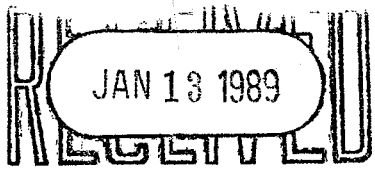
915026

EMPIRE
SOILS INVESTIGATIONS INC.

HOLCOMBE ASSOCIATES, INC.



ENVIRONMENTAL SITE ASSESSMENT
FORMER SITE OF BUFFALO MUNICIPAL PIER
PROPOSED SHOOTERS RESTAURANT
BUFFALO, NEW YORK

For

Holcombe Associates, Inc.
5016 Saunders Settlement Road
Niagara Falls, New York 14305

Attn: Mr. Jerry Holcombe

BTA-88-126
January 13, 1989

S-5167 SOUTH PARK AVENUE, P.O. BOX 0913, HAMBURG, NY 14075, 716-649-8110

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SOILS INVESTIGATIONS INC.

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I. INTRODUCTION

A. General

Empire Soils Investigations, Inc. (ESI) was retained to complete an environmental site assessment on property (former City of Buffalo Municipal Pier) for the proposed Shooters Restaurant located along the Buffalo Waterfront, west of Fuhrmann Boulevard near the foot of Michigan Avenue, in the City of Buffalo, (Erie County), New York. A project location plan is presented as Drawing No. 1 in Appendix A.

The environmental site assessment was completed in conjunction with an ESI companion report entitled "Geotechnical Investigation, Proposed Shooters Restaurant, Buffalo, New York" which presents the results of our subsurface exploration and geotechnical engineering recommendations for the proposed construction. The environmental site assessment was requested and authorized by Mr. Jerry Holcombe, representing Holcombe Associates, Inc. (HAI) in Niagara Falls, New York.

B. Purpose and Scope

ESI was engaged by HAI to render an opinion if significant quantities of oil and hazardous materials, as defined by the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) are present in the soil and ground water beneath the site. To accomplish this objective, ESI completed the following scope of services:

- Made a site visit and reviewed the present site use;
- Discussed the project with Mr. Holcombe and reviewed site plans (provided by HAI) of the subject property;
- Planned a subsurface exploration and sampling program for an environmental site assessment;
- Monitored the drilling of ten (10) test borings and installation of one (1) ground water monitoring well at the subject property (refer to Drawing No. 2 for location in Appendix A);
- Determined organic vapor concentrations during the exploration phase of the project;
- Measured relative ground surface elevations at the ten (10) test boring locations;
- Prepared the test boring logs;
- Engaged a New York State Department of Health (NYSDOH) certified analytical testing laboratory to analyze soil and ground water samples collected from selected test borings and the monitoring well, respectively;
- Evaluated data collected and;
- Summarized the environmental assessment and analytical test results in this report.

Limitations to this report are presented in Appendix B.

II. SITE CONDITIONS

A. Physical Setting

The site discussed in this report occupies approximately 6.2 acres of land (based on dimensions from site maps prepared by Mussachio Architects, Wiliamsville, New York, dated November 1988 and supplied by Mr. Holcombe of HAI), in the City of Buffalo, (Erie County) New York. We understand that the subject property is being leased from the Niagara Frontier Transportation Authority (NFTA). The site is bordered on the north by a water filled slip located between the subject property and the Seaway Piers to the north. The Buffalo Outer Harbor borders the property on the west and Fuhrmann Boulevard borders the property on the east. South of the subject site is vacant land which is presently owned by the NFTA and was previously used as a dredge disposal area.

The site topography is relatively level with a slight slope down to the south-southwest. Based on considerations of area topography and drainage, it appears that ground water beneath the site is generally level with a slight slope down towards Lake Erie and the Outer Harbor which exists about 100-feet to the north and to the west of the site.

B. Site History

Information regarding site history was obtained from the City of Buffalo Engineering and Survey Department, the Erie County Public Library and the Buffalo Historical Society. The discussion below is based solely on information obtained from these limited sources.

In the early 1800's, the Lake Erie Shoreline was approximately east of the Fuhrmann Boulevard and the present day Buffalo Skyway. In about 1840, a seawall was constructed along the shoreline approximately at the location of the present Buffalo Skyway. The outer harbor break wall was constructed approximately 2000-feet off shore from about 1865 to 1890. During this period, the area northeast of the subject site (i.e. near the foot of Michigan Avenue), was occupied by numerous railroad facilities, storage yards, elevators and warehouses related to various water front businesses such as shipbuilding, coal storage and transfer, grain and lumber.

The shoreline near the subject site remained the same (i.e. along Fuhrmann Boulevard) until the construction of the two (2) municipal piers in about 1926. The shoreline configuration south of the subject site changed considerably as dumping by previous owners gradually filled the area between Fuhrmann Boulevard and the Buffalo Outer Harbor. This area was used as a storage yard for new automobiles shipped by Lake freighters from points west (refer to the photograph presented as Drawing No. 3 in Appendix A taken in the mid 1950's). The shoreline south of the municipal piers moving south

continued to change (i.e. westward towards the Outer Harbor) during the late 1950's, 1960's and early 1970's. During this period the subject area was used as a dredge disposal site for outer harbor sediments. The shoreline has remained generally the same from the end of dredge spoil dumping in the mid 1970's until present. The area south of the subject area has recently been used stock piling coal, salt and sand.

Aerial photographs of the subject property were obtained for review from the City of Buffalo Survey Department, Erie County Department of Environment and Planning and the Buffalo Historical Society. The photographs reviewed (1940 through 1982) verified the changes in the basic shoreline configuration (as discussed previously) for the subject site and remained generally the same until present day.

C. Site Visit

ESI visited the site during the field explorations program which was completed from November 30, 1988 to December 7, 1988. The purpose of the site visit was to observe current conditions at the site with respect to the potential presence of hazardous materials in the soils and/or ground water beneath the subject site.

The subject site is generally level land covered by asphaltic pavement, short grass and miscellaneous debris from former stock piles of coal, salt and sand. Two (2) existing structures are located in the approximate center of the property. One building (about 100-feet by 175-feet) is located about 50-feet from the north property line along the edge of the water. The building is vacant and on the north and has a concrete floor which is somewhat deteriorated. It appears that the structure was used to stockpile material (i.e. salt) from the weather. The second structure (80-feet by 120-feet) is located east of the larger structure and

about 140-feet from the edge of water along the north property line. The building also has a concrete floor and is vacant except for a construction trailer stored inside. Along the western property border (edge of the outer harbor) miscellaneous rubble fill and construction debris were observed from the existing ground surface downward to the edge of the water. The area surrounding the two (2) existing buildings is covered with asphaltic pavement. It appears that surface water run-off is towards the outer harbor, north and west, and towards a catch basin located south of the existing buildings.

Based on field observations made during the site visit, there are existing sewer, water, gas, electric and telephone service lines bordering the subject property northeast of the subject site along Fuhrmann Boulevard. However, the field locations of utilities on the site were not confirmed as part of this study.

D. Regulatory Agency Information

ESI contacted Mr. John Tygert of the New York State Department of Environmental Conservation (NYSDEC) and Mr. Melvin Szymanski of the Erie County Department of Environment and Planning (ECDEP). The purpose of the inquiries was to request information with regards to the potential presence of hazardous materials, known environmental releases, prior environmental studies done on property and prior environmental citations on the property.

NYSDEC and ECDEP stated, after a careful review of their respective records, that there are no known waste disposal activities located on the subject property. However, there are three (3) inactive industrial waste disposal site within approximately 2000-feet of the subject site. The Times Beach/Fuhrmann Boulevard, waste site in Buffalo, New York (I.D. No. NYD915080) is about 2000-feet north of the subject site. A waste site known as the City Ship Canal,

west Bank, South Michigan Street, Buffalo, New York is located about 1000-feet northeast of the subject site. The Niagara Frontier Transportation Authority's (NFTA) Outer Harbor disposal property (I.D. No. NYD915026) borders the subject on the southeast. The NFTA Outer Harbor property is registered as a 2A hazardous waste site. A Phase II Site investigation is presently being contemplated by the NFTA to change the site's present 2A listing. The NFTA Outer property is immediately adjacent to the subject property to the southeast.

The NYSDEC and ECDEP also stated that there are no known records of environmental releases at the subject site. It should be noted that the NYSDEC and ECDEP files only reflect those sites where inquiry and/or investigation by NYSDEC, the United States Environmental Protection Agency (USEPA), local health/environmental department, or by input from the public at large, have revealed the possibility of hazardous waste and/or associated activities involving hazardous materials have taken place. It should be further noted that answers to inquiries of this nature only reflect the information currently in the NYSDEC and ECDEP files.

The following local agencies and city departments were also contacted for information regarding known environmental concerns at the site: Erie County Health Department, City of Buffalo Police Department and City of Buffalo Fire Department. Information obtained from these sources indicates that there are no known records of hazardous materials being released at the site.

III. SUBSURFACE EXPLORATION

ESI made ten (10) test borings (B-1 through B-10) and installed a ground water monitoring well in one (1) of the test borings (B-6). The drilling of test borings and the installation of the monitoring well was done from November 30, 1988 to December 7, 1988. The test

boring locations are plotted on Drawing No. 2 in Appendix A.

The ground surface elevation at each of the test boring locations was measured in the field by ESI using optical survey methods. The ground surface elevations were referenced to a bench mark established on the rim of a catch basin located in the approximate center of the property along the south property line. Based on data from a site plan provided by HAI and prepared by Pratt and Huth Associates, the elevation at this point is 579.76. The bench mark location is plotted on Drawing No. 2 presented in Appendix A.

The test borings were advanced to determine subsurface conditions for geotechnical evaluation of the soils and ground water with respect to the proposed consutrction. Based on the configuration of the proposed restaurant, Mussachio Architects generally located six (6) of the geotechnical test borings (B-1 through B-6) within the proposed building area and four (4) test borings (B-7, B-8, B-9 and B-10) in the proposed parking areas. Two (2) test borings, B-4 and B-6 were used as environmental sampling points, with a ground water monitoring well being installed in test boring B-6.

Test boring procedures and ground water monitoring well installation details are discussed in detail in the companion geotechnical report entitled "Geotechnical Investigation, Proposed Shooters Restaurant, Buffalo, New York". The test boring logs and details of the ground water monitoring well installation are presented in Appendix C of this report.

IV. FIELD AND LABORATORY TESTING AND RESULTS

A. General

In conjunction with the environmental assessment and geotechnical exploration at this site, various field and laboratory measurements were taken by ESI and a NYSDOH certified analytical testing laboratory to evaluate air, soil and water quality. Test

procedures and results are summarized in subsequent paragraphs.

B. Air Quality Testing and Results

Organic vapor monitoring was conducted during the subsurface investigation and compared to background measurements to indicate potential hazardous substances below ground. Organic vapor measurements were taken at the top of the hollow stem augers with the augers set at various depths during drilling and as the soil samples were removed from the split-spoon and placed in sample jars.

Organic vapor measurements were taken using a photoionization detector (PID). The PID used to measure ionizable organic vapors was a Hnu PI101 manufactured by Hnu Systems, Inc. of Newton Highlands, Massachusetts with a 10.2 eV ultraviolet light source. The Hnu measures organic vapors up to about 2000 parts per million (ppm). The instrument was calibrated before the start of field work using the manufacturer's recommended calibration standard of Benzene.

Ambient "background" organic vapor measurements were taken approximately 20-feet upwind of each test boring location prior to drilling to establish site conditions. The range of these "background" readings during the monitored period (November 30, 1988 through December 7, 1988) were 0.0 to 0.4 ppm.

PID measurements made during drilling operations near the top of borehole and near the split-spoon samples generally indicated organic vapors less than 0.4 ppm, with a peak reading of 6 ppm measured near the ground surface in test boring B-6. Organic vapor measurements should be compared to ambient background readings ranging from about 0.0 to 0.4 ppm. Field air quality monitoring data are presented on the boring logs in Appendix C.

C. Soil and Analytical Testing and Results

ESI collected composite soil samples from test borings B-4 and B-6 for analytical soil analysis of the Superfund Target Compound List (TCL) which includes Organochlorine Pesticides and PCB's (Test Method 8080), semi-volatile TCL Pollutants (Test Method 8240), semi-volatile TCL Pollutants (Acid and base/neutral extractables, Test Method 8270), Priority Pollutant Metals and Cyanide (Test Method 335.2). We point out that a summary of the Superfund Target Compound List (TCL) compounds and parameters is presented in Appendix E for reference. The results of the chemical analyses done on the composite soil samples collected from test borings B-4 and B-6 are presented in Appendix D.

