Brown's Race Delisting Petition

Genesee River Gorge (Upper to Lower Falls) Inactive

Hazardous Waste Disposal Site NYS Registry #828044



Prepared by the City of Rochester

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#### Executive Summary

The Lower to Upper Falls inactive hazardous waste site (#828044) study area encompasses approximately 350 acres along the Genesee River Gorge in the City of Rochester. Chemical seeps, sometimes characterized as "coal tar material", have been observed oozing from the rock face of the Genesee River Lower Falls for over 15 years. The seeps have also been observed in two tunnels beneath the river located upstream from the Lower Falls. Sampling and analyses of the seeps have consistently identified volatile aromatic and polynuclear aromatic organic compounds.

The New York State Department of Environmental Conservation has completed an expanded Phase I investigation of the seep problem using a study area approach to identify potential sources of the seep contaminants and possible migration pathways. Several potential sources of such materials were identified. However, many locations within the study area have little or no potential for contributing the characteristic contaminants to the seep locations observed in the gorge. The effect of including these non-suspect locations in the Lower Falls Study area has been to unnecessarily inhibit development and create an unfounded apprehension among financial institutions.

This petition addresses a 14 acre area located nearly one mile from the nearest observed seep and 130 feet higher in elevation. The City contends that this "Brown's Race Petition Area" is not contributing to the seep problem and presents supporting documentation for this opinion. A careful review of existing reports on the Upper to Lower Falls site and, in particular, on the 14 acre Brown's Race Petition Area has been performed. Records on past ownership and industrial activities were utilized to prepare a more comprehensive presentation of the historical development of the Brown's Race area. Recent subsurface investigations were reviewed and are discussed in this petition. Boring logs and data for 27 borings and 2 test pits which have been performed in the petition area are presented.

Brown's Raceway, which for decades carried the water which powered much of Rochester's early industry, is the focus of this petition. Much of the raceway and all of the associated tail races have been filled. Brown's Race Street was constructed over the filled raceway and it was this fill material which represented the only potential source of large quantities of waste material in the petition area. Recent raceway borings, test pits, sampling, and analysis of the material used to fill the raceway are discussed in detail.

This new information demonstrates that the raceway contains neither the types nor the quantities of wastes necessary to represent a source of the Genesee River Gorge seeps. The absence of such materials in the raceway and elsewhere in the petition area combined with the physical distance to the observed seeps in the gorge strongly supports the need for a study area boundary revision. Therefore, based on all available information the City requests the Brown's Race petition area be removed from the Upper to Lower Falls site study area.

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The City of Rochester is making this petition to remove the Brown's Race area from the Upper to Lower Falls Inactive Hazardous Waste Site (Registry #828044) for several reasons. Urban Cultural Park plans, real estate financing difficulties, and economic development interests are all reasons why it is desirable for the Brown's Race area to be removed from the study area. Given that the completion of a Remedial Investigation/Feasibility Study is several years off under the most favorable conditions, the impact of the study area boundaries will be felt for some time. The City views the long-term negative impact of the study area boundaries on Brown's Race as unacceptable, particularly given the absence of any documentation of hazardous wastes in the petition area and the somewhat arbitrary establishment of boundaries. The New York State Department of Environmental Conservation (NYS-DEC) has clarified the distinction between a study area and site boundaries, but the difference has little meaning to financial institutions and those with interest in promoting the development of this area.

The City recognizes, however, that the exclusion of Brown's Race from the Upper to Lower Falls study area would not be justified if the presence of hazardous wastes posed a threat to the public or the environment. Contaminants of particular concern for the purposes of this petition are those hazardous chemicals associated with the Genesee River Gorge seeps. The City acknowledges that the threat associated with any contaminants in this area must be considered. All contaminants and available information on this area are therefore, presented. If, in fact, a threat to the public or the environment existed because of materials in Brown's Race, the City would demand a complete investigation and clean-up. The questions to be addressed by this petition are whether a potential source of contamination may be present in the Brown's Race area; and if present, whether the contaminants are likely to be contributing to the identified problem in the Genesee River Gorge. Based on available information, the City submits that a seep contaminant source is not present.

The primary feature of concern within the "Brown's Race petition area" (see Exhibit 2.) is probably Brown's Race. It is important to note that the "petition area" is a subsection of the area defined by the NYS-DEC Expanded Phase I report as "Brown's Race - Area 4 (10) (see Figure 1a). The 172 year old raceway has been partially filled, and 800 feet of filled raceway is located within the petition area. The filled race extends several hundred feet to the north of the petition area and purportedly represents a potential migration pathway for contaminants. A significant portion of this petition addresses the type of material found in the raceway through borings and test pit excavations.

The documentation and field investigations supporting this petition provide a more thorough and comprehensive picture of the history,

usage and subsurface conditions within the petition area than was presented in the NYS-DEC's Expanded Phase I report (10). With the absence of any documentation of hazardous waste disposal or confirmed hazardous waste contamination, the City contends that removal of the petition area from the Lower Falls site study area is justified and merits approval by the New York State Department of Environmental Conservation.

# SECTION 2. BACKGROUND: LOWER TO UPPER FALLS STUDY AREA DEVELOPMENT

An understanding of the sequence of events leading to the establishment of the Lower to Upper Falls Study area is helpful to gain perspective on this petition. A brief discussion of the site investigation process is presented followed in subsequent sections by a discussion of information available at this time on the petition area.

In 1979 the Monroe County Landfill Review Committee issued a monograph report on chemical seepage from the Grimsby Sandstone formation at the Lower Falls (1). This report discussed various possible nearby sources including creosote possibly leaking from timbers in RG&E's Number 5 Tunnel and leachate from the Deep Hollow Ravine. Various limited analyses of the seeps performed in the late 1970's and early 1980's indicated the presence of benzene, toluene, xylene and from the pool below, polynuclear aromatic hydrocarbons (PNAH's).

In July, 1984, similar seep material was also encountered at a slightly lower vertical elevation (285 feet) but in the same Grimsby Sandstone rock unit seeping from the crown of Rochester Gas and Electric's Station Number 5 Tunnel located beneath the river a short distance upstream from the Lower Falls (13). Appendix G is a Generalized Geologic Cross Section of the Genesee River Gorge provided in RG&E's 1986 report on this site. Sampling and analyses detected part per thousand (ppt) levels of PNAH's and part per billion (ppb) levels of BTX's. The seep was characterized as "coal tar base" by O'Brien and Gere Engineers, Inc. after sample analysis (10). In 1984, the NYS-DEC contracted with Recra Research Inc. to perform a Phase I investigation of the Lower Falls area. February, 1985, while the Phase I investigation was underway, Cliff Street siphon tunnel workers, working about 50 feet below the river in the Maplewood Shale formation some 2,500 ft. upstream from the Lower Falls, discovered a seep material very similar to the contaminants identified in the Station Number 5 tunnel. Analyses indicated the presence of benzene and toluene and percent levels of polynuclear aromatic hydrocarbons. The more viscous seep material was described as "coal tar material" by the project engineers, O'Brien and Gere. An aqueous phase with an oily sheen was also noted. The seeps were generally observed entering the tunnel through the invert and the southern side of the tunnel at an elevation of approximately 330 feet (10).

By April 1985, two distinct seeps were observed by NYS-DEC staff inspecting the tunnel: one red and the other black (7). Analyses of the red and black seeps again identified BTX's and PNAH's with the black seep generally having the higher concentrations. These descriptions were consistent with observations made regarding the "A" and lower "B" seeps at the Lower Falls. The upper "B" seep at the Falls was different, with a changing appearance ranging from clear to milky white.

The NYS-DEC considered the available data sufficient to determine that the seeps posed a significant threat to public health and the environment and changed the site classification from "2a" to "2" in April, 1985. Exhibit la identifies the location of the observed seeps within the Expanded Phase I report study area.

With the discovery of the apparently related seep problem in the Cliff Street Tunnel, the City of Rochester, Monroe County, Rochester Gas and Electric Corp., and the NYS-DEC agreed in November, 1985 that the geographic area under consideration in the Phase I investigation was too limited. As a result of this agreement, the City and RG&E undertook efforts to develop supplemental reports to assist the NYS-DEC in gathering information regarding historic and industrial activities in the gorge area which could have generated the types of wastes containing contaminants evident in the seeps. In June, 1986, the supplemental reports were completed and distributed.

The NYS-DEC agreed to a revised scope of work for an expanded Phase I report which would incorporate pertinent information from the City and RG&E reports. By September, the workplan for the expanded Phase I report was finalized. The expanded report was to look at a much larger geographic area to identify potential source locations and migration routes. The study area selected for the expanded Phase I was the same area which was addressed by the City of Rochester supplemental report. This area, "bounded on the north by the Lower Falls, the east by St. Paul Street, the west by Lake Avenue, and on the south by the Upper Falls," encompasses roughly 350 acres with some areas almost a mile removed from the locations where contaminants have been observed. (See Exhibit la.)

The NYS-DEC's consultant, Recra Research Inc., partitioned the study area into seven sub-areas in their report which was issued in draft form in April, 1987. In September, 1987, the Monroe County Health Director, Dr. Joel Nitzkin, issued a letter on behalf of the Monroe County Landfill Review Committee, expressing concern about the lack of definition of the site boundary and the resulting serious impact on development proposals (8). The letter also proposed six conservative criteria which could be used to refine the boundary. The City issued a follow-up letter in support of the County proposal (9).

In October, 1987 the City presented a briefing paper to the New York State Urban Cultural Park (UCP) Advisory Council. The City

requested assistance from the UCP Advisory Council in promoting inter-agency cooperation to obtain "appropriate and responsible site boundaries" for the Upper to Lower Falls site. On June 19, 1988, a meeting was convened in Albany with representatives from the City, NYS-DEC, New York State Health Department, New York State Office of Parks, Recreation and Historic Preservation, and the UCP Advisory Council. As a result of this meeting, the City was invited to submit a petition to the NYS-DEC to "delist" the Brown's Race area accompanied by site specific information.

The expanded Phase I report was finalized in March, 1988 and contained useful summaries of available information but did not identify the source of the seep contaminants. The report stated that "the most probable source of these contaminants would have to be considered to be coal tar" (10). In response to questions raised in the report regarding the need for direct sampling and a more thorough analysis of the Lower Falls seeps, the City undertook a sampling program and forwarded the resultant data to the NYS-DEC (5).

An important issue not resolved by the report was which areas were not realistic sources of seep material. Many locations remained in the study area based only on brief historical descriptions provided in the City of Rochester supplemental report or the somewhat arbitrarily assigned study area boundaries. This was recognized by Recra in the text of the Expanded Phase I report, "Although some of these facilities potential contribution to the contamination problem was probably negligible due to their size, they have been included as potential source areas." (10)

#### SECTION 3. BROWN'S RACE PETITION AREA

# 3.1 Physical Description of the Petition Area

The area addressed by this petition is fourteen and one half acres of land just north of downtown Rochester on the western high bank of the Genesee River Gorge. A map of the petition area is presented in Exhibit 2. The area is bounded in general by State Street on the west, the Conrail rail tracks on the south and Platt Street/Volt Place on the north. The eastern boundary of the petition area is formed by the rim of the gorge "high bank" which has an approximate elevation of 470 feet. The petition site is located within the extreme southwest portion of the Upper to Lower Falls inactive hazardous waste site study area and is within sub-area 4 as defined in the Expanded Phase I report (see Exhibit la). The petition area excludes Rochester Gas & Electric's BeeBee Park, Bee Bee Station and the filled raceway north of Volt Place. The northernmost street in the petition area, Volt Place, is 4,400 ft. south of the nearest

seep observations at the Cliff Street Siphon Tunnel and Brown's Race Street is 130 ft. higher in elevation than the tunnel.

A short section of Brown's Race still carries water to a point north of the Commercial Street Bridge. The water is then diverted down to Rochester Gas and Electric's hydro-electric station located on the river flats and also north to its BeeBee Station. The remainder of the Raceway has been filled and is now covered by a public street.

#### 3.2 Historical Development

The Brown's Race area has been called the "cradle" of Rochester's early industrial development. In 1810, Francis and Matthew Brown purchased 200 acres of land on the west bank of the Genesee River just below the Upper Falls. With the construction of the Brown brothers' water raceway in 1816, the area became the center of the flour milling industry. Also within the petition area, metal foundries were constructed that took advantage of the water power. Such foundaries produced a variety of products including woodworking tools, farm equipment, fire engines, boilers and steam engines. The petition area was the site of furniture manufacturers, machine shops, a brass manufacturer, lithographers, a dye manufacturer, and even a spice mill during the mid-nineteenth century (2, 3, 5, 7, 11, 16).

During the second half of the nineteenth century, clothing related manufacturing occurred at this location and included button manufacturing, box manufacturing, shoe factories, shoe last works and heel manufacturers. Exhibit 3 is a map of the petition area which identifies past manufacturing sites. Many of the businesses would be considered small by twentieth century standards. Little detailed information is available on the day-to-day operations of these companies (2, 7, 11, 16).

Early in this century milling concerns, tool companies, and foundaries still remained, but the useful life of Brown's Race as a source of mechanical energy for manufacturers was coming to a close. Steam and electricity were becoming readily available (7, 16).

By 1910, Rochester Railway and Light Company had land holdings at the Commercial Street/Brown's Race junction and increased holdings on the river flats below. By 1918, Power Station 2 including a spillway and a penstock from Brown's Race had been constructed on the flats and was generating electricity from water diverted from Brown's Race (10). Within the petition area, all the tail races disappeared (7). Other manufacturing concerns present at the time included the tenants of the Gorsline Building (shoe and box makers), the J. G. Davis Company (Granite Mill), and the Willsea Works (metal fabricators)(7, 16).

The Willsea Works and Judson Governor (Power) Co. were prominent features in the petition area by the mid 1920's. Other businesses included the Rochester Button Company, Addison Lithography Co., Rochester Heel Co., and also the long-time resident Rochester Water Works. Brown's Race itself was still covered with wood planking.

By the mid-1930's, RG&E had garage facilities on the former Willsea Works location at 72 Brown's Race. The Rochester Button Company remained, and the National Brass Manufacturing Company had facilities between State and Mill Streets. The NYS Railways bus garage was located on Commercial Street near the open race (7, 16).

In the 1930's, Rochester Gas and Electric constructed a concrete box culvert to carry water to Bee Bee Station for cooling water and boiler water make-up (14). Gradual filling of the raceway followed and by the late-1940's much of the race had been filled. A medina stone and asphalt road surface was installed over the filled race in the 1950's.

#### 3.3 Current Land Use

Currently a mix of office, commercial, parking, and light industrial uses is found within the petition area. Several buildings and sites are vacant, including the former Lost and Found Tavern, Rochester Water Works Building, the Triphammer Site, the Parazin Building, and the Gorsline Building. A site map (from LaBella Associate's Brown's Race Infrastructure Study) indicating present uses of the petition area is presented as Exhibit 4. A 1988 property owner list for parcels within the petition area and a composite property tax map is provided in Appendix 4. At several locations the original structures have been razed and replaced by parking lots.

# SECTION 4 PETITION AREA STUDIES AND INVESTIGATIONS

# Expanded Phase I Report: Findings Within the Petition Area

Recra Environmental Inc.'s Expanded Phase I report included information regarding the Lower Falls and tunnel seeps, suspected and confirmed fill areas, areas of known waste

disposal, potential migration pathways, past industrial activities, aboveground and underground storage tanks, and possible source materials. Information presented in the Expanded Phase I report regarding potential sources and migration pathways within the petition area was primarily speculative. The potential sources identified were from past occupants of parcels within the petition area. No evidence was presented indicating the businesses mentioned left or deposited hazardous wastes.

Several potential migration pathways were presented including Brown's Race itself, but again no incidences, other than the 1888 Vacuum Oil naptha explosion are cited which would suggest that the pathways have permitted the movement of contaminants.

Underground storage tanks were identified at seven locations. However, most of these tanks were small, (1,000 gallons or less), gasoline or oil storage tanks. The largest petroleum tank, a 10,000 gallon fuel oil tank, at the City's new Holly Pump Station was installed in the late 1970's and has already been replaced due to a small leak. Although any leaking underground storage tank is of concern and should be addressed, it is extremely unlikely that the small tanks in the petition area are contributing to the Genesee River Gorge seeps observed at such a great distance away.

The report accurately identifies Brown's Raceway and the individual tail race outfalls as being filled. Although the material used to fill the tail races could be observed to a limited extent, the true nature of the fill material was not known at the time of the preparation of the Expanded Phase I report. The type of fill material will be discussed further in this report.

Finally, and possibly most significant, is the fact that no hazardous wastes or suspicious seep-like materials were presented by the Expanded Phase I report as having been encountered in the petition area. This has essentially been confirmed by recent investigations and a careful review of records.

In its recommendations for additional study, Recra Environmental, Inc., placed little emphasis on the petition area. Aside from preliminary site investigation survey work, Recra made no recommendations for tentative borings or monitoring well locations in the petition area.

# 4.2 Subsurface Investigations

More recent studies performed by the City of Rochester and other parties in the Brown's Race petition area provide information regarding subsurface conditions. Data such as depth to bedrock, overburden descriptions, and results from available analytical work provide information which helps in evaluating whether seep materials

or any other types of wastes have been buried or spilled in this area. A significant amount of information has now been gathered regarding Brown's Race and the material used to fill the raceway.

Data from three subsurface investigations are discussed in this section. An "Interim Report, Geotechnical Investigations, Mill Street Sewer Tunnel, Rochester, New York May, 1988" prepared by H&A of New York for STV/Seelye Stevenson Value & Knecht under contract to the Monroe County Pure Waters Department provides boring logs, general subsurface descriptions and laboratory analysis of groundwater samples from a recently developed bedrock monitoring well. Bedrock borings were drilled to 140+ feet and the boring for the well was drilled to 53 feet. The investigation groundwater analyses were performed to evaluate the condition of the tunnel, to determine what health and safety measures may be necessary to protect tunnel workers, and to determine whether tunnel debris would require special waste handling (12).

Empire Soils Investigations, Inc. performed six borings within the Brown's Race petition area in July, 1988. The borings were located adjacent to the Rochester Water Works Building at 74 - 78 Brown's Race Street. The investigative report, "Subsurface Exploration and Geotechnical Evaluation for the Proposed Urban Cultural Park Interpretive Center, 78 Brown's Race, Rochester, New York," was prepared for the City of Rochester, Bureau of Municipal Facilities. The purpose of the investigation was to gain a better understanding of subsurface conditions and materials. The borings were performed with an awareness that chemical wastes could be encountered. Three additional borings were installed at the base of the gorge and will also be discussed (15).

The remaining subsurface investigation presented in this report was conducted during the "Brown's Race Infrastructure Study", prepared by LaBella Associates, for the City of Rochester, Engineering Bureau. This investigation, completed in September, 1988, focussed on overburden and fill materials under and adjacent to Brown's Race, Furnace Street and Commercial Street. Shallow borings and test pits were completed. Due to the concern over the nature of the fill material in the former raceway, composite and grab samples were obtained and analyzed for several parameters (4).

The results of the three studies are summarized in this section and copies of the boring logs and laboratory reports are included in Appendices B and C. A petition area map depicting the location of borings, monitoring wells, and test pits is presented in Exhibit 5.

# 4.3 Subsurface Conditions

West of Brown's Race Street, overburden generally appears to be shallow with depths to bedrock in the 1.5 to 6 foot range. In Brown's Raceway bedrock is located 8 to 10 feet below grade. Along the edge of the gorge, depth to bedrock appears to become deeper and

more variable, reflecting the foundation and tailrace excavations made years ago.

Information from borings performed throughout the Brown's Race Petition Area indicates varying amounts of gravels, sand, and silts in combination with fill materials such as asphalt, cobble, brick fragments, cinders and wood fragments. Refer to Exhibit 5 for a subsurface description at each boring or test pit location. Subsurface materials found at the Granite Flour Mill's site suggests that when the building was razed some of the resulting debris was used as fill.

Borings logs do not indicate the presence of strong odors, oily or tarry materials, or chemical deposits. Trace petroleum odors were observed from one boring and a test pit excavation into Brown's Race, both near the City Water Works Building. To the east of the petition area, at the base of the gorge (surface elevation 412 to 415 feet), borings did uncover a black "petroleum or tarlike substance coating" fill material. Head space Hnu analysis of fill coated with the black substance later detected 100 to 200 ppm volatile organics (see Appendix B). This location is where oil tank sludge and pitch from the East Gas Station were reported to have been dumped in 1967-68, according to the Expanded Phase I report (15).

Brown's Race was found to contain a variety of fill material including concrete, rubble, red brick, cinders, sand and gravel. Cross-sections of the race based on the observations from the test pit excavations were prepared by LaBella Associates and are presented in Exhibits 6 and 7. Based on this information, and the boring data, a clearer picture exists of the configuration of the original raceway. The stone and mortar-faced raceway walls rest directly atop a bedrock floor, and are between 5.5 and 6.0 feet in height. It seems likely that some bedrock was removed during excavation of the raceway given refusal depths within and adjacent to the raceway. An additional 2.5 feet of fill material was placed over the top surface of the race wall. The 800 foot length of filled raceway within the petition area represents about 7,000 cubic yards of fill material.

Observations of the foundation and first floor window elevations of the older structures in the area such as the Parazin Building and the Parry Machine Building suggest that filling has taken place in other locations as well.

As mentioned, the only location where unusual odors were detected was at boring RWB-6 and Test Pit number 2. RWB-6 was performed as a follow-up to analytical results from testing performed on the series of composite samples of the raceway fill material. The composite sample from RBW-2A yielded results which will be discussed in Section 4.4.1 prompting follow-up sampling and testing at that location. Additionally, during the excavation of Test Pit number 2 slight "petroleum hydrocarbon odors" were noted at the 7 to 8 ft.

depth. With the sampling data from RBW-2A, and the odor observation from test pit number 2 in mind, the follow-up boring was performed, and a slight petroleum/volatile odor was encountered within the first two feet in a cinder type material (4).

Within the petition area, three deep bedrock core borings have been performed for the Monroe County Pure Waters Agency adjacent to the alignment of the Mill Street Sewer Tunnel. The boring logs do not indicate that seep like materials or odors were found. The only other unusual description from these boring logs was a black "ink-like" substance found on the core barrel in shale below 40 feet during the boring for MS102. The surface elevation at MS102 is 489.5 feet. Groundwater level at the time of sampling was 36.56 feet below the top of the well casing, indicating that the sample was taken approximately at the level of the stone sewer. Data from the deep analytical well, MS102, in the area are discussed in Section 4.4.2. The data, field report, and boring logs are provided in Appendix B.

# 4.4 Sampling and Analytical Results

#### 4.4.1 Brown's Race Infrastructure Study

A sampling and testing program was undertaken during the Brown's Race Infrastructure Study prepared by LaBella Associates for the City of Rochester. Composite and grab samples of raceway fill were taken from split spoon borings, as were samples of silty water found in the lower portions of the fill. Each bore hole and test pit was monitored with an Hnu meter during excavations, as were split spoons when opened.

The methodology for the sampling is described in the project workplan proposal found in Appendix C. Five overburden boring locations and two test pit locations were selected for Brown's Race (see Exhibit 5). The raceway borings were performed on Saturday morning July 9, 1988. A total of six bore holes were attempted. One, RWB-2, was aborted when auger penetration became extremely difficult at 3 ft. Refusals for the five successful boring were between 7'10" and 9'6", and were marked by the presence of weathered rock fragments. A more complete summary of each boring is provided in Exhibit 5. Boring logs are included in Appendix B. The test pit excavations were performed at a later date.

Vertical composite samples of fill material were taken from each bore hole for the purpose of running: Extraction Procedure (E.P.) toxicity analyses for metals; EPA Method 8270 for semi-volatile organic compounds; and petroleum hydrocarbons (EPA Method 418.1).

Eight additional grab samples were taken. Analysis for volatile organic compounds (EPA 8240) was performed on the silty water or sludge grab samples from each boring.

Organic vapors were monitored during the boring program. Hnu meter readings were taken at the bore hole and when the two-foot split spoon samples were opened. No readings above background were detected.

The following is a summary of the analytical results from soil samples. Actual results, surrogate recoveries, laboratory chronicle and the chain-of-custody form are found in the appended laboratory report.

- o A plasticizer, Bis (2-ethylhexyl) phthalate was found in composite samples from RWB-5, RWB-4, and RWB-3 at low part per million (ppm) levels.
- The composite sample from RWB-2A yielded low ppm levels of eleven base neutral polynuclear aromatic hydrocarbons (PNAH's). Due to petroleum hydrocarbon interferences during analysis of composite samples at RWB-2, RWB-3, RWB-4, and RWB-5, detection limits were raised to 3.3 ppm. None of the eleven PNAH's were detected in the sample from RWB-1 on which the lower detection limit of 660 parts per billion (ppb) was achieved.
- o The only volatile organic compounds found in the grab samples were chloroform at 27.5 ppb from RWB-3 sample and trichloroethene at 8 ppb from the RWB-5 sample.
- o EP toxicity extractions from composite samples were all below detection limit except for mercury which was detected after extraction at 7 ppb from the RWB-2 sample.
- o Petroleum hydrocarbons were detected at all five boring locations. High levels were found in the composite samples from RWB-2A and RWB-3, a sand and cinder composite sample from RWB-4 was also found to contain high ppm levels of petroleum hydrocarbon. The lowest petroleum hydrocarbon level was detected from RWB-1. Follow-up sampling and analysis at RWB-6 identified significantly lower petroleum hyrdrocarbons (see Exhibit 5).

On September 20, 1988, the analytical data and boring logs were presented to John Swanson and Mike Sosnow of the NYS-DEC at a meeting at the Rochester City Hall. The DEC representatives expressed concern about the 3.3 ppm detection limits for semi-volatile base neutrals and the contaminants detected in the composite sample from RWB-2A. The decision was made to perform a follow-up boring near RWB-2A with sampling and analysis of any suspicious material. Visual observations and information recorded on the July 9th boring log seemed to suggest that the source of

contaminants could have been asphalt material or wet to saturated ash and cinders.

The purpose of the follow-up boring was to determine what type of fill material may be contaminated with PNAH's and petroleum hydrocarbons. The follow-up boring was drilled on October 6, 1988. Mr. Swanson, Mr. Sosnow, and Marshall Shannon of General Testing laboratory were present. At a point located midway between RWB-2 and RWB-2(A), an auger/split spoon boring (RWB-6) was drilled. split spoon to a depth of 8 feet was observed when opened. petroleum-like odor was observed from a sample of cinder and ash material at a depth of 1.5 feet and a sample collected. subsequent two foot split spoon sample was viewed. Petroleum odors or suspicious materials were not encountered and consensus was reached that no additional samples were necessary. The decision was made to run volatile organic chemical analysis on the fill sample; however, too much head space was present in the first sample. As a result, an additional boring, RWB-6A, was made and sampled in the immediate vicinity of RWB-6.

The results from the follow-up sampling and analysis did not show the base neutral semi-volatile contaminants which were identified from the earlier boring, RWB-2A. The only base neutral semi-volatile found was bis (2-ethylhexyl) phthalate at 2.26 ppm. Non-target compound list PNAH's were not found when a library search was conducted. Three volatile organic compounds were detected in the sample from RWB-6A. Methylene chloride, chloroform, and toluene were measured at 31.8, 7.2, and 95.2 ppb respectively. However, methylene chloride probably represents a lab contaminant given that 5.1 ppb methylene chloride were detected from the laboratory blank, and the chloroform was found just above the detection limit of 5 ppb. Additional analysis identified 80 ppm petroleum hydrocarbon.

# 4.4.2 Geotechnical Investigations - Mill Street Sewer Tunnel

The analytical results from the bedrock ground water sample at the southeast corner of Commercial Street and Mill Street (MS102) identified four chlorinated volatile organic compounds. Samples were taken at 36 feet below the top of the well casing. Trans - 1, 2 - Dichloroethylene was detected in the highest concentration at 1.4 ppm in addition to 1, 1 - Dichloroethylene (0.0037 ppm), Trichloroethylene (0.26 ppm), and vinyl chloride (0.14 ppm). The only other target compound list chemical detected was 3 ppb bis (2-ethylhexyl) phthalate. Compounds characteristic of the Lower Falls seeps were not detected in groundwater samples. The analytical report for sampling from MS102 can be found in Appendix C.

#### 4.5 Discussion

Review of available boring logs, test pit logs, and documentation regarding subsurface conditions in the Brown's Race petition area suggest that although the area has received fill material in several locations, hazardous wastes representing a possible source of the seeps observed at the Lower Falls and beneath the river, do not appear to be present. The black tarry material of concern in the RG&E Station #5 and the Cliff Street tunnels and at the Lower Falls was not evident from any of the borings performed within the petition area. Such materials were, however, encountered and sampled during borings performed at the base of the gorge as part of the City Interpretive Center investigation. Materials coated with the black petroleum or tar-like substance were sampled from these borings. Significant volatile readings (130-203 ppm) were obtained from subsequent head space analysis of the samples (15).

Chemical analysis performed on the samples of fill material from Brown's Race and the one ground water well in the petition area indicate that a limited number contaminants are present, but that the concentrated black tarry material of particular concern is not The analysis of materials taken from RWB-1 suggests that contaminants are not migrating through the raceway as was earlier thought possible. The fill in Brown's Race contains a variety of materials including asphalt, cinders and ash which quite possibly represent the source material of the contaminants which were The results from RWB2a, RWB6, and RWB6a indicate that identified. small pockets of materials such as cinders, ash, asphalt, or waste oil containing contaminants probably are present. Given the significant use of the area for parking and the poor condition of the road surface, automotive oils and fluids would likely be present in the raceway fill also. The presence of these contaminants must be considered in any future site excavations, but does not warrant inclusion of the area in a NYS registry site.

The bedrock groundwater sample from MS102 yielded low levels of four chlorinated volatile organic compounds, but not benzene, toluene, xylene, or any of the PNAH's so consistently associated with river seeps (6, 10). Chlorinated volatile organic compounds have not been associated with the river seeps including the most recent sampling and analysis performed for the City of Rochester in the Spring, 1988 (5). The presence of these compounds in groundwater does, however, require some follow-up. Additional subsurface investigations planned by Monroe County Pure Waters Department will provide more information regarding conditions in the petition area, north to the Cliff Street area and south to the Front Street area. (12).

The possibility of Brown's Race containing a source of seep material and acting as a migration pathway has been explored through subsurface investigation and appears unlikely. In addition, the Monroe County Pure Waters investigations of the 1875 stone cut Mill

Street sewer suggest that the tunnel is in good condition below the petition area without evidence of the seep materials found in the Cliff Street Siphon Tunnel project.

Of the underground storage tanks identified within the petition area, the City of Rochester's 10,000 gallon tank at the rear of the Holly Pump Station at 232 Mill Street is the largest petroleum storage tank. In 1987, after confirmation of a fuel oil leak the tank was replaced. Representatives from the Monroe County Health Department, Region 8 office of the NYS-DEC, and City Fire Department on site during the removal observed that no significant oil contamination of the tank bed was present. No other incidents of leaking tanks in the petition area were found in Fire Department records, although two 1,000 gallon tanks were removed from the Kodak parking lot along Mill Street north of Platt Street in 1974. Also, two 1,000 gallon gasoline tanks located at the former New York Central Rail Road facility on Commercial Street were apparently emptied and closed by filing with water sometime in 1950's or 60's according to the City Fire Marshall's Office.

Brown's Raceway and some other locations in the petition area have been shown to contain fill material, but no seep-like materials were found. Asphalt, cinders, and ash are present.

Not without importance is the sheer distance, 4,400 feet, from the petition area to the nearest observed seep in the Cliff Street Siphon Tunnel. The vertical difference in elevation between the tunnel and ground surface at Brown's Race is substantial also. Seeps were encountered at 344 - 345 feet in the Cliff Street tunnel (7). The ground surface elevations in the petition area are greater than 480 feet. Based on available information, it seems unlikely there are quantities of waste materials within the petition area which were missed by twenty-nine borings and test pits, and which are contributing to chemical seeps at over 4,400 feet away and greater than 130 lower in elevation. (See figure la and Appendix G). This spatial perspective was not addressed in the Expanded Phase I report.

Significant effort has been expended by the City to identify past uses of parcels within the petition area. Although a variety of commercial and manufacturing concerns have occupied the area, coal gasification facilities and coal tar waste disposal activities were not located in the petition area. The absence of such facilities or activities in the petition area is noteworthy because they are thought to represent most probable source of the contaminant seeps (7, 10, 13).

The issues raised about the petition area in the Expanded Phase I report have now been addressed in greater detail. A more comprehensive and detailed look at the site and the many businesses and manufacturers which have been located in this

area has failed to turn up documentation or field conditions which suggest that any of these businesses left significant quantities of hazardous wastes, particularly the characteristic seep materials, on site.

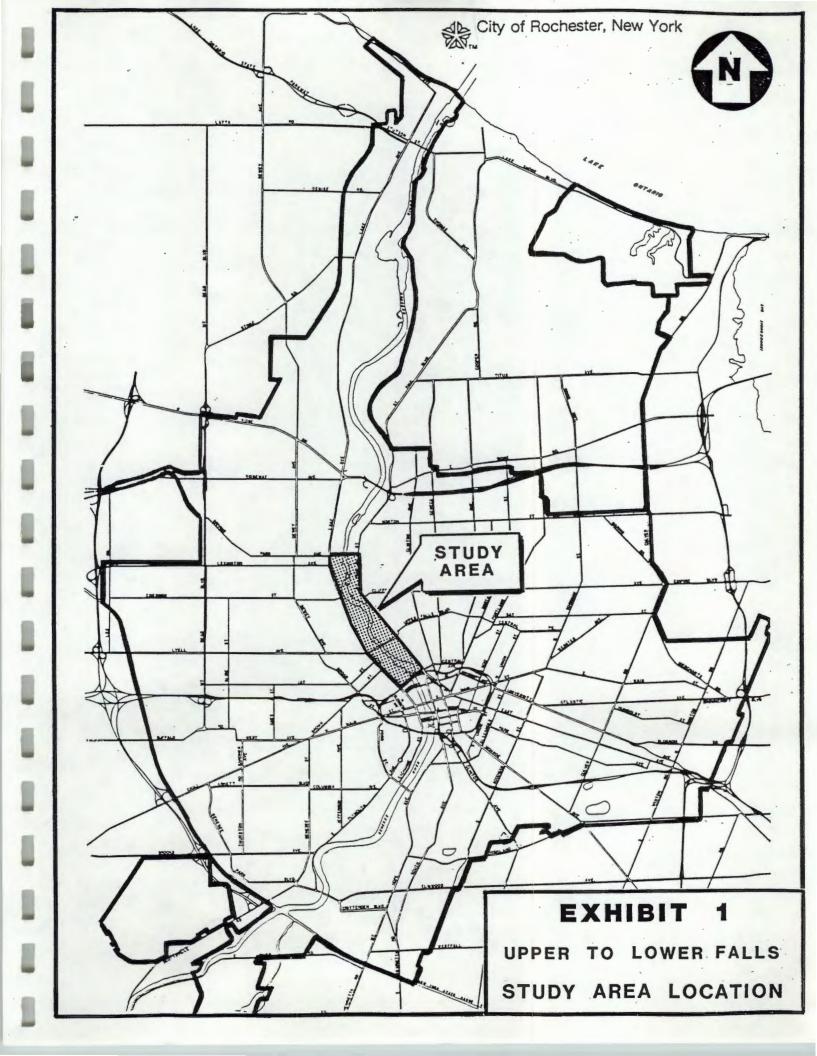
#### Section 5. Recommendations

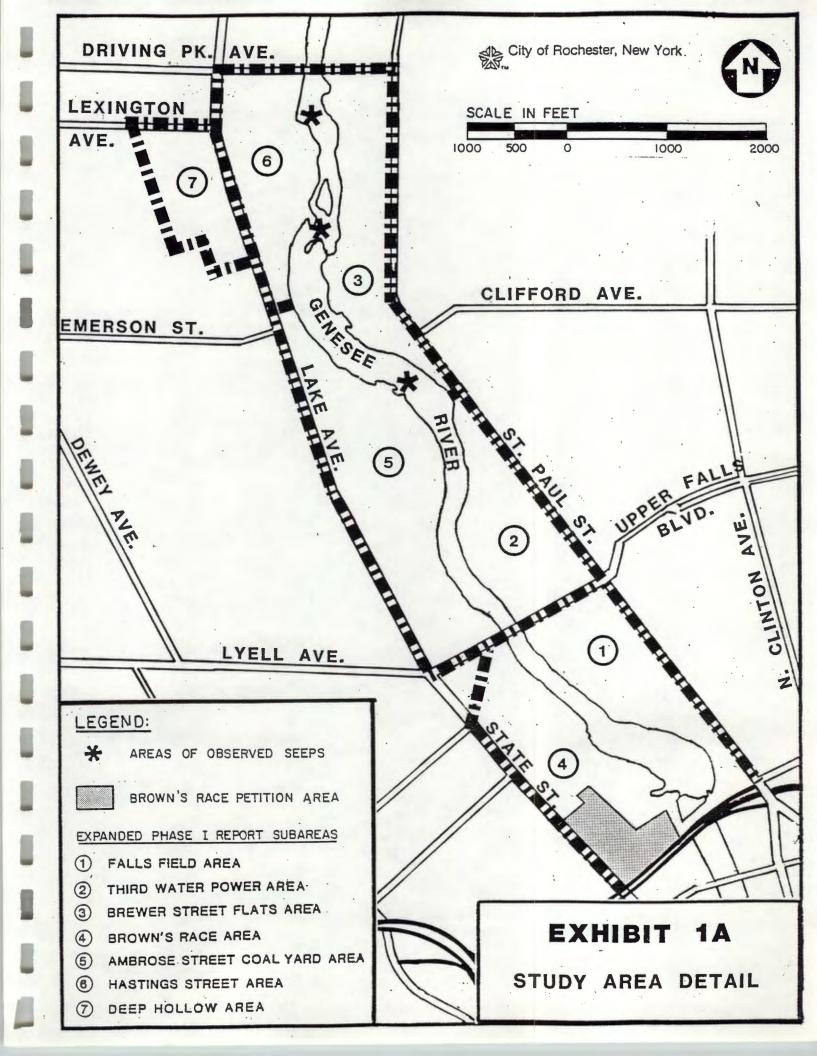
The City of Rochester has reviewed existing available information on subsurface conditions and analytical data from samples taken within the petition area. As a result, a better picture of the overburden and fill materials now exists. The following recommendations and proposals are submitted for consideration.

