Appendix A- 1: Hazardous Waste Permit Part A Application

R 299.9504(1)b

and

40 CFR 270.13

EPA ID NO: | M | I | D || 9 | 8 | 0 || 9 | 9 | 1 || 5 | 6 | 6 |

OMB #: 2050-0034 Expires 11/30/2005

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT INFORMATION FORM

1. Facility Permit Contact (See instructions on page 23)	First Name: Scott	MI:	Last Name: Binder
	Phone Number: (313) 347-1300		Phone Number Extension:
2. Facility Permit Contact Mailing Address (See instructions on page 23)	Street or P.O. Box: 1923 Frederick Street		
	City, Town, or Village: Detroit		
	State: MI		
	Country: U.S.A.		Zip Code: 48211
3. Operator Mailing Address and Telephone Number (See instructions on page 23)	Street or P.O. Box: 1923 Frederick Street		
	City, Town, or Village: Detroit		
	State: MI		
	Country: U.S.A.	Zip Code: 48211	Phone Number (313) 347-1300
4. Legal Owner Mailing Address and Telephone Number (See instructions on page 23)	Street or P.O. Box: 1923 Frederick Street		
	City, Town, or Village: Detroit		
	State: MI		
	Country: U.S.A.	Zip Code: 48211	Phone Number (313) 347-1300
5. Facility Existence Date (See instructions on page 24)	Facility Existence Date (mm/dd/yyyy): 07/30/2002		

6. Other Environmental Permits (See instructions on page 24)

A. Permit Type (Enter code)	B. Permit Number	C. Description
		SEE APPENDIX A-4

7. Nature of Business (Provide a brief description; see instructions on page 24)

See Appendix A-11

EPA ID NO: M I D 9 8 0 9 9 1 5 6 6 OMB #: 2050-0034 Expires 11/30/2005

10. Description of Hazardous Wastes (Continued. Use the Additional Sheet(s) as necessary; number pages as 5 a, etc.)					
				D. PROCESSES	
Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	(1) PROCESS CODES (Enter code)	(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
1					
2				See Table A-2	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					

8. Process Codes and Design Capacities (See instructions on page 24) - Enter information in the Sections on Form Page 3.

A. **PROCESS CODE** - *Enter the code from the list of process codes in the table below that best describes each process to be used at the facility. Fifteen lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), enter the process information in Item 9 (including a description).*

B. **PROCESS DESIGN CAPACITY**- *For each code entered in Section A, enter the capacity of the process.*

1. **AMOUNT** - *Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.*

2. **UNIT OF MEASURE** - *For each amount entered in Section B(1), enter the code in Section B(2) from the list of unit of measure codes below that describes the unit of measure used. Select only from the units of measure in this list.*

C. **PROCESS TOTAL NUMBER OF UNITS** - *Enter the total number of units for each corresponding process code.*

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Disposal:	
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectare-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Disposal	Any Unit of Measure in Code Table Below
	Storage:	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Acres; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Storage	Any Unit of Measure in Code Table Below
	Treatment:	
T01	Tank Treatment	Gallons Per Day; Liters Per Day
T02	Surface Impoundment Treatment	Gallons Per Day; Liters Per Day
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Day; Liters Per Hour; or Million Btu Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; Btu Per Hour; or Million Btu Per Hour

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Treatment (continued):	
T81	Cement Kiln	For T81-T93:
T82	Lime Kiln	
T83	Aggregate Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Liters Per Hour; Kilograms Per Hour; or Million Btu Per Hour
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, or Refining Furnace	
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used In The Recovery Of Sulfur Values From Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed In 40 CFR §260.10	
T94	Containment Building - Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
	Miscellaneous (Subpart X):	
X01	Open Burning/Open Detonation	Any Unit of Measure in Code Table Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; or Million Btu Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit of Measure Listed Below

UNIT OF MEASURE	UNIT OF MEASURE CODE
Gallons	G
Gallons Per Hour	E
Gallons Per Day	U
Liters	L
Liters Per Hour	H
Liters Per Day	V

UNIT OF MEASURE	UNIT OF MEASURE CODE
Short Tons Per Hour	D
Metric Tons Per Hour	W
Short Tons Per Day	N
Metric Tons Per Day	S
Pounds Per Hour	J
Kilograms Per Hour	R
Million Btu Per Hour	X

UNIT OF MEASURE	UNIT OF MEASURE CODE
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu Per Hour	I

8. Process Codes and Design Capacities (Continued)

EXAMPLE FOR COMPLETING Item 8 (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons.

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY (1) Amount (Specify)	(2) Unit of Measure (Enter code)	C. Process Total Number of Units	For Official Use Only
X	1	S	0	2	5 3 3 .7 8 8	G	0 0 1	
	1				SEE TABLE A-1 .			
	2				.			
	3				.			
	4				.			
	5				.			
	6				.			
	7				.			
	8				.			
	9				.			
1	0				.			
1	1				.			
1	2				.			
1	3				.			
1	4				.			
1	5				.			

NOTE: If you need to list more than 15 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, taking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in Item 9.

9. Other Processes (*See instructions on page 25 and follow instructions from Item 8 for D99, S99, T04 and X99 process codes*)

Line Number (Enter #s in sequence with Item 8)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY (1) Amount (Specify)	(2) Unit of Measure (Enter code)	C. Process Total Number of Units	D. Description of Process
X	2	T	0	4	1 0 0 .0 0 0	U	0 0 1	In-situ Vitrification
					.			
					.			
					.			
					.			
					.			

10. Description of Hazardous Wastes (See instructions on page 25) - Enter Information in the Sections on Form Page 5.

A. EPA HAZARDOUS WASTE NUMBER - *Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR Part 261, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.*

B. ESTIMATED ANNUAL QUANTITY - *For each listed waste entered in Section A, estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in Section A, estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C. UNIT OF MEASURE - *For each quantity entered in Section B, enter the unit of measure code. Units of measure which must be used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	*CODE*	*METRIC UNIT OF MEASURE*	*CODE*
POUNDS	*P*	*KILOGRAMS*	*K*
TONS	*T*	*METRIC TONS*	*M*

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure, taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in Section A, select the code(s) from the list of process codes contained in Items 8A and 9A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the listed hazardous wastes.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in Section A, select the code(s) from the list of process codes contained in Items 8A and 9A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of Item 10.D(1).*
3. *Use additional sheet, enter line number from previous sheet, and enter additional code(s) in Item 10.E.*

2. PROCESS DESCRIPTION: *If a code is not listed for a process that will be used, describe the process in Item 10.D(2) or in Item 10.E(2).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. *Select one of the EPA Hazardous Waste Numbers and enter it in Section A. On the same line complete Sections B, C and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.*
2. *In Section A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In Section D(2) on that line enter "included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING Item 10 (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operations. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number		A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)									(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
X	1	K	0	5	4	900	P	T	0	3	D	8	0				
X	2	D	0	0	2	400	P	T	0	3	D	8	0				
X	3	D	0	0	1	100	P	T	0	3	D	8	0				
X	4	D	0	0	2												Included With Above

11. Map (See instructions on pages 25 and 26) See Sheet A-0 in Engineering Drawings

Attach to this application a topographic map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in this map area. See instructions for precise requirements.

12. Facility Drawing (See instructions on page 26) See Sheet A-2 in Engineering Drawings

All existing facilities must include a scale drawing of the facility (see instructions for more detail).

13. Photographs (See instructions on page 26) See Appendix A-15

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

14. Comments (See instructions on page 26)

Appendix A- 2: Hazardous Waste Permit Part B Application

R 299.9504(1)

and

40 CFR 270.14

Michigan Department of Environmental Quality, Waste and Hazardous Materials Division

APPLICATION FORM FOR CONSTRUCTION PERMITS AND OPERATING LICENSES

HAZARDOUS WASTE TREATMENT, STORAGE AND DISPOSAL FACILITIES

Required under authority of Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Failure to submit this information may result in civil or criminal penalties.

(Note: Copies of DEQ Site Identification form EQP5150 and
EPA Part A Permit Application Form 8700-23 must be submitted with this form.)

I. FACILITY EPA ID NUMBER: MID 980 991 566

II. FACILITY'S LEGAL OWNER

A. NAME: Dave Lusk (EQ Detroit, Inc.)

B. STREET OR P.O. BOX: 1923 Frederick St.

C. CITY OR TOWN, STATE, ZIP CODE: Detroit, MI 48211

D. PHONE NUMBER (Area Code and Number): (313) 347-1300

E. OWNER TYPE: F. OWNER CHANGE? Y ☐ N ☒ DATE:

III. FACILITY OPERATOR

A. NAME: EQ Detroit, Inc.

B. STREET OR P.O. BOX: 1923 Frederick St.

C. CITY OR TOWN, STATE, ZIP CODE: Detroit, MI 48211

D. PHONE NUMBER (Area Code and Number): (313) 347-1300

E. OPERATOR TYPE: F. OPERATOR CHANGE? Y ☐ N ☒ DATE:

IV. TITLE HOLDER OF LAND

A. NAME: EQ Detroit, Inc.

B. STREET OR P.O. BOX: 1923 Frederick St.

C. CITY OR TOWN, STATE, ZIP CODE: Detroit, MI 48211

D. PHONE NUMBER: (313) 347-1300

V. CONSTRUCTION PERMIT OR OPERATING LICENSE APPLICATION (Check One)

A. ☐ CONSTRUCTION PERMIT APPLICATION
B. ☐ OPERATING LICENSE APPLICATION
  B.1. ☐ FIRST APPLICATION
  B.2. ☒ RENEWAL APPLICATION
  B.3. ☐ APPLICATION FOR LICENSE MODIFICATION
  B.4. ☐ RESEARCH, DEVELOPMENT AND DEMONSTRATION LICENSE APPLICATION

VI. FIRST OR RENEWAL APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA ID Number, or if this is a revised application, enter your facility's EPA ID Number in Item I above.

A. FIRST APPLICATION	☐ 1. EXISTING FACILITY	☐ 2. NEW FACILITY	
B. REVISED APPLICATION	☒ 1. EXISTING FACILITY	☐ 2. NEW FACILITY	
For existing facilities, provide date operation or construction began	7/30/2002	For new facilities, provide date operation began or is expected to begin	

VII. PERMIT AND LICENSE FEES

A. ☐ CONSTRUCTION PERMIT FIXED FEE (complete the following)

1. Check type of facility:
   - ☐ Land Disposal ($9,000) $______
   - ☐ Incineration or other treatment ($7,200) $______
   - ☐ Storage ($500) $______
2. Site size ________ acres (see fee schedule in section 324.11118 of Act 451) $______
3. Projected waste volume (see fee schedule)
   ________________ Gallons/day $______
   OR ________________ Cubic yards/day $______
4. Hydrogeological characteristics for land disposal (see fee schedule)
   - ☐ Natural Clay
   - ☐ Sand
   - ☐ Compacted Clay
   - ☐ Artificial Liner $______
5. For treatment or storage facilities Is there surface water on the Site?
   - ☐ No
   - ☐ Yes ($75) $______

TOTAL CONSTRUCTION PERMIT FIXED FEE: $______

B. ☒ OPERATING LICENSE FEE $ 500.00

VIII. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	
B. UIC (Underground Injection of Fluids)	
C. RCRA (Hazardous Wastes)	
D. PSD (Air Emissions From Proposed Sources)	X
E. OTHER (Specify)	See Appendix A-4

IX. NATURE OF BUSINESS (*Provide a brief description*)

See Appendix A-11

X. MAP [illegible]

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for specific requirements.

XI. FACILITY DRAWING [illegible]

All existing facilities must include a scale drawing of the facility (see instructions for more detail).

XII. PHOTOGRAPHS [illegible]

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

XIII. PROCESS CODES AND DESIGN CAPACITIES (See instructions.)									
LINE NUMBER	A. PROCESS CODE (from list)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
1					7				
2					8				
3					9				
4					10				
5					11				
6					12				

C. THIS SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

See Table A-1

XIV. DESCRIPTION OF HAZARDOUS WASTES - See Table A-7

Line No.	A. EPA HAZARD WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES				
				1. PROCESS CODES (enter code)				2. PROCESS DESCRIPTION (if no code entered in D.1)

XV. OTHER REQUIRED ATTACHMENTS - See Appendix A-10 for location of required attachments

A. GENERAL INFORMATION

Attach each of the following separately to the application:

1. General facility description
2. Chemical & physical analyses*
3. Waste analysis plan*
4. Security procedures & equipment
5. Inspection schedules
6. Preparedness/prevention or waiver*
7. Contingency plan*
8. Traffic information
9. Location information
10. Personnel training program*
11. Closure/post-closure (C/PC) plan*
12. C/PC cost estimates*
13. Topographic map
14. Liability mechanism
15. Financial assurance Instrument

*Refer to Instructions for Guidance.

B. SUPPLEMENTAL INFORMATION

Attach each of the following separately to all applications:

1. Status of compliance with other federal laws
2. Corrective Action information*
3. Hydrogeological report*
4. Environmental assessment*
5. Environmental monitoring programs*
6. Engineering plans

*Refer to Instructions for Guidance.