Composite soil samples were collected from test borings B-4 and B-6 during drilling from December 6, 1988 to December 7, 1988. The sample collection procedure consisted of compositing representative soil from split-spoon samples taken within the fill material encountered in each of the test borings.

The soil samples were placed into pre-cleaned 40 ml septum vials filled to capacity to prevent air space. The containers were tightly sealed and placed in an ice cooler. The containers were then returned to Huntingdon Analytical Services, Inc. (HAS) in Middleport, New York for testing immediately following collection.

The analytical results indicate that no significant TCL Organochlorine Pesticides and PCB's (USEPA Test Method 8080), semi-volatile TCL Pollutants (Test Method 8240), and semi-volatile TCL pollutants (acid base/ neutral extractables) were detected in the soil samples collected from the two (2) test borings. A concentration of 4400 ug/kg (parts per billion) of acetone was detected in the composite soil sample collected from test boring B-6. The measured concentration of acetone is probably the result of the

decontamination of the soil mixing equipment used to composite the soil samples (Note: boring B-6 was sampled after B-4, with equipment being decontaminated in the field between borings). Minor detectable concentrations of several base neutral extractables detected in Test Method 8270 are not a result of any current activities at the site and are not indicative of widespread or gross contamination across the site and could generally be considered insignificant with respect to the proposed development.

The analytical test results for Priority Pollutant Metals and Cyanide indicate concentrations that are generally considered to be within background levels.

D. Ground Water Analytical Testing and Results

ESI collected a representative water sample from monitoring well B-6 for water quality analysis using USEPA TCL Test Methods for Organochlorine Pesticides and PCB's (Test Method 608), Semi-volatile TCL Pollutants (Test Method 624), Semi-volatile TCL Pollutants (Test Method 625), Priority Pollutant Metals and Cyanide. The results of the chemical analyses done on the water samples collected from monitoring well B-6 are presented in Appendix D.

Ground water samples were collected on December 12, 1988 from the monitoring well installed in test boring B-6. We point out that the monitoring well was "developed" using evacuation techniques following installation. A Brainard-Kilman, hand operated, positive displacement pump was used to evacuate the well. Approximately one (1) hour after three (3) well volumes were purged from the well, a dedicated, pre-cleaned, 3-feet long by 1-inch outside diameter teflon bailer with a teflon check valve was used to purge and sample the well. The sample collection procedure consisted of purging three (3) well volumes from the well and allowing the well to recover prior to sampling. The water sample was collected by lowering

the bailer into the water and allowing it to fill. The bailer was then removed and the contents emptied into pre-cleaned 40 ml glass septum vials filled to capacity to prevent air bubbles. The vials were tightly sealed and placed in an ice cooler and returned to HAS for testing immediately following collection.

The analytical results indicate that TCL Organochlorine Pesticides and PCB's, semi-volatile TCL Pollutants, semi-volatile TCL Pollutants semi-volatile TCL pollutants (acid, base/neutral extractables) were not detected in the ground water samples collected from the monitoring well (B-6). Priority Pollutant Metals and Cyanide were detected at concentrations generally below those specified for New York State Class GA (potable) ground water.

V. SUMMARY AND CONCLUSIONS

The conclusion presented below are subject to the limitations contained in Appendix B. An environmental site assessment and geotechnical investigation were performed for HAI at the site of the proposed Shooters Restaurant, which is located southwest of Fuhrmann Boulevard in Buffalo, New York. This assessment was limited to data obtained during a site visit, a brief review of site history and a field exploration and chemical analysis program. Based on the limited studies conducted and the information made available to ESI, relevant findings are summarized below:

- The site includes approximately 6.2 acres of waterfront property in Buffalo, New York, southwest of Fuhrmann Boulevard. The site is presently level land occupied by two (2) buildings.
- The property will be leased from the NFTA.
- Based on the review of site history, the subject property was covered by water until about 1926 when the City of Buffalo constructed the City Municipal Piers. Land area south of the piers increased through the years as the area was filled with dredge materials from the Buffalo Outer Harbor. The subject property was used for storage of new automobiles, coal, salt and sand.

- Personnel from NYSDEC, ECDEP and local agencies (previously listed) were contacted. No record of releases of hazardous materials or soil/ground water remediations was found for the site. It should be noted that records from ECDEP indicate that three (3) inactive waste disposal sites are within 2000-feet of the subject site.

- Organic vapor concentrations were not detected during the subsurface investigation at the subject site.

- Chemical test results indicate that concentrations of TCL Organochlorine Pesticides and PCB's, semi-volatile TCL Pollutants and semi-volatile TCL Pollutants (acid, base/neutral Extractables) were not detected in water samples collected from the monitoring well installed in boring B-6.

- Chemical test results also indicated that concentrations of TCC Organochlorine Pesticides and PCB's and semi-volatile TCL Pollutants were not detected in composite soil samples collected from borings B-4 and B-6.

- Chemical test results indicated that minor concentrations of some semi-volatile TCL Pollutants (acid, base/neutral extractables) were detected in composite soil samples collected from borings B-4 and B-6.

In summary, ESI has not found any information that indicates that significant quantities of hazardous materials are present in the soil and ground water at the subject site. It is our opinion, based on the data collected and reviewed as part of this environmental site assessment, that significant quantities of hazardous substances are, or have not been, present at the subject site. Evaluation of the possible impact of practices at neighboring locations on the subject site was beyond our contracted scope of services.

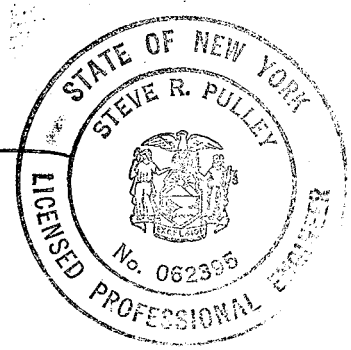
Respectfully submitted,
EMPIRE SOILS INVESTIGATIONS, INC.

Donald B. Abrams

Donald B. Abrams
Senior Environmental Geologist

Steve R. Pulley

Steve R. Pulley, P.E.
Senior Engineer
Engineering Services Manager



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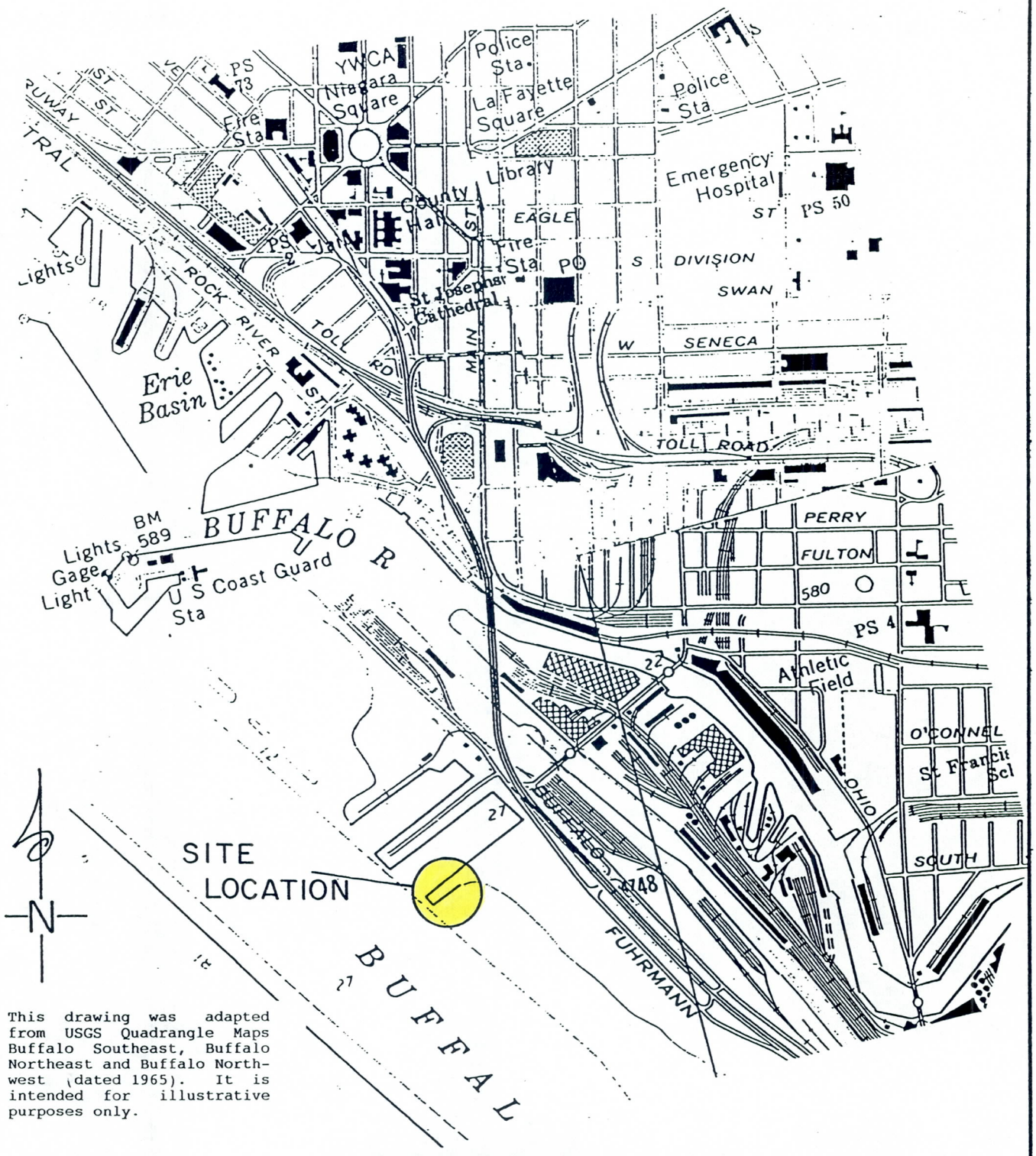
APPENDIX A

DRAWINGS



This drawing was adapted from USGS Quadrangle Maps Buffalo Southeast, Buffalo Northeast and Buffalo Northwest (dated 1965). It is intended for illustrative purposes only.

QUADRANGLE LOCATION

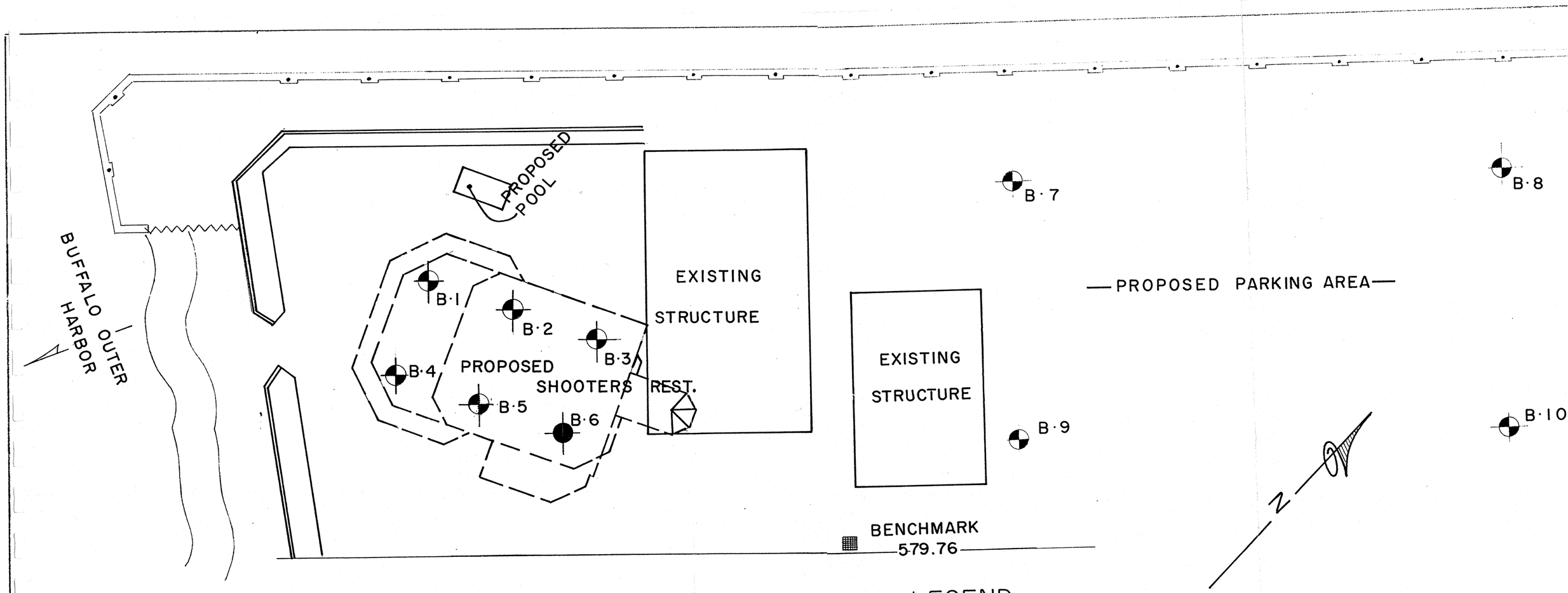
EMPIRE SOILS INVESTIGATIONS INC

SITE LOCATION PLAN

ENVIRONMENTAL SITE ASSESSMENT
PROPOSED SHOOTERS RESTAURANT
BUFFALO, N.Y.