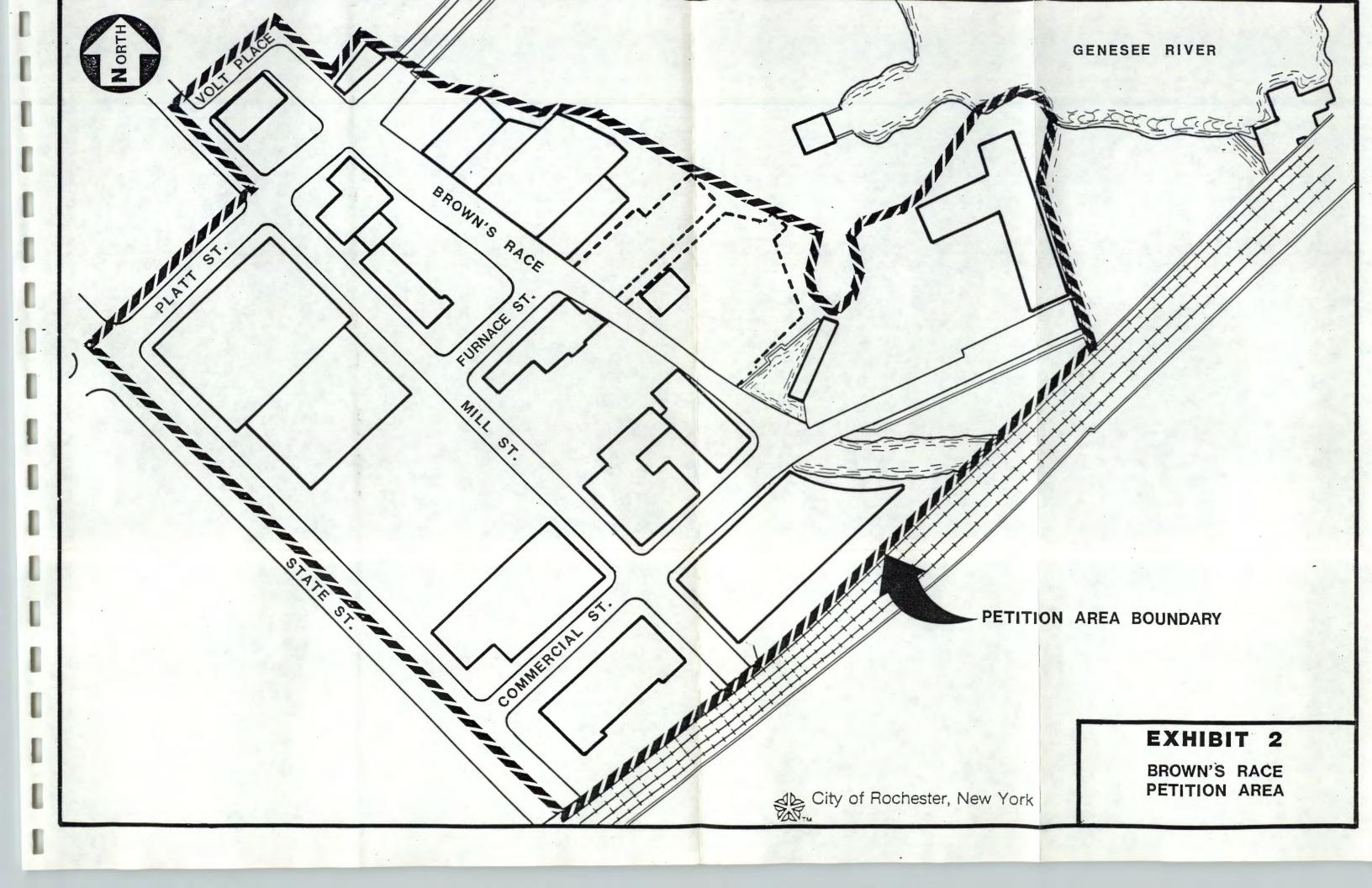
- The City recommends to the Department of Environmental Conservation that the petition area as defined in Exhibit 2 of this report be removed from the Lower to Upper Falls Study area based on interpretation of available data and the absence of any documentation of hazardous wastes or hazardous waste disposal activities. Specific parcels are identified on a tax map with a property owner listing in Appendix D.
- o The City proposes to continue to require test pit excavations, overburden borings or both to evaluate subsurface conditions prior to physical development activities within the petition area. Notification of any such activities will be provided to the NYS-DEC Region 8 Office and the Monroe County Health Department. The City will also share any new information it receives on petition area conditions or contaminants with the NYS-DEC and Monroe County Health Department.
- o Any complaints made regarding suspicious materials, odors, or possible site related illnesses will be reported to the Monroe County Health Department and the New York State Department of Environmental Conservation for investigation.
- o Should the City decide to reconstruct Brown's Race Street or perform other work involving excavations, an evaluation of any material to be excavated will be performed. Appropriate precautions will be taken during any borings and test pit excavations. The excavation and disposal plan will be shared with the Region 8 Office of the NYS-DEC and the Monroe County Health Department prior to the start of work. Sampling and analyses of suspicious materials, particularly in the vicinity of RWB-2A and RWB6, will be performed. The DEC will be consulted if unusual conditions are encountered which could complicate sampling. Contaminated fill material will be disposed of at a

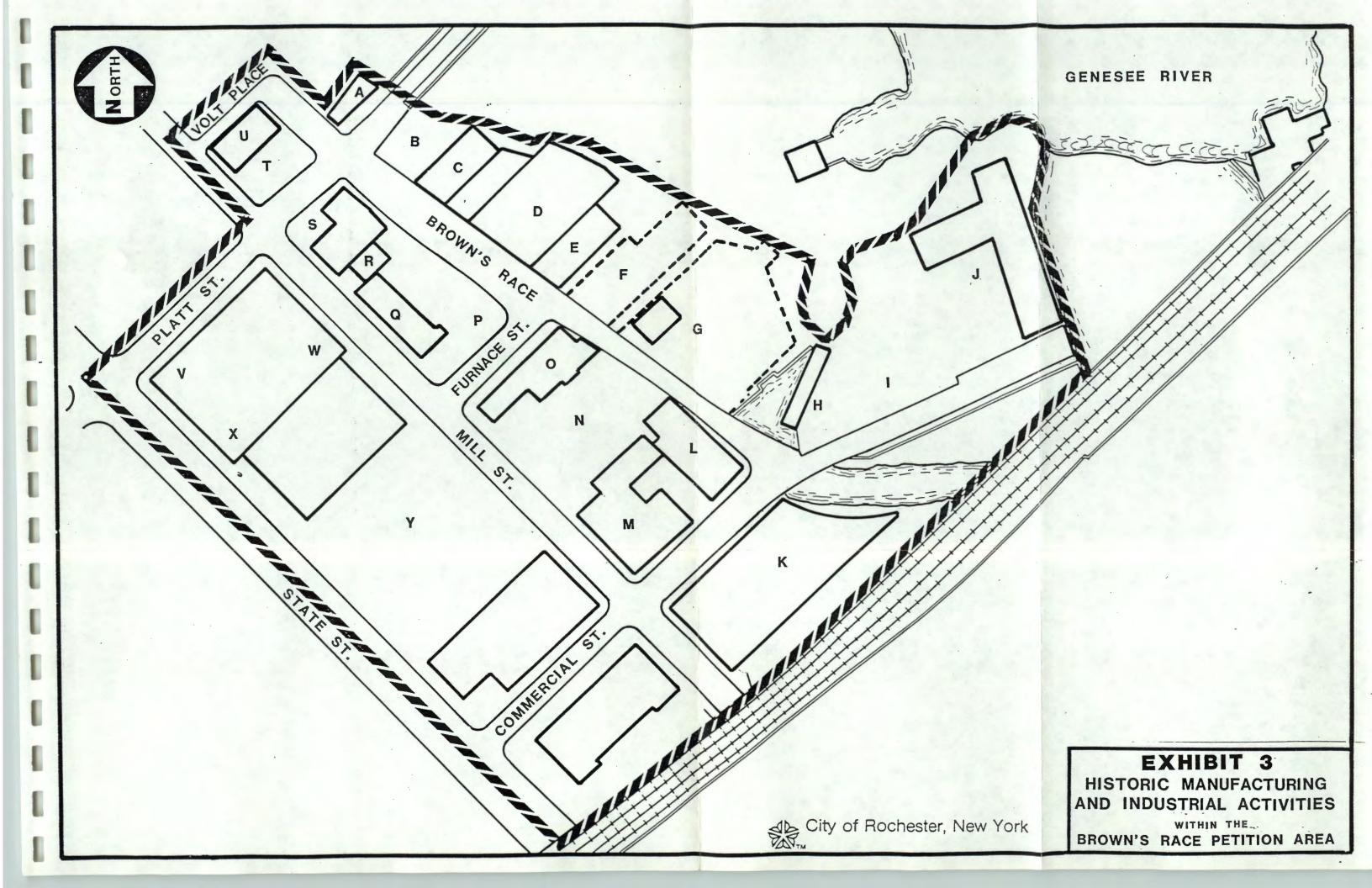
predetermined permitted landfill or in another manner as determined by the NYS-DEC to be appropriate. Hazardous wastes, if found, will be handled and disposed of in accordance with RCRA and 6NYCRR Part 370-372.

Exhibits









# Exhibit 3 Manufacturing and Industrial Activities in Brown's Race Petition Area

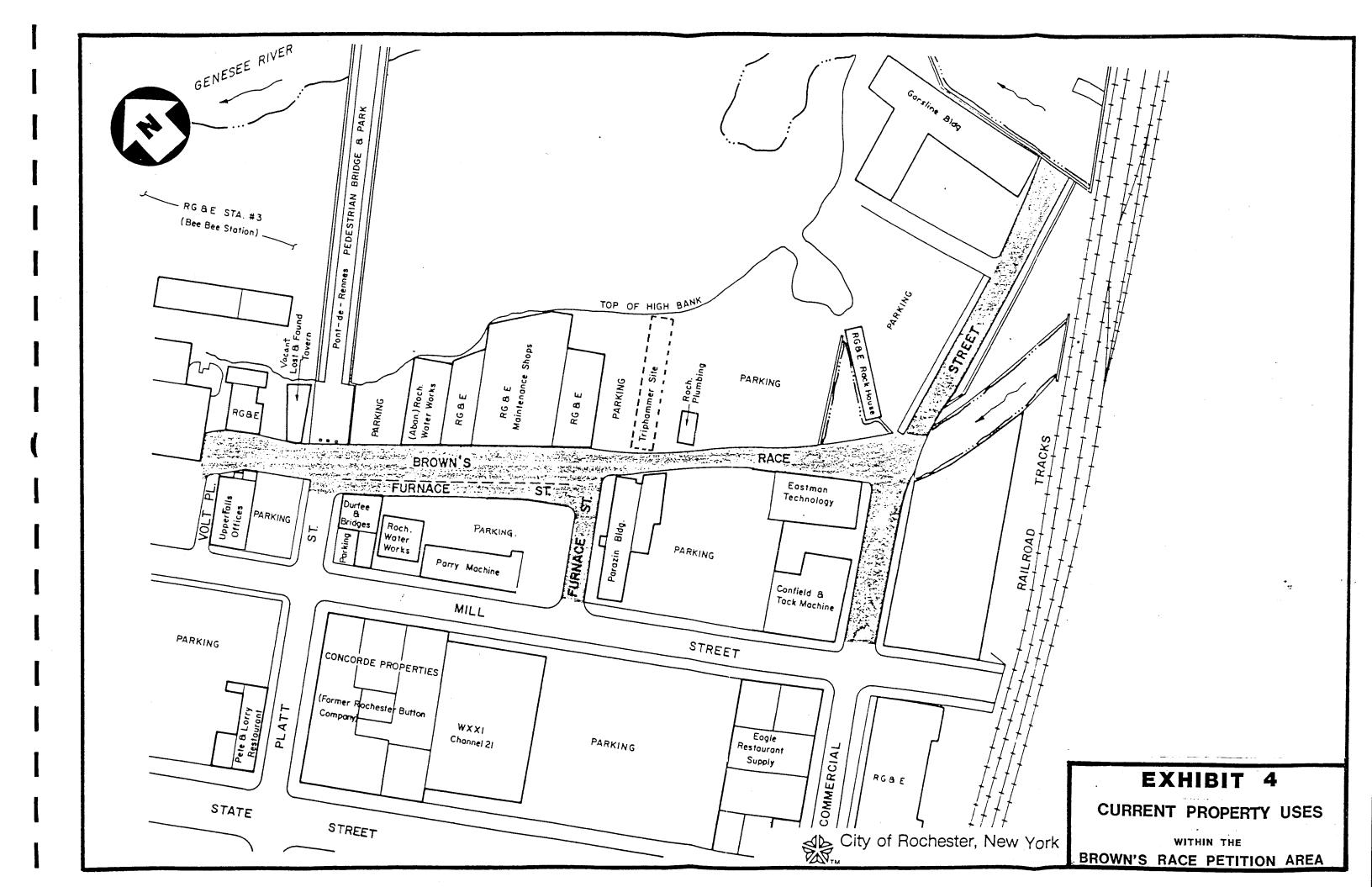
Refer to letters on Exhibit 3 Reference Map for locations. Earliest identified dates of occupation are provided. Available information indicates the following firms operated facilities or owned property at the indicated locations.

_	Location	Date	Company
	Α.	1818	Phoenix (Flour) Mill
•		1870	Michel's Machine Shop
-	В.	1838	Granite (flour) Mill
		1884	Machine Storage Shop
-		1924	Building Razed
	С.	1873	Rochester Water Works Building
	D.	1875	Ezra Jones Machine Shop and Foundry
•		1900	Jones Eagle Foundry
		1918	Willsea Works (metal fabrication)
-		1935	Rochester Gas and Electric Garage
_	Ε.	1851	Robinson Chair Factory
_		1858	Barton Edge Tool Manufacturing
		1900	R. T. French Spice Mills
		1918	Stoandt Mfg. Co.
_			
	F.	1826	Cobb Scythe and Tool Factory
		1832	Selye Fire Engine Factory
		1868	Judson Steam Governors
		1900	Judson Power Co.
		1955	Plastic Bag Factory

	<u>Location</u>	Date	Company
-	G.	1830	Kempshall & Bush Furnace
مىسىم. مىسىم		1850	Kidd Iron Works Machine Shop
•		1874	Gleason Machine Tool Mfg.
		1918	Rochester Heel Co.
		1957	Building Razed for Parking Lot
•	н.	1888	Rochester Cotton Mill
		1910	Rochester Railway & Light Co.
1000		1940	Building Razed for Parking Lot
-	I.	1910	Frankel Bros. Cotton & Woolen Mills
	J.	1850	Jones Sawmill
		1867	Ruckdeschel Furniture Factory,
			Stevens Box Co.
***		1880	Steam Gauge and Lantern Company
		1886	Williams & Hoyt Shoe Factory
-		1897	Folding Box Company
		@ 1955	Parsons Building Razed, Gorsline
			Building Remains
₩	К.	1875	New York Central Railroad Co.
		1900	Rochester Railway Co. Power House
-			(Trolley System)
		1918	New York State Railway Bus Garage
		1938	Rochester Transit Company
		1963	Caldwell Mfg. Company
	L.	1836	Kidd Foundry and Steam Engine
		1874	Gleason Machine Shop
-			Johnson & Co. Machine Sewn Shoes
		1918	W. B. Coon Co. Shoes
		1951	Caldwell Manufacturing Window Sash
			Balances
	м.	1900	Hunt Paper Box Manufacturing
سي		1940	Phillips Process Co., Inc. (carbon
-			paper & inks)

•••	Location	<u>Date</u>	Company
_	N.	1875	Judson Governors
-		1900	Judson Power Co.
		1957	Remaining Buildings Removed
•			for Parking Lot
-	0	1837	Selye Fire Engine Factory
		1844	Kelly Lantern Company
		1868	Judson Pin Works
		1910	Rochester Last, Die, and Pattern
			Works
-		1918	Gleason Plant - Machine Company
		1930	United Shoe Machine Company
		1977	Parazin (Office Equipment)
-	P.	1860	Rochester Barrel Machine
		1875	Barton Edge Tool Factory
***		1918	Willsea Works
_		1940	Sagamore Paper Box (fabrication)
•		1981	Building Razed for Parking Lot
	Q.	1888	Greenwood (Rochester) Barrel
•			Machinery Works
•	R.	1875	Rochester Water Works - Repair Shop
		1918	Hauser Machine and Mfg. Company
		1979	Rochester Water Bureau Holly Pump
	•		Station
-	s.	1889	Dan Sohn Machine Company
		1918	Hauser Machine Company
_		1980	Hauser Building Razed
	т.	1842	Leary's Old Responsible Dye House
		1900	Leary Dying and Dry Cleaning
-		1970's	Buildings Razed for Parking Lot

-	Location	Date	Company
	U.	1870	Barton Edge Tool Factory
-		1970	Rochester Button Company Woodworking
			Shop
-	V.	1875	Machine Shop
		1910	Rochester Button Company
	W.	1918	American Ribbon & Carbon Co.
_		1010	
***	х.	1910	Addison Lithography
	У.	1875	Hayden Furniture Mfg. Company
-		1926	National Brass Mfg. Company



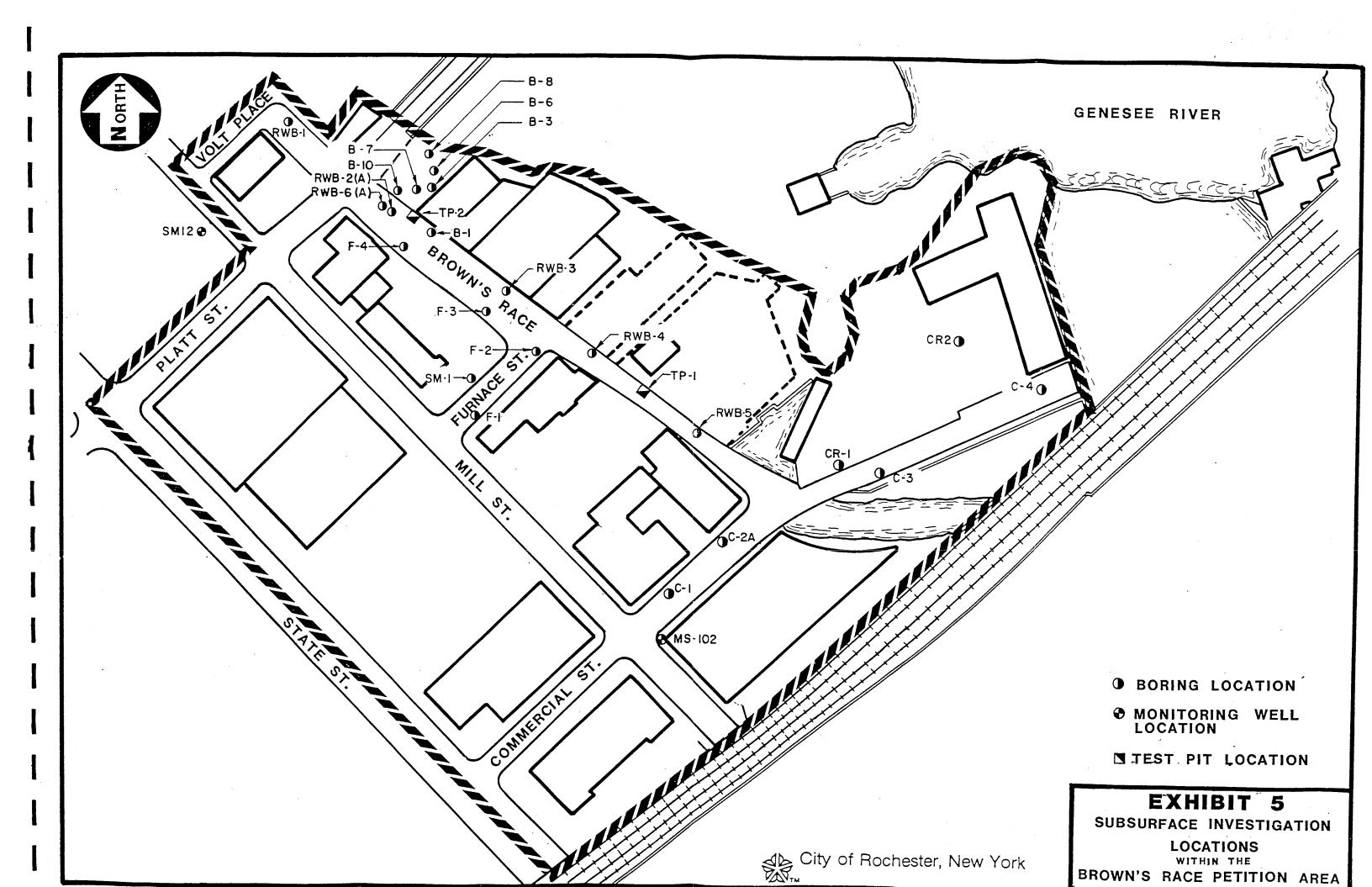


Exhibit 5

Brown's Race Petition Area - Overburden Summary

(Except where specifically noted bedrock encountered was Lockport Dolomite.)

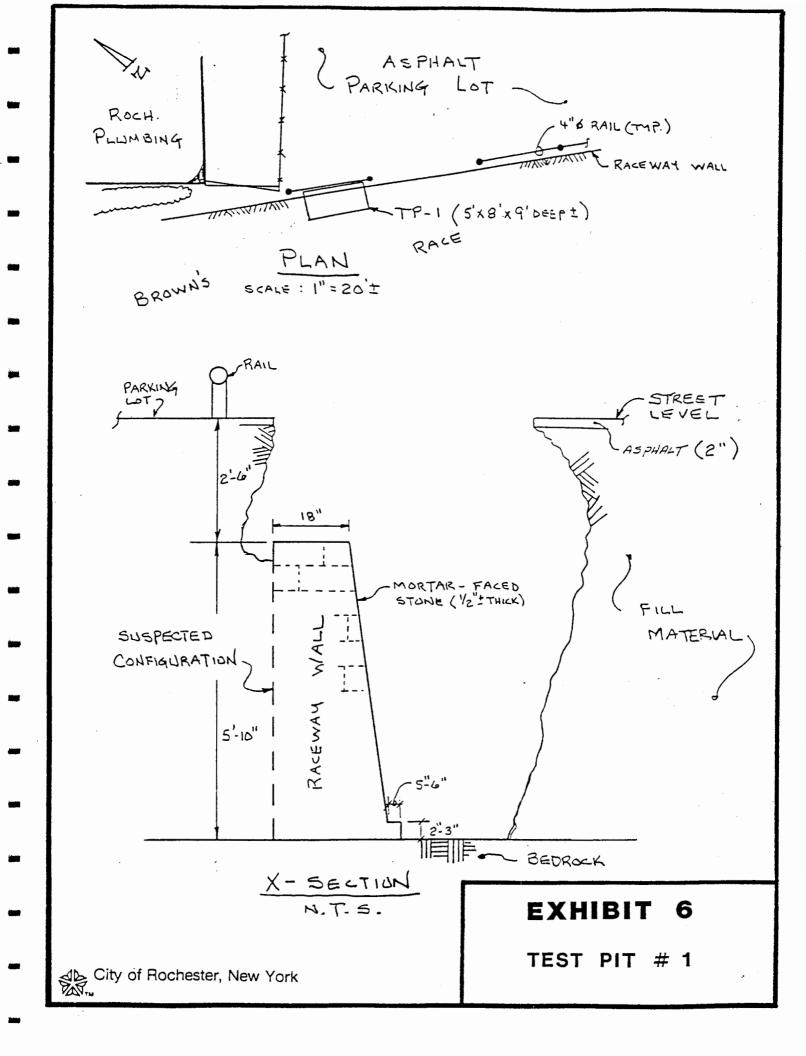
Project	Boring Location	Depth to Bedrock (ft.)	Summary Overburden Description
Geotechnical Investigations Mill Street Sewer Tunnel (GIMSST)	SM12	4.5	Compact sands, fine gravel, silt. Trace brick fragments and cinders
GIMSST	SMl	1.5	Sand and gravel
GIMSST	MS102	3.0	Gravel, sand, silt
Brown's Race Infrastructure Study (BRIS)	RWB-1	9.4	Sand, gravel, cinders asphalt (fill) saturated conditions at 8.5" silts and clays
BRIS	RWB-2		Asphalt, sand, silt, gravel red brick, cinders, (fill) Boring terminated at 4 ft. auger refusal
BRIS	RWB-2a	9.25	Asphalt, sand, gravel, cobbles red brick, cinders, ash, (fill) timber pieces (saturated conditions 8.5 ft.)
BRIS	RWB-3	7.8	Sand, gravel, silt, asphalt cinders, ash (saturated at 5 ft.)
BRIS	RWB-4	8.2	Sand, gravel, asphalt silt, cinders, flyash, (Saturated below 6 ft.)
BRIS	RWB-5	8.2	Sand, gravel, asphalt cinders, silt, wood fragments, flyash saturated at 4 ft.
BRIS	RWB-6(6a)	8.0	Asphalt, cinders, sand, gravel, silt, (slight petroleum like odor noted at 1.5 Ft.)

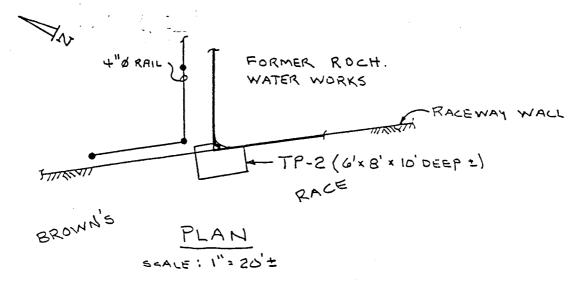
Table 2 Brown's Race Petition Area - Overburden Summary Page Two

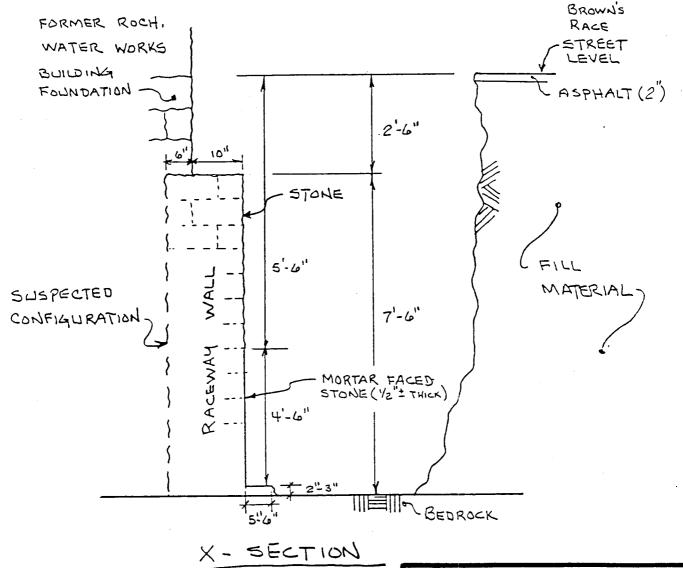
Project	Boring Location	Depth to Bedrock (ft.)	Summary Overburden Description
BRIS	TP-1	8.3	Asphalt, ash, cinders, siltstone, sandstone, cobbles, sand, brick, concrete, water seepage.
BRIS	TP-2	10.0	Asphalt, sand, silt, ash, cinders, silt, gravel, brick, cobbles, rubbish, shells, clay, trace petroleum odors.
BRIS	F-1	> 5.0	Concrete, gravel, silt, sand
BRIS	F-2	> 5.0	Concrete, silt, gravel, sand brick fragments
BRIS	F-3	> 5.0	Concrete, gray stone, sand silt, gravel, cobble fragments
BRIS	F-4	> 4.5	Sand, silt, cobble fragments, gravel
BRIS	C-1	> 5.0	Concrete, brick, gravel sand, silt, ash
BRIS	C-2		Concrete (utilities)
BRIS	C-2A	4.25	Concrete, brick, gravel silt, weathered rock
BRIS	C-3	> 5.0	Concrete, silt sand gravel, wood
BRIS	C-4	> 4.5	Concrete, gravel, silt, sand
BRIS	C-R-1	6.2	Concrete, sand, silt, gravel brick fragments, cobble weathered rock fragments
BRIS	CR-2	12.9	Gravel, silt, brick fragments, silt weathered rock fragments
Proposed Urban Cultural Park Interpretive Center (PUCPIC)	B-1	11.7	Asphalt, sand, cinders, concrete, silt sludge, organic odors (This boring apparently penetrated a concrete box culvert built in the 1930's to supply water to the City Water Works Building from RG&E's concrete flume. See Brown's Race Survey 1941)
PUCPIC	B-3	15.2	Gravel, sand, silt, brick fragments, rubble

Table 2 Brown's Race Petition Area - Overburden Summary Page Three

Project	Boring Location	Depth to Bedrock (ft.)	Summary Overburden Description
PUCPIC	B-6(6A)	28.1 (Rochester Shale)	Sand, gravel, silt, brick and mortar fragments, concrete, wood fragments, organic odors
PUCPIC	B-7(7A)	24.0 (Rochester Shale)	Gravel, sand, silt, brick, concrete and mortar fragments, wood shale fragments, organic odor
PUCPIC	B-8	20.2	Brick and concrete mortar fragments, sand, silt, trace slag, (volatiles detected at 0.1 to 0.2 ppm level at borehole when 15 feet reached)
PUCPIC	B-10	16.0	Asphalt, silt, sand, brick fragments, gravel, wood fragments, steel beam, concrete, dolomite boulders, organic odor







X - SECTION N.T.S.

**EXHIBIT** 7

TEST PIT # 2

City of Rochester, New York

Appendix A

References

## References

- 1) "An Analysis of Closed Dump Sites in Monroe County, Monograph #1 The Lower Falls of the Genesee River, Monroe County Landfill Review Committee, October 15, 1979.
- 2) "Architectural and Historical Survey of Properties in the Genesee River Corridor Area," Rochester, New York by the Landmark Society of Western, New York, Inc. 1984.
- "Brown's Race Historic District", Rochester, New York, State/National Register of Historical Places Nomination, October, 1988.
- 4) "Brown's Race Infrastructure Study" (draft) September, 1988 prepared by LaBella Associates for the City of Rochester Department of Environmental Services.
- 5) "Brown's Race" Self-Guided Walking Tours prepared by the City of Rochester.
- 6) "City of Rochester Lower Falls Sampling Report, August, 1988 prepared by Malcolm Pirnie, Inc. for the City of Rochester, NY.
- 7) City of Rochester Platt Book Series 1875 to 1935. Department of Environmental Services, Bureau of Engineering.
- 8) Dr. Joel Nitzkin, Chairman, Monroe County Landfill Review Committee Letter to Mr. Paul Schmied, Regional 8 Engineer, New York State Department of Environmental Conservation, September 8, 1987.
- 9) Edward Doherty, Commissioner, City of Rochester, Department of Environmental Services, Letter to Mr. Eric Seiffer, Regional Director, New York State Department of Environmental Conservation, October 8, 1987.
- 10) "Expanded Phase I Investigation Genesee River Gorge (Lower Falls) Site I.D. #828044," March, 1988, prepared by Recra Environmental, Inc. for the New York State Department of Environmental Conservation.
- 11) "Frankfort: Birthplace of Rochester's Industry," by Ruth Rosenberg Naparsteck, City Historian, in Rochester History, Vol L, No. 3, July, 1988.
- 12) "Interim Report Geotechnical Investigations Mill Street Sewer Tunnel Rochester, New York" May 1988, prepared by H&A of New York for STV/Seelye Stevenson Value & Knecht under contract to the Monroe County Department of Pure Waters.

- 13) "Preliminary Site Review NYS Superfund Site No. 828044, June, 1986, prepared by Morrison-Knudsen Engineers, Inc. for Rochester Gas and Electric Corporation.
- 14) Rochester Gas and Electric Corporation, General Construction Department. Plans for Brown's Race 6' x 6' Flume. August, 1935, May, 1941 and October, 1941.
- 15) "Subsurface Exploration and Geotechnical Evaluation for the Proposed Urban Cultural Park Interpretive Center 78 Brown's Race, Rochester, New York," October, 1988, prepared by Empire Soils Investigations, Inc. for the City of Rochester Bureau of Municipal Facilities.
- 16) "Supplemental Report to the Phase I Investigation of the Lower Falls Hazardous Waste Disposal Site, Rochester, Monroe County, New York NYS Registry No. 828044, June 1986, prepared by the City of Rochester, New York.

