not uniform and is controlled by the local presence and interconnection of the joint/fracture network of the bedrock.

- Groundwater contaminated with VOC's at concentration levels of less than 1 ppm enter the site in the vicinity of Well SR-11, hydraulically upgradient from the Lexington Avenue Facility. The suite of compounds present in this well cluster, including 1,1,1-trichloroethane (1,1,1-TCA), is indicative of an unidentified off-site source, unrelated to ACR's Lexington Avenue Facility operations.

- Contamination of groundwater by chlorinated organic solvents including trichloroethylene (TCE), tetrachloroethylene (PERC) and associated break-down products including 1,2-dichloroethylene (1,2-DCE), 1,1-dichloroethylene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), and vinyl chloride have been identified at the site. Concentration of VOC's in groundwater range from 162 ppm at SR-216, located within the plant, to 5.2 ppm and 4.5 ppm at Wells R-108 and SR-9, located hydraulically downgradient along AC Rochester's Driving Park Avenue property boundary.

- Potential source areas for the chlorinated solvents present in the groundwater have not been identified in the soils or soil-vapor to date by H&A of New York during investigations conducted in the exterior areas of the Lexington Avenue Facility.

- Investigative activities conducted by H&A of New York at Degreaser Study Area 5, within the interior of the Lexington Avenue Facility have identified source areas of chlorinated solvents in the vicinity of former degreasing operations. Total VOC's detected in soils range from 0.006 ppm to 5900 ppm. Total VOC's detected in groundwater ranged from 5.4 ppm to 650 ppm. The primary constituents are trichloroethylene (TCE), tetrachloroethylene (PERC), 1,2-Dichloroethylene (1,2-DCE) and associated break-down products.

- An apparent localized occurrence of oil-like product was observed in Well SR-216, installed within the Study Area 5 investigative area. The product, containing up to 13% chlorinated solvents, was found floating on the water table, within the upper few feet of bedrock.

- Chlorinated solvents may have become associated with the floating oil-like product as the oils migrated through largely unsaturated soils adjacent to former degreaser locations. The floating product, where present, may serve as a source of groundwater contamination by dissolution of the various soluble constituents.

- Analysis for RCRA Appendix IX listed compounds conducted at the SR-103 and SR-110 well clusters indicates that groundwater contamination at the site appears to be limited to the VOC's previously identified including chlorinated solvents and to a lessor extent benzene, toluene, ethyl-benzene, and xylene (BTEX) compounds.

- Data collected during the installation of Well DR-105 indicate that the chlorinated solvent plume appears to be restricted to the upper 25 feet to 30 feet of bedrock. The restriction in the vertical extent of the contaminant plume is interpreted to be related to the decreasing incidence of open joints/fractures with increasing depth.

- The 7-foot diameter sewer tunnel that parallels Driving Park Avenue appears to affect the groundwater flow regime through localized depression of the water table. The effect of this phenomenon on contaminant transport has not been investigated.

- Contaminant concentration levels in intermediate-bedrock Wells R-108 and R-109, located along the northern ACR property boundary at Driving Park Avenue, hydraulically downgradient from the Lexington Avenue Facility, appear to be gradually increasing over time. This may be indicative of northerly migration of the contaminant plume.

VII. RECOMMENDATIONS

H&A of New York recommends that AC Rochester proceed with the testing of the effectiveness of the Peroxidation Systems, Inc. perox-pure™ treatment technology in remediating site groundwaters contaminated with chlorinated organic solvents. Further investigation to explore the vertical extent of the contaminant plume hydraulically downgradient from the ACR Plant and to asses the local effect of the 7-foot City of Rochester Sewer Tunnel on the hydrogeologic flow regime are warranted. Continuation of ACR's current efforts to characterize source areas of chlorinated solvent and/or floating oil-like-product, followed by implementation of remedial action to minimize further environmental degradation, are also warranted. It is further recommended that AC Rochester install a migration control system, consisting of an engineered, blasted-bedrock trench, groundwater recovery wells and appurtenances and a suitable groundwater treatment system, in order to minimize the potential for off-site migration of the contaminant plume.

7-01. perox-pure™ SYSTEM START-UP

H&A of New York and ACR have identified chemical oxidation technologies utilizing ultraviolet light in combination with hydrogen peroxide and/or ozone as a potential remedial treatment alternative for site groundwaters contaminated with various chlorinated solvents. A successful bench-scale pilot test using groundwater extracted from well Z has been performed by Peroxidation Systems, Inc., (PSI) Tucson, Arizona using the perox-pure™ system. The perox-pure™ system utilizes high energy ultraviolet light and hydrogen peroxide to chemically oxidize chlorinated compounds resulting in the destructive oxidation of the contaminants and producing an effluent stream consisting of water and chloride ions.

A field scale test of the perox-pure™ system using a PSI LV-60 unit is underway utilizing Well Z as a source of contaminated groundwater. Treated water will be discharged to the local Public Owned Treatment Works (POTW).

H&A recommends that during the startup and on-going operation of the pilot test, real-time testing of contaminant concentrations in the influent and effluent be performed with a Photovac model 10s70 or 10s50 portable gas chromatograph (GC) to document the effectiveness of the perox-pure™ equipment in treating site groundwater under various operating conditions. The Photovac GC screening should be supported by scheduled sampling and laboratory analysis of both the influent and effluent utilizing by EPA Method 8240.

H&A recommends that ACR continue the well Z pilot test through design and construction of the proposed migration control system, as further discussed in Section 7-03. Upon completion of the blasted trench the LV-60 unit could also be utilized to treat groundwater collected during the tests of the production capacity of the trench. Interim operation of the trench and treatment of extracted groundwater during the design and construction of full-scale collection and treatment facility is recommended as further discussed in section 7-03.

7-02. SITE DEFINITION

H&A of New York recommends that two deep-bedrock (DR) wells and 8 to 10 piezometer be installed at the approximate locations indicated on Figure 2. Inspection of the 7-foot diameter sewer tunnel is warranted to assess the structure's integrity, as discussed below.

7.2.1 Deep Bedrock (DR) wells

It is recommended that a deep-bedrock well be installed at the R-103 and R-109 well clusters. The well design and construction specifications should be similar to those discussed in Section 2.3.1. The proposed location of DR-103 and DR-109 are hydraulically downgradient from source areas identified within the interior of the plant. Well DR-103 will be installed adjacent to Well R-103 which has historically had the highest levels of VOC's detected in the downgradient monitoring well clusters (up to 88.4 ppm). The DR-103 installation will be utilized to assess the vertical extent of the chlorinated solvent contaminant plume at this area of the facility. Well DR-109 will be installed adjacent to the R-109 well cluster, in proximity to the ACR property boundary along Driving Park Avenue. The DR-109 well installation will be utilized to assess the vertical extent of contamination at the ACR property boundary. Total VOC's of up to 3.9 ppm have been detected in Well R-109 in the intermediate bedrock zone 15 to 25 feet below the top of bedrock.

Upon completion of the installation of DR-103 and DR-109 the entire deep bedrock (DR) groundwater monitoring network including DR-103, DR-105 and DR-109 should be sampled and analyzed by EPA Method 8240. The sampling event should be repeated 2 to 4 weeks later. Data derived from the well installations and analyses of groundwater quality from the respective monitoring locations will be utilized to assess the vertical extent of the contaminant plume in the area of the proposed blasted-bedrock trench and in the design of the proposed migration control system.

7.2.2 Piezometers

It is recommended that eight to ten 2-in. I.D. PVC piezometers be installed at selected locations along the north and south side of the 7-foot-diameter city sewer tunnel. The piezometers should be installed utilizing hollow stem augers with continuous split-spoon sampling in accordance with ASTM requirements. A representative sample specimen from each split-spoon should be retained in a 40 ml. glass VOA vial, refrigerated and submitted for laboratory analysis by EPA method 8240 and for selected metals. Upon reaching the top of bedrock an NX core barrel should be advanced to an elevation approximately 5 to 10 feet below the water table. The NX core-hole should be reamed to a nominal 4-in. diameter and a 2-in. I.D. PVC screen/riser assembly should be installed with appropriate sand-pack and surface seal.

Upon completion of the piezometer installations, the piezometers should be developed by bailing and subsequently sampled for laboratory analysis by EPA method 8240 and selected metals.

It is anticipated that the piezometer sampling will be a one (1)-time event to attempt to ascertain groundwater quality adjacent to the sewer tunnel. The piezometer network installed adjacent to the sewer can be utilized for water level monitoring during the proposed migration control system installation and subsequent operation.

7.2.3 Sewer Tunnel Inspection

H&A recommends that a survey be made inside the 7-foot diameter city sewer tunnel to observe and document tunnel lining conditions. At ACR's direction, H&A personnel will coordinate access to the Lexington Avenue Tunnel with Monroe County Pure Waters. H&A of New York personnel will prepare logs graphically documenting locations of existing cracks along the lining, noting locations and approximate volumes of any water inflows, and indicating any apparent areas where the exposed concrete surface has deteriorated. Grab samples of selected water inflows should be obtained during the survey for subsequent laboratory analysis by EPA Method 8240.

Data collected during the survey will be utilized in association with the piezometer installations, discussed in Section 7.2.2, to assess the effect of the sewer

tunnel on the local groundwater flow regime. Furthermore, information gathered will be used to assess the integrity of the tunnel structure and to identify criteria to be incorporated into the design of the engineered blasted-bedrock migration control trench.

7-03. DESIGN AND INSTALLATION OF MIGRATION CONTROL SYSTEM

H&A recommends that interim remedial action be implemented by ACR to include the design and installation of a migration control system to reduce the potential for off-site migration of the contaminant plume. Design of the migration control system can be initiated after assessment of data collected during the site definition work scope, discussed in Section 7.02, is completed. H&A's current concept of the migration control system includes the following:

- A controlled blasted-bedrock trench approximately 750 to 1000 ft. in length at a tentative location shown on Figure 2.
- One to three recovery wells located within the blasted trench.
- Pumps, automated level controls, well houses and associated groundwater collection facilities discharging to a centralized treatment facility. It is anticipated that on-site treatment of the effluent will be by the PSI perox-pure™ process or by a similar chemical oxidation system.

H&A believes that the trench will provide an effective means of intercepting the bedrock joint/fracture network where the majority of groundwater and/or contaminant transport is believed to occur. Because the blasting of the interceptor trench could accelerate off-site contaminant transport, H&A recommends that immediately after the trench is blasted, a significant flow of groundwater be drawn from the trench and treated on a continuous interim basis, until the design and construction of full-scale collection and treatment facilities is completed.

7-04. CONTINUED ON-SITE GROUNDWATER MONITORING

It is recommended that periodic site-wide groundwater sampling and laboratory analysis for EPA Method 8240 constituents and selected metals be implemented. Site-wide water level monitoring of the entire on-site well network should be implemented during months between sampling events or more often as required by specific projects. H&A recommends that sampling of groundwater from PZ-111, PZ-112, PZ-113 and PZ-115 be

incorporated into the routine sampling events in order to assess groundwater quality along the north-eastern ACR property boundary.

"Fingerprinting" of floating oil-like product, when present in groundwater monitoring wells and/or piezometers, is warranted to assist in determining the apparent source (s) and nature of the product. "Fingerprinting" should be performed through application of gas chromatography to analysis of both product samples and type samples of Stoddard Solvent and/or cutting oils and/or other oil-like products utilized in quantity by AC Rochester. Repetition of the "fingerprint" analysis of selected wells may be warranted periodically to monitor changes in product character during on-going recovery operations.

7-05. WELL MAINTENANCE

It is recommended that ACR initiate a periodic well maintenance program for all on-site wells utilized for groundwater monitoring purposes. The program should include the following:

- Re-development of each monitoring well
- Performance of a falling/rising head permeability test. at each well/piezometer.
- Determination of well integrity and/or initiation of necessary remedial action or well replacement.

As determined by ACR and H&A personnel, a periodic schedule of re-development for all on-site groundwater monitoring wells and/or piezometers should be established. Upon completion of the re-development, each well should have a falling/rising head permeability test run. Permeability values should be compared to values calculated during the initial testing noted on Table 10. Wells exhibiting a significant decrease below their initial test value should be evaluated for possible remedial action, which may include treatment for iron bacteria, surging or jetting singularly or in combination. The effectiveness of any remedial action should be assessed by re-running the permeability test. Wells with significantly lower measured permeabilities, with little or no response to remedial action should be considered for abandonment and replacement, as warranted.

H&A recommends that well R-105 be abandoned by grouting it with cement/bentonite to ground surface. Permeability testing indicates a decrease of several orders of magnitude in hydraulic conductivity in this well, interpreted to be related to the

DR-105 well installation process. Re-development efforts conducted by H&A of New York indicated no apparent increase in permeability. H&A recommends that the R-105 be replaced with a new intermediate-bedrock well during the next phase of field investigations.

7-06. FLOATING OIL-LIKE PRODUCT RECOVERY

It is recommended that localized product recovery efforts be implemented at SR-102/PZ-130 and SR-216. Product recovery at well SR-102 will require the installation of a recovery well, screened to intercept the floating product apparently present above the top of rock/overburden interface. Product recovery may be implemented at the PZ-130 and SR-216 wells utilizing a 2-in. I.D. flexible Axial Perisaltic (FAP) pump system or through the application of hand bailing.

7-07. DEGREASER INVESTIGATION

It is recommended that plans be implemented for the start-up and operation of the Study Area 5 soil-vapor extraction system discussed in H&A's February 1991 report. The system will serve as a pilot test of the effectiveness and applicability of the soil-vapor extraction technology in remediating on-site soil, soil-vapor, and/or groundwater contamination associated with former degreaser locations.

Furthermore, it is recommended that investigative activities be conducted at the five remaining Degreaser Study Areas as discussed in reports prepared by H&A of New York dated October 1990 and February 1991. These investigative efforts will be focused initially on measuring the levels of soil, soil-vapor and/or groundwater contamination at these potential source areas associated with former degreaser locations. Prioritization of additional investigative or remedial activities, if warranted, can be made based on laboratory determined soil and/or groundwater contaminant concentration levels.

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TABLE 1
AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF EPA METHOD 8240 ANALYSES FOR 12-13 MARCH 1990 GROUNDWATER SAMPLING EVENT

Analyte (concentration in ppm)	Vinyl Chloride	Methylene Chloride	1,1-DCE	1,1-DCA	1,2-DCE	1,1,1-TCA	TCE	Benzene	PERC	Toluene	Ethyl Benzene	Total Xylenes	Total VOC
NYSDEC Groundwater Standard	0.002	0.005	0.005	0.005	0.005	0.005	0.005	ND	0.005	0.005	0.005	0.005	0.100
Overburden Wells													
OW-102	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.007	0.007
OW-105	DRY WELL												
OW-6	0.011	BDL	BDL	0.007	0.098	BDL	0.058	BDL	BDL	BDL	BDL	BDL	0.174
OW-7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Shallow Bedrock Wells													
SR-101	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SR-102	0.800	0.012	0.022	0.070	6.800	0.014	3.400	BDL	0.110	BDL	BDL	BDL	11.228
SR-102 LNAPL (mg/kg)	<2.500	<0.800	2.100	<2.400	220.000	3.000	2100.000	<2.200	180.000	<3.000	<3.600	3.500	2508.600
SR-103	1.400	BDL	0.021	BDL	5.700	BDL	0.720	BDL	BDL	BDL	BDL	BDL	7.841
SR-103 Duplicate *	1.300	BDL	0.022	BDL	5.000	BDL	0.550	BDL	BDL	BDL	BDL	BDL	6.872
SR-105	0.120	BDL	BDL	0.028	0.190	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.338
SR-107	0.014	BDL	BDL	BDL	0.010	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.024
SR-8	DRY WELL												
SR-9	0.160	BDL	0.010	0.014	5.000	BDL	0.087	BDL	BDL	BDL	BDL	BDL	5.271
SR-110	6.100	BDL	BDL	0.010	2.700	BDL	0.079	BDL	BDL	BDL	BDL	BDL	8.889
SR-11	BDL	BDL	0.006	0.008	BDL	0.063	0.052	BDL	BDL	BDL	BDL	BDL	0.129
Detection Limits:	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	

Notes:

1. Groundwater sampling events conducted on 12-13 March 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analyses performed by FREE-COL Laboratories, Inc., Meadville, Pennsylvania, except as noted.
   * - Duplicate sample of SR-103 submitted to FREE-COL as blind sample BGS-189.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standards derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. BDL - Below Detection Limit.
5. Refer to text for additional information.
6. Abbreviations: 1,1-DCE = 1,1-Dichloroethene
   1,1-DCA = 1,1-Dichloroethane
   1,2-DCE = 1,2-Dichloroethene
   1,1,1-TCA = 1,1,1-Trichloroethane
   PERC = Tetrachloroethene
   TCE = Trichloroethene

Table 1 continues on the next page.

FILE NO. 70014-42

H & A OF NEW YORK
ROCHESTER, NEW YORK

TABLE 1
(continued)

Analyte (concentration in ppm)	Vinyl Chloride	Methylene Chloride	1,1-DCE	1,1-DCA	1,2-DCE	1,1,1-TCA	TCE	Benzene	PERC	Toluene	Ethyl Benzene	Total Xylenes	Total VOC
NYSDEC Groundwater Standard	0.002	0.005	0.005	0.005	0.005	0.005	0.005	ND	0.005	0.005	0.005	0.005	0.100
Intermediate Bedrock Wells													
R-101	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
R-102	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
R-103	0.980	BDL	0.120	0.190	34.000	BDL	2.400	0.011	BDL	BDL	BDL	BDL	37.701
R-103 Duplicate	1.200	BDL	0.130	0.190	39.000	BDL	2.300	0.010	BDL	BDL	BDL	BDL	42.830
R-103 Duplicate **	1.700	0.006	0.130	BDL	32.000	BDL	2.800	0.011	BDL	BDL	BDL	BDL	36.647
R-105	3.200	BDL	0.150	0.130	45.000	BDL	0.390	BDL	BDL	BDL	BDL	BDL	48.870
R-107	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
R-108	0.460	BDL	BDL	BDL	1.300	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.760
R-109	0.054	BDL	0.008	0.010	2.500	BDL	0.010	BDL	BDL	BDL	BDL	BDL	2.582
R-110	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trip Blank	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Field Blank	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Lab Blank	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Detection Limits:													
FREE-COL Lab.	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	
Enseco-Erco Lab.	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	

Notes:

1. Groundwater sampling events conducted on 12-13 March 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analyses performed by FREE-COL Laboratories, Inc., Meadville, Pennsylvania, except as noted.
   ** - Duplicate sample of R-103 submitted to Enseco-Erco Laboratory, Cambridge, Massachusetts for EPA method 624 analysis.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standards derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. BDL - Below Detection Limit.
5. Refer to text for additional information.
6. Abbreviations: 1,1-DCE = 1,1-Dichloroethene
   1,1-DCA = 1,1-Dichloroethane
   1,2-DCE = 1,2-Dichloroethene
   1,1,1-TCA = 1,1,1-Trichloroethane
   PERC = Tetrachloroethene
   TCE = Trichloroethene

H & A OF NEW YORK
ROCHESTER, NEW YORK

TABLE 2
AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY EPA METHOD 8240 ANALYSES FOR 18-19 JUNE 1990 GROUNDWATER SAMPLING EVENT

Analyte (concentration in ppm)	Vinyl Chloride	Methylene Chloride	1,1-DCE	1,1-DCA	1,2-DCE	1,1,1-TCA	TCE	Benzene	PERC	Toluene	Ethyl Benzene	Total Xylenes	Total VOC
NYSDEC Groundwater Standard	0.002	0.005	0.005	0.005	0.005	0.005	0.005	ND	0.005	0.005	0.005	0.005	0.100
Overburden Wells													
OW-102	BDL	BDL	BDL	BDL	0.012	BDL	BDL	BDL	BDL	BDL	BDL	0.008	0.020
OW-105	DRY WELL												-
OW-6	BDL	BDL	BDL	0.010	0.120	BDL	0.068	BDL	BDL	BDL	BDL	BDL	0.198
OW-7	DRY WELL												-
Shallow Bedrock Wells													
SR-101	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
SR-102	1.100	BDL	0.015	0.071	6.200	0.013	3.300	BDL	0.074	BDL	0.005	0.005	10.783
SR-102 LANPL(mg/kg)	8.000	<0.800	<1.400	<2.400	90.000	2.500	360.000	<2.200	46.000	<3.000	4.000	6.500	517.000
SR-103	1.800	BDL	0.025	BDL	6.700	BDL	0.950	BDL	BDL	BDL	BDL	BDL	9.475
SR-105	0.083	BDL	BDL	0.034	0.200	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.317
SR-107	0.012	BDL	BDL	BDL	0.010	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.022
SR-8	DRY WELL												-
SR-9	0.360	BDL	0.016	0.019	4.200	BDL	0.039	BDL	BDL	BDL	BDL	BDL	4.618
SR-110	9.200	BDL	BDL	0.021	3.900	BDL	0.007	BDL	BDL	0.006	0.005	0.017	13.156
SR-11	BDL	BDL	0.016	0.031	BDL	0.100	0.410	BDL	BDL	BDL	BDL	BDL	0.557
Detection Limits:	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-

Notes:

1. Groundwater sampling events conducted on 18-19 June 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analytical work performed by FREE-COL Laboratories, Inc. Meadville, Pennsylvania.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standards derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. BDL - Below Detection Limit.
5. Refer to text for additional information.
6. Abbreviations: 1,1-DCE = 1,1-Dichloroethene
   1,1-DCA = 1,1-Dichloroethane
   1,2-DCE = 1,2-Dichloroethene
   1,1,1-TCA = 1,1,1-Trichloroethane
   PERC = Tetrachloroethene
   TCE = Trichloroethene

Table 2 continues on the next page.

TABLE 2
(continued)

Analyte (concentration in ppm)	Vinyl Chloride	Methylene Chloride	1,1-DCE	1,1-DCA	1,2-DCE	1,1,1-TCA	TCE	Benzene	PERC	Toluene	Ethyl Benzene	Total Xylenes	Total VOC
NYSDEC Groundwater Standard	0.002	0.005	0.005	0.005	0.005	0.005	0.005	ND	0.005	0.005	0.005	0.005	0.100
Intermediate Bedrock Wells													
R-101	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
R-102	BDL	BDL	BDL	BDL	BDL	BDL	0.008	BDL	BDL	BDL	BDL	BDL	0.008
R-103	1.900	BDL	0.080	0.076	45.000	BDL	40.000	0.005	BDL	0.058	BDL	BDL	87.119
R-103 Dupl.	2.200	BDL	0.073	0.066	43.000	BDL	43.000	0.005	BDL	0.061	BDL	BDL	88.405
R-105	3.300	BDL	0.100	0.120	37.000	BDL	0.260	BDL	BDL	0.010	BDL	BDL	40.790
R-107	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.110	BDL	BDL	0.110
R-108	0.580	BDL	BDL	BDL	2.400	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.980
R-109	0.300	BDL	0.010	0.017	3.500	BDL	0.023	BDL	BDL	BDL	BDL	BDL	3.850
R-110	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trip Blank A & B	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Field Blank 06/18	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Field Blank 06/19	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Detection Limits:	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	-

Notes:

1. Groundwater sampling events conducted on 18-19 June 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analytical work performed by FREE-COL Laboratories, Inc. Meadville, Pennsylvania.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standards derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. BDL - Below Detection Limit.
5. Refer to text for additional information.
6. Abbreviations: 1,1-DCE = 1,1-Dichloroethene
   1,1-DCA = 1,1-Dichloroethane
   1,2-DCE = 1,2-Dichloroethene
   1,1,1-TCA = 1,1,1-Trichloroethane
   PERC = Tetrachloroethene
   TCE = Trichloroethene

TABLE 3
AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF EPA METHOD 624/8240 ANALYSES
VOLATILE COMPOUNDS IN GROUNDWATER
5-8 NOVEMBER 1990 GROUNDWATER SAMPLING EVENT

SAMPLE NUMBER	VINYL CHLORIDE	METHYLENE CHLORIDE	ACETONE	1,1-DCE	1,1-DCA	1,2-DCE	1,1,1-TCA	TCE	BENZENE	PERC	TOLUENE	ETHYL -BENZ.	XYLENE	Total VOC
NYSDEC STANDARD	0.002	0.005	0.050	0.005	0.005	0.005	0.005	0.005	BDL	0.005	0.005	0.005	0.005	0.100
OVERBURDEN WELLS														
OW-6	0.029	--	--	--	0.010	0.120	--	0.100	--	--	--	--	--	0.259
OW-7 (DRY)														
OW-102	--	--	--	--	--	--	--	--	--	--	--	0.007	0.012	0.019
OW-105 (DRY)														
PZ-132	0.038	--	--	--	--	0.022	--	0.010	--	--	--	--	--	0.070
PZ-132 LNAPL	--	--	--	--	--	1.000	6.500	8.000	--	2.600	--	--	--	18.100
SHALLOW BEDROCK WELLS														
SR-1 (NOT SAMPLED)														
SR-2	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
SR-3	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
SR-8 (DRY)														
SR-9	0.390	--	--	0.011	0.017	4.100	--	0.030	--	--	--	--	--	4.548
SR-11	--	--	--	0.086	0.087	--	0.200	0.098	--	--	--	--	--	0.471
SR-101	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
SR-102	1.800	--	--	0.025	0.086	6.800	0.017	3.800	--	0.091	--	0.005	0.005	12.629
SR-102 LNAPL	23.000	--	--	2.100	2.000	260.000	8.600	1,200.000	--	--	--	--	--	1,495.700
SR-103	1.500	--	--	0.025	--	6.200	--	0.760	--	--	--	--	--	8.485
SR-103 *	m 1.000	0.0076 J,B	--	0.014	--	m 3.900	--	m 0.320	0.0023 J,TB	--	--	--	--	5.244
SR-105	0.099	--	--	--	0.027	0.160	--	--	--	--	--	--	--	0.286
SR-107	0.029	--	--	--	--	0.046	--	--	--	--	--	--	--	0.075
SR-110	14.000	--	--	--	0.026	1.200	--	--	--	--	0.008	0.005	0.027	15.266
PZ-129	0.180	--	--	0.012	0.023	16.000	0.008	8.300	--	0.089	--	--	--	24.612
PZ-130	--	--	--	--	0.008	0.007	--	--	--	--	--	--	--	0.015
PZ-130 LNAPL	--	--	--	--	0.008	--	--	--	--	--	--	--	--	0.008
SR-131	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
SR-132	--	--	--	--	--	0.007	--	--	--	--	--	--	--	0.007
SR-216	0.029	--	--	--	0.240	92.000	--	51.000	--	19.000	--	--	0.016	162.285
SR-216 LNAPL	240.000	--	--	26.000	17.000	4,600.000	11.000	25,000.000	--	57,000.000	2.000	9.800	34.000	86,939.800
SR-230	13.000	--	--	0.023	--	95.000	--	--	--	--	--	--	--	108.023
DETECTION LIMITS:														
FREE-COL LAB.	0.010	0.005	0.100	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	
ENSECO/ERCO LAB	0.010	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	

NOTE: TABLE 3 CONTINUES ON THE NEXT PAGE.

TABLE 3, CONTINUED
SUMMARY OF EPA METHOD 624/8240 ANALYSES
5-8 NOVEMBER 1990 GROUNDWATER SAMPLING EVENT

SAMPLE NUMBER	VINYL CHLORIDE	METHYLENE CHLORIDE	ACETONE	1,1-DCE	1,1-DCA	1,2-DCE	1,1,1-TCA	TCE	BENZENE	PERC	TOLUENE	ETHYL-BENZENE	XYLENE	Total VOC
NYSDEC STANDARD	0.002	0.005	0.050	0.005	0.005	0.005	0.005	0.005	BDL	0.005	0.005	0.005	0.005	0.100
INTERMEDIATE BEDROCK WELLS														
R-2	0.093	--	--	--	0.006	0.043	--	--	--	--	--	0.046	0.058	0.246
R-3	--	--	--	--	--	--	--	0.006	--	--	--	--	--	0.006
R-11	--	--	--	--	0.012	0.006	0.011	--	--	--	--	--	--	0.029
R-11 DUPLICATE	--	--	--	--	0.012	0.006	0.011	--	--	--	--	--	--	0.029
R-101	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
R-102	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
R-103 (11/6/90)	0.380	--	--	0.034	0.084	23.000	--	8.000	0.008	--	--	--	--	31.506
R-103 (11/7/90)	1.400	--	--	0.080	0.097	34.000	--	26.000	0.007	--	0.005	--	--	61.589
R-103 (") *	1.300	0.550 J,B	--	--	--	35.000	--	18.000	--	--	--	--	--	54.300
R-103 DUP.(") *	1.900	0.450 J,B	--	--	0.260 J	45.000	--	25.000	--	--	--	--	--	71.900
R-105	0.420	--	--	0.029	0.051	16.000	--	0.120	--	--	--	--	--	16.620
R-106	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
R-107	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
R-108	0.810	--	--	0.006	0.007	4.400	--	0.005	--	--	--	--	--	5.228
R-109	0.220	--	--	0.009	0.012	2.400	--	0.010	--	--	--	--	--	2.651
R-109 DUPLICATE	0.260	--	--	0.012	0.015	2.700	--	0.012	--	--	--	--	--	2.999
R-110	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
R-131	7.900	--	--	0.070	0.031	35.000	--	0.160	--	--	0.008	--	--	43.169
R-131 DUPLICATE	5.400	--	--	0.062	0.031	42.000	--	0.160	--	--	0.008	--	--	47.661
R-132	--	--	--	--	--	--	--	--	--	--	--	--	--	BDL
DEEP BEDROCK WELL														
DR-105	--.	--	0.290	--	--	--	--	--	0.019	--	--	--	--	0.309
DETECTION LIMITS:														
FREE-COL LAB.	0.010	0.005	0.100	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	
ENSECO/ERCO LAB	0.010	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	

NOTES:
1. ALL CONCENTRATIONS REPORTED IN PARTS PER MILLION (PPM, EQUIVALENT TO MILLIGRAMS PER LITER).
2. "--" INDICATES "BELOW DETECTION LIMIT" (BDL).
3. * - INDICATES SAMPLES ANALYZED BY ENSECO-ERCO LABORATORY USING EPA METHOD 624.
   ALL OTHER SAMPLES ANALYZED BY FREE-COL LABORATORIES USING EPA METHOD 8240.
4. m - INDICATES THAT THE CONMCENTRATION OF THIS COMPOUND EXCEEDED THE STANDARD CALIBRATION RANGE IN THE ORGINAL ANALYSIS.
   THE REPORTED CONCENTRATION WAS DERIVED FROM A SECOND ANALYSIS RUN ON A DILUTION OUTSIDE THE HOLDING TIME FOR VOLATILE COMPOUNDS.
5. J - INDICATES AN ESTIMATED CONCENTRATION BELOW THE SAMPLE QUANTITATION LIMIT FOR THIS COMPOUND.
6. B - INDICATES COMPOUND DETECTED IN FIELD, TRIP AND LABORATORY METHOD BLANK SAMPLES.
7. TB - INDICATES COMPOUND DETECTED IN THE TRIP BLANK SAMPLE.
8. CARBON DISULFIDE AND METHYL-ETHYL-KETONE WERE DETECTED IN SAMPLES ANALYZED BY ENSECO-ERCO LABORATORY AT CONCENTRATIONS
   EQUIVALENT TO OR LESS THAN THE CONCENTRATIONS OF THESE COMPOUNDS DETECTED IN LABORATORY METHOD BLANK SAMPLES.
9. REFER TO TEXT AND TABLE 7 FOR ADDITIONAL INFORMATION.

TABLE 4
AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF TOTAL METALS ANALYTICAL DATA AND FIELD PARAMETERS
12-13 MARCH 1990 GROUNDWATER SAMPLING EVENT

Analyte	Chromium	Zinc	Nickel	Tin	Copper	Lead	Mercury		Field Parameters		
									Temp.(C)	pH	Spec.Cond.
NYSDEC Groundwater Standard	0.050	<0.300	700.000	N/A	<0.200	0.025	0.002				
Overburden Wells											
OW-102	0.005	0.018	0.100	BDL	BDL	0.005	BDL	OW-102	16.5	6.5	1,900
OW-105	DRY WELL										
OW-6	0.025	0.062	0.070	0.900	0.020	0.016*	BDL	OW-6	13.8	6.8	3,970
OW-7	Not analyzed - insufficient water										
Shallow Bedrock Wells											
SR-101	0.052	0.050	0.070	1.500	0.030	0.027*	BDL	SR-101	15.6	7.1	2,710
SR-102	0.006	0.013	0.060	BDL	BDL	0.003*	BDL	SR-102	17.9	7.1	2,390
SR-103	0.006	0.020	BDL	BDL	BDL	0.006*	BDL	SR-103	16.5	6.5	2,340
SR-103 Duplicate	0.005	0.017	0.040	BDL	BDL	0.007	0.0001				
SR-105	0.006	0.024	0.040	BDL	BDL	0.007*	BDL	SR-105	16.1	6.5	2,950
SR-107	0.005	0.019	BDL	BDL	BDL	0.005*	BDL	SR-107	14.8	6.7	1,914
SR-8	DRY WELL										
SR-9	0.008	0.031	BDL	BDL	0.020	0.016*	BDL	SR-9	13.2	6.7	1,850
SR-110	0.090	0.142	0.190	BDL	0.100	0.024*	0.0052	SR-110	16.7	7.0	3,620
SR-11	0.100	0.016	BDL	BDL	BDL	0.007	BDL	SR-11	13.9	7.1	557
Detection Limits:	0.001	0.005	0.040	0.800	0.020	0.001	0.0001				

Notes:
1. Groundwater sampling events conducted on 12-13 March 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analyses performed by FREE-COL Laboratories, Inc., Meadville, Pennsylvania, except where noted. SR-103 duplicate sample submitted to Free-Col as blind sample BGS-189.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standard derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. * - Analysis performed by method of Standard additions due to suspected matrix interference.
5. BDL = below detection limit.
6. Refer to text for additional information.

Table 4 continues on the next page.

TABLE 4
(continued)

Analyte	Chromium	Zinc	Nickel	Tin	Copper	Lead	Mercury		Field Parameters		
									Temp.(C)	pH	Spec.Cond.
NYSDEC Groundwater Standard	0.050	<0.300	700.000	N/A	<0.200	0.025	0.002				
Intermediate Bedrock Wells											
R-101	0.027	0.220	0.060	0.900	BDL	0.004*	BDL	R-101	18.4	8.0	8,000
R-102	0.004*	0.122	0.060	0.800	BDL	<0.001*	BDL	R-102	18.0	7.4	7,810
R-103	0.003	0.011	0.040	0.800	BDL	0.003*	BDL	R-103	17.0	6.6	3,210
R-103 Duplicate	0.002	0.007	0.040	BDL	BDL	0.002	BDL	R-103 Dup	17.0	6.6	3,210
R-103 Duplicate **	BDL	BDL	BDL	BDL	BDL	BDL	BDL				
R-105	0.002	0.013	0.040	0.800	BDL	0.003	BDL	R-105	15.9	6.4	2,700
R-107	0.003	0.197	0.200	BDL	BDL	<0.001*	BDL	R-107	15.0	6.3	>20,000
R-108	0.002	0.013	BDL	BDL	BDL	0.007	0.0001	R-108	16.3	6.5	3,000
R-109	0.004	0.006	BDL	BDL	BDL	0.002*	BDL	R-109	14.7	6.7	3,640
R-110	0.006	0.015	0.100	BDL	BDL	0.002*	BDL	R-110	18.9	6.8	12,600
Sample Blanks:											
Trip Blank	0.004*	BDL	BDL	BDL	BDL	0.001	BDL				
Field Blank 03/12	0.004*	BDL	BDL	BDL	BDL	0.001	BDL				
Field Blank 03/13	0.004*	BDL	BDL	BDL	BDL	0.004	BDL				
Lab Blank	0.004	BDL	BDL	BDL	BDL	0.002	BDL				
Detection Limits:											
FREE-COL LAB.	0.001	0.005	0.040	0.800	0.020	0.001	0.0001				
ENSECO-ERCO LAB.	0.010	0.020	0.040	0.050	0.010	0.010	0.0002				

Notes:
1. Groundwater sampling events conducted on 12-13 March 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analyses performed by FREE-COL Laboratories, Inc., Meadville, Pennsylvania, except where noted.
   ** - Indicates sample analyzed by Enseco-Erco Laboratory, Cambridge, Massachusetts.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standard derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. * - Analysis performed by method of Standard additions due to suspected matrix interference.
5. BDL = below detection limit.
6. Refer to text for additional information.