DR.BY: D.W. LABELLE	SCALE: 1" = 2000'	PROJ. NO. BTA 88 126
CK'D.BY: DBA	DATE: JAN 89	DRWG.NO. 1

R/T FORM R-1



NOTES:

(1) Test boring locations were determined in the field by Empire Soils Investigations, Inc. (ESI) from approximate tape measurements referenced to existing site features and plotted on this plan adapted from a site plan provided by Holcombe Associates, Inc. (HAI) of Niagara Falls, New York and prepared by Mussachio Architects of Williamsville, New York dated November 17, 1988. These locations should be considered accurate only to the degree implied by the method used.

(2) Ground surface elevations at test boring locations were measured by ESI using optical survey methods. The ground surface elevations are referenced to a bench mark established on the top of a storm water catch basin grate located along the south property boundary (elevation equals 579.76 feet USCGS Datum) as shown on a drawing provided by HAI and prepared by Pratt and Huth Associates, Engineering Surveyors, not dated.

LEGEND

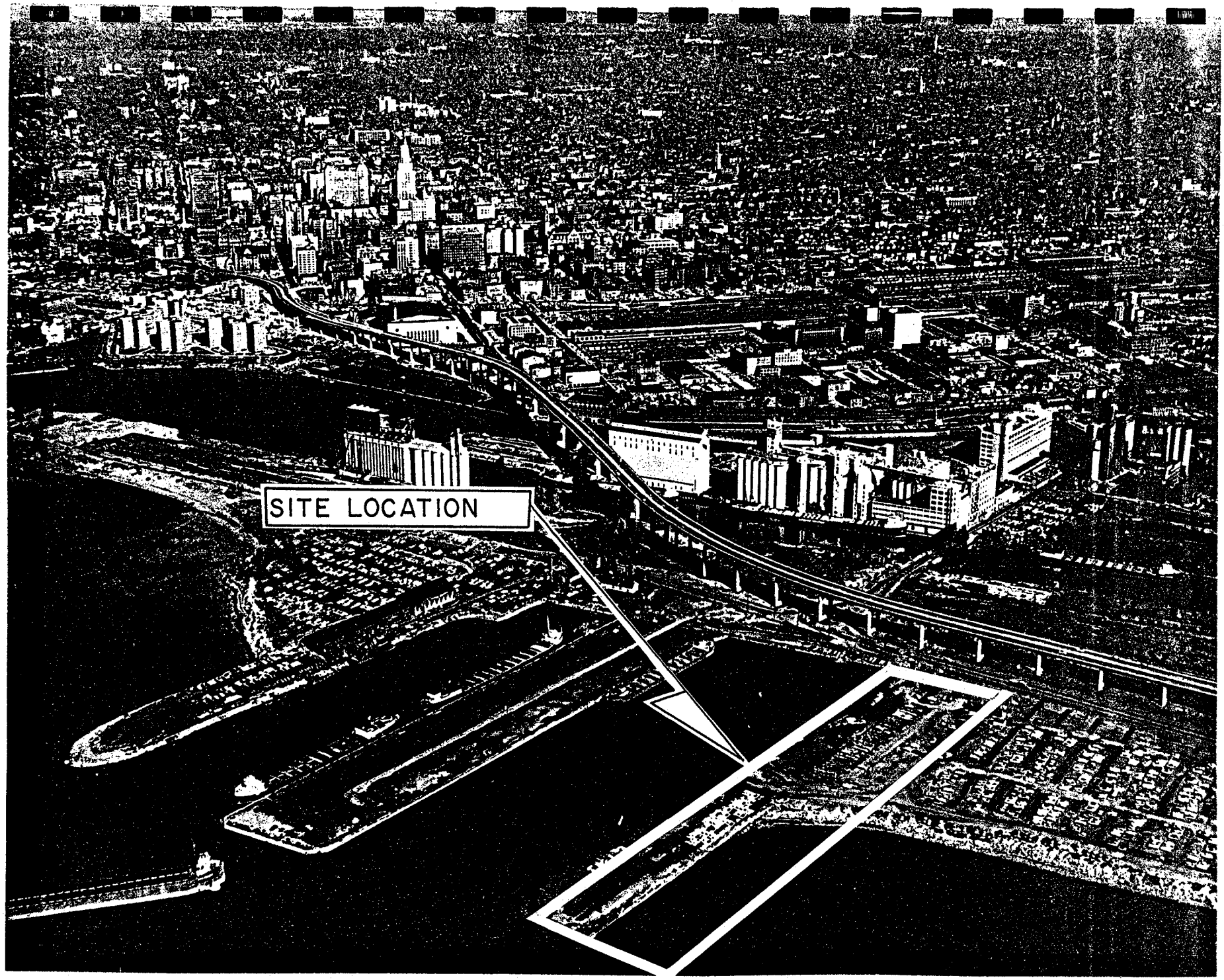
- TEST BORING LOCATION
- TEST BORING LOCATION WITH MONITORING WELL INSTALLED.

EMPIRE SOILS INVESTIGATIONS INC.

TEST BORING LOCATION PLAN

PROPOSED SHOOTERS RESTAURANT
BUFFALO WATERFRONT SEAWAY PIERS
BUFFALO, NEW YORK.

DR.BY: D.W. LABELLE	SCALE: 1" = 50'	PROJ. NO.	87A88126
CK'D.BY:	DATE: JAN. 89	DRWG.NO.	2



DRAWING 3 PROPOSED SHOOTERS RESTAURANT PRE-1955 PHOTOGRAPH

APPENDIX B

LIMITATIONS

APPENDIX B

LIMITATIONS

1. The observations described in this report were made under conditions stated therein. The conclusions presented in the report were based solely upon the services described therein and not tasks and procedures beyond the scope of described services or the time and budgetary constraints imposed by the client.

2. In preparing the limited site history, ESI has relied on certain information provided by State, County and City officials and other parties referenced herein. ESI did not attempt to independently verify the accuracy or completeness of information reviewed or received during the course of the collection of this site history.

3. No specific attempt was made to check on the compliance of present or past owners or operators of the site with Federal, State, or Local laws and regulations, environmental or otherwise.

4. Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the site or to structures was limited or unavailable, ESI renders no opinion as to the presence of hazardous materials or to the presence of indirect evidence relating to hazardous material in that portion of the site or structure.

5. Unless otherwise specified in the report, ESI did not perform testing or analyses to determine the presence or concentrations of asbestos or radon at the site.

6. This report has been prepared for the exclusive use of HAI and its designated agents for the specific application to the Proposed Shooters Restaurant site in Buffalo, New York in accordance with generally accepted engineering practice. No other warranty expressed or implied, is made.

APPENDIX C

SUBSURFACE LOGS

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.

2. 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.

DATE
STARTED 5-1-86
FINISHED 5-1-86
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-175
SURF. ELEV. 325.6
G. W. DEPTH See Note #1

Project _____ LOCATION _____

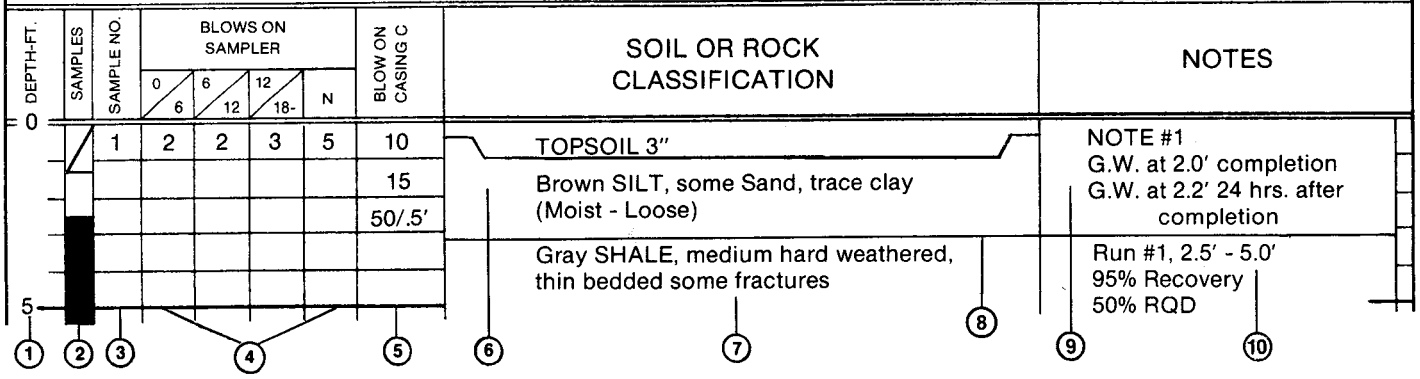


TABLE I

- Split Spoon Sample
- Shelby Tube Sample
- Auger or Test Pit Sample
- Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	> 12"	
Cobble	3" - 12"	
Gravel - Coarse	3" - ¾"	Coarse Grained (Granular)
- Fine	¾" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt-Non Plastic (Granular) Clay-Plastic (Cohesive)	<#200	Fine Grained

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accord with the following terms.

Granular Soils		Cohesive Soils	
Term	Blows per Foot, N	Term	Blows per Foot, N
Loose	< 11	Very Soft	< 3
Firm	11 - 30	Soft	3 - 5
Compact	31 - 50	Medium	6 - 15
Very Compact	> 51	Stiff	16 - 25
		Hard	> 26

(Large particles in the soils will often significantly influence the blows per foot recorded during the Penetration Test.)

TABLE V

Varved	- Horizontal uniform layers or seams of soil(s).
Layer	- Soil deposit more than 6" thick.
Seam	- Soil deposit less than 6" thick.
Parting	- Soil deposit less than ⅛" thick.
Laminated	- Irregular, horizontal and angled seams and partings of soil(s).

TABLE VI

Rock Classification Terms Term		Meaning
Hardness	Soft	Scratched by fingernail
	Medium Hard	Scratched easily by penknife
	Hard	Scratched with difficulty by penknife
	Very Hard	Cannot be scratched by penknife
Weathering	Very Weathered	Judged from the relative amounts of disintegration iron staining, core recovery, clay seams, etc.
	Weathered	
	Sound	
Bedding	Laminated	Natural breaks in Rock Layers (<1")
	Thin bedded	(1" - 4")
	Bedded	(4" - 12")
	Thick bedded	(12" - 36")
	Massive	(>36")

(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers.)