Appendix B

Boring and Test Pit Logs

SM 12 PAGE 3 OF 6 HOLE NO. CORE BORING REPORT HALEY & ALDRICH, INC. Fred Amos GEOLOGIST CAMBRIDGE, MASSACHUSETTS RECOVERY Graphic Strate Drill Core No. Scale RQD Change Rate Log FIELD CLASSIFICATION AND REMARKS Min. per Depth Weeth. Tests Feet % Foot Range Light to medium gray, fine-grained, thin to 35 medium-bedded Dolamite. Very thinly color-3.5 36.0 37.0 37.1 LOCKPORT DOLOMITE (Contact gradational) Light to dark gray, fine-grained dolomitic Mudstone, very thinly color-banded. Trace 4 R-5119 99 SL 40 pits, gypsum nodules and fossils. Secondary 99 119 gypsum seams in closely to very closely spaced partings. 4 ROCHESTER SHALE Severely weathered shaly partings at 38.9, 39.2, 39.6 and 40.2 ft. 4 45 4 46.0 3.5 3.5 3.5 3.5 Gypsum nodule, 0.1 ft. thick, at 50.2 ft. -50 35 99 SL 119 R-6 ROCHESTER SHALE 119 35 Smooth, moderately dipping joint at 51.4 ft. 3.5 3.5 3.5 55 3.5 56.0 3.5 3.5 3.5 3.5 60 ROCHESTER SHALE 3.5 R-7 122 SL 101 \*ROD based on core recovered. 122 100\* 3.5 3.5 3.5 3.5 65 Small gypsum nodule at 66.3 ft. 66.0 3.5 ROCHESTER SHALE 3.5 Light gray, thin to very thin, closely spaced Limestone beds from 66.7 to 133.7 ft. 35 3.5 BEDDING/JOINT SPACING RQD FIELD HARDNESS WEATHERING <2" Excellent >90% V. thin V. Close - Knife can't scratch Mod Severe 2" - 12" Fresh Good 90.75 Close Thin - scratches diff. V. slight Severe 75.50 Fair Medium Mod. Close Med. Hard - scratches easily V. Severe 36" - 120" 50.25 Poor Shuht Wide Thick - urooves < 25 >150. V. Poor Complete Moderate V. thick V. wide - Carves V. Solt

	MALE	· · ·	LDRICH	INC		, ,	CORE BORING REPORT				NO. SM 12	PAGE 4 OF 6
			ASSACH			U	UKE BU	KING K	EPUR	GEOL	ocist Fred	Amos
Scale	Drill Rate Min. per	Core No.	RECOV		Graphic Log	Strata Change		FIEL	LD CLASS	IFICATION	AND REMARKS	s
Feet	Foot	Depth Range	ın.	*	Weath.	Tests						
70	<i>3.5</i>											ic Mudstone,
	3.5											nodules and ely to very
	3.5	R-8	121 121	101 100*	SL		closely	spaced p	parting	s. Ligh	t gray thi	n to very
	3.5		121	100			ROCHESTE	CR SHALE	paceu I	imestone	beas.	•
_ 75 _	3.5 3.5	<b>76.</b> 0										
İ	3.5°						Severely	weather	red sha	ly parti	ngs at 70.	4, and 71.0
.	3.5						ft.				_	•
[	3.5											
- 80 -	3.5			!								
-	ì	R-9		99	SL !		ROCHESTE	R SHALE				
}	3.5		119	99								
}	3.5 3.5											
25	3.5											
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-	3.5					\ /						
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	3.5					PT4	ROCHESTE	R SHALE				
90	3.5				SEV	/ \ 92.0	Severely	weather	red <b>cl</b> a	y bed fro	om 88.9 to	89.2 ft.
	3.5°	R-10	124 120	103 97*	SL		Severely	weather	red sha	lv parti	ng at 92.6	ft.
	3.5						50.01017			-7		
	3.5											
95	3.5											
-	3.5 3.5	96.0					*DOD	od				
	3.5						*RQD bas	eu on co	TE IEC	overed.		
	3.5											
100	3.5											
_		R-11	119 119	99 99	SL		ROCHESTE	R SHALE				
	<i>3.5</i>											
-	3.5											
105	3.5										,	
FIE	LD HA					THERI			G/JOINT	SPACING	> 90%	QD Excellent
Hard Med. Hard	- 50	nife can't latches d ratches e	itt.	1	ight	Seve	- 1	Thin Ci	iose lose lod. Close	2" · 12" 12" · 36"	90-75 75-50	Good Fair
oft 7. <b>S</b> oft	— qr	ooves rves		Mod	erate	V. Se Com		Thick W V. thick V	ide , wide	>120"	50·25 <25	Poor V. Poor

	HALE	Y & AL	LDRICH, INC.			. C	ORE BOI	RING REPORT	GEOLO	GIST Fr	red Armos		
Scale in Feet	Drill Rate Min. per Foot	Core No. Depth	RECOV		Graphic Log Weath,	Strata Change Tests	FIELD CLASSIFICATION AND REMARKS						
105		Range					* : 3	2- )		- 3 - 3 - 3 - 4	1 - 14 - 7		
	3.5 3.5 3.5	106.0				107.3	very thi	o dark gray, fi inly color-band to very closel in to very thi	ded. Tra ly spaced	ce gypsum partings	n seams in 5. Light		
_110_	3.5 3.5 3.5 3.5	R-12	118 118	<u>98</u> 98	SL	PT3	ROCHESTE	ER SHALE					
_ 115	3.5 3.5 3.5 3.5	116.0				114.0 116.5							
_120_	3.5 3.5 3.5 3.5 3.5	R-13	118 117	<u>98</u> 98	SL	117.7	ROCHESTE Severely 121.0 ft	weathered sha	aly parti	ngs at 12	20.5 and		
_ 125_	1	126.0				124.0							
_130_	3.5 3.5 3.5 3.5 3.5 3.5	R-14	121 117	101 97*	SL		133.7 ft  ROCHESTE  Smooth,  130.0 an	R_SHALE low angle part nd 132.9 ft. S	ings with	i h gypsum	seams at		
.135		136.0				133.7	Light to medium gray, fine to medium-grained, thin to medium-bedded, fossiliferous Limestone, interbedded with dark gray, very thin, dolomitic Shale. Secondary gypsum seams in closely spaced partings.						
140	3.5 3.5 3.5 3.5 ELD HA	RDNES	SS		PT1	136.3 \	Severely weathered shaly partings at 134.7 and 135.7 ft. Severely weathered vertical joint from 136.4 to 137.5 ft. Thin, severely weathered Shale bed at 137.5 ft.						
Hard ed. Ha oft Soft	- sc - w	nite can'i ratches d ratches e looves lives	lif t	Siry	light	Seve V. S	I. Severe ire overe iplete	V. thin V. Close Thin Close Medium Mod. Close Thick Wide V. thick V. wide	<2" 12" - 12" 36" - 120" >120"	>90% 90.75 75.50 50.25 < 25	Excellent Good Fair Poor V. Poor		

HOLE NO. SM 12 PAGE 5 OF 6

HOLE NO. SM 12 PAGE 6 OF CORE BORING REPORT HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS Fred Amos GEOLOGIST RECOVERY Graphic Strata Drill Core Scale No. Rate RQD Log Change FIELD CLASSIFICATION AND REMARKS Min. per Depth Feet Tests Weeth. Foot Range Light to medium gray, fine to medium-grained, thin 140 35 140.5 to medium-bedded, fossiliferous Limestone, interbedded with dark gray, very thin, dolomitic Shale. Secondary gypsum seams in closely spaced partings. IRONDEQUOIT LIMESTONE 35 143.0 R-15 120 100 SL Severely weathered clayey shale partings at 139.6, 35 77 92 140.6, 140.8, 141.4, 143.1, 144.3 and 145.0 ft. 3.5 145\_ 3.5 146.0 Bottom of Boring at 146.0 ft. Observation well installed in completed borehole. - 150-WEATHERING BEDDING/JOINT SPACING RQD FIELD HARDNESS < 2.. >90% - Knile can't scratch V. thin V. Close Excellent Fresh Mod. Severe 36" - 120" > 120" Hard - scratches diff. Thin Close 90.75 Good V. slight Severe Med. Hard - scratches easily Medium Mod. Close 75-50 Fair Stight V. Severe 50·25 < 25 Soft -- 11 00 ves Thick Wide Poor Moderate Complete V Soft - carves V. thick V. wide V. Poor

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS  GROUND WATER MONITORING REPORT							
OW/PZ NUMBER	OW SN		NCD ELEVATION SUBTRAI	HEND 488.4 ft.	FILE NO. 374813 PAGE NO. 2 OF 2		
DATE	TIME	<del></del>	DEPTH OF WATER FROM surface	ELEVATION OF WATER	REMARKS	READ BY	
17 Mar. 1981	PM		64.3 ft.	424.1 ft.	Installation Complete	SP	
18 Mar. 1981	PM		70.2	418.2		SP	
15 Apr. 1981	PM		71.1	417.3		FS	
1 May 1981	PM		50.3	438.1		SP	
		0	48.4		Flush Test (Poured in 1 gal.)		
		1	48.7		"		
		2	49.0		"		
		5 min.	49.6	438.8	н		
26 June 1981	AM	101 days	52.0	436.4		MW	
20 July 1981	AM	125 days	51.7	436.7		FS	
5 Aug. 1981	AM	14]. days	52.1	436.3	0% gas reading	EPH	
21 Sept.1981	AM	188 days	52.0	436.4	0% gas reading	ERH	
21 Oct. 1981		218 days	52.4	436.0		SMV	
4 Nov. 1981	PM	232 days	51.0	437.4		ERH	
		0 min.	48.0	440.4	(Poured in 5 gal.)	ERH	
6 Nov. 1981	PM	234 days	52.1	436.3		SMV	
			~=51,9				
					11		

H&A FORM 59A

### COMBUSTIBLE GAS MEASUREMENT

PROJECT CSOAP, Phase II FILE NO. 374813 BORING NO. SM 12 INSPECTOR M. Tierney DRILLER J. Genovese ELAPSED BOTTOM METER DATE READING REMARKS OF HOLE TIME ( MIN) (FT) (%) 12 Mar.81 7.5 0 0 0 16.5 0 0 36.0 0\_ 0 56.0 0. 0 66.0 Ω. 13 Mar.81 12 hrs 66.0 0 Hole capped overnight 0 96.0 0 0 136.0 ٥ Hole capped over weekend 16 Mar.81 60 hrs 136.0 Δ 0 146.0 0 End of Boring 10 146.0 0

C/	HALEY & ALDRICH, INC.		WATER OBSERVATION	FILE NO.						
PRO	DJECT: CSOAP, PHASE	ECT: CSOAP, PHASE II								
LOC	ATION: Rochester, 1	IY		WELL NO.	OW SM 12					
CLI	ENT: L.S.T.			BORING NO.	SM 12					
CON	TRACTOR:Drill and	Test		LOCATION	Mill & Pla					
DRI	LLER: J. Genovese	INSPECTOR: _	S. Putney							
INST	TALLATION DATE17	March 1981		SHEET 1	OF2					
SUR	RVEY	1 11	ELEVATION OR STICKUP ABOV GROUND SURFACE OF <del>CASING</del> WAY BOX		0.0					
			ELEVATION OR STICKUP ABO	VE BELOW	0.2 ft					
GRC ELE	DUND EVATION 488.4 ft.	_	GROUND SURFACE OF RISER F		1.0 ft					
	Refer to test borin		TYPE OF SURFACE SEAL		Concret					
	log for description of soil and rock conditions.		Installed bentonite se rock with Common Fill in overburden.							
		=	TYPE OF CASING		Roadway					
SCALE)			INSIDE DIAMETER OF CASING		0.55 f					
2	OVERBURDEN THICKNESS (ft) 4.5		<del>ELEVATION</del> DEPTH OF BOTTO CASING	OM OF	0.85 f					
(NOT			NSIDE DIAMETER OF RISER P	IPE	1.25 i					
ONS			TYPE OF BACKFILL AROUND	RISER	None in					
TIO			DIAMETER OF BOREHOLE		3.0 in					
E SOIL CONDITIO			NOTE: All connection threaded or or other bon	rivet <b>e</b> d. ding <b>a</b> gen	No glue					
RIZI		1110011	TYPE OF POINT <del>OR MANUFAC</del>		Slotted					
SUMMARIZ			SCREEN GAUGE OR SIZE OF O	PENINGS	10 micr					
S		200	DIAMETER OF WELLPOINT		1.25					
	. •	100	TYPE OF BACKFILL AROUND	POINT	None					
		0.0	ELEVATION DEPTH OF BOTT		121.0 f					
	•	7777	ELEVATION DEPTH OF BOTTO							
			FIGURES REFER TO: EL	_DEPTH_X	]					
	0.85 ft. ][	140.8 ft.	+ 5.0 ft.		= 145.8 f					
LEN		OF RISER PIPE (L1 +		NT (L <sub>2</sub> )	PAY LE					

HALEY	_	DRICH, SEACHU		WA	WATER PRESSURE TEST						. SM 12	TEST NO.	1	
PROJECT:	C	SOAP,	Phas	e II						FILE NO. 374813				
CLIENT:	L	.S.T.								SHEET NO	). <u> </u>	of 1		
CONTRACT	TOR:			WATER		PRESS	IDE	SUR	~ E			t & Mill		
		PACI		METER		GAUG				ELEVATION: 487.3 ft.  DATE START: 16 Mar. 1981			1981	
TYPE		Pneum	atic	Digita	al	Dial		None		DATE FIN	ISH:	16 Mar.	1981	
MFG.		Dia.	Drill	Neptur	ne	Harv	ard					. Genove		
MODEL	NO.	_		Trident -			1/45				-			
M.G.P. = (0.566 to 1.0) x = ROCK TYPE: 2  COMPUTED MAX GAUGE PRESS: (MGP) 100 psi RECOVERY (% R Q D (%)							(%)	100		_ HOLESI	zε 3 in.			
DEPTHS: (A														
										143.0 ER (iž)1				
											5.7			
TO WATER TABLE 29.9 LENGTH OF TEST SECTION 6.7  HEIGHT OF WATER PRESSURE GAUGE ABOVE GROUND SURFACE 0.5														
TIME	ELA Ti	PSED ME AIN)	PACK PRESS (PSI	ER URE	GA PRE	NUGE SSURE PSI)	MI REA	ETER ADING ALS)	VC	LUME OF FLOW (ALS/MIN)		REMA	ARKS	
1300		) .	150		2	5	242	1.5						
		1					242	3.5						
		2					242	5.0						
		3					242	6.5	1	1.7				
									:	- 4				
1305	(				5	)	243	0.8						
		1					243	4.0						
		2					243	7.5				·		
		3					244	2.5						
		4					244	7.0						
		5					245	3.8						
	10						248	5.5	5	5.5				
1318		)			7	5	253	6.5						
		1					254	7.5						
		2					255	8.7						
		3					257	0.0			W-	Water came up in		
	1	4					258	32.2			Ca	sing at	75 psi.	
	+	5	·					3.5					leak around	
	1							4.5	12	2.8	pē	cker.		
	<del>                                     </del>		-	+										
	<del>                                     </del>		<del> </del>											

CAMBRID	e aldrich, Ge, massachi	JSETTS		R PRESS	SURE TE	:ST		SM 12 TEST NO. 2
PROJECT:	CSOAP		II					374813
CLIENT:_		l & Test					SHEET NO.	l of 1 Platt & Mill
CONTRACT	PAC	KER	WATER	PRESSUI	RE SUR	GE	LOCATION:	
	SYS	TEM	METER	GAUGE				T: 16 Mar. 1981
TYPE	Pneum	matic D	igital	Dial	None	e	1	H: 16 Mar. 1981
MFG.	Dia.	Drill N	eptune	Harvard	1 -		DRILLER: _	
MODEL	NO	.   т	rident	_	-		GEOLOGIST	
	.566 to 1.0) x -				ROCK TYPE	. RO	CHESTER S	HALE HOLESIZE 3 in.
COMPUTED	MAX GAUGE	PRESS: (MGP	85 ps	<u>i</u>	RECOVERY	(%) _	98 98	
COMPUTED	INTERNAL FF	RICTION:			RQD (%)_		90	
DEPTHS: (	All Distances Med	sured From G	round Surfac	e in Feet)				
TO TOP OF	ROCK4.	5		TO T	19 I OWED 84	CYER	124.0	
	M OF BORING _							
TO WATER	TABLE	29.9		LENG	TH OF TEST	SECTIO	N	/
HEIGHT OF	WATER PRESS	URE GAUGE	ABOVE GRO	OUND SURFA	CE		·····	
TIME	ELAPSED TIME	PACKEF PRESSUF	RE PRE	AUGE SSURE	METER READING		DLUME OF FLOW	REMARKS
	(MIN)	(PSI)	(	PSI)	(GALS)	(0	ALS/MIN)	
1345	0	150	20	) 2	2674.0			_
	1				4.2			
	2				4.3			
	3				4.3	0	.1	
1350	0		40	) 2	674.5			
	1				4.6			
	2				4.7			
	3				4.8	0	.1	7
	3				1.0	-		
1356	0		60	) 2	2676.0			Probable leak
	1				9.0			around packer at
	2				2682.8			_ 60 psi.
· · · · · · · · · · · · · · · · · · ·	3				2687.1			
<u> </u>					2692.2			-
	4			<del></del>			1 2	-
<del></del>	5				2697.5		1.3	_
1.405					2702.0			-
1405	0		7				<del></del>	-
	1				2710.0			Water came up in
	2				2717.8			casing at 75 psi.  Apparent leak aroun
	5				2741.8			packer.
	10		ì		2777.5		7.6	1

	Y & ALDRICH, DGE, MASSACHU		WATE	R PRES	SURE	TEST	HOLE NO. SA	HOLE NO. SM 12 TEST NO. 3			
PROJECT:	CSOAP	, Phas	e II				FILE NO.	FILE NO374813			
CLIENT:_	L.S.T	•						1 of 1			
CONTRAC		II & Te	WATER	PRESSU	IRE	SURGE		Platt & Mill 487.3 ft.			
		TEM	METER					16 March 1981			
TYPE	Pneum	matic	Digital	Dial		Nane		: 16 Mar. 1981			
MFG.	Dia.	Drill	Neptune	Harva	ard -			J. Genovese S. Putney			
MODEL	NO	. ]	Trident				GEOLOGIST:				
M.G.P (0	).566 to 1.0) x	2	75 %		ROCK	TYPE: ROC	HESTER SHA	ALE HOLE SIZE 3 in.			
COMPUTER	MAX GAUGE	PRESS: (MC RICTION:	3P)	2T		/ERY (%)	98				
						1777					
DEPTHS: (	All Distances Me	esured Fron	Ground Surfac	e in Feet)							
TO TOP OF	ROCK	4.5		TO 1	OP LOW	R PACKER	114.0				
	M OF BORING										
TO WATER TABLE LENGTH OF TEST SECTION 6.7  HEIGHT OF WATER PRESSURE GAUGE ABOVE GROUND SURFACE 3.0											
	ELAPSED	PACK		AUGE	METE		OLUME OF				
TIME	TIME (MIN)	PRESS (PSI		SSURE (PSI)	(GALS		FLOW BALS/MIN)	REMARKS			
1430	0	150	2	0	2783.0						
	1				2783.2	?					
	2				2783.2	2					
	3				2783.2	? (	0.1				
1434	0		4	0	2783.5	5					
	1				2783.8	3					
	2				2783.9						
	3				2784.0	) (	).2	•			
	<del>                                     </del>							1			
1439	0		6	0	2784.8	3					
1433	1			-	2784.8						
	2				2785.0			Probable leak around packer at 60 psi.			
	3				2785.			pactor de ou par.			
	5				2787.						
<del></del>					2797.0		2.4				
	10				2131.			-			
				_	2002 /						
1450	0			5	2802.0						
	1				2812.						
	2				2822.			Water came up in casing at 75 psi.			
	5				2849.0			Apparent leak around			
	10				2895.	5	9.4	packer.			

	& ALDRICH, GE, MASSACHI		WATE	R PRES	SURE TE	ST	HOLE NO. S	M 12 TEST NO. 4			
PROJECT:	CSOAP	, Phas	e II				FILE NO.	374813			
CLIENT:	L.S.T	•					SHEET NO	1 of 1			
CONTRACT	rom: Dril	KER TES	WATER	PRESSU	RE SUR	GE	7	Platt & Mill 487.3 ft.			
		TEM	METER	GAUGE			DATE START: 16 Mar. 81				
TYPE	Pneur	matic	Digital Dial		Na	ne	4	: 16 Mar. 1981			
MFG.	Dia.	Drill	Neptune	Harvar	đ ·			J. Genovese S. Putney			
MODEL	NO	-	Trident	_		-	-				
M.G.P. = (0.566 to 1.0) x = ROCK TYPE: ROCK TYPE: RECOVERY (%) COMPUTED INTERNAL FRICTION: RQ D (%)							103	HALE HOLE SIZE 3 in.			
			n Ground Surfec		OP LOWER PA	CKER	92.0				
							ER ( <del>2</del> )85				
							N6.				
TIME	ELAPSED TIME (MIN)	PACK PRESS (PSI)	URE PRE	AUGE SSURE (PSI)	METER READING (GALS)		DLUME OF FLOW (ALS/MIN)	REMARKS			
1515	0	150	1	5	2901.0						
	1				2901.2						
	2				2901.3						
	3				2901.5	(	).2				
	1 3										
1520	0		3	0	2901.9						
	1				2902.0						
	2				2902.1						
	3				2902.2	(	).1				
1524	0		4	5	2902.2						
	1				2902.3						
	2				2902.3		10				
	5				2902.5						
	10				2902.8		0.1				
	10										
					i						
,											

HALE	A ALDRICH,	INC.	14/4-		CURE TE	·cT	HOLE NO. ~	12 TEST NO.	5
	GE, MASSACH			K PKES	SURE TE	:51			5
PROJECT:	CSOAP	, Phas	e II	-			FILE NO.	374813	
CLIENT:	L.S.T	ים אוו					SHEET NO.	l of l Platt & Mil	<del></del>
CONTRAC	PAC	KER	WATER	PRESSU	RE SUR	GE		487.3 ft.	L
		TEM	METER	GAUGE	CHAM	BER	DATE START	J.6 Mar.198	
TYPE	Pneur	matic I	Digital	Dial	Non	e		16 Mar. 198	
MFG.	Dia.	Drill N	Veptune	Harvar	<u>d</u> _		_	J. Genovese S. Putney	
MODEL	NO	- J	Trident	_	_		GEOLOGIST:		
	).566 to 1.0) x		20					MITE HOLE SIZ	<b>E</b> 3 in.
	MAX GAUGE			(%) _					
DEPTHS: (A	All Distances Me	esured From	Ground Surfac	e in Feet)	<del></del>				
TO TOP OF	поск4.	.5		TO T	OP LOWER PA	CKER	37.0		
	M OF BORING			<del></del>					
TO WATER	TABLE	29.9		LENG	TH OF TEST	SECTIO	N6.7		
HEIGHT OF	WATER PRESS	URE GAUG	GE ABOVE GRO	OUND SURFA	ACE3.0				
TIME	ELAPSED TIME (MIN)	PACK PRESSI (PSI)	URE PRE	AUGE SSURE PSI)	METER READING (GALS)		DLUME OF FLOW (ALS/MIN)	REMA	RKS
1345	0	150	2	0 :	2908.5				· · · · · · · · · · · · · · · · · · ·
	1				2911.5				
	2				2914.5				
	5				2923.2				
					2938.4		3.0		
	10				2930.4				

HALEY & ALDRICH, INC.
CAMBRIDGE, MASSACHUSETTS MILL STREET SEWER SEELYE STEVENSON VALUE & KNECHT ROCHESTER DRILLING CO., INC. PROJECT CLIENT CONTRACTOR CASING DRIVE CORE ITEM

# TEST BORING REPORT

BORING NO. MS102

FILE NO. 7602 SHEET NO. 1 OF 3

LOCATION See Plan

RIG TYPE BIT TYPE	None used Advanced augers to 3.0 ft., Nx core barrel to	DATUM START FINISH	489.5 ft. NCD 12 Feb. 1988 16 Feb. 1988 S. Locanty N. Reigle
RIG TYPE	Mobile 50, truck-mounted		
DRILL MUD	None used	START	12 Feb. 1988
OTHER	ft., Nx core barrel to	DRILLER	S. Locanty
	53.7 ft.	HEA REP	N. Reigle

	łTEM .		CASING	SAMPLER	BARREL	
	METER (IN) HIGHT (LB) LL (IN)		Auger 6-1/4 -	S 1-3/8 140 30	Nx 2-1/8	BIT TYPE Roller bit DRILL MUD None used OTHER Advanced augers to 3.0 ft., Nx core barrel to 53.7 ft.  DATUM NCD START 12 Feb. 1988 FINISH 16 Feb. 1988 DRILLER S. Locanty H&A REP N. Reigle
DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
_		49 15 11 13	S1A S1B 10"/15"	0.6- 1.3 1.3- 2.6	0.6 1.3 3.0	-ASPHALT- Very dense brown coarse to fine sandy GRAVEL, moist.  -FILL- Medium dense reddish-brown, medium to fine SAND, little gravel, trace coarse sand, trace silt, moist.  -FILL- Auger refusal at 3.0 ft.  Top of Rock at 3.0 ft.
5 -						Advanced roller bit to 3.7 ft.  See Core Boring Report.
10 -						
15 -						
20 -						
25 -						
30 -	WATE	R LEVEL (	DATA			SAMPLE IDENTIFICATION SUMMARY
DATE		ELAPSED		PTH (FT) TO	):	O OPEN END ROD
DATE	TIME	TIME (HR)	BOTTOM	воттом	WATER	T THIN WALL TUBE OVERBURDEN (LIN FT) 5.0 U UNDISTURBED SAMPLE ROCK CORED (LIN FT) 50.0

	WATER LEVEL DATA						PLE IDENTIFICATION	SUMMARY		
DATE	TIME	TIME ELAPSED	DEPTH (FT) TO:			0	OPEN END ROD THIN WALL TUBE	OVERBURDEN (LIN FT) 3.0		
	TIME (HR) BOTT		BOTTOM OF CASING	BOTTOM OF HOLE	WATER	ų		ROCK CORED (LIN FT) 50.0 SAMPLES 15, 6R		
See Obse	rvation	Well Rep	ort			Ř	ROCK CORE RUN			
								BORING NO. MS102		

PROJEC CLIENT	MBRIDGE T:	CSO/	T	ns hase	II	EST BOR	ING F	REPO	RT	HOLE NO FILE NO SHEET NO	1 of 6	
CONTR	ACTOR:		D	rill &	Test					LOCATION:	Furnace	& Mil
GROUND	WATER			рерти то	:		CASING	SAMPLER	CORE	ELEVATION:	486.4 ft. 11 Feb.	1001
DATE	Tim	•	WATER	BOTTOM OF CASING	HOLE	TYPE		SS	NX		19 Feb.	
	+	#				MAMMER WT ID		1 <u>-3/8</u> 140	2-1/8		Bill Scu	
						HAMMER FALLIN	24	30			E. Hanna	
	STRATA	CASING BLOW PER FOOT	S BLOWS	SAMPLE	SAMPLE DEPTH RANGE		FIELD (	LASSIFI	CATION	AND REMA	RKS	
-	0.4		-	7	1.0	Loose bro	Cor Two coar	crete :	nedium S	SANDF	IIL-	
-	1.5		1007	.5 S-I	1.5	Very com	act sil	ty fine	SAND, t		rse to fu	ne gra
1	ŀ			⇉	1 1		TOP OF	ROCK A	AT 1.5 f	Et.		
				Ⅎ	1 1							
			+	-								
- 5-	ļ			7								
				-					,			
			-	7								
				#								
10-	-		-	-								
				7								
				-								
	1			7								
	ŀ											
15	-			-								
	1			7								
				-						•		
	Ī			7								
	-			<b>_</b>								
20-	-			1								
	-			-								
				1								
				_								
				-								
				7								
25	-			1								
	-			_								
	-			-								
				1								
BLOWS	FT.	D	ENSITY	BLO	WS FT.	CONSISTENCY	SAI	PLE IDENT	IFICATION		SUMMARY	
0-4			LOOSE		-2	VERY SOFT	· -	SPLIT S		OVERBU	1.5	
4-18 18-70			OSE IM COMPAC	1	. 4 . 8	SOFT MFDIUM STIFF	; =		ALL TUBE URBED PISTOR	SAMPLES		
30-50		COL	PACT		-15	STIFF	• -	OPEN E	HO 800		SM I	
50 •		ASMA	COMPACT	1 15.	- 30	VERY STIFF		- VASH SA	MPLE	HOLEN	D	

	HALEY & ALDRICH, INC.						CURE BURING REPORT					PAGE 2 OF 6
Scale in Feet	Drill Rate Min. per Foot	Core No. Depth Range		VERY QD	Graphic Log Weath.	Strata Change Tests		FIELD	D CLASSI	FICATION A	AND REMARK	s
- 5-	/0 /0 8 8	2.0 R-1	_58 _49	<u>97</u> 82	SL		Ligh thin foss	to mediu	.um gra m—bedd	y, fine	to medium ite, trace	-grained, e pits and
-10 -	9 9 9 8 7	7.0 R-2 11.5	<u>55</u> 48	102 87*	SL		from Very weat para Medi 12.2	2.0 to 2 closely hered joi llel. um gray c to 32.0	2.3 ft. spaced nts fr clolor ft.	l low ang com 2.3 to banded, y	d vertical le modera o 11.4 ft with mott	tely ,, not ling fram
-15 <del>-</del>	7 8 8 6 6 7	R-3	113 103	<u>94</u> 86	SL		High LOCK Secon close Gyps Very	angle jo PORT DOLO  Indary gyp ely space Im-lined  thin, ve	MITE sum sea d part vug at	ams in cings from 15.7 ft	losely to m 13.3 to ced argili	very 32.0 ft.
-25 <b>-</b>	6 6 8 6 7 6 5	21.5	<u>117</u> 60	<u>98</u> 50	SL		* RQD based on core recovered.  Small gypsum nodule at 24.6 ft.  LOCKPORT DOLOMITE  Very thin, argillaceous partings at 18.9, 22.1 and 23.3 ft.  Small gypsum nodule at 24.6 ft.					18.9,
V. Hard Hard	FIELD HARDNESS  V. Hard — Knife can't scratch Hard — scratches diff. Med. Hard — scratches easily Soft — grooves  WE  Fresh V. slight Slight					Seve V. S	Light Mudst ROCHI Vert: NG	cone, ver ESTER SHAI ical join BEDDING	gray, y thin LE t line i/JOINT Close obse de Close	fine-gra ly color d with gy	ypsum seam	emitic Frace pits and fossils.  Is at 33.4 ft.  RQD  Excellent Good Fair Poor V. Poor

# HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS

# **CORE BORING REPORT**

HOLE NO. SM 1 PAGE 3 OF 6

GEOLOGIST

Fred Amos

Scale	Drill Rate	Core No.	RECOV		Graphic Log	Strata Change					
in Fest	Min, per Foot	Depth Range	in.	%	Weath.	Tests		FIELD CLAS	SIFICATION A	ND REMARKS	•
35	7						ROCT	ESTER SHALE			
-40 -	7 7 7 5 5	R-5	113 74	94 62	SL		Ligh Muds pits Seco clos Vert	at to dark gray stone, very the s and fossils. ondary gypsum s sely spaced par- cical joint from thin shaly pare	inly color seams in or rtings from 36.2 to	closely to m 32.0 to m 38.2 ft.	Trace very 135.4 ft.
<del>-</del> 45 -	6 7 7 7 7	R-6	120 69	100 58	SL		46.6 ROCE Vert	and 47.9 ft.  MESTER SHALE  MICCOLOR STATE  TO	_		-
-50 -	7 5 5 6 5	51.5					Vom	y thin light g	ray alogo	alv spaced	
- 55 -	45 45 45 35 4	R-7	118 105	100 89	SL		Lime	estone beds fro			
- 60 -	6.5	61.3					Vert	cical joint fro	om 59.9 to	o 60.2 ft.	
- 65-	3.5 4 3.5 4 3.5 3	R-8	118 109	100 92	SL		ROCE	sum nodule, 0.	e, modera	tely dippi	ng
70	3.5										
	ELD HA	RDNES	SS		WEA	THERI	NG	BEDDING/JOINT	SPACING	R	QD
V. Hard Hard	V. Hard — Knife can't scratch Hard — scratches diff. Med. Hard — scratches easily Soft — urooves  Moderate  V. thin V. Close < 2" > 90% Excellent Thin Close 2"-12" 90-75 Good Medium Mod. Close 12"-36" 75-50 Fair Thick Wide 36"-120" 50-25 Poor			Good Fair Poor							

-		HALE'	Y & AI	LDRICH ASSACH	, INC.		C	CORE BORING REPORT  HOLE NO. SM 1 PAGE 4 OF GEOLOGIST Fred Amos				PAGE 4 OF 6	
-)	Scale in Feet	Drill Rate Min. per Foot	Core No. Depth Range	RECOV RC		Graphic Log Weath.	Strata Change Tests		FIELD	CLASSIF	ICATION A	AND REMARI	κs
	70	4	71.1		en 1,125			ROCH	ESTER S	HALE			
-	- 75-	3.5 3 3.5 3						Mudst fossi Secon	to dark one, very ls. dary gyps ly spaced	thinl sum sea	y color ms on c	banded.	Trace
-		3 3 3	R-9	100 85	83 85*	SL		Low a	STER SHAL	nt at 7			
	- 80	3.5 4						* RQD b	cal crack ased on c	ore re	covered	; same ro	
ù.		4.5	81.2 R-10	<u>53</u> 32	<u>156</u>	SL			9 was re STER SHAL		d in R-	10.	
		4,5	84.0		61*			Gypsu	m nodule,	0.2 f	t. wide	, at 79.3	ft.
· <b>-</b>	- 85-	4.5 5						(NOTE	: Core b		blocked e gripp		ft.
_		6.5 4	R-11	<u>93</u> 85	99 90	SL		weath	al very of ered part 0.3 to 81	ings f	ram 79.		
-	90-	5 5							STER SHAL		<b>.</b>	96.0.90	0 0
		4.5	91.8					95.7	thin shal ft.	e part	ings at	80.0, 89	.o and
		4						(NOTE	: No wat	er ret	urn fra	m 92.0 to	94.5 ft.)
	- 95 -	3 3 2						ROCHE	STER SHAL	E			
-	100	3	R-12	116 113	97 95	SL		Gypsum nodule, 0.1 ft. wide at 98.6 ft. Very thin Shale parting at 99.3 ft. Low angle joint with gypsum seam, and argillaceous parting from 102.3 to 102.4 ft.					d
-	-100-	4	101.7										
_	105	4 3.5 3.5						ROCHESTER SHALE					
	_	ELD HA	ARDNE	SS		WEA	THERING BEDDING/JOINT SPACING RQD					RQD	
-	V. Hard — Knife can't scratch  Hard — scratches diff.  Med. Hard — scratches diff.  Med. Hard — scratches diff.  Med. Hard — scratches diff.  V. stight Severe  V. Severe  Thin Close 2" · 12" 90-75 Good  Medium Mod. Close 12" · 36" 75-50 Fair  V. Severe  V. Severe  Thick Wide 36" · 120" 50-25 Poor					Fair							

Scale	Drill	Core		VERY	Graphic			-		20200	st Fre	d Anos
in Feet	Rate Min. per Foot	No. Depth Range	in.	QD   %	Log Weeth.	Change		FIELD CLA	ASSIFICATI	ION AND	REMAR	KS
105	4						RO	CHESTER SHALE				
-110-	3.5 3.5 4 3.5 3.5	R-13	116	103 95*	SL		Muc Tra Sec	ght to dark g dstone, very ace fossils. condary gypsu osely spaced	thinly m seams	color in cl	banded	•
-115	4											
	<u>5</u>	R-14	121 121	102 100*	SL		ROC	HESTER SHALE				
-120-	5 4 3.5	121.5					Ver	ry small gyps	um nodu	le at	118.7	ft.
125	3.5° 3						* ROI	) based on co	re reco	vered.		
	2.5 2 3		120	100				reasingly for 135.3 ft.	ssilife	rous f	ram 124	4.0 ft.
130	3.5 2.5 2	R-15	120	100	SL		ROC	HESTER SHALE				
	2 4	131.5					ROC	HESTER SHALE				
135	3 3 4.5	R-16	121 121	100 100*	SL	.35.3	thi Int Sha 137	th to medium in to medium in to medium in the medium in th	pedded, n very t in Shale	fossi thin,	lifero dark gr	us Limest ray dolom
140 FII	Y   ELD HA	RDNES	ss L		WEA	THERI		BEDDING/JOH		NG		RQD
/. Hard lard led. Har oft /. Soft	- sc rd - sc	nife can'i ratches d ratches ± ooves	uff,	Sligh	light	Mod. Saver V. Sa Com	evere	V. thin V. Close Thin Close Medium Mod. Clo Thick Wide V. thick V. wide	< 2" 2" · 12'	> 6" 75	90% 0-75 5-50 0-25	Excellent Good Fair Poor V. Poor

HOLE NO. SM 1 PAGE 6 OF 6 **CORE BORING REPORT** HALEY & ALDRICH, INC. Fred Amos GEOLOGIST CAMBRIDGE, MASSACHUSETTS RECOVERY Graphic Strata Drill Core No. Scale Rate RQD Log Change FIELD CLASSIFICATION AND REMARKS Min. per Depth Range Weath. Tests Feet Foot 140 R-16 SL IRONDEQUOIT LIMESTONE 141.5 Bottom of boring at 141.5 ft. Hole grouted to surface. -145-BEDDING/JOINT SPACING RQD WEATHERING FIELD HARDNESS >90% Excellent < 2" V. Close V. thin - Knife can't scratch v. Hard Mod. Severe 2" - 12" 12" - 36" 36" - 120" Fresh 90-75 Good Close Tiun - scratches diff. Hard V. slight Severe Mod. Close 75-50 FAIR Medium - scratches easily Med. Hard Poor V. Severe 50-25 < 25 Slight Wide Thick - grooves

Complete

Moderate

V. thick V. wide

>120"

V. Poor

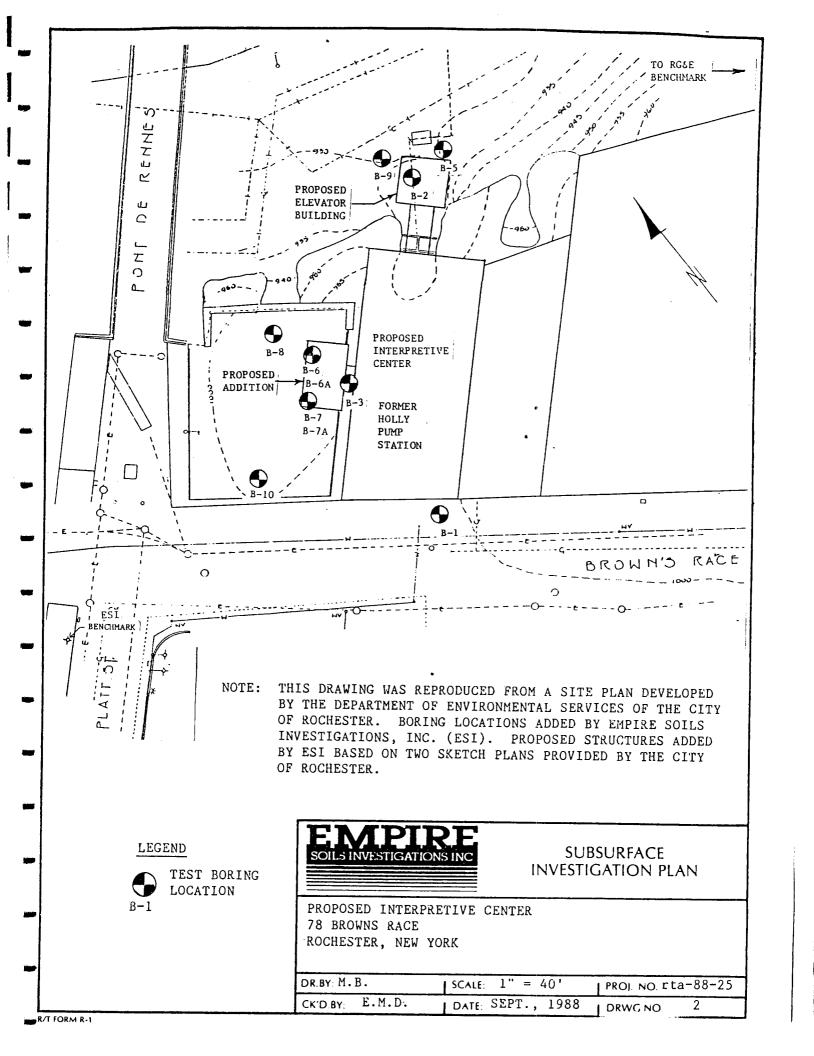
Soft

v. Soft

— carves

HALEY & ALDRICH, INC. HOLE NO. **TEST BORING REPORT** SM 12 CAMBRIDGE, MASSACHUSETTS 374813 CSOAP, Phase II FILE NO. PROJECT:\_ SHEET NO. 1 of 6 L.S.T. CLIENT:\_ LOCATION Mill St. & Platt CONTRACTOR Drill & Test 487.3 ft. 488. CORE GROUNDWATER CASING SAMPLER DEPTH TO DATE START 12 Mar. 1981 BARREL BOTTOM OF BOTTOM OF NX S/S DATE FINISH 13 Mar. 1981 TYPE WATER MANUER UT ] \_3/8 2-1/8 J. Genovese lb M. Tiemey HAMMER FALLIN INSPECTOR". SAMPLER BLOWS PER SCALE SAMPLE DEPTH FIELD CLASSIFICATION AND REMARKS NUMBER FEET RANGE & INCHE Blacktop 0.0 - 0.3 -0.3**-**1.0 Medium compact brown coarse to fine SAND, some silt, trace GERED fine gravel, trace brick fragments and cinders. S-1 3.0 Very compact brown medium to fine SAND, some fine gravel, 4.0 4.5 trace silt. 100 50/.0 5-2 4 5 5 TOP OF ROOK AT 4.5 ft. SAMPLE IDENTIFICATION SUMMARY BLOWS FT CONSISTENCT BLOWS FT. DENSITY SPLIT SPOON OVERBURDEN VERY SOFT VERY LOOSE 0-3 THIN WALL TUBE ROCK\_ LOOSE 2 - 4 SOFT 4-10 SAMPLES - UNDISTURBED PISTON 4 - 8 MFDIUM STIFF U MEDIUM COMPACT 10-10 - DPEN END ROD STIFF R-15 30-50 COMPACT SM 12HOLE NO. WASH SAMPLE VERY STIFF • 50 -VERY COMPACT 15-30