TABLE 5
AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF TOTAL METALS ANALYTICAL DATA AND FIELD PARAMETERS
18-19 JUNE 1990 GROUNDWATER SAMPLING EVENT

Analyte (concentration in ppm)	Chromium	Zinc	Nickel	Tin	Copper	Lead	Mercury		Field Parameters		
									Temp.(C)	pH	Spec.Cond.
NYSDEC Groundwater Standard	0.050	<0.300	700.000	N/A	<0.200	0.025	0.002				
Overburden Wells											
OW-102	0.005*	0.031	0.060	BDL	BDL	0.001*	BDL	OW-102	15.6	6.6	1,639
OW-105	DRY WELL										
OW-6	0.015	0.065	0.050	BDL	0.020	0.004	BDL	OW-6	17.3	7.1	3,990
OW-7	DRY WELL										
Shallow Bedrock Wells											
SR-101	0.059*	0.047	0.050	BDL	0.020	0.013*	0.0001	SR-101	17.5	7.5	2,540
SR-102	0.007	0.037	0.050	BDL	BDL	0.004*	BDL	SR-102	16.9	6.7	2,210
SR-103	BDL	0.013	BDL	BDL	BDL	BDL	BDL	SR-103	13.9	6.7	2,180
SR-105	0.008*	0.059	BDL	BDL	0.030	0.003*	BDL	SR-105	14.7	6.9	3,280
SR-107	0.001*	0.111	BDL	BDL	BDL	BDL	BDL	SR-107	13.1	6.6	1,630
SR-8	DRY WELL										
SR-9	0.003	0.057	0.040	BDL	0.020	0.004	BDL	SR-9	15.2	6.5	1,829
SR-110	0.024	0.152	0.150	BDL	0.040	BDL	0.0012	SR-110	14.3	7.1	3,970
SR-11	0.334	0.039	0.130	BDL	0.030	0.018	BDL	SR-11	13.7	7.0	884
Detection Limits:	0.001	0.005	0.040	0.800	0.020	0.001	0.0001				

Notes:
1. Groundwater sampling events conducted on 18-19 June 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analyses performed by FREE-COL Laboratories, Inc., Meadville, Pennsylvania.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standard derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. * - Analysis performed by method of Standard additions due to suspected matrix interference.
5. BDL = below detection limit.
6. Refer to text for additional information.

Table 5 continues on the next page.

TABLE 5
(continued)

Analyte (concentration in ppm)	Chromium	Zinc	Nickel	Tin	Copper	Lead	Mercury		Field Parameters Temp.(C)	pH	Spec.Cond.
NYSDEC Groundwater Standard	0.050	<0.300	700.000	N/A	<0.200	0.025	0.002				
Intermediate Bedrock Wells											
R-101	0.002*	0.249	0.040	BDL	0.030	BDL	BDL	R-101	14.7	7.3	4,390
R-102	BDL	0.015	BDL	BDL	BDL	BDL	BDL	R-102	17.0	7.5	6,540
R-103	BDL	0.009	BDL	BDL	BDL	0.001*	BDL	R-103	14.4	6.4	2,780
R-103 Duplicate	0.001*	0.016	BDL	BDL	BDL	0.003*	BDL	R-103 Dup	14.5	6.6	2,850
R-105	0.002*	0.130	BDL	BDL	0.020	0.004*	BDL	R-105	16.9	6.7	2,200
R-107	0.002	0.091	0.180	BDL	0.060	<0.005*	BDL	R-107	14.2	6.3	>20,000
R-108	0.001	0.058	0.040	BDL	BDL	0.001*	BDL	R-108	13.6	6.7	4,040
R-109	0.001	0.010	0.040	BDL	BDL	BDL	BDL	R-109	13.0	7.0	4,000
R-110	0.008	0.069	0.100	BDL	0.040	BDL	0.0001	R-110	14.1	7.0	12,280
Sample Blanks:											
Trip Blank A & B	0.003	BDL	BDL	BDL	BDL	0.001	BDL				
Field Blank 06/18	0.005	BDL	BDL	BDL	BDL	0.001	BDL				
Field Blank 06/19	0.004	0.027	BDL	BDL	BDL	0.004	BDL				
Detection Limits:	0.001	0.005	0.040	0.800	0.020	0.001	0.0001				

Notes:
1. Groundwater sampling events conducted on 18-19 June 1990 by FREE-COL Laboratories Inc. and H & A of New York personnel. Analyses performed by FREE-COL Laboratories, Inc., Meadville, Pennsylvania.
2. Analytical data reported in parts per million (ppm).
3. New York State Department or Enviromental Conservation (NYSDEC) groundwater standard derived from NYSDEC internal memorandum 21 June 1989, Groundwater Protection Concentrations and EPA Health Based Soil Ingestion Criteria.
4. * - Analysis performed by method of Standard additions due to suspected matrix interference.
5. BDL = below detection limit.
6. Refer to text for additional information.

TABLE 6
AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF TOTAL METALS ANALYTICAL DATA AND FIELD PARAMETERS
NOVEMBER 5-8, 1990 GROUNDWATER SAMPLING EVENT

SAMPLE NUMBER	CHROMIUM	ZINC	NICKEL	TIN	COPPER	LEAD	MERCURY	FIELD PARAMETERS		
								TEMP. (C)	pH	SPEC. COND.
NYSDEC STANDARD	0.050	0.300	700.000	NA	0.200	0.025	0.002			
OVERBURDEN WELLS										
OW-6	0.007	0.032	--	--	--	s 0.002	--	14.7	6.27	3,120
OW-7 (DRY)										
OW-102 (INSUFFICIENT WATER FOR METALS ANALYSIS)										
OW-105 (DRY)										
PZ-132	s 0.030	0.069	0.040	--	0.020	s 0.012	--	14.8	7.00	2,440
SHALLOW BEDROCK WELLS										
SR-1 (NOT SAMPLED)										
SR-2	0.006	0.032	0.040	--	--	s 0.013	--	13.8	6.74	2,840
SR-3	s 0.024	0.069	0.100	--	0.050	s 0.080	--	13.9	6.81	3,580
SR-8 (DRY)										
SR-9	s 0.140	0.078	0.090	--	0.040	0.281	--	13.2	6.84	2,340
SR-11	0.288	0.079	0.220	--	0.050	0.080	--	9.1	7.13	1,001
SR-101	0.120	0.070	0.060	--	0.040	s 0.030	--	14.5	6.95	2,260
SR-102	0.004	0.039	0.050	--	--	s 0.010	--	15.7	6.71	2,090
SR-103	s 0.004	0.067	0.050	--	0.040	s 0.008	--	9.2	6.95	2,620
SR-105	s 0.032	0.138	0.190	--	0.080	s 0.080	--	13.3	6.35	2,610
SR-107	s 0.004	0.027	--	--	0.030	s <0.005	--	8.5	6.92	1,558
SR-110	0.069	0.143	0.120	--	0.150	s 0.025	A 0.0041	13.9	7.01	4,560
PZ-129	s 0.120	0.433	0.280	--	0.440	0.277	0.0200	14.2	7.05	3,180
PZ-130	s 0.056	0.224	0.160	--	0.260	s 0.104	0.0005	16.4	7.22	2,440
SR-131	0.007	0.038	--	--	--	s 0.065	--	15.1	6.83	2,820
SR-132	s 0.030	0.080	0.110	--	0.090	s 0.080	--	16.3	7.35	3,400
SR-216	0.006	0.043	0.080	--	--	s 0.016	--	22.1	6.09	2,180
SR-230	0.006	0.054	--	--	0.020	s 0.009	--	22.7	6.95	1,640
DETECTION LIMITS:	0.001		0.040	0.800	0.020	0.001	0.0001			

NOTES:
1. ALL CONCENTRATIONS REPORTED IN PARTS PER MILLION (PPM, EQUIVALENT TO MILLIGRAMS PER LITER).
2. "--" INDICATES "BELOW DETECTION LIMIT" (BDL).
3. ALL SAMPLES ANALYZED BY FREE-COL LABORATORIES.
4. A - INDICATES CONCENTRATION DETERMINED BY AVERAGING TWO ANALYSES.
5. s - INDICATES CONCENTRATION DETERMINED BY METHOD OF STANDARD ADDITIONS.
6. REFER TO TEXT FOR ADDITIONAL INFORMATION.

TABLE 6 CONTINUES ON THE NEXT PAGE.

TABLE 6, CONTINUED
SUMMARY OF TOTAL METALS ANALYTICAL DATA AND FIELD PARAMETERS
NOVEMBER 5-8, 1990 GROUNDWATER SAMPLING EVENT

SAMPLE NUMBER	CHROMIUM	ZINC	NICKEL	TIN	COPPER	LEAD	MERCURY		FIELD PARAMETERS		
									TEMP. (C)	pH	SPEC. COND.
NYSDEC STANDARD	0.050	0.300	700.000	NA	0.200	0.025	0.0020				
INTERMEDIATE BEDROCK WELLS											
R-2	s 0.003	0.030	--	--	--	s 0.009	--	R-2	10.6	7.12	1,730
R-3	s 0.002	0.027	--	--	0.020	s 0.008	0.0001	R-3	11.6	6.46	2,750
R-11	0.001	0.040	--	1.400	0.020	s 0.005	--	R-11	9.9	7.05	649
R-11 DUPLICATE	0.001	0.027	0.040	--	--	s 0.002	--	R-11 DUPLICATE	9.9	7.70	663
R-101	s --	0.021	--	--	--	s 0.004	--	R-101	14.3	7.42	4,780
R-102	0.001	0.023	0.050	--	--	s 0.017	--	R-102	13.4	7.69	6,390
R-103 (11/6/90)								R-103 (11/6/90)	11.8	6.53	3,040
R-103 (11/7/90)	s 0.004	0.044	--	--	0.030	s 0.019	--	R-103 (11/7/90)	10.7	6.81	3,150
R-105	0.001	0.070	0.080	--	0.110	s <0.005	--	R-105	11.9	12.93	8,860
R-106	0.005	0.061	0.100	--	0.040	s 0.100	--	R-106	10.7	6.93	17,520
R-107	s 0.001	0.029	0.360	--	0.050	s <0.010	--	R-107	11.3	6.53	>20,000
R-108	--	0.037	0.040	--	--	s 0.002	--	R-108	12.0	7.10	3,400
R-109	s 0.001	0.448	0.060	--	--	s --	--	R-109	11.1	6.76	4,170
R-109 DUPLICATE	s 0.001	0.014	--	--	--	s 0.002	--	R-109 DUPLICATE	11.3	6.89	4,140
R-110	0.003	0.045	0.150	--	0.020	s --	--	R-110	10.5	7.28	13,290
R-131	0.001	0.020	--	--	--	s 0.002	--	R-131	15.5	7.09	2,700
R-131 DUPLICATE	0.001	0.024	--	--	--	s 0.006	--	R-131 DUPLICATE	15.9	7.01	2,730
R-132	--	0.025	--	--	--	s --	--	R-132	14.3	7.66	4,520
DEEP BEDROCK WELL											
DR-105	s 0.004	0.160	1.570	1.700	0.270	s --	--	DR-105	9.7	4.45	>20,000
FIELD BLANK, 11/5/90	0.001	0.022	--	--	--	0.003	--				
FIELD BLANK, 11/6/90	0.005	0.200	--	--	0.110	0.126	--				
FIELD BLANK, 11/7/90	0.001	0.024	--	--	--	0.003	--				
TRIP BLANK, 11/5/90	0.001	0.615	--	--	--	s 0.003	--				
TRIP BLANK, 11/6/90	0.002	0.023	--	--	--	s 0.001	--				
TRIP BLANK, 11/7/90	--	0.027	--	--	--	0.005	--				
TRIP BLANK, 11/8/90	0.001	0.019	--	--	--	0.004	--				
DETECTION LIMITS:	0.001		0.040	0.800	0.020	0.001	0.0001				

NOTES:
1. ALL CONCENTRATIONS REPORTED IN PARTS PER MILLION (PPM, EQUIVALENT TO MILLIGRAMS PER LITER).
2. "--" INDICATES "BELOW DETECTION LIMIT" (BDL).
3. ALL SAMPLES ANALYZED BY FREE-COL LABORATORIES.
4. A - INDICATES CONCENTRATION DETERMINED BY AVERAGING TWO ANALYSES.
5. s - INDICATES CONCENTRATION DETERMINED BY METHOD OF STANDARD ADDITIONS.
6. REFER TO TEXT FOR ADDITIONAL INFORMATION.
7. REFER TO APPENDIX C (FREE-COL LABS. LETTER, 19 FEB. 1991) FOR EXPLANATION OF METALS DETECTED IN BLANKS.

TABLE 7
AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF APPENDIX IX COMPOUNDS DETECTED IN GROUNDWATER SAMPLES

INORGANIC CONSTITUENTS (5 JULY 1990):

SAMPLE #: / CONSTITUENT	Total Concentration (in PPM) SR-103	SR-110	R-103	R-110	Dissolved Concentration (in PPM) SR-103	SR-110	R-103	R-110
Antimony	—	—	—	—	0.0464 B	0.0305 B	0.0314 B	0.0849 B
Arsenic	0.0100	0.0058 B	—	—	0.0026 B	0.0022 B	—	—
Barium	0.0520 B	0.2550	0.0518 B	0.0073 B	0.0483 B	0.2400	0.0494 B	0.0054 B
Beryllium	—	—	—	—	—	—	—	—
Cadmium	—	—	—	—	—	—	—	—
Chromium	0.0072 B	0.0817	—	0.0128 B	—	—	—	—
Cobalt	0.0031 B	0.0061 B	—	—	—	—	—	—
Copper	0.0072 B	0.0935	0.0075 B	0.0206 B	0.0075 B	0.0139 B	0.0052	—
Lead	0.0074	0.0219	0.0046 B	—	—	—	—	—
Mercury	—	0.0046	—	—	—	—	—	—
Potassium	3.9000 B	43.8000	14.9000	56.4000	4.0300 B	45.5000	14.4000	53.5000
Selenium	—	—	—	—	—	—	—	—
Silver	—	—	—	—	—	0.0023 B	—	—
Thallium	—	—	—	—	—	—	—	—
Tin	—	0.0243	—	0.0186	—	—	—	—
Vanadium	—	0.0120 B	0.0036 B	—	—	—	—	—
Zinc	0.0421	0.0885	—	0.0353 B	0.0481	0.0389	0.0477	—

VOLATILE ORGANIC COMPOUNDS (5 JULY 1990 and 7 NOVEMBER 1990):

SAMPLE #: / COMPOUND	5 JULY 1990 (in PPM) SR-103	R-103	R-103(D)	BLANKS (*)	7 NOVEMBER 1990 (in PPM) SR-103	R-103	R-103(D)	BLANKS (*)
Vinyl Chloride	1.300	1.200 J	1.100 J	—	1.0000 m	1.300 J	1.900 J	—
Methylene Chloride	0.320	2.900	1.400 J	0.010	0.0076 J	0.550 J	0.430 J	0.0180
Carbon Disulfide	—	—	—	—	0.0012 J	0.250 J	0.240 J	0.0015
1,1-Dichloroethene	—	—	—	—	0.0140	—	—	—
1,1-Dichloroethane	—	—	—	—	—	—	0.260 J	—
1,2-Dichloroethene	4.600	24.000	27.000	—	3.9000 m	35.000	45.000	0.0084
Methyl-ethyl-ketone	—	—	—	—	—	—	1.200 J	0.0048
Trichloroethene	0.660	25.000	29.000	—	0.3200 m	18.000	25.000	0.0029
Benzene	—	—	—	—	0.0023 J	—	—	0.0012
Tetrachloroethene	—	—	0.086 J	—	—	—	—	—
Total VOC's	6.880	53.100	58.586	0.010	5.2451	55.100	74.030	0.0368

Notes:

1. Analyses performed by Enseco-Erco Laboratory, Cambridge, Massachusetts.
2. B - Indicates that the reported concentration is less than the Contract Required Detection Limit but above the instrument detection limit.
3. J - Indicates an estimated concentration for a compound detected below the sample quantitation limit.
4. m - Indicates that the sample concentration of this compound exceeded the standard calibration range in the original analysis. A second analysis was run, with dilution, outside the CLP holding time.
5. * - This column reports the maximum concentrations detected in the field, trip or laboratory method blanks for each compound.
6. "—" Analyte was tested for but not detected in sample.
7. PPM = parts per million (equivalent to mg/L).
8. D - Indicates a duplicate sample.
9. Analyses of volatile compounds in samples collected on 5 July 1990 were performed outside of the CLP holding time due to instrument failure and consequent laboratory backlog.

TABLE 8
AC ROCHESTER DIVISION - GENERAL MOTORS CORPOPATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF MONITORING WELL LOCATIONS AND ELEVATIONS

WELL NUMBER	NORTHING (FT)	EASTING (FT)	GROUND SURFACE	TOP OF CASING	MONITORING INTERVAL TOP	MONITORING INTERVAL BOTTOM	TOP OF ROCK	GROUND-WATER *
OVERBURDEN WELLS								
OW-102	51258.16	57265.18	513.11	515.82	509.10	496.80	NE	497.74
OW-105	51995.71	57581.10	511.14	513.93	504.10	491.90	NE	DRY
OW-6	51930.23	57176.63	498.14	501.05	489.10	485.60	485.30	492.15
OW-7	52033.52	57909.93	499.76	502.18	490.50	486.20	485.30	DRY
PZ-129	51335.32	57290.67	512.23	514.84	506.00	486.23	488.23	497.26
PZ-130	51295.92	57208.23	511.94	515.16	508.40	486.57	491.60	497.80
PZ-132	51101.16	58081.88	512.67	515.65	507.67	497.48	NE	503.59
SHALLOW BEDROCK WELLS								
SR-1	53018.59	57310.04	497.23	500.36	484.60	474.60	484.60	487.02
SR-2	50058.44	58602.59	513.29	516.33	503.60	493.60	503.60	506.02
SR-3	50479.46	56715.04	519.05	522.10	510.20	500.80	510.20	511.48
SR-11	49558.86	57149.40	530.18	533.42	514.10	510.80	518.40	514.47
SR-101	50911.03	56730.77	511.92	514.34	504.40	498.40	505.40	504.48
SR-102	51252.09	57264.11	513.03	515.91	492.80	484.60	492.80	493.75
SR-103	51693.45	57838.16	510.72	513.95	486.10	479.40	486.20	489.12
SR-105	51991.46	57573.38	510.77	513.75	486.80	479.40	486.80	487.35
SR-107	52049.77	57898.34	499.72	502.53	486.70	479.60	485.20	484.22
SR-8	51345.29	58324.84	500.51	502.99	486.50	483.30	489.50	DRY
SR-9	52348.84	57719.03	497.70	500.32	484.70	480.70	487.70	484.92
SR-110	52329.21	57341.11	498.46	501.25	485.00	478.10	485.00	487.81
SR-131	51201.24	57753.03	512.70	515.00	491.20	484.58	489.70	498.01
SR-132	51123.26	58085.96	512.62	515.55	492.62	484.64	490.60	499.63
SR-216	50788.12	57187.34	516.85	516.85	499.85	493.75	497.05	495.71
SR-230	50874.00	57209.00	516.85	516.85	498.85	491.65	496.85	497.50
INTERMEDIATE BEDROCK WELLS								
R-2	50053.01	58594.31	513.39	516.55	489.18	479.21	504.19	488.02
R-3	50486.63	56729.57	518.92	521.90	499.00	489.17	514.42	500.38
R-11	49554.19	57140.39	530.83	533.39	495.90	485.93	511.33	506.27
R-101	50899.62	56727.53	512.22	514.72	488.90	478.40	505.70	499.12
R-102	51245.99	57262.59	513.02	516.02	473.50	463.50	489.60	486.27
R-103	51679.47	57846.58	510.66	513.96	470.60	460.30	485.80	485.13
R-105	51987.74	57583.41	510.67	513.65	470.90	460.10	487.20	486.05
R-106	51941.68	57182.87	498.22	500.90	465.32	455.22	480.62	491.36
R-107	52041.23	57903.88	499.74	502.73	468.50	458.60	485.20	486.16
R-108	51339.52	58316.07	501.00	503.85	473.80	463.60	490.00	484.55
R-109	52358.01	57711.79	497.72	500.53	469.00	458.70	487.20	485.17
R-110	52333.23	57348.06	498.72	501.84	468.70	458.70	484.80	489.54
R-131	51191.38	57750.18	512.82	515.64	474.62	464.62	489.62	486.60
R-132	51092.62	58080.42	512.77	515.75	476.17	464.57	491.87	487.88
DEEP BEDROCK WELLS								
DR-105	51999.59	57565.83	510.98	513.92	435.98	420.98	485.98	435.77
WELL Z	51619.48	57442.66	511.16	515.16	485.90	401.60	487.40	NR

NOTES:

1. WELL LOCATIONS AND ELEVATIONS SURVEYED BY BERGMANN ASSOCIATES, ROCHESTER, NY. LOCATIONS REFERENCED TO AC ROCHESTER COORDINATE GRID SYSTEM, ELEVATIONS TO NGVD.
2. GROUNDWATER ELEVATIONS MEASURED BY H&A OF NEW YORK ON 5 NOVEMBER 1990.
3. * – GROUNDWATER ELEVATION ADJUSTED FOR THICKNESS OF FLOATING OIL LAYER WHERE NECESSARY.
4. NE = NOT ENCOUNTERED, NA = DATA NOT AVAILABLE, NR = NO READING TAKEN.
5. SEE TEXT FOR ADDITIONAL INFORMATION.

TABLE 9

AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF TEST BORING SOIL AND WATER SAMPLE ANALYSES
1990 WELL INSTALLATIONS

BORING NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DEPTH (ft)	CONCENTRATION OF VOCs IN PPM: CHLORO-FORM	VINYL CHLORIDE	1,2-DCE	TCE	BENZENE	TOTAL VOCs
B-105-C	55-65'	WATER	55-65	0.012	ND	ND	ND	ND	0.012
	55-75'	WATER	55-75	0.006	ND	ND	ND	ND	0.006
DRILL WATER BLANK		WATER	- -	0.028	ND	ND	ND	ND	0.028
B-106	S3	SOIL	5-7	ND	ND	ND	ND	ND	ND
B-129	S7	SOIL	12-14	ND	ND	ND	ND	ND	ND
B-130	S3	SOIL	5-7	ND	ND	ND	ND	ND	ND
	S6	SOIL	11-13	ND	ND	ND	ND	ND	ND
B-131	B-133,S5	SOIL	9-11	ND	ND	0.020	0.005	ND	0.025
B-131-A	B-131, S5-S6	SOIL	8-12	ND	ND	0.005	ND	ND	0.005
	B-131,S7	WATER	12-14	ND	0.051	0.042	ND	0.007	0.100
B-132	S5	SOIL	9-11	ND	ND	0.046	0.031	ND	0.077
	TUB 1	DRILL CUTTINGS		ND	ND	ND	ND	ND	ND
	TUB 2	DRILL CUTTINGS		ND	ND	ND	ND	ND	ND

NOTES:
1. ALL ANALYSES PERFORMED BY FREE-COL LABORATORIES, MEADVILLE, PA. ANALYTICAL METHOD USED WAS EPA METHOD 8240. METHOD 8240 ANALYTES THAT WERE NOT DETECTED IN SAMPLES ARE NOT REPORTED ON THIS TABLE. ANALYTICAL REPORTS ARE PRESENTED IN APPENDIX F.
2. SAMPLE B-132,S5 ANALYZED FOR TOTAL PETROLEUM HYDROCARBONS BY FREE-COL; RESULT = 3,430 PPM.
3. ND = NOT DETECTED.
4. REFER TO TEXT FOR ADDITIONAL INFORMATION.

TABLE 10

AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION
SUMMARY OF HYDRAULIC CONDUCTIVITY TESTING

HYDRAULIC CONDUCTIVITY VALUES (Kh) EXPRESSED IN UNITS OF 10^{-6} cm/sec

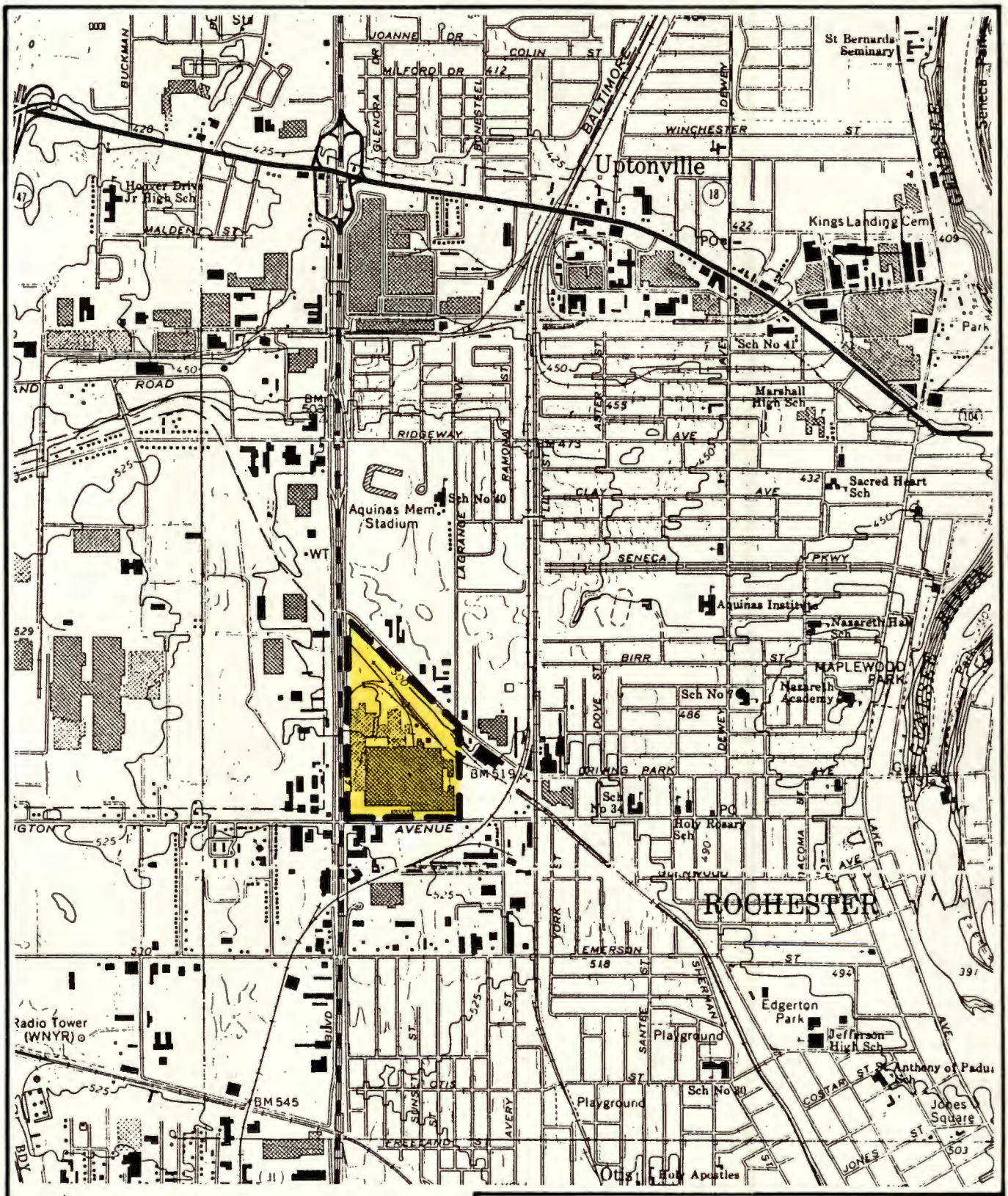
WELL NUMBER	Kh	
OVERBURDEN WELLS		
OW-6	540.0	
OW-7	12.0	
SHALLOW BEDROCK ZONE WELLS		
SR-1	450.00	
SR-2	220.00	
SR-3	330.00	
SR-8	<1	
SR-9	96.00	
SR-11	260.00	
SR-101	320.00	
SR-102	1600.00	
SR-103	1500.00	
SR-105	1800.00	
SR-107	310.00	
SR-110	1.80	
PZ-129	20.77	
SR-131	247.32	
SR-132	19.93	
INTERMEDIATE BEDROCK ZONE WELLS		
R-2	668.90	
R-3	580.50	
R-11	5316.60	
R-101	3.10	
R-102	710.00	
R-103	2400.00	
R-105	1100.00	*
", October,1990	0.71	*
R-106	5.82	
R-107	22.00	
R-108	240.00	
R-109	3600.00	
R-110	7.70	
R-131	1367.67	
R-132	83.00	
DEEP BEDROCK ZONE WELL		
DR-105	0.24	

NOTES:

1. Kh calculated using Hvorslev method described in Lambe and Whitman (1961) and data from rising or falling head tests performed by H&A of New York.

2. * - Kh of intermediate bedrock zone at R-105 was significantly lessened as a consequence of pressure grouting during installation of well # DR-105 in September 1990.

3. Refer to text for additional information and Figure 2 for well locations.



USGS QUADRANGLE: ROCHESTER WEST, N.Y.

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PROJECT LOCUS

SCALE: 1 IN. = 2000 FT. MARCH 1991

FILE NO. 70014-42

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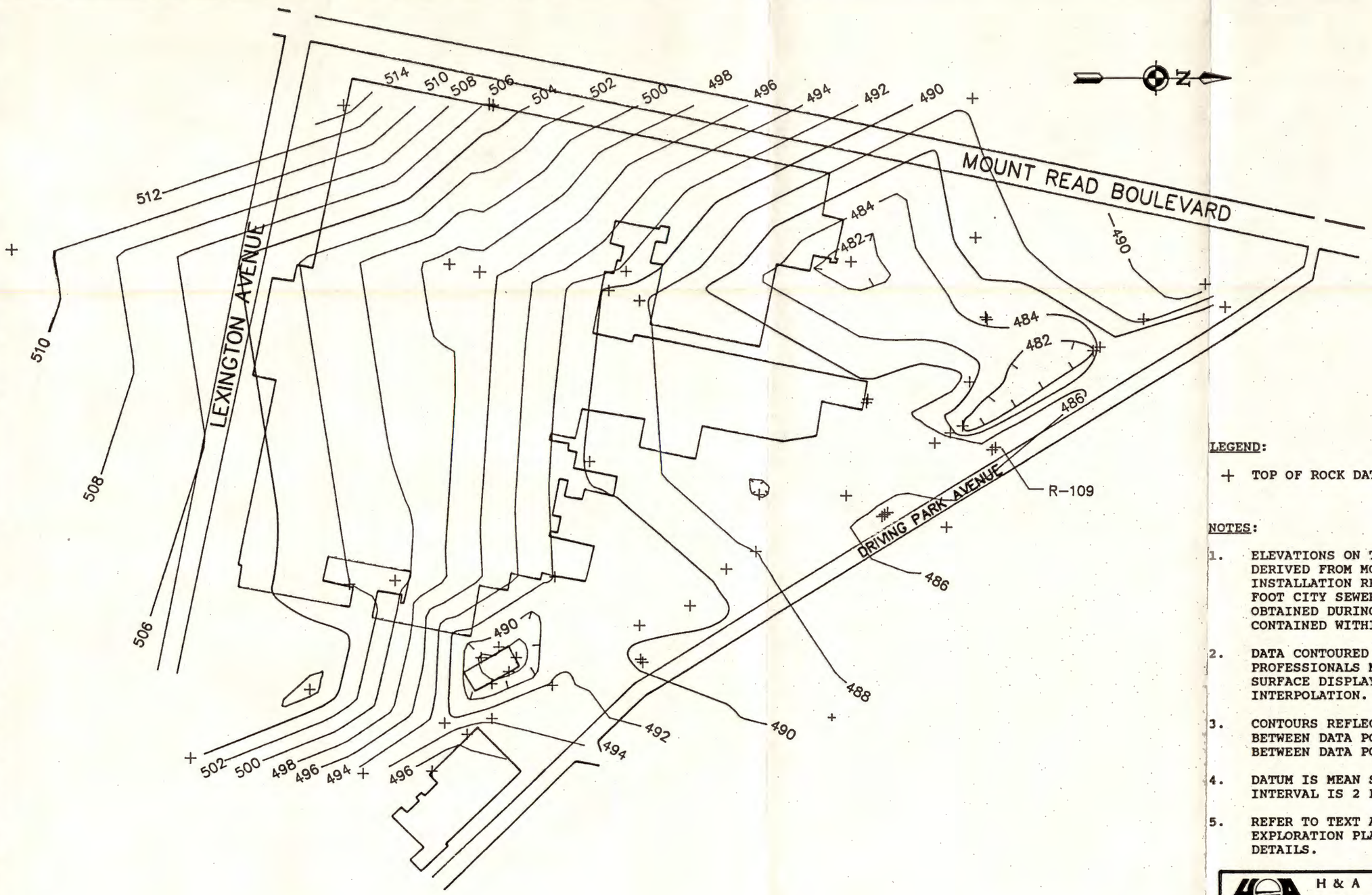
FIGURE 1



LEGEND:

+ TOP OF ROCK DATA POINT.

NOTES:

1. ELEVATIONS ON THE TOP OF BEDROCK AS DERIVED FROM MONITORING WELL INSTALLATION RECORDS, RECORDS FOR THE 7 FOOT CITY SEWER AND TEST BORINGS OBTAINED DURING THE CSOAP PROJECT CONTAINED WITHIN H&A OF NEW YORK FILES.
2. DATA CONTOURED USING DESIGN PROFESSIONALS MANAGEMENT SYSTEM'S SURFACE DISPLAY SYSTEM WITH LINEAR INTERPOLATION.
3. CONTOURS REFLECT VALUES INTERPOLATED BETWEEN DATA POINTS. ACTUAL VALUES BETWEEN DATA POINTS WILL VARY.
4. DATUM IS MEAN SEA LEVEL (MSL). CONTOUR INTERVAL IS 2 FT.
5. REFER TO TEXT AND FIGURE 2 SUBSURFACE EXPLORATION PLAN FOR ADDITIONAL DETAILS.

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GENERAL MOTOR CORPORATION
LEXINGTON AVENUE FACILITY

TOP-OF-ROCK CONTOUR MAP

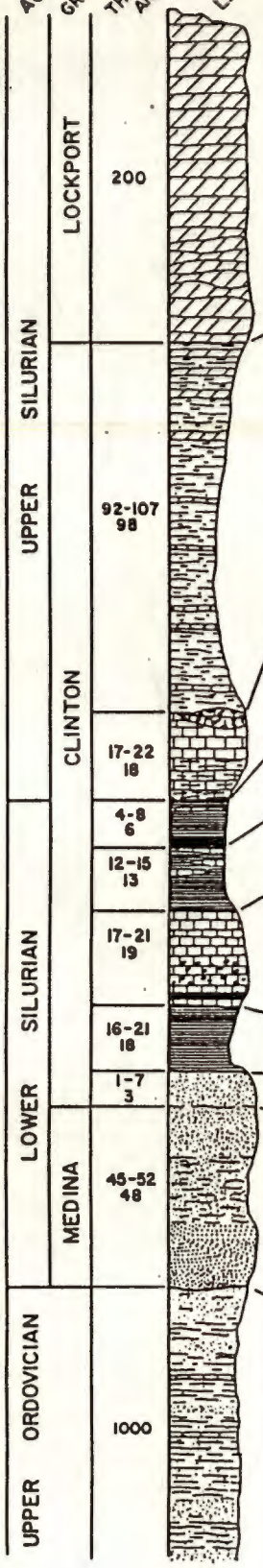
SCALE: 1 IN. = 300 FT. JANUARY 1991

FILE NO. 70014-42

CHARRETTE

FIGURE 3

GENERAL STRATIGRAPHIC PROFILE



FORMATION DESCRIPTION:

LOCKPORT DOLOMITE - Light to medium gray, fine to medium-grained, thin to medium-bedded, siliceous DOLOMITE. Stylolites, secondary gypsum nodules, pits and vugs; close to moderately close argillaceous partings, some of which contain secondary gypsum seams.

Consists of three members in Rochester area: Oak Orchard at top, Penfield, Decew at base.

Basal few feet of Oak Orchard Member contains a heavily pitted, vuggy zone of secondary mineralization. Upper 25 ft. of Penfield Member contains a heavily pitted zone a few feet thick; lower 30 ft. of Penfield has one or two slickensided shears of minor displacement. Decew Member is argillaceous and mottled and grades downward, becoming increasingly shaly. In places, a clay parting marks the contact with underlying Rochester, but where this parting is absent, the basal contact of Decew is indistinct and arbitrary.