DATE
STARTED 12/1/88
FINISHED 12/1/88
SHEET 1 OF 2

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-1
SURF. ELEV. 578.60
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	16	25				Black-Brown GRAVEL, some Sand (moist, FILL)	PID=Photoionization detector reading in ppm
			32	36		57	0.2		
		2	25	22				Black f-c SAND, some Gravel, tr. paper, tr. glass, tr. brick, fill (moist, FILL)	
			31	38		53	0.3		
5		3	25	10				Brown f-c SAND, tr. cinders (moist, FILL)	
			7	7		17	0.3		
		4	5	5				Black f-c SAND, tr. cinders (moist, FILL)	
			5	5		10	0.3		
		5	2	1				Black SILT, and fine Sand (moist, FILL)	
10			2	2		3	0.3		
		6	10	15				Gray fine SAND, and Silt (moist, compact, SM)	
			18	14		33	0.2		
15		7	23	17				Contains "little" Silt (moist, firm, SP)	
			5	4		22	0.2		
20		8	3	3				(wet, loose)	
			6	10		9	0.2		
25		9	20	24	49	73	0.2	Gray fine SAND, tr. silt, occasional f-m Gravel lenses (wet, very compact, SP)	
30		10	2	18	30	48	0.2	Gray f-c SAND, little fine Gravel, tr. silt (wet, compact, SW)	
		11	6	8	13	21	0.2	Gray f-c SAND, tr. silt (wet, firm, SW)	
35									
40		12	14	20	16	36	0.2	(wet, compact)	

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 12/1/88
FINISHED 12/1/88
SHEET 2 OF 2

EMPIRE SOILS INVESTIGATIONS INC. — **SUBSURFACE LOG**

HOLE NO. B-1
SURF. ELEV. 578.60
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
40									
45		13	10	12	13	25	0.1	(wet, firm)	
50		14	15	16	22	38	0.1	Gray fine SAND, some Silt (wet, compact, SM)	
55		15	27	50				(wet, very compact)	
			50/0.2			REF	0.0	Boring Complete with Auger refusal at 55.2'	Free standing water recorded at 18.0' at Boring Completion
60									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 12/1/88
FINISHED 12/1/88
SHEET 1 OF 2

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV. 578.73
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	16	31				Brown f-c SAND,"and-some" f-c Gravel	PID=Photoionization detector reading in ppm
			30	45		61	0.2	(moist, very compact,GP)	
		2	31	30				Black f-c SAND, little fine Gravel,	
			30	35		60	0.2	(moist, very compact, SW)	
		3	14	13				Little Slag (moist, compact)	
5			21	30		34	0.3		
		4	21	20				(moist-wet, compact)	
			16	18		36	0.3		
		5	6	8				Black f-m SAND, little fine Gravel	Wet spoon recovered at Sample #5
			8	6		16	0.2	(wet, loose, SW)	
10		6	6	10				Gray f-c SAND (wet, firm, SW)	
			14	12		24	0.2		
15		7	3	5				(wet, loose)	
			5	7		10	0.2		
		8	WOR	4				Black f-c SAND, little Silt (moist,	WOR=weight of rod
20			5	5		9	0.2	loose, SW)	
		9	WOR	WOR				Brown f-c SAND, little f-m Gravel	
25			5	24		5	0.2	(wet, loose, SW)	
		10	3	5				Brown f-c SAND, tr. silt (wet, firm,	
30			7	10		12	0.2	SW)	
		11	5	10	17	27	0.2	Gray f-c SAND (moist, firm, SW)	
35									
40									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 12/1/88
FINISHED 12/1/88
SHEET 2 OF 2

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-2
SURF. ELEV. 578.73
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
40		12	13	10	20	30	0.2	Gray f-m SAND, little Silt (wet, compact, SP-SM)	
45		13	10	21	23	44	0.2	Gray fine SAND, tr. silt (wet, compact, SP-SM)	
50		14	12	10	14	24	0.1	Gray fine SAND, little Silt (wet, firm, SP-SM)	
55		15	15	14				Gray fine SAND (wet, compact, SP)	
			27/0.2			REF	0.1	Boring Complete with Auger refusal at 55.2'	Free standing water was not recorded due to drilling conditions
60									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE STARTED 12/2/88 FINISHED 12/2/88 SHEET 1 OF 2

EMPIRE SOILS INVESTIGATIONS INC. — **SUBSURFACE LOG**

HOLE NO. B-3 SURF. ELEV. 578.86 G. W. DEPTH see note

PROJECT Shooters International BTA-88-126

LOCATION Buffalo Waterfront Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	25	85				Black f-c SAND, some Cinders, little salt, tr. gravel (moist, FILL)	PID=Photoionization detector reading in ppm
			83	60/.3		168	0.2		Could not advance casing, move north 3'
5		2	1	25				Little Gravel, tr. cinders, tr. glass (moist, FILL)	
			16	8		41	0.2		
		3	8	12				Gray f-c SAND, tr. silt (moist, compact, SW)	
			18	21		30	0.2		
		4	13	8				Little Gravel (moist, firm)	
10			10	12		18	0.1		
		5	14	10				(wet, firm)	
			6	8		16	0.2		
15		6	3	3				Gray f-c SAND, tr. silt (wet, loose, SW)	
			3	3		6	0.0		
20		7	6	7				Gray SILT, little fine Sand, tr. wood (moist, firm, ML)	
			7	11		14	0.1		
25		8	33	28				Gray f-c SAND, tr. silt, tr. fine gravel (wet, compact, SW)	
			22	13		50	0.0		
30		9	10	12				Gray f-m SAND, tr. silt (wet, firm, SW)	
			14	10		26	0.0		
		10	29	28				Gray fine SAND, tr. silt (wet, compact, SP)	
35			20	20		48	0.0		
40									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING SPUN CASING (3"ID)

DATE
STARTED 12/2/88
FINISHED 12/2/88
SHEET 2 OF 2

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-3
SURF. ELEV. 578.86
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
40									
		11	10	13				Contains "and" Silt (firm, SM)	
			10	14		23	0.0		
		12	13	12					
45			16	18		28	0.1		
		13	18	16	26	42	0.0	(compact)	
50									
		14	13	18					
55			16	13		34	0.0		
									Casing refusal at 60.0'
60								Gray LIMESTONE, hard sound, thick bedded, tr. fractures, 0.3' void noted at 62.1' to 62.4'	Run #1 60.0-65.0' REC=94% RQD=76% NQ'2' Size Core
65								Boring Complete at 65.0'	Free standing water recorded at 6.9' at Boring Completion

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING SPUN CASING (3"ID)

DATE
STARTED 12/6/88
FINISHED 12/6/88
SHEET 1 OF 2

EMPIRE SOILS INVESTIGATIONS INC. SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV. 578.71
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	8	22				Black f-c SAND, tr. cinders, tr. slag (moist, FILL)	PID=Photoionization detector reading in ppm
			23	34		45	0.0		
		2	22	30				Contains tr. glass	
			26	27		56	0.2		
		3	7	13				Brown f-c SAND, tr. fine Gravel (moist, FILL)	
5			7	8		20	0.1		
		4	6	6				Contains tr. glass (moist, FILL)	
			9	6		15	0.1		
		5	6	6				Gray fine SAND, tr. silt (wet, loose, SP)	
			4	4		10	0.0		
10		6	9	11				(wet, loose, SP)	
			11	12		22	0.0	(wet, firm)	
15		7	5	2				Gray SILT, and very fine Sand (wet, loose, ML)	
			2	2		4	0.0		
20		8	3	5					No sample recovered wood blocked spoon
			6	6		11	0.0		
25		9	11	17				Gray f-c GRAVEL, some f-c Sand (wet, compact, GW)	
			27	15		44	0.0		
30		10	7	14				Gray f-m SAND (wet, firm, SP-SW)	
			13	15		27	0.0		
35		11	7	11				Gray fine SAND, tr. silt (wet, firm, SP)	
			18	18		29	0.0		
40									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.
C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING SPUN CASING (3"ID)

DATE
STARTED 12/6/88
FINISHED 12/6/88
SHEET 2 OF 2

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-4
SURF. ELEV. 578.71
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
40		12	8	17					
			13	13		30	0.0		
45		13	7	14				(compact)	
			19	17		33	0.0		
50		14	3	4				Gray very fine SAND and Silt (wet, loose, SM)	Casing refusal at 55.5'
			6	6		10	0.0		
55								Gray LIMESTONE with chert nodules, medium hard-hard, thick bedded, sound, tr. fractures	Run #1 55.5-60.5' REC=93% RQD=84% NQ'2' Size Core
60								Boring Complete at 60.5'	Free standing water recorded at 6.9' at Boring Completion
65									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

METHOD OF INVESTIGATION: ASTM D-1586 USING SPUN CASING (3"ID)

CLASSIFICATION Visual by on-site Geologist

DATE
STARTED 12/5/88
FINISHED 12/5/88
SHEET 1 OF 2

EMPIRE SOILS INVESTIGATIONS INC. **SUBSURFACE LOG**

HOLE NO. B-5
SURF. ELEV. 578.54
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	12	22				Black f-c SAND, little Cinders,	PID=Photoionization detector reading in ppm
			60	14		82	0.1	little Salt, tr. slag (moist, FILL)	
		2	35	20				Brown f-c SAND, tr. salt, tr. glass	
			19	16		39	0.1	(moist, FILL)	
5		3	6	7				Brown f-c SAND, tr. silt, tr. wood	
			10	12		17	0.1	(wet-moist, FILL)	
		4	12	13				Gray f-c SAND, tr. silt, tr. slag,	
			11	10		24	0.1	tr. brick (wet, FILL)	
		5	7	3				Gray f-c SAND, tr. silt, tr. glass	
10			4	3		7	0.1	(wet, FILL)	Bottom Fill 10.0'
		6	12	8				Gray f-m SAND, tr. silt (wet, firm,	
			9	10		17	0.1	SW-SP)	
		7	8	3				Gray fine SAND, tr. silt (wet,	
15			4	3		7	0.2	loose, SP)	
		8	5	5				Black SILT, little fine Sand,	
20			8	11		13	0.2	(moist, firm, ML)	
		9	14	24	28	52	0.1	Gray fine SAND, tr. silt, tr. wood	Note: wood saw dust like material
25								(moist, very compact, SP)	
		10	5	6	9	15	0.1	Gray f-c SAND, and fine Gravel	Running in augers
30								(wet, loose, SW)	
		11	53	52	43	95	0.0	(very compact)	
35									
		12	18	13	14	27	0.0	Gray f-c SAND,"tr.-little" silt	
40								(moist, firm, SM)	

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 12/5/88
FINISHED 12/5/88
SHEET 2 OF 2

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-5
SURF. ELEV. 578.54
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
40								Gray f-c SAND, tr. to little silt (moist, firm, SM)	"Running Sands" unable to obtain sample. Filled up auger 16'. Rod stuck in hole, 1 hour to get 1 sample
45									
50									
55								Boring Complete with Auger refusal at 56.0'	Unable to obtain free standing water level due to introduction of water into the hole.
60									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 12/7/88
FINISHED 12/7/88
SHEET 1 OF 2

EMPIRE SOILS INVESTIGATIONS INC. — **SUBSURFACE LOG**

HOLE NO. B-6
SURF. ELEV. 578.68
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	21	50				White fill material, tr. sand, tr.	Tip in hole 2.2-4.6
			52	54		102	2-6	slag, tr. brick (moist, FILL)	
		2	27	87				Black f-c SAND, little fine Gravel,	PID=Photoionization
			13	9		100	2-3	tr. slag (moist, FILL)	detector reading in
		3	40	18				Gray f-c SAND, tr. fill material,	ppm
5			14	16		32	0.3	tr. silt (wet, FILL)	
		4	6	10				Gray f-m SAND, tr. silt (wet, firm,	
			12	19		22	0.3	SP-SW)	
		5	7	6				Gray fine SAND, tr. silt, tr. gravel	
10			7	12		13	0.2	(wet, firm, SP)	
15		6	6	8				Gray fine SAND, tr. silt, tr. wood	
			7	9		15	0.2	(wet, firm, SP)	
20		7	12	42					
			16	18		58	0.0	(very compact)	
25		8	27	25				Gray f-c SAND, little fine Gravel,	
			32	27		55	0.1	"tr. little" silt, (wet, very	
								compact, GW-SP)	
30		9	28	37	32	69	0.0	Gray f-m SAND, tr. silt (wet, very	
								compact)	
35								No recovery	
40		10	12	20	24	44	0.1	Gray fine SAND, tr. silt, tr. gravel	
								(wet)	

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING SPUN CASING (3"ID)

DATE
STARTED 12/7/88
FINISHED 12/7/88
SHEET 2 OF 2

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-6
SURF. ELEV. 578.68
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
40									
45		11	9	13				Gray fine SAND, little Silt (wet, firm)	No water return between 45.0-50.0'
			17	35		30	0.0		
50		12	12	19				(wet, compact)	
			26	27		45	0.0		
55									
								Boring Complete with Casing refusal at 55.8'	Free standing water recorded at 7.2' at Boring Completion
									Note: Monitoring well installed in a separate adjacent hole using 4¼-inch I.D. hollow stem augers
									WELL DETAILS:
									• 2" Diameter PVC pipe
									• Slotted zone at 7' to 22'
									• Bottom of boring at 25'
									• 4Q sand pack from 5' to 25'
									• Bentonite pellets from 3' to 5'
									• Grout to surface and set protective casing.
60									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING SPUN CASING (3"ID)

DATE
STARTED 11/30/88
FINISHED 11/30/88
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-7
SURF. ELEV. 580.52
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0								ASPHALTIC CONCRETE 0.4'	Note: augered from 0.0 to 1.0'
		1	45	42				Gray SLAG (moist, FILL)	PID=Photoionization detector reading in ppm
			12	7		54	0.0	Black f-c SAND and Cinders, tr. glass, tr. gravel, tr. brick (moist, FILL)	
		2	7	6					
5			4	5		10	0.0	Boring Complete at 5.0'	No free standing water encountered at Boring Completion
10									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 11/30/88
FINISHED 11/30/88
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-8
SURF. ELEV. 580.52
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	33	84				SAND (FILL)	PID=Photoionization detector reading in ppm
			50	29		134	0.0	Gray SLAG, and Cinders, tr. glass, tr. concrete, tr. brick (moist, FILL)	
		2	16	18					
			22	12		40	0.0		
5		3	4	7	7	14	0.0	Brown f-c SAND, tr. silt (moist, FILL)	
								Boring Complete at 5.5'	No free standing water encountered at Boring Completion
10									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 11/30/88
FINISHED 11/30/88
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. — **SUBSURFACE LOG**