Attach each of the following separately to operating license applications:

1. Proof of issuance of other permits or licenses
2. For new facilities, construction certification
3. Capability certification/compliance schedule
4. Restrictive covenant (landfills only)

C. FACILITY SPECIFIC INFORMATION

Attach the required technical information to all applications separately for each of the following units or processes:

1. Containers*
2. Tanks*
3. Incineration or thermal treatment
4. Treatment
5. Surface impoundments
6. Waste piles
7. Landfills
8. Land treatment
9. Miscellaneous units
10. Underground mines or caves
11. Air emissions from process vents, equipment leaks, tanks, containers, & surface impoundments*
12. Drip pads
13. Boilers and industrial furnaces

*Refer to Instructions for Guidance.

XVI. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

OWNER NAME (type or print) Dave Lusk	SIGNATURE	DATE SIGNED 9/9/08
OPERATOR NAME (type or print) Tim Tilotti	SIGNATURE	DATE SIGNED 9/8/08
NAME OF TITLEHOLDER OF LAND (type or print) EQ Detroit, Inc.	SIGNATURE	DATE SIGNED 9/10/08

APPENDIX A-3

NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

Required under authority of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Failure to submit this information may result in civil or criminal penalties.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
Waste and Hazardous Materials Division

SITE IDENTIFICATION

DEQ

I. The form is being submitted CHECK CORRECT BOX(ES) If submitting a subsequent notification you can contact the MDEQ-WHMD District or Lansing office for a pre-populated form. For locations and phone numbers go to www.michigan.gov/deq.	☐ **as initial notification**: to notify as a new site or new owner for the site: Mail this form and the user charge fee with either a receipt from paying the $50.00 fee on-line using a Master Card, VISA, or Discover Card (https://www.thepayplace.com/mi/deq/siteid) or by check made payable to the State of Michigan. Mail to MDEQ Revenue Office - HWUC, PO Box 30657, Lansing, MI 48909-8157 OR ☒ **as subsequent notification**: to change, update, or verify site information for an existing owner of a site with a previously issued Site ID number: Mail directly to WHMD-MDEQ at WHMD-MDEQ, Notification Unit, PO Box 30241, Lansing, MI 48909-4797 if a fee is not required. Otherwise submit to MDEQ Revenue Office (see above). **AND ANY OF THE FOLLOWING** ☒ as a component of a Hazardous Waste Permit Part A (submit to WHMD-MDEQ) ☐ as a component of the Hazardous Waste (biennial) Report (submit to WHMD-MDEQ)
II. Site's ID Number	A. Site's Identification (ID) Number: EPA ID No. MID 980 991 566
III. Name of Site TYPE OR PRINT CLEARLY	A. Legal Company Name: EQ Detroit, Inc. B. Site Specific Name (d/b/a):
IV. NAICS for this Site	A. 562211 B. C. D.
V. Site Location Address and Other Site Information TYPE OR PRINT CLEARLY	Street Address line 1: 1923 Frederick St, Address line 2 City, Town, or Village: Detroit State, Province or Subdivision (2 letters): MI Country: U.S.A County Name (MI only): Wayne Zip or Postal Code: 48211 - Tax Number: 74-2879386 Approx / Ave Number of Employees: 68
VI. Site Mailing Address TYPE OR PRINT CLEARLY	Street Address line 1 or PO Box: 1923 Frederick St. Address line 2: City, Town, or Village: Detroit State, Province or Subdivision (2 letters): MI Country: U.S.A Zip or Postal Code: 48211 -
VII. Site Contact Person TYPE OR PRINT CLEARLY	First Name: Scott MI: Last Name: Binder Phone Number: (313) 347-1300 Phone number extension: email address: Scott.binder@eqonline.com Fax number: (313) 923-0217
VIII. Indian Reservation	Facility on Indian Reservation Land ☐yes ☒no

EQP5150 (rev. 12/07)

IX. Owner of the site and/or Operator of Site

TYPE OR PRINT CLEARLY

A. (check applicable box(es))

[ ] Owner [X] Operator

Approx date became owner or operator: 2/4/2004

Approx date ceased as owner or operator:

Name: Tim Tilotti

Type (check one): [X] Private [ ] County [ ] District [ ] Federal [ ] Indian [ ] Municipal [ ] State [ ] Other

B. (check applicable box(es))

[X] Owner [ ] Operator

Approx date became owner &/or operator: 2/4/2004

Approx date ceased as owner &/or operator:

Name: Dave Lusk

Type (check one): [X] Private [ ] County [ ] District [ ] Federal [ ] Indian [ ] Municipal [ ] State [ ] Other

Add any additional owners or operators on the comment page. The property owner is not required unless said property owner also acts as the owner or operator of the activity that generates the waste

C. (check applicable box(es))

[ ] Owner [ ] Operator

Approx date became owner or operator:

Approx date ceased as owner or operator:

Name:

Type (check one): [ ] Private [ ] County [ ] District [ ] Federal [ ] Indian [ ] Municipal [ ] State [ ] Other

X. Type of Regulated Waste Activity
Mark 'X' in the appropriate box(es) for the activity on-site as of the date signed or the date entered in comment section XII.

A. Hazardous Waste Activity(ies) **at this location**

1. Generator of hazardous waste (can only choose one of the following three categories a-c)

[X] a. LQG: Greater than 1,000 kg/mo (2,200 lbs.) of non-acute hazardous waste; **or**

[ ] b. SQG: 100 to 1,000 kg/mo (220 - 2,200 lbs.) of non-acute hazardous waste; **or**

[ ] c. CESQG: Less than 100 kg/mo of non-acute hazardous waste

For items 2 through 8, check all that apply

2. Transporter of hazardous waste

[X] a. Transport hazardous waste

[X] b. Commingle waste

[X] c. Offloads during transportation

[may require a permit & registration]

3. Designated facility (hazardous waste received from off-site)

[X] a. Treats or treated waste on-site at this location

[X] b. Stores or stored waste on-site at this location

[ ] c. Disposes of or disposed of waste on-site at this location

[ ] d. Recycles recyclable materials on-site at this location **[requires submittal of Part A & permit]**

[ ] 4. Underground injection well on-site at this location

[X] 5. Import agent for hazardous waste

[ ] 6. Generates mixed radioactive waste on-site at this location

[X] 7. Accepts hazardous waste from CESQG & accumulates over 1000kg on-site at this location

8. Exempt boiler and/or Industrial Furnace on-site at this location

[ ] a. Smelting, melting, and refining furnace exemption

[ ] b. Small quantity on-site burner exemption

B. Polychlorinated biphenyls (PCBs) generated at this location.

[ ] Generated an item, product, or material containing a concentration equal to or greater than 100 ppm of PCB

X. Type of Regulated Waste Activity - CONTINUED
Mark 'X' in the appropriate box(es) for the activity on-site as of the date signed or the date entered in comment section XII.

C. Used Oil Activities **at this location**, check all that apply: (used oil generator only - go to E.)
[see comments for additional information]

1. Used Oil Fuel Marketer
   - ☒ a. Marketer who directs shipments of off-specification used oil to used oil burner.
   - ☐ b. Marketer who first claims the used oil meets the specifications.

☐ 2. Off-specification Used Oil Burner

3. Used Oil Transporter (check one only)
   - ☐ a. Transporter only
   - ☐ b. Transporter with transfer facility
   [requires a permit & registration]

☒ 4. Used Oil Processor
☐ 5. Used Oil Re-refiner
☒ 6. Used Oil Collection or Aggregation Point
☒ 7. Collection Center or Aggregation Point that accepts DIY Used Oil

D Universal Waste Activities **at this location**, check all that apply:

1. Large Quantity Handler: check the box(es) for the universal wastes generated or accumulated

type of universal waste	generating	accumulating over 5,000kg
a. Batteries	☐	☐
b. Thermostats	☐	☐
c. Mercury Thermometers	☐	☐
d. Devices containing elemental mercury	☐	☐
e. Mercury Switches	☐	☐
f. Pesticides	☐	☐
g. Electric Lamps	☐	☐
h. Pharmaceuticals	☐	☐
i. Consumer Electronics	☐	☐

☐ 2. Destination Facility of Universal Waste (a hazardous waste permit may be required for this activity)

E. Liquid Industrial Waste Activities **at this location**, check all that apply: (not hazardous waste activity)

☐ 1. Liquid Industrial Waste Transporter **[requires a permit & registration]**
☐ 2. Transporting own waste
☒ 3. Liquid Industrial Waste Generator
☒ 4. Liquid Industrial Waste Designated Facility

F. All generation of waste has ceased at this location and/or any other regulated waste activity specified in Section X. Check one box and enter in a date using this format (mm/dd/yyyy):

☐ 1. still in business at this location
☐ 2. out of business at this location

Date ceased:______________________________

XI. Certification: I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Signature of owner, operator, or authorized representative	Name and Official Title (type or print)	Date Signed (mm-dd-yyyy)
Tim Tilotti	Tim Tilotti (Name) Vice President (Title)	09/10/2008

XII. Comments:

If there is a change in the activity status under Section X.A.1.a-c or Section X.C.1, 2, 4, or 5, from the previously reported regulated waste activity at this site, the actual data of the change could impact the user fee. Please indicate below the actual date of the regulated waste activity change(s) at this site and add an explanation. Otherwise, the effective date of the regulated waste activity(ies), specified in Section X, will become effective on the certification date (Section XI). To determine the current waste activity at this location please log into to the public website at http://www.deqstate.mi.us/wdspi

Appendix A- 4: List of all Necessary Environmental Permits

R 299.9508(1)(f)

and

40 CFR 270.13(k)

Detroit Water and Sewerage Department Wastewater Discharge Permit

DWSD Permit No.923-91964-IU

RECEIVED SEP 1 2 2006

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
INDUSTRIAL WASTE CONTROL DIVISION

303 S. LIVERNOIS AVENUE
DETROIT, MICHIGAN 48209
PHONE: 313.297.9400
FAX: 313.297.5860
WWW.CI.DETROIT.MI.US

CERTIFIED MAIL

September 6, 2006

Mr. Scott Maris
EQ Detroit, Inc
1923 Frederick Street
Detroit, MI 48211

Re: Wastewater Discharge Permit No. 923-91964-IU

Dear Mr. Maris:

Enclosed please find your Wastewater Discharge Permit as issued by the Detroit Water and Sewerage Department (DWSD). The terms and conditions of this permit are based on applicable law, data and other related information your company has submitted to the Industrial Waste Control (IWC) Division.

This permit contains the specific discharge limitations, effective dates, self-monitoring and reporting requirements for your facility to comply. Please note that any and all penalties, pretreatment schedules, compliance agreements, and/or Administrative Orders previously imposed as a consequence of violations by the industrial user, prior to the issuance of this permit, remain in full force and effect.

In accordance with City of Detroit, Ordinance No. 08-05, or equivalent local ordinance, any appeal regarding this permit must be submitted in writing within twenty (20) days from the date of mailing of this permit.

If you have questions, please contact Mr. Andrew E.C. Anyanonu, IWC Permits Section, at (313) 297-5851.

Sincerely,

Stephen J. Kuplicki
Stephen J. Kuplicki
Manager
Industrial Waste Control Division

SJK/AECA/vb
Enclosure

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
INDUSTRIAL WASTE CONTROL DIVISION

303 S. LIVERNOIS AVENUE
DETROIT, MICHIGAN 48209
PHONE: 313.297.9400
FAX: 313.297.5860
WWW.CI.DETROIT.MI.US

WASTEWATER DISCHARGE PERMIT
PERMIT NO.: 923-91964-IU

SECTION A: GENERAL INFORMATION

Facility I.D. No.: 91964

Company Name: EQ Detroit, Inc

Facility Address: 1923 Frederick Street
Detroit, MI 48211

Mailing Address: 1923 Frederick Street
Detroit, MI 48211

The Detroit Water and Sewerage Department (DWSD) hereby authorizes the Industrial User specified above to discharge industrial wastewater to the City of Detroit sewer system. This authorization is granted in accordance with the City's Wastewater Discharge Ordinance or equivalent local ordinance and any applicable provisions of federal or state laws or regulations.

The requirements and conditions established in this permit do not relieve the company of its obligation to comply with any applicable pretreatment regulations, standards, requirements, or laws that may become effective during the term of this permit.

In addition, this permit is granted in accordance with the application filed with DWSD, and in conformity with plans, specifications, and other substantive data submitted to the Department in support of the above application.

To continue discharging industrial wastewater after the expiration date, it is the responsibility of the Industrial User to submit an application for permit reissuance at least ninety (90) days before the expiration of the existing permit. The permit reapplication form may be requested from this Department.