ROCHESTER SHALE - Light to dark gray, fine-grained, dolomitic MUDSTONE, very thinly color-banded. Has few pits and small vugs, decreasing downward and scattered fossils, increasing downwards. Gypsum nodules are scattered throughout the formation. Secondary gypsum seams occur in close to very close, undulating partings.

Upper 15 to 20 ft. is Gates Dolomite Member; thin to very thin argillaceous dolomite beds interbedded with shale. Thin to very thin, silty, close to moderately close, limestone beds occur from just below Gates member, to within few feet of base of Rochester; their thickness and frequency generally increasing downward. They are fine-grained and grade into mudstone above and below.

Occasional very thin clay beds and severely weathered clay partings occur.

Basal contact grades into underlying formation with distinct color and lithology change.

IRONDEQUOIT LIMESTONE - Light to medium gray, fine to medium-grained, thin to medium-bedded, fossiliferous LIMESTONE, interbedded with dark gray, thin to very thin dolomitic SHALE beds. Few pits and small vugs near top.

Occasional gypsum nodules. Close to moderately close argillaceous partings; some may have secondary gypsum seams. Bedding undulates; small scattered reefs in uppermost few feet. Lower quarter is limy shale. Basal contact distinct; lithology change.

WILLIAMSON SHALE - Dark greenish gray SHALE, with some very thin scattered, fossil zones. Light to medium gray, very thin limestones near top and interbedded with very thin black fissile shale beds, containing graptolites, near base. Basal contact distinct.

LOWER SODUS SHALE - Dark greenish gray to grayish brown SHALE. Fossils present at several levels. In upper third of formation are several light gray, thin to very thin shell limestone beds, called "Pearly Shell". Lower half of formation predominantly brown. Basal contact distinct; lithology change.

REYNALES LIMESTONE - Light to medium gray, fine to medium-grained, crystalline, thin-bedded, fossiliferous LIMESTONE, interbedded with dark gray, very thin shale beds. Pits and vugs may occur near top; stylolites at several levels. Secondary gypsum seams in some of the close to very close argillaceous partings. Scattered lenses of chert and occasional thin beds of arenaceous dolomite. Thin Furnaceville hematitic limestone member occurs at top of lower sixth of formation. Basal contact sharp; lithology change.

MAPLEWOOD SHALE - Light greenish gray argillaceous SHALE. Barren of fossils, lower few inches dark gray and silty. Basal contact may be gradational, but sometimes distinct; color and lithology change.

THOROLD SANDSTONE - Light gray to greenish gray, fine to medium-grained, medium to thick-bedded SANDSTONE. Basal contact distinct; but only color change.

GRIMSBY SANDSTONE - Reddish brown, fine to medium-grained, thin to thick-bedded SANDSTONE. Gray and greenish gray color mottling in upper two-thirds. Closely to widely spaced, argillaceous partings with occasional gypsum seams.

Swirly bedding, due to action of marine worms, in upper third. Middle third shaly and gray, green, brown and pink banded, with some shallow cross-bedding. Lower third is massive, has shallow cross-bedding, and has largest grain size in formation.

Basal contact is sharp and undulating; an unconformity in Rochester area. No color change, similar lithology but smaller grain size in Queenston below. Frequently marked by weathered shaly or clay parting.

QUEENSTON SHALE - Reddish brown, fine-grained, thin to thick-bedded SANDSTONE, with some greenish gray to light gray mottling and very thin color banding. Close to moderately close argillaceous partings, some of which have secondary gypsum seams. Lithology grading laterally and vertically, including sandstone, siltstone, mudstone and very thin limestone beds. Barren of fossils.

NOTE: Formation descriptions prepared by Fred C. Amos, based on examination of over 32,000 ft. of rock core.

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GENERAL MOTORS CORPORATION
LEXINGTON AVENUE FACILITY
ROCHESTER, NEW YORK

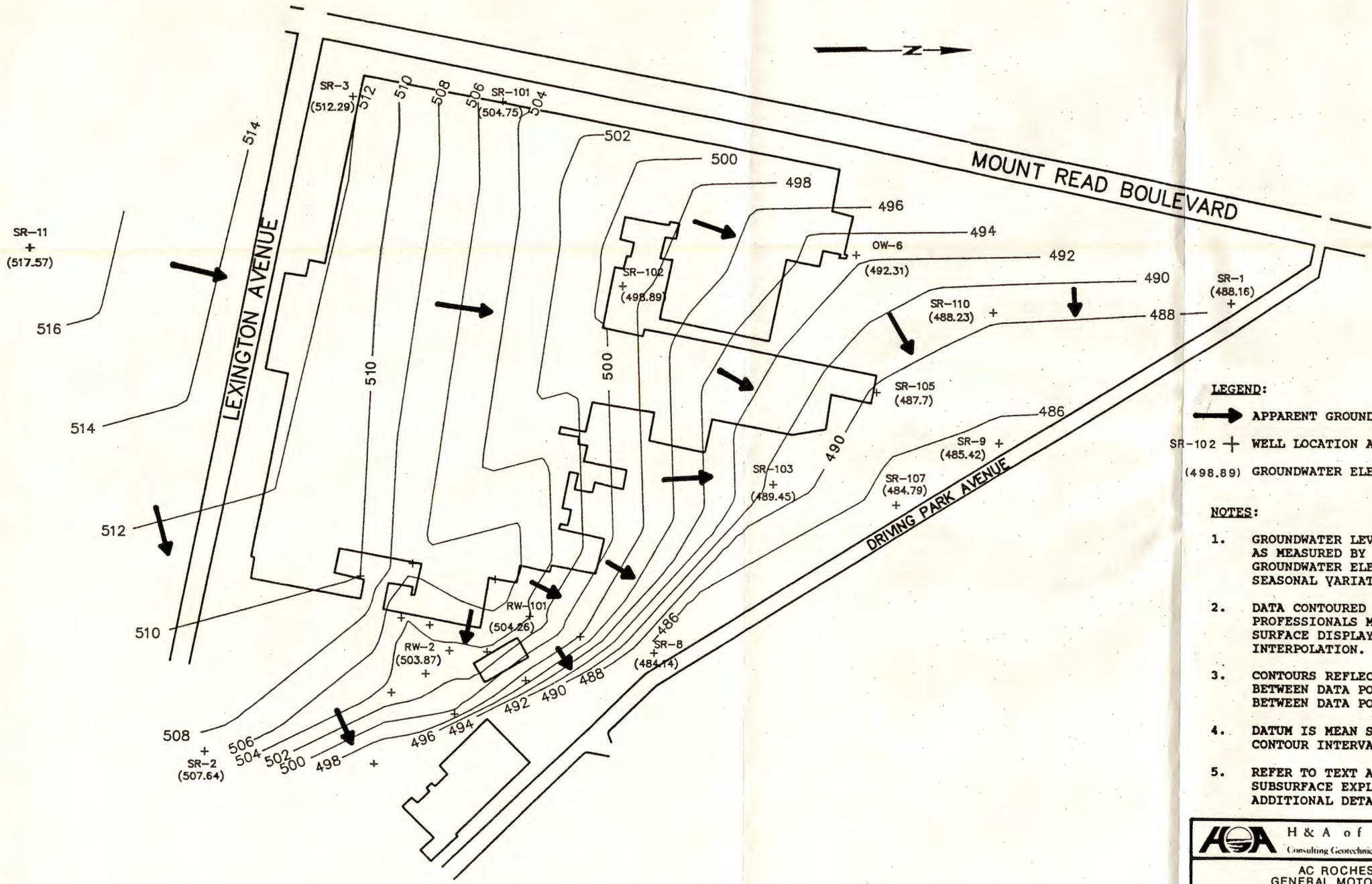
GENERAL STRATIGRAPHIC PROFILE

MARCH 1991

FILE NO. 70014-42

CHARRETTE

FIGURE 4



LEGEND:

→ APPARENT GROUNDWATER FLOW DIRECTION

SR-102 + WELL LOCATION AND NUMBER

(498.89) GROUNDWATER ELEVATION

NOTES:

1. GROUNDWATER LEVELS 12-13 MARCH 1990 AS MEASURED BY H&A PERSONNEL. ACTUAL GROUNDWATER ELEVATIONS SUBJECT TO SEASONAL VARIATION.
2. DATA CONTOURED USING DESIGN PROFESSIONALS MANAGEMENT SYSTEM'S SURFACE DISPLAY SYSTEM WITH LINEAR INTERPOLATION.
3. CONTOURS REFLECT VALUES INTERPOLATED BETWEEN DATA POINTS. ACTUAL VALUES BETWEEN DATA POINTS WILL VARY.
4. DATUM IS MEAN SEA LEVEL (MSL). CONTOUR INTERVAL IS 2 FEET.
5. REFER TO TEXT AND FIGURE 2 - SUBSURFACE EXPLORATION PLAN FOR ADDITIONAL DETAILS.

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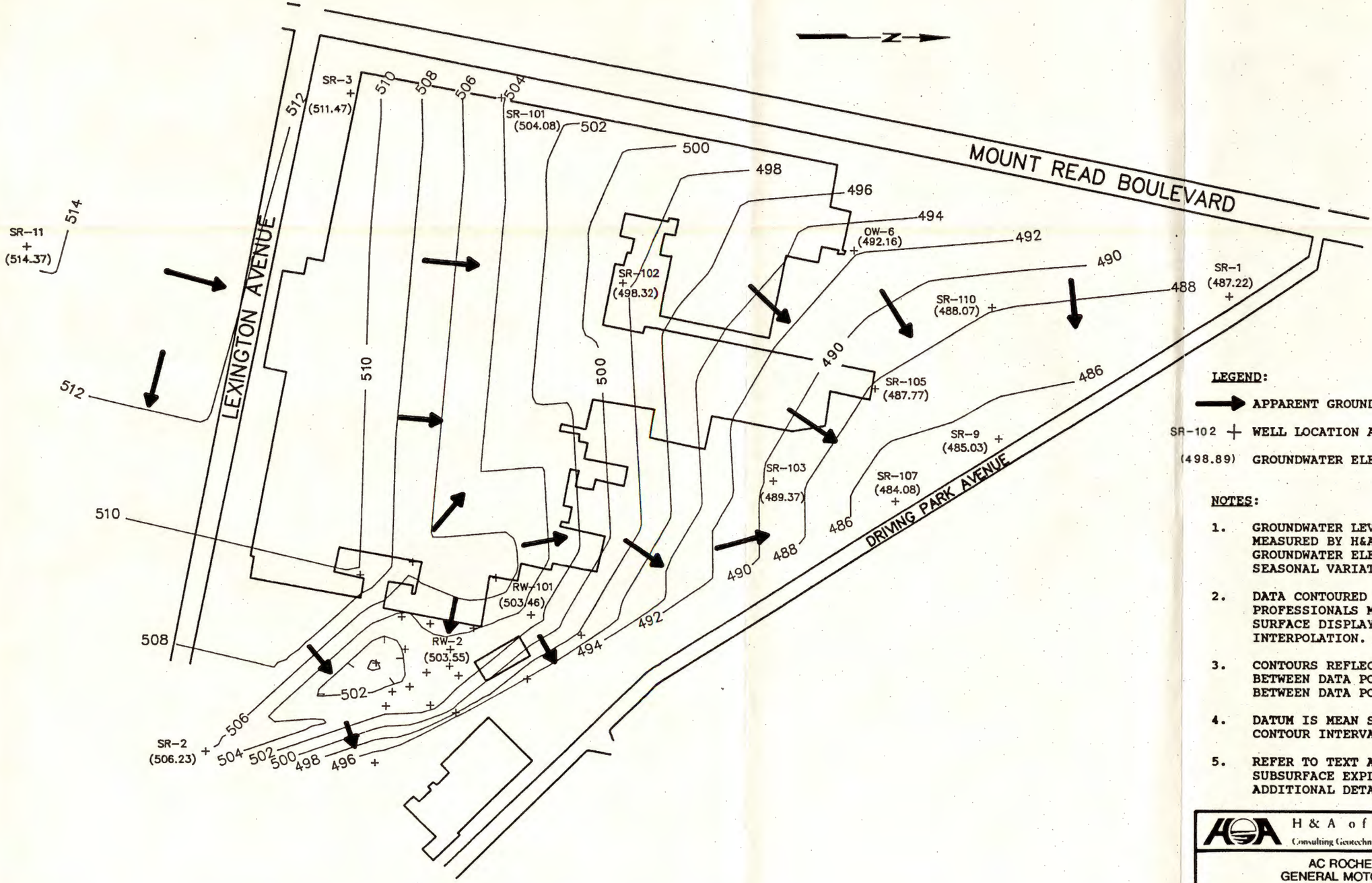
SHALLOW BEDROCK GROUNDWATER CONTOUR MAP 12-13 MARCH 1990

SCALE: 1 IN. = 300 FT. JULY 1990

FILE NO. 70014-42

CHARRETTE

FIGURE 5



LEGEND:

→ APPARENT GROUNDWATER FLOW DIRECTION

SR-102 + WELL LOCATION AND NUMBER

(498.89) GROUNDWATER ELEVATION

NOTES:

1. GROUNDWATER LEVELS 18-21 JUNE 1990 AS MEASURED BY H&A PERSONNEL. ACTUAL GROUNDWATER ELEVATIONS SUBJECT TO SEASONAL VARIATION.
2. DATA CONTOURED USING DESIGN PROFESSIONALS MANAGEMENT SYSTEM'S SURFACE DISPLAY SYSTEM WITH LINEAR INTERPOLATION.
3. CONTOURS REFLECT VALUES INTERPOLATED BETWEEN DATA POINTS. ACTUAL VALUES BETWEEN DATA POINTS WILL VARY.
4. DATUM IS MEAN SEA LEVEL (MSL). CONTOUR INTERVAL IS 2 FEET.
5. REFER TO TEXT AND FIGURE 2 - SUBSURFACE EXPLORATION PLAN FOR ADDITIONAL DETAILS.

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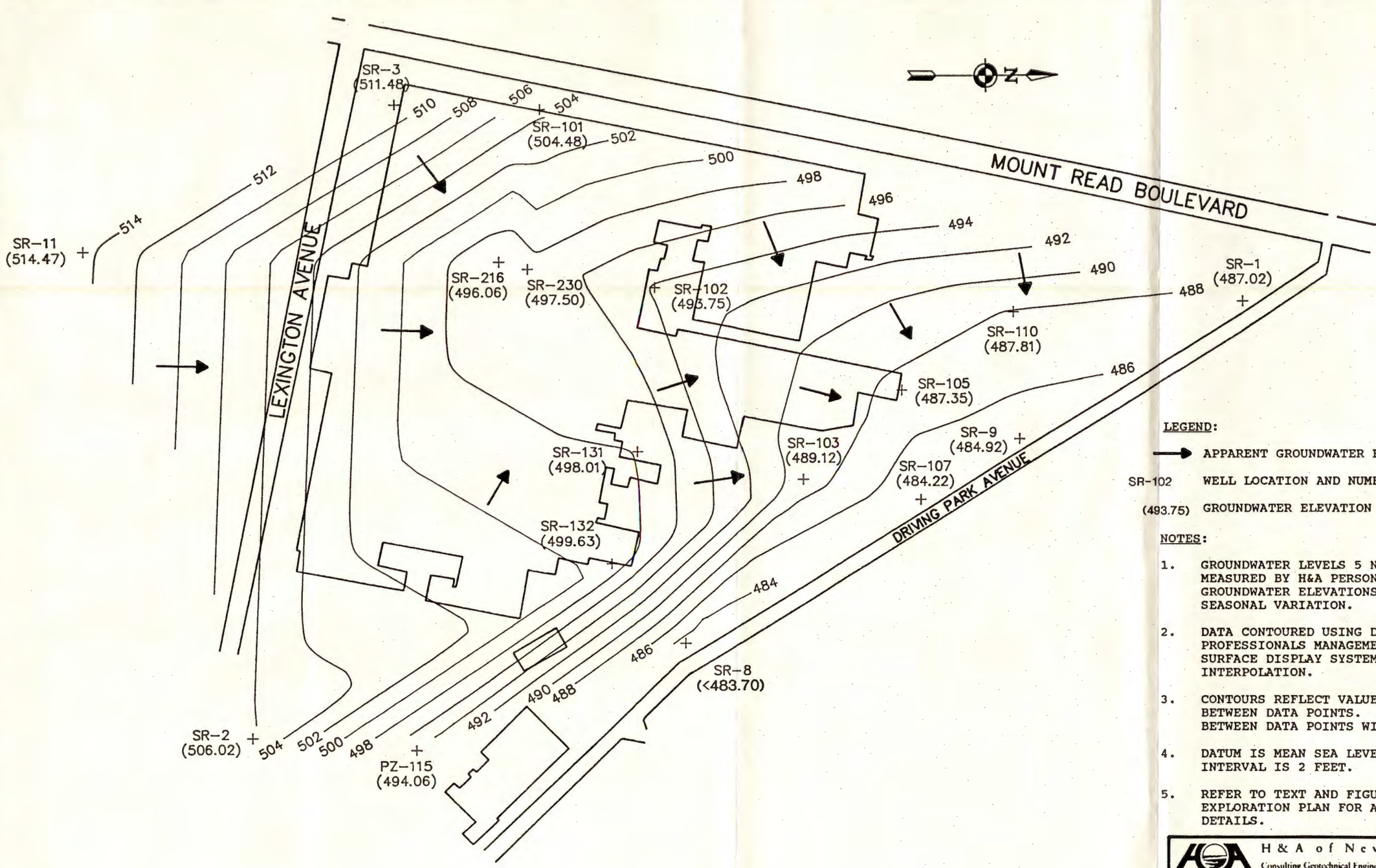
SHALLOW BEDROCK GROUNDWATER CONTOUR MAP 18-21 JUNE 1990

SCALE: 1 IN. = 300 FT. JULY 1990

FILE NO. 70014-42

CHARRETTE

FIGURE 6



LEGEND:

→ APPARENT GROUNDWATER FLOW DIRECTION

SR-102 WELL LOCATION AND NUMBER

(493.75) GROUNDWATER ELEVATION

NOTES:

1. GROUNDWATER LEVELS 5 NOVEMBER 1990 AS MEASURED BY H&A PERSONNEL. ACTUAL GROUNDWATER ELEVATIONS SUBJECT TO SEASONAL VARIATION.
2. DATA CONTOURED USING DESIGN PROFESSIONALS MANAGEMENT SYSTEM'S SURFACE DISPLAY SYSTEM WITH LINEAR INTERPOLATION.
3. CONTOURS REFLECT VALUES INTERPOLATED BETWEEN DATA POINTS. ACTUAL VALUES BETWEEN DATA POINTS WILL VARY.
4. DATUM IS MEAN SEA LEVEL (MSL). CONTOUR INTERVAL IS 2 FEET.
5. REFER TO TEXT AND FIGURE 2 - SUBSURFACE EXPLORATION PLAN FOR ADDITIONAL DETAILS.

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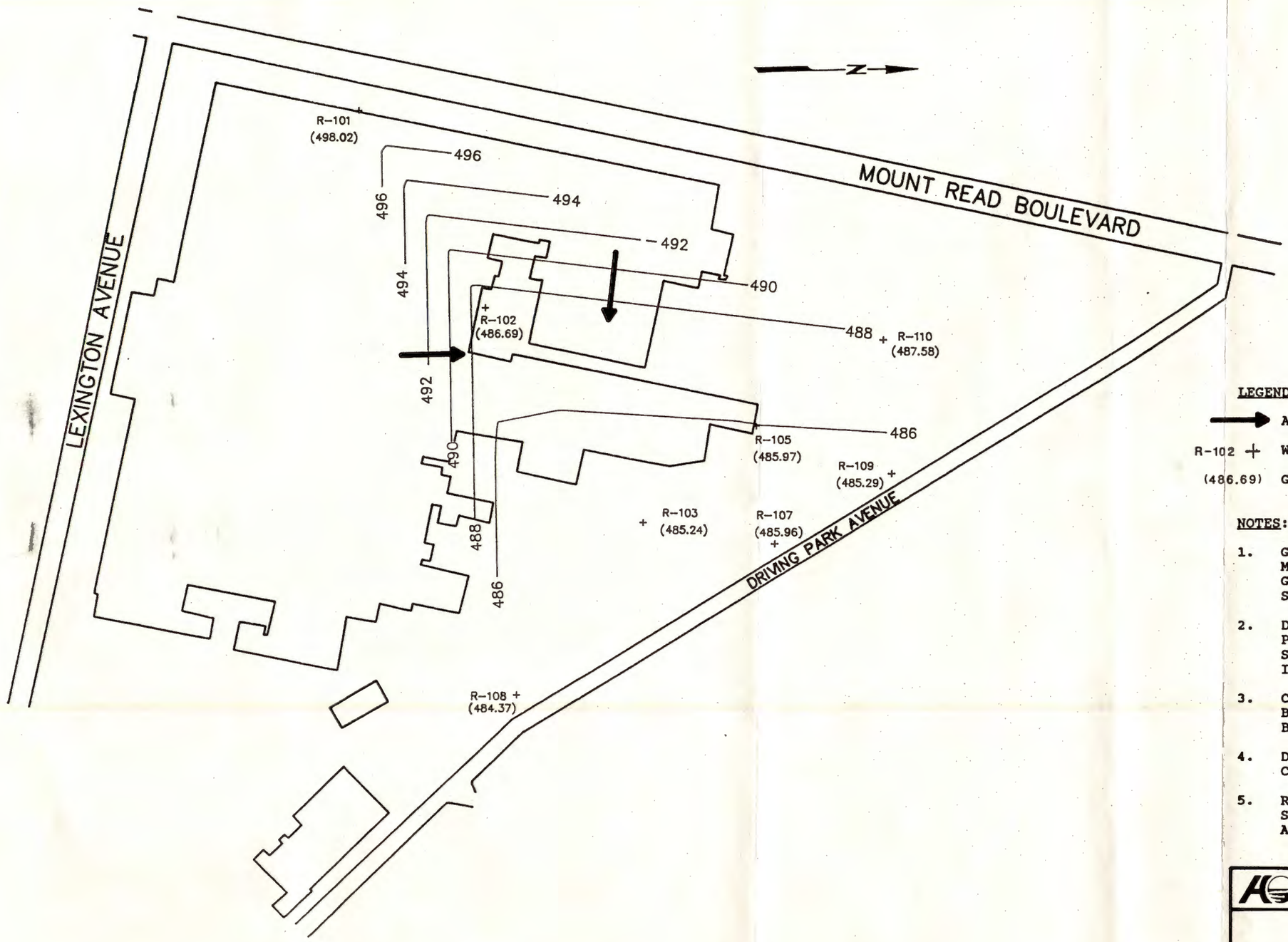
SHALLOW BEDROCK GROUNDWATER CONTOUR MAP 5 NOVEMBER 1990

SCALE: 1 IN. = 300 FT. JANUARY 1991

FILE NO. 70014-42

CHARRETTE

FIGURE 7



LEGEND:

APPARENT GROUNDWATER FLOW DIRECTION

R-102 + WELL LOCATION AND NUMBER

(486.69) GROUNDWATER ELEVATION

NOTES:

1. GROUNDWATER LEVELS 18 JUNE 1990 AS MEASURED BY H&A PERSONNEL. ACTUAL GROUNDWATER ELEVATIONS SUBJECT TO SEASONAL VARIATION.
2. DATA CONTOURED USING DESIGN PROFESSIONALS MANAGEMENT SYSTEM'S SURFACE DISPLAY SYSTEM WITH LINEAR INTERPOLATION.
3. CONTOURS REFLECT VALUES INTERPOLATED BETWEEN DATA POINTS. ACTUAL VALUES BETWEEN DATA POINTS WILL VARY.
4. DATUM IS MEAN SEA LEVEL (MSL). CONTOUR INTERVAL IS 2 FEET.
5. REFER TO TEXT AND FIGURE 2 - SUBSURFACE EXPLORATION PLAN FOR ADDITIONAL DETAILS.

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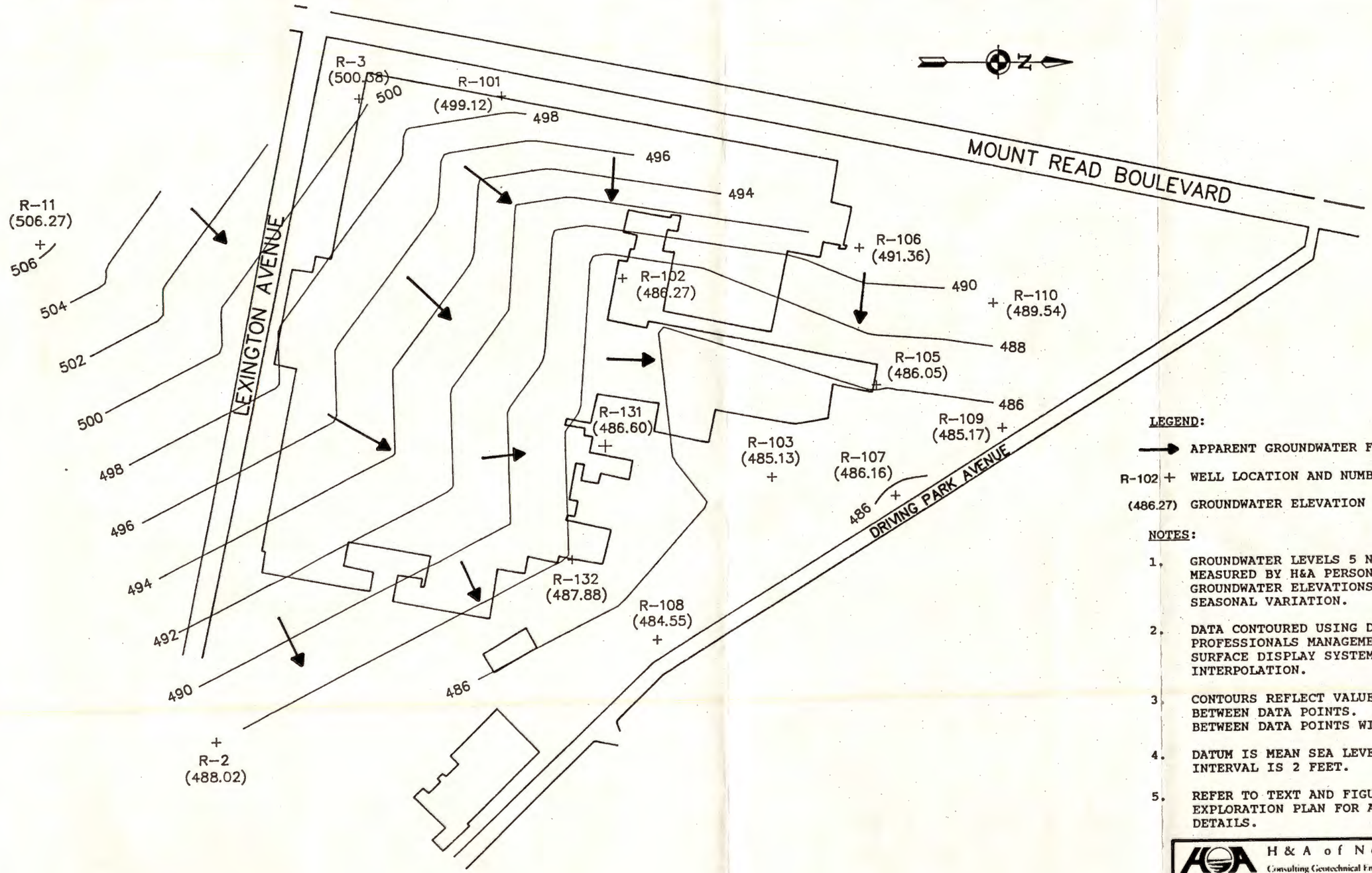
INTERMEDIATE BEDROCK GROUNDWATER CONTOUR MAP
18 JUNE 1990

SCALE: 1 IN. = 300 FT. JULY 1990

FILE NO. 70014-42

CHARRETTE

FIGURE 9



LEGEND:

→ APPARENT GROUNDWATER FLOW DIRECTION

R-102 + WELL LOCATION AND NUMBER

(486.27) GROUNDWATER ELEVATION

NOTES:

1. GROUNDWATER LEVELS 5 NOVEMBER 1990 AS MEASURED BY H&A PERSONNEL. ACTUAL GROUNDWATER ELEVATIONS SUBJECT TO SEASONAL VARIATION.
2. DATA CONTOURED USING DESIGN PROFESSIONALS MANAGEMENT SYSTEM'S SURFACE DISPLAY SYSTEM WITH LINEAR INTERPOLATION.
3. CONTOURS REFLECT VALUES INTERPOLATED BETWEEN DATA POINTS. ACTUAL VALUES BETWEEN DATA POINTS WILL VARY.
4. DATUM IS MEAN SEA LEVEL (MSL). CONTOUR INTERVAL IS 2 FEET.
5. REFER TO TEXT AND FIGURE 2 - SUBSURFACE EXPLORATION PLAN FOR ADDITIONAL DETAILS.

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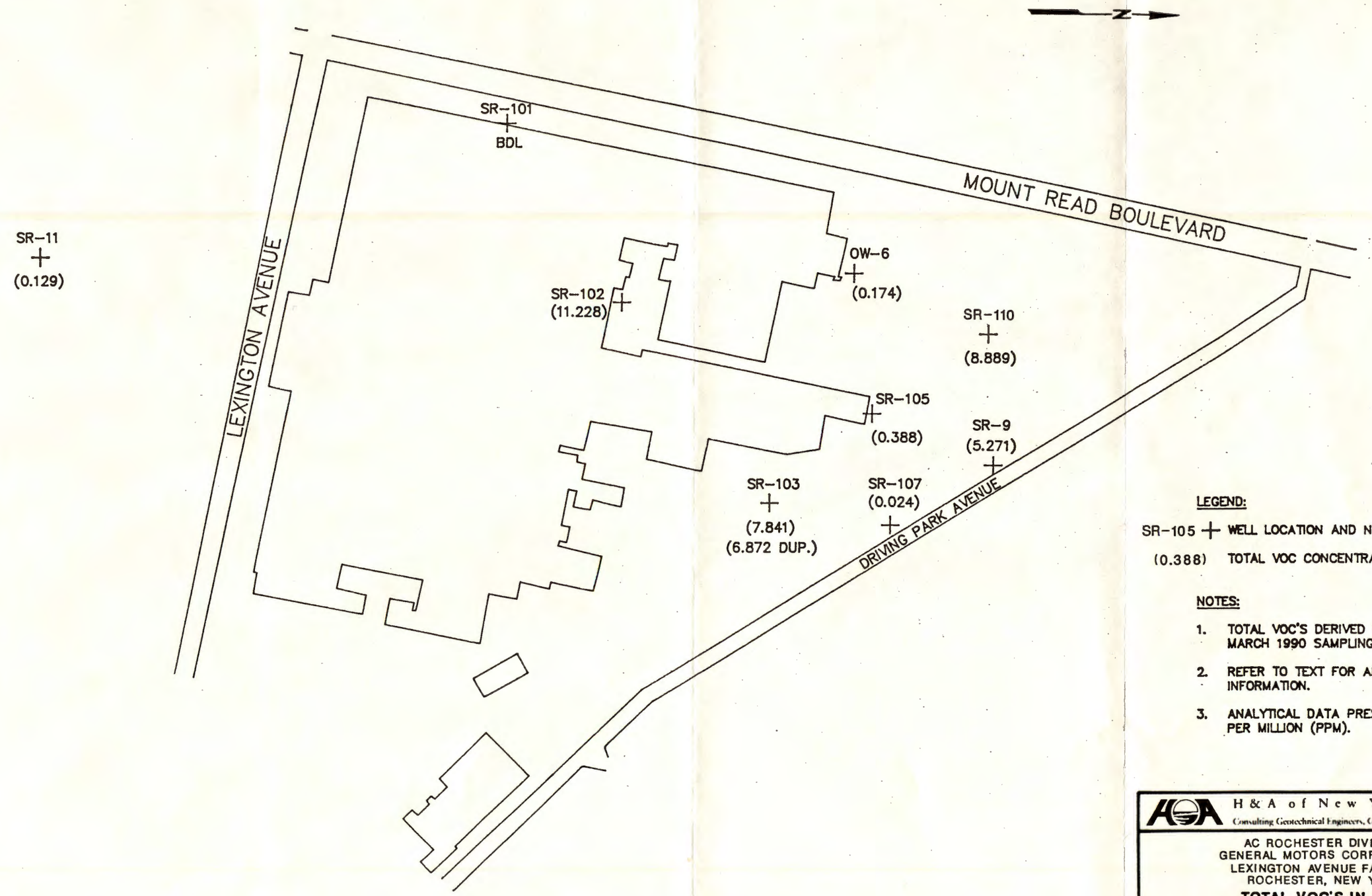
INTERMEDIATE BEDROCK GROUNDWATER CONTOUR MAP 5 NOVEMBER 1990

SCALE: 1 IN. = 300 FT. JANUARY 1991

FILE NO. 70014-42

CHARRETTE

FIGURE 10



LEGEND:

SR-105 + WELL LOCATION AND NUMBER

(0.388) TOTAL VOC CONCENTRATION

NOTES:

1. TOTAL VOC'S DERIVED FROM 12-13 MARCH 1990 SAMPLING EVENT.
2. REFER TO TEXT FOR ADDITIONAL INFORMATION.
3. ANALYTICAL DATA PRESENTED IN PARTS PER MILLION (PPM).

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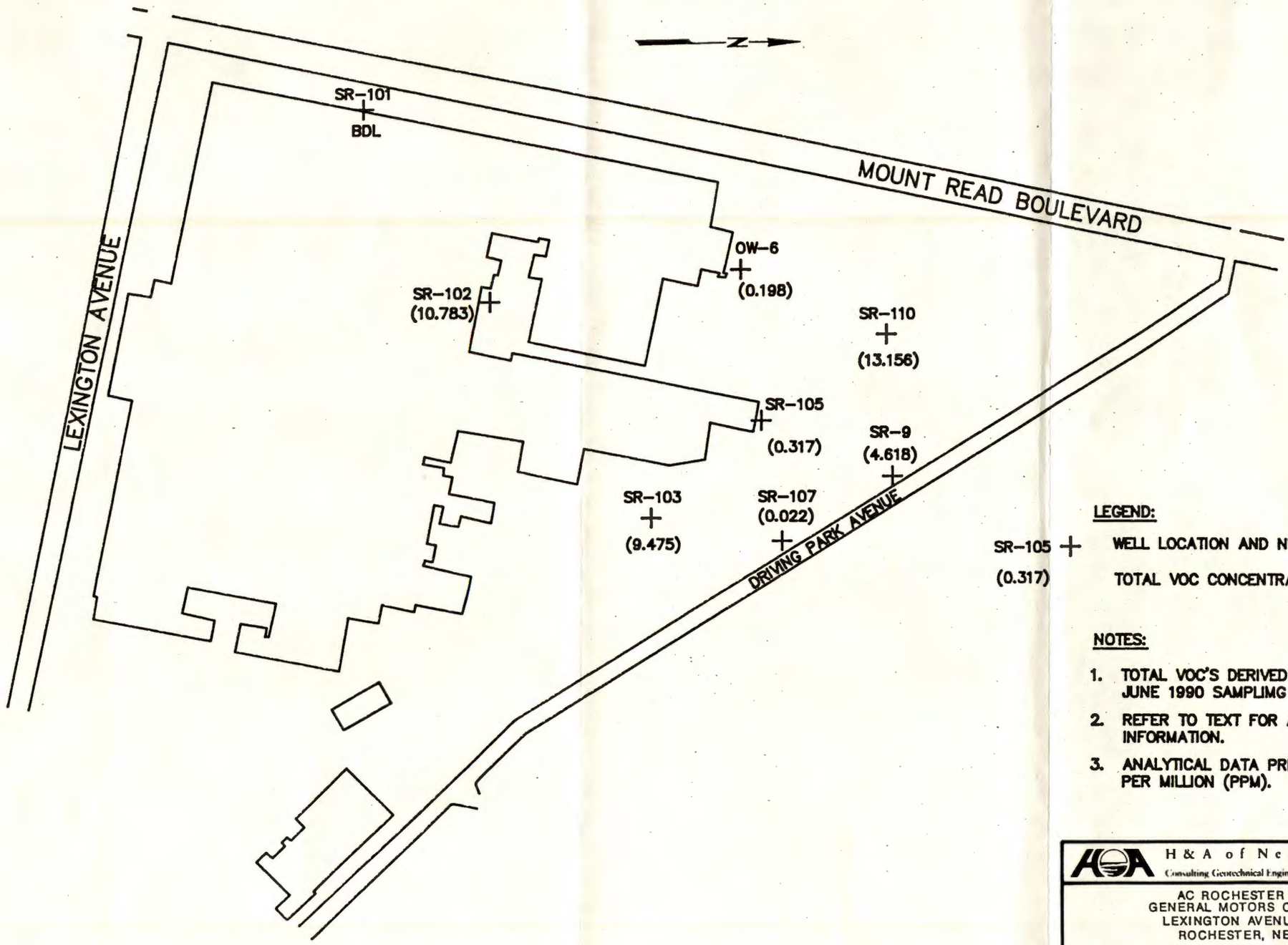
TOTAL VOC'S IN PPM
SHALLOW BEDROCK ZONE
12-13 MARCH 1990

SCALE: 1 IN. = 300 FT. JULY 1990

FILE NO. 70014-42

CHARRETTE

FIGURE 13



LEGEND:

SR-105 (0.317) — WELL LOCATION AND NUMBER; TOTAL VOC CONCENTRATION

NOTES:

1. TOTAL VOC'S DERIVED FROM 18-19 JUNE 1990 SAMPLIMG EVENT.
2. REFER TO TEXT FOR ADDITIONAL INFORMATION.
3. ANALYTICAL DATA PRESENTED IN PARTS PER MILLION (PPM).