HOLE NO. B-9
SURF. ELEV. 580.68
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0								ASPHALTIC CONCRETE 0.4'	Augered from 0.0'-0.5'
		1	30	32				Gray SLAG (moist, FILL)	
			40	50		72	0.0	Black f-c SAND and Cinders, tr. glass, tr. gravel, tr. brick (moist, FILL)	Note: concrete slab encountered at 3.5'-4.0'
		2	21	100	/.5	REF	0.0		
		3	18	6	6	12	0.0		
5								Concrete	
								Black f-c SAND and Cinders, tr. glass, tr. gravel, tr. brick (moist, FILL)	PID=Photoionization detector reading in ppm
10								Boring Complete at 5.5'	No free standing water encountered at Boring Completion

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

DATE
STARTED 11/30/88
FINISHED 11/30/88
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

HOLE NO. B-10
SURF. ELEV. 581.77
G. W. DEPTH see note

PROJECT Shooters International
BTA-88-126

LOCATION Buffalo Waterfront
Seaway Piers, Buffalo, New York

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	(PID)	SOIL OR ROCK CLASSIFICATION	NOTES
0								ASPHALTIC CONCRETE 0.4'	Auger from 0.0'-1.0'
		1	45	50					PID=Photoionization detector reading in ppm
			30	61		80	0.0	Gray SLAG (moist, FILL)	
		2	15	21				Black f-c SAND and Cinders, tr. concrete, tr. glass, tr. brick (moist, FILL)	
5			30	20		51	0.0		
								Boring Complete at 5.0'	No free standing water encountered at Boring Completion
10									

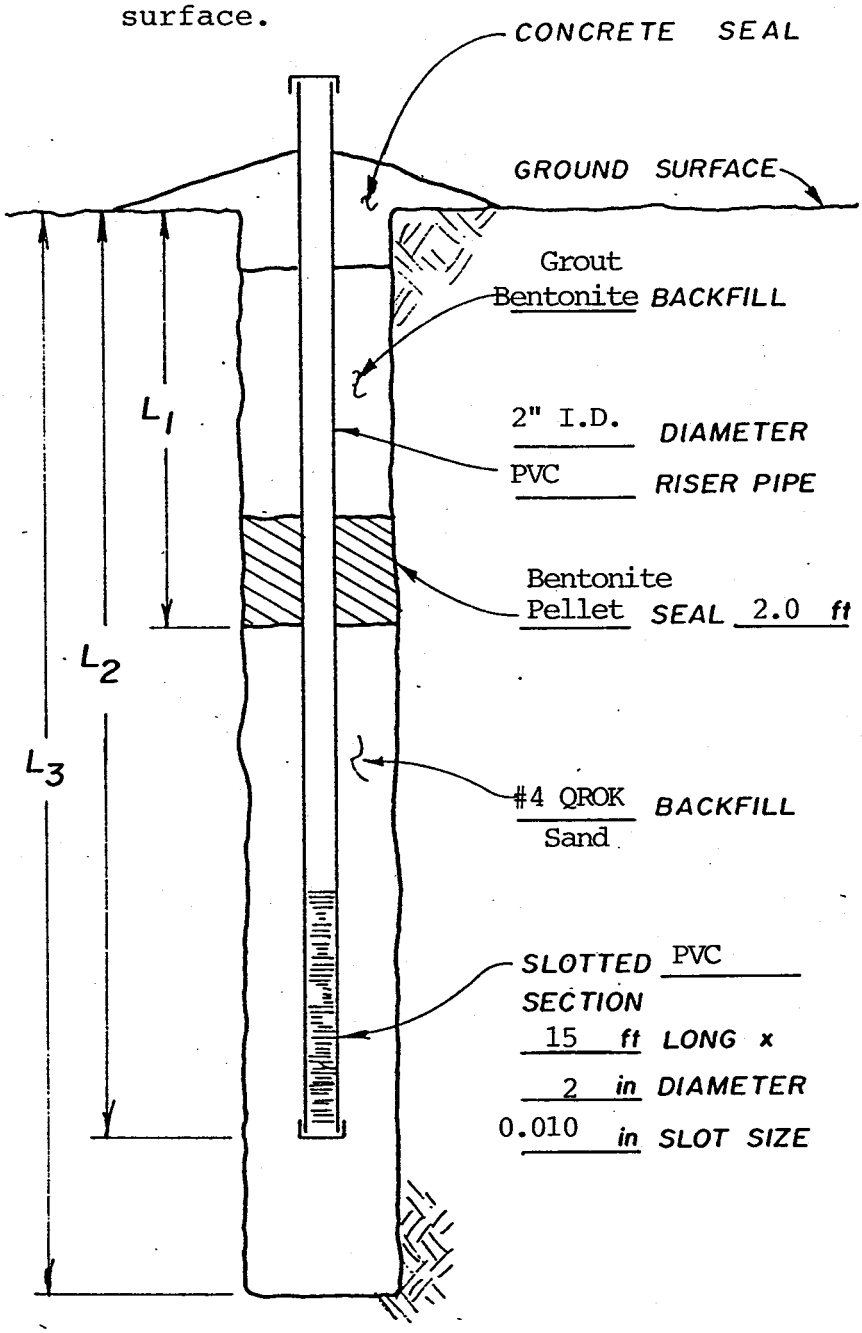
N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

CLASSIFICATION Visual by on-site Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS (2¼"ID)

NOTE: 4-inch I.D. Steel Protective Casing installed at ground surface.



WELL Nº	L_1	L_2	L_3
B-6	5.0'	22.0'	25.0'

EMPIRE SOILS INVESTIGATIONS INC

OBSERVATION WELL INSTALLATION DETAILS

ENVIRONMENTAL SITE ASSESSMENT
PROPOSED SHOOTERS RESTAURANT
BUFFALO, NEW YORK

DR.BY:	DBA	SCALE:	None	PROJ. NO.	BTA-88-126
CK'D.BY:	DBA	DATE:	Jan. 1989	DRWG.NO.	

R/T FORM R-1

APPENDIX D

ANALYTICAL RESULTS

HUNTINGDON ANALYTICAL SERVICES
Division of **EMPIRE SOILS INVESTIGATIONS INC.**
PO Box 250 Middleport New York 14105
Telephone (716) 735-3400 Telex 131246

ENVIRONMENTAL ANALYTICAL REPORT

HAS REF. #30-796

DECEMBER 1988

HAS

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL REPORT

HAS Reference Number: #30-796

December 1988

Statement of Work Performed

I hereby declare that the work was performed under my supervision according to the procedures outlined by the following references and that this report provides a correct and faithful record of the results obtained.

- 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," October 26, 1984 (Federal Register) U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency, "Test Methods of Evaluating Solid Waste - Physical/Chemical Methods," Office of Solid Waste and Emergency Response, SW-846, 2nd Edition and 3rd Edition.
- New York State Department of Health, Analytical Toxicology Laboratory Handbook, August 1982.

Richard D. Fitzpatrick
Environmental Laboratory Director

REPORT CODE LEGEND:

<DL = Less than detection limit
ND = Not detected
NA = Not applicable
<LQ = Response not statistically significant from laboratory background values

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HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 608
TCL ORGANOCHLORINE PESTICIDES AND PCB's

Sample Identification:		B-6	Method Blank				
HAS Sample #30-796		003	--				
Date Sampled:		12/12/88	--				
Date Received:		12/12/88	--				
Date Prepared:		12/13/88	12/13/88				
Date Analyzed:		12/20/88	12/14/88				
Dilution Factor:		1.0	1.0				
COMPOUND	Detection Limit µg/l	Result µg/l	Result µg/l	Result µg/l	Result µg/l	Result µg/l	Result µg/l
AC-1016	0.5	ND	ND				
AC-1221	0.5	ND	ND				
AC-1232	0.5	ND	ND				
AC-1242	0.5	ND	ND				
AC-1248	0.5	ND	ND				
AC-1254	1.0	ND	ND				
AC-1260	1.0	ND	ND				

HUNTINGDON ANALYTICAL SERVICES
METHOD 624 ANALYSIS DATA SHEET
SEMI-VOLATILE TCL POLLUTANTS

Sample Identification:	B-6	SYSTEM
HAS Sample #	796-003	SYS BLK
Date Sampled:	12/12/88	12/14/88
Date Analyzed:	12/14/88	12/14/88
Holding Time (days):	2	0
Matrix:	WATER	WATER
Dilution Factor:	1	1

Compound	Detection Limit	Result ug/l	Result ug/l
Acetone	10.0	<DL	<DL
Benzene	5.0	<DL	ND
Bromodichloromethane	5.0	ND	ND
Bromoform	5.0	ND	ND
Bromomethane	10.0	ND	ND
2-Butanone	10.0	ND	ND
Carbon disulfide	5.0	ND	ND
Carbon tetrachloride	5.0	ND	ND
Chlorobenzene	5.0	ND	ND
Chloroethane	10.0	ND	ND
2-Chloroethylvinyl ether	10.0	ND	ND
Chloroform	5.0	ND	ND
Chloromethane	10.0	ND	<DL
Dibromochloromethane	5.0	ND	ND
1,2-Dichlorobenzene	5.0	ND	ND
1,3-Dichlorobenzene	5.0	ND	ND
1,4-Dichlorobenzene	5.0	ND	ND
1,1-Dichloroethane	5.0	ND	ND
1,2-Dichloroethane	5.0	ND	ND
1,1-Dichloroethene	5.0	ND	ND
cis-1,2-Dichloroethene	5.0	ND	ND
trans-1,2-Dichloroethene	5.0	ND	ND
1,2-Dichloropropane	5.0	ND	ND
cis-1,3-Dichloropropene	5.0	ND	ND
trans-1,3-Dichloropropene	5.0	ND	ND
Ethylbenzene	5.0	ND	ND
2-Hexanone	10.0	ND	ND
Methylene chloride	5.0	<DL	<DL
4-Methyl-2-pentanone	10.0	ND	ND

HUNTINGDON ANALYTICAL SERVICES
METHOD 624 ANALYSIS DATA SHEET
SEMI-VOLATILE TCL POLLUTANTS

Sample Identification:	B-6	SYSTEM
HAS Sample #	796-003	SYS BLK
Date Sampled:	12/12/88	12/14/88
Date Analyzed:	12/14/88	12/14/88
Holding Time (days):	2	0
Matrix:	WATER	WATER
Dilution Factor:	1	1

Compound	Detection Limit	Result ug/l	Result ug/l
Styrene	5.0	ND	ND
1,1,2,2-Tetrachloroethane	5.0	ND	ND
Tetrachloroethene	5.0	ND	ND
Toluene	5.0	ND	ND
Total Xylenes	5.0	ND	ND
1,1,1-Trichloroethane	5.0	ND	ND
1,1,2-Trichloroethane	5.0	ND	ND
Trichloroethene	5.0	ND	ND
1,2,3-Trichloropropane	5.0	ND	ND
1,2,4-Trimethylbenzene	5.0	ND	ND
Trichlorofluoromethane	10.0	ND	ND
Vinyl Acetate	10.0	ND	ND
Vinyl chloride	10.0	ND	ND
Surrogates		**% Recovery**	**% Recovery**
Bromofluorobenzene		85.7	89.1
1,2-Dichloroethane-d4		93.1	80.8
Toluene-d8		100.8	99.2

HUNTINGDON ANALYTICAL SERVICES
METHOD 625 ANALYSIS DATA SHEET
SEMI-VOLATILE TCL POLLUTANTS

Acid Extractables

Sample Identification:	B-6	WATER-BL
HAS Sample #	796-003	WATER-BL
Date Sampled:	12/12/88	NA
Date Analyzed:	12/13/88	12/13/88
Holding Time (days):	0	0
Matrix:	WATER	WATER
Dilution Factor:	1	1

Compound	Detection Limit	Result ug/l	Result ug/l
4-Chloro-3-Methylphenol	10	ND	ND
2-Chlorophenol	10	<DL	<DL
2,4-Dichlorophenol	10	ND	ND
2,4-Dimethylphenol	10	ND	ND
2,4-Dinitrophenol	50	ND	ND
4,6-Dinitro-2-Methylphenol	50	ND	ND
2-Methylphenol	10	ND	ND
2-Nitrophenol	10	ND	ND
4-Nitrophenol	50	ND	ND
Pentachlorophenol	50	ND	ND
Phenol	10	<DL	ND
2,4,6-Trichlorophenol	10	ND	ND
2,4,5-Trichlorophenol	50	ND	ND
Surrogates		% Recovery	% Recovery
Phenol-D5		42	79
2-Fluorophenol		51	121
2,4,6-Tribromophenol		71	111