Effective Date: September 6, 2006

Expiration Date: September 1, 2009

Issued and Authorized by:

Stephen J. Kuplicki
Manager, IWC
Industrial Waste Control Division

SECTION B: DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

Point Source Category: Centralized Wastetreatment Facility 40 CFR Part 437.46 (b)

Subcategory: Subpart D-Multiple Wastestreams, Pretreatment Standards for Existing Sources (PSES)

Representative Sampling Location: 01 SL: Controlled MH: 12' S. of south wall of Bio-plant ; 187' E. of west fence

Batch Discharge information: Frequency: 8 batches per day average (from all 4 tanks)
Duration: 3 hours per batch (average) per tank
Maximum Volume: 78,000 gallons per batch per tank

Applicable Discharge Limitations

PARAMETER (reported in mg/l unless otherwise indicated)		Daily Max.	Monthly Avg.*	Min. Sampling Frequency**
2,4,6-Trichlorophenol	TCPH	0.155	0.106	1 / 4 Days
2,4-Dichlorophenol	DCPH	5.5		1 / 6 Months
2,4-Dinitrophenol	DNPH	2.0		1 / 6 Months
2-Chlorophenol	CLPH	2.0		1 / 6 Months
4-Chloro-3-methylphenol	4C3MP	1.0		1 / 6 Months
4-Chlorophenol	4CP	2.0		1 / 6 Months
4-Methylphenol	4MP	5.0		1 / 6 Months
4-Nitrophenol	4NPH	15.0		1 / 6 Months
Acidity/Alkalinity (pH)	pH	5.0 - 11.5 Units		2 / Month
Antimony	Sb	0.249	0.206	1 / 4 Days
Arsenic	As	0.162	0.104	1 / 4 Days
Biochemical Oxygen Demand	BOD	7500.0		1 / 6 Months
Bis (2-Ethylhexyl) Phthalate	BEHP	0.267	0.158	1 / 4 Days
Cadmium	Cd	0.474	0.0962	1 / 4 Days
Carbazole	CARB	0.392	0.233	1 / 4 Days
Chromium	Cr	0.947	0.487	1 / 4 Days
Cobalt	Co	0.192	0.124	1 / 4 Days
Copper	Cu	0.405	0.301	1 / 4 Days
Cyanide (Available)	AVCN	1.0		2 / Month
Fats, Oil or Grease	FOG	1500.0		2 / Month

Fluoranthene	FLAN	0.787	0.393	1 / 4 Days
Iron	Fe	1000.0		2 / Month
Lead	Pb	0.222	0.172	1 / 4 Days
Mercury	Hg	Non-detect*	0.000739	1 / 4 Days
Nickel	Ni	3.95	1.45	1 / 4 Days
Phenol Alcohol	PHEN AL	14.0		1 / 6 Months
Phosphorus	P	250.0		1 / 6 Months
Silver	Ag	0.120	0.0351	1 / 4 Days
Tin	Sn	0.409	0.12	1 / 4 Days
Titanium	Ti	0.0947	0.0618	1 / 4 Days
Total PCB	PCB	Non-detect*		1 / 6 Months
Total Suspended Solids	TSS	7500.0		2 / Month
Vanadium	V	0.218	0.0662	1 / 4 Days
Zinc	Zn	2.87	0.641	1 / 4 Days
n-Decane	NDEC	5.79	3.31	1 / 4 Days
n-Octadecane	NOCT	1.22	0.925	1 / 4 Days
o-Cresol	OCRE	1.92	0.561	1 / 4 Days
p-Cresol	PCRE	0.698	0.205	1 / 4 Days

* See page 3

** The Minimum Sampling Frequency of one (1) sample every four (4) operating days, the facility operating days shall be based upon a schedule for:

( ) Monday – Friday
( ) Monday – Saturday
(X) Monday – Sunday

All parameters shall be analyzed in accordance with 40 CFR Part 136 methods. All MDL shall be reported with the sample results, and any cleanup procedures and sample interference indicated.

DEFINITIONS and REQUIREMENTS

1. **Total PCB** – means the sum of the individual analytical results for each of the PCB aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260 during any single sampling event with any aroclor result less than the quantification level being treated as zero.

   The limitation for Total PCB is Non-detect – Total PCB shall not be discharged at detectable levels, based upon U.S. EPA Method 608, and the quantification level shall not exceed 0.2 μg/l, unless a higher level is appropriate because of demonstrated sample matrix interference. Where one or more samples indicate detectable levels of Total PCB, the user shall be required to demonstrate compliance. For purposes of this section, this demonstration may be made using analytical data showing that the Total PCB concentration is below the detection level, or submission of a BMP in accordance with 56-3-66.1(d).

2. **The Limitation for Mercury (Hg)** – is Non-detect. Mercury (Hg) shall not be discharged at detectable levels, based upon U.S. EPA Method 245.1, and the quantification level shall not exceed 0.2 μg/l, unless a higher level is appropriate because of demonstrated sample matrix interference. Where one or more samples indicate detectable levels of Mercury, the user shall be required to demonstrate compliance. For purposes of this section, this demonstration may be made using analytical data showing that the mercury concentration is below the detection level, or submission of a BMP in accordance with 56-3-66.1(d).

3. **Available Cyanide** – means the quantity of cyanide that consists of cyanide ion (CN); hydrogen cyanide in water (HCNaq); and the cyano-complexes of zinc, copper, cadmium, mercury, nickel, and silver, determined by EPA method OIA-1677, or other method designated as a Standard Method or approved under 40 CFR Part 136.

4. **Total Phenolic Compounds** – means the sum of the individual analytical results for each of the phenolic compounds of 2-chlorophenol, 4-chlorophenol, 4-chloro-3-methylphenol, 2,4-dichlorophenol, 2,4-dinitrophenol, 4-methylphenol, 4-nitrophenol, and phenol during any single sampling event expressed in mg/l.

5. **Quantification Level** – means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

6. **Best Management Practices (BMP)** – means programs, practices, procedures or other directed efforts, initiated and implemented by a User, which can or does lead to the reduction, conservation or minimization of pollutants being introduced into the ecosystem, including but not limited to the Detroit sewer system. BMPs include, but are not limited to, equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control, and may include technical and economic considerations.

DEFINITIONS and REQUIREMENTS

Discharge Specific Requirements

The Department has classified your facility as a Batch Discharger, based on the information submitted in your permit application or reapplication.

BATCH DISCHARGE
A non-continuous release of treated wastewater, resulting from a collection of one or more compatible wastestreams whose volume, duration or frequency of generation warrant periodic releases as the most efficient and effective means of discharge.

The permittee shall maintain a record for all wastewater discharges from the site including but not limited to:

i) Date of Discharge
ii) Volume of wastewater discharged

The company shall provide notice to the Department of any material or substantive changes in the frequency or volume of your batch discharge.

DEFINITIONS and REQUIREMENTS

TOTAL TOXIC ORGANICS (TTO) is the summation of all quantifiable values greater than 0.01 mg/l for the listed toxic organics. TTO requirement shall be as follows:

(a) All parameters shall be analyzed in accordance to 40 CFR Part 136 methods. Usage of approved analytical procedures is essential to the detection of parameters being analyzed. All MDLs should be reported with the sample results, and any cleanup procedures and sample interference shall be reported.

(b) In lieu of monitoring for TTO, facilities subject to either 40 CFR Part 413 or Part 433 may be allowed to make the TTO certification as a comment to the Six Month Report, provided:

i) At least one complete set of analytical results has been submitted for all the TTO pollutants of concern, and

ii) The Industrial User has submitted a Toxic Organic Management Plan (TOMP) in compliance with either 40 CFR Part 413 or 433 requirements, and

iii) The TOMP has been approved by the Department.

TOTAL METAL is the sum of the concentration of Copper (Cu), Nickel (Ni), Total Chromium (CrT) and Zinc (Zn).

4-DAY AVERAGE is the highest allowable mass or concentration standard of discharges over four (4) consecutive, independent daily sampling events. Compliance with this limitation is calculated as the summation of individual daily discharge, measurements for a parameter taken during four (4) consecutive daily sampling events divided by four (4). The four (4) consecutive sampling events need not occur on consecutive calendar days.

30-DAY AVERAGE is the summation of individual daily measurements for a parameter during a thirty (30) consecutive calendar day period, divided by the number of individual measurements for that parameter taken during that thirty (30) day period. The recommended minimum number of samples (1 set) required to demonstrate compliance are ten (10) independent daily samples.

MONTHLY AVERAGE is the summation of individual daily measurements for a parameter during a calendar month, divided by the number of individual measurements for that parameter taken during that month. The recommended minimum number of samples (1 set) required to demonstrate compliance are 10 independent daily samples.

SECTION C: AUTHORIZED WASTESTREAMS

1) As a result of the permit applications and supporting information filed with the Department, the permittee is authorized to release treated wastewater to the Detroit POTW of the following general types as defined in 40 CFR Part 437:

   (a) Oily waste Subpart B
   (b) Organic waste Subpart C
   (c) Metal bearing waste Subpart A

   The permittee is specifically prohibited from discharging any wastes containing PCBs (Polychlorinated Biphenyls).

2) Upon request of the Department, the permittee shall provide the Department access to waste manifests, or other bills of lading, for all incoming materials within seven (7) days of the request; all analytical information available for each manifest or bill of lading shall be included. Copies shall be provided by the permittee of information selected by the Department.

SECTION D: APPLICABLE LIMITS ON RATE AND TIME OF DISCHARGE & FLOW REGULATION

The permittee is authorized for discharge treated wastewater to the Detroit POTW under the following conditions and restrictions:

Days of Operation:	Monday - Sunday
Hours of Operation:	24 hours per day 6:30 AM-6:30 AM
Daily Rate Limits:	The total volume discharged to the Detroit POTW shall not exceed 500,000 gallons per day of treated process wastewater.

Discharge authorization may be granted for releases during Holiday periods where the permittee provides at least 72 hours notification to the Department and receives prior written authorization from the DWSD for the proposed Holiday discharge.

SECTION E: SELF-MONITORING CONDITIONS AND REQUIREMENTS

1) The sampling location(s) used for purposes of compliance sampling and reporting is identified in Section B. No alternate locations will be accepted unless approved by the Department. Except in emergencies, all requests for an alternate sample location or change in the sampling location shall be submitted in writing at least thirty (30) days prior to the proposed date of change.

2) The minimum sampling frequency per pollutant for purposes of compliance sampling and reporting is identified in Section B. The Department recommends and supports sampling efforts greater than the stated minimums.

   The sampling frequency has been calculated by the Department for your facility based upon the information submitted in your application (or re-application), or from prior reports or inspections, including:

   (a) Evaluation of compliance history (effluent and non-effluent)
   (b) Volume of process wastewater discharged to the sewer
   (c) Reported discharge frequency (if other than daily)

3) The specific pollutant parameters, which are to be monitored for purposes of compliance sampling and reporting, are identified in Section B.

   (a) A single daily composite sample shall be collected and analyzed for all parameters specified in Section B, except for Fats, Oil or Grease (FOG), Cyanide (total, available, or amenable), pH, Total Phenols, and the volatile organic compounds included in the TTO list, which shall be collected by one or more grab samples. The sample shall be representative of the facility's discharge.

   (b) All daily samples shall be individually analyzed, reported and compared against the applicable daily maximum limitations listed in Section B. Any required average, if applicable, shall be calculated from the individual results, and compared against the applicable average limitations listed in Section B.

4) All sampling and analyses reports for purposes of compliance sampling and reporting, as identified in Section B, must be performed in accordance with the methods and techniques specified in 40 CFR Part 136 and any amendments thereto.

5) The usage of approved analytical procedures, as defined in 40 CFR Part 136 is essential to the detection of the parameters being analyzed. Samples analyzed by other methods, e.g. SW-846, are specifically prohibited.

SECTION F: REPORTING AND NOTIFICATION REQUIREMENTS

1) If sampling performed by the permittee indicates a violation of the stated permit limitations, then the permittee shall make a demonstration of compliance, which is acceptable to the Department. This demonstration shall consist of the following minimum requirements:

(a) Notification to the Department's Inspection Section at telephone number (313) 297-5826 or fax number (313) 297-5860 within twenty-four (24) hours of becoming aware of the violation.

NOTE: For purposes of this section, when interpreting, ***"within twenty-four hours of becoming aware"*** the Department shall consider the reasonable time frame which the authorized representative, or their designated authorized representative, actually or should have become aware of the exceedance or violation through due diligence.

(b) Report the suspected or known causes of violation and any corrective measures taken or planned to prevent future noncompliance.

(c) A demonstration of compliance by collecting and analyzing at least two (2) more individual daily samples.

(d) Submission of the report to the Department within thirty (30) days of becoming aware of the noncompliance.

2) The facility elected to comply with the specific limitations for each of the eight (8) individual phenolic compounds in lieu of the Total Phenols Limitation.

SECTION G: OTHER REQUIREMENTS

1) The permittee is prohibited from disposing of or discharging any waste or wastewater not identified in the permit application, to the POTW.

2) The permittee is required to comply with all conditions, standards, and requirements of this permit. Failure to comply will result in enforcement action.

3) Slug Control/Spill Prevention Plan

   The permittee is required initially to submit and implement a Slug Control/Spill Prevention Plan (SC/SPP), in accordance with the City of Detroit Ordinance 08-05, to provide protection against accidental discharges to the POTW, unless the permittee has a written notification from the Department exempting them from this requirement.