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GENERAL MOTORS CORPORATION
LEXINGTON AVENUE FACILITY
ROCHESTER, NEW YORK

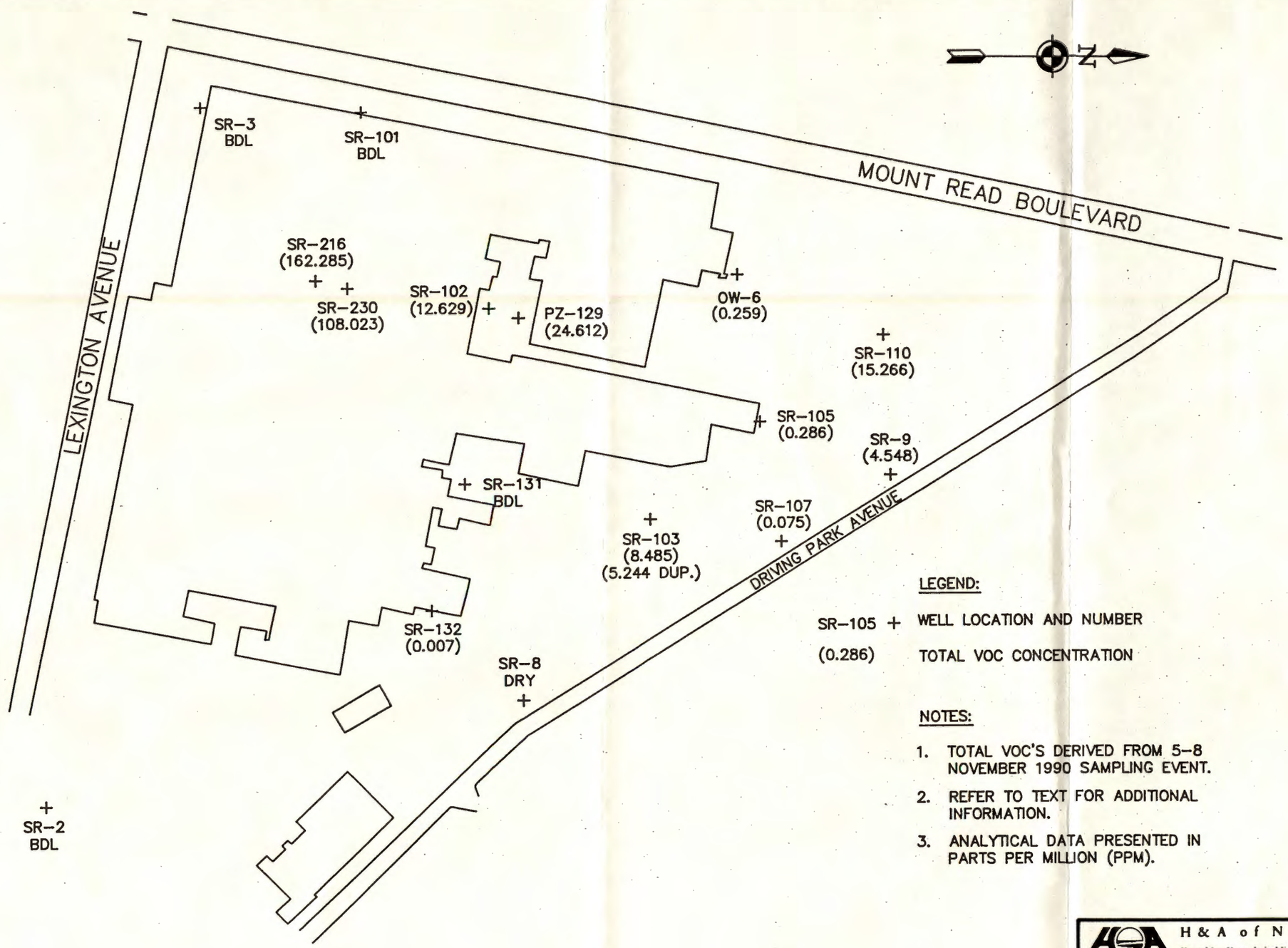
TOTAL VOC'S IN PPM
SHALLOW BEDROCK ZONE
18-19 JUNE 1990

SCALE: 1 IN. = 300 FT. JULY 1990

FILE NO. 70014-42

CHARRETTE

FIGURE 14



LEGEND:

SR-105 + WELL LOCATION AND NUMBER

(0.286) TOTAL VOC CONCENTRATION

NOTES:

1. TOTAL VOC'S DERIVED FROM 5-8 NOVEMBER 1990 SAMPLING EVENT.
2. REFER TO TEXT FOR ADDITIONAL INFORMATION.
3. ANALYTICAL DATA PRESENTED IN PARTS PER MILLION (PPM).

H&A of New York
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

AC ROCHESTER DIVISION
GENERAL MOTOR CORPORATION
LEXINGTON AVENUE FACILITY

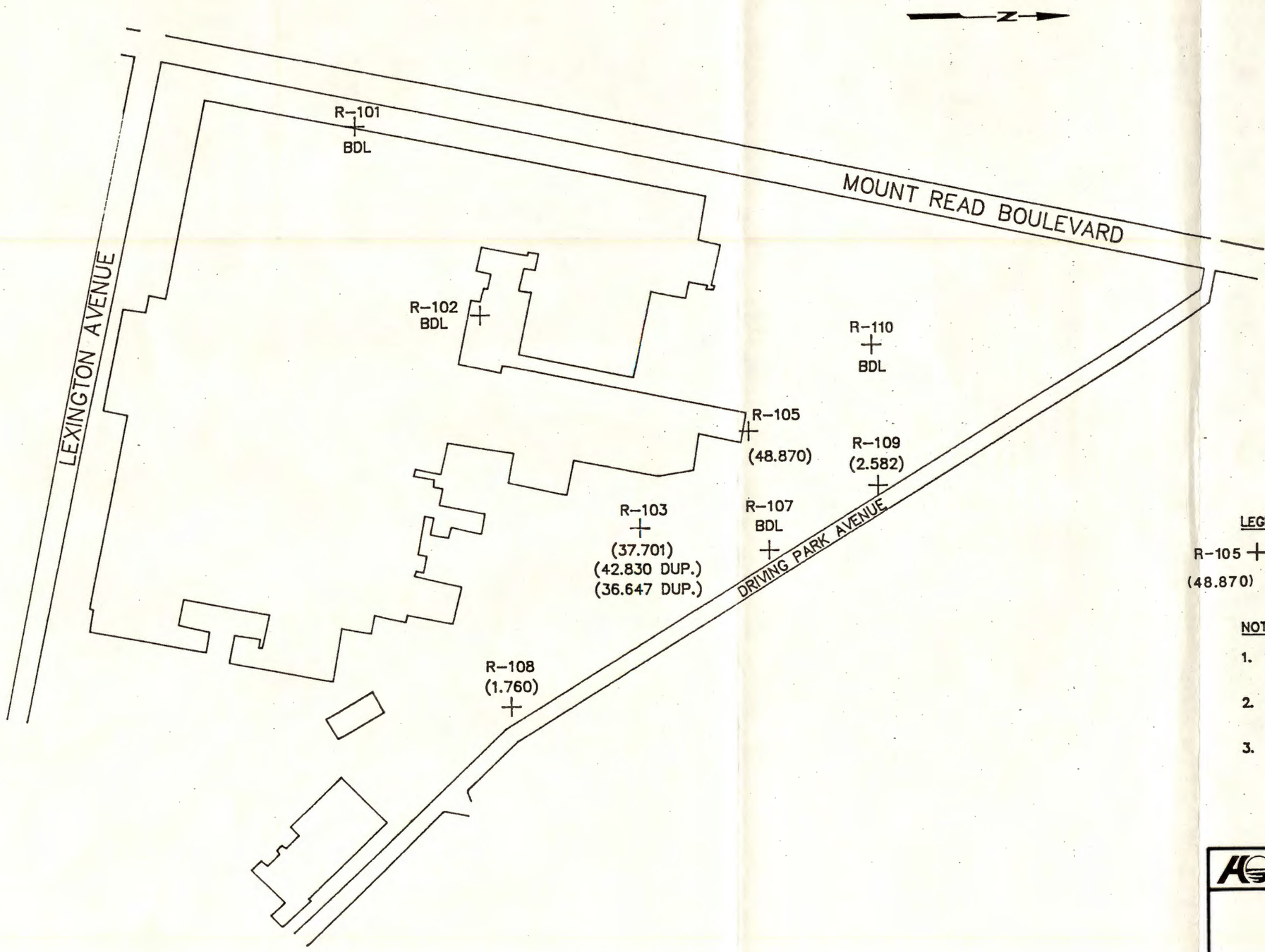
TOTAL VOC'S IN PPM
SHALLOW BEDROCK ZONE
5-8 NOVEMBER 1990

SCALE: 1 IN. = 300 FT. JANUARY 1991

FILE NO. 70014-42

CHARRETTE

FIGURE 15



LEGEND:

R-105 + WELL LOCATION AND NUMBER

(48.870) TOTAL VOC CONCENTRATION

NOTES:

1. TOTAL VOC'S DERIVED FROM 12-13 MARCH 1990 SAMPLING EVENT.
2. REFER TO TEXT FOR ADDITIONAL INFORMATION.
3. ANALYTICAL DATA PRESENTED IN PARTS PER MILLION (PPM).

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AC ROCHESTER DIVISION
GENERAL MOTORS CORPORATION
LEXINGTON AVENUE FACILITY
ROCHESTER, NEW YORK

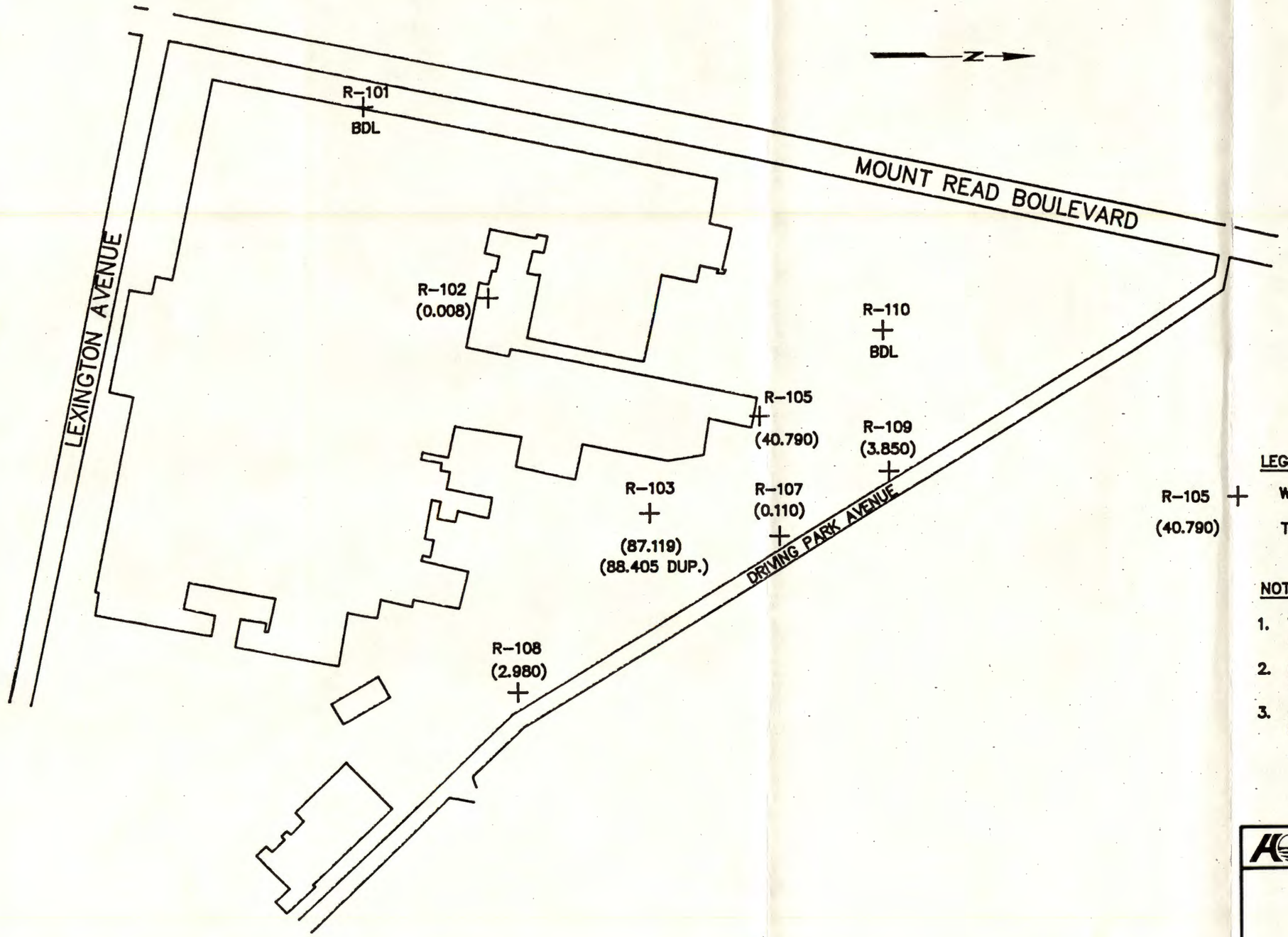
TOTAL VOC'S IN PPM
INTERMEDIATE BEDROCK ZONE
12-13 MARCH 1990

SCALE: 1 IN. = 300 FT. JULY 1990

FILE NO. 70014-42

CHARRETTE

FIGURE 16



LEGEND:

R-105 (40.790) — WELL LOCATION AND NUMBER; TOTAL VOC CONCENTRATION

NOTES:

1. TOTAL VOC'S DERIVED FROM 18-19 JUNE 1990 SAMPLIMG EVENT.
2. REFER TO TEXT FOR ADDITIONAL INFORMATION.
3. ANALYTICAL DATA PRESENTED IN PARTS PER MILLION (PPM).

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LEXINGTON AVENUE FACILITY
ROCHESTER, NEW YORK

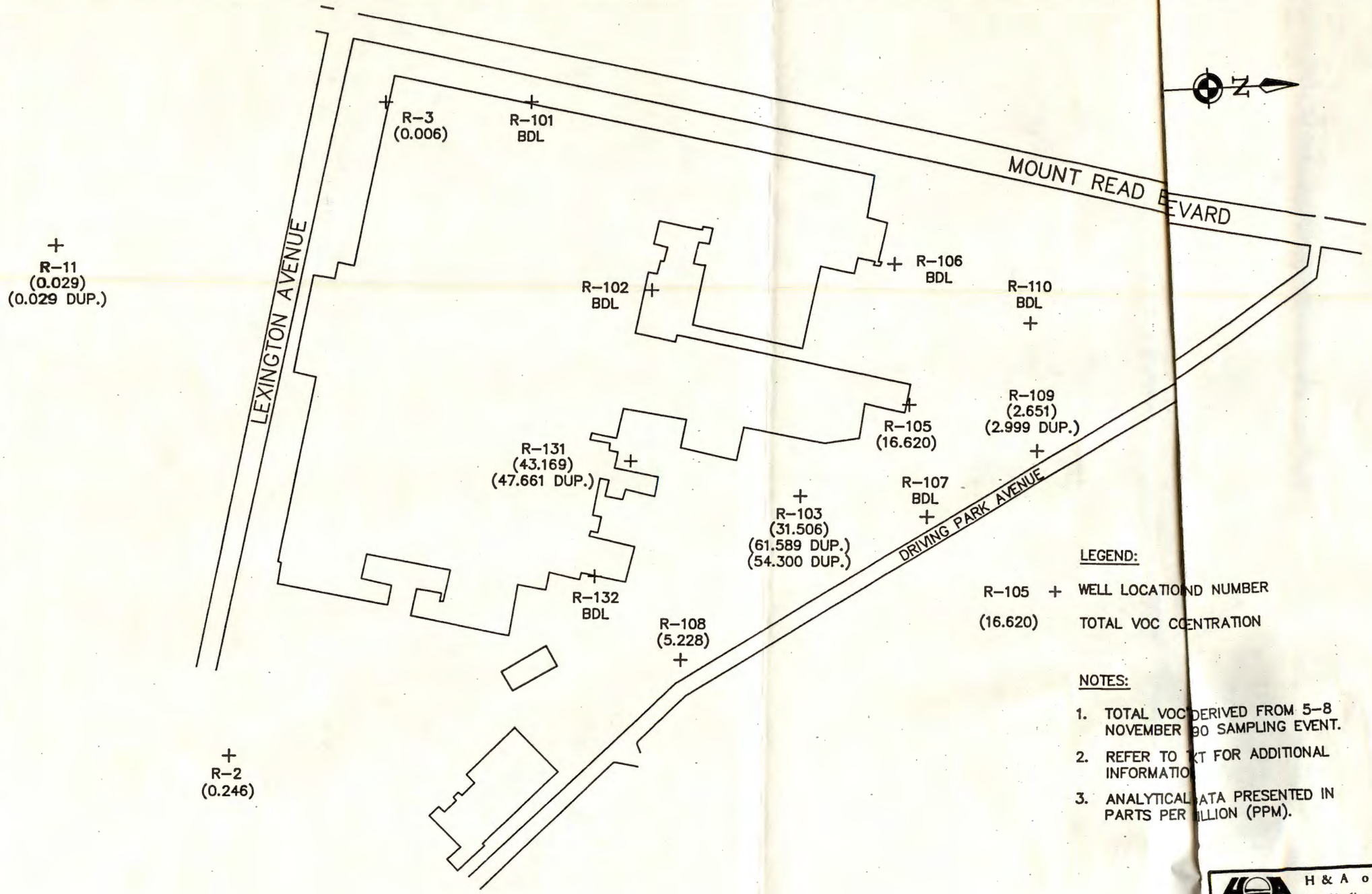
TOTAL VOC'S IN PPM
INTERMEDIATE BEDROCK ZONE
18-19 JUNE 1990

SCALE: 1 IN. = 300 FT. JULY 1990

FILE NO. 70014-42

CHARRETTE

FIGURE 17



LEGEND:

R-105 + WELL LOCATION AND NUMBER

(16.620) TOTAL VOC CONCENTRATION

NOTES:

1. TOTAL VOC DERIVED FROM 5-8 NOVEMBER 90 SAMPLING EVENT.
2. REFER TO TEXT FOR ADDITIONAL INFORMATION.
3. ANALYTICAL DATA PRESENTED IN PARTS PER MILLION (PPM).

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AC ROCHESTER DIVISION
GENERAL MOTOR CORPORATION
LEXINGTON AVENUE FACILITY

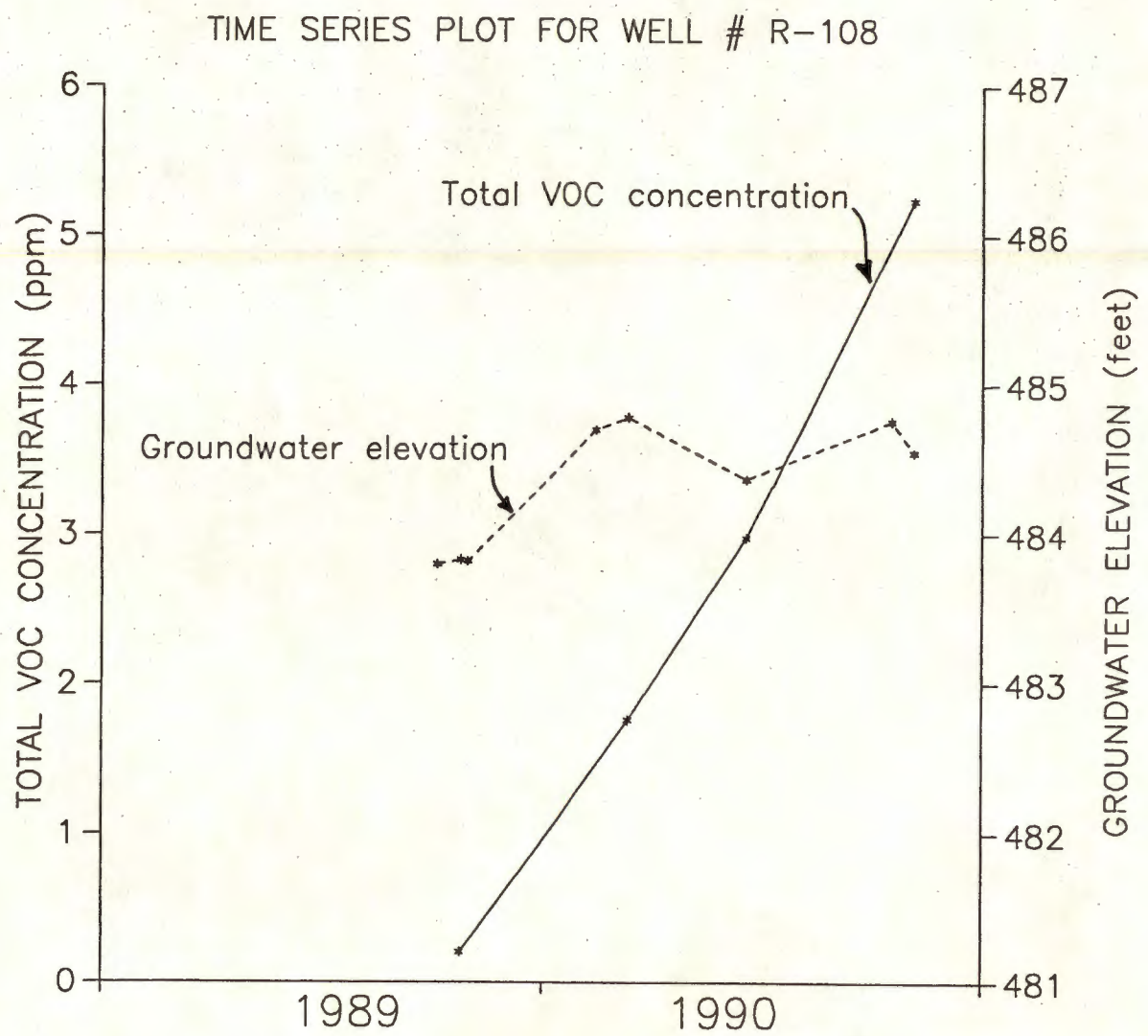
TOTAL VOC'S IN PPM
INTERMEDIATE BEDROCK ZONE
5-8 NOVEMBER 1990

SCALE: 1 IN. = 300 FT. JANUARY 1991

FILE NO. 70014-42

CHARRETTE

FIGURE 18



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AC ROCHESTER DIVISION
GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION

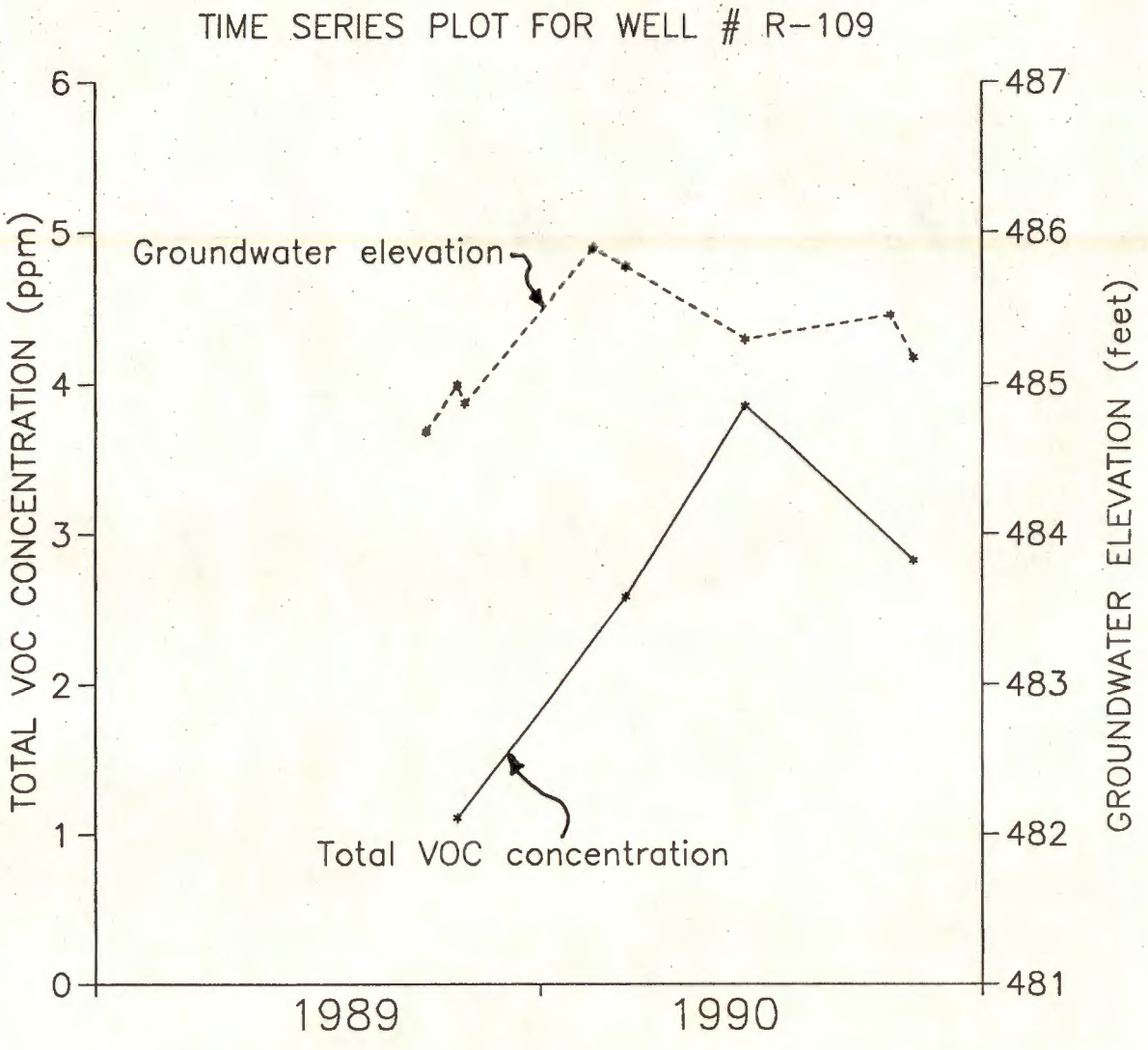
TIME SERIES PLOT
WELL R-108

MARCH 1991

FILE NO. 70014-42

CHARRETTE

FIGURE 19



FILE NO. 70014-42

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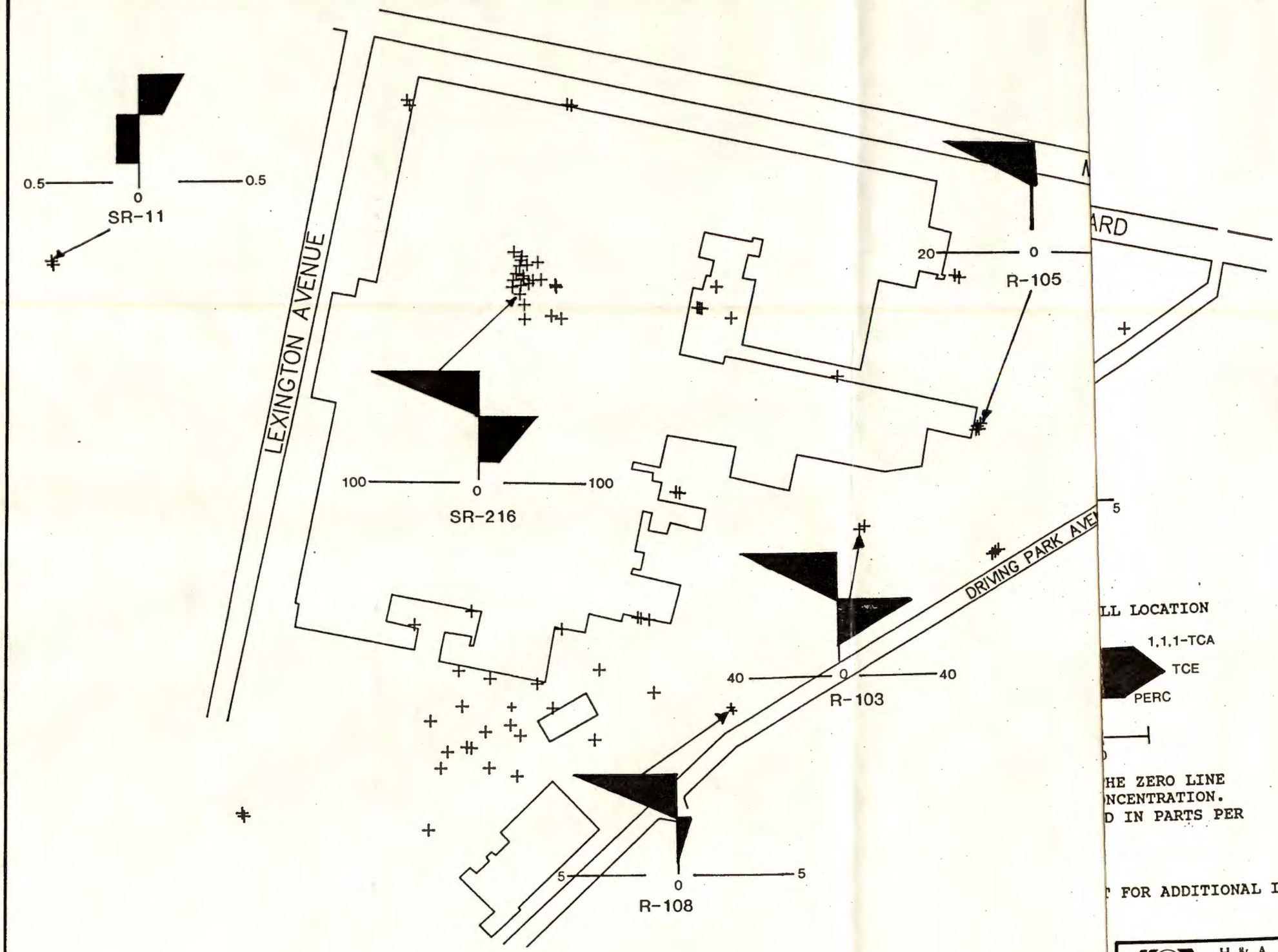
AC ROCHESTER DIVISION
GENERAL MOTORS CORPORATION
HYDROGEOLOGIC INVESTIGATION

TIME SERIES PLOT
WELL R-109

MARCH 1991

CHARRETTE

FIGURE 20



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FOR ADDITIONAL INFORMATION.

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AC ROCHESTER DIVISION
GENERAL TESTING CORPORATION
LEXINGTON AVENUE FACILITY
ROCHESTER, NEW YORK

CONTAMINANT CHARACTERIZATION PLAN
5-8 NOVEMBER 1990

SCALE: 1 IN. = 300 FT. JANUARY 1991

FIGURE 21

FILE NO. 70014-42

CHARRETTE

APPENDIX A

Test Boring Reports
(for 1990 well installations)

DESCRIPTION AND CLASSIFICATION OF SUBSURFACE MATERIALS

SOIL

Soil descriptions on logs of subsurface explorations are based on Standard Penetration Test results, visual-manual examination of exposed soil and soil samples, and the results of laboratory tests on selected samples. The criteria, descriptive terms and definitions, in sequence as they appear on the logs are as follows:

DENSITY OR CONSISTENCY

Density of Cohesionless Soils	Penetration Resistance (Blows per ft)	Consistency of Cohesive Soils	Penetration Resistance (Blows per ft)
Very loose	0 - 4	Very soft	0 - 2
Loose	4 - 10	Soft	2 - 4
Medium	10 - 30	Medium	4 - 8
Dense	30 - 50	Stiff	8 - 15
Very dense	Over 50	Very stiff	15 - 30
		Hard	Over 30

Penetration Resistance

Standard Penetration Test (ASTM D-1586) - Number of blows required to drive a standard 2-in. O.D. split spoon sampler 12 inches with a 140-lb. weight falling freely through 30 inches.

COLOR: Basic colors and combinations: black, brown, gray, yellow-brown . . .

COMPONENT DEFINITIONS BY SIZE GRADATION:

Material	Definitions	Fractions	Sieve Limit Upper	Sieve Limit Lower
Boulder	Will not pass through 12-in. square opening.	—	—	12-in.
Cobble	Passes through a 12-in. square opening; retained on 3-in. sieve.	—	12-in.	3-in.
Gravel	Passes through 3-in. sieve; retained on 1/4-in. (No. 4) sieve.	Coarse	3-in.	3/4-in.
		Fine	3/4-in.	No. 4
Sand	Passes through No. 4 sieve; retained on No.200.	Coarse	No. 4	No. 10
		Medium	No. 10	No. 40
		Fine	No. 40	No.200.
Silt	Passes through No. 200 sieve. Non-plastic; little or no strength when dried.	—	No. 200	—
Clay	Passes through No. 200 sieve. Plastic; very strong when air-dried.	—	No. 200	—

BOULDERS AND COBBLES: FREQUENCY

Term	Percentage
Very few	0 - 10
Few	10 - 25
Common	25 - 40
Numerous	40 - 50
With	Undetermined

COMPONENT

Major soil component	- Upper case letters
Secondary component	- Adjective for 20-50% of total.
Third component	- "some" for 20-30% of total.
Minor components	- "little" for 10-20% of total.
	- "trace" for 5-10% of total.
	- "with" for undetermined amount.

SUPPLEMENTAL SOIL TERMINOLOGY

Lamina	- 0 to 1/16 in. thick (cohesive)
Parting	- 0 to 1/16 in. thick (granular)
Seam	- 1/16 to 1/2 in. thick
Layer	- 1/2 to 12 in. thick
Stratum	- > 12 in. thick
Pocket	- small, erratic deposits less than 12-in. size
Lens	- Lenticular deposits larger than a pocket
Occasional	- One or less per foot of thickness
Frequent	- More than one per foot of thickness
Interbedded	- Alternating soil layers of differing composition
Varved	- Alternating thin seams of silt and clay
Mottled	- Variation in color

OTHER DESCRIPTIVE TERMS

Deposit type - GLACIAL TILL, ALLUVIUM, FILL . . .

The natural soils are also classified by criteria of Unified Soil Classification System (USCS), with appropriate group symbol in parenthesis for each soil description. Fill materials are not classified.

ROCK

Rock descriptions noted on logs of subsurface explorations are based on visual-manual examination of exposed rock outcrops and core samples. The criteria, descriptive terms and definitions used are as follows:

FIELD HARDNESS: A measure of resistance to scratching.

Very Hard	- Cannot be scratched with knife point or sharp pick.
Hard	- Can be scratched with knife point or pick only with difficulty.
Moderately Hard	- Can be readily scratched with knife point or pick.
Medium	- Can be grooved or gouged 1/16 in. deep with firm pressure on knife or pick point.
Soft	- Can be grooved or gouged easily with knife or pick point.
Very Soft	- Can be carved with knife and excavated with point of pick.

WEATHERING: The action of organic and inorganic processes, resulting in alteration of color, texture and composition.