Base/Neutral Extractables

Compound	Detection Limit	Result ug/l	Result ug/l
Acenaphthene	10	<DL	ND
Acenaphthylene	10	<DL	ND
Anthracene	10	<DL	ND
Benzidine	50	ND	ND
Benzo(a)Anthracene	10	<DL	ND
Benzo(b)Fluoranthene	10	ND	ND
Benzo(k)Fluoranthene	10	<DL	ND
Benzo(a)Pyrene	10	ND	ND
Benzo(g,h,i)Perylene	10	ND	ND
Benzoic Acid	50	ND	ND
Benzyl Alcohol	10	ND	ND
bis(2-Chloroethoxy)Methane	10	ND	ND
bis(2-Chloroethyl)Ether	10	ND	ND
bis(2-Chloroisopropyl)Ether	10	ND	ND
bis(2-Ethylhexyl)Phthalate	10	<DL	<DL

(Continued on Next Page)

UNTINGDON ANALYTICAL SERVICES
METHOD 625 ANALYSIS DATA SHEET
SEMI-VOLATILE TCL POLLUTANTS

ase/Neutral Extractables

Compound	Detection Limit	Result ug/l	Result ug/l
Butylbenzylphthalate	10	<DL	<DL
4-Bromophenyl-phenylether	10	ND	ND
4-Chloroaniline	10	ND	ND
2-Chloronaphthalene	10	ND	ND
4-Chlorophenyl-phenylether	10	ND	ND
Chrysene	10	<DL	ND
Dibenz(a,h)Anthracene	10	ND	ND
Di-n-Butylphthalate	10	<DL	<DL
Dibenzofuran	10	<DL	ND
1,2-Dichlorobenzene	10	ND	ND
1,3-Dichlorobenzene	10	ND	ND
1,4-Dichlorobenzene	10	ND	ND
3,3'-Dichlorobenzidine	20	ND	ND
Diethylphthalate	10	<DL	ND
Dimethyl Phthalate	10	ND	ND
2,4-Dinitrotoluene	10	ND	ND
2,6-Dinitrotoluene	10	ND	<DL
Di-n-Octyl Phthalate	10	<DL	<DL
1,2-Diphenylhydrazine	10	ND	ND
Fluoranthene	10	<DL	ND
Fluorene	10	<DL	ND
Hexachlorobenzene	10	ND	ND
Hexachlorobutadiene	10	ND	ND
Hexachlorocyclopentadiene	10	ND	ND
Hexachloroethane	10	ND	ND
Indeno(1,2,3-cd)Pyrene	10	ND	ND
Isophorone	10	ND	ND
2-Methylnapthalene	10	<DL	ND
Naphthalene	10	<DL	<DL
2-Nitroaniline	50	ND	ND
3-Nitroaniline	50	ND	ND
4-Nitroaniline	50	ND	ND
Nitrobenzene	10	ND	ND
N-Nitrosodimethylamine	10	ND	ND
N-Nitrosodiphenylamine (1)	10	<DL	ND
N-Nitroso-Di-n-Propylamine	10	ND	ND
Phenanthrene	10	<DL	ND
Pyrene	10	<DL	ND
1,2,4-Trichlorobenzene	10	ND	ND
Surrogates		**% Recovery**	**% Recovery**
d-5 Nitrobenzene		83	117
2-Fluorobiphenyl		103	100
Terphenyl		138	142

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 8080
TCL ORGANOCHLORINE PESTICIDES AND PCB's

Sample Identification:		B-4	B-6	Method Blank			
HAS Sample #30-796		001	002	--			
Date Sampled:		12/6/88	12/7/88	--			
Date Received:		12/12/88	12/12/88	--			
Date Prepared:		12/15/88	12/15/88	12/15/88			
Date Analyzed:		12/20/88	12/20/88	12/20/88			
Dilution Factor:		1.0	1.0	1.0			
COMPOUND	Detection Limit µg/g	Result µg/g	Result µg/g	Result µg/g	Result µg/g	Result µg/g	Result µg/g
Aldrin	0.01	ND	ND	ND			
a-BHC	0.01	<DL	<DL	ND			
b-BHC	0.01	ND	ND	ND			
d-BHC	0.01	ND	ND	ND			
g-BHC	0.01	ND	ND	ND			
Chlordane	0.10	ND	ND	ND			
4,4'-DDD	0.02	<DL	ND	ND			
4,4'-DDE	0.02	<DL	ND	ND			
4,4'-DDT	0.02	ND	ND	ND			
Dieldrin	0.02	ND	ND	ND			
Endosulfan I	0.01	ND	ND	ND			
Endosulfan II	0.02	ND	ND	ND			
Endosulfan sulfate	0.02	ND	ND	ND			
Endrin	0.02	ND	ND	ND			
Endrin aldehyde	0.02	ND	ND	ND			
Endrin ketone	0.02	ND	ND	ND			
Heptachlor	0.01	ND	ND	ND			
Heptachlor epoxide	0.01	ND	ND	ND			
Methoxychlor	0.10	ND	ND	ND			
Toxaphene	0.20	ND	ND	ND			
Hexabromobenzene Surrogate % Rec.		114	109	105			

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 8080
TCL ORGANOCHLORINE PESTICIDES AND PCB's

Sample Identification:		B-4	B-6	Method Blank			
HAS Sample #30-796		001	002	--			
Date Sampled:		12/6/88	12/7/88	--			
Date Received:		12/12/88	12/12/88	--			
Date Prepared:		12/15/88	12/15/88	12/15/88			
Date Analyzed:		12/20/88	12/20/88	12/20/88			
Dilution Factor:		1.0	1.0	1.0			
COMPOUND	Detection Limit µg/g	Result µg/g	Result µg/g	Result µg/g	Result µg/g	Result µg/g	Result µg/g
AC-1016	0.5	ND	ND	ND			
AC-1221	0.5	ND	ND	ND			
AC-1232	0.5	ND	ND	ND			
AC-1242	0.5	ND	ND	ND			
AC-1248	0.5	ND	ND	ND			
AC-1254	1.0	ND	ND	ND			
AC-1260	1.0	ND	ND	ND			

HUNTINGDON ANALYTICAL SERVICES
METHOD 8240 ANALYSIS DATA SHEET
SEMI-VOLATILE TCL POLLUTANTS

Sample Identification:	B-4	B-6	MET BL
HAS Sample #	796-001	796-002	796-BLK
Date Sampled:	12/6/88	12/7/88	12/14/88
Date Analyzed:	12/14/88	12/14/88	12/14/88
Holding Time (days):	8	7	0
Matrix:	SOIL	SOIL	SOIL
Dilution Factor:	1	1	1

Compound	Detection Limit	Result ug/kg	Result ug/kg	Result ug/kg
Acetone	1250.0	<DL	4400	<DL
Benzene	625.0	ND	ND	ND
Bromodichloromethane	625.0	ND	ND	ND
Bromoform	625.0	ND	ND	ND
Bromomethane	1250.0	ND	ND	ND
2-Butanone	1250.0	ND	ND	ND
Carbon Disulfide	625.0	ND	ND	ND
Carbon tetrachloride	625.0	ND	ND	ND
Chlorobenzene	625.0	ND	ND	ND
Chloroethane	1250.0	ND	ND	ND
2-Chloroethylvinyl ether	1250.0	ND	ND	ND
Chloroform	625.0	ND	ND	ND
Chloromethane	1250.0	<DL	ND	ND
Dibromochloromethane	625.0	ND	ND	ND
1,2-Dichlorobenzene	625.0	ND	ND	ND
1,3-Dichlorobenzene	625.0	ND	ND	ND
1,4-Dichlorobenzene	625.0	ND	ND	ND
1,1-Dichloroethane	625.0	ND	ND	ND
1,2-Dichloroethane	625.0	ND	ND	ND
1,1-Dichloroethene	625.0	ND	ND	ND
cis-1,2-Dichloroethene	625.0	ND	ND	ND
trans-1,2-Dichloroethene	625.0	ND	ND	ND
1,2-Dichloropropane	625.0	ND	ND	ND
cis-1,3-Dichloropropene	625.0	ND	ND	ND
trans-1,3-Dichloropropene	625.0	ND	ND	ND
Ethylbenzene	625.0	ND	ND	ND
2-Hexanone	1250.0	ND	ND	ND
Methylene chloride	625.0	<DL	<DL	<DL
4-Methyl-2-pentanone	1250.0	ND	ND	ND

HUNTINGDON ANALYTICAL SERVICES
METHOD 8240 ANALYSIS DATA SHEET
SEMI-VOLATILE TCL POLLUTANTS

Sample Identification:		B-4	B-6	MET BL
HAS Sample #		796-001	796-002	796-BLK
Date Sampled:		12/6/88	12/7/88	12/14/88
Date Analyzed:		12/14/88	12/14/88	12/14/88
Holding Time (days):		8	7	0
Matrix:		SOIL	SOIL	SOIL
Dilution Factor:		1	1	1
Compound	Detection Limit	Result ug/kg	Result ug/kg	Result ug/kg
Styrene	625.0	ND	ND	ND
1,1,2,2-Tetrachloroethane	625.0	ND	ND	ND
Tetrachloroethene	625.0	ND	ND	ND
Toluene	625.0	ND	ND	ND
Total Xylenes	625.0	ND	ND	ND
1,1,1-Trichloroethane	625.0	ND	ND	ND
1,1,2-Trichloroethane	625.0	ND	ND	ND
Trichloroethene	625.0	ND	ND	<DL
1,2,3-Trichloropropane	625.0	ND	ND	ND
1,2,4-Trimethylbenzene	625.0	ND	ND	ND
Trichlorofluoromethane	1250.0	ND	ND	ND
Vinyl Acetate	1250.0	ND	ND	ND
Vinyl chloride	1250.0	ND	ND	ND
Surrogates		% Recovery	% Recovery	% Recovery
Bromofluorobenzene		100.7	105.7	106.7
1,2-Dichloroethane-d4		105.7	100.8	110.1
Toluene-d8		114.1	115.7	118.7

HUNTINGDON ANALYTICAL SERVICES
METHOD 8270 ANALYSIS DATA SHEET
SEMI-VOLATILE TCL POLLUTANTS
Acid Extractables

Sample Identification:	B-4	B-6	SOIL-PRE
HAS Sample #	796-001	796-002	SOIL-PRE
Date Sampled:	12/06/88	12/07/88	NA
Date Analyzed:	12/19/88	12/19/88	12/19/88
Holding Time (days):	4	4	4
Matrix:	SOIL	SOIL	SOIL
Dilution Factor:	1	1	1

Compound	Detection Limit	Result ug/Kg	Result ug/Kg	Result ug/Kg
4-Chloro-3-Methylphenol	330	ND	ND	ND
2-Chlorophenol	330	<DL	<DL	<DL
2,4-Dichlorophenol	330	ND	ND	ND
2,4-Dimethylphenol	330	ND	ND	ND
2,4-Dinitrophenol	1600	ND	ND	ND
4,6-Dinitro-2-Methylphenol	1600	ND	ND	ND
2-Methylphenol	330	ND	ND	ND
2-Nitrophenol	330	ND	ND	ND
4-Nitrophenol	1600	<DL	<DL	ND
Pentachlorophenol	1600	ND	ND	ND
Phenol	330	ND	ND	<DL
2,4,6-Trichlorophenol	330	ND	ND	ND
2,4,5-Trichlorophenol	1600	ND	ND	ND
Surrogates		% Recovery	% Recovery	% Recovery
Phenol-D5		91	94	88
2-Fluorophenol		90	93	87
2,4,6-Tribromophenol		65	67	71

Base/Neutral Extractables

Compound	Detection Limit	Result ug/Kg	Result ug/Kg	Result ug/Kg
Acenaphthene	330	<DL	<DL	ND
Acenaphthylene	330	<DL	<DL	ND
Anthracene	330	<DL	<DL	ND
Benzidine	1660	ND	ND	ND
Benzo(a)Anthracene	330	440	<DL	ND
Benzo(b)Fluoranthene	330	440	<DL	ND
Benzo(k)Fluoranthene	330	330	<DL	ND
Benzo(a)Pyrene	330	570	<DL	ND
Benzo(g,h,i)Perylene	330	<DL	<DL	ND
Benzoic Acid	1600	<DL	ND	ND
Benzyl Alcohol	330	ND	ND	ND
bis(2-Chloroethoxy)Methane	330	ND	ND	ND
bis(2-Chloroethyl)Ether	330	ND	ND	ND
bis(2-Chloroisopropyl)Ether	330	<DL	<DL	ND
bis(2-Ethylhexyl)Phthalate	330	370	<DL	<DL