   In addition, the permittee shall review and, if necessary, modify or update its SC/SPP and notify the Department:

   i) every two (2) years and/or

   ii) any substantial change in operation

4) Six Month Report

   The Six Month Report must be submitted to the Department semiannually on or before June 30 and December 31 of each year. The report must be submitted in the form prescribed by the Department or on an alternative form approved by the Department. It must contain the following requirements:

   i) the analytical part (Self-Monitoring Requirements/Wastewater Analyses), and

   ii) the descriptive part (i.e. facility information, water usage/discharge information, certified statement, certification, etc.)

   Self-Monitoring report for PCB, Phenolic compounds and TTO should be reported based on the following understanding:

   i) if the company chooses to submit the results in the December Six Month Report, the June report should indicate the company's preference, or

   ii) if the company submits the results in the June report, the December report should state that the results have already been submitted in the June report.

This report shall be signed and dated by the authorized representative of the Industrial User

SECTION G: OTHER REQUIREMENTS (Cont'd)

5) Sewerage Flow Meter

i) The facility must conduct an annual maintenance evaluation of its sewerage flow meter. The facility shall provide the Department with its certification attesting the workability/accuracy of the meter and last calibration date during Comprehensive Inspection (CI) or with its Six Month Report (SMR). No discharge shall bypass the flow meter

ii) If the facility's sewerage flow meter malfunctions, the company must notify the Department's revenue group at (313) 297-5862 within forty-eight (48) hours of problems.

iii) If the facility plans to replace or install a new sewerage flow meter, the revenue group must also be notified prior to replacement or installation of sewerage flow meter.

6) **CWT Subpart D (40 CFR 437.41) Requirements**

Centralized Waste Treatment Facilities subject to 40 CFR 437 Subpart D shall submit periodic certification of providing equivalent treatment to the wastes received and discharged by the facility. This certification must be submitted every year with the December 31 Six Month Report. The facility is required to provide adequate treatment as certified to all the wastes discharged into the Detroit Sewer System. The facility shall also maintain the on-site compliance paper work as required by 40 CFR 437.41.

GENERAL TERMS AND CONDITIONS

The Industrial User (IU) is authorized to discharge industrial wastewater to the City of Detroit sewer system in compliance with the City's Wastewater Discharge Ordinance or equivalent local ordinance and any applicable provisions of federal or state law or regulation, and in accordance with discharge point(s), effluent limitations, monitoring requirements, and other conditions set forth herein.

1) **Records for monitoring activities** shall be maintained in accordance with ordinance requirements and shall include the following information for all samples:

   a) The date, time, exact place and method of sampling
   b) The names of persons taking the sample
   c) The technique or method of analysis, the date and results of analysis
   d) The names of person performing the analysis

2) **Notification and Reporting Requirements**

CONTROL CENTERS

Systems Control Center	(313) 267-6000	(24-hours)
Wastewater Treatment Plant	(313) 297-9000	
Industrial Waste Control Office	(313) 297-5826	
Industrial Waste Control Fax No.	(313) 297-5860	

Notification

A. **Sampling Violations - Self Monitoring**
Within 24 hours of becoming aware of a violation, the IU shall notify DWSD by telephone at (313) 297-5826 or by fax at (313) 297-5860.

B. **Slug Loading / Accidental Discharge**
Within one (1) hour of becoming aware of a discharge entering into the sewer system which exceeds or does not conform with federal, state or City of Detroit laws, regulations or the permit requirements, the Industrial User (IU) shall telephone Detroit Water and Sewerage Department (DWSD) at the Systems Control Center and inform the Department about the details of the discharge.

C. **Upset at the IU's Pretreatment Facility**
Within twenty-four (24) hours of becoming aware of an upset, the IU shall telephone DWSD at the System Control Center and inform the Department about the details of the upset and discharge.

D. **Unanticipated Bypass of IU's Pretreatment Facility**
Within twenty-four (24) hours of becoming aware of the bypass, IU shall telephone DWSD at the System Control Center and inform the Department about the details of the discharge.

Submission of Report

For the incidents B, C, and D, a written report shall be submitted to the Department within five (5) calendar days of becoming aware of the incident. This report shall contain the following information:

i) A description of the discharge and the cause of the incident;
ii) The duration of the incident including exact dates and times or, if not corrected, the anticipated time the incident is expected to continue;
iii) Steps being taken and/or planned to reduce, eliminate and prevent future occurrences of a similar incident.

Anticipated Bypass

If an IU anticipates the need for a bypass, prior notice shall be submitted to the Department at least ten (10) days, if possible, before the date of bypass. The report shall be accompanied by analytical data, if available, which shows the characteristics of the material to be bypassed. Upon evaluation, the Department will provide the IU with its determination on the bypass.

The IU may also have certain notification requirements under applicable federal regulations, including but not limited to 40 CFR Part 403.

3) **Limitations on Permit Transfer**

The wastewater discharge permit shall not be reassigned or transferred without the written approval of the City of Detroit Water and Sewerage Department and provision of a copy to the new owner or operator. The permittee shall notify the Department of any such changes at least thirty (30) days prior to the change.

4) **Modifications or Revisions of the Permit**

The permittee should notify the Department of any facility or operational changes which may affect the permit.

The terms and conditions of the permit may be subject to modification by the City of Detroit Water and Sewerage Department during the terms of the permit, in accordance with applicable law, including but not limited to the City's ordinance.

5) **Confidential Information**

Except for data accepted by the City as confidential under the City ordinance, all information and data on the permittee obtained from written reports, questionnaires, permit applications, permits, monitoring programs and inspections shall be available to the public or other government agencies without restriction.

6) **Legal Actions**

a) Any user who violates any local provision, including the failure to pay any fees, charges, or surcharges imposed hereby, or any condition or limitation of a permit issued pursuant thereto or who knowingly makes any false statements, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to this ordinance or wastewater discharge permit or who tampers with, or knowingly renders inaccurate any monitoring device required under this ordinance is guilty of a misdemeanor and shall, upon conviction, be punished by a fine not to exceed $500 for each violation per day or by imprisonment for not more than ninety (90) days or by both.

The Department is hereby authorized to seek, through its counsel, prosecution of criminal charges against any person violating any provision of this ordinance.

b) If any person discharges sewage, industrial wastes, or other wastes into the POTW contrary to the provisions of the ordinance, permit or order issued thereunder, the Director or Board may commence a civil action to enjoin such discharge or to enforce compliance with this ordinance, permit or order issued thereunder, in the Circuit Court for the County of Wayne or other appropriate court. Upon a proper showing of a violation of this ordinance, permit or order issued thereunder, a permanent or temporary injunction may be granted without bond. The Department or Board may also seek additional legal and/or equitable relief.

Instituting suit in the Circuit Court does not constitute as exclusive election of remedies and does not proit the Department, Director, Board, or City of Detroit from commencing action in Federal Court for discharges believed to be in violation of this ordinance, State and Federal requirements pursuant to the Clean Water Act, the City's NPDES permit, or other applicable laws or requirements.

The City of Detroit may also recover reasonable attorney fees, court costs, court reporters fees, and other unusual expenses related to enforcement activities or litigation against the person found to have violated this ordinance or the orders, rules, regulations, and permits issued hereunder.

c) All fines, costs and penalties which are imposed by any court of competent jurisdiction shall be payable to the clerk of such court, who shall deposit the same with the City Treasurer, all of which fines, costs, and penalties shall be credited to the appropriate fund of the Water and Sewerage Department.

7) **All reports shall be addressed to:** Detroit Water and Sewerage Department
Industrial Waste Control Division
303 S. Livernois
Detroit, Michigan 48209

8) **Requirement to Reapply**
This permit shall expire on the expiration date identified. Existing permittees shall apply for permit reissuance a minimum of ninety (90) days prior to the expiration of existing permits on a form prescribed by the Department. Upon timely application for reissuance of a permit, the expired permit shall be automatically extended until modified or reissued by the Department. Failure to submit a timely reapplication for reissuance may result in a delayed issuance of a permit and a cessation of unpermitted discharges to the sewer system.

9) **Records Retention**
The permittee shall maintain records of all information from monitoring activities, permit requirements, or 40 CFR Part 403.12 for no less than three (3) years.

10) **Operation and Maintenance of Pretreatment Facilities**
The permittee shall operate and maintain any and all pretreatment facilities in a prudent and professional manner. Records of operation and maintenance shall be provided to the Department for review, upon request.

11) **Right of Entry**
The Department's employees or authorized representative shall have ready access to the industrial user's premises to engage in inspection, sampling, compliance monitoring and/or metering activities. Each such activity shall be commenced and completed at reasonable times, and in a reasonable manner. It is the permittees' responsibility to make prompt and necessary arrangements so that upon presentation of appropriate credentials, personnel from the Department will be permitted to enter immediately for the purposes of performing their specific responsibilities.

Denial of access to any authorized Department representative shall result in enforcement action.

12) **Permit Revocation**
The Department may revoke this permit at any time in accordance with applicable law. Actions for which a permit may be revoked include, but are not limited to, failure of a facility to comply with the permit, failure to comply with an administrative order, or court order, discharging wastewater which has the potential to or does threaten the POTW or the community, discharges which would cause the POTW to violate its NPDES permit.

Where such action is taken by the Department, the former permittee shall have an opportunity for a hearing for permit reinstatement in accordance with applicable law.

If the CWT facility receives the wastes listed in the waste classification table, the subcategory determination may be made solely from this information. For purposes of this rule, the CWT facility need not determine the percentage of each type of waste within a subcategory or between subcategories. The CWT facility only needs to determine what subcategory the wastes fall into: one or multiple subcategories.

Table – Waste Receipt Classification

Metals Subcategory	–spent electroplating baths and/or sludges –metal finishing rinse water and sludges –chromate wastes –air pollution control blow down water and sludges –spent anodizing solutions –incineration wastewaters –waste liquid mercury –cyanide-containing wastes –waste acids and bases with or without metals –cleaning, rinsing, and surface preparation solutions from electroplating or phosphating operations –vibratory deburring wastewater –alkaline and acid solutions used to clean metal parts or equipment
Oils Subcategory	–used oils –oil-water emulsions or mixtures –lubricants –coolants –contaminated groundwater clean-up from petroleum sources –used petroleum products –oil spill clean-up –bilge water –rinse/wash waters from petroleum sources –interceptor wastes –off-specification fuels –underground storage remediation waste –tank clean-out from petroleum or oily sources –non-contact used glycols –aqueous and oil mixtures from parts cleaning operations –wastewater from oil bearing paint washes
Organics Subcategory	–landfill leachate –contaminated groundwater clean-up from non-petroleum sources –solvent-bearing wastes –off-specification organic product –still bottoms –byproduct waste glycol –wastewater from paint washes –wastewater from adhesives and/or epoxies formulation –wastewater from organic chemical product operations –tank clean-out from organic, non-petroleum sources

Waste Characterization Using Numerical Criteria

For wastestreams that are from non-specific sources or not listed in the waste receipt classification table, the facility should additionally complete the following steps. The facility should use data collected during the waste acceptance procedures to classify the waste into the appropriate subcategory. EPA recommends the CWT facility apply the following hierarchy:

1. If the waste receipt contains oil and grease at or in excess of 100 mg/L, the waste receipt should be classified in the oils subcategory;

2. If the waste receipt contains oil and grease <100 mg/L, and has any of the pollutants listed below in concentrations in excess of the values listed below, the waste receipt should be classified in the metals subcategory.

cadmium	0.2 mg/L
chromium	8.9 mg.L
copper	4.9 mg/L
nickel	37.5 mg/L

3. If the waste receipt contains oil and grease <100 mg/L and does not have concentrations of cadmium, chromium, copper, or nickel above any of the values listed above, the waste receipt should be classified in the organics subcategory.

PERMIT DEFINITION

1. **FACILITY DESCRIPTION**

EQ Detroit, Inc. is a Centralized Waste Treatment Facility which accepts hazardous and non-hazardous materials from various industrial and commercial sources. The .facility is identified and characterized by three subcategories, metals subcategory, oils subcategory and organics subcategory. These categories clearly identify the sources of the facility's accepted waste materials. The facility, has sixty-five (65) employees, operates 24 hours per day, three (3) shifts per day, seven (7) days a week.

2. **PROCESS DESCRIPTION**

The wastes are separated on the basis of their characteristics and/or sources. The wastes are subsequently pretreated by one or more of the following processes: Metals precipitation, neutralization, chemical oxidation/reduction, carbon adsorption, sand filtration, oil-water separation, cyanide destruction and emulsion breaking. The sludge generated from t he processes is hauled off-site by licensed haulers, and the process wastewater is discharged to the sewer.

3. **APPLICABLE CLASSIFICATION**

The facility is classified as a Categorical Significant Industrial User (SIU) under 40 CFR Part 437.46(b), Subpart D-combined waste receipts from Subparts A, B and C (PSES). The indicated Subparts are metals treatment, oils treatment and organic treatment subcategories. In addition, the facility discharges more than 25,000 gpd of treated process wastewater.