Fresh FR	- No visible sign of alteration, except perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered SL	- discoloration of rock material and discontinuity surfaces.
Moderately weathered MOD	- Less than half the rock material decomposed to soil. Some fresh rock; continuous "framework."
Highly weathered HIGH	- More than half the rock material decomposed and/or disintegrated to soil. Fresh rock corestones or discontinuous "framework."
Completely weathered COMP	- All rock material disintegrated to soil, but mass still intact.
Residual Soil	- All rock material converted to soil. Volume of mass changed, but material has not been significantly transported.

COLOR: Basic colors and combinations: gray, light gray brown, green, red-brown.

TEXTURE: Size, shape and arrangements of constituents.

Aphanitic	- Individual grains invisible
Fine-grained	- Grains barely visible to the unaided eye, up to 1/16-in. diameter
Medium-grained	- Grains between 1/16 and 3/16-in. diam.
Coarse-grained	- Grains between 3/16 and 1/4-in. diam.
Very coarse-grained	- Grains larger than 1/4 in.

LITHOLOGY: Rock classification and modifiers; accepted formation names.

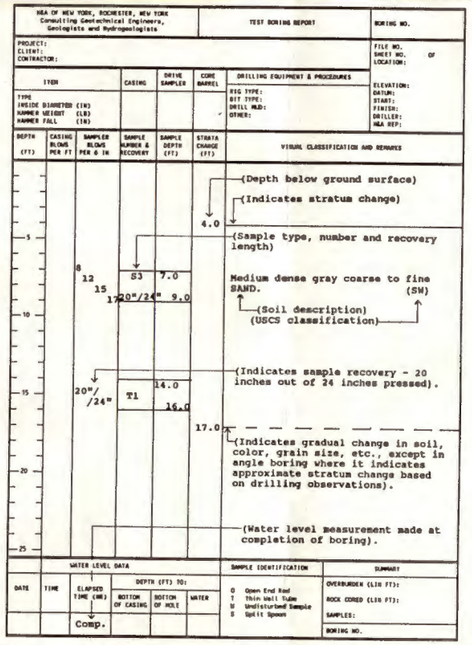
DISCONTINUITIES:

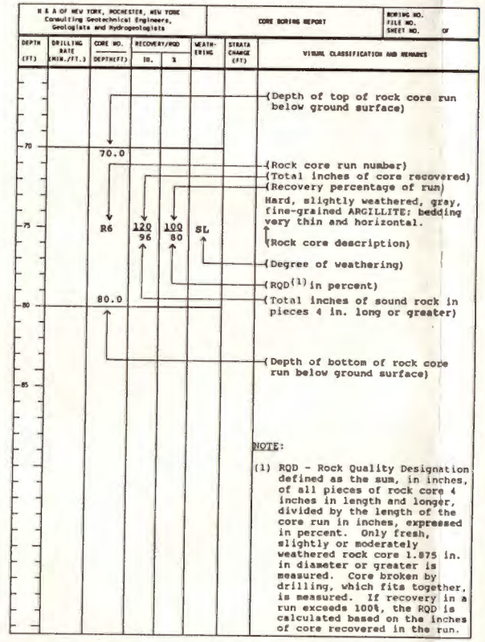
Type	Definition
Joint	- A natural fracture along which no displacement has occurred. May occur in parallel groups called sets.
Shear	- A natural fracture along which displacement has occurred. Surface may be slickensided or striated.
Fault	- A natural fracture along which displacement has occurred. Usually lined with gouge and slickensides.
Shear or Fault zone	- Zone of fractured rock and gouge bordering the displacement plane.

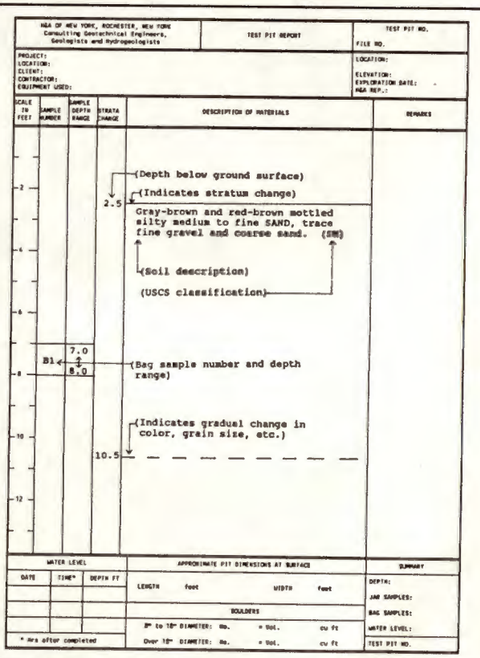
GENERAL NOTES

1. Logs of subsurface explorations depict soil, rock and groundwater conditions only at the locations specified on the dates indicated. Soil, rock and groundwater conditions elsewhere, or at other times, may vary.
2. Water levels noted on the logs were measured at the times and under the conditions indicated. During test borings, these water levels could have been affected by the introduction of water into the borehole, extraction of tools or other procedures and thus may not reflect actual groundwater level at the test boring location. Groundwater level fluctuations may also occur as a result of variations in precipitation, temperature, season, tides, adjacent construction activity and pumping of water supply wells and construction dewatering systems.

LEGEND FOR SUBSURFACE EXPLORATION LOGS







ROCK (cont'd.)

ORIENTATION / ATTITUDE:

Term	Angle (degrees)
Horizontal	0 - 5
Low Angle	5 - 35
Moderately dipping	35 - 55
High Angle	55 - 85
Vertical	85 - 90

SPACING:

Term	Inches	Centimeters
Extremely close	< 3/4	< 2
Very close	3/4 - 2 1/2	2 - 6
Close	2 1/2 - 8	6 - 20
Moderate	8 - 24	20 - 60
Wide	24 - 80	60 - 200
Very wide	80 - 20 ft.	200 - 600
Extremely wide	> 20 ft.	> 600

PERSISTENCE / CONTINUITY:

Term	Extent Feet	Extent Meters
Very Low	0 - 3	< 1
Low	3 - 10	1 - 3
Medium	10 - 40	3 - 10
High	40 - 80	10 - 20
Very high	> 80	> 20

APERTURE / GAP:

Term	Opening Inches	Opening Metric
Very tight	< 0.004	< 0.1 mm
Tight	0.004 - 0.01	0.1 - 0.25 mm
Partly Open	0.01 - 0.02	0.25 - 0.5
Open	0.02 - 0.1	0.5 - 2.5
Moderately wide	0.1 - 0.4	2.5 - 10
Wide	> 0.4	> 10 mm
Very wide	0.4 - 4.0	1 - 10 cm
Extremely wide	4.0 - 40	10 cm - 1m
Cavernous	> 40	> 1m

SOLUTION CAVITIES

Term	Size
Pit	Barely visible to 1/4 in.
Vug	1/4 in. - 2 in.
Cavity	2 in. - 2 ft.
Cave	> 2 ft.

H&A of New York
Geotechnical Engineers and Environmental Consultants

SUBSURFACE EXPLORATION KEY

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-2

PROJECT: HYDROGEOLOGIC INVESTIGATION-LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION-GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 50053.01N
58594.39E
ELEVATION: 513.39 ft.
DATUM: NGVD
START: 2 August 1990
FINISH: 7 August 1990
DRILLER: S. Loranty
H&A REP: T.Wells/W.Lanik

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	NX
INSIDE DIAMETER (IN)	6-1/4	1-3/8	2 1/8
HAMMER WEIGHT (LB)	---	140(A)	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 7S, Truck Mounted
BIT TYPE: Tricone roller, 7 7/8 in.
DRILL MUD: ---
OTHER: (A) Automatic hammer drive

DEPTH (FT)	OVA READING	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	Asphalt.
	ND	5 2 3	S1 18"/18"	0.5 2.0		Loose dark gray silty SAND, moist. -FILL-
	ND	4 2 6	S2 6"/24"	2.0 4.0	3.0	Loose orange-brown silty SAND, trace clay, moist.
	ND	14 4 12	S3 20"/20"	4.0 6.0		Medium dense brick PIECE, little fine SAND, dry. -FILL- Medium dense red-brown coarse to fine SAND, trace gravel, moist to wet. -FILL-
5		12 16				
	ND	16 100/0.4	S4 11/11"	6.0-6.9	6.2	Same, wet. Very dense gray-brown sandy SILT with SHALE pieces, dry.
	ND	36 100/0.3	S5 10/10"	8.0-8.8		-HIGHLY WEATHERED BEDROCK- Same.
10					9.2	Top of Bedrock at 9.2 ft.
15						
20						
25						

Notes:

1. Advanced augers to 9.2 ft.
2. Installed 8-in. temporary steel casing to 9.3 ft.
3. See core boring report, page 2.

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
2 Aug	1400	0.5	9.2	9.2	ND

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
R Rock Core

SUMMARY

OVERBURDEN (LIN FT):	9.2
ROCK CORED (LIN FT):	25.0
SAMPLES:	5S, 3R
BORING NO.	B-2

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B-2 FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	DRILLING RATE MIN./FT.	CORE NO. — DEPTH(FT)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
							Top of Bedrock at 9.2 ft. Began core boring at 9.3 ft.
10	4	9.3					Moderately hard slightly weathered gray to brown-gray fine grained dolomitic MUDSTONE, with horizontal bedding, indistinct color banding, occasional pits and vugs, and secondary gypsum mineralization as partings in fracture and joint apertures, fossil replacements, and vug fillings. Closely spaced smooth planar to undulating tight (or occasionally open, where noted) bedding plane and low angle joints throughout.
	4						
	4	R1	58/41	97/68			
	4						
	4	14.3					
15	4	14.3					-ROCHESTER SHALE- Smooth planar open bedding place joint with silt and fine sand in joint aperture at 12.5 ft. Smooth planar tight vertical joints at 90 degrees to each other from 15.3 to 15.6 ft. Secondary or sulfur mineralization noted in joint apertures from 16.6 - 19.0 ft.
	3						
	4						
	4						
	4	R2	114/107	99/92			
20	4						
	3						
	4						
	4						Core barrel blocked at 24.0 ft.
	4	24.0			SL		
	3						Advanced 7 7/8 in. tricone roller bit to 24.21 ft. Installed 4.0-in. black iron pipe well casing to 24.21 ft. Advanced 3 7/8-in. tricone roller bit to 24.27 ft. Began coring R3 at 24.27 ft.
25	3	24.3					
	3						
	3						
	4						
	4	R3	118/113	98/94			Joints horizontal to low angle, smooth, planar to undulating fresh to slightly discolored, open at 24.9 ft., 25.9 ft., 27.7 ft., 28.0 ft. 29.8 ft., and 31.1 ft. Joint, vertical, smooth, undulating, fresh, closed from 27.5 ft. to 27.7 ft. Vug, partly filled with gypsum, at 28.6 ft.
30	3						
	3						
	3						
	3	34.3					
35							Bottom of Exploration at 34.18 ft. Note: 1. Monitoring well installed in completed borehole. See bedrock monitoring well report for R-2. 2. Loss of 60 gallons drilling fluid (water) noted during R1 and R2. Loss of 350 gallons noted during R3.

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-3

PROJECT: HYDROGEOLOGIC INVESTIGATION-LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION-GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 50486.63N
56729.57E
ELEVATION: 518.92 ft.
DATUM: NGVD
START: 3 August 1990
FINISH: 7 August 1990
DRILLER: S. Loranty
H&A REP: W. Lanik

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	NX
INSIDE DIAMETER (IN)	6-1/4	1-3/8	2 1/8
HAMMER WEIGHT (LB)	---	140(A)	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 7S, Truck Mounted
BIT TYPE: Tricone roller, 7 7/8 in.
DRILL MUD: ---
OTHER: (A) Automatic hammer drive

DEPTH (FT)	OVA READING	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		8 18	S1	0.0		Very dense light brown coarse sandy SILT, trace gravel, trace organics in top 0.5 ft., dry.
	10 ppm	49 100/0.3	19"/24"	1.8		-FILL-
	3 ppm	100/0.5	S2 6/6"	2.0-2.5		Very dense brown sandy SILT, little gravel, dry.
					4.0	
5	ND	100/0.1	S3 1/1"	4.0-4.1	4.5	Very dense gray-brown sandy SILT, with SHALE pieces, dry. -HIGHLY WEATHERED BEDROCK-
						Top of Rock at 4.5 ft.
10						Notes: 1. Advanced auger to 4.5 ft. 2. Installed 8-in. temporary steel casing to 4.5 ft. 3. See Core Boring Report, page 2.
15						
20						
25						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
R Rock Core

SUMMARY

OVERBURDEN (LIN FT):	4.5
ROCK CORED (LIN FT):	25.0
SAMPLES:	3S, 3R
BORING NO.	B-3

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B-3 FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	DRILLING RATE MIN./FT.	CORE NO. — DEPTH(FT)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
							Began core boring at 4.5 ft.
5	3	4.5				4.5	Moderately hard slightly weathered gray to brown-gray fine grained dolomitic MUDSTONE; with horizontal bedding, indistinct color banding, occasional pits and vugs, and secondary gypsum mineralization as partings in fracture and joint apertures, fossil replacements, and vug fillings.
	3						
	3	R1	58/46	96/76			-ROCHESTER SHALE-
	3						
	3	9.5					
10	3	9.5					Joints, horizontal to low angle, very closely to closely spaced, smooth, planar to undulating, fresh, tight.
	3						
	3						Joint vertical, smooth, planar, fresh, tight from 4.9 to 5.1 ft.
	3						Joints, horizontal to low angle, rough, undulating, discolored, open at 6.2 ft., 6.6 ft., 7.4 ft., 7.7 ft., 8.5 ft., 10.6 ft., 12.6 ft., 13.4 ft., and 13.7 ft.
	3	R2	115/110	96/92			
15	3						Vug, partly filled with gypsum at 10.5 and 11.9 ft.
	3						
	3						Joint, vertical, smooth, undulating, slightly discolored, tight from 11.0 to 11.6 ft.
	4						
	4				SL		Lost approximately 400 gallons of washwater starting at 7.5 ft. during core runs R1 and R2, water observed exiting from casing of monitoring well SR3. Good washwater return during roller-bit reaming.
		19.5					
20							Advanced 7-7/8 in. tricone roller bit to 19.92 ft.
	4	19.9					Installed 4.0 in. black iron pipe well casing to 19.92 ft.
	4						Advanced 3-3/8 in. tricone roller bit to 19.95 ft.
	4						Began coring R3 at 19.95 ft.
	4						
	4	R3	116/104	97/87			Joints, horizontal to low angle, smooth, planar to undulating, discolored, open at 21.0 ft., 21.7 ft., 22.1 ft., 23.3 ft., 24.5 ft., 26.9 ft., 28.2 ft.and 29.2 ft.
25	5						
	5						
	5						Partial loss of washwater throughout R3, total loss of washwater at 29.7 ft. (total 300 gallons).
	4	29.75					
30							Bottom of Exploration at 29.75 ft.

Note:

1. Monitoring well installed in completed borehole. See bedrock monitoring well report for R-3.
2. Total loss of approximately 700 gallons drilling fluid noted during test boring procedure.

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-11

PROJECT: HYDROGEOLOGIC INVESTIGATION-LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION-GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 49554.19N
57140.39E
ELEVATION: 530.83 ft.
DATUM: NGVD
START: 30 July 1990
FINISH: 2 August 1990
DRILLER: S. Loranty
H&A REP: T. Wells

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	NX
INSIDE DIAMETER (IN)	6-1/4	1-3/8	---
HAMMER WEIGHT (LB)	---	140(A)	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 7S, Truck Mounted
BIT TYPE: Tricone roller, 7 7/8 in.
DRILL MUD: Bentonite mud used to ream
OTHER: from 30.0 ft. to 34.9 ft.
(A)-Automatic hammer drive

DEPTH (FT)	OVA READING	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	Asphalt.
	ND	11 9 4	S1 18"/18"	0.5 2.0	1.5	Medium dense gray-brown sandy GRAVEL, damp. -CRUSHED STONE FILL-
	ND	4 3 3 4	S2 18"/24"	2.0 4.0	3.2	Loose brown silty coarse to fine SAND, minor black staining, moist. -FILL- Loose black to brown SILT, little medium to fine cinder and brick particles, with root fibers, moist.
5	ND	8 33 50 81	S3 24"/24"	4.0 6.0	4.5	Loose brown SILT, little clay, moist. -RESIDUAL SOIL-
	ND	49 100/0.4	S4 15/11"	6.0-6.9		Same. Very dense light brown SILT, with weathered bedrock fabric and weathered shale pieces, dry. -COMPLETELY WEATHERED BEDROCK-
	ND	10 100/0.4	S5 11/11"	8.0-8.9		Same.
10	ND	40 54 100/0.4	S6 17"/17"	10.0 11.4		Same, except light gray-brown.
	ND	100/0.4	S7 5"/5"	12.0-12.4	12.0	Very dense light gray SILT and SHALE FRAGMENTS dry. -HIGHLY WEATHERED BEDROCK-
15	ND	100/0.3	S8 3"/4"	14-14.3		Same.
	ND	100/0.4	S9 1"/5"	16-16.4		Same.
	ND	100/0.3	S10 2/4"	18-18.3		Same.
20					19.5	Top of Bedrock at 19.5 ft.
						Note: See core boring report, p.2.
25						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT):	19.5
ROCK CORED (LIN FT):	25.4
SAMPLES:	10S, 4R
BORING NO.	B-11

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B-11 FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	DRILLING RATE MIN./FT.	CORE NO. DEPTH(FT)	RECOVERY/RQD IN.	RECOVERY/RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
							Top of Bedrock at 19.5 ft. Began Core Boring at 19.5 ft.
	5/0.5	19.5				19.5	
20	3	R1 20.0	6/0	100/0	SL		Moderately hard slighly weathered gray to brown-gray fine grained dolomitic MUDSTONE, with horizontal bedding, indistinct color banding, occasional pits and vugs, and secondary gymsum mineralization as partings in fractures, fossil replacement, or vug filling.
	6	20.0					-ROCHESTER SHALE-
	5	R2	50	83	SL-		Closely spaced smooth planar tight (occasionally open) bedding plane and low angle joints throughout.
	3		24	48*	FR		
	4	25.0					Moderately dipping smooth curved tight joint at 20.0 ft.
25	2.5	25.0					Loss of approximately 600 gallons drilling fluid (water) noted during coring of R1 and R2. Reamed borehole to 24.5 ft. with 7-7/8 inch roller bit before coring R3.
	3						
	3.5						
	4						Vug at 26.0 ft.
	3.5						
30	3	R3	118	104	SL-		Loss of approximately 200 gallons drilling fluid noted during coring of R3.
	3		56	47*	FR		Advanced 7-7/8 in. roller bit to 34.85 ft.
	4						Grouted 4 in. I.D. black iron pipe to 34.85 ft.
	5						Grout set in casing to 25 ft. below ground surface.
	3/0.5	34.5					Advanced 3 7/8 in. roller bit to 34.9 ft.
35	4	34.9					-ROCHESTER SHALE-
	3						
	4						
	3						
	3						
40	3	R4	118	98	SL-		
	4		79	67	FR		
	3						
	4						Rough stepped moderately dipping tight joint at 43.1 ft.
	4	44.9					Note: Complete rapid loss of drilling fluids at 44.6 ft.
45							Smooth planar open weathered bedding plane joint at 44.6 ft with brown silt and clay in joint aperture.
							Bottom of Exploration at 44.9 ft.

Notes:

1. Intermediate bedrock monitoring well R-11 installed in completed borehole; see report.
2. * - ROD % based on length of core recovered.
3. Total drilling fluid loss of approximately 900-1000 gallons during test boring.

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B105-C

PROJECT: Hydrogeologic Investigation - Lexington Avenue Facility
CLIENT: AC Rochester Division - General Motors Corporation
CONTRACTOR: Nothnagle Drilling

FILE NO. 70014-42
SHEET NO. 1 OF 3
LOCATION: 51999.59N
57565.83E

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Black Iron	None	NX
INSIDE DIAMETER (IN)	11.75	----	----
HAMMER WEIGHT (LB)	----	----	----
HAMMER FALL (IN)	----	----	----

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: See notes below
BIT TYPE:
DRILL MUD:
OTHER:

ELEVATION: 510.98 ft.
DATUM: NGVD
START: 25 September 1990
FINISH: 2 October 1990
DRILLER: S. Loranty
H&A REP: T. Wells

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
5						Notes: 1. Borehole advanced without sampling to 24.0 ft. with 14-in. air-rotary tricone roller bit drilling (rig type: Reedrill SK-35). 2. 11.75-in. I.D. black iron pipe installed through open hole and driven to 25.0 ft. with air-hammer (Reedrill SK-35). 3. See Core Boring Report pages 2 and 3.
10						
15						
20						
25					25.0	Top of Bedrock at 25.0 ft.

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
R NX Core

SUMMARY

OVERBURDEN (LIN FT):	25.0
ROCK CORED (LIN FT):	65.0
SAMPLES:	5R
BORING NO.	B105-C

H & A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B105-C FILE NO. 70014-42 SHEET NO. 2 OF 3

DEPTH (FT)	DRILLING RATE (MIN./FT.)	CORE NO. DEPTH(FT)	RECOVERY/RQD IN.	RECOVERY/RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
						25.0	Top of Bedrock at 25.0 ft. -ROCHESTER SHALE-
							Notes: (cont) 4. Borehole advanced without sampling to 45.0 ft. with 9-7/8-inch air-rotary tri-cone roller bit (Reedrill SK-35). 5. Advanced NX core boring with CME-75 drilling rig. 6. Borehole reamed to 55.0 ft. with 10-7/8-inch air-rotary tri-cone roller bit (Reedrill SK-35). 7. 8.25-inch I.D. black iron pipe installed and pressure-grouted to 54.9 ft. (CME-75).
30							
35							
40							
45							-ROCHESTER SHALE-
	4						Moderately hard slightly weathered to fresh gray fine-grained dolomitic MUDSTONE, with horizontal closely spaced bedding and indistinct color banding, and secondary gypsum mineralization as thin partings in joint apertures, as fossil replacement and as filling in pits and small vugs. Fossils are occasional at top of core boring.
	5						
	5						
	5						
	5	R1	113/22	93/19			-ROCHESTER SHALE-
50	4						Very closely to closely spaced bedding plan and low angle joints throughout; generally smooth, planar, tight (occasionally open).
	5						
	5						Driller noted loss of 1500 gallons of drilling fluid (water) during coring of R1.
	5						
	4						
55	6	55.0					
	5						
	6						
	5	R2	114/26	96/22			-ROCHESTER SHALE-
	5						
60							

H & A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B105-C FILE NO. 70014-42 SHEET NO. 3 OF 3

DEPTH (FT)	DRILLING RATE (MIN./FT.)	CORE NO. DEPTH(FT)	RECOVERY/RQD IN.	RECOVERY/RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	4						-ROCHESTER SHALE-
	5						
	5	R2 (cont.)	114/26	96/22	FR		(Closely spaced bedding plane and low angle joints throughout).
	4						
	3						Driller noted increased rate of advance from 63.0 - 64.9 ft.
	2	64.9					Open bedding plane joint at 64.5 ft.
65							Driller noted no measurable loss of drilling fluid during coring of runs R2 and R3.
	5	64.9					
	5						-ROCHESTER SHALE-
	4						
	4						
	4						
70							
	5	R3	114/26	96/22	FR		
	6						
	5						
	5						Notes: (cont)
	4	74.8					8. Borehole reamed with 7-7/8-inch tri-cone roller bit to 75.0 ft. 4.0-inch black iron pipe installed and pressure grouted to 75.0 ft.
75							
	5	75.0					Fossil density increases with depth, fossils frequent throughout R4 and R5.
	4						
	5						-ROCHESTER SHALE-
	6						
	4						
80							Driller noted loss of 50 gallons of drilling fluid (water) during coring of runs R4 and R5.
	5	R4	116/51	96/43	FR		
	5						Moderately dipping smooth planar open joint at 83.9 ft.
	4						
	5						-ROCHESTER SHALE-
	4	85.0					
85							
	3	85.0					
	2						Basal contact is sharp; low angle joint at contact.
	3	R5	48/24	80/50*	FR	86.8	Hard to moderately hard fresh green-gray fine to medium grained fossiliferous LIMESTONE, with horizontal moderately spaced bedding, occasional gypsum-filled vugs. -IRONDEQUOIT LIMESTONE-
	5						
	6	90.0					Dark gray shaley seam at 88.1 ft.
90							Bottom of exploration at 90.0 ft.
							Notes: (cont)
							9. *-calculation of RQD based on length of core recovered.
							10. Bedrock Monitoring Well Dr-105 installed in completed borehole; see report.
95							

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-106

PROJECT: HYDROGEOLOGIC INVESTIGATION-LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION-GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 51941.68N
57182.87E

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	NX
INSIDE DIAMETER (IN)	6-1/4	1-3/8	2-1/8
HAMMER WEIGHT (LB)	---	140(A)	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, Truck Mounted
BIT TYPE: Tricone roller, 5 7/8 in.
DRILL MUD: ---
OTHER: Automatic drive hammer

ELEVATION: 498.22 ft.
DATUM: NGVD
START: 9 August 1990
FINISH: 13 August 1990
DRILLER: S. Loranty
H&A REP: W.Lanik/T.Wells

DEPTH (FT)	OVA READING	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	-Asphalt-
	200-400 ppm methane	20 35 6 2	S1 18"/24"	1.0 3.0	2.0	Very dense gray-brown coarse GRAVEL, little silt, trace sand. -FILL-
	400-800 methane	2 1 1 1	S2 12"/24"	3.0 5.0		Medium stiff dark gray to black mottled organic SILT, little to trace gravel, trace clay, moist. Same, except soft and trace sand. -SWAMP DEPOSIT-
5	20-50 methane	4 1 2 3	S3 5"/24"	5.0 7.0	7.0	Soft gray brown sandy SILT, little gravel, trace organics, wet. (Sample submitted for analysis).
	8-10 methane	4 6 8 5	S4 12"/24"	7.0 9.0		Medium dense brown sandy SILT, little gravel, moist. -RESIDUAL SOIL- (Completely weathered bedrock)
10	20 methane	4 6 9 7 9	S5 12"/24"	9.0 11.0	11.0	Medium dense light brown to gray-brown mottled silt, little sand, trace gravel, dry to moist.
	3 ppm	35 100/0.3	S6 16/16"	11.0-12.3		Very dense gray-brown SILT, little to trace shale fragments, dry. -HIGHLY WEATHERED BEDROCK-
	---	40 100/0.3	S7 10/10"	13.0-13.8		Same.
15	---	100/0.4	S8 5"/5"	15-15.4		Very dense gray SHALE FRAGMENTS.
		100/0.0	S9 NR*	17.0	17.6	*No recovery.
						Top of Rock at 17.6 ft.
20						Notes: 1. Advanced augers to 17.6 ft. 2. Installed 8-in. temporary steel casing to 17.6 ft. 3. See core boring report, page 2.
25						

WATER LEVEL DATA					
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
R Rock Core

SUMMARY

OVERBURDEN (LIN FT):	17.6
ROCK CORED (LIN FT):	25.4
SAMPLES:	9S, 3R
BORING NO.	B-106

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B-106 FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	DRILLING RATE MIN./FT.	CORE NO. — DEPTH(FT)	RECOVERY IN.	RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	3					17.6	Began coring at 17.6 ft.
	4	17.6					Moderately hard, slightly weathered, gray to brown-gray, fine grained dolomitic MUDSTONE, with horizontal bedding, indistinat color banding, occasional pits and vugs, and secondary gypsum, mineralization as partings in fracture and joint apertures, fossil replacements, and vug fillings.
	4						
20	4	R1	58/58	96/96			-ROCHESTER SHALE-
	4						Joints, horizontal to low angle, very closely to closely spaced, smooth, planar to undulating, fresh, tight to open.
	3	22.6					
	3	22.6					
	3						Joints, low angle, extremely closely spaced, smooth to rough, planar discolored, open from 24.1 to 24.4 ft.
25	3						
	3						Partial water return starting at approximately 24 ft. (total volume lost = 250 gallons).
	3	R2	119/116	99/97			
	3						
	3						Advanced 7 7/8 in. tricone roller bit to 32.9 ft.
	3				SL		Installed 4.0 in. black iron pipe well casing to 32.9 ft.
30	3						Advanced 3 7/8 in. tricone roller bit to 33.0 ft.
	3						Began coring at 33.0 ft.
	3	32.6					-ROCHESTER SHALE-
		33.0					Open smooth planar bedding plane joints at 35.8 and 36.8 ft. with silt and drill cuttings in joint aperture.
	4						
35	3						Rough planar tight vertical joint at 37.9-38.1 ft.
	3						
	3	R3	117/102	97/85			
	3						
	4						Distinct light gray color bands at 39.5-39.7 ft. and 40.4-40.0 ft.
40	3						
	3						-ROCHESTER SHALE-
	3	43.0					
							Bottom of Exploration at 43.0 ft.
45							
							Note:
							1. Bedrock monitoring well installed in completed borehole; see report for R-106.

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-129

PROJECT: HYDROGEOLOGIC INVESTIGATION-LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION-GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 51335.32N
57290.67E
ELEVATION: 512.23 ft.
DATUM: NGVD
START: 30 July 1990
FINISH: 31 July 1990
DRILLER: S. Loranty
H&A REP: T. Wells

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	
INSIDE DIAMETER (IN)	6-1/4	1-3/8	
HAMMER WEIGHT (LB)		140(A)	
HAMMER FALL (IN)		30	

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 7S, Truck Mounted
BIT TYPE: ---
DRILL MUD: ---
OTHER: A-Automatic hammer drive

DEPTH (FT)	OVA READING	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	Asphalt.
	2ppm	3 3 2	S1 18"/18"	0.5 2.0		Loose light brown to dark gray sitly coarse to fine SAND, moist. -FILL-
	ND	1 4 2 3	S2 18"/24"	2.0 4.0		Some except dark gray, with coarse to fine gravel.
5	ND	1 1 2 3	S3 NR	4.0 6.0		(No recovery. Pieces of brick and concrete in auger spoil.) -FILL-
	ND	2 13 13 8	S4 14"/24"	6.0 8.0		Medium dense brown silty SAND, with coarse to fine gravel and broken concrete pieces, dry. -FILL-
	ND	1 2 2 1	S5 14"/24"	8.0 10.0		Loose light brown to gray (mottled) silty coarse to fine SAND, little gravel, very moist. Some black staining. -FILL-
10	ND	1 1 3 1	S6 12"/24"	10.0 12.0		Very loose brown silty coarse to fine SAND, with specks of brick or ceramic tile, very moist.
	4ppm	1 5 4 6	S7 12"/24"	12.0 14.0		Loose brown to dark gray-brown silty SAND, with concrete piece in bottom of sample, wet, with film of oil. -FILL-
	3ppm	48 44 18 8	S8 20"/24"	14.0 16.0	13.8	Concrete, very dense. -FILL-
15	ND	6 10 10 12	S9 18"/24"	16.0 18.0	15.5	Medium dense light gray to light brown silty fine SAND, trace trace medium sand, damp, mottled with gray staining. -FILL-
	ND	3 2 2 3	S10 8"/24"	18.0 20.0	17.0	Same, except with little coarse to medium sand.
20	ND	3 5 6 10	S11 20"/24"	20.0 22.0		Same, except with indistinct bedding and bedrock fabric. Loose light brown silty medium to fine SAND, moist. -RESIDUAL SOIL (DISTURBED)-
	ND	18 100/0.4	S12 11/11"	22.0-22.9	21.0	Same.
					22.1	Medium dense brown fine sandy SILT, trace medium sand, thin bedded, wet, (moist at bottom). Same. -RESIDUAL SOIL-
	ND	24 100/0.2	S13 7"/7"	24.0-24.6	24.0	Dark brown SILT with rock fragments, moist. -COMPLETELY WEATHERED BEDROCK-
25						Dark gray SHALE (very dense),highly weathered. -ROCHESTER SHALE-

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT): 24.0
ROCK CORED (LIN FT): 5.0(augered)
SAMPLES: 13S
BORING NO. B-129

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-129 FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
						-ROCHESTER SHALE- (highly weathered)
30						Bottom of Exploration at 29.0 ft.

Notes:

1. Advanced augers to 29.0 ft. Bottom of exploration at 29.0 ft. Washed boring to 29.0 ft. with 6-in. tricone roller bit.
2. Installed piezometer PZ-129 in completed borehole; see report.

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-130

PROJECT: HYDROGEOLOGIC INVESTIGATION-LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION-GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 1
LOCATION: See Plan
51295.92N
57208.23E
ELEVATION: 511.94 ft.
DATUM: NGVD
START: 8 August 1990
FINISH: 8 August 1990
DRILLER: S. Loranty
H&A REP: W. Lanik

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	---
INSIDE DIAMETER (IN)	6-1/4	1-3/8	---
HAMMER WEIGHT (LB)	---	140(A)	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, Truck Mounted
BIT TYPE: Tricone roller, 5-7/8 in.
DRILL MUD: ---
OTHER: Automatic drive hammer

DEPTH (FT)	OVA READING	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	-Asphalt-
	ND	2 10 8 6	S1 8"/24"	1.0 3.0		Medium dense brown sandy SILT, little to trace gravel. -FILL-
	20-30 methane	5 3 4 4	S2 14"/24"	3.0 5.0		Loose brown fine sandy SILT, trace coarse to medium sand, trace gravel, moist.
5	200- 300	1 1 2 3	S3 16"/24"	5.0 7.0	5.0	Soft light brown SILT, little clay, trace sand, moist. -FILL- * Sample submitted for analysis.
	100- 200	1 1 2 3	S4 19"/24"	7.0 9.0		Same, except little sand, with layer of brown coarse to fine SAND from 8.3 to 8.4 ft., wet at bottom. Medium stiff gray and red-brown mottled SILT, little sand, trace clay.
10	500- 800 methane	3 3 3 2	S5 16"/24"	9.0 11.0		Same, except soft and trace decomposed organic at bottom, with black, oil stained 12 ft. of sand from 11.8 to 11.9 ft.
	200- 500	1 1 1 2	S6* 12"/24"	11.0 13.0		-FILL-
	300- 400	1 1 1 2	S7 14"/24"	13.0 15.0	13.0	Soft reddish-gray to black mottled SILT, little sand, trace clay, trace decomposed organics, with black, oil staind layer of SAND, little fine gravel from 13.5 to 13.7 ft., also with cinders. -SWAMP FILL-
15	+1,000 methane	3 4 7 7	S8 20"/24"	15.0 17.0	15.4	Stiff gray-brown mottled SILT, little sand, trace gravel, trace clay, moist, with layer of block organic silt from 15.2 to 15.4 ft. -RESIDUAL SOIL-
	100 methane	15 14 25 100/0.5	S9 24"/24"	17.0 19.0	17.3 18.5	Same. Hard brown to gray mottled SILT. -COMPLETELY WEATHERED BEDROCK-
20	50- 100	28 32 100/0.3	S10 16"/16"	19.0 20.3	20.3	Very dense gray-brown SILT with shale fragments. -HIGHLY WEATHERED BEDROCK-
	0-3 off wash water during roller bit					Top of Rock at 20.3 ft. Notes: 1. Advanced augers to 19.4 ft., split spoon to 20.3 ft., and tricone roller bit (5-7/8 in.) to 27.0 ft. 2. Installed piezometer in completed borehole. See Piezometer report for PZ-130. Bottom of Boring at 27.0 ft.
25	drilling					

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
8/8/90	1045	0.5	19.4	20.3	18.2
8/8/90	1145	1.5	19.4	20.3	16.9

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
R Rock Core

SUMMARY

OVERBURDEN (LIN FT):	20.3
ROCK CORED (LIN FT):	---
SAMPLES:	10S
BORING NO.	B-130

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B131

PROJECT: Hydrogeologic Investigation - Lexington Avenue Facility
CLIENT: AC Rochester Division - General Motors Corporation
CONTRACTOR: Nothnagle Drilling

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 51191.38N
57750.18E
ELEVATION: 512.82 ft.
DATUM: NGVD
START: 24 August 1990
FINISH: 24 September 1990
DRILLER: S. Loranty
H&A REP: T. Wells

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	NX
INSIDE DIAMETER (IN)	6-1/4	1-3/8	2-1/8
HAMMER WEIGHT (LB)	----	140	----
HAMMER FALL (IN)	----	30	----

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, truck mounted,
BIT TYPE:
DRILL MUD:
OTHER:

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	OVA (ppm)					Fill (not sampled)
	ND	2 8 12 9	S1 12"/24"	1.0 3.0		Medium dense gray-brown sandy GRAVEL, dry. -CRUSHED STONE FILL-
	ND	4 16 20 13	S2 16"/24"	3.0 5.0	2.8	Medium dense brown silty SAND, moist.
5	ND	4 4 5 9	S3 4"/24"	5.0 7.0		Dense brown coarse to fine SAND, little silt, trace gravel, mottled with black staining, with dolomite fill block at 4.5 ft -FILL- Loose gray-brown gravelly SAND, dry to moist, with iron oxide staining (orange). -FILL-
	ND	4 1 2 2	S4 6"/24"	7.0 9.0		Very loose brown gravelly SAND, little silt, moist to wet, with iron oxide staining (orange), spoon wet at 8.0 ft. -FILL-
	7 ppm	1 2 1 2	S5 6"/24"	9.0 11.0		Very loose brown fine SAND, little medium to coarse sand, trace fine gravel, sheen of oil, wet. -FILL-
10		5 6 2 2	S6 8"/24"	11.0 13.0		Same, except loose, increasing gravel towards bottom. -FILL-
		1 3 4 6	S7 20"/24"	13.0 15.0	12.8 14.0	Soft dark brown CLAY, little organic silt, wet, with shell fragments. -SWAMP DEPOSIT- Soft black organic SILT, with shell fragments, grades downwards to gray very loose silty fine SAND, little organic silt and clay, trace medium sand. -SWAMP DEPOSIT-
15		1 1 3 10	S8 16"/24"	15.0 17.0	15.2	Loose brown to gray SILT, little medium to fine sand, little clay, with root fibers and organics, moist. -RESIDUAL SOIL- Same, except without sand, moist. -RESIDUAL SOIL- Medium dense brown mottled SILT, little clay, trace coarse sand, moist, to wet at bottom. -RESIDUAL SOIL-
		3 6 16 17	S9 24"/24"	17.0 19.0		
20		37 105/.5	S10 12"/12"	19.0 20.0		Dense brown to gray SILT, with bedrock fabric, moist. -COMPLETELY WEATHERED BEDROCK- Same, except very dense, wet to moist.
		40 50 100/.1	S11 10"/13"	21.0 22.1		Same, with trace clay. Top of Bedrock at 23.3 ft.
25						Note: Advanced augers to 23.3 ft. Installed 8.0-in. I.D. temporary casing to 23.4 ft. Advanced 7-7/8-in. tri-cone roller bit to 23.3 ft. See core Boring Report, page 2.