HUNTINGDON ANALYTICAL SERVICES
METHOD 8270 ANALYSIS DATA SHEET
SEMI-VOLATILE PRIORITY POLLUTANTS
Base/Neutral Extractables

Compound	Detection Limit	Result ug/Kg	Result ug/Kg	Result ug/Kg
Benzyl Alcohol	330	ND	ND	ND
bis(2-Chloroethoxy)Methane	330	ND	ND	ND
bis(2-Chloroethyl)Ether	330	ND	ND	ND
bis(2-Chloroisopropyl)Ether	330	<DL	<DL	ND
bis(2-Ethylhexyl)Phthalate	330	370	<DL	<DL
Butylbenzylphthalate	330	<DL	ND	<DL
4-Bromophenyl-phenylether	330	ND	ND	ND
4-Chloroaniline	330	ND	ND	ND
2-Chloronaphthalene	330	ND	ND	ND
4-Chlorophenyl-phenylether	330	ND	ND	ND
Chrysene	330	480	<DL	ND
Dibenz(a,h)Anthracene	330	ND	<DL	ND
Di-n-Butylphthalate	330	340	<DL	<DL
Dibenzofuran	330	<DL	<DL	ND
1,2-Dichlorobenzene	330	<DL	ND	ND
1,3-Dichlorobenzene	330	ND	ND	ND
1,4-Dichlorobenzene	330	<DL	<DL	ND
3,3'-Dichlorobenzidine	660	<DL	ND	ND
Diethylphthalate	330	<DL	<DL	ND
Dimethyl Phthalate	330	ND	ND	ND
2,4-Dinitrotoluene	330	ND	ND	ND
2,6-Dinitrotoluene	330	ND	ND	ND
Di-n-Octyl Phthalate	330	ND	ND	ND
1,2-Diphenylhydrazine	330	<DL	ND	ND
Fluoranthene	330	760	380	ND
Fluorene	330	<DL	<DL	ND
Hexachlorobenzene	330	ND	ND	ND
Hexachlorobutadiene	330	ND	ND	ND
Hexachlorocyclopentadiene	330	ND	ND	ND
Hexachloroethane	330	ND	<DL	ND
Indeno(1,2,3-cd)Pyrene	330	<DL	<DL	ND
Isophorone	330	ND	<DL	ND
2-Methylnapthalene	330	<DL	<DL	ND
Naphthalene	330	<DL	350	ND
2-Nitroanaline	1600	ND	ND	ND
3-Nitroanaline	1600	ND	ND	ND
4-Nitroaniline	1600	ND	ND	ND
Nitrobenzene	330	ND	<DL	ND
N-Nitrosodimethylamine	330	ND	ND	ND
N-Nitrosodiphenylamine (1)	330	<DL	<DL	ND
N-Nitroso-Di-n-Propylamine	330	ND	ND	ND
Phenanthrene	330	550	<DL	ND
Pyrene	330	710	350	ND
1,2,4-Trichlorobenzene	330	ND	ND	ND
Surrogates		**% Recovery**	**% Recovery**	**% Recovery**
d-5 Nitrobenzene		67	68	69
2-Fluorobiphenyl		95	99	98
Terphenyl		80	92	98

Sample Iden: COMP B-4
HAS Sample #30-796-001
Date Sampled: 12-6-88

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/kg	QC %SPKR	QC RPD
ANTIMONY	200.7	12-14-88	12-15-88	2.34	<DL		*95
ARSENIC	200.7	12-14-88	12-15-88	1.64	7.86		*95
BERYLLIUM	200.7	12-14-88	12-15-88	0.23	<DL		*95
CADMIUM	200.7	12-14-88	12-15-88	0.23	2.49		*95
CHROMIUM	200.7	12-14-88	12-15-88	0.47	9.72		*95
COPPER	200.7	12-14-88	12-15-88	0.47	42.30		*95
LEAD	200.7	12-14-88	12-15-88	2.34	77.20		*95
MERCURY	7471	12-15-88	12-15-88	0.08	0.55		*95
NICKEL	200.7	12-14-88	12-15-88	1.87	7.89		*95
SELENIUM	7740	12-14-88	12-27-88	0.23	1.08		*95
SILVER	200.7	12-14-88	12-15-88	0.47	<DL		*95
THALLIUM	7841	12-14-88	12-16-88	0.47	<DL		*95
ZINC	200.7	12-14-88	12-15-88	0.94	131.00		*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

Sample Iden: COMP B-6
HAS Sample #30-796-002
Date Sampled: 12-7-88

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/kg	QC %SPKR	QC RPD
ANTIMONY	200.7	12-14-88	12-15-88	2.38	<DL		*95
ARSENIC	200.7	12-14-88	12-15-88	1.66	4.82		*95
BERYLLIUM	200.7	12-14-88	12-15-88	0.24	<DL		*95
CADMIUM	200.7	12-14-88	12-15-88	0.24	0.44		*95
CHROMIUM	200.7	12-14-88	12-15-88	0.48	5.33		*95
COPPER	200.7	12-14-88	12-15-88	0.48	19.30		*95
LEAD	200.7	12-14-88	12-15-88	2.38	24.70		*95
MERCURY	7471	12-15-88	12-15-88	0.11	0.29		*95
NICKEL	200.7	12-14-88	12-15-88	1.9	5.18		*95
SELENIUM	7740	12-14-88	12-27-88	0.24	0.71		*95
SILVER	200.7	12-14-88	12-15-88	0.48	<DL		*95
THALLIUM	7841	12-14-88	12-16-88	0.48	0.52		*95
ZINC	200.7	12-14-88	12-15-88	0.95	56.30		*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

Sample Iden: B-6
HAS Sample #30-796-003
Date Sampled: 12-12-88

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC %SPKR	QC RPD
ANTIMONY	200.7	12-14-88	12-15-88	0.05	<DL		*95
ARSENIC	7060	12-14-88	12-26-88	0.01	<DL		*95
BERYLLIUM	200.7	12-14-88	12-15-88	0.005	<DL		*95
CADMIUM	200.7	12-14-88	12-15-88	0.005	<DL		*95
CHROMIUM	200.7	12-14-88	12-15-88	0.01	<DL		*95
COPPER	200.7	12-14-88	12-15-88	0.01	0.05		*95
LEAD	7421	12-14-88	12-23-88	0.005	0.07		*95
MERCURY	7470	12-14-88	12-15-88	0.0004	<DL		*95
NICKEL	200.7	12-14-88	12-15-88	0.04	<DL		*95
SELENIUM	7740	12-14-88	12-27-88	0.005	<DL		*95
SILVER	200.7	12-14-88	12-15-88	0.01	<DL		*95
THALLIUM	7841	12-14-88	12-16-88	0.01	<DL		*95
ZINC	200.7	12-14-88	12-15-88	0.02	0.17		*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

Sample Iden: B-6
HAS Sample #30-796-003 FILTERED
Date Sampled: 12-12-88

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC %SPKR	QC RPD
ANTIMONY	200.7	12-14-88	12-15-88	0.1	<DL	80.7	1.44
ARSENIC	7060	12-14-88	12-26-88	0.02	0.02	100.8	1.62
BERYLLIUM	200.7	12-14-88	12-15-88	0.01	<DL	95.8	1.61
CADMIUM	200.7	12-14-88	12-15-88	0.01	<DL	94.7	1.48
CHROMIUM	200.7	12-14-88	12-15-88	0.02	<DL	97.9	1.15
COPPER	200.7	12-14-88	12-15-88	0.02	0.04	94.4	<1.0
LEAD	7421	12-14-88	12-23-88	0.01	<DL	96.3	<1.0
MERCURY	7470	12-14-88	12-15-88	0.0004	<DL	115.0	<1.0
NICKEL	200.7	12-14-88	12-15-88	0.08	<DL	102.8	4.83
SELENIUM	7740	12-14-88	12-27-88	0.01	0.02	94.7	6.42
SILVER	200.7	12-14-88	12-15-88	0.02	<DL	76.8	2.11
THALLIUM	7841	12-14-88	12-16-88	0.02	0.02	91.9	9.64
ZINC	200.7	12-14-88	12-15-88	0.04	0.10	98.9	8.41

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

Sample Iden: METHOD BLANK
HAS Sample #30-796
Date Sampled: NA

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC %SPKR	QC RPD
ANTIMONY	200.7	12-14-88	12-15-88	0.05	<DL		*95
ARSENIC	7060	12-14-88	12-26-88	0.01	<DL		*95
BERYLLIUM	200.7	12-14-88	12-15-88	0.005	<DL		*95
CADMIUM	200.7	12-14-88	12-15-88	0.005	<DL		*95
CHROMIUM	200.7	12-14-88	12-15-88	0.01	<DL		*95
COPPER	200.7	12-14-88	12-15-88	0.01	0.01		*95
LEAD	7421	12-14-88	12-23-88	0.005	<DL		*95
MERCURY	7470	12-14-88	12-15-88	0.0002	<DL		*95
NICKEL	200.7	12-14-88	12-15-88	0.04	<DL		*95
SELENIUM	7740	12-14-88	12-27-88	0.005	<DL		*95
SILVER	200.7	12-14-88	12-15-88	0.01	<DL		*95
THALLIUM	7841	12-14-88	12-16-88	0.02	<DL		*95
ZINC	200.7	12-14-88	12-15-88	0.02	0.04		*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

Inorganic Wet Chemical Analyses

Analyte: Cyanide

EPA Method No.: 335.2

Date Sampled: 12/6/88, 12/7/88, and 12/12/88

HAS Sample #	Client I.D.	Date Prepared	Date Analyzed	Detection Limit	Concentration	Units	QC in %
30-796-001	B-4	12/13/88	12/14/88	0.02	6.67	mg/kg	*94
30-796-002	B-6	12/13/88	12/14/88	0.02	0.823	mg/kg	*94
30-796-003	B-6	12/13/88	12/14/88	0.02	0.071	mg/l	*94

*A known standard of the analyte of interest was analyzed along with this sample with the percent recovery indicated above.

WATER (DRINKING)
Shooters

metals

Proj No.	Project Name
ESTA-88-126	Shooters IWT

Samplers (Signature): Jerry Jones

Sta. No.	Date	Time	Comp.	Grab	Station Location	No. of Containers	(VOA) 624	Cyanide	609, 625	Metals Unfiltered	Metals Filtered		Remarks
B-6	12-12	10:30		X	Well B-6 AT Shooters	6	2	1	1	1	1		VOA NOT Preserved
													Cyanide ~~NOT~~ Preserved
													NOTE: 2 metals (plastic
													one (1) is filtred (1) one
													is ~~NOT~~ Filtred

Relinquished by: (Signature)	Date Time	Received by: (Signature)	Relinquished by: (Signature)	Date Time	Received by: (Signature)
Jerry Jones	12-12 12:50	J Whalen	J Whalen	12/12/88 13:30	Tammy Storms
Relinquished by: (Signature)	Date Time	Received by: (Signature)	Relinquished by: (Signature)	Date Time	Received by: (Signature)
Tammy Storms	12-12 3:00	Christine Shafer			
Relinquished by: (Signature)	Date Time	Received for Laboratory by: (Signature)		Remarks	

EMPIRE SOILS INVESTIGATIONS INC

CHAIN OF CUSTODY RECORD

9b

SOIL Samples

Shooters INT,

EMPIRE SOILS INVESTIGATIONS INC

CHAIN OF CUSTODY RECORD

Proj No.	Project Name
~~BTA-68-126~~	Shooters INT

Samplers (Signature): Jerry Jones

Sta. No.	Date	Time	Comp	Grab	Station Location	No. of Containers	Cyanide Amber Glass	8270 8080 Semi metals	4240				Remarks
B-4	12-6	10:00 Am	X		shooters - waterfront B-4 0'-10'	3	1	1	1				comp 0-10' SOIL SAMPLES 3 TOTAL
B-6	12-7	11:00 Am	X		shooters - waterfront B-6 0'-10'	3	1	1	1				comp soil 0'-10'

Relinquished by: (Signature)	Date Time	Received by: (Signature)	Relinquished by: (Signature)	Date Time	Received by: (Signature)
Jerry Jones	12-12 12:50	G Whalen	G Whalen	12/12/98 13:30	Tammy Storms
Relinquished by: (Signature)	Date Time	Received by: (Signature)	Relinquished by: (Signature)	Date Time	Received by: (Signature)
Tammy Storms	12:12 - 3:20	Christine Shafer			
Relinquished by: (Signature)	Date Time	Received for Laboratory by: (Signature)		Remarks	

HUNTINGDON ANALYTICAL SERVICES - ANALYTICAL REQUEST FORM

Tracking Date 12-14 Init. TSJ

Enpure - Hanburg BTA-88-126
Customer Name

Address

Dan Abrams 649-8110
Contact Name Phone #

P.O. # 011307 Quote # 12-5 HAS Ref. # 30-796

Billing Address

Date Submitted 12/12/88 Date Due

Sampler(s) Signature

Total # of Samples 3 Client No.