	HALE	Y & A	LDRICH ASSACHI	I, INC.	<b>.</b>	C	ORE BO	ORING REPO	RT —		PAGE 2 OF 6
Scale	Drill Rate Min. per	Core No.	RECOV	D .	Graphic Log	Change		FIELD CLA	SSIFICATIO	N AND REMARK	S
Feet	Foot	Depth Range	ın.	*	Weath.	Tests					
. 5	35				ļ			Begin co	ring at	4.5 ft.	
- O	3.5	4.5 R-1 7.5	<u>32</u> 26	89 72	SL- MOD		t a	ight gray, : o medium-beo nd vugs. OCKPORT DOLO	dded Do		
- 10 -	3.5 3.5				SL- MOD	:	a: 4	ix smooth, and the smooth of the smooth, and the smooth of the smooth, and the smooth of the smooth	erately	dipping mooth, high	joints fro angle
•	3.5 3.5	R-2	102 102	<u>100</u> 100	SL		Si	mooth, low a	angle,		
- <b>1</b> 5 —	3.5 3.5 3.5	16.0			עכ		LOCKPORT DOLOMITE Light to medium gray, fine-grained, th to medium-bedded Dolomite, thinly color-banded and mottled, from 10.5 to 35.1 ft. Secondary gypsum seams in closely spaced partings from 10.5 to				
	3.5 3.5 3.5						3: Se	losely space 5.1 ft. everely weat 5.1, 17.1 ar	hered	shaly part	
20	3.5 3.5	R-3	<u>122</u> 117	102 96*	SL	21.0	L	DCKPORT DOLO	OMITE		20 0 +0
	3.5 3.5		***			22.7	22.0 20 22.6 Se	0.2 ft. everely weat	hered	shaly part	tings at
25	3.5 3.5	26.0					*]	3.5, 25.1, 2 RQD based or	core	recovery.	
	3.5 3.5							ertical crac		28.6 to 2	29.0 ft.
30 _	3.5 3.5 3.5	R-4	119 119	<u>99</u> 99	SL	30.3	Se	everely weat	hered	clayey sh	ale partir
35	3.5 3.5				,		Ve	t 33.5 ft. ery thin sevent 34.3 ft.	verely	weathered	clay bed
35   FII	3.5 ELD HA	ARDNE	ss	Ι		PT5	ING	BEDDING/JOI	NT SPACIN	IG	RQD
V. Hard Hard Med. Ha Soft V. Soft	- K - Si - 31	Chite can' Clatches c cratches s rooves arves	t scratch sitt	V.	esh slight yht oderate	Seve	d. Severe ere jevere npiete	V. thin V. Close Thin Close Medium Mod. Clo Thick Wide V. thick V, wide	<pre>&lt; 2" 2" · 12" 36" · 120 &gt; 120"</pre>	75.50	Excellent Good Fair Poor V. Poor



1

#### NOTES:

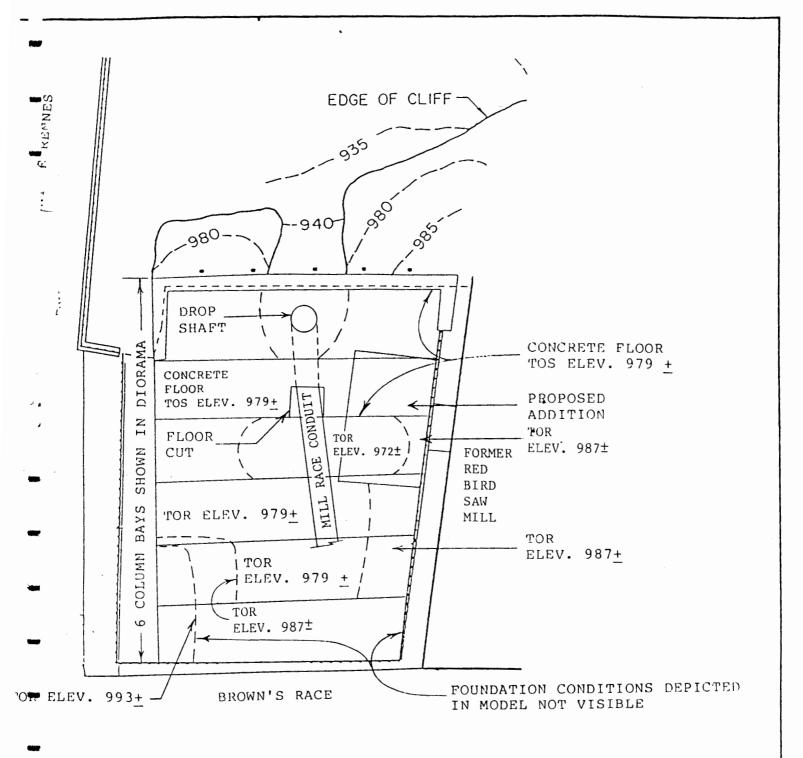
- 1. DRAWING PREPARED USING BASE PLAN PROVIDED BY CITY OF ROCHESTER, ENTITLED SITE PLAN, DATED 11/13/87. DATUM IS REPORTEDLY BASED ON PK NAIL IN BROWNS RACE SIDEWALK ESTABLISHED AS ELEVATION 1000.00.
- 2. THIS DRAWING WAS PREPARED FROM REVIEW OF CONDITIONS DEPICTED BY THE ROCHESTER MUSEUM OF SCIENCE DIORAMA OF THE GRANITE MILLS AS THEY OPERATED AT APPROXIMATELY 1850. SCALE AND ACCURACY OF THE DIORAMA ARE NOT KNOWN.
- 3. APPROXIMATE DIORAMA SCALE ESTABLISHED FROM COMPARISON OF DIORAMA LENGTH (40 INCHES +) AND APPROXIMATE FOUNDATION LENGTH (80 FEET+).
- 4. DIORAMA ELEVATION OF STREET LEVEL ALONG BROWN'S RACE ASSUMED TO BE APPROXIMATELY AT PRESENT GRADE (ELEVATION 1000.00).
- 5. DIORAMA MEASUREMENTS WERE APPROXIMATED FROM THE DIORAMA CASE EXTERIOR, AND ARE THEREFORE IMPRECISE.
- 6. THIS DRAWING SHOULD NOT BE ASSUMED TO REPRESENT AS-BUILT CONDITIONS AND SHOULD NOT BE RELIED UPON FOR PREPARATION OF ACCURATE BID QUANTITY ESTIMATES. DRAWING SHOULD BE CONSIDERED ONLY TO REFLECT GENERAL LAYOUT AND APPROXIMATE RELATIVE ELEVATIONS.

### LEGEND

-- APPI IN '

TOR TOP

TOS TOP



XIMATE LOCATION OF CHANGE P OF ROCK ELEVATION

FROCK

F SLAB



APPROXIMATE SKETCH OF HISTORICAL FOUNDATION INFORMATION

PROPOSED INTERPRETIVE CENTER 78 BROWN'S RACE ROCHESTER, NEW YORK

DR.BY:	МЈВ	SCALE. APPROX	. 1"=201	PROL NO RT.	88-25
CK'D.BY:	EMD	DATE: SEPT.	1988	DRWG.NO.	3

APPENDIX B Test Boring Logs

STARTED		MPI SINVESTIGATIO		ACE LOG	HOLE NO. B-175  SURF. ELEV. 325.6  G. W. DEPTH See Note #1	
HEET1 OF1			SOBSORI	ACL LOG	Son None	
Project					G. W. DEPTH See Note #1	
					_ <u></u>	
BLOWS ON			LOCATION _			
BLOWS ON						
SAMPLER	N O		SOIL OR ROCK			
BLOWS ON SAMPLER  O 6 12 18	BLOW ON CASING C	1	CLASSIFICATION		NOTES	
0 1 2 2 3	5 10	TOPSOI	L 3"		NOTE #1	
	15 50/.5'	Brown S (Moist -	ILT, some Sand, trace c Loose)	lay	G.W. at 2.0' completion G.W. at 2.2' 24 hrs. after completion	
			ALE, medium hard weat	hered,	Run #1, 2.5' - 5.0'	
┆╾╇╾┼┶┼┷		- Inin Bed	ded some tractures		95% Recovery   50% RQD -	
0 0 0	(5)	6	$\odot$		<b>(a)</b>	
TABLE I	TABLE II			TABLE III		
Split Spoon Sample	estimate of		made on basis of an not in the case of fine plasticity.	soils cons	ring terms are used in classifying isting of mixtures of two or mor. The estimate is based on weigh	
Shelby Tube	Soil Type	Soil Particle	e Size	of total sa		
Sample	Boulder	> 12"		Tern		
	Cobble Gravel - Co	3" - 12" parse   3" - ¾"	Coarse Grained	"and		
Auger or Test Pit Sample	- Fin	ne ¾" - #4	(Granular)	"little	10 - 20	
Pit Sample	Sand - Coa - Med			"trace	e" less than 10 ampling gravelly soils with a stand	
	- Fine			ard split	spoon, the true percentage of	
Rock Core	Clay-Plastic	astic (Granular)<#	200 Fine Grained		often not recovered due to the small sampler diameter.)	
TABLE IV				TABLE V		
The relative compactne	ss or consiste	ency is described	in accord with the	Varved	- Horizontal uniform layers o	
following terms.  Granular Soils	1	Cohe	sive Soils	1	seams of soil(s).	
	er Foot, N	Term	Blows per Foot, N	Layer	- Soil deposit more than 6" thick	
Loose	< 10 11 - 30	Very Soft Soft	·< 2 3-5	Seam	- Soil deposit less than 6" thick	
Firm Compact	31 - 50	Medium	6 - 15	Parting	- Soil deposit less than %" thick	
Very Compact	> 51	Stiff Hard	16 - 25 > 26	Laminated	<ul> <li>Irregular, horizontal and angled seams and partings of soil(s).</li> </ul>	
(Large particles in the so foot recorded during the		significantly influ	- 1			
ABLE VI	renetiation	1 65(.)		<u> </u>		
Rock Classification Term	ns					
Term				Meaning		
Hardness So	oft edium Hard		Scratched by fingernation Scratched easily by per-			
Ha	ard		Scratched with difficu	Ity by penknife	•	
	ery Hard ery Weathered	<u> </u>	Judged from the relat		disintegration	
{ w	eathered ound		iron staining, core rec		•	
30	minated		Natural breaks in	(<1" )		
Bedding / La						
Bedding La	nin bedded		Rock Layers	(1" - 4" )		
Bedding La			Rock Layers	(1" - 4" ) (4" - 12" ) (12" - 36")		

# **GENERAL INFORMATION & KEY TO SUBSURFACE LOGS**

The Subsurface Logs attached to this report present the observations and mechanical data collected by the driller at the site, supplemented by classification of the material removed from the borings as determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between the sampled intervals. The data presented on the Subsurface Logs together with the recovered samples will provide a basis for evaluating the character of the subsurface conditions relative to the project. The evaluation must consider all the recorded details and their significance relative to each other. Often analyses of standard boring data indicate the need for additional testing or sampling procedures to more accurately evaluate the subsurface conditions. Any evaluation of the contents of this report and the recovered samples must be performed by Professionals. The information presented in the following defines some of the procedures and terms used on the Subsurface Logs to describe the conditions encountered.

- 1. The figures in the Depth column defines the scale of the Subsurface Log.
- The sample column shows, graphically, the depth range from which a sample was recovered. See Table 1 for a description of the symbols used to signify the various types of samples.
- 3. The Sample No. is used for identification on sample containers and/or Laboratory Test Reports.
- 4. Blows on Sampler shows the results of the "Penetration Test", recording the number of blows required to drive a split spoon sampler into the soil. The number of blows required for each six inches of penetration is recorded. The first 6 inches of penetration is considered to be a seating drive. The number of blows required for the second and third 6 inches of penetration is termed the penetration resistance, N. The outside diameter of the sampler, the hammer weight and the length of drop are noted at the bottom of the Subsurface Log.
- 5. Blows on Casing shows the number of blows required to advance the casing a distance of 12 inches. The casing size, the hammer weight and the length of drop are noted at the bottom of the Subsurface Log. If the casing is advanced by means other than driving, the method of advancement will be indicated in the Notes column or under the Method of Investigation at the bottom of the Subsurface Log.
- 6. All recovered soil samples are reviewed in the laboratory by an engineering technician, geologist or geotechnical engineer, unless note otherwise. The visual descriptions are made on the basis of a combination of the driller's field descriptions and observations and the sample as received in the laboratory. The method of visual classification is based primarily on the Unified Soil Classification (ASTM D 2487-83) with regard to the particle size and plasticity. (See Table No. II) Additionally, the relative portion, by weight, of two or more soil types is described for granular soils in accordance with "Suggested Methods of Test for Identification of Soils" by D. M. Burmister, ASTM Special Technical Publication 479, June 1970. (See Table No. III) The description of the relative soil density or consistency is based upon the penetration records as defined on Table No. IV. The description of the soil moisture is based upon the relative wetness of the soil as recovered and is described as dry, moist, wet and saturated. Water introduced in the boring either naturally or during drilling may have affected the moisture condition of the recovered sample. Special terms are used as required to describe materials in greater detail; several such terms are listed in Table V. When sampling gravelly soils with a standard two inch diameter split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders and large gravel is sometimes, but not necessarily, detected by an evaluation of the casing and samplers blows or through the "action" of the drill rig as reported by the driller.
- 7. The description of the rock shown is based on the recovered rock core and the driller's observations. The terms frequently used in the description are included in Table VI.
- 8. The stratification lines represent the approximate boundary between soil types and the transition may be gradual. Solid stratification lines are based on the driller's field observations.
- 9. Miscellaneous observations and procedures noted by the driller are shown in this column, including water level observations. It is important to realize the reliability of the water level observations depends upon the soil type (water does not readily stabilize in a hole through fine grained soils), and that drill water used to advance the boring may have influenced the observations. The ground water level typically will fluctuate seasonally. One or more perched or trapped water levels may exist in the ground seasonally. All the available readings should be evaluated. If definite conclusions cannot be made, it is often prudent to examine the conditions more thoroughly through test pit excavations or water observation wells.
- 10. The length of core run is defined as the length of penetration of the core barrel. Core recovery is the length of core recovered divided by the core run. The RQD (Rock Quality Designation) is the total pieces of NX core exceeding 4 inches in length divided by the core run. The size core barrel used is also noted.

STARTED 7/23/88  FINISHED 7/23/88  SHEET 1 OF 1  PROJECT INTERPRETIVE CENTER  RTA-88-25  FINISHED 7/23/88  SOILS INVESTIGATIONS INC  SUBSURFACE LOG  HOLE NOB-1  SURF. ELEV97.7 *  C. W. DEPTH See Notes  LOCATION 78 BROWNS RACE  ROCHESTER, NEW YORK										
- 01 PIH 11	SAMPLES	PLL NO		BLOW	LER		BLOW ON CASING C	SOIL OR ROCK	NOTES	
5 - 10 - 10 - 15 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	ws /		2 4 WOH		0.1	6	BI O	CLASSIFICATION  1.5' ASPHALT Black coarse to fine SAND (cinders)  concrete  Dark grey SILT, organic odor (very loose, wet)  -SLUDGE- Boring complete at 11.7 feet	* ESI field datum.  concrete augered from 2.6'-4.5 (apparent crown of race) WOH-weight of hammer  Water on surface of sludge  Concrete encountered at 11.7 feet (apparent invert of race). Notes:  l. Background reading with H-nu 0-0.2 ppm No volatiles detected in breathing zone or	
	C	blow	s to dr	ive_2		spoo	pon1	2." with 140_lb_pin wt. falling 30"per blow. CLA!	borehole during drilling.  2. No free water encountered in borehole upon completion hole upon completion Geologist	

STARTED 8/16/88  FINISHED 8/16/88  SOILS INVESTIGATIONS INC. SUBSURFACE LOG SUBSURFACE SUBSURFACE LOG SUBSURFACE LOG								HOLENO B-2
	S	TARTED	8/16	788	-	SOILS	INVESTIGATIONS INC. SURSURFACE LOC	HOLE NO. <u>B 2</u>
			8/16	1	-		Jobson Mee Ede	G. W. DEPTH See Note 4
	1	ET		F				C. W. BEFTH
	PRO				NTE	RPRETI	VE CENTER LOCATION BROWNS	RACE
	-		RTA-88	-25			ROCHESTE	R, NEW YORK
	=	≈ 8		WS ON		Z U	SOUL OR BOSK	
	DIPIH	SAMPLES	0 / 6	MPLER		BLOW ON	SOIL OR ROCK CLASSIFICATION	NOTES
	=0 =	۲. ا	<u> </u>	2 18	7	<b>a</b> 0		
	-	$\frac{1}{1}$	3 7				1 ,	*NYS Barge Canal datum.
İ	-	1/2	6 5		13		grey fine to coarse SAND some silt,	H
	-	1/1-	7 6	_	15		faint organic odor, trace organics (moist, firm)	H
-	-	//3	7 18		15			H
i	5-	1/1-	9 9		27		grades to little fine to coarse sand trace silt, trace organics (wet)	+1
	-	/4	7 4		<b>4</b> 7		· ·	H
1		/	4 4		8		grades to moist, loose	Н
-	_	5	12 6				grades to and fine to coarse SAND,	
	-10-	<u> </u>	7 4		13		some silt, trace organics (wet,firm)	NQ core Run #1
	-	1		-			Auger refusal at 10.0 ft.	10.0-14.0
Ţ	-	-					No Recovery	Rec=0%, RQD=0%
	-			+				<del>                                      </del>
	-	/ 6	12 15	1.	-		Dark grey shale GRAVEL and BRICK	H
7	15—	1/1	13 12		28		FRAGMENTS, and brown-grey to black	H-nu screening of
1	-	1/7	6 14		۲۵.		fine to coarse SAND, little silt,	total volatiles in
	-	1	14 16		28		lightly coated with black substance,	sample head space conducted 9/2/88
T	_						slight tar or petroleum odor noted.	S6 203 ppm
1	- 20-						grades to wet -FILL- Auger refusal at 19.5 feet	S7>195 ppm
-	_	<b>!</b>		1			Dark gray, medium hard, sound, thin	NQ core Run #2
	_	<b>_</b>		-			bedded SHALE, closely fractured on	19.5-24.5 Rec=64%
	_		ļ <del>-</del>	-			horizontal bedding planes with	RQD=16%
7	-	<b>_</b>	<del></del>	1-1			multiple vertical and high angle/ fractures 19.5-20.7	
	25—			1			POSSIBLE ROCK FILL /	<del> </del>
	_						111	Notes: 1. Driller noted ap-
T							Driller notes void 20.7-22.0_/	parent void from 20.7
'	_						Dark grey medium hard, sound, thin	r r
-				$\bot$				2. All water was lost
	_						fractured on horizontal bedding planes, fracture surfaces slightly	during coring  3. Background reading
	_			-			rough.	with H-nu organic vapor
	-						-ROCHESTER SHALE-	detector were 0 ppm.
Н	-	<del>                                     </del>						No volatiles detected
	_				-		Boring complete at 24.5 feet	in breathing zone, or borehole during
	_							drilling
	_							4. No free water en-
	_							countered in borehole
,	v = v	No blow	s to drive_		" spo	on12	" with 140 lb. pin wt. falling 30 "per blow. CLASS	upon completion  IFICATION <u>Visual by</u>
-	] = N	to blow-	to drive_	_	" casi	UK	" withlb, weight falling "per blow. Eng	ineering Technicican
١,	METH	OD OF	NVESTIG	ATION		AS	TM D 1586 using hollow stem augers	
_	T Form H							

Soil OR ROCK CLASSIFICATION    Soil OR ROCK   Soil	SH	FINI	RTED SHED	_7/	HOLE NO. B-3  SURF. ELEV. 98.3*  C. W. DEPTH See Notes  S. RACE  R. NEW YORK					
Gray fine to coarse gravel pavement at surface.    Gray-brown fine to coarse SAND, some silt, occasional brick fragments (moist, loose) FILL		- 1	SAMPLE NO		SAMP	LER 12	2	BLOW ON CASING C		NOTES
Auger Refusal 13.1 feet    15	7		1.1	4	5		10		at surface.  Gray-brown fine to coarse SAND, some silt, occasional brick fragments	
Apparent top of Rock at 15.2 feet (based on recovery)  Dark Gray medium hard sound bedded, shaly DOLOMITE, occasional vugs containing calcite crystals, moderately to colosely fractured on horizontal bedding planes, vertical fracture 20.4 to 20.7, Fracture surfaces slightly rough.  Boring complete at 21.1 feet  Boring complete at 21.1 feet  13.1-21.1 feet Driller reports apparent rubble 13.1-15.5' based on core barrel progress  Recovery 74% Recovery 74% Reversional vugs contained by the progress recovery 74%	-10	- - - - - - - - -	/2	1	1 5		2		grades to gray and black, little .silt.	NO core run #1
TO WELL AND THE STATE OF THE ST						2			Apparent top of Rock at 15.2 feet (based on recovery) Dark Gray medium hard sound bedded, shaly DOLOMITE, occasional vugs containing calcite crystals, moderately to closely fractured on horizontal bedding planes, vertical fracture 20.4 to 20.7, Fracture surfaces slightly rough.  -LOCKPORT DOLOMITE-  Boring complete at 21.1 feet	13.1-21.1 feet Driller reports apparent rubble 13.1-15.5' based on core barrel progress Recovery 74% RQD 69%  1. All water lost during coring 2. Background readings with Photovac Tip II ranged from 0 to 5ppm during day, due to proximity of drill rig to wall. No volatiles (above background) were detected in breathing zone or borehole during drilling.

STARTED 8/15/8 FINISHED 3/15/8 SHEET 1 OF 1 PROJECT PROPOSED		VE CENTER LOCATION BROWN'S RA	G. W. DEPTHSee Notes						
RTA-88-25		ROCHESTER,							
5 0 0 BLOWS ON SAMPLER 0 6 12 1	Z BIOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES						
=0	14   6   10   18   32   1   1   1   1   1   1   1   1   1	Black medium to fine SAND and SILT, little organics and BRICK fragments, (moist, firm)  Same, with 2 inch diameter shale fragment in sampler nose, loose -TOPSOIL and FILL-  Dark gray coarse to fine, SAND, some silt, little gravel (shale), trace brick fragments, (moist, loose)  FILL  Dark gray coarse to fine GRAVEL (shale) little coarse to fine SAND little silt trace brick fragments, (wer, firm)  grades to gray-brown, trace organics, compact -FILL-  Auger refusal at 10.0 feet  Dark gray medium hard, very weathered, thin bedded, SHALE, closely   Ifractured at low to high angles   POSSIBLE ROCK FILL  Dark gray medium hard, weathered, thin bedded, SHALE, closely to intensely fractured on horizontal bedding planes, fracture surfaces slightly rough -ROCHESTER SHALE-  Boring complete at 14.0 feet							
		withlb_pin wt. fallingper blow. CLASSwithlb_weight fallingper blow. Eng.	IFICATION Visual by ineering Technician						
		The state of the s							
Form H	ETHOD OF INVESTIGATION ASTM D 1586 using hollow stem augers								

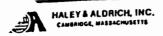
DATE HOLE NO. B-6 STARTED 7/23/88 SOILS INVESTIGATIONS INC. SUBSURFACE LOG SURF. ELEV. 96.5\* FINISHED 7/23/88 G. W. DEPTH See Notes SHEET 1 OF 1 PROJECT PROPOSED INTERPRETIVE CENTER LOCATION BROWN'S RACE RTA-88-25 ROCHESTER, NEW YORK BLOWS ON ò BLOW ON CASING C SOIL OR ROCK SAMPLER NOTES CLASSIFICATION 0 Gray fine to coarse SAND and GRAVEL, | \*ESI field datum. trace silt (moist, firm) 5 20 2 11 22 FILL Dark Gray SILT and fine to coarse 6 4 SAND, trace gravel, organic odor (very 2 2 6 moist, loose) FILL 1 1 2 1 3 Dark Gray fine to coarse SAND and 8 Gravel, trace silt (very moist,loose) 6 19 FILL 11 BRICK and CONCRETE MORTAR fragments, 7 14 and coarse to fine sand from 4 7 disintegrated mortar (moist) 7 10 FILL 7 6 4 17 6 8 6 9 3 10 7 7 REF-Sample Refusal 1000.2 REF NOTES: Boring complete with sample refusal 1. Background readings at 18.2 feet with H-nu were 0-0.2 ppm. No volatiles were detected in the breathing zone or borehole during drilling. 2. No free water encountered in borehole upon completion. CLASSIFICATION Visual by N = No blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow" Geologist IC = No blows to drive\_\_\_\_\_\_\_ casing\_\_\_\_\_\_\_ with\_\_\_\_\_\_lb. weight falling\_\_\_\_\_\_ "per blow.

METHOD OF INVESTIGATION ASTM D 1586 using hollow stem augers

# CORE BORING REPORT

BORING NO. MS102 FILE NO. 7602 SHEET NO. 2 OF 3 ,

		_						SHEET NO. 2 OF 3 ,
	DEPTH ORILLING RATE MIN./FT.		CORE NO.		RECOVERY RQD		STRATA CHANGE	VISUAL CLASSIFICATION AND REMARKS
		MIN./FT.	DEPTH (FT.)	IN. L		ERING	(FT.)	
								Begin Coring at 3.7 ft.
	- 5 –	7	3.7		0.2	MOD- SEV		Light to medium gray, fine to medium-grained, thin to medium bedded, siliceous DOLOMITE with stylolites, very close to moderately close argillaceous partings and vugs.
		7	R1	<u>55</u> 29	92 48			-LOCKPORT DOLOMITE-  Very closely to moderately closely spaced, moderately weathered bedding plane joints from 4.2 to 20.3 ft.
	. 10 -	7 7 7	8.7			SL- MOD		Moderately weathered, smooth, high angle joint from 4.7 to 5.0 ft.
		7						Moderately weathered, rough, iron-stained high angle joint from 5.1 to 5.3 ft.
		6	R2	116 99	97 83	SL- MOD		Slightly weathered vertical joint intersecting a moderately weathered, smooth, low angle joint from 9.9 to 10.0 ft.
-	. 15 -	6						Moderately weathered, smooth, moderately dipping joint from 10.5 to 10.6 ft.  Slightly weathered, rough, high angle crack from 11.3
		6						to 11.5 ft. Slightly to moderately weathered, smooth low angle joint at 12.2 and 13.1 ft.
	 . 20 -	5	18.7					
		5						Close to widely spaced, slightly to moderately weathered, smooth to rough bedding plane joints from 20.3 to 53.7 ft.
		5	R3	121 121	101 100*			Moderately weathered, smooth, curved low angle joint at 19.9 ft.
	. 25 -	5						-LOCKPORT DOLOMITE-
		5	28.7			SL		
	. 30 -	5						
		5						
	- 35 -	5	R4	R4 121 120			35.8	
		5 5					٥.ر	Light to dark gray, fine grained, fossiliferous dolomitic MUDSTONE with interbeds of dolomite and limestone, and secondary gypsum seams in closely to very closely spaced partings.
			38.7		-	SL		-ROCHESTER SHALE- *RQD based on core recovered.
1	- 40 -							BORING NO. MS102



# **CORE BORING REPORT**

BORING NO. MS102 FILE NO. 7602 SHEET NO. 3 OF 3

							—— Т			
	DEPTH	DRILLING	CORE NO.	RECO'		WEATH -	STRATA CHANGE	VICUAL CLASSISICATION AND BEHABES		
3	(FTJ)	RATE MIN./FT.	DEPTH	IN.	•	ERING	(FT.)	VISUAL CLASSIFICATION AND REMARKS		
<u> </u>		-	(FT.)			SL -		Light to dark gray, fine-grained fossiliferous dolomitic MUDSTONE with interbeds of dolomite and limestone and		
		-				MOD		secondary gypsum seams in closely to very closely spaced partings.		
1		-					l i	-ROCHESTER SHALE- (Note: Core water return lost from approximately		
١			R5	112 109	93 91			41.0 to 43.0 ft.)		
ŀ	45 _	-				SL -		(Note: Driller noted a black substance resembling ink eoating the core barrel in runs R5 and R6.)		
١		-				MOD		Slightly weathered, rough vertical joint from 42.5 to 42.6 ft.		
		-				ļ		Several gypsum nodules in bedding plane joint from 41.8 to 42.1 ft.		
		-	48.7			1				
-	50 _	-								
			R6	54 46	90 77	SL -				
1		-				MOD				
1			53.7							
-								Bottom of Boring at 53.7 ft.		
H	_							Notes:		
١								1. Fair to good core water return throughout boring		
١								except between 41.0 and 43.0 ft. where core water return was lost.		
١								2. Bedrock groundwater observation well installed in		
١	-							completed borehole. See Bedrock Groundwater Obser- vation Well Report.		
ı	-									
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								BORING NO. MS102		
								BURING NO. MS102		

SHEET 1 OF 1								MPIRE SINVESTIGATIONS INC. SUBSURFACE LOC	HOLE NO. B-6A  SURF. ELEV. 96.5*  G. W. DEPTH See Notes	
PRO	DJE		NTER			E C	ENTER	LOCATION 78 BROWN ROCHESTE	S RACE R, NEW YORK	
= 0 =	SAMPLES	SAMPLE NO	0 6	SAMP	LER 12	2	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES	
5 —								Advanced augers to 18.2 feet without sampling. Refer to log of boring B-6.	NOTES:  1. Backgroud readings with Photovac Tip II organic vapor detector were 0 ppm. No volatile detected in breathing zone or borehole during drilling.	
10-								•	2. All water was lost during coring at Runl. All water was recovered during coring of Run 2.	
15-									3. No free water en- countered in borehole upon completion.	
20 -								Auger refusal at 18.2 feet	NQ Core Run #1 18.2'-18.7' Rec=40%	
- - -	/	2	4 4 6 26	4 9		8		WOOD FRAGMENTS and GRAVEL, coarse to fine sand, silt. -FILL_ Auger refusal at 25.0 feet	NQ Core Run #2 25.0-30.0 Rec=90% RQD(rock only)=0%	
25			20 1	100		35		CONCRETE, coring breaks typically at 5"-9" lengths Top of Rock at 28.1 feet		
30 - - - - -								Dark grey medium hard, sound, thin bedded SHALE, closely fractured on horizontal bedding planes, undulating vertical joints 18.5 to 18.7 and 18.9 to 19.3 feet -ROCHESTER SHALE-	*ESI field datum	
35— 								Boring complete at 30.0 feet		
N = No blows to drive 2 "spoon 12 "with 140 lb. pin wt. falling 30 "per blow. CLASSIFICATION Visual by  C = No blows to drive "casing "with lb. weight falling "per blow.  METHOD OF INVESTIGATION ASTM D1586 using hollow stem augers										

SHE	NIS ET	HED	7_	/23/ /23/ OF_	88 1	_		SINVESTIGATIONS INC. SUBSURFACE LO	G. W. DEPTH See Notes
PRO	)JEC	CT _		ROPO ra-8			ERPRE	TIVE CENTER LOCATION BROWNS ROCHESTE	RACE ER, NEW YORK
= O =	SAMPLES	SAMPLE NO	0 /6	BLOW SAME		2	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
5		2	8 19 4 8	11 7 12 8		30		PARKING LOT GRAVEL  Brown-black coarse to fine SAND and SILT, little gravel (moist, Firm) (organic odor ) FILL  BRICK and CONCRETE MORTAR fragments and coarse to fine SAND from disintegrated mortar moist.  FILL	*ESI field datum.
-10-    1 <del>5</del> -		3	4 8	4 8		12		contains wood	
-20-	/ / /	5	3 12 20 16	8		6 ** 27			*indicates sampler driven with 300 lb hammer
-	/   		19 50/	0.0					Auger Refusal
-								Boring complete at 24.0 feet  with 140 lb pin wt falling 30 per blow CLAS	l. Background reading with H-nu were 0-0.2pp No volatiles were detected in the breathing zone or borehole during drilling.  2. No free water encountered in borehole upon completion.

DATE B-7A HOLE NO. STARTED 9/17/88 SOILS INVESTIGATIONS INC. SUBSURFACE LOG SURF. ELEV. 96.6 \* FINISHED 9/17/88 G. W. DEPTH See Notes SHEET 1 OF 1 INTERPRETIVE CENTER LOCATION 78 BROWNS RACE PROJECT \_\_ RTA-88-25 ROCHESTER, NEW YORK BLOWS ON 2 BLOW ON CASING C SOIL OR ROCK SAMPLER NOTES CLASSIFICATION \*ESI field datum. NOTES: 1. Background readings with Photorac Tip II Advanced augers to 24.0 feet without organic vapor detector sampling. Refer to log of boring was 0 ppm. No vol-B-7 · atiles detected in breathing zone or bore hole during drilling. 10 2. All water was lost during coring. 3. No free water encountered in borehole upon completion. 20 Auger refusal at 24.0 feet NQ core Run #1 24.0-29.0 Dark grey medium hard, sound, thin 25 Rec=99% bedded SHALE, occasional calcite RQD=15% coated vugs, closely fractured on horizontal bedding planes, fracture surfaces slightly rough. -ROCHESTER SHALE-30-Boring complete at 29.0 feet N = No blows to drive  $\frac{2}{2}$  spoon  $\frac{12}{2}$  with  $\frac{140}{2}$  lb. pin wt. falling  $\frac{30}{2}$  "per blow. CLASSIFICATION Visual by Engineer C = No blows to drive\_\_\_\_\_\_ casing\_\_\_\_\_ with\_\_\_\_\_\_ lb. weight falling\_\_\_\_\_ "per blow.

METHOD OF INVESTIGATION \_\_ASTM D1586 using hollow stem augers

STARTED 7/30/88  FINISHED 7/30/88  SHEET 1 OF 1  PROJECT PROPOSED INTERPRET  RTA-88-25						INTE	SOILS	SUBSURFACE LOG HOLE NOB-8 SURF. ELEV96.5* C. W. DEPTHSee Notes  PIVE CENTER LOCATIONBROWNS RACE ROCHESTER			
0 DEPTHAT	SAMPLES	SAMPLE NO	0/6	SAMI		2	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES		
5—		1 2 3	3 5	5 5 5 5 5 3 2 2		9		BRICK and CONCRETE MORTAR fragments little coarse to fine SAND, trace silt (moist, loose) -FILL- grades to wet at 10.5 feet	*ESI field datum.		
25—		4	100	/.2		100		Borings complete 25.1 feet  NOTES:  1. All water lost during coring 2. Background readings with Photora Tip II were Oppm. When the borehole was drilled to 15 feet below grade, 0.2ppm was detected in the breathing zone. During coring and upon com pletion, 0.1 to 0.2 ppm was detected at the hole at ground surface.  3. No free water encountered in borehole upon completion.	20.2 to 22.3  Rec=40%  RQD=0%  NQ core Run #2  P2.3 to 25.1  Rec=14%  RQD=0%		
'C = ^	o l	olows	to dr	ve		" casi	ng		SECATION Visual by		

DATE HOLE NO. B-98/16/88 STARTED \_\_ SOILS INVESTIGATIONS INC. SUBSURFACE LOG SURF. ELEV. \_\_415,4\* 8/17/88 FINISHED \_\_\_ G. W. DEPTH See Notes SHEET \_\_\_\_\_OF\_\_\_1 PROJECT PROPOSED INTERPRETIVE CENTER LOCATION BROWNS RACE RTA-88-25 ROCHESTER, NEW YORK BLOWS ON Q BLOW ON CASING C SAMPLER **SOIL OR ROCK** NOTES CLASSIFICATION 12 Black SAND and SILT, trace organics 3 8 |\*NYS Barge Canal datum. (moist, compact) -TOPSOIL-18 6 26 4 3 Black fine to coarse SAND, some gravel 2 6 little silt, occasional brick frag-3 2 ments (moist, loose)FILL & TOPSOIL 2 11 Brown fine SAND, little silt, some 3 2 gravel, (moist, firm) 3 6 3 grades to trace clay 2 Dark gray fine to coarse SAND, little 5 gravel, little silt, trace organics 3 3 -10-(wet, loose) Background readings with H-nu organic vapor detector were Oppm. No volatiles were de-4 37 6 grades to trace gravel, wood fragtected in breathing 44 7 zone, or borehole ments FILL during drilling to 16 feet. No H-nu Dark gray shale GRAVEL and coarse monitoring in field to fine SAND, little silt, trace below 16 feet 15 11 20 organics, (wet, firm) 19 H-nu screening of 30 total volatiles in grades to coated with black substance sample head space strong petroleum-like odor conducted 9/2/88: S8 130 ppm 6 17 8 100/0.3 RER Auger refusal at 25.3 feet NQ Core Run #1 Dark gray, medium hard, sound thin-25.3 to 30.3 Rec=95% bedded SHALE, moderately to closely fractured on horizontal bedding RQD=62% plants, intensely fractured zone 26.3 - 26.6 feet, fracture surfaces slightly rough-ROCHESTER SHALE-All water was lost during coring Boring complete at 30.3 feet No water encounteredinborehole upon completion CLASSIFICATION Visual by N = No blows to drive 2 "spoon 12" with 140 lb. pin wt. falling 30 "per blow Geologist C = No blows to drive \_\_\_\_\_ " casing \_\_\_\_ " with \_\_\_\_ lb. weight falling \_\_\_\_ "per blow. METHOD OF INVESTIGATION \_\_\_\_\_ ASTM D 1586 using hollow stem augers

STARTED 7/23/88  FINISHED 7/23/88  SHEET 1 OF 1	EMPIRE SOILS INVESTIGATIONS INC.  SUBSURFACE LOG SURF. ELEV. 97.2*  G. W. DEPTH See Notes  RPRETIVE CENTER BROWNS RACE							
PROJECT PROPOSED INTER	ROCHESTER LOCATION BROWNS R. ROCHESTER	, NEW YORK						
SAMPLER  0 6 12 18 N	SOIL OR ROCK CLASSIFICATION	NOTES						
1 6 12 12 14 24 5 2 1 2 1 1 1 3	Black SILT and fine SAND, organic odor FILL  Brown coarse to fine SAND, little silt, brick fragments (moist, firm) color grades to black FILL	*ESI field datum.  - Steel beam seen in						
10 3 17 30 37 4 37	Gray shale GRAVEL, little silt, trace organics, (moist, compact)  FILL	hole at 3.0' (8" I- beam) — Large concrete frag- ments seen loose in hole at approximately 10 feet						
20-	Gray SHALE and DOLOMITE BOULDERS with concrete mortar	Sample Refusal  NQ Core Run #1  16.0'-21.0'  Rec. =62%  RQD=0%						
5-	Boring complete at 21.9 feet	NOTES:  1. All water was lost during coring  2. Background reading with H-nu were 0-0.2 ppm. No volatiles detected in breathing zone or borehole during drilling.  3. No free water encountered in borehole upon completion.						
= No blows to drive 2 "spoon12 "with 140 lb. pin wt. falling 30 "per blow CLASSIFICATION Visual by  = No blows to drive "casing "with lb. weight falling "per blow Geologist  ASTM D 1586 using hollow stem augers								



: ^

# Subsurface Investigation

Site:

### Brown's Race

Rochester, New York

To:

La Bella Associates, P.C.