4. **WASTEWATER DISCHARGE FLOW INFORMATION**

Process Wastewater:	200,326 gpd (average)
Sanitary:	1,400 gpd (average)
Total Plant Flow	201,726 gpd (average)

BATCH DISCHARGE INFORMATION

Frequency:	8 batches per day (from all 4 tanks)
Duration:	3 hours per batch (average) per tank
Maximum Volume:	78,000 gallons per batch per tank of four (4) tanks

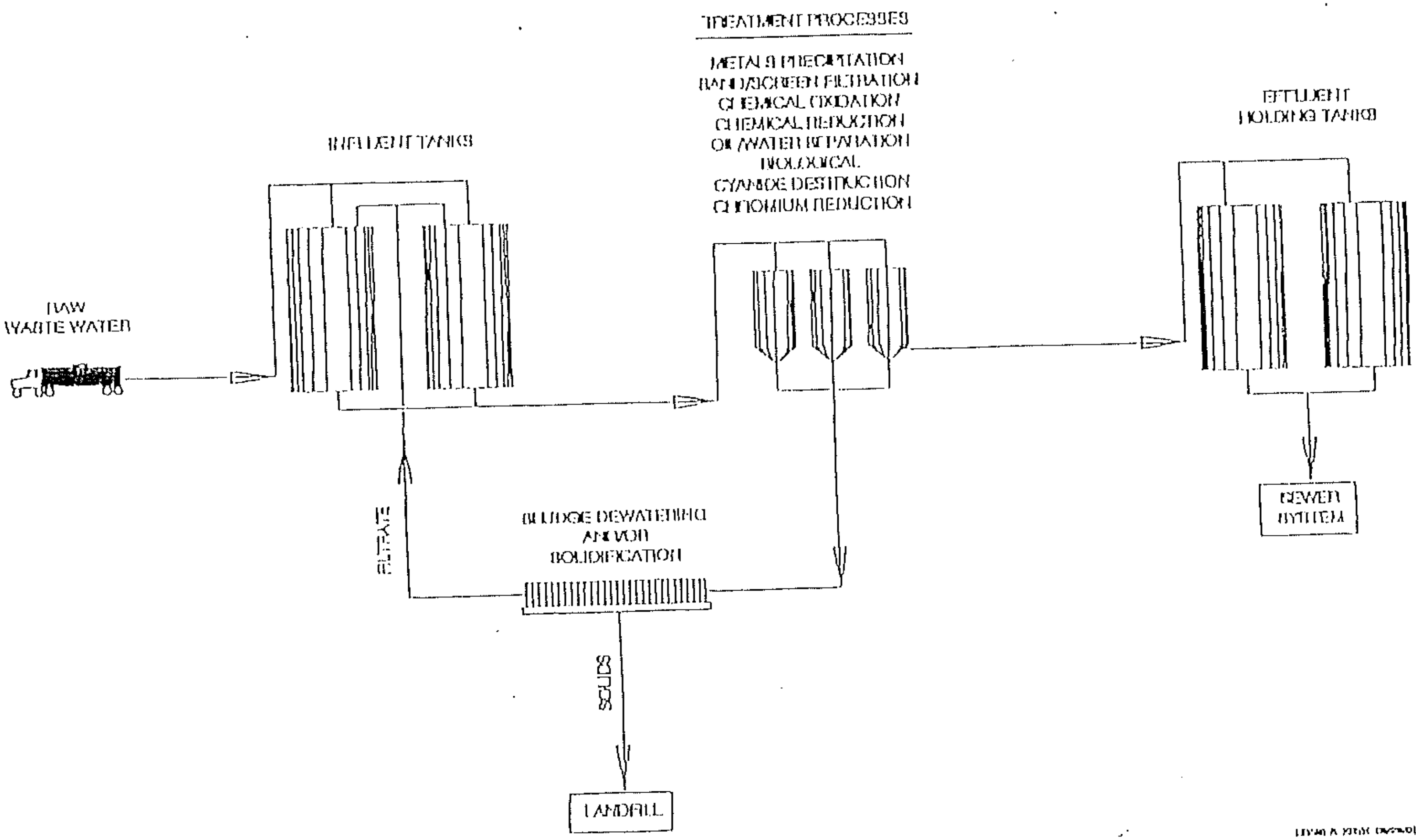
5. **SOURCES OF INFORMATION**

i) Permit Application dated June 8, 2006
ii) Comprehensive Inspection dated May 11, 2006

Prepared by: ______ Reviewed by: ______

Date: 09/05/06 Date: 09/05/06

LIQUIDS WASTE WATER FLOW DIAGRAM



Michigan Department of Environmental Quality
Air Quality Division
Permit to Install No. 268-04B

Michigan Department of Environmental Quality

Air Quality Division

Permit to Install No. 268-04B

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

February 14, 2007

PERMIT TO INSTALL
No. 269-04B

ISSUED TO
EQ Detroit, Inc.

LOCATED AT
1923 Frederick Street
Detroit, Michigan 48211

IN THE COUNTY OF
Wayne

STATE REGISTRATION NUMBER
M4545

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.120 1(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: **10/23/2006**	
DATE PERMIT TO INSTALL APPROVED: **2/14/2007**	SIGNATURE:
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

PERMIT TO INSTALL

Table of Contents

Common Abbreviations / Acronyms

Common Acronyms		Pollutant/Measurement Abbreviations	
AQD	Air Quality Division	Btu	British Thermal Unit
ANSI	American National Standards Institute	°C	Degrees Celsius
BACT	Best Available Control Technology	CO	Carbon Monoxide
CAA	Clean Air Act	dscf	Dry standard cubic foot
CEM	Continuous Emission Monitoring	dscm	Dry standard cubic meter
CFR	Code of Federal Regulations	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H_2S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NOx	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality	PM	Particulate Matter
MIOSHA	Michigan Occupational Safety & Health Administration	PM-10	Particulate Matter less than 10 microns diameter
MSDS	Material Safety Data Sheet	pph	Pound per hour
NESHAP	National Emission Standard for Hazardous Air Pollutants	ppm	Parts per million
NSPS	New Source Performance Standards	ppmv	Parts per million by volume
NSR	New Source Review	ppmw	Parts per million by weight
PS	Performance Specification	psia	Pounds per square inch absolute
PSD	Prevention of Significant Deterioration	psig	Pounds per square inch gauge
PTE	Permanent Total Enclosure	scf	Standard cubic feet
PTI	Permit to Install	sec	Seconds
RACT	Reasonably Available Control Technology	SO_2	Sulfur Dioxide
ROP	Renewable Operating Permit	THC	Total Hydrocarbons
SC	Special Condition	tpy	Tons per year
SCR	Selective Catalytic Reduction	µg	Microgram
SRN	State Registration Number	VOC	Volatile Organic Compounds
TAC	Toxic Air Contaminant	yr	Year
TEQ	Toxicity Equivalence Quotient		
VE	Visible Emissions		

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **[R336.1201(1)]**

2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **[R336.1201(4)]**

3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **[R336.1201(6)(b)]**

4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **[R336.1201(8), Section 5510 of Act 451, PA 1994]**

5. The AQD District Supervisor shall be notified, in writing, of a change in ownership or operational control of the stationary source or emission unit(s) authorized by this Permit to Install pursuant to R336.1219. The notification shall include all of the information required by R336.1219(1)(a) and (b). In addition, a new owner or operator must submit a written statement pursuant to R336.1219(1)(c), agreeing to and accepting the terms and conditions of this Permit to Install, and shall notify the AQD District Supervisor of any change in the contact person for this Pemit to Install. **[R336.1219]**

6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **[R336.1901]**

7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **[R336.1912]**

8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.

9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law nor does it affect any liability for past violations under the Natural Resources and Environmental Protection Act, 1994 PA 451.

10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R336.1303. **[R336.1301]**

    a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.

    b) A visible emission limit specified by an applicable federal new source performance standard.

    c) A visible emission limit specified as a condition of this Permit to Install.

12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R336.1370(2). **[R336.1370]**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R336.2001 and R336.2003, under any of the conditions listed in R336.2001. **[R336.2001]**

SPECIAL CONDITIONS

Emission Unit Identification

Emission Unit ID	Emission Unit Description	Stack Identification
EUTREATMENT	EQ Detroit waste management facility. Consists of a waste stabilization operation which processes hazardous and non-hazardous off-site waste using chemical stabilization. Reagents include: lime, cement kiln dust, ferrous sulfate, sand, and fly ash. All emissions from the stabilization building are controlled by a baghouse and vented to the atmosphere through two stacks.	SVTREAT1 SVTREAT2
EUTANK13	Tank for primary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK14	Tank for primary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK15	Tank for primary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK16	Tank for primary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK17	Tank for primary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK18	Tank for primary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK120	Tank for secondary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK121	Tank for secondary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK122	Tank for secondary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUTANK123	Tank for secondary processing of oil/water mixtures	SVPACKEDSCRUBBER
EUOILRECOVERY	FGPRIMARYTANKS, FGSECONDARYTANKS, Oil recovery process. Oils are separated from oil/water mixtures in multiple stages using heat and chemicals. Tank emissions are controlled by a packed bed scrubber	SVPACKEDSCRUBBER
Changes to the equipment described in this table are subject to the requirements of R336.1201, except as allowed by R336.1278 to R336.1290.		

Flexible Group Identification

Flexible Group ID	Emission Units Included in Flexible Group	Stack Identification
FGPRIMARYTANKS	EUTANK13, EUTANK14, EUTANK15, EUTANK16, EUTANK17, EUTANK18 All tanks in FGPRIMARYTANKS are cone roof tanks with the following dimensions: EUTANK13, EUTANK15, EUTANK17: Height: 30 feet, Diameter: 30 feet EUTANK14, EUTANK16, EUTANK18: Height: 30 feet, Diameter: 24 feet	SVPACKEDSCRUBBER
FGSECONDARYTANKS	EUTANK120, EUTANK121, EUTANK122, EUTANK123 All tanks in FGSECONDARYTANKS are cone roof tanks with the following dimensions: Height: 18 feet Diameter: 12 feet	SVPACKEDSCRUBBER
FGFACILITY	EUTREATMENT, EUOILRECOVERY All process equipment at the facility including equipment covered by other permits, grand-fathered equipment and exempt equipment.	

The following conditions apply to: EUTREATMENT

Pollution Control Equipment: Fabric filter control system (baghouse)

Emission Limits

	Pollutant	Equipment	Limit	Time Period	Testing/ Monitoring Method	Applicable Requirement
1.1a	PM	EUTREATMENT	0.002 grains/dry standard cubic foot	Test Protocol	SC 1.9, 1.10	**R336.1225, R336.1331**
1.1b	PM	EUTREATMENT	4.3 pph	Test Protocol	SC 1.9, 1.10	**R336.1225, R336.1331**
1.1c	VOC	EUTREATMENT	25.0 pph	Test Protocol	SC 1.9, 1.10, 1.11, 1.12, 1.13	**R336.1225, R336.1702(a)**
1.1d	1,4-Dichlorobenzene	EUTREATMENT	9.8 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1e	Benzene	EUTREATMENT	5.6 pph	Test Protocol	GC 13 SC 1.11, 1.12	**R336.1225**
1.1f	Benzene	EUTREATMENT	.7 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1g	Bromodichloromethane	EUTREATMENT	1.9 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1h	1,1,2,2-tetrachloroethane	EUTREATMENT	1.4 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1i	1,2-Dichloropropane	EUTREATMENT	0.7 pph	Test Protocol	GC 13 SC 1.11, 1.12	**R336.1225**
1.1j	1,1,2-Trichoroethane	EUTREATMENT	4.2 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1k	Bromomethane	EUTREATMENT	0.9 pph	Test Protocol	GC 13 SC 1.11, 1.12	**R336.1225**
1.1l	1,2-Dichloroethane	EUTREATMENT	2.8 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1m	Dibromochloromethane	EUTREATMENT	2.8 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1n	Vinyl chloride	EUTREATMENT	7.7 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**
1.1o	Carbon Tetrachloride	EUTREATMENT	4.9 tpy	12-month rolling time period*	SC 1.11, 1.12, 1.13	**R336.1225**

*12-month rolling time period as determined at the end of each calendar month.