Customer I.D.	Date	Time	Sample Type	Sample Location	No. of Cont.	Analysis Requested	Comments	HAS No.	Billing
B-4	12/6/88	10 AM	Comp ~~Water~~ Soil	Shooters - waterfront B-4 B-18.	1	Cyanide		001.01	1055
"	"	"	"	"	1	8270, 8080, Metals		001.02	
"	"	"	"	"	1	8240 - VOA		001.03	
B-6	12/7/88	11 AM	Comp Soil	Shooters - waterfront B-16 B-10	1	Cyanide		002.01	1055
"	"	"	"	"	1	8270, 8080 Metals		002.02	
"	"	"	"	"	1	8240 - VOA		002.03	
B-6	12/12/88	10:30 AM	Grab Water	Well B-6 Shooters	2	VOA - 624		003.01	A/B 1055
"	"	"	"	"	1	Cyanide		003.02	
"	"	"	"	"	1	608, 625		003.03	
"	"	"	"	"	1	Metals - unfiltered		003 04	

Relinquished by	Date/Time	Received by	Relinquished by	Date/Time	Received by
Check Client Chain of custody			metals - filtered		003.05
Relinquished by	Date/Time	Received by	Relinquished by	Date/Time	Received by

Comments:

Initial Total	Met.	Wet Chem.	GC/MS Org.	Trip Blanks	Other	Final Total
3165	585	165	270/2145			3165

APPENDIX E

SUPERFUND TARGET COMPOUND LIST

SECTION I
CLP ORGANICS
Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)*

	Volatiles	CAS Number	Quantitation Limits** Low Water µg/L	Low Soil/Sediment[a] µg/Kg
1.	Chloromethane	74-87-3	10	10
2.	Bromomethane	74-83-9	10	10
3.	Vinyl chloride	75-01-4	10	10
4.	Chloroethane	75-00-3	10	10
5.	Methylene chloride	75-09-2	5	5
6.	Acetone	67-64-1	10	10
7.	Carbon Disulfide	75-15-0	5	5
8.	1,1-Dichloroethylene	75-35-4	5	5
9.	1,1-Dichloroethane	75-35-3	5	5
10.	1,2-Dichloroethylene(total)	540-59-0	5	5
11.	Chloroform	67-66-3	5	5
12.	1,2-Dichloroethane	107-06-2	5	5
13.	2-Butanone	78-93-3	10	10
14.	1,1,1-Trichloroethane	71-55-6	5	5
15.	Carbon tetrachloride	56-23-5	5	5
16.	Vinyl acetate	108-05-4	10	10
17.	Bromodichloromethane	75-27-4	5	5
18.	1,1,2,2-Tetrachloroethane	79-34-5	5	5
19.	1,2-Dichloropropane	78-87-5	5	5
20.	cis-1,3-Dichloropropene	10061-01-5	5	5
21.	Trichloroethene	79-01-6	5	5
22.	Dibromochloromethane	124-48-1	5	5
23.	1,1,2-Trichloroethane	79-00-5	5	5
24.	Benzene	71-43-2	5	5
25.	trans-1,3-Dichloropropene	10061-02-6	5	5
26.	Bromoform	75-25-2	5	5
27.	2-Hexanone	591-78-6	10	10
28.	4-Methyl-2-pentanone	108-10-1	10	10
29.	Tetrachloroethylene	127-18-4	5	5
30.	Toluene	108-88-3	5	5
31.	Chlorobenzene	108-90-7	5	5
32.	Ethyl Benzene	100-41-4	5	5
33.	Styrene	100-42-5	5	5
34.	Total Xylenes	1330-20-7	5	5

[a]Medium Soil/Sediment Contract Required Quantitation Limits (CRQL) for Volatile TCL Compounds are 100 times the individual Low Soil/Sediment CRQL.

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

**Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the protocol, will be higher.

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)*

	Semivolatiles	CAS Number	Quantitation Limits** Low Water µg/L	Low Soil/Sediment µg/Kg
35.	Phenol	108-95-2	10	330
36.	bis(2-Chloroethyl) ether	111-44-4	10	330
37.	2-Chlorophenol	95-57-8	10	330
38.	1,3-Dichlorobenzene	541-73-1	10	330
39.	1,4-Dichlorobenzene	106-46-7	10	330
40.	Benzyl alcohol	100-51-6	10	330
41.	1,2-Dichlorobenzene	95-50-1	10	330
42.	2-Methylphenol	95-48-7	10	330
43.	bis(2-Chloroisopropyl) ether	108-60-1	10	330
44.	4-Methylphenol	106-44-5	10	330
45.	N-Nitroso-dipropylamine	621-64-7	10	330
46.	Hexachloroethane	67-72-1	10	330
47.	Nitrobenzene	98-95-3	10	330
48.	Isophorone	78-59-1	10	330
49.	2-Nitrophenol	88-75-5	10	330
50.	2,4-Dimethylphenol	105-67-9	10	330
51.	Benzoic acid	65-85-0	50	1600
52.	bis(2-Chloroethoxy) methane	111-91-1	10	330
53.	2,4-Dichlorophenol	120-83-2	10	330
54.	1,2,4-Trichlorobenzene	120-82-1	10	330
55.	Naphthalene	91-20-3	10	330
56.	4-Chloroaniline	106-47-8	10	330
57.	Hexachlorobutadiene	87-68-3	10	330
58.	4-Chloro-3-methylphenol (p-chloro-m-cresol)	59-50-7	10	330
59.	2-Methylnaphthalene	91-57-6	10	330
60.	Hexachlorocyclopentadiene	77-47-4	10	330
61.	2,4,6-Trichlorophenol	88-06-2	10	330
62.	2,4,5-Trichlorophenol	95-95-4	50	1600
63.	2-Chloronaphthalene	91-58-7	10	330
64.	2-Nitroaniline	88-74-4	50	1600
65.	Dimethyl phthalate	131-11-3	10	330
66.	Acenaphthylene	208-96-8	10	330
67.	2,6-Dinitrotoluene	606-20-2	10	330
68.	3-Nitroaniline	99-09-2	50	1600
69.	Acenaphthene	83-32-9	10	330
70.	2,4-Dinitrophenol	51-28-5	50	1600
71.	4-Nitrophenol	100-02-7	50	1600
72.	Dibenzofuran	132-64-9	10	330

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)*

	Semivolatiles (cont.)	CAS Number	Quantitation Limits** Low Water µg/L	Low Soil/Sediment µg/Kg
73.	2,4-Dinitrotoluene	121-14-2	10	330
74.	Diethylphthalate	84-66-2	10	330
75.	4-Chlorophenyl phenyl ether	7005-72-3	10	330
76.	Fluorene	86-73-7	10	330
77.	4-Nitroaniline	100-01-6	50	1600
78.	4,6-Dinitro-2-methylphenol	534-52-1	50	1600
79.	N-nitrosodiphenylamine	86-30-6	10	330
80.	4-Bromophenyl phenyl ether	101-55-3	10	330
81.	Hexachlorobenzene	118-74-1	10	330
82.	Pentachlorophenol	87-86-5	50	1600
83.	Phenanthrene	85-01-8	10	330
84.	Anthracene	120-12-7	10	330
85.	Di-n-butyl phthalate	84-74-2	10	330
86.	Fluoranthene	206-44-0	10	330
87.	Pyrene	129-00-0	10	330
88.	Butyl benzyl phthalate	85-68-7	10	330
89.	3,3'-Dichlorobenzidine	91-94-1	20	660
90.	Benz(a)anthracene	56-55-3	10	330
91.	Chrysene	218-01-9	10	330
92.	bis(2-ethylhexyl)phthalate	117-81-7	10	330
93.	Di-n-octyl phthalate	117-84-0	10	330
94.	Benzo(b)fluoranthene	205-99-2	10	330
95.	Benzo(k)fluoranthene	207-08-9	10	330
96.	Benzo(a)pyrene	50-32-8	10	330
97.	Indeno(1,2,3-cd)pyrene	193-39-5	10	330
98.	Dibenz(a,h)anthracene	53-70-3	10	330
99.	Benzo(g,h,i)perylene	191-24-2	10	330

[b] Medium Soil/Sediment Contract Required Detection Limits (CRDL) for Semi-Volatile HSL Compounds are 60 times the individual Low Soil/Sediment CRDL.

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

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

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limits (CRQL)*

	Pesticides/PCBs	CAS Number	Quantitation Limits** Low Water µg/L	Low Soil/Sediment[c] µg/Kg
100.	alpha-BHC	319-84-6	0.05	8.0
101.	beta-BHC	319-85-7	0.05	8.0
102.	delta-BHC	319-86-8	0.05	8.0
103.	gamma-BHC (Lindane)	58-89-9	0.05	8.0
104.	Heptachlor	76-44-8	0.05	8.0
105.	Aldrin	309-00-2	0.05	8.0
106.	Heptachlor epoxide	1024-57-3	0.05	8.0
107.	Endosulfan I	959-98-8	0.05	8.0
108.	Dieldrin	60-57-1	0.10	16.
109.	4,4'-DDE	72-55-9	0.10	16.
110.	Endrin	72-20-8	0.10	16.
111.	Endosulfan II	33213-65-9	0.10	16.
112.	4,4'-DDD	72-54-8	0.10	16.
113.	Endosulfan sulfate	1031-07-8	0.10	16.
114.	4,4'-DDT	50-29-3	0.10	16.
115.	Endrin ketone	53494-70-5	0.10	16.
116.	Methoxychlor	72-43-5	0.5	80.
117.	alpha-Chlordane	5103-71-9	0.5	80.
118.	gamma-Chlordane	5103-74-2	0.5	80.
119.	Toxaphene	8001-35-2	1.0	160.
120.	AROCLOR-1016	12674-11-2	0.5	80.
121.	AROCLOR-1221	11104-28-2	0.5	80.
122.	AROCLOR-1232	11141-16-5	0.5	80.
123.	AROCLOR-1242	53469-21-9	0.5	80.
124.	AROCLOR-1248	12672-29-6	0.5	80.
125.	AROCLOR-1254	11097-69-1	1.0	160.
126.	AROCLOR-1260	11096-82-5	1.0	160.

[c]Medium Soil/Sediment Contract Required Detection Limits (CRDL) for Pesticide HSL compounds are 15 times the individual Low Soil/Sediment CRDL.

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

**Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the protocol, will be higher.

SECTION II

CLP INORGANICS

Superfund Target Compound List (TCL) and
Contract Required Quantitation Limit

	Parameter	Contract Required Quantitation Level[1] [2] (µg/L)
1.	Aluminum	200
2.	Antimony	60
3.	Arsenic	10
4.	Barium	200
5.	Beryllium	5
6.	Cadmium	5
7.	Calcium	5000
8.	Chromium	10
9.	Cobalt	50
10.	Copper	25
11.	Iron	100
12.	Lead	5
13.	Magnesium	5000
14.	Manganese	15
15.	Mercury	0.2
16.	Nickel	40
17.	Potassium	5000
18.	Selenium	5
19.	Silver	10
20.	Sodium	5000
21.	Thallium	10
22.	Vanadium	50
23.	Zinc	20
24.	Cyanide	10

CLP Inorganics

(continued)

1: Any analytical method specified in Exhibit D, CLP-Inorganics may be utilized as long as the documented instrument or method detection limits meet the Contract Required Quantitation Level (CRQL) requirements. Higher quantitation levels may only be used in the following circumstance:

If the sample concentration exceeds two times the quantitation limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the contract required quantitation level. This is illustrated in the example below:

For lead:
Method in use = ICP
Instrument Detection Limit (IDL) = 40
Sample concentration = 85
Contract Required Quantitation Level (CRQL) = 5

The value of 85 may be reported even though instrument detection limit is greater than Contract Required Quantitation Limit. The instrument or method detection limit must be documented as described in Exhibit E.

2: These CRQL are the instrument detection limits obtained in pure water that must be met using the procedure in Exhibit E. The quantitation limits for samples may be considerably higher depending on the sample matrix.