300 State Street, Rochester, New York 14614

Presented by:

ROCHESTER DRILLING COMPANY, INC.

45 Steel Street, Rochester, New York 14606



Refusal

Depth in boring where more than 150 blows per foot are

needed to advance the sample spoon.

Cohesive Soil

Very fine grained soils. Plastic soils can be rolled into

Penetration Resistance

26 or more

a thin thread if moist. Clays and silty clays show

cohesion.

Description	Blows / Foot
Very Soft	0 - 2
Soft	3 - 5

Medium 3 - 5 Stiff 6 - 15

Hard

Non-Cohesive Soil Soils composed of silt, sand, and gravel, showing no cohesion or very slight cohesion.

	Penetration Resistance
Description	Blows / Foot
Loose	0 - 10
Firm	11 - 25
Compact	26 - 40
Dense	41 - 50
Very Dense	50 or more

# Composition Estimated Percentage

And	50
Some	30 - 49
Little	11 - 29
Trace	0 - 10

NOTE: WE CANNOT BE RESPONSIBLE FOR INTERPRETATIONS OR OPINIONS

MADE BY OTHERS FROM THE ENCLOSED DATA.



# TEST BORINGS FOUNDATION INVESTIGATIONS GROUND WATER MONITORING WELLS

45 STEEL STREET \* ROCHESTER, NEW YORK 14606 \* 1-716-458-0821

1	`
N	The number of blows to drive a split-spoon sampler for up to 12 inches of split-spoon penetration.
С	The number of blows to drive a casing for up to 12 inches of casing penetration.
100/1 inch	Number of blows to drive sampler or casing the distance shown. Used for indicating refusal.
WR	Sampler advanced by weight of rods only, indicating softer material.
WH	Sampler or casing advanced by weight of hammer only, indicating softer material.
ST	Shelby Tube Sampler (piston sample or pressed tube sample)
cs	Continuous sampling.
AX	1-1/8 inch rock core.
BX	1-5/8 inch rock core.
NX	2-1/8 inch rock core.
75%	Percentage of rock core removed.
P.L.	Plastic limit.
L.L.	Liquid limit.
M.C.	Moisture content (visual) Dry, Damp, Moist, Wet, Saturated
H.C.	Boring caved in after casing or augers were removed.
W.C.	Weight of casing only, indicating softer material.

NOTE: WE CANNOT BE RESPONSIBLE FOR INTERPRETATIONS OR OPINIONS MADE BY OTHERS FROM THE ENCLOSED DATA.

### PROJECT MEMORANDUM

TO:

File - 88042B

FROM:

N. Harding

DATE:

July 11, 1988

RE:

Observations during Raceway Bore Operations

### RWB-5:

Using 8" hollow stem auger, hole caved in below asphalt causing cavern  $\sim 51$ " deep x 24" across; wood material found at the 21" depth; to 12" - 15" depth - 1-1-1/2" gravel fill; 15" - 24" sand and silt; G.T. 24" - concrete chunks - 5" - 6" across; Zero reading from H.NU meter - both in hole and ambient breathing air. Composite sample from 2' intervals, 4" - 5" from each 2' depth. 0645-0730 hrs.

### - RWB-4:

Zero reading from H.NU meter - both in hole and breathing space; 4" - 5" grab samples at 2' intervals; sample is wet at 6' level; 2 vial samples - dry sample from all composite - wet sample from 6' - 8' and 8' - 8' - 2" depths; 0735-0810 hrs.

### - RWB-3:

Zero reading from H.NU meter-both in hole and breathing space; 4" - 5" spoon samples grabbed from 0-2', 2'-4', 4'-6' & 6'-7'-10" at refusal; 2 vial samples. 0815-0835 hrs.

### - RWB-2:

Zero readings from H.NU meter - both in hole and breathing space; 4"-5" grab from 0-2'; 2'-2'-6" level encountered hard cobblestone material - broke threaded end of spoon - augered directly over spoon to retrieve; auger continued to 3' level - encountered "smooth" refusal (maybe poured concrete) pulled auger and moved bore location 7' north of first location; grab 4"-5" from 2'-4' level; grab sandy material - 4"-5" from 4'-6' level; 0845-0945 hrs.

### RWB - 1:

Zero reading from H.NU meter - both in hole and breathing space; grab 4"-5" from 0-2', 2'-4' and 4'-6' levels; 1000-1100 hrs.

### SAMPLE SUMMARY

RWB - 1: 1 Amber Composite

1 40 ml. vial - Water/silt from 9'-10' level

RWB - 2: 1 Amber Composite

1 40 ml. vial - Water/silt from 6'-8' level

1 40 ml. vial - Sludge from 9' level

RWB - 3: 1 Amber Composite

1 40 ml. vial - Water/silt from 4'-6' & 6'-7'-10" levels.

RWB - 4: 1 Amber Composite

1 40 ml. vial - Sludge from 6'-8' level

1 40 ml. vial - Cinder/Sand from 2'-6' level

RWB - 5: 1 Amber Composite

1 40 ml. vial - Water/silt from 6' level

1 40 ml. vial - Sludge from 8' level

NOTE: Amber Composites are ~1 1. grab samples from 0-2', 2'-4',

4'-6', 6'-8' and 8'-10' levels.

- END OF MEMO -

FC

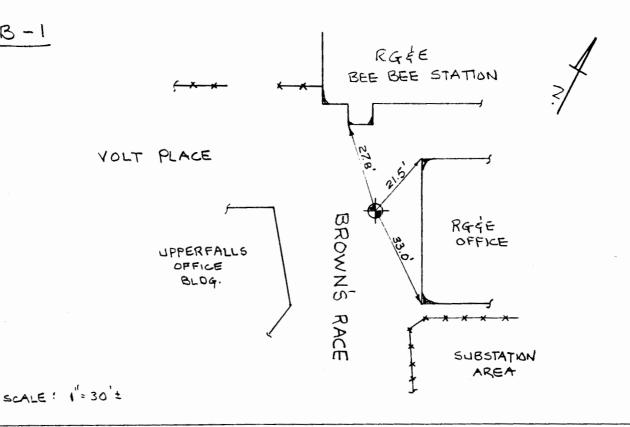
### **LABELLA**

LaBella Associates, P.C. 300 State Street Rochester, New York 14614 716 454-6110

PROJECT BROWN'S RACE INFRAS, ZUCTURE SHEET 1 OF 3 STUDY CALC. BY NT DATE 7 12 38 CHECK BY \_\_\_\_\_ DATE \_\_ SUBJECT RACEWAY BORE LOCATIONS

RWB-1

SCALE: 1 = 30 +



RWB-2\$2A PLATT ST. GRAYEL PARKING DURFEE \$ BRIDGES LOT -GUARD RATE ROCH. FORMER WATER WORKS ∆ - OBSTRUCTION @ 3' LEVEL

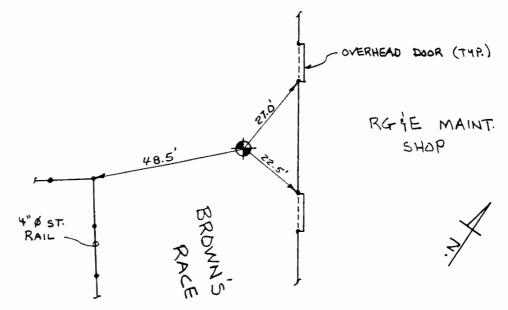
# **LABELLA**

LaBella Associates, P.C.

300 State Street Rochester, New York 14614 716 454-6110

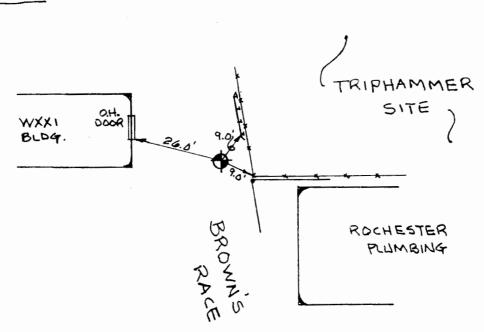
PRUJECT BROWN'S RACE !	NERNSTRUCTURE SHEET 2 OF 3
STUDY	CALC. BY NH DATE 7/12/88
	CHECK BY DATE
SUBJECT RACEWAY BORE	LOCATIONS (CONT'D.)





SCALE: 1" = 30'+

## RWB-4



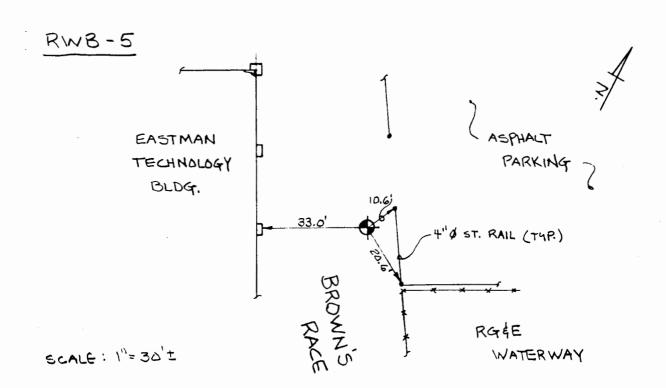
SCALE : 1"=30" +

Z/

# RBELLA

LaBella Associates, P.C.

300 State Street Rochester, New York 14614 716 454-6110 PROJECT NO. 880428 CHECKBY DATE
SUBJECT RACEWAY BORE LOCATIONS (CONT'D.)





Environmental Drilling Services, Landfill Gas Extraction Wells Monitoring Wells, Test Borings, Foundation Investigations 45 Steel Street, Rochester, New York 14606 Telephone 716-458-0821 • FAX 716-458-5041

Test Boring No.	RWB-1			
Page _	1	of	_1_	
RDC Job #	3	381	.01	

E	Below	Level - Surfac	e - Ca	sing O	out	None,	Cave	e in 6'6"	Inspector Nick Harding
								observed water lev	els.
		Blo	ws on		er 18 <b>7</b>		5	Sample	Soil and Rock Information
0	С	6.	12		24.	N	No.	Depth	Remarks
		3	3	9	4	23	1	0'0"-2'0"	Asphalt 0'6"  Brown moist misc. fill consisting of sand, gravel, cinders and asphalt
		3	Ů	1	WH	4	2	2'0"-4'0"	Brown moist misc. fill
5		1	4						Brown wet misc. fill 4'8"
		3	6	9	5	15	3	4'0"-6'0" 6'0"-8'0"	Loose brown wet fine sand, some silt, little medium to fine gravel, trace clay (possible fill)
<u>1 0</u>		4	35	100/5		135/11	5	8'0"-9'5"	Firm brown wet (possible fill)  Very dense brown saturated (possible fill)
<u>15</u>									Very dense gray saturated medium to fine sand, some silt and weathered rock fragments, trace clay  Advanced split spoon sampler to refusal
20									Boring terminated at 9'5".  Notes: Advanced test boring with split spoon sampler. Boring backfilled and surface asphalt patched on completion.
<u>25</u>									
<u>30</u>									
<u>35</u>									
		-	<del> </del>	<u> </u>		-	-	-	



Environmental Drilling Services, Landfill Gas Extraction Wells Monitoring Wells, Test Borings, Foundation Investigations 45 Steel Street, Rochester, New York 14606 Telephone 716-458-0821 • FAX 716-458-5041 Page 1 of 1

RDC Job # 3381.01

									Rochester, New York 14614 7/9/88 Driller M. Legare
٧	Vater	Level -	Casir	ig In -		None			Inspector Nick Harding
В	elow	Surfac	e - Ca	sing C	out	None,	Cave	e in 1'6"	
								observed water lev	rels.
		Blo	ws on	Sampl	ler		_	Sample	Soil and Rock Information
		0.	6.	127	187			Sample	
0	С	6.	12		124.	N	No.	Depth	Remarks
$\neg$		30	15			2.1			Asphalt 0'1
- }		20	21	9	10	24	1	0'0"-2'0"	Brown moist misc. fill consisting of sand silt, gravel, red brick and asphalt
		20		47	11	68	2	2'0"-4'0"	Brown moist misc. fill (sand, gravel and
5									cinders)
$\neg$								}	Auger penetration extremely difficult a
		ļ					┞	ļ	possible cobble fill or concrete utility be
1					<del> </del>	-	1-	1	
10									Boring terminated at 4'0".  Notes: Advanced test boring with holk
$\neg$									stem auger casing. Boring
						<u> </u>	-		backfilled and surface asphalt
- }						-	╁	ł	patched on completion.
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Environmental Drilling Services, Landfill Gas Extraction Wells Monitoring Wells, Test Borings, Foundation Investigations 45 Steel Street, Rochester, New York 14606 Telephone 716-458-0821 • FAX 716-458-5041

Page 1 of 1

RDC Job # 3381.01

									7/9/88 Driller M. Legare  Inspector Nick Harding				
٧	Polow	Cevel -	o - Ca	sina O		Vone.	Cave	ave in 7'6"					
								observed water lev	rels.				
	0000		ws on						Soil and Rock Information				
		0-/	6 - /	<u> </u>	187		5	Sample					
0	С	6.	12			N	No.	Depth	Remarks				
									Asphalt 0'5"				
	<b></b>						-		Misc. fill consisting of asphalt, sand and				
									gravel 3'6"				
5		18	4						Yellow sandstone cobbles noted during dri				
				2	2	6	1_	4'0"-6'0"	(possible cobblestone street debris)				
		1	1	1	1	2	2	6'0*-8'0*	Brown moist misc. fill consisting of sand,				
	<b> </b>	1	3				<u> </u>		gravel, red brick and cinders				
10				100/3		103/9	3	8'0"-9'3"	Brown wet misc. fill				
i	<u> </u>								Brown saturated misc. fill 8'6"				
							-		Black saturated misc. fill sonsisting of fl ash, sand, silt, gravel and cinders				
								]	(Wood (timber) noted at 8'10")				
<u>15</u>									Advanced split spoon sampler to refusal				
						ļ	_						
							<u> </u>						
		<b> </b>							Paring terminated at 910				
20									Boring terminated at 9'3".  Notes: Advanced test boring with hollo				
	<u> </u>			ļ		<u> </u>		·	stem auger casing (0'0"-4'0").				
		-	<del> </del>						Advanced test boring with split				
								]	spoon sampler (4'0"-9'3"). So classifications made visually				
<u>25</u>									from auger cuttings only				
		<del> </del>		<del> </del>	<u> </u>	<u> </u>	_		(0'0"-4'0"). Boring offset 10				
			<u> </u>		<u> </u>				feet south of RWB-2. Boring				
									backfilled and surface asphalt patched on completion.				
<u>30</u>	ļ	<u> </u>		-	ļ	ļ	_		patened on completion.				
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Test Boring No.	_	RWE	3-3
Page _	1	of	_1
RDC Job #			

							/88	Completed	7/9/88 Driller M. Legare
٧	Vater I	Level -	Casin	ig In -		1'0"			Inspector Nick Harding
E	Below	Surface	е - Са	sing C	ot	'0", C	ave	in 5'6*	
S	Seasonal and climatic changes may alter of							bserved water lev	els.
		Blo	ws on	Sampl	er		9	Sample	Soil and Rock Information
		0.	6.					·	Domanda.
0	С	6.	/12	18"	/24"	Z	No.	Depth	Remarks
		31	11						Asphalt 0'5"
				12	7	23	1	0'0"-2'0"	Brown moist misc. fill consisting of sand,
		3	2	2	3	4	2	2'0"-4'0"	gravel, asphalt and cinders Brown moist misc. fill
5		2	2		<u> </u>		1-		Brown saturated misc. fill 5'0"
				2	2	4	3	4'0"-6'0"	Black-gray saturated misc. fill consisting
		2	1						fly-ash, silt, sand and gravel
				1	50/4	2	4	6'0"-7'0"	Black-gray saturated (fly-ash and silt)
10							╁╾		Very dense gray saturated weathered roof fragments
							†		Advanced split spoon sampler to refusal
									7'10"
							<del> </del>		Boring terminated at 7'10".  Notes: Advanced test boring with split
15							├		spoon sampler. Boring backfille
							-		and surface asphalt patched on
				<del>                                     </del>			1		completion.
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Test Boring No.	_	F	RWE	3-4	
Page _	1	_	of	1	
RDC Job #					

								Completed _	Rochester, New York 14614 7/9/88 Driller M. Legare		
٧	Vater I	Level -	- Casing In - 7'0" Inspector Nick Harding ce - Casing Out- 7'0", Cave in 7'0"								
Е	Below	Surface	e - Ca	sing C	ut	7'0 <b>"</b> , C	ave	in 7'0"			
								bserved water le	vels.		
		Blo	ws on	Samp	er		-	ample	Soil and Rock Information		
		0.	6./	127	187		3	ample			
٥١	С	6.	/12		24"	N	No.	Depth	Remarks		
		10	9						Asphalt 0'4"		
				8	8	17	1	0'0"-2'0"	Brown damp misc. fill consisting of sand,		
		10	9			4-7		010* 410*	gravel, and asphalt 1'4"		
۔ ا		4	3	8	6	17	2	2'0"-4'0"	Firm brown damp silt and medium to fine sa		
5		4	3	3	5	6	3	4'0"-6'0"	little medium to fine gravel, trace clay (possible fill) 2'0"		
		10	6	Ť	Ť	Ť	-		Firm brown damp coarse to fine sand, some		
				5	10	11		6'0"-8'0 <i>"</i>	coarse to fine gravel, trace silt and misc.		
		100/2				100/2	5	8'0"-8'2"	(cinders)		
10						<u> </u>			Loose brown wet 6'0"		
		<u> </u>		<u> </u>	<u> </u>				Black wet misc. fill consisting of fly-ash,		
							├		sand and silt Black saturated misc. fill		
					<del></del>		<del>                                     </del>		Advanced split spoon sampler to refusal		
15						<del>                                     </del>			Victorioss spin spoon sampler to refusal		
								1			
									Boring terminated at 8'2".		
							┞		Notes: Advanced test boring with split spoon sampler. Boring backfilled		
		<u> </u>					<del> </del>		and surface asphalt patched on		
<u>20</u>			_				├		completion.		
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Test Boring No.	F	RWE	3-5
Page	1_	of	_1_
RDC Job #	3	381	.01

E	levati	on		s	tart .	7/9	/88		7/9/88 Driller M. Legare
٧	Vater I	Level -	Casin	ıg In -		1'0"			Inspector Nick Harding
Ε	Below :	Surface	e - Ca	sing C	ut	1'0", C	ave	in 4'0"	
	Seasonal and climatic changes may alter								els.
				Sampl					Soil and Rock Information
1		0.	6-/		187		5	Sample	Con and Hook information
0	С	6.	/12*		24.	N	No.	Depth	Remarks
			2						Asphalt 0'4"
		3	5	1	1	3_	1_	0'6"-2'0"	Brown moist misc. fill consisting of sand,
		3	3	3	4	8	2	2'0"-4'0"	gravel, asphalt and cinders  Brown moist misc. fill 4'0"
5		3	5	Ť	<u> </u>		<u> </u>		Brown moist misc. fill 4'0"  Black saturated fill consisting of sand, si
				9	10	14	3	4'0"-6'0"	gravel and cinders
		2	2						Black saturated misc. fill (wood
		2 : 1=		2	29	4		6'0"-8'0"	fragments noted at 7'6") 8'0"
		61 <b>/</b> 2				61 <b>/</b> 2	5	8'0"-8'2"	Black saturated misc. fill consisting of fly
10							<del> </del>	1	ash, sand, silt, gravel and cinders
							-		(Wood fragments noted throughout sample Advanced augers to refusal 8'2"
									02
								]	
15									
									Boring terminated at 8'2".
				<del> </del>			├	ł	Notes: Advanced test boring with hollow
				<del></del>			<b>-</b>		stem auger casing. Boring
20								1	backfilled and surface asphalt
									patched on completion.
					<u> </u>		├		
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	<u> </u>	DI	4 - Dai	. 2		1	2"		nt30* Ea. Blow



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RDC Job # 3449.01

										10/4/88 Driller D. Miller
	۷	Vater	Level -	Casin	ig In -	<u> </u>	Cave	n 5'	ς•	Inspector
									5*	
_	- <del>1</del>	easor					may a	iter (	observed water le	
	١			ws on			l	S	Sample	Soil and Rock Information
(	,	С	0.	6.			N	No.	Depth	Remarks
_	٦		10	18						Black moist misc. fill consisting of asphalt
					10	7	28	1	0'0"-2'0"	cinders, sand and gravel
			51	47	30	22	77	2	2'0"-4'0"	Black moist misc. fill
5			36	16	30	22	<del>  ' '                                 </del>	+		Black moist misc, fill 4'6"
_					13	6	29	3	4'0"-6'0"	Brown moist misc. fill consisting of sand,
			30	19						gravel and cinders 5'0"
					19	22	38	4	6'0"-8'0"	Black moist misc. fill consisting of asphal
1	٥						-	-		cinders, gravel and sand Black wet misc. fill 8'0"
÷	Ť								1	Diddy Wet Imse, III
			·							
							<u> </u>	<del>                                     </del>		Boring terminated at 8'0".
1	5		-					-		Notes: Advanced test boring with hollow stem auger casing. Boring
_	Ť							<del>                                     </del>		backfilled on completion.
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RDC Job # 3449.01

								ester, New York						
									Rochester, New York 14614					
									10/4/88 Driller D. Miller					
				Casing In - Non - Casing Out- Non										
							y alter observed water levels.							
	Seasor T					may a	iter (	bserved water lev						
				Sampl			S	ample	Soil and Rock Information					
0	l c	0.	6.	127	18.	N	No.	Depth	Remarks					
<u> </u>		8	15	10	724		10.		Black moist misc. fill consisting of asphalt,					
,				7	6	22	1	0'0"-2'0"	sand, cinders and gravel 2'0"					
5									Boring terminated at 2'0".					
, —									Notes: Advanced test boring with hollow stem auger casing. Boring					
							-		backfilled on completion.					
1	-						$t^-$							
10														
	<u></u>			ļ	<del>                                     </del>	<u> </u>	├—							
,	<b>—</b>	<u> </u>	<u> </u>	<del>                                     </del>			-							
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_		Plows	to Del	vo 2	<u> </u>	~	12"	with 140 lb s	wt30" Ea. Blow					
									wt Ea. Blow					



PROJECT 1	10. 8-	1066	PAGE 1	OF 1 TEST PIT NO. TP-1
PROJECT	Brown's	s Race Str	eet Evalua	tion, Rochester, New York
CLIENT	LaBella	a Associat	es, P.C.,	300 State Street, Rochester, New York
ELEVATION	·		WEATHER	Sunny INSPECTOR R. D'Hollander
DATE STAF	RTED 8,	/20/88	COMPLETE	0 8/20/88 OPERATOR
Test p	it excava	ated with	a tractor	mounted backhoe
DEPTH			DEPTH	SOIL AND ROCK CLASSIFICATIONS
BELOW SURFACE	P.P. (tsf)	SAMPLE NO.	OF SAMPLE	REMARKS
				ASPHALT 0'2"
		S-1	1'0"	Firm black ASH and CINDERS 1'2"
2				Angular siltstone and fine sandstone
4		S-2	3'6"	COBBLES with some boulders and a matrix of loose silt, some sand, trace clay, bricks and concrete, Seam of black ash and cinders at 3'0"
6				Water seepage at 5'10"
				Water pouring in at 6'6" in south- east corner
8				
				Backhoe refusal 8'4"
				Test pit terminated at 8'4"
10				Notes: Water at 7'2" 2 hours after completion
				Side walls caving Wall encountered at a depth of 2'6" on east side of test pit



PROJECT N	10. <u>8-</u>	1066	PAGE 1	OF 1 TEST PIT NO. TP-2
PROJECT	Brown'	s Race Str	eet Evalua	tion, Rochester, New York
CLIENT	<u>LaBell</u>	a Associat	es, P.C.,	300 State Street, Rochester, New York
ELEVATION	ı		WEATHER	Sunny INSPECTOR R. D'Hollander
DATE STAF	RTED 8	/20/88	COMPLETE	D <u>8/20/88</u> OPERATOR
Test pi	it excav	ated with	a tractor	mounted backhoe
DEPTH			DEPTH	SOIL AND ROCK CLASSIFICATIONS
BELOW	P.P.	SAMPLE	OF SAMPLE	DEMARKS
SURFACE	(tsf)	NO.	SAMPLE	REMARKS
				ASPHALT 0'2" Loose brown fine to medium SAND.
				trace silt 0'6"
2		Ş <b>-</b> 1	2'0"	Loose black moist ASH and CINDERS
		S-2	3'6"	3'6"
4				Loose to firm brown moist SILT,
				little sand, gravel, brick, cobbles, rubbish, trace clay and shells
				•
6				6'0"
				Loose gray wet SILT, trace clay
				Water seepage at 7'0"
8				Trace petroleum hydrocarbon odors
10				Backhoe refusal 10'0"
10				Backhoe refusal 10'0"
				Test pit termianted at 10'0"
				Notes: Water at 9'0" 0.5 hours
				after completion Side walls caving
				Race wall encountered at
				a depth of 2'6" on east
				side of test pit

`	PROJECT	ROWNS KACE	113FR1	JRINTURE	SHEETOF_G
		STUDY		CALCRY , NA	DATE 8 22 3
ciates, P.C.		830420			
ردeet در, New York 14614	PROJECT NO		 V = = 1 =	CHECK BY	
₹10	SUBJECT	EST PIT SI	KETCHE	5 - FIGU	KE
ROCH. PLUMBING  BROWN	NS SCALE		•	4"& RAIL ( RAIL ( 9' DEEP ±)	(TMP.) ACEWAY WALL
PARKING LOT ?	S'-10"	RACEWAY WALL	RTAR - FAC DNE ( 1/2" + TH		STREET LEVEL ASPHALT (2")
	X	- SECTION	_	,	
		N.T.S.			

## **LABELLA**

716 454-6110

LaBella Associates, P.C. 300 State Street Rochester, New York 14614 PROJECT BROWN'S RACE INFRA RUCTURE SHEET 2 OF 2

STUDY

CALC. BY NH DATE 8 22 188

PROJECT NO. 680428 CHECKBY DATE

SUBJECT TEST PIT SKETCHES - FIGURE



FORMER ROCH.
WATER WORKS

RACEWAY WALL

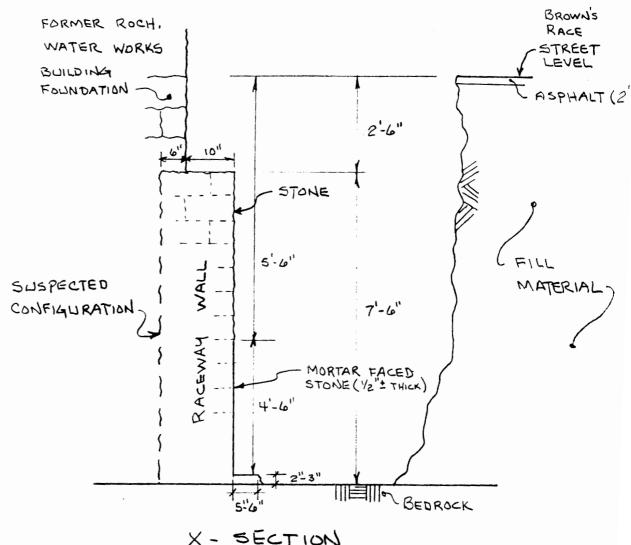
TP-2 (G'x 8' x 10' DEEP 2)

RACE

BROWN'S

PLAN

SSALE: 1"= 20'±



X - SECTION N.T.S.

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Test Boring No	F-1
Page 1	of 1
RDC Job #	3381 02

•	ect nt						State Street, Roc		
							Completed		
Wate	r Leve	I - Casir	ng In -		None		•		
		асе - Са							
Seas					may a	ter o	bserved water leve	els.	
		lows on				S	ample	Soil	and Rock Information
c	0.		12"/		NI-		Depth	-	Remarks
0	1	12.	18"	/24"	N	No.	Бери	Bituminu	s Concrete, top 0'5;"
-	6	10	<del> </del>					Portland	cement concrete (1" maximum
			5	8	15	1	1'0"-3'0"	aggregat	te size) 0'11" windamp coarse to fine gravel, son
	5	2	5	6	7	2	3'0"-5'0"	silt	wn damp coarse to line gravel, son 3'0"
5			-	l °		-		Loose be	rown damp silt, some coarse to fine
								gravel a	nd coarse to fine sand 5'0"
						_			
·	+-					-			g terminated at 5'0". : Advanced test boring with split
+								140185	spoon sampler. Cored surface
									with thin walled single tubed
			ļ		ļ	├			core barrel and diamond bit.  Boring backfilled and surface
15		+-	-	-	<del> </del>				asphalt patched on completion.
-									
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			+-	+-		1	1		
35	-								
					-	+	-		
			+-	-	+-	+	1		
-		<del></del>	+	+			1		
40	-								
	of Plo	ws to Dr	ive 2	• Sp	oon	12"	with 140 lb.	wt. <u>30"</u> Ea.	Blow
N=NO.	of Blo	ws to Dr	ive	Ca	sing_	<u></u>	_with lb.	wt Ea.	Blow

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Test Boring No.	F-2
Page <u>1</u>	of _1_
RDC Job #	

	Client Elevation			St	art		88	Completed	9/2/88 Driller T. Smith
١	<b>V</b> ater I	Level -	Casin	g In -		None			Inspector
				sing O		None			
5	Seasor	al and	l clima	tic cha	nges i	may al	ter o	bserved water lev	/els.
				Sampl			S	ample	Soil and Rock Information
0	С	0 6		· -/	18.	N	No.	Depth	Remarks
_									Bituminus concrete, top 0'3;"
		6	10					410# 010#	Portland cement concrete (1; maximum aggregate size) 0'10;
				10	13	20	1	1'0"-3'0"	aggregate size) 0'10; Firm brown damp silt and medium to fine
5		8	5	5	6	10	2	3'0"-5'0"	gravel, little fine sand 3'0"
³_				- 3	-	10	-		Firm red-brown damp brick fragments,
									coarse gravel and silt (fill) 5'0"
									Boring terminated at 5'0".
10								ĺ	Notes: Advanced test boring with split
									spoon sampler. Cored surface
									with thin walled single tubed
									core barrel and diamond bit.
							_		Boring backfilled and surface
1 5_							-		asphalt patched on completion.
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Test Boring No.	F-3
Page 1	of _1
RDC Job #	

		on					88	Completed	9/2/88 Driller T. Smith
٧	Nater 1	Level -	Casin	g In -		None			Inspector
		Surfac		-		None			
	Seasor	_				may a	ter c	bserved water le	vels.
		L		Sampl			S	Sample	Soil and Rock Information
0	С	0,	6"/12"		18'	N	No.	· · · · · · · · · · · · · · · · · · ·	Remarks
									Bituminus concrete, top 0'3"
		9	8				<del>  _</del> _		Light gray stone 0'9'z'  Compact brown damp fine sand and silt,
	<u> </u>	9	14	21	16	29	1_	1'0"-3'0"	coarse gravel and cobble fragments
5		9	1 4	12	15	26	2	3'0"-5'0"	Compact brown damp 5'0"
					<b> </b>	<u> </u>			
		<del> </del>				<del> </del>	<del> </del>	1	Sarias Ass. 1. A. A. Siss.
10							1		Boring terminated at 5'0".  Notes: Advanced test boring with split
							<u> </u>	1	spoon sampler. Cored surface
								]	with thin walled single tubed
			<u> </u>	<u> </u>		<b></b>	<b> </b>		core barrel and diamond bit.
15	<b></b>		<b></b>			<del> </del>	<del> </del>	-	Boring backfilled and surface
' 3		<del> </del>	ļ			-	+-	-	asphalt patched on completion.
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40	-	+	-	<del>                                     </del>		<del>                                     </del>	+	†	
_	<u> </u>						~"	with 140 lb.	wt. 30" Ea. Blow



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RDC Job # 3381.02

	C	Projec Client		a Bell	a Asso	ciates	, P.C.,	300	State Street, Roo	chester, New York  2010 10 10 10 10 10 10 10 10 10 10 10 10
			on Level -			tart .	9/2/ None	88	Completed	9/2/88 Driller T. Smith
			Surfac		-		None			_ Inspector
					-			ter c	bserved water lev	els.
		Joudon	Blo	ws on	Sampl	er			Sample	Soil and Rock Information
	0	С	0.	67	12.	18*/	N	No.	Depth	Remarks
					ļ	ļ				Bituminus concrete, top 0'3"
			7	10	9	12	19	1	0'6"-2'6"	Firm brown damp fine sand and silt Firm brown damp Pushing cobble fragments or gravel ahead
	5	<u></u> _	12	12	10	7	22	2	2'6"-4'6"	split spoon to 4'6" 4'6"
	10_									Boring terminated at 4'6".  Notes: Advanced test boring with split spoon sampler. Cored surface with thin walled single tubed core barrel and diamond bit.  Boring backfilled and surface asphalt patched on completion.
	15_									
-	20_									
-	25_									
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- -	40									
	N=N								with lb. v	vt Ea. Blow vt Ea. Blow

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Test Boring No.	C-1
Page 1	of 1
RDC Job #	3381.02

Below Surface - Casing Out- Seasonal and climatic changes may alter observed water levels.    Sample   Soil and Rock Information				Casia			9/2/ None	88	Completed _	9/2/88 Driller T. Smith Inspector	
Seasonal and climatic changes may after observed water levels.    Blows on Sample   Sample   Soil and Rock Information					_					mspector	
Blows on Sampler  O C 6 12 18 24 N No. Depth  6 10 6 16 1 1 1'0'-3'0'  5 4 6 6 8 2 3'0'-5'0'  Boring terminated at 5'0'. Notes: Advanced test boring with s spoon sampler. Cored surface and all administration with thin Boring backfilled and surface asphalt patched on completic asphalt patched asphalt patched on completic asphalt patched on completic asphalt patched asphalt patched asphalt patched asphalt patched asphalt patched asphalt patched asphalt patched asphalt patched a					_			1407.0	beened water lev	vole	
C   0		easor					llay a				
C 6 12 18 24 N No. Depth  Bituminus concrete, top 0  Brick C Firm brown damp coarse to medium some sith and coarse sand 3  Some sith and coarse sand 3  Loose brown sit, little ash and brick medium to fine gravel (fill) 5  Boring terminated at 5'0". Notes: Advanced test boring with some some same sith and coarse sand with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completic								S	Sample	Soil and Rock Information	ר
Bituminus concrete, top 0  6 10 6 6 16 1 1'0'-3'0"  5 4 6 8 2 3'0'-5'0"  Boring terminated at 5'0".  Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit.  Boring backfilled and surface asphalt patched on completic		С			· -/		N	No.	Depth	Remarks	
Firm brown damp coarse to medium some silt and coarse sand 3  4 6 8 2 3'0"-5'0"  Boring terminated at 5'0". Notes: Advanced test boring with some spon sampler. Cored surfawith thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completions.	-			7 12	7 10	2 24		1		Bituminus concrete, top	0'4'
5 4 6 8 2 3'0"-5'0"  Some silt and coarse sand 3 Lose brown silt, little ash and brick medium to fine gravel (fill) 5'  Boring terminated at 5'0". Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completion asphalt			6	10					]		0'1
Loose brown silt, little ash and brick medium to fine gravel (fill)  Boring terminated at 5'0".  Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit.  Boring terminated at 5'0".  Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit.  Boring terminated at 5'0".  Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit.  Boring terminated at 5'0".  Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit.  Boring terminated at 5'0".  Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit.  Boring terminated at 5'0".  Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit.  Boring terminated at 5'0".	- {				6	6	16	1	1'0"-3'0"		
Boring terminated at 5'0". Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completion	5		5	4	4	6	8	2	3'0*-5'0*		
Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completic	Ĭ+				-	-		-	30-30		0"
Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completic	į										
Notes: Advanced test boring with s spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completic											
spoon sampler. Cored surfa with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completic	ا ۱							-			
with thin walled single tubed core barrel and diamond bit. Boring backfilled and surface asphalt patched on completion asphalt	`*+							_			
core barrel and diamond bit. Boring backfilled and surface asphalt patched on completic											
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Test Boring No. C-2 Page 1 of 1 RDC Job # 3381.02

	Elevati Water I				lart _	9/2/ None		Completed	9/2/88
	Below			•		None			
						nay a	lter o	oserved water lev	els.
			ws on	Sampl	er		S	ample	Soil and Rock Information
	c	0./	6.	127	18"			•	Remarks
0_	<u> </u>	<u>6.</u>	12.	18"	/24°	N	No.	Depth	Bituminus concrete, tope strength 0'3
	<b></b>						$\vdash$		Portland cement concrete (1" maximum
									aggregate size) 0'5
_							$\vdash$		
5_				<u> </u>	<b></b>		+		Boring terminated at 0'5 1".
									Notes: Cored surface with thin walled
							<del>                                     </del>		single tubed barrel and diamon
10	ļ				<b> </b>		-		bit. Abandoned boring due to underground utilities. Boring
	<b>†</b>								backfilled and surface asphalt
						·			patched on completion.
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RDC Job # 3381.02