Material Usage Limits

1.2 The VOC content of all liquid waste received for treatment in EUTREATMENT shall not exceed 500 ppm in hazardous waste or 5.0 percent by weight in non-hazardous waste. Analysis of VOC content shall be performed according to the procedure described in Appendix A. **[R336.1225, R336.1702(a)]**

1.3 The waste streams processed in EUTREATMENT shall not contain any measurable quantities of the following compounds: **[R336.1225, R336.1901]**

a. Benzylamine
b. 2-Butanethiol
c. Butyric Acid
d. Diethyl Sulfide
e. Dimethyl Sulfide
f. Diethylamine
g. Diisobutyl Ketone
h. Ethanethiol
i. Methylamine
j. Thioglycolic Acid
k. Thionyl Chloride
l. Thiram
m. Trimethylamine

Process/Operational Limits

1.4 The permittee shall not operate EUTREATMENT unless a program for continuous fugitive dust emissions control for all plant roadways, the plant yard, all material storage piles, and all material handling operations has been implemented and is maintained. **[R336.1372, Act 451 324.5524]**

1.5 The permittee shall keep no more than one bay door to the EUTREATMENT building open during normal operation, except during unloading, at which time up to two bay doors may be open. Normal operation is defined in Appendix B. **[R336.1901]**

1.6 The permittee shall maintain negative pressure in the EUTREATMENT building during normal operation. This includes, but is not limited to, complying with SC 1.5 and maintaining the treatment building's proper structural integrity. Negative pressure shall be verified using the procedure outlined in Appendix B. **[R336.1901]**

1.7 The permittee shall not operate EUTREATMENT unless an approved preventative maintenance plan and malfunction abatement plan for the fabric filter control system, or alternate plans approved by the AQD District Supervisor, are implemented and maintained. If the malfunction abatement plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the malfunction abatement plan within 45 days after such an event occurs and submit the revised plan to the AQD District Supervisor. The revised plan shall include procedures for maintaining and operating in a satisfactory manner, EUTREATMENT, add-on air pollution control devices, or monitoring equipment during malfunction events, and a program for corrective action for such events. **[R336.1910, R336.1911]**

Equipment

1.8 The permittee shall not operate EUTREATMENT unless the fabric filter (baghouse) is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes, but is not limited to, following the plans required in SC 1.4. **[R336.1225, R336.1301, R336.1331, R336.1910]**

Testing

1.9 Within 180 days after commencement of trial operation, verification of VOC and Particulate Matter emission rates from EUTREATMENT, by testing at owner's expense, in accordance with Department requirements will be required. No less than 30 days prior to testing, a complete test plan shall be submitted to the AQD. The final plan must be approved by the AQD prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **[R336.1205(3), R336.1225, R336.1331, R336.1702(a), R336.2001, R336.2003, R336.2004]**

1.10 Verification of the negative static pressure in the waste treatment building by testing, at owner's expense, in accordance with Department requirements, will be required for operating approval. The negative static pressure in the waste treatment building shall be determined by using smoke tubes, or an alternative method as approved by the AQD, and by visual observation of the air movement and direction. Alternative testing procedures and associated operational parameters must have prior approval by the AQD District Supervisor. Permittee shall conduct the verification tests at least once every year. Any request for a change in the testing frequency must be submitted to the AQD District Supervisor for review and approval. **[R336.1225, R336.1331, R336.2001, R336.2003]**

Recordkeeping/Reporting/Notification

1.11 The permittee shall keep, in a satisfactory manner, calendar month summaries of the VOC and HAP analyses for liquid waste received for treatment, as required by SC 1.2. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1225, R336.1702(a)]**

1.12 The permittee shall keep, in a satisfactory manner, daily and cumulative monthly total records of the type (by waste code) and amount of waste processed in EUTREATMENT. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1205(3)]**

1.13 The permittee shall calculate the VOC and HAP emission rates from EUTREATMENT for each month and 12-month rolling time period, using the method in Appendix A, or an alternative method acceptable to the AQD District Supervisor. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1205(3)]**

1.14 The permittee shall keep, in a satisfactory manner, negative pressure determination records for the EUTREATMENT building, as required by SC 1.6, 1.10, and Appendix B. The permittee shall keep all records on file at the facility for a period of at least five years and make them available to the Department upon request. **[R336.1225, R336.1331, R336.1901]**

Stack/Vent Restrictions

	Stack & Vent ID	Maximum Diameter (inches)	Minimum Height Above Ground Level (feet)	Applicable Requirement
1.15a	SVTREAT1	80	72	**R336.1225**
1.15b	SVTREAT2	80	72	**R336.1225**
	The exhaust gases shall be discharged unobstructed vertically upwards to the ambient air.			

<u>The following conditions apply to: EUOILRECOVERY</u>

Pollution Control Equipment: packed bed scrubber

Material Usage Limits

2.1 The permittee shall not process more than the following amounts of liquid oil/water waste mixture in EUOILRECOVERY, on a 12-month rolling time period as determined at the end of each calendar month:
  a) FGPRIMARYTANKS: 73,000,000 gallons per year
  b) FGSECONDARYTANKS: 36,500,000 gallons per year

[R336.1702(a), R336.1225, R336.1901]

Process/Operational Limits

2.2 The temperature of the liquids stored in EUOILRECOVERY shall not exceed the following:
  a) FGPRIMARYTANKS 190F

b) FGSECONDARYTANKS 210F

[R336.1702(a), R336.1901]

2.3 The permittee shall not operate EUOILRECOVERY unless an approved preventative maintenance plan and malfunction abatement plan for the packed bed scrubber, or alternate plans approved by the AQD District Supervisor, are implemented and maintained. If the malfunction abatement plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the malfunction abatement plan within 45 days after such an event occurs and submit the revised plan to the AQD District Supervisor. The revised plan shall include procedures for maintaining and operating in a satisfactory manner, EUOILRECOVERY, add-on air pollution control devices, or monitoring equipment during malfunction events, and a program for corrective action for such events. **[R336.1910, R336.1911]**

Equipment

2.4 The permittee shall not operate EUOILRECOVERY unless emissions from all tanks are ducted to a packed bed scrubber that is installed, maintained, and operated in a satisfactory manner. Satisfactory operation includes maintaining the following conditions in the packed bed scrubber: **[R336.1901, R3136.1910]**

a) the scrubbing liquid pH shall be maintained at 5.0 or higher
b) the oxidation/reduction potential (ORP) of the scrubbing liquid shall be maintained at 350 mV or higher
c) the scrubbing liquid flow rate shall be maintained between 100 and 135 gallons per minute
d) the pressure drop across the packed bed scrubber shall be maintained between 4" and 6.5" water gauge

Testing

2.5 Upon AQD request, the permittee shall verify and quantify odor emissions from EUOILRECOVERY, by testing at owner's expense, in accordance with Department requirements. Within 60 days after AQD request, the permittee shall submit to the AQD, a complete stack sampling and odor threshold analysis plan using the Dynamic Dilution Method. The stack sampling plan shall include provisions for various plant operating conditions, and odor neutralizer system operation (if any). The AQD must approve the final plan prior to testing. Verification of emissions includes the submittal of a complete report of the test results to the AQD within 60 days of the test. **[R336.1901, R336.2001, R336.2003, R336.2004]**

Monitoring

2.6 The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor the temperature of the liquid in each tank in EUOILRECOVERY on a continuous basis. **[R336.1702(a), R336.1901]**

2.7 The permittee shall install, calibrate, maintain and operate in a satisfactory manner, devices to monitor the following packed bed scrubber operating parameters on a continuous basis: **[R336.1901, R3136.1910]**

a) scrubbing liquid pH
b) oxidation/reduction potential (ORP) of the scrubbing liquid
c) scrubbing liquid flow rate
d) pressure drop across the packed bed scrubber

Recordkeeping/Reporting/Notification

2.8 The permittee shall keep, in a satisfactory manner, daily records of the amount of liquid oil/water waste mixture processed in FGPRIMARYTANKS and FGSECONDARYTANKS. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1702(a), R336.1225, R336.1901]**

2.9 The permittee shall keep, in a satisfactory manner, records of the monitored temperature of each liquid in each tank in EUOILRECOVERY. The temperature shall be recorded at least once per day and shall be measured at a time when EUOILRECOVERY is actively processing oil/water mixtures. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1702(a), R336.1225, R336.1901]**

2.10 The permittee shall keep, in a satisfactory manner, records of the following monitored parameters for the packed bed scrubber:

a) scrubbing liquid pH
b) oxidation/reduction potential (ORP) of the scrubbing liquid
c) scrubbing liquid flow rate
d) pressure drop across the packed bed scrubber

Records of the monitored parameters shall be recorded at least once per day and shall be measured at a time when EUOILRECOVERY is actively processing oil/water mixtures. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1901, R3136.1910]**

2.11 The permittee shall keep, in a satisfactory manner, records of the date and amount of each addition of chemicals to the packed bed scrubbing liquid. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1901, R3136.1910]**

Stack/Vent Restrictions

	Stack & Vent ID	Maximum Diameter (inches)	Minimum Height Above Ground Level (feet)	Applicable Requirement
2.12	SVPACKEDSCRUBBER	18	36	R336.1225
	The exhaust gases shall be discharged unobstructed vertically upwards to the ambient air. Additional text, descriptions, stack/vent conditions, etc. as needed.			

The following conditions apply to: FGFACILITY

Emission Limits

	Pollutant	Equipment	Limit	Time Period	Testing/ Monitoring Method	Applicable Requirement
3.1a	VOC	FGFACILITY	89.9 TPY	12-month rolling time period as determined at the end of each calendar month.	SC 3.3	**R336.1205(3)**
3.1b	Individual HAP	FGFACILITY	Less than. 9 TPY	12-month rolling time period as determined at the end of each calendar month.	SC 3.3	**R336.1205(3)**
3.1c	Total HAPs	FGFACILITY	Less than 22.5 TPY	12-month rolling time period as determined at the end of each calendar month.	SC 3.3	**R336.1205(3)**

Equipment

3.2 Within 45 days of issuance of this permit, the permittee shall label all tanks included in EUTREATMENT and EUOILRECOVERY, according to the company identification numbers shown in the Emission Unit Identification table with a method acceptable to the AQD District Supervisor. Within seven days of completing the labeling, the permittee shall notify the AQD District Supervisor, in writing, as to the date the labeling was completed. **[R336.1201]**

Recordkeeping / Reporting / Notification

3.3 The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period calculations of VOC and HAP emissions from FGFACILITY. All records shall be kept on file for a period of at least five years and made available to the Department upon request. **[R336.1205(3)]**

APPENDIX A

Methodology to Determine Emission Rates for Demonstrating Compliance

PROCEDURE TO DETERMINE VOC/HAP EMISSIONS FROM EUTREATMENT

The permittee shall use the following calculations in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in SC 1.1.

The following formula shall be used to calculate and monitor the VOC/HAP emissions from EUTREATMENT, based on a 12-month rolling time period, as determined at the end of each calendar month:

$$VOC_e = \Sigma[V_i \times W_i \times D_i] \times Er \times [1-A_e]$$

Where:

VOC_e =Cumulative VOC/HAP emissions from the unit during the period

i = Each iteration of waste stream treated during the time period

V_i = Volume of waste stream i processed

W_i = Weight fraction of VOC/HAP present in waste stream i processed

D_i = Density of waste stream i processed in appropriate unit; assumed to average 8.5 lbs/gal

Er = Emission factor for VOC/HAP released from waste during treatment process = 0.15 (15% wt) based on site specific data and testing, as approved by the AQD District Supervisor.

A_e = Control efficiency = 0 for EUTREATMENT (no control)

The permittee shall use the VOC/HAP emission factor, VOC/HAP capture efficiency and the control device control efficiency cited above until these parameters are determined by testing. Upon approval by the AQD, permittee shall use the test results for these parameters for VOC/HAP emission calculations unless a new determination by the permittee is approved by the AQD.

APPENDIX B

Protocol for Determining Building Negative Pressure

EQ Detroit will demonstrate that the chemical fixation/stabilization building meets the criteria of a permanent total enclosure using US EPA's "Procedure T" described in 40 CFR Section 52.741 or other applicable method approved by the AQD District Supervisor. These criteria are listed as follows:

1. Any natural draft opening (NDO) shall be at least four (4) equivalent diameters from each VOC emitting point.
2. The total area of all NDOs shall not exceed five (5) percent of the surface area of the enclosure's four walls, floor, and ceiling.
3. The average facial velocity (FV) of air through all NDOs shall be at least 3,600 m/hr (200 fpm). The direction of air through all NDOs shall be into the building.
4. All access doors and windows whose areas are not included in the area calculation described in item 2 and are not included in the calculation in item 3 shall be closed during routine operation of the process.
5. All VOC emissions must be captured and contained for discharge through a control device.

The demonstration will be submitted to the Air Quality Division within thirty days from the end of the trial operation period. Procedure T shall be performed in the initial permanent total enclosure demonstration, with a smoke test used to confirm it, as required by SC 1.10. An annual smoke test shall be performed starting the following year, as required by SC 1.10. In addition, if any changes are made that affect the original Procedure T calculation (such as adding a new door, changing location of process equipment, etc), then a new Procedure T calculation must be performed.

Furthermore, EQ Detroit shall implement a standard operating procedure which includes the following:

a) The main system fan shall be maintained according to vendor's recommendations.
b) The treatment building shall be maintained at negative pressure during normal operation.
c) The main system fan shall continue to run for two hours after waste treatment (i.e. mixing of waste with treatment reagents) and drum shredding activities have stopped.

[1]Normal operation is defined as any period that: (i) material in the treatment vaults is uncovered, (ii) material in the treatment vaults has been covered for less than two hours, (iii) the pug mill is operating or has been operating in the previous two hours, (iv) the shredder is operating or has been operating in the previous two hours, and (v) any period when hazardous waste has been charged into or discharged from a vault in the previous two hours.