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
R NX Rock Core

SUMMARY

OVERBURDEN (LIN FT):	23.3
ROCK CORED (LIN FT):	24.9
SAMPLES:	11S, 3R
BORING NO.	B131

H & A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B131 FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	DRILLING RATE (MIN./FT.)	CORE NO. / DEPTH(FT)	RECOVERY/RQD IN.	RECOVERY/RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
							Top of Bedrock at 23.3 ft. Began Core Boring at 23.4 ft.
	3	23.4				23.3	Moderately hard slightly weathered gray to brown-gray fine grained dolomitic MUDSTONE, with horizontal bedding, and with secondary gypsum mineralization as partings in joint apertures and vug fillings; occasional fossils toward bottom of boring.
	4						-ROCHESTER SHALE-
25	4	R1	54/0	90/0	SL		Very closely spaced low angle to horizontal (bedding plane) smooth planar open joints throughout R1. Occasional irregular planar to stepped rough high angle to vertical joints.
	3						
	5	28.4					Very closely to closely spaced smooth planr open (occasionally tight) bedding plane and low angle joints throughout R2 and R3.
	3	28.6					
	4						
30	4						
	5						
	5						
	4	R2	117/37	97/30	SL		
	5						
35	5						Rough vertical joint between bedding plane joints at 35.3 ft., one-inch gap filled with brown silt, sand, and shale fragments.
	5						
	4						
	3	38.6					
	6	38.3					
40	5						
	6						
	5						
	5	R3	112/38	94/30	SL		Note: Approximately 50 gallons drilling fluid lost during coring of R3. Driller noted that inner core barrel had not been rotating freely during part of R3 coring; R.Q.D. may consequently be somewhat lower than in situ condition.
	6						
45	5						-ROCHESTER SHALE-
	5						
	5	48.2					Bottom of Exploration at 48.2 ft.
							Notes:
50							1. Borehole reamed to 38.1 ft. with 7-7/8-in. roller bit after completion of R2. 40.03 ft. length of 4-in. I.D. black iron pipe pressure-grouted to depth of 38.1 ft.
							2. Bedrock monitoring well R-131 installed in completed borehole; see report.
55							

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-131-A

PROJECT: HYDROGEOLOGIC INVESTIGATION - LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 51390N 57730E
ELEVATION: 513 ft.
DATUM: NGVD
START: 14 August 1990
FINISH: 14 August 1990
DRILLER: S. Loranty
H&A REP: T. Wells

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	---
INSIDE DIAMETER (IN)	6-1/4	1-3/8	---
HAMMER WEIGHT (LB)	---	140	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, Truck Mounted
BIT TYPE: ---
DRILL MUD: ---
OTHER: Automatic hammer drive

DEPTH (FT)	OVA READING	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
	(ppm)				0.5	ASPHALT (Not sampled).
	ND	4 2 2	S1 18"/18"	0.5 2.0		Loose brown to black coarse to fine SAND, little silt, trace gravel, with brick pieces, moist. -FILL-
	ND	2 2 2	S2 12"/24"	2.0 4.0		Very loose brown coarse to fine SAND, little gravel, moist. -FILL- Same to 4.5 ft.
5	ND	2 4 2	S3 18"/24"	4.0 6.0	4.5	Loose red-brown, medium to fine sand, little coarse gravel, moist. -FILL-
	ND	7 7 7	S4 12"/24"	6.0 8.0	6.0	Medium dense brown gravelly fine SAND, moist. -FILL-
	>10	2 4 2	S5 4"/24"	8.0 10.0		Loose brown coarse to fine sandy GRAVEL, with cobbles or bolders wet and oil soaked, odor of pertoleum product. -FILL-
10	ND	23 10 1	S6 6"/24"	10.0 12.0		Same, except dense to medium dense. Note: Samples of S5 and S6 composited for analysis.
	6	3 5 11	S7 4"/24"	12.0 14.0		Same, poor recovery, medium dense. -FILL- Note: Sample of liquid in split spoon collected for analysis. Film of oil present on drilling and sampling tools.
	ND	11 2 2	S8 18"/24"	14.0 16.0	14.5	Same. Soft brown (with black staining) clayey SILT, wet. -GLACIOLACUSTRINE-
15	5	5 5 8	S9 1"/24"	16.0 18.0		Same, except stiff (? - very poor recovery). -GLACIOLACUSTRINE-
	ND	8 8 9	S10 24"/24"	18.0 20.0	18.8	Same, except very stiff dark brown to black, with wood fibers and decayed organic matter at base.
20	ND	5 5 10	S11 24"/24"	20.0 22.0	21.0	Medium dense mottled light brown to light gray fine sandy SILT, trace coarse to medium sand, wet. Same. -GLACIAL TILL-
	ND	5 10 28	S12 20"/24"	22.0 24.0		Dense light brown SILT, little fine sand. -COMPLETELY WEATHERED BEDROCK- Same, with distinet bedrock fabric.
25						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
8/14/90	1430	0	27.0	27.0	6.5*

* - in annulaus of boring

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT):	27.0
ROCK CORED (LIN FT):	---
SAMPLES:	14S
BORING NO.	B-131-A

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-131-A FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
25		32 80 100/0.3	S13 16"/16"	24.0 25.3		Very dense light brown SILT, little fine sand, moist to wet. -COMPLETELY WEATHERED BEDROCK- Same, with piece of shale, mottled light brown to gray.
		100/0.5	S14 6/6"	26-26.5		
30						Bottom of Exploration at 27.0 ft. Note: 1. Advanced augers to 27.0 ft. (auger refusal). 2. Borehole abandoned to allow repair to 12 inch sewer line intersected at depth of 6.5 ft. Electrical cables parallel to sewer line present (apparently intact) at same depth. 3. Borehole backfilled to 10 ft. with bentonite-cement grout. 4. Borehole location and elevation estimated by H&A of New York (not surveyed).

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B-132

PROJECT: HYDROGEOLOGIC INVESTIGATION - LEXINGTON AVENUE FACILITY
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70014-42
SHEET NO. 1 OF 1
LOCATION: Adjacent to B-132A (See Report)

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	
INSIDE DIAMETER (IN)	6-1/4	1-3/8	
HAMMER WEIGHT (LB)		140	
HAMMER FALL (IN)		30	

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, Truck Mounted
BIT TYPE: ---
DRILL MUD: ---
OTHER: Automatic hammer drive

ELEVATION: 512.7 ft.
DATUM: NGVD
START: 15 August 1990
FINISH: 17 August 1990
DRILLER: S. Loranty
H&A REP: T. Wells

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	Asphalt.
		4 4 4 4	S1 12"/24"	1.0 3.0		Loose brown to gray-brown gravelly SAND, with cobbles, damp. -CRUSHED STONE FILL-
		4 29 8 2	S2 4"/24"	3.0 5.0	3.0	Dense gray dolomite BLOCK or PIECE, dry. -COARSE FILL-
5		9 17 10 5	S3 10"/24"	5.0 7.0		Dense gray-brown sandy GRAVEL, damp.
		4 4 1 2	S4 4"/24"	7.0 9.0		Same, except loose. -COARSE FILL- (Oil and water on spoon 9.0 ft.)
10		2 2 3 2	S5 4"/24"	9.0 11.0		Same, except saturated and oil soaked. -COARSE FILL-
		8 20 5 8	S6 6"/24"	11.0 13.0		Same.
		5 2 3 4	S7 12"/24"	13.0 15.0	13.5 14.5	Same. Medium stiff dark brown to black clayey SILT, oil stained, with decayed organic matter at 14.5 ft. -LACUSTRINE-
15		3 3 6 9	S8 16"/24"	15.0 17.0		Loose light brown SILT, trace clay, with root fibers, moist. -RESIDUAL SOIL- Loose dark brown to light brown mottled SILT, little clay, with organic fibers, moist -RESIDUAL SOIL-
		3 9 13 13	S9 20"/24"	17.0 19.0		Same, except medium dense, without organic fibers.
20		13 20 8 100/0.5	S10 20"/24"	19.0 21.0	20.5	Same. Very dense gray brown, SILT and SHALE. -HIGHLY WEATHERED BEDROCK-
25						Bottom of Exploration at 21.0 ft.

Notes: 1. Auger refusal at 20.6 ft.; 2. Repeated caving of borehole at depth of 8-10 ft. (large dolomite blocks) necessitated borehole abandonment. Borehole backfilled with bentonite-cement grout to 8.0 ft., with crushed stone to 1.0 ft. with cement grout to surface. 3. See test boring report B132A.

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT):	21.0
ROCK CORED (LIN FT):	---
SAMPLES:	S10
BORING NO.	B132

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B132-A

PROJECT: Hydrogeologic Investigation - Lexington Avenue Facility
CLIENT: AC Rochester Division - General Motors Corporation
CONTRACTOR: Nothnagle Drilling

FILE NO. 70014-42
SHEET NO. 1 OF 2
LOCATION: 51092.62N
58080.42E
ELEVATION: 512.77 ft.
DATUM: NGVD
START: 17 August 1990
FINISH: 21 August 1990
DRILLER: S. Loranty
H&A REP: T. Wells

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	B.I.P.	----	NX
INSIDE DIAMETER (IN)	10, 8	----	2-1/8
HAMMER WEIGHT (LB)	----	----	----
HAMMER FALL (IN)	----	----	----

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75,truck mounted, (Reed drill SK35 used to set 8-in. casing)
DRILL MUD: Bentonite mud used
OTHER: See notes below

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
5						**Notes:** 1. Boring installed 2.5 ft. north of test boring B-132 (see report). Overburden material not sampled in B-132A. 2. Advanced 6-1/4-in. I.D. augers to 8.0 ft. Installed 10-1/4-in. I.D. temporary casing to 6.0 ft. 3. Advanced 10-in. tricone roller bit to 9.0 ft. with bentonite mud drilling fluid. 200 gallons mud lost during drilling. 4. Advanced 10-in. tricone roller bit with air rotary drilling rig to 15.0 ft. Advanced 8.0-in. temp. casing to 16.8 ft. with air hammer. 5. Advanced 8.0-in. tricone roller bit to 21.3 ft. Advanced 8.0-in. casing to 20.9 ft. Casing sealed at top with bentonite pellets and grout. 6. Began core boring at 21.3 ft. (See core boring report).
10						
15						
20					20.9	Top of Bedrock at 20.9 ft.
25						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER
8/20/90	0800	65			6.6

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT):	21.3
ROCK CORED (LIN FT):	24.8
SAMPLES:	3R
BORING NO.	B132-A

H & A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B132-A FILE NO. 70014-42 SHEET NO. 2 OF 2

DEPTH (FT)	DRILLING RATE (MIN./FT.)	CORE NO. / DEPTH(FT)	RECOVERY/RQD IN.	RECOVERY/RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
						20.9	Top of Bedrock at 20.9 ft.
		21.3					Began core boring at 21.3 ft.
	4						Moderately to slightly weathered moderately hard gray to brown gray fine grained dolomitic MUDSTONE, with horizontal bedding, indistinct color banding, and secondary gypsum minimalization as partings in joint apertures, vug filling or occasional fossil replacement.
	3	R1	57/5	95/8	MOD -SL		
	4						-ROCHESTER SHALE-
25	3						Closely to very closely spaced bedding plane and low angle smooth planar, tight to open joints throughout. Hightly weathered section from 23.3 to 23.8 ft. with seam of brown clayey silt from 23.4 to 23.6 ft.
	3	26.3					Open bedding plane joint at 25.9 ft, with gray silt in joint aperture.
	3	26.3					Rough irregular planar discontinuous tight to open vertical joints: 21.8-22.4 ft., 26.5-27.1 ft., 27.6-28.2 ft., 30.8-32.6 ft., 33.8-34.0 ft. with core generally highly fractured in these sections.
	2						
	3						Drilling fluid return lost during coring of R1. Partial drilling fluid return during reaming of R1. No drilling fluid return during coring and reaming of R2. Total loss of drilling fluids of approximately 4000 gallons. Borehole reamed to 36.5 ft. 4.0-in. I.D. casing installed to 36.5 ft. (pressure grouted 90 gallons, waited 3 hours, tremied 150 gallons between 4" and 8" casings). Recovered 0.15 ft. of grout at top of R3. No No loss of drilling fluids noted during coring of R3.
	3						
30	4	R2	120/39	100/33	SL		
	3						
	3						
	4						
	3				SL-FR		
35	3	36.3					
	3	36.1					
	4						
	5						
	4						Driller noted 2-in. void at 38.5 ft. Corresponding open bedding plane joint noted in drill core.
40	5						
	5	R3	115/26	96/22	FR		-ROCHESTER SHALE-
	5						
	6						
	5						
45	4	46.1					
							Bottom of Exploration at 46.1 ft.
							Notes:
							1. Bedrock monitoring well R-132 installed in completed borehole; see report.
50							2. Approximately 4000 gallons drilling fluid lost during coring and reaming, as noted above.
55							

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B216

PROJECT: DEGREASER INVESTIGATION
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70138-40
SHEET NO. 1 OF 1
LOCATION: 18.1 ft. North, 24.5 ft. East of MM-21 (50,788N, 57,187E)
ELEVATION: 516.85 ft.
DATUM: NGVD
START: 4 September 1990
FINISH: 5 September 1990
DRILLER: F. Gratten
H&A REP: T. Wells

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Augers	SS	---
INSIDE DIAMETER (IN)	4 1/4	1 3/8	---
HAMMER WEIGHT (LB)	---	140	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: Diedrich D-25
BIT TYPE: ---
DRILL MUD: ---
OTHER: See notes below

DEPTH (FT)	VOC (PPM)	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
					0.5	-CONCRETE FLOOR SLAB-
	15	16 13 13	S1 18"/18"	0.5 2.0		Medium dense brown silty fine SAND, trace coarse to medium sand, damp to moist. -FILL-
	3	10 7 15 19	S2 18"/24"	2.0 4.0		Same, except with little gravel. -FILL-
	NR	67 27 18 17	S3 20"/24"	4.0 6.0	4.5 4.8 5.1	Same. Asphalt, dry. -BURIED PAVEMENT- Crushed stone fill, dry. -FILL-
5	NR	2 5 6 9	S4 16"/24"	6.0 8.0	7.0	Dense brown silty fine SAND, little coarse to medium sand, trace gravel, moist. Same, except loose. -FILL-
	NR	8 8 11 15	S5 22"/24"	8.0 10.0	9.5	Medium dense, gray-brown SILT, little fine sand, trace coarse to medium sand, moist. -FILL- Same, except increasingly dark gray with depth.
10	NR	8 10 12 16	S6 20"/24"	10.0 12.0	10.5 11.5	Medium dense dark gray SILT, trace clay, trace sand, moist. -SWAMP DEPOSIT- Medium dense, mottled light dark gray silty fine SAND, moist. -LACUSTRINE-
	6	28 43 44 100/0.3	S7 18"/24"	12.0 14.0		Medium dense brown SILT, with weathered bedrock fabrick, damp to moist. -COMPLETELY WEATHERED BEDROCK-
15	19	100/0.3	S8 4/4"	14-14.3		Same, except very dense. Same (insufficient sample for VOC analysis). -COMPLETELY WEATHERED BEDROCK- Bottom of Exploration at 26.8 ft. (See Notes)
20					19.8	
25						

Notes:

1. Advanced 4 1/4 in. auger to refusal at 15.0 ft.
2. Installed 4 in. I.D. temporary casing to 14.94 ft. Temporary bentonite seal placed in annular space around casing (to bottom of casing).
3. Advanced 4.0 in. tri-cone roller bit to 26.8 ft.
4. Installed observation well 6R-216 in completed borehole; see report.
5. Top of competent bedrock approximately 19.8 ft., as noted by driller.
6. Volatile organic vapor concentrations in parts per million measured along split spoon samples with Foxboro 128 OVA or HNU (11.7 ev) PID. NR = No reading.

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT): 19.8
ROCK CORED (LIN FT): 7.0 (roller bit)
SAMPLES: 8S
BORING NO. B216

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B230

PROJECT: DEGREASER INVESTIGATION
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING

FILE NO. 70138-40
SHEET NO. 1 OF 2
LOCATION: 6.4 ft. northwest of VM-217

ELEVATION: 516.8 ft.
DATUM: NGVD
START: 29 October 1990
FINISH: 30 October 1990
DRILLER: F. Gratten
H&A REP: T. Wells

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	Flush Jt.	---	HQ
INSIDE DIAMETER (IN)	4.0		2.5
HAMMER WEIGHT (LB)	140		
HAMMER FALL (IN)	30		

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: Diedrich D-25
BIT TYPE: See notes
DRILL MUD: None
OTHER: See notes below

DEPTH (FT)	VOC (PPM)	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
5						Notes: 1. Borehole installed approximately 6.4 ft. northeast of test boring/monitoring well VM-217. See B-217 test boring report for description of overburden soils to depth of 14.9 ft. 2. Floor slab cut with circular saw by AC Rochester to depth of 0.8 ft. 4-1/4 in. augers used to bore through concrete of former catch basin structure. 3. Advanced augers to refusal at 15.8 ft. Weathered bedrock material noted on bottom end of augers. 4. Advanced 4.0 in. I.D. flush joint casing to 16.3 ft. using 140 lb. hammer.
10						
15					15.8	5. Advanced 3-7/8 in. tricone roller bit to 20.0 ft. Competent bedrock noted by driller at 20.0 ft.
20					20.0	Top of Bedrock at 20.0 ft. 6. See core boring report, p. 2.
25						

WATER LEVEL DATA					
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	DEPTH (FT) TO: BOTTOM OF HOLE	DEPTH (FT) TO: WATER

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon
R HQ Rock Core

SUMMARY

OVERBURDEN (LIN FT):	20.0
ROCK CORED (LIN FT):	6.0
SAMPLES:	2R
BORING NO.	B230

H & A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	CORE BORING REPORT	BORING NO. B230 FILE NO. 70138-40 SHEET NO. 2 OF 2

DEPTH	DRILLING RATE (MIN./FT.)	CORE NO. DEPTH (FT)	RECOVERY/RQD IN.	RECOVERY/RQD %	WEATHERING	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
						20.0	Began Core Boring at 20.0 ft.
20	8	20.0 R1	9	75			Top of Bedrock at 20.0 ft.
		21.0	0	0			Moderately hard moderately to slightly weathered gray fine-grained dolomitic MUDSTONE, with horizontal bedding, and occasional pits and vugs.
	14	21.0			MOD-SL		- Closely to very closely spaced bedding plane and low angle planar open joints throughout.
	7				COMP		- Closely to moderately spaced steeply dipping to moderately dipping rough planar open joints throughout.
	8	R2	52 0	87 0	MOD HIGH		- Completely weathered section of brown silt with shale pieces from 23.5 to 23.8 ft.
	11				MOD-SL		- Highly weathered section with seam of gray clayey silt at 24.6 to 24.8 ft.
25	10	26.0					Bottom of Exploration at 26.0 ft.
							Notes:
30							1. Shallow bedrock monitoring well SR-230 installed in completed borehole; see report.
							2. Loss of drilling fluids during roller bit and core drilling totaled approximately 20-40 gallons.
35							
40							
45							

APPENDIX B

Well Construction and Groundwater Level Reports

- Monitoring Well Installation Reports
  (for wells installed during 1990)

- Groundwater Level Monitoring Reports
  (for all Lexington Avenue facility monitoring wells)

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

BEDROCK MONITORING WELL REPORT

PROJECT: HYDROGEOLOGIC INVESTIGATION
LOCATION: LEXINGTON AVENUE FACILITY, ROCHESTER, NEW YORK
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING
DRILLER: S. LORANTY RIG TYPE: CME 75, TRUCK MOUNTED
INSTALLATION DATE: 2-7 AUGUST 1990

FILE NO.: 70014-42
WELL NO.: R-2
LOCATION: 50053.01N
58594.31E
SHEET: 1 OF 2
INSPECTOR: T. WELLS/ W. LANIK

Survey Datum NGVD

Ground Elevation: 513.39 ft.

SUMMARIZE Soil Conditions

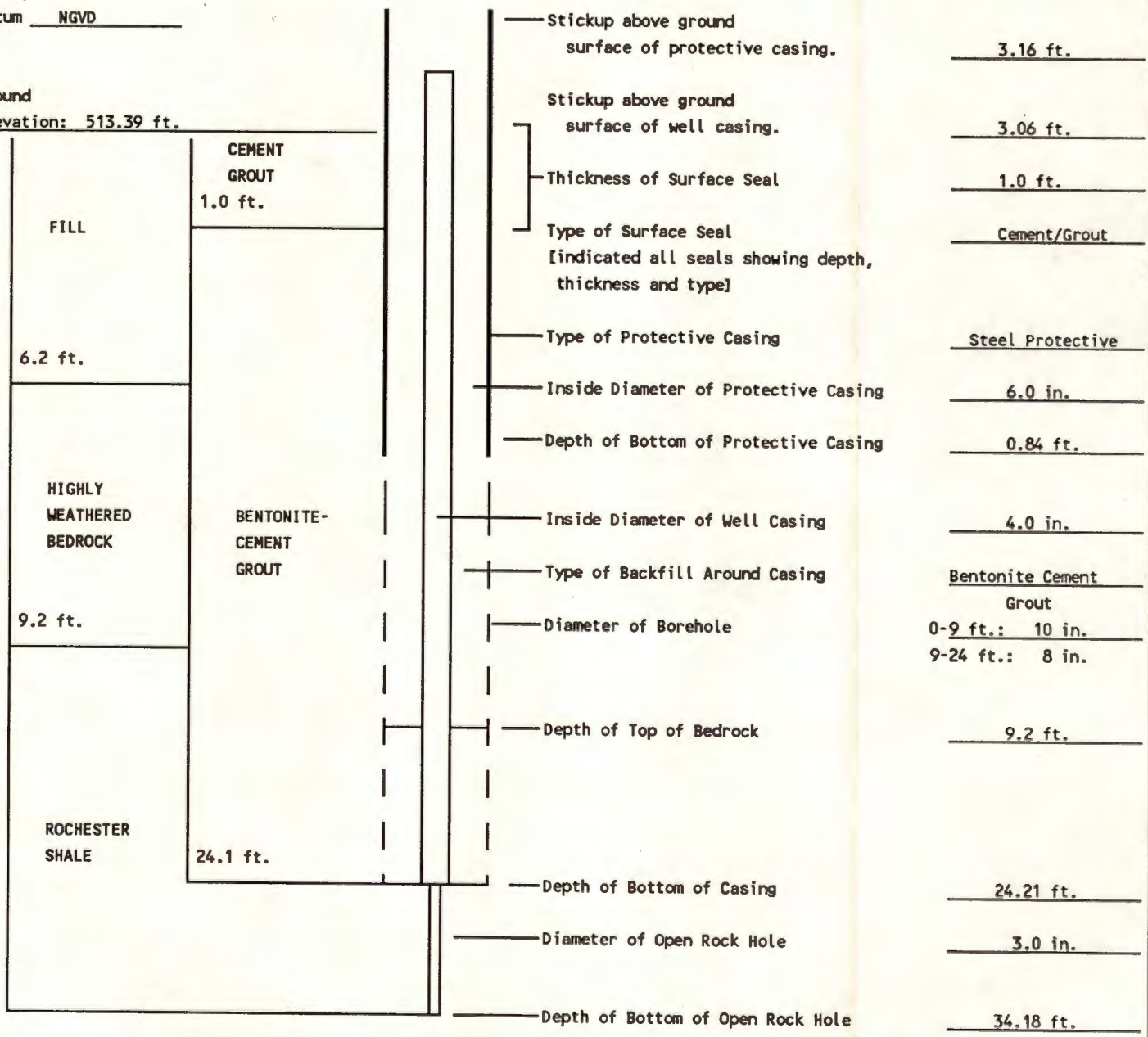
FILL — 6.2 ft.

HIGHLY WEATHERED BEDROCK — 9.2 ft.

ROCHESTER SHALE — 24.1 ft.

CEMENT GROUT 1.0 ft.

BENTONITE-CEMENT GROUT



Stickup above ground surface of protective casing.	3.16 ft.
Stickup above ground surface of well casing.	3.06 ft.
Thickness of Surface Seal	1.0 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Cement/Grout
Type of Protective Casing	Steel Protective
Inside Diameter of Protective Casing	6.0 in.
Depth of Bottom of Protective Casing	0.84 ft.
Inside Diameter of Well Casing	4.0 in.
Type of Backfill Around Casing	Bentonite Cement Grout
Diameter of Borehole	0-9 ft.: 10 in. 9-24 ft.: 8 in.
Depth of Top of Bedrock	9.2 ft.
Depth of Bottom of Casing	24.21 ft.
Diameter of Open Rock Hole	3.0 in.
Depth of Bottom of Open Rock Hole	34.18 ft.

Method and Materials used to grout casings:
Well casing: 4.0 in. I.D. black iron pipe, 27.27 ft. length, with threaded casing joint at 20.7 ft. below top of casing, centralizers at 14 ft. and 19 ft. depth, pressure grouted in place.

Remarks:

Well No. R-2

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

BEDROCK MONITORING WELL REPORT

PROJECT: HYDROGEOLOGIC INVESTIGATION
LOCATION: LEXINGTON AVENUE FACILITY, ROCHESTER, NEW YORK
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING
DRILLER: S. LORANTY RIG TYPE: CME 75, TRUCK MOUNTED
INSTALLATION DATE: 3-7 AUGUST 1990

FILE NO.: 70014-42
WELL NO.: R-3
LOCATION: 50486.63N
56729.57E
SHEET: 1 OF 2
INSPECTOR: W. LANIK

Survey
Datum NGVD

Ground
Elevation: 518.92 ft.

SUMMARIZE SOIL CONDITIONS

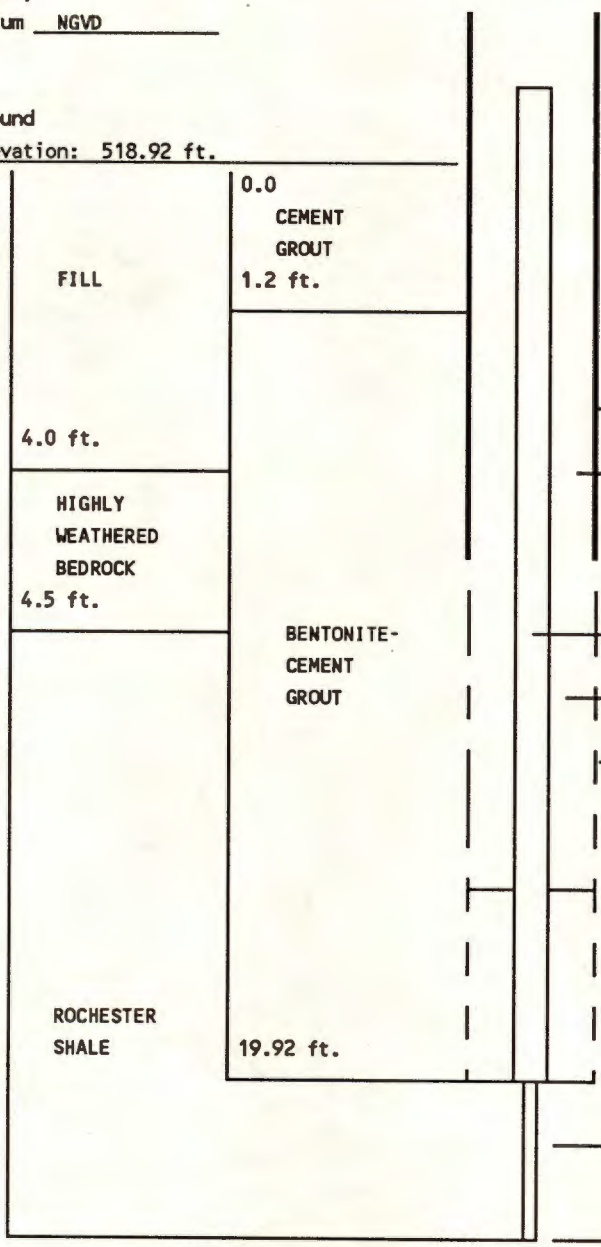
FILL
4.0 ft.

HIGHLY
WEATHERED
BEDROCK
4.5 ft.

ROCHESTER
SHALE
19.92 ft.

0.0
CEMENT
GROUT
1.2 ft.

BENTONITE-
CEMENT
GROUT



Stickup above ground surface of protective casing. 2.99 ft.

Stickup above ground surface of well casing. 2.50 ft.

Thickness of Surface Seal 1.2 ft.

Type of Surface Seal [indicated all seals showing depth, thickness and type] Cement/Grout

Type of Protective Casing Steel Protective

Inside Diameter of Protective Casing 6.0 in.

Depth of Bottom of Protective Casing 1.01 ft.

Inside Diameter of Well Casing 4.0 in.

Type of Backfill Around Casing Bentonite Cement Grout

Diameter of Borehole 0-4.5 ft.: 10 in.
4.5-19.9 ft.: 8 in.

Depth of Top of Bedrock 4.5 ft.

Depth of Bottom of Casing 19.92 ft.

Diameter of Open Rock Hole 3.0 in.

Depth of Bottom of Open Rock Hole 29.75 ft.

Method and Materials used to grout casings:
Well casing: 4.0 in. I.D. black iron pipe, 22.42 ft. length, pressure grouted in place.

Remarks:

Well No. R-3

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

BEDROCK MONITORING WELL REPORT

PROJECT: HYDROGEOLOGIC INVESTIGATION
LOCATION: LEXINGTON AVENUE FACILITY, ROCHESTER, NEW YORK
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING
DRILLER: S. LORANTY RIG TYPE: CME 75, TRUCK MOUNTED
INSTALLATION DATE: 2 AUGUST 1990

FILE NO.: 70014-42
WELL NO.: R-11
LOCATION: 49554.19N
57140.39E
SHEET: 1 OF 2
INSPECTOR: T. WELLS

Survey Datum NGVD

Ground Elevation: 530.83 ft.

SUMMARIZED SOIL CONDITIONS

FILL AND RESIDUAL SOIL — 4.5 ft.

COMPLETELY TO HIGHLY WEATHERED BEDROCK — 19.5 ft.

ROCHESTER SHALE — 44.9 ft.

CONCRETE (8/2/90) — 3.0 ft.

BENTONITE-CEMENT GROUT (8/1/90)

Stickup above ground surface of protective casing.	2.56 ft.
Stickup above ground surface of well casing.	2.45 ft.
Thickness of Surface Seal	3.0 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Concrete
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	6.0 in.
Depth of Bottom of Protective Casing	2.3 ft.
Inside Diameter of Well Casing	4.0 in.
Type of Backfill Around Casing	Bentonite-cement grout
Diameter of Borehole 0-19.5 ft. - 10 in. 19.5-34.9 ft. - 8 in.	
Depth of Top of Bedrock	19.5 ft.
Depth of Bottom of Casing	34.93 ft.
Diameter of Open Rock Hole	3.0 in.
Depth of Bottom of Open Rock Hole	44.9 ft.

Method and Materials used to grout casings:
Casing: 37.38 ft., 4.0 in. I.D. black iron pipe. Threaded casing joint at 18.6 ft. below TOC.
Casing pressure grouted in place.

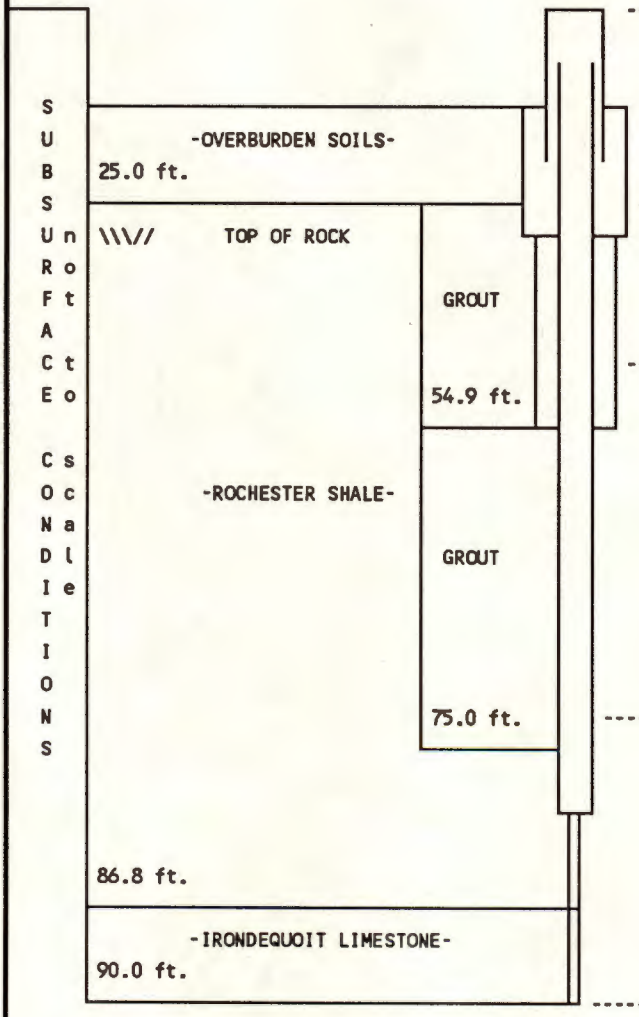
Remarks:

Well No. R-11

H & A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	BEDROCK MONITORING WELL INSTALLATION REPORT

PROJECT	Hydrogeologic Investigation		FILE NO. 70014-42
LOCATION	Lexington Avenue Facility - Rochester, New York		WELL NO. DR-105
CLIENT	AC Rochester Division - General Motors Corporation		LOCATION 51999.59N 57565.83E
CONTRACTOR	Nothnagle Drilling		
DRILLER	S. Loranty	RIG TYPE Reedrill SK35 and CME-75	SHEET NO. 1 OF 2
INSTALLATION DATE	2 October 1990		INSPECTOR T. Wells

GROUND SURFACE ELEVATION 510.98 ft.
INNER CASING TOP ELEVATION 513.91 ft.



PROTECTIVE CASING:
- TYPE: Steel
- HEIGHT: 2.94 ft.
- DIAMETER: 6 in.
- BOTTOM DEPTH: 2.1 ft.

STICK-UP TO TOP OF INNER CASING: 2.93 ft.