	Water I Below					None None			Inspector
				-			ter c	bserved water leve	els.
			Blows on Sampler			Sample			Soil and Rock Information
<u>0</u> 5	С	0, 6, 12.			18"/	N	No.		Remarks
		-	12"	7 18	7 24				Bituminus concrete, top 0'5;
		11	23						Brick 0'1
		10		18	17	41	1	1'0"-3'0"	Compact brown damp medium to fine grand silt 3'0"
	<u> </u>	12	11	100/3		111/9	2	3'0"-4'3"	Very dense brown damp silt 4'0'
J_				1000		11.70	-		Weathered rock fragment
								]	Refusal with split spoon sampler 4'3
								]	
						ļ			Boring terminated at 4'3".
10_	<u> </u>								Notes: Advanced test boring with spli
							-		spoon sampler. Cored surface with thin walled single tubed
	<u> </u>	<u> </u>	<u> </u>						core barrel and diamond bit.
									Boring backfilled and surface
15_									asphalt patched on completion.
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RDC Job # 3381.02

	lient		a Bell	a Asso	ociates,	P.C.,	300	State Street, Ro	sessment, Rochester, New York schester, New York 14614
Ε	levatio	on		S	tart	9/2/	88	Completed _	9/2/88 Driller T. Smith
				g In -		None			Inspector
В	elow	Surface	ө - Ca	sing C	ut	None			
s	eason	al and	clima	tic cha	inges r	nay al	ter o	bserved water le	vels.
				Sampl					Soil and Rock Information
		0.	6"/	12"/	18'		0	lample	
0	С	6.	12.	18"	24.	N	No.	Depth	Remarks
									Bituminus Concrete, top 0'52"
		6	10						Portland cement concrete (1" maximum
1		1.5		17	12	27	1	1'0"-3'0"	aggragate size) 0'9"  Compact brown damp silt and fine sand,
5		15	6	6	7	12	2	3'0"-5'0"	some fine gravel 3'0"
~ <del>+</del>				-			-		Firm brown damp silt and wood, some fine
1									gravel (fill) 5'0"
							-		Boring terminated at 5'0".
10									Notes: Advanced test boring with split
		<u> </u>					-	{	spoon sampler. Cored surface
					<del>                                     </del>		<del> </del>	1	with thin walled single tubed core barrel and diamond bit.
					<b>†</b>				Boring backfilled and surface
15									asphalt patched on completion.
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		210140	Drive	_ 2*	Smo	on 1	2"	with 140 lb.	wt. 30" Ea. Blow

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Test Boring No.	C-4
Pag <b>e</b> <u>1</u>	_ of _1
RDC Job #	

						_			Name of the State
	Projec								Assessment, Rochester, New York
	Client								Rochester, New York 14614
	Elevation						88	Completed	9/1/88 Driller T. Smith
	Water I			_		None			Inspector
	Below :					None			
	Season	al and	clima	tic cha	inges i	may a	ter o	bserved water	levels.
		Blo	ws on	Sampl	er		S	ample	Soil and Rock Information
		0.	6"/	127	18"				Remarks
0	С	6.	/12*	/18*	/24.	N	No.	Depth	
							<b> </b>		Bituminus Concrete, top 0'3"  Portland cement concrete (1" maximum
		5	3	_		-	-	0'6"-2'6"	aggragate size) 0'6"
		5	6	3	6	6	1	06-26	Loose brown wet coarse to fine gravel and
5		<u> </u>	-	3	7	9	2	2'6"-4'6"	
-	<b></b>								Loose brown wet silt and fine gravel, some
									coarse to fine sand 4'6"
							<u> </u>		
10	<u> </u>								Boring terminated at 4'6".
10_	+				<del> </del> -		-		Notes: Advanced test boring with split
					<del> </del> -		+		spoon sampler. Cored surface with thin walled single tubed
	-	<del>                                     </del>			$\vdash$	<b>†</b>		]	core barrel and diamond bit.
								]	Boring backfilled and surface
15							↓_	1	asphalt patched on completion.
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								with <u>140</u> It	
C=	No. of	Blows	to Driv	ө	Cas	sing		with lt	o. wt Ea. Blow

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RDC Job # 3381.02

ŀ	Projec								sessment, Rochester, New York
	Client								ochester, New York 14614
							88	Completed _	9/1/88 Driller T. Smith
	Water			-		6'0"			Inspector
	Below			•				e in 2'4"	
	Seasor					may al	ter c	bserved water le	vels.
		1	ws on	Sampl	er		S	ample	Soil and Rock Information
		0.	6.	12"/	187				Remarks
0	С	6.	12.	18"	/24"	N	No.	Depth	PARTLAND
						1.0		0105 0105	Bitumbus concrete. binder 0'3" 6"
			5	11	8	16	1	0'6"-2'0"	Firm brown damp fine sand and medium to fine gravel, some silt 2'0"
	<del> </del>	5	6	8	6	14	2	2'0"-4'0"	Firm brown damp silt and fine sand, some
5		5	7				_		fine gravel 4'0"
				100/2		107/8	3	4'0"-5'2"	Very dense red-brown damp brick
		16	31			1010		5'2"-6'4"	fragments, cobble fragments and silt (fill)
		<u> </u>		100/2		131/8	4	32 -04	Very dense brown wet fine sand and
10							-		weathered rock fragments, little silt
-		-		-	<b></b>				Advanced augers to refusal 6'2"
									Device terminated at 6100
									Boring terminated at 6'2".  Notes: Advanced test boring with
									hollow stem auger casing.
15	<del> </del>			<del> </del>		<u> </u>			Cored surface with thin walled
	<u> </u>						-		single tubed core barrel and
		$\vdash$	<del> </del>				_		diamond bit. Boring backfilled and surface asphalt patched on
									completion.
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N_N	lo of I	Slowe	n Driv	2"	Sm	on 1	2"	with 140 lb. v	wt. 30" Ea. Blow
								with ib	



### ROCHESTER DRILLING COMPANY, INC.

Environmental Drilling Services, Landfill Gas Extraction Wells Monitoring Wells, Test Borings, Foundation Investigations 45 Steel Street, Rochester, New York 14606 Telephone 716-458-0821 • FAX 716-458-5041

Test Boring No. <u>CR-2</u>

Page <u>1</u> of <u>1</u>

RDC Job # <u>3381.02</u>

E	levatio	on		—. °	iari .	12:25		Completed	9/1/88 Driller T. Smith
W	/ater l	_evel -	Casin	ig in -		None		in 6'0"	Inspector
В	elow :	Surfac	e - Ca 	sing C	)ut <u>'</u>	YOHO,	cave	in 6'0"	
<u> </u>	eason					may a	iter (	observed water lev	
į		Blo	ws on				S	Sample	Soil and Rock Information
		0./		12				·	Remarks
<u></u>	C	<u>6.</u>		18"	<u>/24°</u>	N	No.	Depth	
}		6	12	10	7	22	1	0'0"-2'0"	Firm brown dry fine gravel, little silt 2'0'
ŀ		7	6		<b></b>		广	-	Firm red-brown damp brick fragments,
į				7	8	13	2	2'0"-4'0"	silt, little gravel
5		3	5				<u> </u>		
-		5	8	5	7	10	3	4'0"-6'0"	Firm red-brown damp
ŀ		3	- 0	3	3	11	4	6'0"-8'0"	Firm red-brown wet (wood noted)
Ì		3	5					]	( ( ( ( )
10				100/4		105/10	<u> </u>	8'0"-9'4"	Very dense brown wet
		14	23	20	32	43	-	10'0"-12'0"	No recovery sample# 6 12'
- }		21	100/5		32	100/5		12'0"-12'11"	No recovery sample# 6 12'  Very dense brown wet silt and weathere
ł			1.040						fragments
15							L		Advanced augers to refusal 12'
		<u> </u>	ļ	ļ	ļ		<del> </del>	1	
l			<del> </del>		-	<del> </del>	-		
			<del> </del>		<b></b>	<b>†</b>		1	Boring terminated at 12'11".
20								]	Notes: Advanced test boring with holl
					<u> </u>	ļ	↓	4	stem auger casing. Boring
					<del> </del>	<del></del>	╁	-	backfilled on completion.
			<del>                                      </del>	<del> </del> -	$\vdash$	+	╁	1	
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						<u> </u>	<del>                                     </del>	4	
		-	┼	<del> </del>	-	-	+	4	
40	<b></b>	┼	+	+	1-	+	+	┥	

Appendix C

Analytical Data

#### PROJECT MEMORANDUM

#### 88042B

TO:

City of Rochester

FROM:

LaBella Associates, P.C.

RE:

Brown's Race Infrastructure Study (88042)

DATE:

23 June, 1988

LaBella Associates has tentatively scheduled subsurface investigation of the Brown's Race Infrastructure Study according to the following:

- 1) Rochester Drilling Co., Inc. will advance test bores on 29-30 June, 1988. This will include 5 overburden test bores along the raceway and several shallow overburden test bores along Commercial and Furnace Streets. Composite samples will be taken from the 5 raceway bores to determine chemical content, while the other shallow test bores will be performed to determine load bearing capacity of the existing roadways.
- 2) General Testing Corporation is prepared to perform analytical testing of the 5 composite samples extracted from the raceway. It is anticipated that laboratory turnaround time should be approximately 3 weeks from time of sample delivery.

Particulars for test bores and laboratory analytical protocol are described on the attached work plan.

#### Proposed Work Plan for Rochester Drilling Co., Inc. and General Testing Corp.

Schedule for test bores: 29 and 30 June, 1988.

A) Advance 5-2 1/2" diameter split spoon test bores along the raceway. All material removed will be classified according to the Casagrande System and will be secured in clean glass containers for compositing at the laboratory.

The following agencies will be notified of the planned work:

- 1) NYS DEC, Avon, N.Y.
- 2) Monroe County Traffic Department
- 3) All utilities in the area, and
- 4) RG&E maintenance officials

#### Details of the planned work:

- o Rochester Drilling will begin the work using Level D protection procedures and upgrading as necessary. A P.I.D. meter will be used to monitor bore hole gas concentrations, as well as ambient breathing areas. Concentrations of gases at 5 PPM over background concentrations will initiate upgrading to the next protection level.
- o 55 gallon drums will be placed on-site for securing any material that is suspected to be contaminated.
- o Each boring site along the raceway will be secured and cleaned up prior to relocating to next bore. The drill rig to be used will not be staged on site overnight.
- Split spoons used for extracting samples will be decontaminated between bores using a detergent solution and rinsed with deionized water.
- o Attached information sheets describe in detail the level of protection to be used by drilling personnel.
- B) General Testing Corporation will perform analytical work according to a schedule pre-determined by the City of Rochester. The attached sheet describes in detail proposed analytical protocol, pricing, and other pertinent data.

PM

### SURCHARGES FOR LEVELS OF PERSONAL PROTECTION

per day per man Highest Degree of Protection Level  $\lambda$ :

SCBA Presure-Demand or Pressure-Respiratory Protection:

Demand Breathing Apparatus with appropriate primary air supply

and air supply hose.

Total Encapsulating Suit Full-Body Protection:

Highest Degree of Respiratory Protection and Lesser Level B: Degree of Skin Protection

Same as Level A Protection Respiratory Protection:

Polyethylene-Coated Tyvek, single-Full-Body Protection: .

use suit, gloves and boots

Exposures to known Concentrations of Contaminants Level C:

per day per man

OLINIOLO CON

Full or Half Facepiece dual-cartridge Respiratory Protection:

Respirator with appropriate cartridges

Same as Level B Full-Body Protection:

per day per man Lowest Level of Protection Level D:

None Respiratory Protection:

Same as Level B or Splash Suit, gloves Full-Body Protection:

and boots

18A

45 STEEL STREET • ROCHESTER, NEW YORK 14606 • (716) 458-6060

### general testing corporation

#### water and wastewater testing specialists

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

August 25, 1988

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614

Re: Brown Race - 88042B

Dear Mr. Harding:

Enclosed is the Analytical Data report for the above referenced project. Thirteen (13) samples were received into our laboratory on July 11, 1988. All were analyzed according to the parameters specified on the Chain of Custody form.

Due to high levels of Petroleum Hydrocarbons present, higher dilutions were necessary to eliminate interferences for the Semi-Volatile Fractions.

Insufficient samples were available to perform Job Specific QC. However, Laboratory Blanks and Reference Standards analyzed on the same days as your samples are available upon request.

A Chronology and Documentation information are also included.

We trust you will find all in order. Please contact us if you have questions regarding this report.

Sincerely,

GENERAL TESTING CORPORATION

Karen Bunker

Client Representative

KB/lg

Encs.

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference:

Brown Race 88042B

Received

: 7/11/88

P.O. #:

Sample: Location:  Date Collected: Time Collected:	-001  RWB-1  Composite  7/9/88  10:30	-002  RWB-2  Composite  7/9/88  09:30	-003  RWB-3  Composite  7/9/88  08:30	-004  RWB-4  Composite  7/9/88  07:45	-005  RWB-5  Composite  7/9/88  07:15	-006  RWB-1  Grab: W/S  7/9/88  10:30	-007  RWB-2  GRAB: W/S  7/9/88  09:30	-00  RWB-  Grab  7/9/3
							************	
EP TOX Extract, Metals	   .*	   *	*	   •	*	1	! 	
Arsenic	<0.020	<0.020	,   <0.020	<0.020	<0.020	i	i	i
Barium	<1.00	<1.00	<1.00	<1.00	<1.00	i	i	i
Cadmium	<0.10	<0.10	<0.10	<0.10	<0.10	i	i	i
Chromium	<0.50	<0.50	<0.50	<0.50	<0.50	i	i	i
Lead	<0.50	<0.50	<0.50	<0.50	<0.50	İ	i	İ
Mercury	<0.0020	0.00704	<0.0020	<0.0020	<0.0020	1	1	1
Selenium	<0.020	<0.020	<0.020	<0.020	<0.020	1	1	1
Silver	<0.10	<0.10	<0.10	<0.10	<0.10	1	ł	1
Volatile Organics-GC/MS	1	1	1	1	1	**	<b>**</b>	1
Semivolatile Organics	**	**	**	<b>**</b>	**	1	1	1
Pet. Hydrocarbons, IR +	111	3620	1020	818	643	1	1	27
	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1

\*EP TOX Extraction in accordance with Federal Register, Volume 45, No. 98, May 19, 1980, Rules and Regulations.

+ Units - ug/g wet weight

\*\* See Attached Data

Analytical procedures in accordance with Standard Methods for the Examination of Water and Wastewater, 15th Edition and Methods for Chemical Analysis of Water and Wastes, EPA. (<) indicates lowest detectable concentration with procedures used. Data on quality control performed with above sample(s) is available upon request.

Michael K. Perry Laboratory Director

> ا الرفران سر

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760

85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference:

Brown Race 88042B

Received

: 7/11/88

P.O. #:

Sample:	-009	-010	-011	-012	-013	!	!	ļ
Location:	RWB-3	RWB-4	RWB-4	RWB-5	RWB-5	!	!	ļ
	Comp: W/S	Grab	Comp: S/C	Grab: W/S	Grab	1	1	ļ
Date Collected:	7/9/88	7/9/88	7/9/88	7/9/88	7/9/88	. !	1	
Time Collected:	08:30	07:45	07:45	07:15	07::15	1	l	1
=======================================	:======== 	========= 	 	======================================	======================================			1
EP TOX Extract, Metals		i	i	İ	i	i		i
Arsenic	ĺ	1	1	1		1	1	1
Barium	1	1	1	1		1	1	1
Cadmium	1	1	1	1			1	j
Chromium	1	1		1		I	1	l
Lead	1	1	ı	1	1	1	1	i
Mercury	1	1	1	1	1	1	1	l
Selenium	1		1	1	1	I	l	ļ
Silver	1	1	I	1	1	l	ŀ	1
Volatile Organics-GC/MS	**	**	I	**		l	1	1
Semivolatile Organics	1	1		l		1	1	1
Pet. Hydrocarbons, IR +	1	1	1010	1	748		1	1
	1	1		1		1	1	1
	ŀ	i .	1	1	1	1	1	1

\*EP TOX Extraction in accordance with Federal Register, Volume 45, No. 98, May 19, 1980, Rules and Regulations.

- + Units ug/g wet weight
- \*\* See Attached Data

Analytical procedures in accordance with Standard Methods for the Examination of Water and Wastewater, 15th Edition and Methods for Chemical Analysis of Water and Wastes, EPA. (<) indicates lowest detectable concentration with procedures used. Data on quality control performed with above sample(s) is available upon request.

Milael K. Pery

Laboratory Director

ar principle of the principle of

# general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference

Brown Race 88042B

Received

: 7/11/88

P.O. #:

BASE NEUTRALS BY	EPA ME	HOD 827	/ () *	ANALYTI	CAL RESU	LTS -	ug/kg	Wet W
Sample:	-001	-002	-003	-004	-005		1	1
Location:	RWB-1	RWB-2	RWB-3	RWB-4	RWB-5		ì	i
20020,000	Composite	Composite	Composite	Composite	Composite		i	i
Date Collected:	7/9/88	7/9/88	7/9/88	7/9/88	7/9/88		i	i
Time Collected:	110:30	09:30	08:30	07:45	107:15		i	i
**********************						=======	' 5888888888	' 
ate Extracted:	7/21/88	7/21/88	7/21/88	7/21/88	7/21/88		1	1
Date Analyzed:	8/18/88	8/22/88	8/18/88	8/18/88	8/18/88		i	i
N-Nitrosodimethylamine	<660	<3300	<3300	<3300	<3300		i	i
Bis(2-chloroethyl) ether	<660	<3300	·   <3300	<3300	<3300		İ	i
1,3 Dichlorobenzene	<660	<3300	<3300	·   <3300	<3300		i	i
1,4 Dichlorobenzene	<660	·   <3300	<3300	·   <3300	<3300		1	i
1,2 Dichlorobenzene	<660	<3300	<3300	<3300	<3300		1	i
bis(-2-chloroisopropyl)ether	<660	·   <3300	<3300	<3300	<3300		1	İ
N-Nitroso-Di-n-propylamine	<660	<3300	<3300	<3300	<3300		i	i
Hexachloroethane	<660	<3300	<3300	·   <3300	<3300		i	į
Nitrobenzene	<660	<3300	<3300	<3300	<3300		ĺ	i
Isophorone	<660	<3300	<3300	·   <3300	<3300		ĺ	i
bis(-2-chloroethoxy)methane	<660	<3300	·   <3300	<3300	<3300		ĺ	İ
1,2,4-Trichlorobenzene	·   <660	<3300	<3300	<3300	<3300		i	i
Naphthalene	·   <660	·   <3300	<3300	<3300	<3300		i	i
Hexachlorobutadiene	<660	<3300	<3300	<3300	<3300		i	i
Heaxachlorocyclopentadiene	<660	<3300	·   <3300	·   <3300	i <3300 i		i	i
2-Chloronaphthalene	<660	<3300	<3300	<3300	<3300		i	i
Dimethyl phthalate	<660	<3300	<3300	,   <3300	<3300		i	i
Acenaphthylene	<660	3450	<3300	<3300	<3300		i	i
Acenaphthene	<660	<3300	<3300	<3300	<3300		i	i
2,4-Dinitrotoluene	<660	<3300	<3300	<3300	<3300		i	i
2,6-Dinitrotoluene	<660	<3300	<3300	<3300	<3300		i	i
Diethyl phthalate	<660	<3300	·   <3300	<3300	<3300		i	i
4-Chlorophenyl-phenyl-ether	<660	<3300	<3300	<3300	<3300		i	i
Fluorene	<660	<3300	<3300	<3300	<3300		1	i
1,2-Diphenylhydrazine	<660	<3300	<3300	·   <3300	<3300		İ	i
N-Nitrosodiphenylamine	<660	<3300	<3300	<3300	<3300		i	j
4-Bromophenyl-phenylether	<660	<3300	<3300	<3300	<3300		i	i
Hexachlorobenzene	<660	<3300	<3300	<3300	<3300		i	i
Phenanthrene	<660	11,200	<3300	·   <3300	<3300		1	l
Anthracene	<660	4260	<3300	<3300	<3300		i	i
Di-n-butyl phthalate	638	<3300	<3300	<3300	<3300		i	i
Benzidine	<660	<3300	<3300	<3300	<3300		i	i
Fluoranthene	<660	34,200	<3300	<3300	<3300		i	İ
Pyrene	<660	31,900	<3300	<3300	<3300		i	i
Butyl benzyl phthalate	<660	<3300	<3300	<3300	<3300		i	i

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

#### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference

Brown Race 88042B

Received

: 7/11/88

P.O. #:

Location:	Composite  7/9/88  10:30     7/21/88  8/18/88     <1300	-002  RWB-2  Composite  7/9/88  09:30 ========  7/21/88  8/22/88	-003  RWB-3  Composite  7/9/88  08:30   7/21/88  8/18/88	-004  RWB-4  Composite  7/9/88  07:45	-005  RWB-5  Composite  7/9/88  07:15	           	           	       
rate Collected:  ime Collected:  rate Extracted:  Date Analyzed:  3,3'-Dichlorobenzidine  Benzo(a)anthracene	Composite  7/9/88  10:30     7/21/88  8/18/88     <1300	Composite  7/9/88  09:30  7/21/88	Composite  7/9/88  08:30  7/21/88	Composite  7/9/88  07:45   7/21/88	Composite  7/9/88  07:15  7/21/88	         	       	     
ate Collected:  Time Collected:  Pate Extracted:  Date Analyzed:  3,3'-Dichlorobenzidine  Benzo(a)anthracene	7/9/88  10:30     7/21/88  8/18/88     <1300	7/9/88  09:30     7/21/88	7/9/88  08:30  7/21/88	7/9/88  07:45 ====================================	7/9/88  07:15     7/21/88	     	     	     
ime Collected:	10:30 	09:30 ====================================	08:30     7/21/88	07:45 ====================================	07:15    7/21/88	   	   ==================================	!   
pate Extracted:   Date Analyzed:   3,3'-Dichlorobenzidine   Benzo(a)anthracene	7/21/88  8/18/88     <1300	  7/21/88	7/21/88	========  7/21/88	  7/21/88	 ====================================	 ====================================	 =======
Date Analyzed:	8/18/88     <1300	•	•	•	•			
3,3'-Dichlorobenzidine   Benzo(a)anthracene	<1300	8/22/88 	8/18/88	10/40/00	•			1
Benzo(a)anthracene		l	1	8/18/88	8/18/88	İ	i	i
Benzo(a)anthracene		L 4700	4500	1 4500	1 -4500		1	!
•		<6500	<6500	<6500	<6500	!	!	!
Ris(7-athylhayyl)nhthalata	<660	17,800	<3300	<3300	<3300	!	ļ .	ļ
• • •	<660	<3300	6760	8030	24,100	!	1	!
Chrysene	<660	17,500	<3300	<3300	<3300		1	ļ
Di-n-octyl phthalate	598	<3300	<3300	<3300	<3300		1	1
Benzo(b)Fluoranthene	<660	17,800	<3300	<3300	<3300		l	1
Benzo(k)fluoranthene	<660	11,500	<3300	<3300	<3300		I	1
Benzene(a)pyrene	<660	12,900	<3300	<3300	<3300		1	1
Indeno(1,2,3-cd)pyrene	<660	5300	<3300	<3300	<3300		1	
Dibenzo(a,h)anthracene	<660	<3300	<3300	<3300	<3300		1	1
Benzo(g,h,i)perylene	<660	<3300	<3300	<3300	<3300		1	ĺ
		1	1	 	1		1	1
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\* SW846 Manual, Test Methods for Evaluating Solid Waste, 3rd Edition, 11/86.

Michael K. Peng

Laborato Director

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### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference

Brown Race 88042B

Received

: 7/11/88

P.O. #:

Location:   RWB-1   RWB-2   RWB-3   RWB-4   RWB-5	Sample:	-001	-002	-003	-004	-005	1	1	1
Date Collected:   7/9/88   7/9/85   7/9/88   7/9/88   7/9/88   7/9/88   7/9/88   7/9/85   7/9/85   7/9/85   7/9/88   7/9/85   7/9/85   7/9/88   7/9/85   7/9/85   7/9/85   7/9/88   7/9/85   7/9/85   7/9/88   7/9/85   7/9/85   7/9/85   7/9/88   7/9/85   7/9/85   7/9/85   7/9/85   7/9/88   7/9/85   7	Location:	RWB-1	RWB-2	RWB-3	RWB-4	RWB-5	ĺ	1	İ
Date Extracted:   17/21/88   7/21/88   7/21/88   7/21/88   7/21/88	Ĵ(	Composite	Composite	Composite	Composite	Composite	1	i	i
Date Extracted:  7/21/88  7/21/88  7/21/88  7/21/88   7/21/88	Collected:	7/9/88	7/9/88	7/9/88	7/9/88	7/9/88	1	i	i
Date Analyzed:   8/18/88   8/20/88   8/20/88   8/20/88   8/20/88	Collected:	10:30	09:30	08:30	07:45	07:15	İ	İ	İ
Phenol   <600   <3000   <600   <600   <600     2-Chlorophenol   <660   <3000   <600   <600   <600     2-Nitrophenol   <660   <3000   <600   <600   <600     2,4-Dimethylphenol   <600   <3000   <600   <600   <600     2,4-Dichlorophenol   <600   <3000   <600   <600   <600     4-Chloro-3-methylphenol   <1300   <6500   <1300   <1300   <1300   <1300     2,4,6-Trichlorophenol   <600   <3000   <600   <600   <600     2,4-Dinitrophenol   <3300   <16,500   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3300   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <3000   <300	e Extracted:	7/21/88	7/21/88	7/21/88	7/21/88	7/21/88			
2-Chlorophenol   <660   <3000   <600   <600   <600     2-Nitrophenol   <600   <3000   <600   <600   <600     2,4-Dimethylphenol   <600   <3000   <600   <600   <600     2,4-Dichlorophenol   <600   <3000   <600   <600   <600     4-Chloro-3-methylphenol   <1300   <6500   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <1300   <	e Analyzed:	8/18/88	8/20/88	8/20/88	8/20/88	8/20/88	!	!	1
2-Nitrophenol   <600   <3000   <600   <600     <600	nol [	<600	<3000	   <600	<600	<600	! 	 	
2,4-Dimethylphenol       <600	hlorophenol	<660	<3000	<600	<600	<600	1	1	
2,4-Dichlorophenol       <600	itrophenol	<600	<3000	<b>  &lt;600</b>	<600	<600	1	1	1
4-Chloro-3-methylphenol   <1300   <6500   <1300   <1300   <1300	-Dimethylphenol	<600	<3000	<600	<600	<600	i	1	1
2,4,6-Trichlorophenol         <600	-Dichlorophenol	<600	<3000	<600	<600	<600	1	1	ļ
2,4-Dinitrophenol   <3300   <16,500   <3300   <3300   <3300	hloro-3-methylphenol	<1300	<6500	<1300	<1300	<1300	1	1	1
4-Nitrophenol   <3300   <16,500   <3300   <3300   <3300	,6-Trichlorophenol	<600	<3000	<600	<b>&lt;</b> 600	<600	l	1	1
2-Methyl-4,6-dinitrophenol   <3300   <16,500   <3300   <3300	-Dinitrophenol	<3300	<16,500	<3300	<3300	<3300	1	1	1
	itrophenol	<3300	<16,500	<3300	<3300	<3300	1	1	1
Pentachlorophenol   <3300   <16,500   <3300   <3300   <3300	ethyl-4,6-dinitrophenol	<3300	<16,500	<3300	<3300	<3300	I	1	
	tachlorophenol	<3300	<16,500	<3300	<3300	<3300	ļ	ĺ	į
			1	1	1	1	<b>!</b>		1
	ļ		1	1	1	1		1	
			1	1			! <b> </b>	İ	1
	1		1		 	<u> </u>	[ 	! 1	1
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\* SW846 Manual, Test Methods for Evaluating Solid Waste, 3rd Edition, 11/86.

Milael K. Perry Laboratory rector

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

#### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference

Brown Race 88042B

Received

: 7/11/88

P.O. #:

Sample:	-001	-002	-003	-004	-005		1	1	
Location:	RWB-1	RWB-2	RWB-3	RWB-4	RWB-5	1	-	1	
	Composite	Composite	Composite	Composite	Composite	1	1	ı	
Date Collected:	7/9/88	7/9/88	7/9/88	7/9/88	7/9/88		1	1	
Time Collected:	10:30	09:30	08:30	07:45	07:15	1	1	1	
********************						=======	======		===
Date Analyzed:	8/20/88	8/20/88	8/20/88	8/20/88	8/18/88	1	1	1	
Date Extracted:	7/21/88	7/21/88	7/21/88	7/21/88	7/21/88	i	1	1	
	1	1	1	1	1	1	1	1	
ACIDS	1	1	1	1	1		1	1	
	I		i	1	1	1	1	1	
2-Fluorophenol	94%	64%	129% ++	72%	73%	1		ļ	
Acceptance Limits: 25-121%)	1	1	1	1	1	1	1	1	
	1	1	1	ļ	1	1		1	
Phenol-d5	100%	45%	110%	87%	77%	1		l	
Acceptance Limits: 24-113%)	!	!	!	ļ	!		1	1	
	1	1		!		!	ļ	!	
2,4,6-TriBromophenol	69%	43%	105%	80%	70%	!	!		
Acceptance Limits: 19-122%)	!	!	!	!	!	!	ļ	1	
	!	!	!	!	ļ	]	ļ	!	
BASE NEUTRALS	!	1	1	!	!	!	ļ	ļ	
				10.40.40	10.40.40	!		!	
Date Analyzed:	8/18/88	8/22/88	8/18/88	8/18/88	8/18/88	!	!	1	
Nitrobenzene-d5	   48%	1   35%	1 21%++	1   37%	42%	1		I	
Acceptance Limits: 23-120%)	1 40%	32%	1 21644	3/%	1 42%	 	i	!	
Acceptance Chilles: 25-120%)	l l	1	1	1	1	l L	1		
2-Fluorobiphenyl	l 1 59%	i i 85%	1 61%	1 67%	1 77%	1	1	1	
Acceptance Limits: 30-115%)	1	1	1	1	1 ''"	1	i	1	
receptance timits. 30°113%)	1	1	i	1	1			1	
Terphenyl-d14	62%	89%	I 75%	1 86%	93%	i		1	
Acceptance Limits: 18-137%)	1	1	1	1	1	i	i		

<sup>\*</sup> SW846 Manual, Test Methods for Evaluating Solid Waste, 3rd Edition, 11/86.

Michael K. Peny Laboratory Director

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<sup>++</sup> Outside of Current Acceptance Limits.

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760

85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference

Brown Race 88042B

Received

: 7/11/88

P.O. #:

			ソンとみてル					
Sample:	-006	-007	-009	-010+	-012	!		
Location:	RWB-1	RWB-2	RWB-3	RWB-4	RWB-5			1
	Grab: W/S	GRAB: W/S	Comp: W/S	Grab	Grab: W/S	<u> </u>		l
Date Collected:	7/9/88	7/9/88	7/9/88	7/9/88	7/9/88		!	!
ime Collected:	10:30	09:30 	08:30 	07:45 =======	07:15	 	 ========	 
Date Analyzed:	7/20/88	7/20/88	7/20/88	7/20/88	7/20/88			
Acrylonitrile	<100	<b>&lt;100</b>	<500	<500	<100	1	1	1
Acrolein	<200	<200	<1000	<1000	<200	1	1	1
Chloromethane	<10	<10	<50	<50	<10			1
Bromomethane	<10	<10 ·	<50	<50	<10	1		ĺ
Dichlorodifluoromethane	<10	<10	<50	<50	<10		İ	ĺ
Vinyl Chloride	<10	<10	<50	<b>  &lt;50</b>	<10		1	1
Chloroethane	<10	<10	<b>  &lt;50</b>	<50	<10		İ	į
Methylene Chloride	<5	<5	<25	<25	<5	l		1
Trichlorofluoromethane	<5	<5	<25	<25	<5	l	1	1
1,1-Dichloroethene	<b>  &lt;</b> 5	<5	<25	<25	<5	1	1	
1,1-Dichloroethane	<5	<5	<25	<25	<5			l
1,2-Dichloroethene	<5	<5	<25	<25	<5		1	1
Chloroform	<5	<b>  &lt;</b> 5	27.5	<25	<5	,	1	1
1,2-Dichloroethane	<5	<5	<25	<25	<b>  &lt;5</b>		i	i
1,1,1-Trichloroethane	<5	<5	<25	<25	<5		İ	i
Carbon Tetrachloride	<5	<5	<25	<25	<b>  &lt;</b> 5		i	i
Bromodichloromethane	<5	<5	<25	<25	<5		i	i
1,2-Dichloropropane	<5	<5	<25	<25	<5		Ì	İ
Trans-1,3-Dichloropropene	<5	<5	<25	<25	<5		İ	i
Trichloroethene	<5	<5	<25	<25	8.0		1	1
Dibromochloromethane	<5	<5	<25	<25	<5		1	ļ
1,1,2-Trichloroethane	<5	<5	<25	<25	<5	l	1	1
Benzene	<5	<5	<25	<25	<5		1	
1,3-Dichloropropene(Cis)	<5	<5	<25	<25	<b>  &lt;</b> 5		1	1
2-Chloroethylvinyl Ether	<5	<5	<25	<25	<5		1	ļ
Bromoform	<5	<5	<25	<25	<5	ł		- 1
Tetrachloroethene	<5	<b>  &lt;</b> 5	<25	<25	<5	İ		1
1,1,2,2-Tetrachloroethane	<b>  &lt;</b> 5	<5	<25	<25	<b>  &lt;</b> 5		-	1
Toluene	<b>  &lt;</b> 5	<5	<25	<25	<5	1	1	1
Chlorobenzene	<5	<5	<25	<25	<b>  &lt;</b> 5			1
Ethylbenzene	<5	<b>  &lt;</b> 5	<25	<25	<5		Į.	
1,3-Dichlorobenzene(m)	<5	<b>  &lt;5</b>	<25	<25	<5	1		1
1,2-Dichlorobenzene(o)	<5	<5	<25	<25	<5			1
1,4-Dichlorobenzene(p)	<5	<5	<25	<25	<5			1

## general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

#### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference

Brown Race 88042B

Received

: 7/11/88

P.O. #:

Sample:	-006	-007	-012	İ	1	i	- 1
Location:	RWB - 1	RWB-2	RWB-5	i	i	i	i
	Grab: W/S	GRAB: W/S	Grab: W/S	į	i	i	i
Date Collected:	7/9/88	7/9/88	7/9/88	ĺ	i	i	i
	10:30	09:30	07:15	i	i	i	ì
	==========				.=========		
	1	1	1 1	1	1	- 1	1
Date Analyzed:	7/20/88	7/20/88	7/20/88	i	i	i	i
	i İ	İ	i i	i	i	i	i
Surrogate Standard Recoveries	İ	1	i i	ĺ	i	i i	i
			i i	j	İ	i	į
		1	i i	İ	İ	i	i
2-Bromo-1-chloropropane	94%	98%	90%	i	İ	i	İ
(Acceptance Limits: 76-114%)			i i	. 1	i	i	i
	I	i	i i	i	i	i	i
Toluene d8	97%	85%	j 91% j	i	i	i	i
(Acceptance Limits: 88-110%)	İ	i	i i	i	i	i	i
		i	i i	i	i	i	i
Bromofluorobenzene	92%	94%	92%	i	i	i	i
(Acceptance Limits: 86-115%)	i	i	i i	i	i	i	i
	, 	i	i i	i	i	i	i
	i I	i	i	i	i	i	i
	i	İ	i	i	i	i	
	! 	1	i	i		i	i
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\* SW846 Manual, Test Methods for Evaluating Solid Waste, 3rd Edition, 11/86.

Michael K. Peny Laborato Director

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### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/02238

Date: AUG. 25 1988

Client:

Mr. Nick Harding Labella Associates 300 State Street Rochester, NY 14614 Sample(s) Reference

Brown Race 88042B

Received

: 7/11/88

P.O. #:

		shab Tasia	WAD 0246		VAT VIII CA	T DECUTE	·	
SURROGATE RECOVE	KIES /	LPA MET	HOD 8240	)* Ar	MALTICA	L RESULT	S - %	
Sample:	-009	-010	1	1	1	1	1	ı
Location:	RWB-3	RWB-4	ĺ	Ì	İ	İ	İ	į
	Comp: W/S	Grab	1	1	1	1	ĺ	Ì
Date Collected:	7/9/88	7/9/88	1	1	1	1	I	!
Time Collected:	08:30	07:45	1	1	1	1	l	1
	*****			*********	**********	=======================================		=========
			!	!	!	I		1
Date Analyzed:	7/20/88	7/20/88	1	!	ļ	1	!	!
Output Ou	- 1	1	!			İ		
Surrogate Standard Recoverie	s	1	!		!	!	!	
	-1	1	1		1	!	!	1
2-Bromo-1-chloropropane	1 94%	1   95%	1		1	1	1	
(Acceptance Limits: 20-121%)	1 74%	73%	-	1	1	ļ	! !	1
(Acceptance Limits: 20-121%)		1	i	1	1	1	[ 	1
·Toluene d8	95%	92%	1	1	-	1	1 1	 
(Acceptance Limits: 81-117%)	1 /3/	/2/	i	ì	-	1	i I	! 
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	i	i	i	i	i	Ì	1 1	! }
Bromofluorobenzene	91%	93%	i	' 	i	i	i	1
(Acceptance Limits: 74-121%)	i	i	i	i	i	i	į	! !
	i	i	i	i	i	i	i	i
i	i	i	i	i	i	i	1	i
	i	i	i	i	i	i		İ
	i	i	i	i	i	i	i	i
	i	İ	İ	i	i	İ	İ	İ
1	ĺ	Ì	Ì	ĺ	1	1	l	1
į	1		1	1	1	1	1	1
	1	1	1	1	1	1		1
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\* SW846 Manual, Test Methods for Evaluating Solid Waste, 3rd Edition, 11/86.