Michigan Department of Environmental Quality
Waste and Hazardous Materials Division
Solid Waste Operating License No. 9004

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

DEQ

STEVEN E. CHESTER
DIRECTOR

March 12, 2004

CERTIFIED MAIL

Mr. Scott Maris, V.P. Regulatory Affairs
EQ Detroit, Inc.
1923 Frederick Street
Detroit, Michigan 48211

Dear Mr. Maris:

SUBJECT: Application for Solid Waste Disposal Area Operating License

The staff of the Department of Environmental Quality (DEQ) has reviewed your application for a solid waste processing plant, known as US Liquids of Detroit, Inc., located in the city of Detroit, Wayne County, Michigan. This review was conducted under the provisions of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Based upon our review of your application, your operating license is hereby granted. Enclosed is your license with operating stipulations.

If you have any questions, please contact Dr. Benedict Okwumabua, Southeast Michigan District Supervisor, Waste and Hazardous Materials Division, at 734-953-1430.

Sincerely,

L. C. Lee

Lonnie C. Lee, Chief
Storage Tank and Solid Waste Section
Waste and Hazardous Materials Division
517-373-4735

Enclosure

cc: Wayne County Department of Environment
City of Detroit Clerk
Dr. Benedict Okwumabua, DEQ – Southeast Michigan
Mr. Syed Jafry, DEQ – Southeast Michigan
Facility File

DEQ

Michigan Department of Environmental Quality
Waste and Hazardous Materials Division

SOLID WASTE DISPOSAL AREA OPERATING LICENSE

This license is issued under the provisions of Part 115, Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.11501 et seq., and authorizes the operation of this solid waste disposal area (Facility) in the state of Michigan. This license does not obviate the need to obtain other authorizations as may be required by state law.

FACILITY NAME: EQ Detroit, Inc.

LICENSEE/OPERATOR: EQ Detroit, Inc.

FACILITY OWNER: EQ Detroit, Inc.

PROPERTY OWNER: EQ Detroit, Inc.

FACILITY TYPE(S): Solid Waste Processing Plant

FACILITY ID NUMBER: 399367

COUNTY: Wayne

LICENSE NUMBER: 9004

ISSUE DATE: March 12, 2004

EXPIRATION DATE: March 12, 2009

FACILITY DESCRIPTION: The EQ Detroit, Inc., a Solid Waste Processing Plant, consists of 11.50 acres located at 1923 Frederick Street, City of Detroit, Wayne County, Michigan, as identified in Attachment A and fully described in this license.

AREA AUTHORIZED FOR DISPOSAL OF SOLID WASTE: As identified in Attachment "A."

RESPONSIBLE PARTY: Mr. Scott Maris, V.P. Regulatory Affairs
EQ Detroit, Inc.
1923 Frederick Street
Detroit, Michigan 48211
313-923-0080

FIRST OPERATING LICENSE: This License Number 9004 is the first operating license issued for this Facility to this licensee.

This license is subject to revocation by the Director of the Michigan Department of Environmental Quality (Director) if the Director finds that this Facility is not being constructed or operated in accordance with the approved plans, the conditions of a permit or license, Part 115, or the rules promulgated under Part 115. Failure to comply with the terms and provisions of this license may result in legal action leading to civil and/or criminal penalties pursuant to Part 115. This license shall be available through the licensee during its term and remains the property of the Director.

THIS LICENSE IS NOT TRANSFERABLE.

Lonnie C. Lee, Chief, Storage Tank and Solid Waste Section
Waste and Hazardous Materials Division

Licensee: EQ Detroit, Inc.
Facility Name: EQ Detroit, Inc.
Operating License Number: 9004
Issue Date: March 12, 2004

The licensee shall comply with all terms of this license and the provisions of Part 115 and its administrative rules. This license includes the license application and any attachments to this license.

1. The licensee shall operate the Facility in a manner that will prevent violations of any state or federal law.

2. The attached map (Attachment A) shows the Facility, the area permitted for construction and/or placement and acceptance of waste, other disposal areas, scale, and related appurtenances, as applicable.

3. Issuance of this license is conditioned on the accuracy of the information submitted by the Operator/Applicant in the Application for License to Operate a Solid Waste Disposal Area (Application) received by the Michigan Department of Environmental Quality (Department) on December 15, 2003, and any subsequent amendments. Any material or intentional inaccuracies found in that information is grounds for the revocation or modification of this license, and may be grounds for enforcement action. The licensee shall inform the Department's Waste and Hazardous Materials Division, Southeast Michigan District Supervisor, of any inaccuracies in the information in the Application upon discovery.

4. This license is issued based on the Department's review of the Application, submitted by EQ Detroit, Inc., for the EQ Detroit, Inc., dated December 11, 2003. The Application consists of the following:

   a. Application Form EQP 5507.

   b. Application fee in the amount of $500.00.

   c. Certification of construction by Mr. John Balconi, P.E., dated February 10, 2004.

   d. Financial Assurance.

   Financial Assurance Required:

   The amount of financial assurance required for this Facility was calculated based on the requirements of Section 11523(1)(c), is indicated on the form EQP 5507A entitled, "Form A Financial Assurance Required," and is $30,000.00.

   The Facility has provided financial assurance totaling $30,000.00, based on the requirements of Section 11523 of Part 115. The financial assurance mechanism used by the Facility is summarized below.

   The following financial assurance has been received from the licensee to meet the amount of financial assurance required:

☒ Irrevocable Letter of Credit	$30,000
Total Amount Received:	$30,000.00

5. The documents approved with Construction Permit Number(s) 0356 issued to the City Environmental, Inc., on January 16, 1998, are incorporated in this license by reference.

6. The following additional documents, approved since the issuance of the construction permit(s) referenced in Item 5, are incorporated in this license by reference:

   a. Solid Waste Processing Plant Operations Plan, US Liquids of Detroit, Inc., Detroit, Wayne County, Michigan, dated June 2002 and prepared by CTI and Associates, Inc., and approved with modifications on September 12, 2002, which supersedes and replaces in its entirety the August 1997 "Operating Procedures" located in Section F of the 1997 construction permit application.

   b. CTI drawing Sheet 1, dated March 8, 2004, received by the Department on March 10, 2004.

7. Consent Order: N/A.

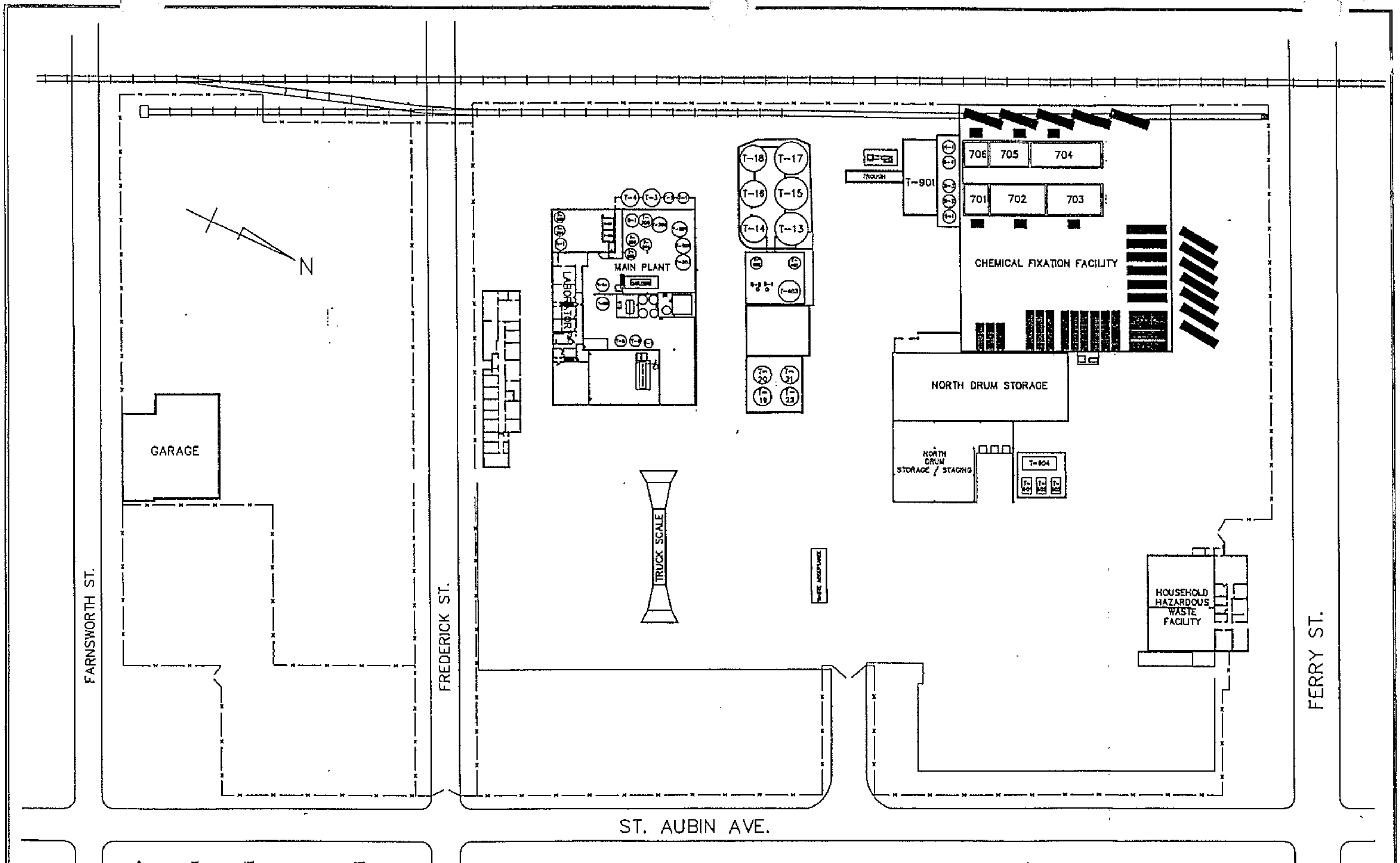
8. The licensee shall conduct hydrogeological monitoring in accordance with the approved hydrogeological monitoring plan, dated N/A. The sampling analytical results shall be submitted to the Department's Waste and Hazardous Materials Division, Southeast Michigan District Office.

9. Modifications to approved engineering plans that constitute an upgrading, as defined in R 299.4106a(e), may be approved, in writing, by the Waste and Hazardous Materials Division, Southeast Michigan District Supervisor.

10. **SPECIAL CONDITIONS**: N/A.

11. **TERM**: This license shall remain in effect until its expiration date, unless revoked or continued in effect, as provided by the Administrative Procedures Act, 1969 PA 306, as amended, or unless superseded by the issuance of a subsequent license.

END OF LICENSE



ATTACHMENT A. EQ DETROIT, INC.

CTI and Associates, Inc.

12482 Emerson Drive Brighton, MI 48116 248.486.5100 248.486.5050 Fax

February 10, 2004
Project 28010034

Dr. Benedict N. Okwumabua, Ph.D.
Southeast Michigan District Supervisor
Michigan Department of Environmental Quality
Waste and Hazardous Materials Division
38980 Seven Mile Road
Livonia, Michigan 48152

Re: License Renewal Application
Environmental Quality of Detroit (82-000089)
Detroit, Wayne County, Michigan

Dear Dr. Okwumabua:

On behalf of our client, The Environmental Quality Company (EQ), please consider this letter as certification that no new construction has taken place at the solidification/processing plant since the previously submitted license application at the Environmental Quality of Detroit (Facility). The Facility is located at 1923 Frederick Street, Detroit, Wayne County, Michigan. The Facility's solid waste disposal area operating license, number 8891, was issued September 12, 2002 under the provisions of Part 115, Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Based on my observations of the Facility and inquiries of Facility personnel, the information submitted is, to the best of my knowledge, true, accurate, and complete.

If you have any questions regarding the content of this letter, please feel free to contact the undersigned at 248-486-5100.

Sincerely,

CTI and Associates, Inc.

John Balconi, P.E.
Principal

cc: Scott J. Maris, EQ
Kristin Rachwal, EQ

EQ DETROIT, INC.