OUTER CASING:
- BOTTOM DEPTH: 25.0 ft.
- CASING TYPE: Black Iron
- CASING DIAMETER: 11.75 in.
- BOREHOLE DIAMETER: 14 in. +

INTERMEDIATE CASING:
- BOTTOM DEPTH: 54.9 ft.
- CASING TYPE: Black Iron
- CASING DIAMETER: 8.25 in.
- BOREHOLE DIAMETER: 11. in. +

INNER CASING:
- BOTTOM DEPTH: 75.0 ft.
- CASING TYPE: Black Iron
- CASING DIAMETER: 4.0 in.
- BOREHOLE DIAMETER: 8 in.

DEPTH TO BOTTOM OF ROCK HOLE: 90.0 ft.
BOREHOLE DIAMETER: 3.0 in.

NOTES:
1. ALL DEPTHS EXPRESSED IN FT.
2. ALL CASING DIAMETERS ARE INSIDE-DIAMETER, EXPRESSED IN INCHES.
3. NX CORE PIECE, 0.6 FT. LONG, AT BOTTOM OF ROCK HOLE (not recovered in core barrel).

METHOD AND MATERIALS USED TO GROUT CASINGS:

Outer casing advanced through open hole to 24.0 ft., air-hammer-driven to 25.0 ft. Intermediate casing pressure-grouted to 54.9 ft. with bentonite-cement grout; casing joints are welded. Inner casing pressure-grouted (bentonite-cement grout) to 75.0 ft.; threaded casing joints at 0.0, 20.3, 41.5 and 59.2 ft.

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

BEDROCK MONITORING WELL REPORT

PROJECT: HYDROGEOLOGIC INVESTIGATION
LOCATION: LEXINGTON AVENUE FACILITY, ROCHESTER, NEW YORK
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING
DRILLER: S. LORANTY RIG TYPE: CME 75, TRUCK MOUNTED
INSTALLATION DATE: 9-13 AUGUST 1990

FILE NO.: 70014-42
WELL NO.: R-106
LOCATION: 51941.68N
57182.87E
SHEET: 1 OF 2
INSPECTOR: T. WELLS/W. LANIK

Survey Datum NGVD

Ground Elevation: 498.22 ft.

SUMMARIZED SOIL CONDITIONS

- ASPHALT 0.5 ft.
- FILL 2.0 ft.
- -SWAMP DEPOSIT- 7.0 ft.
- -RESIDUAL SOIL- 11.0 ft.
- COMPLETELY TO HIGHLY WEATHERED BEDROCK 17.6 ft.
- ROCHESTER SHALE 43.0 ft.

CEMENT GROUT 4.0 ft.
BENTONITE-CEMENT GROUT 32.9 ft.

Depth/Stickup above/below ground surface of protective casing.	2.68 ft.
Depth/Stickup above/below ground surface of well casing.	2.53 ft.
Thickness of Surface Seal	4.0 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	6.0 in.
Depth of Bottom of Protective Casing	1.4 ft.
Inside Diameter of Well Casing	4.0 in.
Type of Backfill Around Casing	Bentonite-cement grout
Diameter of Borehole, 0-17.6 ft.:	10 in.
17.6-32.9 ft.:	8 in.
Depth of Top of Bedrock	17.6 ft.
Elevation/Depth of Bottom of Casing	32.9 ft.
Diameter of Open Rock Hole	3.0 in.
Depth of Bottom of Open Rock Hole	43.0 ft.

Method and Materials used to grout casings:
35.45 ft. of black iron pipe (4.0-in.), threaded joint at 15.45 ft. from bottom - pressure grouted in place.

Remarks:

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

PIEZOMETER INSTALLATION REPORT

PROJECT: HYDROGEOLOGIC INVESTIGATION
LOCATION: LEXINGTON AVE FACILITY, ROCHESTER, NEW YORK
CLIENT: AC ROCHESTER DIVISION-GENERAL MONITORING CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING
DRILLER: S. LORANTY RIG TYPE: CME 75, Truck Mounted
INSTALLATION DATE: 31 JULY 1990

FILE NO.: 70014-42
WELL NO.: PZ-129
LOCATION: 51335.32N
57290.67E
SHEET: 1 OF 2
INSPECTOR: T. WELLS

Survey Datum NGVD

Ground Elevation: 512.23 ft. (* -at nail in grout)

SUMMARIZE SOIL COLLECTION

-FILL- 13.8 ft.

CONCRETE 15.8 ft.

NATIVE OVERBURDEN 22.1 ft.

WEATHERED BEDROCK 24.0 ft.

ROCHESTER SHALE 29.0 ft.

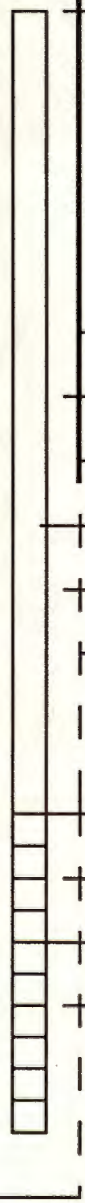
BENTONITE-CEMENT GROUT 4.2 ft.

BENTONITE PELLETS 6.2 ft.

QUARTZ SAND 26.0 ft.

QUARTZ SAND AND ROCKCUTTINGS 28.0 ft.

BENTONITE PELLETS 29.0 ft.



Stickup above ground surface of protective casing (*).	2.61 ft.
Stickup above ground surface of riser pipe. (* - above nail in grout)	2.30 ft.
Thickness of Surface Seal	4.2 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Bentonite-Cement Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	4.25 in.
Depth of Bottom of Protective Casing	2.2 ft.
Inside Diameter of Riser Pipe	2.0 in.
Type of Backfill Around Riser	See Diagram
Diameter of Borehole	10.0 in.
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser	7.85 ft.
Depth of Top of Slots: 8.00 ft.	
Type of Wellscreen	PVC
Screen Slot Size	0.010 in.
Not slotted from 17.52 to 18.02 ft.	
Diameter of Wellscreen	2.0 ft.
Type of Backfill Around Wellscreen	Quartz Sand
Boottom of Slots: 27.54 ft.	
Depth of Bottom of Wellscreen	28.01 ft.
Depth of Bottom of Borehole	29.0 ft.

Remarks:

Well No. PZ-129

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

PIEZOMETER INSTALLATION REPORT

PROJECT:	HYDROGEOLOGIC INVESTIGATION	FILE NO.:	70014-42
LOCATION:	LEXINGTON AVE FACILITY, ROCHESTER, NEW YORK	WELL NO.:	PZ-130
CLIENT:	AC ROCHESTER DIVISION-GENERAL MONITORING CORPORATION	LOCATION:	51295.92N
CONTRACTOR:	NOTHNAGLE DRILLING		57208.23E
DRILLER:	S. LORANTY RIG TYPE: CME 75, Truck Mounted	SHEET:	1 OF 2
INSTALLATION DATE:	8 AUGUST 1990	INSPECTOR:	W. LANIK

Survey Datum NGVD

Ground Elevation: 511.94 ft.

SUMMARIZED SOIL CONDITIONS

ASPHALT 0.5 ft.	0.0 ft.
	CEMENT GROUT 1.5 ft.
-FILL-	BENTONITE PELLETS 3.5 ft.
13.0 ft.	
-SWAMP FILL- 15.4 ft.	
-RESIDUAL SOIL- 17.3 ft.	
COMPLETELY WEATHERED BEDROCK 18.5 ft.	QUARTZ SAND (3Q)
HIGHLY WEATHERED BEDROCK 20.3 ft.	
ROCHESTER SHALE	
	26.0 ft.
27.0 ft.	BENTONITE PELLETS 27.0 ft.

Depth/Stickup above/below ground surface of protective casing.	3.24 ft.
Depth/Stickup above/below ground surface of riser pipe.	2.84 ft.
Thickness of Surface Seal	1.5 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Cement Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	4.0 ft.
Depth of Bottom of Protective Casing	1.76 ft.
Inside Diameter of Riser Pipe	2.0 ft.
Type of Backfill Around Riser	See Diagram
Diameter of Borehole	12.0 in.
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser	5.21 ft.
Depth of Top of Slots: 5.35 ft.	
Type of Wellscreen	PVC
Screen Slot Size	0.010 in.
Not Slotted from 14.89-15.37 ft.	
Diameter of Wellscreen	2.0 in.
Type of Backfill Around Wellscreen	Quartz Sand
Depth of Bottom of Wellscreen	25.37 ft.
Depth of Bottom of Slots: 24.91 ft.	
Depth of Bottom of Borehole	27.0 ft.

Remarks:

Well No. PZ-130

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

BEDROCK MONITORING WELL REPORT

PROJECT:	Hydrogeologic Investigation	FILE NO.:	70014-42
LOCATION:	Lexington Avenue Facility, Rochester, New York	WELL NO.:	R-131
CLIENT:	AC Rochester Division - General Motors Corp.	LOCATION:	51191.38N
CONTRACTOR:	Nothnagle Drilling		57750.18E
DRILLER:	S. Loranty RIG TYPE: CME 75, Truck Mounted	SHEET:	1 OF 1
INSTALLATION DATE:	24 September 1990	INSPECTOR:	T. Wells

Survey Datum NGVD

Ground Elevation: 512.82

SUMMARIZED SOIL CONDITIONS

-FILL-

12.7 ft.

-NATIVE OVERBURDEN SOILS-

23.2 ft.

ROCHESTER SHALE

48.2 ft.

CEMENT GROUT

3.0 ft.

BENTONITE CEMENT GROUT

38.2 ft.

Stickup above ground surface of protective casing.	2.82 ft.
Stickup above ground surface of well casing.	1.84 ft.
Thickness of Surface Seal	3.0 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Cement Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	6.0 in.
Depth of Bottom of Protective Casing	2.5 ft.
Inside Diameter of Well Casing	4.0 in.
Type of Backfill Around Casing	Grout
Diameter of Borehole	0-23 ft. = 12 in. 23-38.1 ft. = 8 in.
Depth of Top of Bedrock	23.2 ft.
Depth of Bottom of Casing	38.2 ft.
Diameter of Open Rock Hole	3.0 in.
Depth of Bottom of Open Rock Hole	48.2 ft.

Method and Materials used to grout casings: 40.03 ft. length of black iron pipe, threaded at 20.9 ft. below TOC, pressure grouted in place on 27 August 1990 to depth of 38.3 ft. below ground surface.

Remarks:

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	SHALLOW BEDROCK MONITORING WELL REPORT

PROJECT:	Hydrogeologic Investigation	FILE NO.:	70014-42
LOCATION:	Lexington Avenue Facility - Rochester, New York	WELL NO.:	SR-131
CLIENT:	AC Rochester Division - General Motors Corp.	BORING NO.:	B-131B
CONTRACTOR:	Nothnagle Drilling	LOCATION:	51201.24N
DRILLER:	S. Loranty H&A REPRESENTATIVE: T. Wells		57753.02E
INSTALLATION DATE:	25 September 1990	SHEET:	1 OF 2

Survey Datum NGVD

Ground Elevation: 512.70 ft.

SUMMARIZE SOIL CONDITIONS

-FILL- (very coarse) — 14.0 ft.

NATIVE OVERBURDEN SOILS — 23.0 ft.

ROCHESTER SHALE — 30.0 ft.

CEMENT GROUT — 2.5 ft.

BENTONITE-CEMENT GROUT — 20.0 ft.

BENTONITE PELLETS — 21.5 ft.

#3 Q QUARTZ SAND — 29.0 ft.

BENTONITE PELLETS — 30.0 ft.

Stickup above ground surface of protective casing.	2.30 ft.
Stickup above ground surface of riser pipe.	2.02 ft.
Thickness of Surface Seal	2.5 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Bentonite-Cement Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	4.0 in.
Depth of Bottom of Protective Casing	2.5 ft.
Inside Diameter of Riser Pipe	2.0 in.
Type of Backfill Around Riser	Bentonite-Cement Grout
Diameter of Borehole	0-23 ft. 12 in. + 23-30 ft. 6 in. +
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser Top of slots at 23.28 ft.	23.10 ft.
Type of Wellscreen	304 Stainless Steel
Screen Slot Size	0.010 in.
Diameter of Wellscreen	2.0 in.
Type of Backfill Around Wellscreen Bottom of slots at 27.87 ft.	Quartz sand
Depth of Bottom of Wellscreen	28.12 ft.
Depth of Bottom of Borehole	30.0 ft.

Remarks:

H&A of New York
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

BEDROCK OBSERVATION WELL REPORT

PROJECT: Hydrogeologic Investigation
LOCATION: Lexington Avenue Facility - Rochester, NY
CLIENT: AC Rochester Division-General Motors Corporation
CONTRACTOR: Nothnagle Drilling
DRILLER: S. Loranty INSPECTOR: T. Wells
INSTALLATION DATE 21 August 1990

FILE NO. 70014-42
WELL NO. R-132
BORING NO. B132-A
LOCATION 51092.62N
58080.42E
SHEET 1 OF 2

SURVEY DATUM NGVD

GROUND ELEVATION 512.77 ft.

SUMMARY OF SUBSURFACE CONDITIONS (NOT TO SCALE)

FILL AND NATIVE OVERBURDEN SOILS

20.9 ft.

ROCHESTER SHALE

BENTONITE-CEMENT GROUT

36.6 ft.

46.2 ft.

~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF PROTECTIVE CASING	2.98 ft.
~~ELEVATION OR~~ STICKUP ABOVE/~~BELOW~~ GROUND SURFACE OF INNER CASING.	2.79 ft.
~~ELEVATION OR~~ STICKUP ~~ABOVE~~ BELOW GROUND SURFACE OF OUTER CASING.	-1.03 ft.
TYPE OF PROTECTIVE CASING.	Steel
INSIDE DIAMETER OF PROTECTIVE CASING.	6.0 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF PROTECTIVE CASING.	2.0 ft.
TYPE OF BACKFILL AROUND OUTER CASING.	None
~~ELEVATION~~/DEPTH OF TOP OF BEDROCK.	20.9 ft.
TYPE OF OUTER CASING.	Black Iron
INSIDE DIAMETER OF OUTER CASING.	8.0 in.
TYPE OF BACKFILL AROUND INNER CASING.	Bentonite-Cement Grout
DIAMETER OF BOREHOLE: 0-7 ft.: / 7-20.9 ft.:	12 in. / 10 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF OUTER CASING.	20.9 ft.
TYPE OF INNER CASING.	Black Iron
INSIDE DIAMETER OF INNER CASING.	4.0 in.
DIAMETER OF BOREHOLE.	8.0 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF INNER CASING.	36.6 ft.
DIAMETER OF ROCK HOLE.	3.0 in.
~~ELEVATION~~/DEPTH OF BOTTOM OF ROCK HOLE.	46.2 ft.

[FIGURES REFER TO: EL. ___ DEPTH X]

[19.9 ft. (OUTER CASING LENGTH)] 39.4 ft. (INNER CASING LENGTH) + 9.6 ft. (LENGTH OF ROCK HOLE) = 49.0 ft. (TOTAL LENGTH)

H&A OF NEW YORK
CONSULTING GEOTECHNICAL ENGINEERS
GEOLOGISTS AND HYDROGEOLOGISTS

SHALLOW BEDROCK MONITORING WELL REPORT

PROJECT: Hydrogeologic Investigation
LOCATION: Lexington Avenue Facility - Rochester, New York
CLIENT: AC Rochester Division - General Motors Corp.
CONTRACTOR: Nothnagle Drilling
DRILLER: S. Loranty H&A REPRESENTATIVE: T. Wells
INSTALLATION DATE: 23 August 1990

FILE NO.: 70014-42
WELL NO.: SR-132
BORING NO.: B-132B
LOCATION: 51123.26N
58085.96E
SHEET: 1 OF 2

Survey Datum NGVD

Ground Elevation: 512.62 ft. * measured at bolt in grout

SUMMARIZED SOIL CONDITIONS

-FILL- 8.5 ft.

-NATIVE SOIL- 18.0 ft.

-ROCHESTER SHALE- 22.2 ft.

30.0 ft.

BENTONITE-CEMENT GROUT

BENTONITE PELLETS 20.0 ft.

QUARTZ SAND (#3 Q-ROK) 29.0 ft.

BENTONITE PELLETS 30.0 ft.

Stickup above ground surface of protective casing.	2.93 ft.
Stickup above ground surface of riser pipe.	2.06 ft.
Thickness of Surface Seal	2.5 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Bentonite-Cement Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	4.0 in.
Depth of Bottom of Protective Casing	2.0 ft.
Inside Diameter of Riser Pipe	2.0 in.
Type of Backfill Around Riser	Bentonite-Cement Grout
Diameter of Borehole	0-22.2 ft. 10 in. 22.2-30.0 ft. 6 in.
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser Top of slots at 23.2 ft.	23.06 ft.
Type of Wellscreen	Stainless Steel
Screen Slot Size	0.010 in.
Diameter of Wellscreen	2.0 in.
Type of Backfill Around Wellscreen	Quartz sand
Depth of Bottom of Wellscreen	27.98 ft.
Depth of Bottom of Borehole	30.0 ft.

Remarks:

H&A OF NEW YORK
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PIEZOMETER INSTALLATION REPORT

PROJECT:	Hydrogeologic Investigation	FILE NO.:	70014-42
LOCATION:	Lexington Avenue Facility - Rochester, New York	WELL NO.:	PZ-132
CLIENT:	AC Rochester Division - General Motors Corp.	BORING NO.:	B-132C
CONTRACTOR:	Nothnagle Drilling	LOCATION:	51101.16N
DRILLER:	S. Loranty H&A REPRESENTATIVE: T. Wells		58081.88E
INSTALLATION DATE:	23 August 1990	SHEET:	1 OF 2

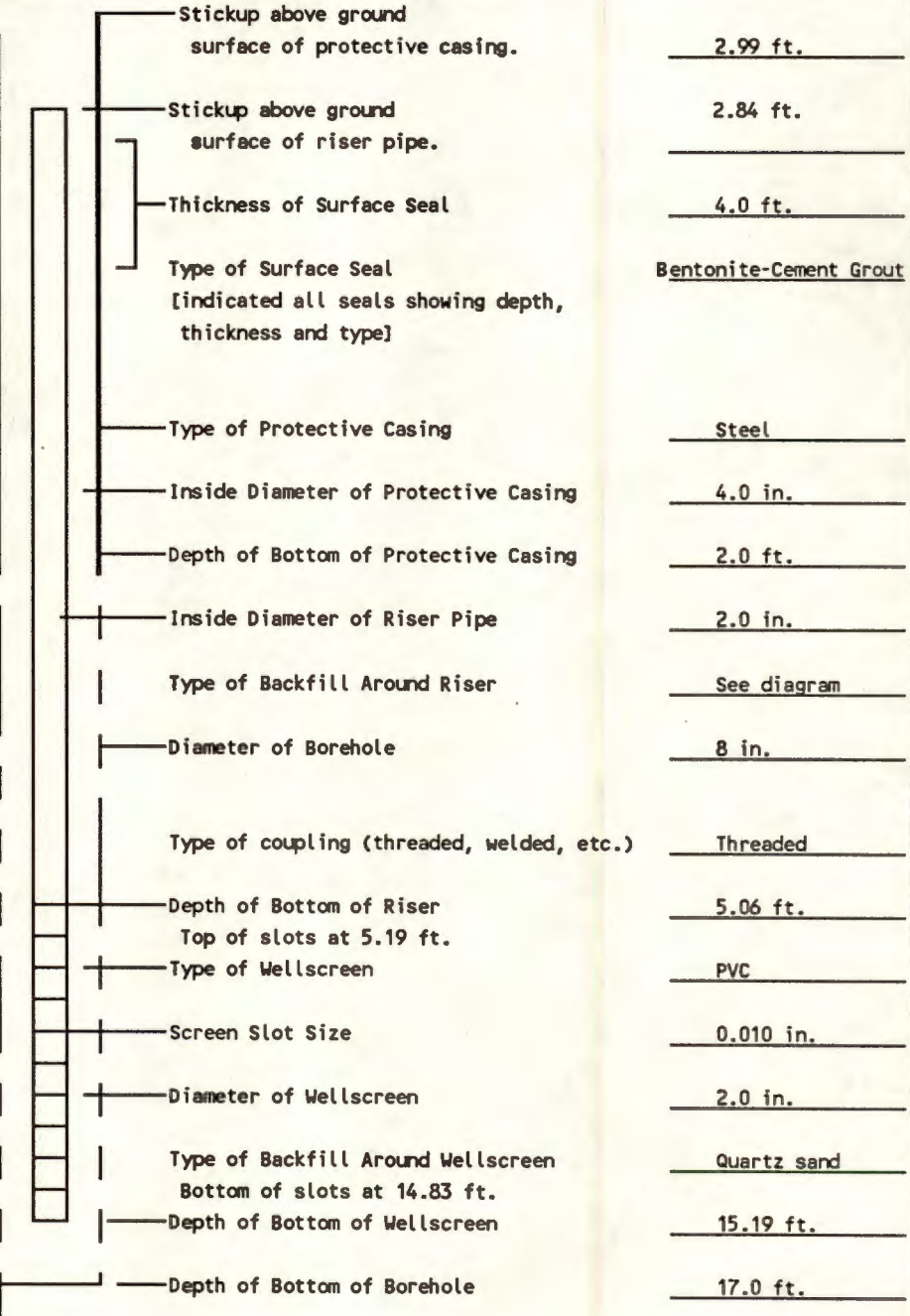
Survey Datum NGVD

Ground Elevation: 512.67 ft.

SUMMARIZED SOIL CONDITIONS

-FILL- 13.5 ft.

-NATIVE SOIL- 17.0 ft.



Stickup above ground surface of protective casing.	2.99 ft.
Stickup above ground surface of riser pipe.	2.84 ft.
Thickness of Surface Seal	4.0 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Bentonite-Cement Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	4.0 in.
Depth of Bottom of Protective Casing	2.0 ft.
Inside Diameter of Riser Pipe	2.0 in.
Type of Backfill Around Riser	See diagram
Diameter of Borehole	8 in.
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser Top of slots at 5.19 ft.	5.06 ft.
Type of Wellscreen	PVC
Screen Slot Size	0.010 in.
Diameter of Wellscreen	2.0 in.
Type of Backfill Around Wellscreen Bottom of slots at 14.83 ft.	Quartz sand
Depth of Bottom of Wellscreen	15.19 ft.
Depth of Bottom of Borehole	17.0 ft.

Remarks:

Well No. PZ-132

H&A OF NEW YORK
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SHALLOW BEDROCK MONITORING WELL REPORT

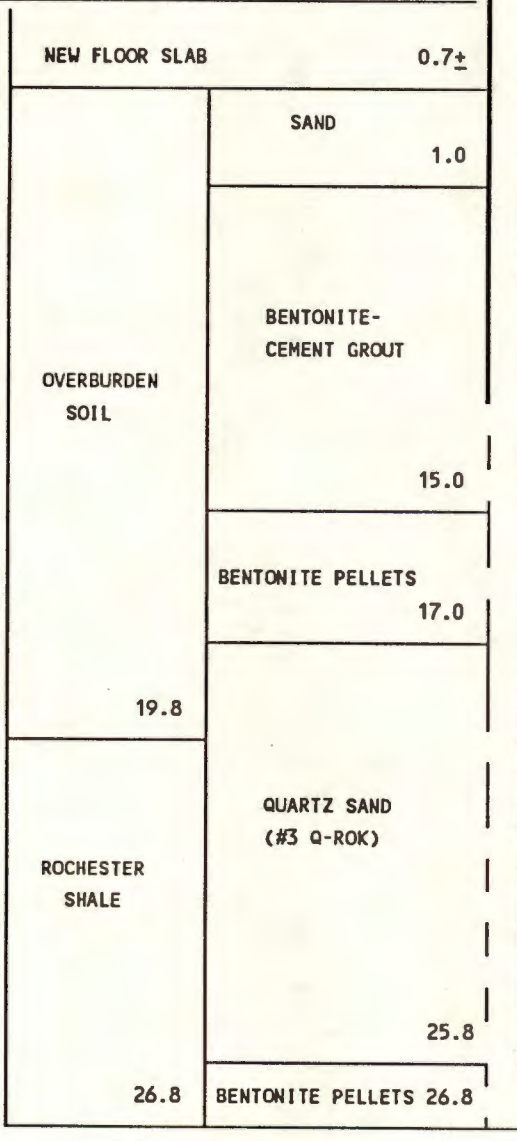
PROJECT: DEGREASER INVESTIGATION
LOCATION: LEXINGTON AVENUE FACILITY - ROCHESTER, NEW YORK
CLIENT: AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR: NOTHNAGLE DRILLING
DRILLER: F.GRATTEN RIG TYPE: Diedrich D-25
INSTALLATION DATE: 5 SEPTEMBER 1990

FILE NO.: 70138-40
WELL NO.: SR-216
LOCATION: 50,788.12 North, 57,187.34 East
SHEET: 1 OF 2
INSPECTOR: T.Wells

Survey Datum NGVD

Ground Elevation: 516.85 ft.

SUMMARIZE Soil Conditions



Include to Scale

Stickup above/below ground surface of protective casing.	0.00 ft.
Stickup below ground surface of riser pipe.	0.25 ft.
Thickness of Surface Seal	See diagram
Type of Surface Seal [indicated all seals showing depth, thickness and type]	See diagram
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	7.5 in.
Depth of Bottom of Protective Casing	1.0 ft.
Inside Diameter of Riser Pipe	2.0 in.
Type of Backfill Around Riser	See diagram
Diameter of Borehole	0.0-17.0 ft.:8 in. 17.0-26.8 ft.:4 in.
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser	18.26 ft.
Top of Slots at 18.43 ft.	
Type of Wellscreen	Stainless Steel
Screen Slot Size	0.010 in.
Diameter of Wellscreen	2.0 in.
Type of Backfill Around Wellscreen	Quartz Sand
Bottom of slots at 23.06 ft.	
Depth of Bottom of Wellscreen	23.1 ft.
Depth of Bottom of Borehole	26.8 ft.

Remarks:

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GEOLOGISTS AND HYDROGEOLOGISTS

SHALLOW BEDROCK MONITORING WELL REPORT

PROJECT:	DEGREASER INVESTIGATION
LOCATION:	LEXINGTON AVENUE FACILITY - ROCHESTER, NEW YORK
CLIENT:	AC ROCHESTER DIVISION - GENERAL MOTORS CORPORATION
CONTRACTOR:	NOTHNAGLE DRILLING
DRILLER:	F.GRATTEN RIG TYPE: Diedrich D-25
INSTALLATION DATE:	30 OCTOBER 1990

FILE NO.:	70138-40
WELL NO.:	SR-230
LOCATION:	6.4 feet northeast of VM-217
SHEET:	1 OF 2
INSPECTOR:	T.Wells

Survey Datum NGVD

Ground Elevation: 516.85 ft.

SUMMARIZE SOIL CONDITIONS

-CONCRETE SLABS- 2.5 ft.

-FILL AND NATIVE SOILS- 16.3 ft.

-WEATHERED BEDROCK- 20.0 ft.

-ROCHESTER SHALE- 26.0 ft.

-BENTONITE CEMENT GROUT- 16.0 ft.

-BENTONITE PELLETS- 18.0 ft.

QUARTZ SAND (#3 Q-ROK) 25.2 ft.

-BENTONITE PELLETS- 26.0 ft.

Stickup above/below ground surface of protective casing.	0.00 ft.
Stickup below ground surface of riser pipe.	0.55 ft.
Thickness of Surface Seal	16.0 ft.
Type of Surface Seal [indicated all seals showing depth, thickness and type]	Bentonite/Cement Grout
Type of Protective Casing	Steel
Inside Diameter of Protective Casing	7.5 in.
Depth of Bottom of Protective Casing	1.0 ft.
Inside Diameter of Riser Pipe	2.0 in.
Type of Backfill Around Riser	Grout
Diameter of Borehole	0.0-15.8 ft.:8 in. 15.8-26.0 ft.:4 in.
Type of coupling (threaded, welded, etc.)	Threaded
Depth of Bottom of Riser	19.97 ft.
Top of Slots at 20.15 ft.	#302
Type of Wellscreen	Stainless Steel
Screen Slot Size	0.010 in.
Diameter of Wellscreen	2.0 in.
Type of Backfill Around Wellscreen	Quartz Sand
Bottom of slots at 24.73 ft.	
Depth of Bottom of Wellscreen	25.15 ft.
Depth of Bottom of Borehole	26.0 ft.

Remarks:

Well No. SR-230

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	BEDROCK MONITORING WELL REPORT

PROJECT:	Hydrogeologic Investigation	FILE NO.:	70014-42
LOCATION:	Lexington Avenue, Rochester, New York	WELL NO.:	Well Z
CLIENT:	AC Rochester	LOCATION:	51,619.48N 57,442.66E
		SHEET:	1 OF 2
		INSPECTOR:	---

Survey Datum NGVD

Ground Elevation: 511.56 ft.

SUMMARIZE SOIL CONDITIONS

OVERBURDEN

ROCHESTER SHALE

IRONDEQUOIT LIMESTONE

Stickup above ground surface of protective cap.	3.60 ft.
Stickup above ground surface of well casing.	3.54 ft.
Inside diameter of well casing	8.0 in.
Type of casing	Steel
Diameter of borehole	Not known
Approximate depth of top of bedrock	24.0 ft.
Depth of bottom of casing	25.0 ft.
Diameter of borehole	7.9 in.
Depth of reduction in borehole diameter	58.0 ft.
Depth of top of grout plug	67.5 ft.
Depth of top of bentonite pellet seal	71.5 ft.
Diameter of Borehole	7.0 in.
Approximate depth of top of Irondequoit Limestone	90.0 ft.
Depth of bottom of boring	110 ft.

Method and Materials used to grout casings: Not known. Well Z was reportedly installed by AC Rochester for use as a production water well, date unknown.

Remarks: Construction information derived from television inspection survey performed by Hydro Group, Inc., 1 June 1989. Bentonite plug installed by Nothnagle Drilling, January 1991 and modified by Rochester Drilling Co., April 1991.

Well No. Well Z

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-1	GROUND/TOP OF CASING ELEVATION: 500.36 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well Installed (#1)	
6/27/89	1142			488.2 ft.*	Perm. Test	JGT
9/28/89			13.66 ft.	486.70	Well Developed	TDW
10/24/89			13.38 ft.	486.98		TDW
11/7/89			13.53 ft.	486.83	Perm. Test	TDW
2/13/90	1357		12.16 ft.	488.20	Missing inner cap	TDW
3/12/90	1227		12.30 ft.	488.16	Bottom: 24.27 ft.	Free Col
6/18/90	1245		13.14 ft.	487.22	Bottom: 24.90 ft.	Free Col
10/17/90	1235		13.09 ft.	487.27		TDW
11/5/90	1130		13.34 ft.	487.02	Bottom 24.98 ft.	Free Col

* - Water level measurement corrected for addition of above ground protective casing on 6 September 1990.
T.O.C. - T.O.R. + 1.08 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-2	TOP OF CASING ELEVATION: 516.55 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/7/90					Well Installed	
8/15/90					Well Developed (20 g.)	Noth-nagle
10/10/90	1510		29.21 ft.	487.34 ft.		TDW
10/17/90	1319		27.93 ft.	488.62	Sound of water entering well audible at TOC	TDW, MJC
10/18/90			27.78 ft.	488.77	Permeability Test Performed	TDW, MJC
11/5/90	1225		28.53 ft.	488.02	Bottom: 37.36	TDW, ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-2	TOP OF CASING ELEVATION: 516.33 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well Installed (#2)	
6/27/89	1429		8.2 ft.	508.1 ft.*	Perm. Test	JGT
9/28/89			10.84 ft.	505.49	Well Developed	TDW
10/24/89	1115		10.50 ft.	505.83		TDW
11/7/89	0925		10.94 ft.	505.39	Perm. Test	TDW
2/13/90	1506		8.70 ft.	507.63		
3/12/90			8.69 ft.	507.64	Bottom sounded at 21.28 ft. B.T.O.C.	Free Col
6/18/90	1342		9.80 ft.	506.53	Bottom: 21.29 ft.	Free Col
10/17/90	1321		10.15 ft.	506.18		TDW, MJC
11/5/90	1228		10.31 ft.	506.02	Bottom: 21.28 ft.	TDW, ER

* - Water level measurement corrected for addition of above ground protective casing on 27 September 1990.
T.O.C. = T.O.R. + 0.88 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-3	TOP OF CASING ELEVATION: 521.90 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/7/90					Well Installed	
8/15/90					Well Developed (20 gallons)	Noth-nagle
10/10/90	1313	2 mos.	22.33 ft.	499.57 ft.	Perm. Test	TDW
10/17/90	1612		20.97 ft.	500.93		TDW, MJC
11/5/90	1125		21.52 ft.	500.38	Bottom: 32.85 ft.	Free Col

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-3	TOP OF CASING ELEVATION: 522.10 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well Installed (#3)	
6/27/89	1557		10.6 ft.*	511.5 ft.*	Perm. Test	JGT
9/28/89			10.91 ft.	511.19	Well Developed	TDW
10/24/89	0940		10.75 ft.	511.35		TDW
10/30/89	1508		10.88 ft.	511.22	Perm. Test	TDW
2/13/90	1208		9.66 ft.	512.44	Missing inner cap	TDW
3/12/90	1200		9.81 ft.	512.29	Bottom sounded at 19.18 ft. B.T.O.C.	Free Col
6/18/90	1240		10.63 ft.	511.47	Bottom: 19.21 ft.	Free Col
8/6/90	Water observed flowing from TOC during pressure grouting at R-2 Well.					WL
10/10/90	1351		10.58 ft.	511.52	Bottom: 19.19 ft., grout noted on probe.	TDW
10/17/90	1613		10.73 ft.	511.37		TDW, MJC
11/5/90	1405		10.62 ft.	511.48	Bottom: 19.28 ft.	Free Col

* - Water level measurement corrected for addition of above ground protective casing on 6 September 1989.
T.O.C. = T.O.R. + 0.59 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-11	TOP OF CASING ELEVATION: 533.39 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/2/90					Well Installed	
8/15/90					Well developed (25 gallons)	Noth-nagle
10/10/90	1430	10 weeks	30.06 ft.	503.33 ft.		TDW
10/17/90	1327		26.78 ft.	506.61	Bottom: 46.88 ft. (el: 486.51 ft.)	TDW, MJC
10/19/90	1420		26.90 ft.	506.49	Permeability Test Performed	MJC, TDW
11/5/90	1230		27.12 ft.	506.27	Bottom: 47.10 ft.	TDW, ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-11	TOP OF CASING ELEVATION: 533.42 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well installed (#11)	
6/28/89	1500		19.0 ft.*	514.4 ft.	Perm. Test	JGT
9/28/89			---		Well is dry	TDW
10/5/89			---		Well is dry	TDW
10/24/89	1123		18.95 ft.	514.47		TDW
10/25/89	1045	---	19.09 ft.	514.33	Well Purged	TDW
10/25/89	1125	0	---		Bailed dry, 10 gallons	TDW
10/25/89	1131	6 min.	21.84 ft.	511.58	Bottom of well at 510.8 ft.	
11/7/89	0900		22.23 ft.	511.19		TDW
2/13/90	1512		16.47 ft.	516.95 ft.		TDW
3/12/90			15.85 ft.	517.57	Bottom sounded at 22.51 ft. B.T.O.C.	Free Col
6/18/90	1350		19.05 ft.	514.37	Bottom: 22.50 ft.	
10/17/90	1325		18.98 ft.	514.44	Bottom: 22.47 ft.	TDW, MJC
11/5/90	1232		18.95	514.47	Bottom: 22.48 ft.	TDW, ER

* - Water level measurement corrected for addition of above ground protective casing on 6 September 1989.
T.O.C. = T.O.R. + 0.91 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-101	TOP OF CASING ELEVATION: 514.72 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/22/89					Well Installed	
9/28/89			11.34 ft.	503.38 ft.	Well developed	TDW
10/24/89	0927		15.77 ft.	498.95		TDW
10/25/89	1330		15.96 ft.	498.76	Purged for sampling	TDW
10/25/89	1410				Bailed Dry (12 gallons)	TDW
10/25/90	1528		34.84 ft.	479.88	Bottom of well at 478.5 ft.	TDW
10/30/89	1540		16.66 ft.	498.06	Perm. Test	TDW
2/13/90	1159		14.87 ft.	499.85	Missing inner cap	TDW
3/1/90					Well re-developed	HT
3/12/90	1155		15.58 ft.	499.14	Bottom sounded at El. 478.91 ft.	Free Col
6/18/90	1232		16.70 ft.	498.02	Bottom: 35.87 ft. (El: 478.85 ft.)	Free Col
10/17/90	1610		15.62 ft.	499.10		TDW, MJC
11/5/90	1116		15.60 ft.	499.12	Bottom: 35.95 ft.	Free Col

T.O.C. = T.O.R. + 0.29 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-101	TOP OF CASING ELEVATION: 514.34 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/21/89					Well installed	
9/28/89			10.45 ft.	503.89 ft.	Well developed	TDW
10/24/89	0929		10.29 ft.	504.05		TDW
10/25/89	1325		10.27 ft.	504.07	Purged for sampling	TDW
10/25/89	1350				End of purge (3 vol.)	TDW
10/25/89	1406		12.24 ft.	502.10		TDW
10/30/89	1614		10.39 ft.	503.95	Perm. Test	
2/13/90	1202		9.52 ft.	504.82	Missing inner cap, grout apron heaved	TDW
3/1/90					Redeveloped	HT/EY
3/12/90	1150		9.59 ft.	504.75	Bottom sounded at 16.14 ft. B.T.O.C.	Free Col
6/18/90	1230		10.26 ft.	504.08	Bottom: 16.14 ft.	Free Col
10/17/90	1608		9.63 ft.	504.71		TDW, MJC
11/5/90	1115		9.86 ft.	504.48	Bottom: 16.20 ft.	Free Col

T.O.C. = T.O.R + 0.27 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-102	TOP OF CASING ELEVATION: 516.02 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/17/89					Well installed	
8/23/89	0715	6 days	29.69 ft.	486.33 ft.		TDW
8/30/89	1640	13 days	30.06 ft.	485.96		TDW
9/15/89					Well developed (20 gallons-black in color throughout)	Roch. Drilling
9/20/89			30.14 ft.	485.88	Purged for sampling (24 gallons)	TDW
9/28/89					Well re-developed	
10/24/89	0948		29.78 ft.	486.24		TDW
10/26/89	1428		29.82 ft.	486.20	Purged for sampling	TDW
10/26/89	1547		31.34 ft.	484.68	End of purge (40 gallons)	TDW
10/26/89	1555		31.19 ft.	484.83	Well sampled	TDW
11/7/89	1443		29.96 ft.	486.06	Perm. Test	TDW
2/13/90	1217		28.75 ft.	487.27	Missing inner cap	TDW
2/28/90	1300				Well re-developed 37 gallons	TW/HT
3/12/90	1210		28.56 ft.	487.46	Bottom sounded at 52.23 ft. B.T.O.C.	Free Col
6/18/90	1409		29.33 ft.	486.69	Bottom: 52.55 ft.	Free Col
10/17/90	1500		29.50 ft.	486.52		TDW, MJC
11/5/90	1437		29.75 ft.	486.27	Bottom: 52.49 ft.	TDW, ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-102	TOP OF CASING ELEVATION: 515.91 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/18/89					Well installed	
8/23/89	0720	5 days	18.56 ft.	497.35 ft.		TDW
8/30/89	1645	12 days	18.78 ft.	497.13		TDW
9/15/89					Well developed (10 gallons)	
9/20/89			21.02 ft.	494.89	5 gallon purged for sampling	TDW
10/24/89	0950		21.02 ft.	494.89		
10/26/89	1425		20.89 ft.	494.93	Purged for sampling	TDW
10/26/89	1505		21.08 ft.	494.83	End of Purge (5.5 gallons)	TDW
10/26/89	1512		21.04 ft.	494.87	Well sampled	TDW
11/7/89	1512		21.00	494.91	Perm. Test	TDW
2/13/90	1110		19.75 - oil 25.96 - water	496.16 - oil 489.95 - water	Top of slots in screen at 489.73	TDW
			21.45	494.46 adjusted water table		
2/28/90	1600				Bailed oil, approx. 0.1 ft. of oil remaining	TDW
3/7/90	1920		20.55 - oil 21.92 - water	495.01 - *	(* = adjusted water level)	TDW
3/12/90	1216		22.40 - water		Bottom sounded at 32.30 ft. B.T.O.C.	Free Col
3/12/90	1315		20.28 - oil 22.27 - water	494.95 - *	(* = adjusted water level)	TDW

T.O.C. = T.O.R. + 0.50 ft.