Michael K. Perry Laboratory Firector

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general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760

85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

Job No. R88/02238

Date AUG. 25 1988

### LABORATORY REPORT

Client:

Sample(s) Reference

Brown Race 88042B

Date Received: 7/11/88

Labella Associates

Date Sample Taken: 7/9/88

	•	DAT	E ANALY		LE 				
Sample: Location:	RWB-1  Composite	RWB-2  Composite	RWB-3  Composite	RWB-4  Composite	RWB-5  Composite	RWB-1  Grab: W/S	RWB-2  GRAB: W/S	•	-009  RWB-3  Comp: W
Arsenic	i	İ	     07/15/88 	İ	İ	İ	 	 	
Barium	07/19/88	  -  -07/19/88	07/19/88	07/19/88	07/19/88	   	   	   	
Cadmium, Total	07/19/88	07/19/88	07/19/88	07/19/88	     07/19/88 			   	
Chromium, Total	07/21/88	07/21/88	     07/21/88	07/21/88	     07/21/88	   	 	   	
Lead, Total	07/19/88	07/19/88	   07/19/88 	07/19/88	     07/19/88 	     		   	
Mercury, Total	07/18/88	07/18/88	07/18/88	07/18/88	07/18/88		     	   	
Selenium, Total	07/15/88	07/15/88	07/15/88	07/15/88	     07/15/88	   		!     	-!     
Silver, Total	07/21/88	07/21/88	07/21/88	07/21/88	   07/21/88 	   	   		
Volatile Organics-GC/MS			   		   	7/20/88	7/20/88	! ! !	   7/20/8
Semivolatile Organics	8/18/88	8/22/88	8/18/88	8/18/88	8/18/88	1		1	
Pet. Hydrocarbons, IR	7/9/88	7/9/88	7/9/88	7/9/88	7/9/88			7/9/88	

# general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760

85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

Job No. R88/02238

Date AUG. 25 1988

### LABORATORY REPORT

Client:

Sample(s) Reference

Brown Race 88042B

Labella Associates

Date Received: 7/11/88 Date Sample Taken: 7/9/88

		LABORA'. DATI	PORY CI		LE 				
Sample: Location:	RWB-4  Grab	-011  RWB-4  Comp: S/C	RWB-5  Grab: W/S	RWB-5  Grab	       <b> </b>	     	     	     	     
Arsenic	.	 	   	 	   	   	   	   	   
Barium		 	   	   	   		 		     
Cadmium, Total		! ! !	 		     	 	     	   	     
Chromium, Total		     		   	     	     	     	   	
Lead, Total			   	   	   			   	! [
Mercury, Total		   	   		   	   	     	     	     
Selenium, Total			   			     	     		     
Silver, Total					     	     	! ! !	     	     
Volatile Organics-GC/MS	   7/20/88		   7/20/88		     	     	 	     	     
Semivolatile Organics				   	 	   	   	   	   
Pet. Hydrocarbons, IR	     	7/9/88		     7/9/88	   		   	     	     

	C88/	2238			С	H	AIN	(	JE	=		CL	しか	ķi (		<b>)</b> '	Y	-1	R	Ē	C	O	R	D	)	_	■ <del>-</del> <i>F8/</i> 2238	-1		ı	-1	
	PROJECT NO.	PROJECT NAME	Rown's	RACE	- 10	JFR	AST.					1.,	Sk.	AN/																		
	88042B	PROJECT LOCATIO	N 3120	wn5	RA	CE		] /	6	5/3	\$\\ \$\\\	78/	1/	//			/	//	/	/	/	/		/	/							
\ h #	T SAMPL	E NAME	DATE 1988	TIME HRS.	GRAB	COMP.	SAMPLE MATRIX	W.					//	//				//	/	/,					/	/		REM	/AR	κs		•
Ï	RWB -1		7/9	1030		X	SOIL	X		X	Χ						T		$\top$			1	$\Box$									
7	RWB-2		7/9	0930		X	SOIL	X	1	Χ	X	$\top$							1	$\top$			1	1			-					
3	RWB-3	> 12 AMBER	7/9	0830		X	SOIL	X	Π	X	X							T	1	$\top$				1								
-	RNB-4	\	7/9	0745		X	SOIL	X	1	X	X										$\top$	1	1	$\exists$								
-	RWB-5.		7/9	0715		X		+	1	X	Χ		T			1	1		1	1				7								
			1						Г	Ì	Ì		†				十		1	$\top$	$\top$	_	1	7								
2	RWB 1	) n	7/9	1836	X		WATER/ SILT		X								1	1	+		+		1	1								,
7	RWB Z	V V	7/9	0930	X		WATER/ SILT		X										T													
?	RWB Z	11	7/9	0930	X		SLUME				X								T		$\top$			1								
7	RWB 3	10	7/9	0830		X	WATER/		χ.				T				$\dashv$	$\top$	1	$\top$	$\top$	$\dashv$	$\dashv$	1				7				
q	RWB 4	73	7/9	0745	X		उत्तासिह		X			_	1			$\top$	1		$\dagger$	$\top$	$\top$	1	$\top$	+	$\exists$							
7	RWB 4	1 2	<del></del>	0745	1	X	SAND/ CINDER	1			X	$\top$	T		H	$\dashv$	+	$\top$	$\dagger$	$\top$	$\top$	$\dashv$	$\top$	$\dashv$	1							
7	RWB 5	12		0715	<del>                                     </del>		WATER/		X.	-		+	1			$\dashv$	$\dagger$	+	T	$\dagger$	$\top$	+	+	+	$\dashv$							
	RWB 5	<del></del>	7/9	0715	1		SLUDGE				X	$\top$	$\top$	<		Huli	m	R.		lale	e d			Sa	m	ρl	ler incou	100+	14	119		
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	•				<del>                                     </del>			$\vdash$	<del> </del>			+	+			+	$\dashv$	+	+	+	+	$\dashv$	+	+								
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	SAMPLED BY		2/	Har	, il	75	RECE	IVE	D B	<b>Y</b> :										DA	TE	T	TIM	IE .	F	REL	SEE ATTACHED FO	JH HEO	UESTE	ט טבוו	ECTION	LIMIT
	COMPANY:	ABOUR	Asso	C.		<del>/-</del>	СОМЕ	PAN	<b>Y</b> :						· · · ·				1						1	O	MPANY:					
	RELINQUISHE	D BY:	Pen H-	Last	4	T	DATE	TIME	E	RE	CEI	VED V&C	BY I	LAB	:												\BFI I	^	-	300 STA	TE ST.	
	COMPANY:	2	Assoc	<del>ر</del> ک	<del>\</del>	7	7/11/88 1	100	7	LA	B:	66	NE	FRI	<del>Q</del> L	7	ES	577	N	1	C	·				101	PACHECUM and Sun			HESTER (716) 45	R, N.Y. 14 64-6110	614



710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

NOV. 4 1988

Mr. Nick Harding LaBella Associates 300 State Street Rochester, NY 14620

Re: Browns Race

Dear Mr. Nick Harding

Enclosed are the results of the analysis requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at 454-3760.

Thank you for letting us provide this service.

Sincerely,

GENERAL TESTING CORPORATION

We albarner -

Julie Warner

Client Representative

sa

Enc.

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Mr. Nick Harding LaBella Associates

300 State Street Rochester, NY 14620 Job No: R88/03469

Date: NOV.

4 1988

Client:

Sample(s) Reference:

Browns Race

\*\*\*\*\*CORRECTED COPY\*\*\*\*

Collected

: 10/5/88

P.O. #:

				Al	NALYTICA	L UNITS	- ug/g	Wet Wt.	
٠	Sample:	-001	-002	!	1	1	I	I	1
	Location:	RWB-6	RWB-6A	!	ļ	ļ	İ	1	
	Date Collected:	  10/5/88	  10/5/88	1	1	1	1	1	
			18:47		i	İ	i		i
		======================================	======================================	======================================	 	======== 			
'	Pet. Hydrocarbons, IR	80.0	! 	! !	i	i	İ		i
	Volatile Organics-GC/MS		   **	 	 		1		1
۱ ۰	votative organics depins	1	) . 	1	Ì	1			
ı	Semivolatile Organics	**		!	1	1	1	!	!
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\*\* See Attached Data

Miland K. Penny

Analytical procedures in accordance with Standard Methods for the Examination of Water and Wastewater, 15th Edition and Methods for Chemical Analysis of Water and Wastes, EPA. (<) indicates lowest detectable concentration with procedures used. Data on quality control performed with above sample(s) is available upon request.

# general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/03469

Date: NOV. 4 1988

Client:

Mr. Nick Harding LaBella Associates 300 State Street Rochester, NY 14620 Sample(s) Reference

Browns Race

Collected

: 10/5/88

P.O. #:

Sample:	-002	1	1	1	1	1	1
Location:	RWB-6A	1		1	1	1	ĺ
	1 1	1	1.	1	1	1	
Date Collected:	10/5/88	1	1	i	1	1	
Time Collected:	18:47	 	l	1	1	l	l
Date Analyzed:	10/19/88	 		 	:======== 	 	===== 
Acrylonitrile	<100	i	i	í	i	i	i
Acrolein	<200	İ	i	i	i	i i	İ
Chloromethane	<10	İ	İ	i	i	i	i
Bromomethane	<10		ĺ	i	İ	i	i
Dichlorodifluoromethane	<10	i	İ	i	i	i	i
Vinyl Chloride	<10	İ	İ	i	i	i	i
Chloroethane	<10	i	ĺ	i	i	i	i
Methylene Chloride	31:8***	į ·	İ	i	i	i	i
Trichlorofluoromethane	<5	i	İ	i	İ	i	i
1,1-Dichloroethene	<5	i	İ	i	i	ì	i
1,1-Dichloroethane	<5	i	İ	i	i	į	i
1,2-Dichloroethene	<5	i	İ	i	1	Ì	i
Chloroform	7.2	i	İ	i	İ	İ	ĺ
1,2-Dichloroethane	<5	Ì	İ	i	İ	İ	İ
1,1,1-Trichloroethane	<5	i	İ	i	i	İ	i
Carbon Tetrachloride	<5	i	İ	i	1	į	İ
Bromodichloromethane	<5	i	İ	i	İ	i	İ
1,2-Dichloropropane	<5	1	Ì	1	Ī	ĺ	ĺ
Trans-1,3-Dichloropropene	<5	ı	1	İ	İ	1	
Trichloroethene	<5	1	1	Ì	1	1	
Dibromochloromethane	<5	1	1	1	1	1	1
1,1,2-Trichloroethane	<5	1		1	1	1	
Benzene	<5	1	1	1	1	1	1
1,3-Dichloropropene(Cis)	<5	ĺ	Ì	1	1	1	
2-Chloroethylvinyl Ether	<5	1	1	1	1	1	
Bromoform	<5	1	1	1	1	i	1
Tetrachloroethene	<5	1		1	1		ļ
1,1,2,2-Tetrachloroethane	<5	Į.	1	1	1	i	
Toluene	95.2	1	1	1	1	1	
Chlorobenzene	<5	Į.	1	1	1	l	
Ethylbenzene	<5	1		1	1	I	1
1,3-Dichlorobenzene(m)	<5		1	1	1	1	
1,2-Dichlorobenzene(o)	<5	1		1	1	l	
1,4-Dichlorobenzene(p)	<5	1	1	1	i	1	l

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760

85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/03469

Date: NOV. 4 1988

Client:

Sample(s) Reference

Mr. Nick Harding LaBella Associates 300 State Street

Browns Race

Rochester, NY 14620

++ Sample re-analyzed. Surrogate recovery still outside Q.C. limits.

Collected

: 10/5/88

P.O. #:

Milal K. Peny

Laborato Director

Sample:	-002	1	1	- 1	I	1	1	1
Location:	RWB-6A	1	1		1	1	1	1
	1	1	I		1	ı	1	1
Date Collected:	10/5/88	-	1		1	1	1	1
Time Collected:	18:47	1	1	1	!	I	1	1
	**********		=======================================	=======================================	***************************************		1	.=========
Date Analyzed:	  10/19/88	ŀ	- !	!	l 1	1	-	1
Date Analyzed:	1 10/ 19/00	1	<u> </u>		1	1	i i	-
Surrogate Standard Recoverie	e I	1	;	. 1	1	1	1	-
Surrogate Standard Recoverre	•  •	1	· [	1	1		i	i
		i	1	! 	i		ļ	
2-Bromo-1-chloropropane	94%	i	i	i	i	i	i	i
Acceptance Limits: 76-114%)	1	i	i	i	i	i	i	i
	i	i	i	i	i	i	i	i
Toluene d8	97%	i	i	i	i	i	i	i
Acceptance Limits: 88-110%)	i	i	i	i	i	i	İ	i
·	į	Ĺ	i	i	į	İ	Ì	Ì
Bromofluorobenzene	64%++	ĺ	1	1	1	1	1	1
Acceptance Limits: 86-115%)	1	1	I	1	1	1	1	1
	1	-	1	1	1	1	1	1
		-	ı		1	1	1	1
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### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/03469

Date: NOV. 4 1988

Client:

Sample(s) Reference

Mr. Nick Harding LaBella Associates 300 State Street Rochester, NY 14620

Browns Race

Collected

: 10/5/88

P.O. #:

Sample:	-003		!	!	!	!	!	!
Location:	Lab		!	!	į.	!	!	!
	Blank			!	!	1	!	!
Date Collected:	1		1	!	!	1	ļ	!
Time Collected:		l 	l 	l 		 		 
Date Analyzed:	10/19/88			 I		 I		1
Acrylonitrile	<100	1	İ	! 	i	1	i	i
Acrolein	<200		1		i	i	i.	i
Chloromethane	<10	! 	1	 	i	i	i	i
Bromomethane	<10	i . I		1	i		1	-
Dichlorodifluoromethane	<10	i İ	i I	i I	i	i	i	i
Vinyl Chloride	<10		i i	i	i	i	i	
Chloroethane	<10		i	İ	i	i	i	i
Methylene Chloride	5.1***		1	1	i	1	i	i
Trichlorofluoromethane	<5	i i	1	! 	1		i	i
1,1-Dichloroethene	<5		İ	: 1	i	i	i	i
1,1-Dichloroethane	<5	i i	i	, I	i	Ì	i	ì
1,2-Dichloroethene	<5	! 	i	! !	i	1	i	i
Chloroform	<5		i	' 	i	i	i	i
1,2-Dichloroethane	v   <5		i	;	i	i	i	i
1,1,1-Trichloroethane	<5		i	i	i	i	i	ì
Carbon Tetrachloride	<5	i	i	i I	i	i	i	i
Bromodichloromethane	<5	! 	İ	i i	i	i	i	i
1,2-Dichloropropane	<5		i	i	i	i	i	i
Trans-1,3-Dichloropropene	l <5		i	i	i	i	i	i
Trichloroethene	<5		i	i	i	ĺ	i	i
Dibromochloromethane	<5		i	, 	i	i	i	i
1,1,2-Trichloroethane	<5		i	i	i	i	i	i
Benzene	<5		i	i	i	i	1	i
1,3-Dichloropropene(Cis)	<5	l	i	i	i	i	i	i
2-Chloroethylvinyl Ether	<5		i	i	i	i	i	i
Bromoform	<5		İ	i	i	i	i	i
Tetrachloroethene	<5		i	i	i	i	i	i
1,1,2,2-Tetrachloroethane	<5	Ì	i		i	i	i	i
Toluene	<5		İ	1	i	i	i	i
Chlorobenzene	<5		i I	i	i	i	i	i
Ethylbenzene	<5		İ	i	i	i	i	i
1,3-Dichlorobenzene(m)	<5		İ	i	i	i	i	
1,2-Dichlorobenzene(o)	<5		i	i	i	i	i	i
1,4-Dichlorobenzene(p)	<5		i	i	i	i	i	i

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/03469

Date: NOV. 4 1988

Client:

Sample(s) Reference

Mr. Nick Harding LaBella Associates 300 State Street Rochester, NY 14620

Browns Race

Collected

\*\*\* Common Lab Contaminant

: 10/5/88

P.O. #:

Michael K. Peny

Laboratory

Sample:	-003	1	1	1	ı	ı	1	1
Location:	Lab		1		1	ı	I	1
	Blank		1		1	1	1	1
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Time Collected:	 :=======		 	 				
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Date Analyzed:	10/19/88	1			ļ		ļ	1
Surrogate Standard Recoverie	i el	l I	ŀ	 	1	1	1	1
	- l	ı			l		;	
	i	1	1 	! 	i	i i	ì	i
2-Bromo-1-chloropropane	93%	i	i	i	i	i	i	i
Acceptance Limits: 76-114%)	İ	i	i	i	i	i	i	i
	i	i	j	Ì	į	i	i	i
Toluene d8	108%	I	1	1	Ì	1	ĺ	İ
Acceptance Limits: 88-110%)	!	!	Į.	Į.	!	ļ	!	. 1
Bromofluorobenzene	   105%	 	 	!	1	1	1	l i
Acceptance Limits: 86-115%)	1	1	i		i	i	i	i
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# general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760

85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No: R88/03469

Date: NOV.

4 1988

Client:

Sample(s) Reference

Mr. Nick Harding LaBella Associates 300 State Street Rochester, NY 14620

Browns Race

Collected

: 10/5/88

P.O. #:

BASE NEUTRALS	BY EPA	METHOD	8270*	ANALYTICAL	RESULTS	- ug/k	g Wet	Wt
0	1 004		,					
Sample:	-001	l	1	1 !	1	1	1	
. Location:	RWB-6	ļ	ļ		1	!	1	
S. S. S. S. S. S. S. S. S. S. S. S. S. S	14075 400	1	1	1 1	i	l	1	
Date Collected:	10/5/88	!	ļ.	1	!	1	!	
Time Collected:	17:45	ı	ı	1 1	ı	ı	ı	
								=====
Date Extracted:	10/12/88	!	ļ.	! !	!	!	!	
Date Analyzed:	11/02/88	1	1	1 1	!	1	! .	
		1	1		ļ.	Į.	1	
3,3'-Dichlorobenzidine	<1300		I		1	ł	- 1	
Benzo(a)anthracene	<b>  &lt;660</b>	1	1	1 1	1	ı	1	
Bis(2-ethylhexyl)phthalate	2260	1	1	.1	1	I	- 1	
Chrysene	<660	1	i .	1 1	l.	1	i	
Di-n-octyl phthalate	<660	1	1		I	ı	1	
Benzo(b)Fluoranthene	<660	1	1	1	1	ı	1	
Benzo(k)fluoranthene	<660	1	•	1 1	1	I	1	
Benzene(a)pyrene	<660	1	1	1	I	I	- 1	
Indeno(1,2,3-cd)pyrene	<660	1	1	1	1	ı	1	
Dibenzo(a,h)anthracene	<660	1	1	1 1	i	1	ı	
Benzo(g,h,i)perylene	<660	1	i	1	1	1	- 1	
1	1	1	1		1	I	1	
	1	1	1	1 1	1	ı	1	
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* SW846 Manual, Test Methods	for Evaluati	ng Solid Was	te. 3rd Fdi	tion, 11/86.				
a sword manual, rest methods	o, Eratuati		,					

Michael K. Perry Laboratory Mirector

# general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760

85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Mr. Nick Harding

Job No: R88/03469

Date: NOV.

4 1988

Client:

Sample(s) Reference

LaBella Associates

300 State Street Rochester, NY 14620 Browns Race

Collected

: 10/5/88

P.O. #:

SURROGATE	RECOVERIES /	EPA	METHOD	8270*	ANALYTICAL	RESULTS	- %	
Sample:	-003	ŀ	i	. 1	1 1	l I		I
Location:	Lab	ı	1	1	1			
	Blank	1	i	1				ļ
Date Collected:		1	1	1	1 1	1		l
Time Collected:				 				 
Date Analyzed:	10/31/88	 		 				 
Date Extracted:	10/12/88	ĺ	i	Ĺ	į	İ		
	l	1	ĺ	ĺ	ĺ	ŀ		İ
BASE NEUTRALS	1	- 1	. 1	1				ĺ
		1		ĺ		ĺ		•
	1	1	1	1	1	ĺ		
Nitrobenzene-d5	59%	1	1	1	l i			
Acceptance Limits:	23-120%)	- 1		- 1	1			
		1	ĺ	1	1 1	i		}
2-Fluorobiphenyl	63%	- 1	l	1	1	1		l
Acceptance Limits:	30-115%)	1	1			! 1		1
		- 1	ı	1	1	1		
Terphenyl-d14	94%	I	1	1	[ [	1		
Acceptance Limits:	18-137%)	1	l	- 1				l
	1	1	i			I		
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Michael K. Peny

Laboratory Director

general testir	ng Ver
corp	ŏoration

NYSDEC	Sample	No.:	
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710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

Lab Code: GTC  Matrix: (soil/wat  Sample wt/vol:  Level: (low/med)  % Moisture: not de  Extraction: (SepF/C  GPC Cleanup: (Y/N)	TENTATIVELY IDENTA	ENTIFIED CONTENT LABELLA  AS No.:  ab Sample II  ab File ID:  ate Received  ate Extracte  ate Analyzed  ilution Fact  ENTRATION U	MPOUNDS  SDG No  R88/3469-0  >BB838 d: ed: 10/12/88 d: 10/31/88 tor: NITS:	01AE
	COMPOUND NAME			
1.			<b>!</b>	======
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FORM I SV-TIC NYSDEC B-78

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710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

Lab Name: General To Lab Code:GTC Matrix: (soil/water Sample wt/vol: Level: (low/med) % Moisture: not dec Extraction: (SepF/Con GPC Cleanup: (Y/N)	TENTATIVELY IDENTA	ENTIFIED CONTROL CONTR	MPOUNDS  A SDG No  R88/3469- >BB844  d: ed: 10/12/88 d: 10/31/88 tor: 0.1  NITS:	0.: 001BN
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FORM I SV-TIC NYSDEC B-78

### general testing corporation

710 Exchange Street Rochester, NY 14608 (716) 454-3760 85 Trinity Place Hackensack, NJ 07601 (201) 488-5242

### LABORATORY REPORT

Job No. R88/03469

Date NOV. 4 1988

Client:

Sample(s) Reference

LaBella Associates Browns Race

Date Received: 10/5/88 Date Sample Taken: 10/5/88

	bace Received.					Juce De				
	LABORATORY CHRONICLE  DATE ANALYZED									
-	Sample: Location:	RWB-6 	-002    RWB-6A	.		 	 	   	 	
•	Pet. Hydrocarbons, GC	     10/9/88  _	1			<b>=====</b>     	======     	=======     	=======     	
	Volatile Organics-GC/MS		   10/19/88  			   		   	   	
•	Semivolatile Organics	11/02/88	 					1	   	
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INTERIM REPORT
GEOTECHNICAL INVESTIGATIONS
MILL STREET SEWER TUNNEL
ROCHESTER, NEW YORK

For STV/Seelye Stevenson Value & Knecht Rochester, New York

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

File No. 7602

May 1988



STV/Seelye Stevenson Value & Knecht 3 May 1988
Page 2

#### SUBSURFACE EXPLORATIONS

Subsurface explorations performed for this study consisted of a series of five test borings. The explorations were performed approximately at the locations shown on the Subsurface Exploration Location Plan, Figure 2, under the observation of H&A of New York personnel. Surveyed ground surface elevations and boring locations were provided by STV/Seelye Stevenson Value & Knecht (SSVK). All elevations in this report are expressed in feet and are referenced to New City Datum (NCD).

The test borings were conducted during the period 8 February through 5 March 1988, in accordance with generally accepted practices, by Rochester Drilling Co., Inc. of Rochester, New York. The borings were advanced to depths ranging from 53.5 to 60.5 ft. below ground surface by a truck-mounted Mobile B61 rotary drill rig using hollow stem auger casing.

Soil samples were obtained with a Standard Split Spoon Sampler (2.0-in. O.D., 1.375-in. I.D.) in accordance with ASTM Specification D1586-67. Field measurement of in situ soil conditions consisted of the Standard Penetration Resistance (N) which is defined as the number of blows required to drive the Standard Split Spoon Sampler 1.0 ft. into undisturbed soil with a 140-lb. weight falling freely for 30 inches.

Rock core samples were obtained with an NX sized M-series core barrel. This barrel produces rock core that is approximately 2-1/8 in. in diameter. Field measurements of rock properties consisted of core recovery, defined as the length of core recovered by the total length of core drilled, expressed as a percent.

All drilling equipment and tools were steam-cleaned prior to starting the explorations and after completing each boring to prevent cross-contamination of groundwater wells.

Soil samples obtained during the test borings were examined and classified by H&A of New York field personnel. All rock core recovered from the test borings was logged by H&A field personnel and examined by an H&A staff geologist. Descriptions of the soil and rock samples for each test boring are presented on the Test Boring Reports prepared by H&A of New York and contained in Appendix A.



STV/Seelye Stevenson Value & Knecht 3 May 1988 Page 3

Rock classification included determination of the Rock Quality Designation (RQD), as a measure of the average quality of the rock mass. RQD is defined as the sum of the lengths of good quality core pieces greater than or equal to 4 inches in length, expressed as a percent of the length drilled.

Soil samples and rock core recovered from the boreholes were screened for volatile organic vapors using an HNU P101 photoionization detector. In general, soil samples were placed in glass jars, sealed, and allowed to warm. The headspace in the jars was then sampled with the HNU P101. Rock core samples were generally screened during removal from the core barrel and then again in the core box.

Breathing space around the drilling rig and air directly over the borings was also periodically sampled with the HNU P101.

Four bedrock groundwater observation wells were installed in the completed boreholes at Borings MS101, 102, 103, and 105. The wells consist of 4.0-in. I.D. steel casing extending from ground surface to approximately five ft. into bedrock, grouted into place. Below the casing is an open rock hole which extends to the bottom of the boring. A protective roadway box was installed and sealed at ground surface for all the wells except MS 103, which received a 4.0-in. diameter locked casing extending above the ground surface.

After installation, the wells were developed by evactuating water with compressed air or by using a bailer for a minimum of one half hour or until the evacuated water was clear and free of drill cuttings or sediment. Details of the installation, along with a record of the subsequent readings, are contained on the Groundwater Observation Well Reports in Appendix B.

No observation well was installed in boring MS104. During drilling the drill rods and core barrel were broken off in the hole while attempting to recover the final core run. Attempts to recover the drill tools were eventually abandoned and the borehole was grouted to the ground surface with cement grout.

#### GROUNDWATER SAMPLING AND LABORATORY TESTING

Groundwater samples were collected from OW101, OW102 and OW103 for laboratory water quality analysis. The sampling was conducted on 9 March 1988 by Recra Environmental, Inc. personnel according to EPA recommended sampling methods. The sampling was performed under the observation of H&A personnel. Each well was evacuated to three times the standing water volume



STV/Seelye Stevenson Value & Knecht 3 May 1988 Page 4

or until all water was removed using a dedicated stainless steel bailer and nylon rope. Each well was allowed to recover to a water level sufficient to provide a sampleable volume prior to sampling. OW104 was dry at the time of sampling and no water sample could be obtained.

Samples to be analyzed for volatile organic compounds were placed in clean VOA vials in a manner such that no headspace was remaining in the vial. Samples to be analyzed for total metals were taken in clean plastic one-liter bottles. Acid extractable/base neutral samples were placed in clean one-liter brown glass bottles. All samples were preserved according to appropriate EPA protocol and were kept chilled until analyzed.

The groundwater samples were analyzed for volatile organic compounds (EPA Method 8240), base/neutral/acid extractables (EPA Method 8270), and total metals.

Analytical results, a field report, and chain of custody forms prepared by Recra are contained in Appendix C.

#### SUMMARY OF SUBSURFACE CONDITIONS

#### Soil

Soil conditions at the project site are primarily the result of urban development. The thickness of soil overburden encountered in the recent test borings MS101, 102, 104 and 105 varied from approximately 3.0 to 5.5 ft. with an average of about 3.8 ft. Overburden extending to a depth of 15.0 ft. was encountered in boring MS103 near the north end of the alignment.

The soil overburden thicknesses are generally consistent with thicknesses encountered by borings previously performed for the State St.-Mt. Hope Avenue Tunnel project in February 1981 and June 1982. The locations of those previous borings are shown on the Boring Location Plan and on the Subsurface Profile, Figure 3.

It is noted that soil overburden thickness increases somewhat at the southern end of the tunnel alignment where the tunnel passes under the Genesee River, upstream of the Upper Falls. Soil thickness increases up to approximately 16 ft. where the tunnel alignment passes beneath railroad and highway embankments, adjacent to the river.



STV/Seelye Stevenson Value & Knecht 3 May 1988 Page 5

The soil overburden thickness also increases near the north end of the project where the tunnel passes near an old drainage channel in the vicinity of Cliff Street that has since been filled in. The location of that previous drainage outlet, as obtained from historical record maps, is shown on Figure 4.

The soil deposits encountered in the recent test borings generally consisted of miscellaneous fills comprised of sands and silts with varying amounts of gravel, cinders, glass, asphalt, decomposed rock, and other debris. Obstructions such as concrete, rubble, and boulders were also common. The density of the fill deposit was variable, ranging from medium dense to very dense. In addition to fill materials, Boring MS103 encountered 5.5 ft. of very dense, decomposed bedrock. For information about soil conditions at specific boring locations, refer to the test boring logs in Appendix A.

#### Rock Formation

The stratigraphy of the project area consists of a sequence of sedimentary rock formations including limestone, dolomite, mudstone, sandstone, and shale. On a regional basis, these strata strike approximately N75°E and dip toward the south at about 50 ft. per mile. Zones of structural deformation, including minor folding and faulting, are known to exist throughout the region.

Two generally recognized geologic rock formations were encountered in the recent borings along the Mill Street tunnel. These formations are the Lockport Dolomite and the Rochester Shale. The Lockport is a generally competent dolomite formation that forms the cap rock for the Upper Falls. The Rochester Shale is actually a dolomitic mudstone, is typically not fissile, and is usually harder and thicker-bedded than a shale. Variations occur in each formation, as is common in natural deposits. Reference should be made to the Test Boring Reports and to Figure 3 for additional information about rock conditions at specific boring locations.

Rock encountered in situ was generally of fair to good overall quality with the RQD values ranging from approximately 60 to 90 percent at tunnel depth.

Some poorer quality rock was encountered in boring MS101 at the tunnel elevation. RQD values at this location ranged from approximately 50 to 60 percent.

KER

Planes of weakness in the rock identified by the borings included partings and joints. Partings occur throughout the rock mass as natural breaks, parallel to bedding and are often marked by thin seams of shale, or secondary mineralization. Most joints encountered in the borings were high angle to vertical with some low angle to moderately dipping joints noted. Descriptions of the discontinuities encountered in borings are provided on the Test Boring Reports in Appendix A.

Geologic investigations and mapping performed for the Rochester Combined Sewer Overflow Abatement Program identified four general zones of apparent geologic structural deformation within the project area. These zones were identified by local variations in rock formation contact elevations in test borings and as observed in rock outcrops exposed in the project area. The apparent distortion of rock bedding is believed to result from minor faulting and folding which trends in a general northwest direction. Recent field mapping within the mined CSOAP tunnels has generally confirmed the presence of minor faults and folds that affect formation contacts.

The Mill Street Tunnel is located within the limits of one of the four zones described above. It is anticipated that minor folding and faulting will be exposed in the Mill Street Tunnel excavation as well. As shown on Figure 3, there is substantial variation in the Lockport/Rochester contact between test borings. Some of this variation is suspected to be due to folding and faulting, as discussed. However, the variations may be amplified in some cases by the gradational nature of the Lockport/Rochester contact which makes it difficult to precisely locate in some test borings.

Recent geologic reconnaissance along the Genesee River gorge failed to identify any major features that would contribute to the formation contact variation shown on Figure 3. It is anticipated that the apparent offsets are due to combinations of minor features.

#### Groundwater Quality and Environmental Conditions

Volatile organic compounds were detected in the groundwater samples taken from wells OW102 and OW103. Benzene, 1,1-dichloroethylene, trans-1,2-dichloroethylene, toluene, trichloroethylene, vinyl chloride and bis(2-ethylhexyl) phthalate were all detected in well OW103. The compounds 1,1-dichloroethylene, trans 1,2-dichloroethene, trichloroethylene, vinyl chloride and bis(2-ethylhexyl)



phthalate were also detected in well OW102. Table I presents a summary of the detected concentrations as well as the health-based Threshold Limit Value (TLV) concentrations for acceptable eight-hour exposure to the substances, as established by the National Institute for Occupational Safety and Health (NIOSH).

It is noted that none of the concentrations detected in the wells sampled exceed the established TLV's except vinyl chloride which was detected in well OW103 at 2.5 times the TLV of 1.0 ppm.

The presence of the identified compounds in the groundwater will have an impact on tunnel renovations. Additional study may be required to better define the presence and extent of these materials. Special construction procedures may be necessary to protect workers and to treat or handle debris removed from the tunnel, as discussed later.

#### VIDEO-TAPED INSPECTION

As part of our investigation, we have reviewed video tapes prepared by Skanex Pipe Services, Inc. during their inspection of the Mill Street Sewer Tunnel. The inspection was performed during the period 16 to 25 February 1988.

Based on our initial review of these tapes and discussions with Skanex personnel, it appears that the tunnel is in relatively good condition. The brick-lined sections were generally in very good shape with little or no deterioration and were relatively free of debris on the tunnel invert. The limits of the brick-lined sections were consistent with the record drawings. No additional brick lining was observed other than shown on the drawings, indicating that no major repairs have been made since the tunnel was originally constructed.

With a few exceptions, the unlined tunnel sections also appeared to be in generally good condition. No areas were noted where substantial fallout or tunnel collapse had occurred. There were frequent zones that appeared as if rock slabs had fallen from the roof but the tunnel height generally did not appear to extend above approximately eight feet at any location. On the contrary, at many locations throughout the tunnel the crown was lower than six feet high. In some cases this may have been due to a build-up of debris on the tunnel invert. However, it is likely that the tunnel was not mined to the full design height initially.



Planes of weakness in the rock identified by the borings included partings and joints. Partings occur throughout the rock mass as natural breaks, parallel to bedding and are often marked by thin seams of shale, or secondary mineralization. Most joints encountered in the borings were high angle to vertical with some low angle to moderately dipping joints noted. Descriptions of the discontinuities encountered in borings are provided on the Test Boring Reports in Appendix A.

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The Mill Street Tunnel is located within the limits of one of the four zones described above. It is anticipated that minor folding and faulting will be exposed in the Mill Street Tunnel excavation as well. As shown on Figure 3, there is substantial variation in the Lockport/Rochester contact between test borings. Some of this variation is suspected to be due to folding and faulting, as discussed. However, the variations may be amplified in some cases by the gradational nature of the Lockport/Rochester contact which makes it difficult to precisely locate in some test borings.

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It is noted that none of the concentrations detected in the wells sampled exceed the established TLV's except vinyl chloride which was detected in well OW103 at 2.5 times the TLV of 1.0 ppm.

The presence of the identified compounds in the groundwater will have an impact on tunnel renovations. Additional study may be required to better define the presence and extent of these materials. Special construction procedures may be necessary to protect workers and to treat or handle debris removed from the tunnel, as discussed later.

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With a few exceptions, the unlined tunnel sections also appeared to be in generally good condition. No areas were noted where substantial fallout or tunnel collapse had occurred. There were frequent zones that appeared as if rock slabs had fallen from the roof but the tunnel height generally did not appear to extend above approximately eight feet at any location. On the contrary, at many locations throughout the tunnel the crown was lower than six feet high. In some cases this may have been due to a build-up of debris on the tunnel invert. However, it is likely that the tunnel was not mined to the full design height initially.



The crown over most of the tunnel length is unsupported. Only the short section between the North Water St. shaft and the Front Street structure contained roof bolts.

At one location, near the intersection with the temporary Front Street Tunnel, substantial fallout has apparently occurred. This fallout probably resulted from the mining of the temporary Front Street Tunnel which created a fairly wide chamber at the tunnel intersection. The fallout has apparently developed as a result of the increased unsupported span width.

The tunnel alignment is quite variable and generally wanders back and forth across the design centerline. At many locations the tunnel width and cross section also vary. At some locations the tunnel cross section is generally narrow and arch-shaped. At other locations, the tunnel is fairly wide and rectangular in cross section with a flat roof. This variation may have resulted from the initial mining or the tunnel cross section may have changed over the years due to continued ravelling and rock fallout in the upper quarterpoints and crown.

There were a number of locations where buildups of debris had caused blockages in the tunnel that restricted flow and backed-up sewage. Two such locations occurred downstream of brick-lined tunnel sections near the White Street and Spencer Street Drop Shafts.

#### PRELIMINARY ASSESSMENTS AND RECOMMENDATIONS

As discussed in the previous section, the tunnel appears to be in relatively good condition. Both the lined and unlined sections appear to be stable. There is no evidence of substantial collapse or loss of support.

There are some locations in the tunnel that show signs of deterioration with time and there are locations where tunnel debris has built up and is restricting flow. The debris is probably the result of minor ravelling and fallout from the tunnel crown and sidewalls in the unlined sections.

With the exception of the area at the Front Street Tunnel intersection, no areas in the tunnel appear to require additional support at this time. The geologic structure predicted by the test borings is either masked by the brick-lined sections or is minor in nature and not immediately evident from the video tapes.



Upon closer inspection, there may be areas in the tunnel that will require support during the cleaning work, particularly to provide for worker safety. However, those areas and extent of support required cannot be determined without a more detailed inspection.

Due to the variation in tunnel cross section, it may be necessary to remove additional rock from the crown and sidewalls to facilitate the planned cleaning. These mining activities may precipitate the need for additional support. It is also anticipated that substantial work will be required at some of the drop shaft locations to provide access and facilitate the cleaning operations.

The presence of volatile organic compounds in the groundwater outside the tunnel will present some concerns and potential problems with the cleaning and restoration work. It is anticipated that a site-specific health and safety program will be required to provide for worker safety and monitoring of the work space during tunnel renovations. The plan should address routes of worker exposure including inhalation, ingestion, contact, and absorption for the various volatile constituents detected. Employees working in the tunnel should be afforded skin protection that is appropriate for the compounds detected. Protective materials may include impervious coveralls, gloves, boots and/or eye wear.

In addition, ventilation will be required to maintain sufficient oxygen and to remove volatiles from the tunnel work space. It may be necessary to take periodic air bag samples to be analyzed for the volatile organic compounds. The potential presence of vinyl chloride in tunnel air is of particular concern. This compound is a suspected carcinogen, has a very low TLV (1 ppm), and has poor exposure warning properties. NIOSH requires that self-contained breathing apparatus (SCBA) be used in uncontrolled atmospheres containing vinyl chloride. It will be important to maintain a controlled atmosphere through adequate ventilation such that air concentrations are kept within acceptable limits of TLV's.

In addition to the routine monitoring for oxygen  $(O_2)$  levels and hydrogen sulfide  $(H_2S)$  that would normally be done in sewage tunnel work, instrumentation should also be present in the tunnel during the work to monitor for total volatile organics and vinyl chloride. This instrumentation might include appropriate photoionization detectors, or organic vapor



analyzers for monitoring the volatile organic compounds and Draeger Tube detection instruments for monitoring for the presence of vinyl chloride.

It may be necessary to have full face dual cartridge air purifying respirators with organic vapor cartridges available for use should concentrations of the organic compounds in the breathing zone exceed recommended levels.

Further investigation will be required to better define and quantify the presence of volatile organic compounds before proceeding with the cleaning and removation work.

The presence of these compounds or other substances in the debris removed from the tunnel may also affect handling and disposal of that material. It will be necessary to sample and analyze those materials prior to starting the work and to develop a disposal program that is consistent with current regulations.

#### SUMMARY

At this time it appears that the tunnel is structurally in generally good shape. Some areas will require additional support. Other areas requiring support or modification may become evident once the extent of the renovations are defined.

Health and safety issues during the cleaning and renovation work will be a concern. Further study may be required to better define the environmental and health and safety aspects of the work as design continues.

We will continue to evaluate tunnel conditions and geotechnical recommendations as planning for the proposed tunnel cleaning and renovations proceeds. In the mean time, if you have any questions or need additional information, please do not hesitate to contact us.

Sincerely yours, H&A OF NEW YORK

James D. Smith, P.E.

time Olmit

Senior Engineer

Joseph J. Rixner
Manager

JDS/JJR/bmm

KER

Enclosures: Table I - Summary of Laboratory Analyses

Figure 1 - Project Locus

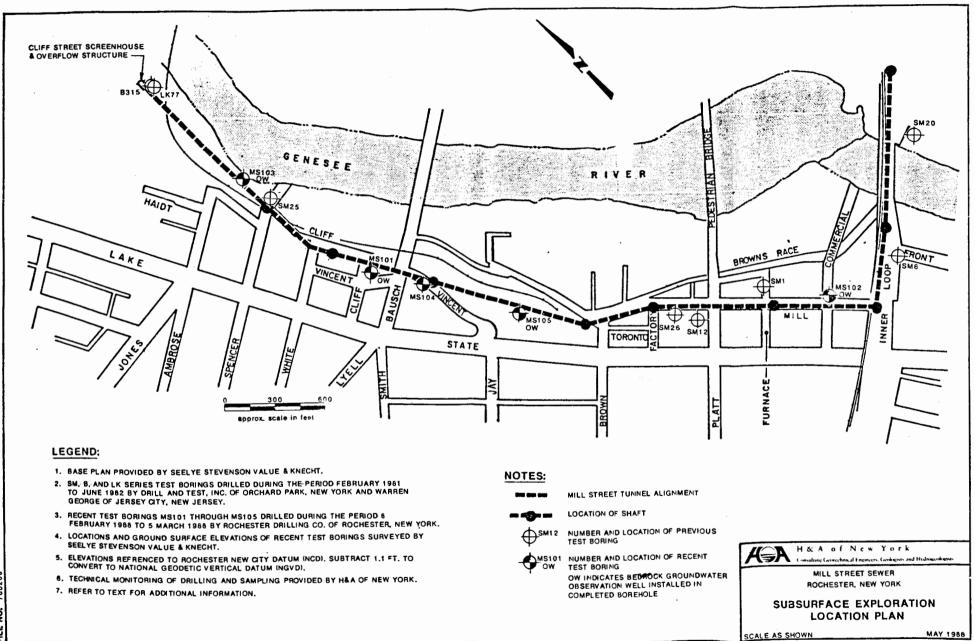
Figure 2 - Boring Location Plan Figure 3 - Subsurface Profile

Figure 4 - Cliff Street Screenhouse Area

Appendix A - Test Boring Reports

Appendix B - Observation Well Reports Appendix C - Water Quality Analyses





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HARRETTE

FIGURE 2

ORGANIC COMPOUNDS DETECTED IN THE LABORATORY ANALYSIS
OF THE GROUNDWATER SAMPLES

TABLE I

COMPOUND [All	<u>OW101</u> concentrati	OW102	OW103	TLV lion (ppm)]
(				(FF/ 1
Benzene	ND	ND	0.012	1.0
1,1-Dichloroethylene	ND	0.0037	ND	5.0
Trans-1,2-Dichloroethylene	ND	1.4	2.6	200
Methylene Chloride	ND	ND	0.0058	500
Toluene	ND	ND	0.160	100
1,1,1-Trichloroethane	ND	ND	0.0063	350
Trichloroethylene	ND	0.26	0.0035	50
Vinyl Chloride ~	ND	0.14	2.5	1.0
bis (2-ethylhexyl) phthalate	ИД	0.003	0.019	N.S.

TLV - Threshold Limit Value as published in the NIOSH Pocket Guide to Chemical Hazards (Sept. 1985) by the U.S. Dept. of Health and Human Services. DHEW Publication No. 78-210

N.S. - No Standard Set



#### APPENDIX C

WATER QUALITY ANALYSES

by Recra Environmental, Inc.

H & A OF NEW YORK ROCHESTER NEW YORK

# 1/8176 RECRA ENVIRONMENTAL, INC.

Chemical Waste Analysis, Prevention and Control

1088

April 12, 1988

H & A of New York

Mr. Robert J. Mahoney H & A of New York 189 North Water Street Rochester, NY 14604

Re: Analytical Results

Dear Mr. Mahoney:

Please find enclosed results concerning the analyses of the samples recently collected on your behalf by Recra Environmental, Inc.

Pertinent Information: Quote #:

Quote #: Q88-158 Matrix: Aqueous/Oil/Waste

Samples Received: 3/9/88

Sample Date: 3/9/88

If you have any questions concerning these data, do not hesitate to contact our Customer Service Representative at (716) 691-2600.

Sincerely,

RECRA ENVIRONMENTAL, INC.

a.K. Bhattacharya Idjt

Arun K. Bhattacharya, Ph.D. Senior Vice President/Laboratory Director

MDL/AKB/sk Enclosure - Field Report

> I.D. #88-368 #8C1183

#### ANALYTICAL RESULTS

Prepared For

H & A of New York 189 North Water Street Rochester, NY 14604

Prepared By

Recra Environmental, Inc. 10 Hazelwood Drive, Suite 106 Amherst, New York 14150

#### METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to the following U.S. Environmental Protection Agency reference.

o U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. July 1982, SW-846, Second Edition.

#### COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

The values reported as "less than or equal to"  $(\leq)$  indicate the compound may be present at trace levels relative to the detection limit but not subject to accurate quantification.



# AQUEOUS MATRIX METHOD 8240 - VOLATILES

(continued)

# AQUEOUS MATRIX METHOD 8240 - VOLATILES

		E IDENTIFICATION	(DATE)
ADDITIONAL	WELL 101	WELL 102	WELL 103
SAMPLE INFORMATION	(3/9/88)	(3/9/88)	(3/9/88)
Analysis Date <pre>Internal Standards Level Added = 50 µg/l (% Recovery)</pre>	3/15/88	3/15/88	3/15/88
Bromochloromethane	100	89	112
1,4-Difluorobenzene	108	102	115
Chlorobenzene-D <sub>5</sub>	100	103	109
Surrogates Level Added = 50 µg/l (% Recovery) 4-Bromofluorobenzene 1,2-Dichloroethane-D <sub>4</sub> Toluene-D <sub>8</sub>	99 95 115	104 98 78	104 76 110

AQUEOUS MATRIX
METHOD 8270 - BASE/NEUTRAL/ACID EXTRACTABLES

	SAMPL	E IDENTIFICATION	(DATE)
COMPOUND	WELL 101	WELL 102	WELL 103
(Units of Measure = $\mu g/1$ )	(3/9/88)	(3/9/88)	(3/9/88)
Acenaphthene	<1.9	<1.9	<1.9
Acenaphthylene	<3.5	<3.5	<3.5
Anthracene	<1.9	<1.9	<1.9
Benzo(a)anthracene	<7.8	<7.8	<7.8
Benzo(b)fluoranthene	<4.8	<4.8	<4.8
Benzo(k)fluoranthene	<2.5	<2.5	<2.5
Benzo(a)pyrene	<2.5	<2.5	<2.5
Benzo(g,h,i)perylene	<4.1	<4.1	<4.1
Bis(2-chloroethyl)ether	<5.7	<5.7	<5.7
Bis(2-chloroethoxy)methane	< <b>5.</b> 3	<5.3	<5.3
	<5.7	<5.7	<5.7
Bis(2-chloroisopropyl)ether	<2.5	3.0	19
Bis(2-ethylhexyl)phthalate	<u>₹</u> 2.5 ₹1.9	<1.9	<1.9
4-Bromophenylphenylether			
Butyl benzyl phthalate	<2.5 ₹1.9	<2.5 <1.9	<2.5 71.0
2-Chloronaphthalene			₹1.9
4-Chlorophenylphenylether	<4.2	<4.2	<4.2
Chrysene	<2.5	<2.5	<2.5
Dibenzo(a,h)anthracene	<2.5	<2.5	<2.5
Di-n-butyl phthalate	<2.5	<2.5 71.0	<2.5 71.0
1,2-Dichlorobenzene	₹1.9	₹1.9	₹1.9
1,3-Dichlorobenzene	<1.9	<1.9	<1.9
1,4-Dichlorobenzene	<4.4	<4.4 	<4.4 
3,3'-Dichlorobenzidine	₹17	₹17	₹17
Diethylphthalate	<1.9	<u>&lt;1.9</u>	<1.9
Dimethylphthalate	₹1.6	₹1.6	<1.6
2,4-Dinitrotoluene	<5.7	<5.7	<5.7
2,6-Dinitrotoluene	<1.9	<1.9	<1.9
Di-n-octylphthalate	<2.5	<2.5	<2.5
Fluoranthene	<2.2	<2.2	<2.2
Fluorene	<1.9	<1.9	<1.9
Hexachlorobenzene	<1.9	<1.9	<1.9
Hexachlorobutadiene	<0.9	<0.9	<0.9
Hexachlorocyclopentadiene	<25	<25	<25
Hexachloroethane	<1.6	<1.6	<1.6
Indeno(1,2,3-cd)pyrene	<3.7	<3.7	<3.7
Isophorone	<2.2	<2.2	<2.2
Naphthalene	<1.6	<1.6	<1.6
Nitrobenzene	<1.9	<1.9	<1.9
N-nitrosodi-n-propylamine	<25	<25	<25
Phenanthrene	<5.4	<5.4	<5.4
Pyrene	<1.9	₹1.9	<1.9
. 3. 2	= · <del>-</del>		
Ŧ	L		L

(Continued)



AQUEOUS MATRIX
METHOD 8270 - BASE/NEUTRAL/ACID EXTRACTABLES

	SAMPI	E IDENTIFICATION	N (DATE)
COMPOUND	WELL 101	WELL 102	WELL 103
(Units of Measure = µg/l)	(3/9/88)	(3/9/88)	(3/9/88)
1,2,4-Trichlorobenzene	11.0		
4-Chloro-3-methylphenol	<1.9	<1.9	<1.9
2-Chlorophenol	<3.0	<3.0	<3.0
2,4-Dichlorophenol	<3.3	<3.3	<3.3
2,4-Dimethylphenol	<2.7	₹2.7	<2.7
2,4-Dinitrophenol	<2.7	<2.7	<2.7
2-Methyl-4,6-dinitrophenol	<42	<42	<42
2-Nitrophenol	<24	<24	<24
4-Nitrophenol	<3.6 <2.4	<3.6	<3.6
Pentachlorophenol	<3.6	<2.4	<2.4
Phenol	<1.5	<3.6	<3.6
2,4,6-Trichlorophenol	<2.7	<1.5	<1.5
2,4,0477 Tenror opnehor	\2.7	<2.7	<2.7
Extraction Date	2/15/00	2/15/00	
Analysis Date	3/15/88	3/15/88	3/15/88
Internal Standards	3/18/88	3/18/88	3/18/88
Level Added = 40 µg/1			
	·		
(% Recovery)	00		
Phenanthrene-D <sub>10</sub>	89	94	91
Surrogates Level Added = 100 µg/l			
(% Recovery)			ļ
Decafluorobiphenyl	16	40	
2-Fluorobiphenyl	46	40	55
2-Fluorophenol	79	69	85
Phenol-Ds	72 42	76	86
1 1161101-05	42	41	59

#### AQUEOUS MATRIX TOTAL METALS

			SAMPLE IDENTIFICATION (DATE)
PARAMETER	METHOD	ANALYSIS	WELL 102
(Units of Measure = mg/l)	NUMBER	DATE	(3/9/88)
Total Antimony	7041	4/10/88	<0.005
Total Arsenic	7060	4/1/88	<0.005
Total Beryllium	7090	4/10/88	0.002
Total Cadmium	7130	4/7/88	<0.005
Total Chromium	7190	4/8/88	0.007
Total Copper	7210	4/6/88	0.007
Total Lead	7420	4/7/88	<0.05
Total Mercury	7470	4/7/88	<0.0006
Total Nickel	7520	4/7/88	<0.05
Total Selenium	7740	4/1/88	<0.005
Total Silver	7760	4/6/88	<0.005
Total Thallium	7840	4/5/88	<0.05
Total Zinc	7950	4/6/88	0.011
_			

# QUALITY CONTROL INFORMATION - ACCURACY AQUEOUS MATRIX TOTAL METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Antimony Total Arsenic Total Beryllium Total Cadmium Total Chromium Total Copper Total Lead Total Mercury Total Nickel Total Selenium Total Silver Total Thallium Total Zinc	7041 7060 7090 7130 7190 7210 7420 7470 7520 7740 7760 7840 7950	*	50 500 500 500 500 500 0.40 500 500 500	88 90 102 100 83 93 103 103 98 85 94 107 97

 $<sup>\</sup>star$ Quality control results were generated from a sample of similar matrix at the time of analysis.

PROJECT Q-88 SAMPLEF STATION NO	3-15 15 151G	NATUF	SCII S	GRAB		1- Roch. NY	NO. OF CON- TAINERS	<u>/</u> ;	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	x /	/	REMARKS
1	3/4/		·	<b>\</b>	WELL	102 *	හ	a	4	a			(	1600 plastics - preserved with nitric to ph less than 2.
(3)					WELL	101	3	1	જ					
3	4			4	WELL	103	3	i	ぴ					
														•
RELINQUI	SHED	BY (SIC	NATUE		DATE/TIME:	RECEIVED BY ISIGNATUR	RE): 	RELII	NQUIS	SHED	8Y (S	IGNA1	TURE	DATE/TIME. RECEIVED BY (SIGNATURE):
RELINQUI						RECEIVED BY ISIGNATU	RE):	RELIN	NQUIS	HED	BY (S	IGNA1	TURE	DATE/TIME: RECEIVED BY (SIGNATURE):
RELINQUI	SHED	BY (SIC				RECEIVED FOR LABORAT (SIGNATURE).	<del></del>	1	DATE	TIME	REI	MARK	s: A/6	AC.
			Distribut	ion Origin	al accompanies ship	pment, copy to coordinator field:	liles				1			

# RECRA ENVIRONMENTAL, INC.

Chemical Waste Analysis, Prevention and Control

FIELD REPORT

GROUNDWATER SAMPLING ROCHESTER, NEW YORK

MARCH 9, 1988

Prepared For:

Haley & Aldrich of New York 189 North Water Street Rochester, New York 14604

Attention: Mr. Robert Mahoney

Prepared By:

Recra Environmental, Inc. Audubon Business Centre 10 Hazelwood Drive, Suite No. 106 Amherst, New York 14150

#8C1183

Reviewed By:

Date: \_\_\_\_\_\_3/15/88

#### 1.0 INTRODUCTION

This report describes the collection of groundwater samples in the city of Rochester, New York. This event conducted on March 9, 1988 by Recra Environmental, Inc. personnel Lloyd J. Marciniak. Assistance was provided by H & A of New York representative Susan Wheatcraft.

#### 2.0 FIELD METHODOLOGIES

#### 2.1 Bottom and Water Level Measurements

Prior to evacuation, each well bottom was sounded with either a weighted fiberglass measuring tape or a slope electronic water level meter and engineer's rule. Measurements were referenced from the top of the protective casing and recorded to the nearest hundreth of a foot (0.01). This data is presented in Table I. The length of the device utilized during well bottom measurements was rinsed with deionized water upon removal from each well.

Top of casing to water level measurements were obtained by sounding with either a weighted fiberglass measuring tape or a slope electronic water level meter and engineer's rule. Measurements were recorded to the nearest hundreth of a foot (0.01), (Table I). The length of the device utilized was rinsed with deionized water upon removal from each well.

The only deviation from this procedure occurred at Well 101. Accurate water level could not be attained via the aforementioned methods. Therefore the well was purged to dryness and based upon the volume (gallons) of purgings collected, an approximate water level was recorded. (See Field Observation Sheet).



#### 2.2 Well Purging

All wells were evacuated to a maximum of three (3) times their standing water volume. A well volume is defined as the volume of water standing inside the casing prior to evacuation. Individual 1½" x 5' stainless steel bailers and ½" nylon rope were used at each well. If a well was evacuated to dryness, sampling activities were conducted upon well recharge to a sufficient Water level. Purgings were collected into calibrated buckets for volume measurement and then dumped on the ground surface.

#### 2.3 Groundwater Sampling

Upon completion of well purging as described in Section 2.2, groundwater samples were obtained using the aforementioned bailers and rope. Following sample collection, all appropriate samples were preserved in accordance with accepted EPA methodologies.

#### 3.0 FIELD MEASUREMENTS

Measurements of pH, temperature and specific conductance were taken and recorded subsequent to sampling. An Orion 201 pH meter was used to obtain pH readings. The meter was two-point calibrated with pH 7 and pH 10 buffers. Thermometers were calibrated prior to the start of field work with an NBS traceable reference. A Horizon conductivity meter was used for specific conductivity measurements. The meter was calibrated to a 2767 µmhos potassium chloride standard.



#### 4.0 CHAIN OF CUSTODY

Chain of custody was initiated at the time of sample collection and maintained through delivery to the Recra Environmental, Inc. laboratory located in Tonawanda, New York. A copy of this document is included with this submission.



TABLE II

H & A OF NEW YORK ROCHESTER, NEW YORK

#### FIELD MEASUREMENTS MARCH 1988

SAMPLE I.D.	DATE	TIME	pH (STANDARD UNITS)	SPECIFIC CONDUCTANCE (µmhos/cm)	TEMP.	COMMENTS
101	3/9/88	1455	7.05	5,500	8.5	Brown, turbid liquid
102	3/9/88	1244	7.16	4,750	8.0	Cloudy liquid
103	3/9/88	1535	6.92	3,500	8.0	Brown, slightly turbid liquid
105	3/9/88	-	-	-	-	Dry - No Sample
102	3/9/88	1245	7.17	4,800	8.0	Cloudy liquid; QA/QC

HECRA ENVIRONMENTAL, INC.

## FIELD OBSERVATIONS

	SITE H & A of	New York		WELL #	101
*	TYPE OF SAMPLE	Groundwater	(X) Grab	( ) Composite ( )	Other
1					
		1	EVACUATION I	NFORMATION	
151	EVACUATION: D	ate/Time <u>3-9-88/1330</u>	0 & 1415	Method of Evac. St	ainless Steel Bailer
I	Well Casing Di	ameter (inches) <u>3</u>		_ Total Well Depth (	ft)53.50
1	Top of Casing	to Water Level (ft) /	Approx. 51.4	O Standing Water Vol	ume (gal.) Approx. 0.75
	Total Volume E	vac. (Gallons)0.7	75 to dry		ŕ
Ī					
75			SAMPLING IN	FORMATION	
-	SAMPLING: Date	e/Time <u>3-9-88/1455</u>		_ Method of Sampling	Stainless Steel Bailer
7	Top of Casing t	to Water Level Measur	rement (ft)	Approx. 51.40	
			•		
		<u> </u>	TELD MEASURE	EMENT DATA	
<b>-</b>	Time	pH (standard units)		ic Conductance (µmhos/cm)	Temperature (°C)
	1455	7.05		5,500	8.5
<b>-</b>					
!_			GENERAL INFO	DRMATION	
	Weather Conditi	ions at Time of Sampl	ina 40°	PF. showers	
		eristicsBrown, tur			
1	Comments and Ob			ll for accurate water	level measurement:
_		therefor	e, the well	was purged twice, bo	oth times yielding 0.75 standing water volume
<b>-</b>		formula	calculations	, approximately 51.4 ild yield 0.75 gallon	O feet would be a
Γ,		Cliff St		J. 1. 2 3. 7 3 4 . 7 0 1	
	124				

### FIELD OBSERVATIONS

SITE H&A	of New York	WELL # _	102
TYPE OF SAMPLE	Groundwater	_ (X) Grab ( ) Composite (	( ) Other
	<u>E</u>	VACUATION INFORMATION	
EVACUATION: D	ate/Time <u>3-9-88/1125</u>	Method of Evac.	Stainless Steel Bailer
Well Casing Dia	ameter (inches)3	Total Well Dept	th (ft)53.70
Top of Casing	to Water Level (ft) _	32.85 Standing Water	Volume (gal.) 7.65
Total Volume Ev	vac. (Gallons)23		
		SAMPLING INFORMATION	
SAMPLING: Date	e/Time <u>3-9-88/1244</u>	Method of Sampl	·
Tan of Casian A	an Habara Lawa I Manaya	20.50	Bailer
lop of Casing t	to water Level Measur	ement (ft) <u>36.56</u>	
	_	151 D MEACUREMENT DATA	
	<u>F</u>	IELD MEASUREMENT DATA	
Time	pH (standard units)	Specific Conductance	Temperature
		(µmhos/cm)	(°C)
1244	7.16	4,750	8
1245	7.17	4,800	8
	. <u> </u>	GENERAL INFORMATION	
Washban Conditi	ons at Time of Samul	4005	
	ons at Time of Sampl		
	eristics <u>cloudy li</u>	quid	
Comments and Ob	servations Addition	nal sample volume taken at t	his well for the purpose
		ity control. Well located or	



#### FIELD OBSERVATIONS

TIF HEV	of New York	<del></del>	WELL #		· · · · · · · · · · · · · · · · · · ·
TYPE OF SAMPL	E <u>Groundwater</u>	(X) Grab	( ) Composite	( ) Oth	er
	<u> </u>	VACUATION II	NFORMATION		
EVACUATION:	Date/Time <u>3-9-88/1430</u>	)	Method of Evac.	Stai	nless Steel Bailer
Well Casing D	iameter (inches) 3		_ Total Well Dep	th (ft)	55.10
Top of Casing	to Water Level (ft) _	36.45	_ Standing Water	Volume	(gal.) 6.84
Total Volume	Evac. (Gallons)7 t	o dry			•
		SAMPLING INF	FORMATION		
SAMPLING: Da	te/Time 3-9-88/1535		_ Method of Samp	ling	
SAMPLING: Da	te/Time <u>3-9-88/1535</u>	·	_ Method of Samp	ling	Stainless Steel Bailer
	te/Time 3-9-88/1535 to Water Level Measur		_	ling	
			_	ling	
	to Water Level Measur		51.70	ling	
	to Water Level Measur	ement (ft) _	51.70 EMENT DATA	ling	Bailer
	to Water Level Measur	rement (ft) _ IELD MEASURE Specifi	51.70	ling	
Top of Casing	to Water Level Measur	rement (ft) _ IELD MEASURE Specifi	51.70  EMENT DATA  Ic Conductance	ling	Bailer Temperature
Top of Casing	to Water Level Measur  F  pH (standard units)	rement (ft) _ IELD MEASURE Specifi	51.70  EMENT DATA  ic Conductance (µmhos/cm)	ling	Temperature (°C)
Top of Casing	to Water Level Measur  F  pH (standard units)  6.92	rement (ft) _ IELD MEASURE Specifi	51.70  EMENT DATA  ic Conductance (µmhos/cm)  3,500	ling	Temperature (°C)
Time  1535	to Water Level Measur  PH (standard units)  6.92	TELD MEASURE Specifi	51.70  EMENT DATA  ic Conductance (µmhos/cm)  3,500  DRMATION	ling	Temperature (°C)
Time 1535	to Water Level Measur  PH (standard units)  6.92	TELD MEASURE  Specifi  GENERAL INFO  ing40°F,	51.70  EMENT DATA  ic Conductance (µmhos/cm)  3,500  DRMATION  , showers	ling	Temperature (°C)
Time 1535	to Water Level Measur  PH (standard units)  6.92	TELD MEASURE  Specifi  GENERAL INFO  ing40°F,	51.70  EMENT DATA  ic Conductance (µmhos/cm)  3,500  DRMATION  , showers	ling	Temperature (°C)



HECRA ENVIRONMENTAL, INC.

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## FIELD OBSERVATIONS

Н & А (	of New York	WELL # _ 105
OF SAMPLE	Groundwater	( ) Grab ( ) Composite (X) Other <u>Dry</u>
	•	
		EVACUATION INFORMATION
ATION: Date/Time		Method of Evac. None
		3 Total Well Depth (ft) 60.50
		60.50 Standing Water Volume (gal.)0
		0
7070		
		SAMPLING INFORMATION
ING: Date	e/Time <u>3-9-88</u>	Method of Sampling None
: Cacina !	o Water Level Measu	urement (ft)60.50
casing t	to water tever heast	
		ETELD MEACHDEMENT DATA
		FIELD MEASUREMENT DATA
Time	pH (standard units)	Specific Conductance Temperature (µmhos/cm) (°C)
		GENERAL INFORMATION
ا	ions at Time of Same	
		pling
e Characte	hearyations n	
nts and O	oservationsOr	r - no sample
ı		

Appendix D.

Property Owner List and Tax Map

Tresent property Conter

ARL20 CROSS REFERENCE - BY PROPERTY I.D.

```
MOVE THE CURSOR TO THE DESIRED ACCOUNT AND PRESS PF20 TO TRANSFER TO ARMSUM.
     ... PROPERTY I.D.
106 700 0001 001 000 0000 IU 0100
                                                                                                               ADDRESS/OWNER NAME
                                                                                           PLATT ST
                                                                                                                            ROCH GAS & ELECTRIC CORP.
ROCH GAS & ELECTRIC CORP
     106 700 0001 002 000 0000 JN 0256
                                                                                           MILL ST
                                                                                        MILL ST
MILL ST
     105 700 0001 0(B) 000 0000 OF 0218-220
                                                                                                                          MITTER STANSACTORIATES
    PF20-TRANSFER TO ARMSUM CROSS REF'S: PF13-NAME PF14-ADDR PF15-TAX PF16-PID ARMXRFS ARL20 CROSS REFERENCE - BY PROPERTY I.D. DATE 09/15/88 +1R
     MOVE THE CURSOR TO THE DESIRED ACCOUNT AND PRESS PF20 TO TRANSFER TO ARMSUM
                                                                          . . .
                                                                                                              ADDRESS/OWNER NAME
                             FROMERTY I.D.
     106 700 0001 000 0000 PI 0222-230 MILL ST
                                                                                                                          CAMUELERERARRYSMACHICUMI
     104 700 0001 000 000 0000 JL 0232
                                                                                           MILL ST
                                                                                                                          CITY OF ROCHESTER
  106 700 0001 020 000 0000 JL 0232 MILL ST DURE ELEMANE STERN 106 700 0001 020 000 0000 KX 0236 MILL ST MILL ST MILL ST ASSOCIATES MILL ST MILL ST ASSOCIATES MILL ST MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES MILL ST ASSOCIATES 
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CENTRAL AV
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                                                                                                                          CABLE - WIEDEMER INC
     105 710 0001 003 000 0000 KR 0305 CENTRAL AV
105 710 0001 004 000 0000 LK 0307 CENTRAL AV
105 710 0001 005 000 0000 MD 0301 CENTRAL AV
                                                                                                                           MIDJ IMC
                                                                                                                           VIDCOM INDUSTRIES INC
                                                                                          CENTRAL AV
                                                                                                                           VIDCOM INDUSTRIES INC
     106 710 0001 006 000 0000 MW 0293-295 CENTRAL AV
                                                                                                                           SENUTA JEROME
                                                             CROSS REF'S: PF13-NAME PF14-ADDR PF15-TAX PF16-PID
     PF20-TRANSFER TO ARMSUM
                              ARL20 CROSS REFERENCE - BY PROPERTY I.D. DATE 09/15/88 *
     ARMXRFS
     MOVE THE CURSOR TO THE DESIRED ACCOUNT AND PRESS PF20 TO TRANSFER TO ARMSUM
                                                                                                              ADDRESS/OWNER NAME
                               PROPERTY I.D.
                                                                                           STATE ST
      106 780 0001 0€3 000 0000 NQ 0280
106 780 0001 0€7 000 0000 QD 0218
                                                                                                                           ROCHESTER AREA EDUCATION
                                                                                          STATE ST
                                                                                                                           ROCH GAS & ELECTRIC CORP
      104 780 0001 000 001 0000 SW 0108-0112 COMMERCIAL ST MEASTMAN KODAKTCOMPANY
      104 780 0001 000 001 0000 MZ 0264
                                                                                           STATE ST
                                                                                                                           EASTMAN KODAK COMPANY
     106 780 0001 011 000 0000 MW 0198
106 780 0001 012 000 0000 MW 0198
106 780 0001 013 000 0000 NF 0194
106 780 0001 013 000 0000 DI 0192
106 780 0001 013 000 0000 FB 0078
106 780 0001 015 000 0000 FU 0060
106 780 0001 015 000 0000 RZ 0000
106 780 0001 018 000 0000 RZ 0000
106 780 0001 019 000 0000 SZ 0084
                                                                                         MILL ST
MILL ST
MILL ST
                                                                                                                          COMIDA - CONCORDE GRP IN
                                                                                                                         LAFLERTENGRAVING CO INC
                                                                                                                         CANFIELD & TACK INC
                                                                                           COMMERCIAL ST EASTMAN KODAK COMPANY
                                                                                           COMMERCIAL ST
                                                                                                                          EASTMAN KODAK COMPANY
                                                                                           COMMERCIAL ST
                                                                                                                           TUCKER NEIL
                                                                                           CENTRAL AV
                                                                                                                           STATE OF NEW YORK
                                                                                           ANDREWS ST
                                                                                                                           ROCH GAS & ELECTRIC CORP
                                                                                           ANDREWS ST
                                                                                                                           CITY OF ROCHESTER
      104 780 0001 024 001 0000 SB 0052
     104 780 0001 027 000 0000 RY 0044
104 780 0001 028 000 0000 SR 0150
104 780 0001 029 000 0000 TK 0100
                                                                                           ANDREWS ST
                                                                                                                           CITY OF ROCHESTER
                                                                                           STATE ST
                                                                                                                           CARROLL MUMFORD COMPANY
                                                                                           STATE ST
                                                                                                                           UNITED STATES OF AMERICA
                                                                                                                ZICARI BRUCE B
                                                                                           STATE ST
      104 780 0001 030 000 0000 NN 0135
```



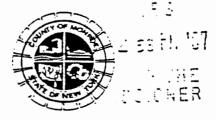
Appendix E

Letter: Nitzkin to Schmied

E. Hoberty

# County of Monroe

LUCIEN A. MORIN
COUNTY EXECUTIVE



JOEL L. NITZKIN, M.D. DIRECTOR

## Department of Health

111 Westfall Road, Caller 632 • Rochester, N.Y. 14692

September 8, 1987

New York State Department of Environmental Conservation 6274 East Avon-Lima Road Avon, New York 14414 Attn: Paul F. Schmied, P.E. Regional Engineer

SUBJECT: Genesee River Gorge (Lower Falls) Waste Site NYS Registry Site I.D. # 828044

Dear Mr. Schmied:

The Monroe County Landfill Review Committee is very concerned about the lack of definition of site boundary for the Genesee River Gorge (Lower Falls) waste site. There are currently a number of significant development proposals in the vicinity of this site. Confusion over the waste site boundary can have a very serious negative impact on these projects creating problems with land purchasing and project financing.

The waste disposal report for the Genesee River Gorge site contained in the December 1986 "Inactive Hazardous Waste Disposal Sites in NYS" Report lists the site as being located between the Upper and Lower Falls of the Genesee River (south of the Driving Park Bridge and East of Lake Avenue) including the former Deep Hollow Creek Ravine. The Draft Expanded Phase I Report issued in April 1987 by Recra Environmental, Incorporated established a site study area of the Upper Falls on the south, Lower Falls on the north, St. Paul Boulevard on the east and Lake Avenue on the west. Several developers, attorneys, and lending institutions have assumed the study area to be the waste site boundary.

The Draft Expanded Phase I Report provides a detailed assessment of current and past land use practices within the study area. The report includes identification and mapping of approximate locations of potential contamination sources. Using this available information we believe that the waste site boundary can be more clearly defined. The Monroe County Landfill Review Committee therefore strongly recommends that the New York State Department of Environmental Conservation improve the boundary definition of the Genesee River Gorge waste site. We would recommend the following criteria be used to establish the waste site boundary:

- 1. Include all land areas between the Upper and Lower Falls below the rim line of the gorge.
- Include all properties where coal gasification facilities were located.
- 3. Include confirmed hazardous waste disposal areas identified in the Draft Expanded Phase I Report (including the Ambrose Coal yard, Bee Bee park, and the west side of the gorge at the Middle Falls).
- 4. Include properties identified in the NYS Community Rightto-Know Report, Volume II, dated April 1985 (Rae Oil Company, 10 Ambrose Street).
- 5. Include properties identified on the Federal CERCLA Section 103(c) list (RG&E Property #29, #32, and #34).
- 6. Include all areas of extensive fill identified in the Draft Expanded Phase I Report. In this regard we believe that certain fill area boundary established in the Draft Expanded Phase I Report are inaccurate and will require expansion (e.g., Deep Hollow Creek Ravine), while other boundary should be contracted (e.g., the demarcation of the easterly portion of the Bee Bee Park fill area should not include the Gorsline Building at 12-18 Commercial Street).

The Monroe County Landfill Review Committee would welcome the opportunity to work with you and your staff to better define this site. We urge that these recommendations be forwarded to the appropriate NYSDEC Central Office staff for formal consideration.

September 8, 1987 Page 3

Please advise if we can be of further assistance.

Sincerely,

(Joel L. Nitzkin, M.D. Director of Health

JLN; ts

xc: Eric Seiffer/Frank Shattuck, NYSDEC-Avon

Print Dehects and Jeffrey Swain, City of Rochester

Mayor Thomas Ryan, City of Rochester

Deputy Mayor James Malone, City of Rochester

Monroe County Executive Lucien Morin

Gabriel Russo, Commissioner of Human Services

Assistant County Executive Alexander DiPasquale

file

# Appendix F

Letter: Doherty to Seiffer

#### City of Rochester



Department of Environmental Services

Office of the Commissioner City Hall 30 Church Street Rochester, New York 14614

October 8, 1987

Mr. Eric Seiffer, Regional Director Department of Environmental Conservation 6274 Avon-Lima Road Avon, New York 14414

Subject: Monroe County Landfill Review Committee Letter Regarding the "Lower Falls" Site Boundary

Dear Mr. Seiffer:

The City of Rochester would like to express its concurrence with the Monroe County Landfill Review Committee's September 8th letter to Mr. Paul Schmied of Region 8, regarding the Lower Falls site. The letter outlines the MCLRC's concern over the chilling effect that the confusion over the Lower to Upper Falls site boundary can have on development proposals for the gorge area. The City shares this concern.

We also support the LRC's recommended criteria for defining a site boundary distinct from the present study area. The criteria represent a technically and environmentally responsible proposal and should result in the inclusion of any potential contamination locations or sources. The first criterion listed in the letter, we feel however, requires some clarification before DEC could effectively use it to define the site boundary. While supporting the concept, we feel the statement "all land areas between the Upper and Lower Falls below the rim line of the gorge" needs more definition. We suggest that the phrase "below the rim line of the gorge" in essence means the entire gorge floor including the river channel, the adjoining banks, and the river flats. The criterion would then read, "Include the entire gorge floor, specifically the river channel, the adjoining banks, and the river flats, between the Upper and Lower Falls.

The City recognizes the need to include all potential contamination sources in the site boundary, but is nonetheless very concerned about the negative impacts on development effects that are arising over the misinterpretation of the study area as the site boundary. An environmentally responsible site boundary is needed. We feel the criteria proposed by the MCLRC with the modification suggested above can result in a responsible site boundary.

Page 2 Mr. Eric Seiffer

Please contact my office with any questions or concerns on this matter. Resolution of the Upper to Lower Falls site boundary is a matter of priority for the City of Rochester. It is our understanding that the recommended criteria will be reviewed by the Region 8 staff and have also been forwarded to the appropriate DEC Albany staff for their review. We look forward to your comments.

Thank you for your assistance on this important issue.

Yery truly yours,

Edward J. Doherty

Commissioner, DES

EJD:G/k

xc: Mayor Thomas Ryan

Deputy Mayor James Malone

Jeffrey Swain Suressa Forbes Thomas Argust

Joel Nitzkin, MCDOH/MCLRC Paul Schmied, NYS-DEC Frank Shattuck, NYS-DEC

# Appendix G

Generalized Geologic Cross Section