See note on Page 3.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-102	TOP OF CASING ELEVATION: 515.91 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
3/13/90	1920				Floating oil removed during sampling event	Free Col
6/18/90	1414		30.60 - water	485.31 ft.	Oil present, thickness not determined, water elevation not adjusted.	Free Col
7/6/90	0920		20.49 - oil water not detected		Bottom: 25.86 ft.	TDW, SB
8/23/90	1355	1 year	20.01 - oil 30.12 - water	492.36*	Oil layer thickness = 10.11 ft.	TDW
8/27/90					Oil layer bailed (1.75 g)	ACR
9/4/90					Oil layer bailed (0.5 g)	ACR
9/14/90					Oil layer bailed (0.5 g)	ACR
10/17/90	1456		20.73 - oil 23.55 - water	494.76*	Oil layer: 2.82 ft.	TDW, MJC
10/31/90	1442		20.81 - oil 23.95 - water	494.63*	Oil layer: 3.14 ft.	TW, ER
11/5/90	1440		20.65 - oil 24.95 - water	494.62*	Oil layer: 4.30 ft. Bottom: 31.23 ft.	TW, ER
					Began bailing oil (periodically) again, 12/90	ACR

Specific gravity of oil used for calculation = 0.65 before 10/90, 0.85 after 10/1/90.
* - Elevation of water adjusted for thickness of oil layer.
T.O.C. = T.O.R. + 0.50 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: OW-102	TOP OF CASING ELEVATION: 515.82 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/29/89					Well Installed	
8/30/89		1 day	ND		Well is dry	TDW
9/8/89		10 days	ND		Well is dry; flushed well with distilled/D.I. water	
9/14/89		16 days			Oil at 497.25 ft.	TDW
9/20/89		22 days			Oil at 497.34 ft.	TDW
9/25/89		27 days			Oil at 497.34 ft.	TDW
9/26/89		38 days			Oil at 497.36 ft.	TDW
9/28/89		30 days			Oil at 497.40 ft.	TDW
10/24/89	0957	8 weeks	18.47 ft.	497.35 ft.	Oil at 497.37 ft.	TDW
10/26/89	1430		18.37 ft.	497.45	Purged for sampling	TDW
10/26/89	1530				(Purged dry - bottom of well at 496.86 ft.)	
10/26/89	1616		18.50 ft.	497.32		
2/13/90	1053		17.22 ft.	498.60	Thin film of oil	TDW
2/28/90	1130				Surged & Bailed 3 gallons	TDW
3/12/90	1221		16.93 ft.	498.89	Bottom sounded at El. 496.78 ft.	Free Col
6/18/90	1411		17.50 ft.	498.32	Bottom: 19.0 ft. (496.82 ft.)	Free Col

T.O.C. = T.O.R. + 0.30 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: OW-102	TOP OF CASING ELEVATION: 515.82 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
7/6/90	0915		17.99 ft.	497.83 ft.		TDW
8/23/90	1350		17.86 ft.	497.94	Film of oil on probe	TDW
10/17/90	1452		18.19 ft.	497.63	No oil detected	TDW, MJC
10/31/90	1437		18.11 ft.	497.71	No oil detected	TDW, ER
11/5/90	1435		18.08 ft.	497.74	No oil detected	TDW, ER

T.O.C. = T.O.R. + 0.30 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-103	TOP OF CASING ELEVATION: 513.96 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/6/89					Well installed	
9/15/89			29.77 ft.	484.19 ft.	Well developed	TDW
9/21/89			29.56 ft.	484.40	Well sampled	TDW
10/24/89	1106		29.09 ft.	484.87		TDW
10/26/89	1108		29.17 ft.	484.79	Purged for sampling	TDW
10/26/89	1230		29.21 ft.	484.75	End of Purge (39 gallons)	TDW
11/7/89	1110		29.27 ft.	484.69	Perm. Test	TDW
2/13/90	1436		27.99 ft.	485.97		TDW
2/28/90	1615				Well re-developed 40 gallons	HT/TW
3/1/90					Bottom sounded at 47.01 ft. B.T.O.C.	TDW
3/2/90					Attempt to purge material from bottom of well not successful	HT
3/12/90	1257		28.07 ft.	485.89	Bottom sounded at 47.05 ft. B.T.O.C.	Free Col
6/18/90	1316		28.72	485.24	Bottom: 49.87 ft.	Free Col
7/5/90	1100		28.94	485.02	Appendix IX sampling	TDW, SB
10/17/90	1251		28.46	485.50		TDW, MJC
11/5/90	1231		28.83	485.13	Bottom: 52.37 ft.	Free Col

T.O.C. = T.O.R. + 0.59 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-103	TOP OF CASING ELEVATION: 513.95 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/14/89					Well installed	
9/15/89					Well developed - 15 gallons (bailed dry after 12 gallons)	TDW
9/21/89			25.36 ft.	488.59 ft.	Purged 9 gallons for sampling	TDW
10/24/89	1105		25.03 ft.	488.92		TDW
10/26/89	1105		25.08 ft.	488.87	Purged for sampling	TDW
10/26/89	1147		25.43 ft.	488.52	End of purge (6 gallons)	TDW
10/26/89	1155		25.28	488.67	Well sampled	TDW
11/7/89	1043		25.26 ft.	488.69	Perm. Test	TDW
2/13/90	1440		24.29 ft.	489.66		TDW
2/28/90	1500				Surged & bailed 25 gallons	TW/HT
3/12/90	1250		24.50 ft.	489.45	Bottom sounded at 34.60 ft. B.T.O.C.	Free Col
6/18/90	1320		24.58 ft.	489.37	Bottom: 34.61 ft.	Free Col
7/5/90	1105		24.83 ft.	489.12		TDW, SB
10/17/90	1253		24.46 ft.	489.49		TDW, MJC
11/5/90	1229		24.83 ft.	489.12	Bottom: 34.72 ft.	Free Col

T.O.C. = T.O.R. + 0.28 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: DR-105	TOP OF CASING ELEVATION: 513.92 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
10/2/90					Well installed	
10/3/90	1000	1 day	22.1 ft.	491.8 ft.		TDW
10/3/90	1300		92.57 ft.		Well purged with Bennett pump (1 volume)	TDW
10/3/90	1530		92.37 ft.		Bottom sounded at 92.83 ft.	TDW
10/5/90	1130		89.92 ft.			TDW
10/10/90	1412		84.80 ft.			TDW
10/17/90	1436	2 weeks since purge	79.20 ft.	434.72	Recovery to static level appears to be very slow	TDW, MJC
10/18/90	0959		78.61 ft.	435.31	Well surged and bailed, light brown silt and fine sand	TDW, MJC
					evident in purged water.	
10/18/90	1120		91.28 ft.		(after purge)	TDW, MJC
10/18/90	1234		91.15 ft.			TDW, MJC
10/19/90	0829		90.36 ft.			TDW, MJC
11/1/90	1259		80.50 ft.	433.42		TW, ER
11/5/90	1055		78.15 ft.	435.77	Bottom: 92.68 ft.	Free Col
12/7/90	0920		74.94 ft.	438.98		TDW
1/7/91	0925		67.67 ft.	446.25		TDW
2/21/91	142S		58.42 ft.	455.50		TDW

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-105	TOP OF CASING ELEVATION: 513.65 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/24/89					Well installed	
8/30/89	0735	6 days	25.16 ft.	488.49 ft.		TDW
9/15/89					Well developed (bailed 35 gallons)	Roch. Drilling
9/21/89	0800		28.46 ft.	485.19	Purged for sampling (26 gallons)	TDW
10/24/89	0840		28.01 ft.	485.64		TDW
10/26/90	0822		28.05 ft.	485.60	Purged for sampling	TDW
10/26/89	1015		37.91	475.74	End of purge (42 gallons)	TDW
10/26/89	1015.5		37.86 ft.	475.79	Well sampled	TDW
11/7/89	1330		28.26 ft.	485.39	Perm. Test	TDW
2/13/90	1240		27.04 ft.	486.61		TDW
3/12/90	1120		27.99 ft.	485.66	Bottom sounded at 53.23 ft. B.T.O.C.	Free Col
6/18/90	1152		27.68 ft.	485.97	Bottom: 52.83 ft.	Free Col
10/2/90	1000			Well pumped to purge water introducted by drilling of DR-105. Grout noted on pump apparatus when pump was withdrawn from well.		
10/3/90	1240		38.50 ft.		Well purged dry	TDW
10/3/90	1540		49.50 ft.		Bottom sounded: 53.40 ft.	TDW

T.O.C. = T.O.R. + 0.81 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-105	TOP OF CASING ELEVATION: 513.65 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
10/5/90	1045		31.28 ft.			TDW
10/5/90	1215		31.42 ft.		After purging 0.25 gallons at 1100	TDW
10/10/90	1404		28.35 ft.			TDW
10/17/90	1434		27.51 ft.	486.14 ft.		TDW, MJC
10/18/90	0948		27.44 ft.	486.21	Well surged and bailed dry	TDW, MJC
10/18/90	1125		53.57 ft.			TDW, MJC
10/18/90	1230		51.10 ft.			TDW, MJC
10/19/90	0827		38.57 ft.			TDW, MJC
11/1/90	1249		27.38 ft.	486.27		TDW, ER
11/5/90	1045		27.60 ft.	486.05	Bottom: 53.62 ft.	Free Col
12/7/90	0930		27.10 ft.	486.55		TDW

T.O.C. - T.O.R. + 0.81 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-105	TOP OF CASING ELEVATION: 513.75 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/29/89					Well installed	
8/31/89	0737		26.75 ft.	487.00 ft.		TDW
9/15/89					Well developed (bailed 35 gallons)	TDW
9/21/89	1010		26.96 ft.	486.79	Purged for sampling	TDW
10/24/89	0835		26.55 ft.	487.20		TDW
10/26/89	0820		26.58 ft.	487.17	Purged for sampling	TDW
10/26/89	0935		26.62 ft.	487.13	End of purge (5 gallons)	TDW
10/26/89	0945		26.62 ft.	487.13	Well sampled	TDW
11/7/89	1355		26.65 ft.	487.10	Perm. test	TDW
2/13/90	1237		25.57 ft.	488.18		TDW
3/12/90	1115		26.05 ft.	487.70	Bottom sounded at 34.43 ft. B.T.O.C.	Free Col
6/18/90	1150		25.98 ft.	487.77	Bottom: 34.16 ft.	Free Col
10/3/90					Well purged with Bennett pump 400 gallons	TDW
10/4/90					Bennett pump - 400 gallons	TDW
10/5/90	1115		26.87 ft.	486.88		TDW
10/10/90	1408		26.73 ft.	487.02		TDW

T.O.C. = T.O.R. + 0.23 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-105	TOP OF CASING ELEVATION: 513.75 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
10/17/90	1437		26.13 ft.	487.62		TDW, MJC
10/18/90					Well purged with Bennett pump - 700 gallons	TDW, MJC
10/19/90	0831		26.33 ft.	487.42		TDW, MJC
11/1/90	1253		26.29 ft.	487.46		TDW, ER
11/5/90	1048		26.40 ft.	487.35	Bottom: 34.73 ft.	Free Col
12/7/90	0925		26.18 ft.	487.57		TDW

T.O.C. = T.O.R. + 0.23 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: OW-105	TOP OF CASING ELEVATION: 513.93 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/30/89					Well installed	
8/31/89	0740		ND	(< 492 ft.)	Well is dry	TDW
9/15/89			ND		Well flushed with distilled/DI water	TDW
9/25/89			ND		Bottom: 22.01 ft. (Elevation = 491.92 ft.)	TDW
10/24/89			ND			TDW
1/29/90			ND			TDW
2/13/90	1235		ND			TDW
3/12/90	1128		ND		Bottom sounded at 22.01 B.T.O.C.	Free Col
6/18/90	1158		ND		Bottom: 21.65 ft.	Free Col
10/2/90			ND			TDW
10/5/90			ND			TDW
10/10/90			ND			TDW
10/17/90			ND			TDW, MJC
11/1/90			ND			TDW, ER
11/5/90			ND		Bottom: 22.07 ft.	Free Col

ND = Not Detected.
T.O.C. = T.O.R. + 0.67 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-106	TOP OF CASING ELEVATION: 500.90 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/13/90					Well installed	
8/15/90					Well developed (20 gallons)	Noth-nagle
10/1/90	1220		10.63 ft.	490.27 ft.	Well developed with Waterra pump (3 gallons)	TDW
10/1/90	1245		15.46 ft.		Recovery approximately 0.01 ft. per minute	TDW
10/3/90	1415		12.55 ft.		Perm. test	TDW
10/17/90	1600		10.50 ft.	490.40 ft.		TDW, MJC
11/5/90	1415		9.54 ft.	491.36	Bottom: 45.72 ft.	Free-Col

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: OW-6	TOP OF CASING ELEVATION: 501.05 ft.	FILE NO. 70014-42 PAGE NO. 3 of 3

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well installed (#6)	
6/27/89	0840		8.8 ft.*	492.2 ft.*	Perm. test	JGT
9/28/89			9.39 ft.	491.66	Well developed	TDW
10/5/89					Additional development, thin film of LNAPL observed.	TDW
10/24/89	0919		9.21 ft.	491.84		TDW
10/25/89	1445		9.18 ft.	491.87	Well purged for sampling	TDW
10/25/89	1500		15.06 ft.	485.99	End of purge. (4 volumes)	TDW
10/25/89	1512		10.27 ft.	490.78	Well sampled	TDW
10/31/89	0900		9.19 ft.	491.86	Perm. Test	TDW
2/13/90	1152		8.42 ft.	492.63	Missing inner cap	TDW
3/12/90	1140		8.74 ft.	492.31	Bottom sounded at 15.74 ft. B.T.O.C.	Free Col
6/18/90	1220		8.89 ft.	492.16	Bottom: 15.72 ft.	Free Col
10/3/90	1430		9.18 ft.	491.87	Bottom: 15.68 ft.	TDW
10/17/90	1601		8.84 ft.	492.21		TDW, MJC
11/5/90	1415		8.90 ft.	492.15	Bottom: 15.75 ft.	Free Col

* - Water level measurement corrected for addition of above-ground protective casing on 6 September 1989.
T.O.C. = T.O.R. + 0.86 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-107	TOP OF CASING ELEVATION: 502.73 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/8/89					Well installed	
9/28/89			14.64 ft.	488.09 ft.	Well developed (1 volume purged, recovery slow)	TDW
10/24/89	1042		17.47 ft.	485.26	Sampling event	TDW
10/24/89	1450				Start of purge (bailed 38 gallons)	
10/24/89	1649		33.52 ft.	469.21	End of purge	TDW
10/24/89	1700		32.27 ft.	470.46	Well sampled	TDW
10/30/89	1031		17.20 ft.	485.53	Perm. Test	TDW
2/13/90	1425		15.69 ft.	487.04		TDW
3/1/90					Well re-developed	HT/EY
3/12/90	1231		16.17 ft.	486.56	Bottom sounded at 44.04 ft.	Free Col
6/18/90	1307		16.77 ft.	485.96	Bottom: 44.07 ft.	Free Col
10/17/90	1246		16.54 ft.	486.19		TDW, MJC
11/5/90	1219		16.57 ft.	486.16	Bottom: 44.19 ft.	Free Col

T.O.C. = T.O.R. + 0.37 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-107	TOP OF CASING ELEVATION: 502.53 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/25/89					Well installed	
9/28/89			17.86 ft.	484.67 ft.	Well developed (purged 8 gallons).	TDW
10/24/89	1040		17.42 ft.	485.11	Sampling event	TDW
10/24/89	1510				Start of purge (bailed 5 volumes)	TDW
10/24/89	1518		21.90 ft.	480.60	End of purge	TDW
10/24/89	1529		18.77 ft.	483.76	Well sampled	TDW
10/30/89	1033		17.99 ft.	484.54	Perm. Test	TDW
2/13/90	1423		17.85 ft.	484.68		TDW
3/1/90					Well re-developed	HT/EY
3/12/90	1240		17.74 ft.	484.79	Bottom sounded at 23.01 ft. B.T.O.C.	Free Col
6/18/90	1303		18.45 ft.	484.08	Bottom: 23.02 ft.	Free Col
10/17/90	1248		17.66 ft.	484.87		TDW, MJC
11/5/90	1215		18.31 ft.	484.22	Bottom: 23.12 ft.	Free Col

T.O.C. = T.O.R. + 0.33 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: OW-7	TOP OF CASING ELEVATION: 502.18 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well installed (#7)	
6/28/89	1134		15.13 ft.	487.05 ft.	Perm. Test	JGT
9/28/89			15.50 ft.	486.70	Bottom of well at 15.9 ft., 486.3 elevation	TDW
10/4/89					Well developed (flushed with distilled/DI water, surged and bailed)	TDW
10/24/89	1045		15.44 ft.	486.74	Insufficient water for sampling	TDW
10/30/89	1030		15.76 ft.	486.49	Bottom of well at elevation 486.33 ft.	TDW
2/13/90			15.18 ft.	487.00		TDW
3/12/90	1235		15.16 ft.	487.02	Bottom sounded at 15.73 ft. B.T.O.C. (elevation 486.45 ft.)	Free Col
6/18/90	1308		ND		Bottom: 15.87 ft.	Free Col
10/17/90	1244		15.32 ft.	486.86		TDW, MJC
11/5/90	1221		ND		Bottom: 15.92 ft.	Free Col

T.O.C. = T.O.R. + 0.16 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-108	TOP OF CASING ELEVATION: 503.85 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/28/89					Well installed	
9/28/89					Well developed (8 gallons purged dry)	
10/5/89			20.05 ft.	483.80 ft.	Well developed (12 gallons)	TDW
10/24/89	1056		20.02 ft.	483.83	Sampling event	TDW
10/24/89	1250				Start of purge	TDW
10/24/89	1354		25.55 ft.	478.30	End (bailed 31 gallons)	TDW
10/24/89	1358		25.00 ft.	478.80	Well sampled	TDW
10/30/89	0840		20.03 ft.	483.82	Perm. test	TDW
2/13/90	1445		19.15 ft.	484.70	Missing inner cap	TDW
3/12/90	1259		19.07 ft.	484.78	Bottom sounded at 39.38 ft. B.T.O.C.	Free Col
6/18/90	1330		19.48 ft.	484.37	Bottom: 39.37 ft.	Free Col
10/17/90	1255		19.09 ft.	484.76		TDW, MJC
11/5/90	1239		19.30 ft.	484.55	Bottom: 39.44 ft.	Free Col

T.O.C. = T.O.R. + 0.40 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-8	TOP OF CASING ELEVATION: 502.99 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well installed (#8)	
6/28/89			18.02 ft.	484.97 ft.	Perm. test	JGT
9/28/89			18.83 ft.*		*Water level after development (purged dry, less than 1 gallon)	TDW
10/4/89					Well developed (flushed with dis./D.I. water, surged and and bailed dry.)	TDW
10/24/89	1053		ND		Well is dry (bottom of well at elevation 483.3 ft.)	TDW
10/30/89	0833		ND		Well is dry	TDW
2/13/90	1449		19.14 ft.	483.85	Bottom of well at 483.77 ft. Missing inner cap	TDW
3/12/90	1306		18.85 ft.	484.14	Bottom of well at elevation 483.90 ft. (19.09 ft.)	Free Col
6/18/90	1334		ND		Bottom: 19.22 ft.	Free Col
10/17/90	1256		18.84 ft.	484.15	Bottom: 19.20 ft.	TDW, MJC
11/5/90			ND		Bottom: 19.23 ft.	Free Col

T.O.C. = T.O.R. + 0.14 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-109	TOP OF CASING ELEVATION: 500.53 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/13/89					Well installed	
9/28/89			15.85 ft.	484.68 ft.	Well developed, (purged dry, 1 volume)	TDW
10/24/89	1032		15.54 ft.	484.99		TDW
10/25/89	0830		15.55 ft.	484.98	Purged for sampling	TDW
10/25/89	0935				End of purge (43 gallons)	
10/25/89	0959		15.63 ft.	484.90	Well sampled	
10/30/89	1325		15.66 ft.	484.87	Perm. test	TDW
2/13/90	1403		14.64 ft.	485.89	Missing inner cap	TDW
3/12/90	1246		14.76 ft.	485.77	Bottom sounded at 41.79 ft. B.T.O.C.	Free Col
6/18/90	1250		15.24 ft.	485.29	Bottom: 41.83 ft.	Free Col
10/17/90	1238		15.08 ft.	485.45		TDW, MJC
11/5/90	1138		15.36 ft.	485.17	Bottom: 41.85 ft.	Free Col

T.O.C. = T.O.R. + 0.48 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-9	TOP OF CASING ELEVATION: 500.32 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
1981					Well installed (#9)	
6/28/89	1004		14.68 ft.	485.64 ft.	Perm. test	JGT
9/28/89			15.93 ft.	484.39	Well purged (3 volumes)	TDW
10/4/89					Well developed (surged & bailed, flushed with dis./D.I. water)	TDW
10/24/89	1031		15.61 ft.	484.71		
10/25/89	0832		15.62 ft.	484.70	Purged for sampling	TDW
10/25/89	0918				End of purge (1 gallon)	TDW
10/25/89	0940		16.30 ft.	484.02	Well sampled	TDW
10/30/89	1328		15.70 ft.	484.62	Perm. test	TDW
2/13/90	1406		14.85 ft.	485.47		TDW
3/12/90	1241		14.90 ft.	485.42	Bottom sounded at 18.57 ft. B.T.O.C.	Free Col
6/18/90	1252		15.29 ft.	485.03	Bottom: 17.75 ft.	Free Col
10/17/90	1239		15.14 ft.	485.18		TDW, MJC
11/5/90	1145		15.40 ft.	484.92	Bottom: 18.55 ft.	Free Col

T.O.C. = T.O.R. + 0.13 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-110	TOP OF CASING ELEVATION: 501.84 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/20/89					Well installed	
9/28/89			12.10 ft.	489.74 ft.	Well developed (25 gallons)	TDW
10/24/89	1138		12.04 ft.	489.80		TDW
10/25/89	1600		13.06 ft.	488.78	Purged for sampling	TDW
10/25/89	1655		40.50 ft.	461.30	End of purge (purged 25 gallons)	TDW
10/25/89	1717		38.74 ft.	463.10	Well sampled (Note: GW very turbid)	TDW
10/31/89	1114		16.12 ft.	485.72	Perm. Test	TDW
2/13/90	1412		11.69 ft.	490.15		TDW
3/1/90					Well re-developed	HT, EY
3/12/90			14.53 ft.	487.31	Bottom sounded at 43.30 ft. B.T.O.C.	Free Col
6/18/90	1357		14.26 ft.	487.58	Bottom: 43.37 ft.	Free Col
7/5/90	1435		15.74 ft.	486.10	Appendix IX sampling	TDW, SB
10/17/90	1625		13.03 ft.	488.81		TDW, MJC
10/18/90	0845		12.99 ft.	488.85		TDW, MJC
11/5/90	1425		12.30 ft.	489.54	Bottom: 43.45	Free Col

T.O.C. = T.O.R. + 0.49 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-110	TOP OF CASING ELEVATION: 501.25 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/19/89					Well installed	
9/28/89			13.86 ft.	487.39 ft.	Well developed (10 gallons)	TDW
10/24/89	1136		13.44 ft.	487.81		TDW
10/25/89	1600		13.43 ft.	487.82	Purged for sampling	TDW
10/25/89	1635		22.40 ft.	478.85	End of purge (3 volumes)	TDW
10/25/89	1640		22.22 ft.	479.03	Well sampled	TDW
10/31/89	1121		13.65 ft.	487.60	Perm. test	TDW
2/13/90	1414		12.75 ft.	488.50		TDW
3/1/90					Well re-developed	HT, EY
3/12/90			13.02 ft.	488.23	Bottom sounded at 23.53 ft.	Free Col
6/18/90	1357		13.18 ft.	488.07	Bottom: 23.58 ft.	Free Col
7/5/90	1430		13.40 ft.	487.85	Appendix IX sampling	TDW, SB
10/17/90					Unable to open padlock (corroded)	TDW, MJC
10/18/90					Unable to open padlock (corroded)	TDW, MJC
11/5/90	1440		13.44 ft.	487.81	Bottom: 23.79 ft.	Free Col

T.O.C. = T.O.R. + 0.39 ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: PZ-129	TOP OF CASING ELEVATION: 514.84 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
7/13/90					Piezometer installed	
8/1/90					Well developed - 25 gallons, very turbid	Noth-nagle
8/8/90					Well developed - 25 gallons, very turbid	Noth-nagle
8/21/90			17.58 ft.	497.26 ft.		TDW
10/17/90	1507		17.53 ft.	497.31		TDW, MJC
10/31/90	1434		17.68 ft.	497.16		TW, ER
11/5/90	1448		17.58 ft.	497.26	Bottom: 28.74 ft.	TW, ER

T.O.C. = T.O.R. + ft.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: PZ-130	TOP OF CASING ELEVATION: 515.16 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/8/90					Well installed	
8/21/90			15.78 ft.			TDW
9/24/90					Well developed, 15 gallons	Noth-nagle
10/17/90			17.21 - oil 17.23 - water	497.95 ft.	Oil layer: 0.02 ft.	TDW, MJC
10/31/90	1430		17.38 - oil 17.43 - water	*497.77	Oil layer: 0.05 ft.	TW, ER
11/5/90	1445		17.28 - oil 17.50 - water	*497.85	Oil layer: 0.22 ft. Bottom: 27.27 ft.	TW, ER

* - Groundwater elevation adjusted for thickness of floating oil layer.
Specific gravity of oil layer = 0.85.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-131	TOP OF CASING ELEVATION: 515.64 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/24/90					Well installed	
10/2/90					Well developed (20 gallons)	Noth-nagle
10/10/90	1445		29.30 ft.	486.26 ft.		TDW
10/17/90	1430		28.84 ft.	486.80		TDW, MJC
11/6/90	0902		29.04 ft.	486.60	Bottom: 51.14 ft.	TDW, ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-131	TOP OF CASING ELEVATION: 515.00 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
9/29/90					Well installed	
10/2/90					Well developed (5 gallons)	Noth-nagle
10/10/90	1440		17.50 ft.	497.50 ft.		TDW
10/17/90	1428		16.92 ft.	498.08		TDW, MJC
11/6/90	0900		16.99 ft.	498.01	Bottom: 30.50 ft.	TDW, ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: R-132	TOP OF CASING ELEVATION: 515.75 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/21/90					Well installed	
9/24/90					Well developed (15 gallons)	Noth-nagle
10/17/90	1402		27.89 ft.	487.86	Bottom: 49.03 ft.	TDW, MJC
10/19/90	0843		27.94 ft.	487.81	Purged 100 gallons with Bennett pump	TDW, MJC
10/19/90	1330		30.99 ft.		Bottom: 49.02 ft.	TDW, MJC
11/5/90	1432		27.87 ft.	487.88	Bottom: 49.07 ft.	TDW, ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-132	TOP OF CASING ELEVATION: 515.55 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/23/90					Well installed	
9/24/90					Well developed (5 gallons total, dry twice)	Noth-nagle
10/17/90	1407		19.35 ft.	496.20 ft.	Bottom: 30.94 ft.	TDW, MJC
10/19/90	0922		19.14 ft.	496.41 ft.	Permeability test and well purge performed (10 gallons purged)	TDW, MJC
10/19/90	1331		27.26 ft.		Bottom: 30.92 ft.	TDW, MJC
11/5/90	1430		15.92 ft.	499.63	Bottom: 30.96 ft.	TDW, ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: PZ-132	TOP OF CASING ELEVATION: 515.65 ft.	FILE NO. 70014-42/70043-41 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
8/23/90					Well installed	
8/24/90	1500		12.27 ft. - oil 12.56 ft. - water	*503.28 ft.	Oil layer: 0.29 ft.	TDW
9/10/90	1542		12.16 ft. - oil 12.34 ft. - water	*503.43	Oil layer: 0.18 ft.	SFP
9/24/90					Well developed (20 gallons)	Noth-nagle
9/24/90					Development water reading = 25 ppm (OVA)	
9/25/90			12.12 ft. - oil 12.30 ft. - water	*503.47	Oil layer: 0.18 ft.	MJC
10/17/90	1404		11.98 ft. - oil 12.16 ft. - water	*503.61	Oil layer: 0.18 ft.	TDW, MJC
10/31/90	0717		11.97 ft. - oil 12.15 ft. - water	*503.62	Oil layer: 0.18 ft.	TW, ER
11/5/90	1050		12.00 ft. - oil 12.18 ft. - water	*503.59	Oil layer: 0.18 ft.	TDW, ER
11/28/90			11.88 ft. - oil 12.03 ft. - water	*503.72 ft.	Oil layer: 0.15 ft.	SFP
Note: Specific gravity of oil layer - before 1991: 0.65 after 1/1/91: 0.85						

* - Elevation of water adjusted for thickness of floating oil layer.

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS			GROUNDWATER LEVEL MONITORING REPORT			
WELL NUMBER: SR-216			TOP OF CASING ELEVATION: 516.85 ft.		FILE NO. 70138-40 PAGE NO. 2	
DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM TOC	ELEVATION OF WATER	REMARKS	READ BY
9/05/90					Well installed.	
9/06/90	2355		21.30 ft. (oil - ND)	495.55 ft.	Thin film of oil noted. Well sampled.	TDW
9/07/90	2100				Well purged (6 gallons) steadily increasing thickness of oil	JGT/ TDW
					noted during purge process. Sample collected for GC analysis	
9/08/90	0400				320-400 ppm. VOC detected at TOR Floating oil layer=0.6 ft.	JGT/ TDW
9/11/90	0400				Sampled product (floating oil layer) for GC analysis.	JGT
9/13/90	0015	8 days	20.95 ft. (oil) 21.35 ft. (water)	*495.90 ft.	(*-approximate water level corrected for product thickness)	
9/13/90	0530				Product thickness prior to purge. 0.73 ft. 3 gallons purged, well	JGT
					water and product sampled. 420 ppm. VOC detected at TOR.	
9/13/90	0615		21.85 ft. (water)		Product thickness not measured	JGT/ TDW
9/23/90	1600		21.33 ft. - oil 22.24 ft. - water	*495.38 ft.	Product thickness = 0.91 ft.	TDW
10/17/90	1535		20.74 ft. - oil 22.10 ft. - water	*495.90 ft.	Product thickness = 1.36 ft.	TDW, MJC
11/01/90	1130		- oil 22.05 ft. - water		Product thickenss not measured. Bottom depth = 23.10 ft.	TW, ER
11/05/90	1525		20.68 ft. - oil 22.05 ft. - water	*496.06 ft.	Product layer 1.37 ft.	ER
11/06/90	1130				LNAPL (oil) sampled Specific gravity = 0.92	TW/ ER
11/06/90	1145 1230				Well bailed (4 gallons)	ER
11/06/90	1400				Groundwater sampled	TW/ ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: SR-230	TOP OF CASING ELEVATION: 516.85 ft.	FILE NO. 70138-40 PAGE NO. 1

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM TOC	ELEVATION OF WATER	REMARKS	READ BY
10/31/90					Installation completed.	
11/01/90	1122		19.52 ft.	497.33 ft.		TW/ ER
11/05/90	1455		19.35 ft.	497.50 ft.	Well developed with Waterra pump (17 gal.)	TW/ ER
11/06/90	1145-1215				Well purged (5 gallons, Waterra pump)	TW
11/06/90	1340				Groundwater sampled.	TW/ ER

H&A OF NEW YORK CONSULTING GEOTECHNICAL ENGINEERS GEOLOGISTS AND HYDROGEOLOGISTS	GROUNDWATER LEVEL MONITORING REPORT

WELL NUMBER: Well Z	TOP OF CASING ELEVATION: 515.16 ft.	FILE NO. 70014-42 PAGE NO. 2

DATE	TIME	ELAPSED TIME	DEPTH OF WATER FROM T.O.C.	ELEVATION OF WATER	REMARKS	READ BY
10/24/89	1715		27.76 ft.	487.40 ft.	(TOC = top of casing)	TDW
2/13/90	1224		26.76 ft.	488.40		TDW
12/7/90	0950		27.48 ft.	487.68		TDW
1/4/91	1250		26.60 ft.	488.56 ft.	Purged 225 gallons	TDW
1/7/91	0835				Purged 240 gallons prior to sampling well.	TDW
4/91					Bentonite pellet seal and grout plug installed.	
4/29/91	1000		26.90 ft.	488.26 ft.		TDW
" "	1009		70.4 ft.		Pump running full throttle for 9 min., 35 sec.	TDW
" "	1038		31.7 ft.		Pump off for 28 min., 20 sec.	TDW