36255 MICHIGAN AVENUE ~ WAYNE, MI 48184 ~ tel 734-329-8000 ~ fax 734-329-8140 ~ www.eqonline.com

Overnight Mail

February 5, 2004

Mr. Syed Jafry
Department of Environmental Quality
Waste Management Division
SE Michigan District HQ
38980 Seven Mile Road
Livonia, Michigan 48152

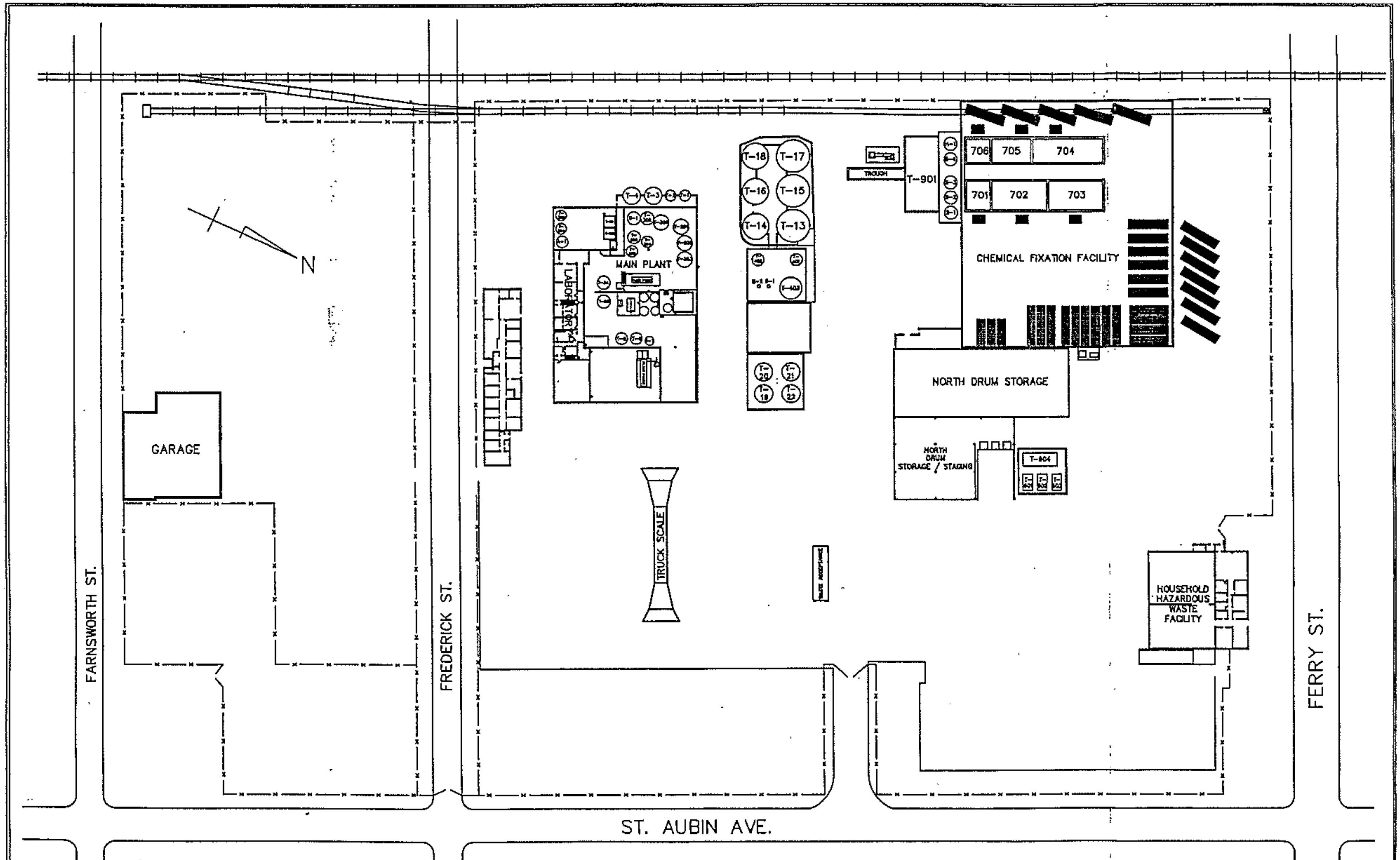
Dear Mr. Jafry:

Attached for your review is a revised Attachment A to the EQ Detroit, Inc., Application for License to Operate a Solid Waste Disposal Area. I'll be working with Paul Sgricia to provide you with a Certification of Construction as soon as possible. Thank you for your help. If you have any questions, please don't hesitate to call me.

Sincerely,

Scott Maris
Vice President
Regulatory Affairs

Attachment
C: Paul Sgricia
Kristen Rachwal



Attachment A. EQ Detroit, Inc.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAR 30 2004

CERTIFIED MAIL: 7001 0320 0006 0202 5271

REPLY TO THE ATTENTION OF: DW-8J

Scott Maris
EQ–The Environmental Quality Company
36255 Michigan Avenue
Wayne, Michigan 48184

Re: RCRA Permit Modification
US Liquids of Detroit, Inc.
MID 980 991 566

Dear Mr. Maris:

This is to approve the request for a modification to the permit issued to US Liquids of Detroit (USL) pursuant to the Resource Conservation and Recovery Act (RCRA). That request, by letter dated January 29, 2004, was to transfer the ownership of the hazardous waste management facility (facility) at 1923 Frederick Street, Detroit, Michigan from USL to EQ Detroit, Incorporated effective February 4, 2004. Additional information was received by fax on February 11, 2004 and March 3, 2004, including a copy of the written agreement documenting the specific date for transfer of permit responsibility between the old and new permittees.

The RCRA regulations at 40 CFR § 270.42 provide that a change in ownership or operational control of a facility may be made as a class 1 permit modification with Regional Administor approval as indicated at item A.7 in Appendix I to 40 CFR § 270.42. In accordance with 40 CFR 270.40(b), EQ Detroit, Incorporated must demonstrate compliance with the financial requirements of 40 CFR part 264 subpart H within six months of the date of the change of ownership or operational control of the facility.

Approval of the above permit modification request is hereby issued under 40 CFR § 270.42(a)(1). Please replace the old pages in the permit with the new pages enclosed in this letter, except for the signature page from the original permit. In accordance with 40 CFR 270.42(a)(ii), you must send a notice of the above modification to all persons on the facility mailing list, and the appropriate units of State and local government, as specified in 40 CFR 124.10(c)(ix). The above referenced notices must be made within 90 calendar days of the date of this approval. If you have any questions, please contact John Gaitskill of my staff at (312) 886 6795 or by his email address, **gaitskill.john@epa.gov.**

Sincerely,

for José G. Cisneros, Chief
Waste Management Branch

Enclosure

cc: Steve Sliver, MDEQ

U.S EPA RCRA
Part A
Operating License

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

RESOURCE CONSERVATION AND RECOVERY ACT PERMIT

Facility Name and Location: EQ Detroit, Inc.
1923 Frederick Street
Detroit, MI 48211

Owner: EQ Detroit, Inc.
Operator: EQ Detroit, Inc.

U.S. EPA Identification Number: MID 980 991 566

Effective Date: December 12, 2003

Expiration Date: December 12, 2008

Authorized Activities:

The United States Environmental Protection Agency (U.S. EPA) hereby issues the Federal portion of the Resource Conservation and Recovery Act (RCRA) permit (hereinafter referred to as the "permit") to EQ Detroit, Inc., (hereinafter referred to as the "Permittee," or addressed in the second person as "you") in connection with the hazardous waste treatment, storage, and disposal activities at 1923 Frederick Street, Detroit, Michigan.

This permit is issued under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984 (42 USC § 6901 *et seq.*) (collectively referred to as RCRA) and U.S. EPA's regulations promulgated thereunder (codified, and to be codified, in Title 40 of the Code of Federal Regulations (40 CFR)). Specifically, this permit addresses hazardous waste codes in 40 CFR Part 261, Subpart D that the Michigan Department of Environmental Quality is not authorized to implement.

The RCRA permit is comprised of both this permit, which contains the effective Federal RCRA permit conditions, and the effective RCRA permit license conditions issued by the State of Michigan's RCRA program authorized under 40 CFR Part 271 (hereinafter called the "state-issued portion of the RCRA permit"). Any hazardous waste activity, which requires a RCRA permit and is not included in the RCRA permit is prohibited.

Permit Approval:

On October 30, 1986, the State of Michigan received final authorization pursuant to Section 3006 of RCRA, 42 USC § 6926, and 40 CFR Part 271, to administer the pre-HSWA RCRA hazardous waste program. The State of Michigan has also received final authorization to administer certain additional RCRA requirements on several occasions since then. However, because the U.S. EPA has not yet authorized the State of Michigan to administer the RCRA requirements for some hazardous waste codes, U.S. EPA is issuing the RCRA permit requirements for operations at the Permittee's facility that manages these hazardous wastes.

You must comply with all terms and conditions contained in this permit. This permit consists of all the conditions contained herein, all documents attached hereto and all documents listed or cross-referenced in these documents, approved submittals (including plans, schedules and other documents), and the applicable regulations contained in 40 CFR Parts 124, 260, 261, 262, 264, 268, 270, and applicable provisions of RCRA.

This permit is based on the assumptions that (1) the information submitted in the Permittee's RCRA permit application dated March 16, 1992, and in any subsequent modifications to that application (hereinafter referred to as the "Application") is accurate, and (2) the facility is configured, operated and maintained as specified in the permit application.

Any inaccuracies in the submitted information may be grounds for the U.S. EPA to terminate, revoke and reissue, or modify this permit in accordance with 40 CFR §§ 270.41, 270.42 and 270.43; and for enforcement action. You must inform the U.S. EPA of any deviation from, or changes in, the information in the Application that might affect your ability to comply with the applicable regulations or conditions of this permit.

Opportunity to Appeal:

Petitions for review must be submitted within 30 days after the U.S. EPA serves notice of the final permit decision. Any person who filed comments on the draft permit or participated in the public hearing may petition the Environmental Appeals Board to review any condition of the permit decision. Any person who failed to file comments or failed to participate in the public hearing on the draft permit may file a petition for review only to the extent of the changes from the draft to the final permit decision. The procedures for permit appeals are found in 40 CFR § 124.19.

Effective Date:

This permit is effective as of December 12, 2003 and will remain in effect until December 12, 2008, unless revoked and reissued under 40 CFR § 270.41, terminated under 40 CFR § 270.43, or continued in accordance with 40 CFR § 270.51(a).

By: Original signed on January 9, 2004 Date:______________________
Margaret M. Guerriero, Director
Waste, Pesticides and Toxics Division

TABLE OF CONTENTS

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SECTION I—STANDARD PERMIT CONDITIONS

I.A EFFECT OF PERMIT

The RCRA permit is comprised of both this permit, which contains the effective Federal RCRA permit conditions, and the effective state RCRA license. You are hereby allowed to manage hazardous waste in accordance with this permit. Under this permit, the storage and treatment of RCRA hazardous waste must comply with all terms and conditions in this permit. Other aspects of the storage and treatment of RCRA hazardous wastes are subject to the conditions in the state-issued portion of the RCRA permit. Any hazardous waste activity, which requires a RCRA permit and is not included in the RCRA permit, is prohibited.

Subject to 40 CFR § 270.4, compliance with the RCRA permit during its term generally constitutes compliance for purposes of enforcement with Subtitle C of RCRA. (40 CFR § 270.4)

This permit does not: (1) convey any property rights or any exclusive privilege (40 CFR § 270.30(g)); (2) authorize any injury to persons or property, or invasion of other private rights; or (3) authorize any infringement of state or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any order issued, or any action brought, under: (1) Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; (2) Sections 104, 106(a), or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC §§ 9601 *et seq.* (commonly known as CERCLA); or (3) any other law protecting human health, welfare, or the environment.

I.B PERMIT ACTIONS

I.B.1 Permit Review, Modification, Revocation and Reissuance, and Termination

The U.S. EPA may review and modify, revoke and reissue, or terminate this permit for cause, as specified in 40 CFR § 270.41, § 270.42, and § 270.43. The U.S. EPA may also review and modify this permit, consistent with 40 CFR § 270.41, to include any terms and conditions it determines are necessary to protect human health and the environment under Section 3005(c)(3) of RCRA. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance on your part will not stay the applicability or enforceability of any permit condition. (40 CFR § 270.30(f))

You must not perform any construction associated with a Class 3 permit modification request until such modification request is granted and the modification becomes effective. You may perform construction associated with a Class 2 permit modification request beginning 60 days after submission of the request unless the Director establishes a later date. (40 CFR § 270.42(b)(8))

I.B.2 Permit Renewal

This permit may be renewed as specified in 40 CFR § 270.30(b) and Condition I.E.2 of this permit. In reviewing any application for a permit renewal, the U.S. EPA will consider improvements in the state of control and measurement technology, and changes in applicable regulations. (40 CFR § 270.30(b) and RCRA Section 3005(c)(3))

I.C SEVERABILITY

This permit's provisions are severable; if any permit provision, or the application of any permit provision to any circumstance, is held invalid, such provision's application to other circumstances and the remainder of this permit will not be affected. Invalidation of any statutory or regulatory provision on which any condition of this permit is based does not affect the validity of any other statutory or regulatory basis for that condition. (40 CFR § 124.16(a))

I.D DEFINITIONS

The terms used in this permit will have the same meaning as in 40 CFR Parts 124, 260 through 266, 268 and 270, unless this permit specifically provides otherwise. Where neither the regulations nor the permit define a term, the term's definition will be the standard dictionary definition or its generally accepted scientific or industrial meaning.

I.E DUTIES AND REQUIREMENTS

1.E.1 Duty to Comply

You must comply with all conditions of this permit, except to the extent and for the duration for which an emergency permit authorizes such noncompliance (see 40 CFR § 270.61). Any permit noncompliance, except under the terms of an emergency permit, constitutes a violation of RCRA and will be grounds for: enforcement action; permit termination; revocation and reissuance; modification; or denial of a permit renewal application. (40 CFR § 270.30(a))

I.E.2 Duty to Reapply

If you wish to continue the permit regulated activities after the expiration date, you must apply for and obtain a new permit. You must submit a complete application for a new permit at least 180 days before the permit expiration date, unless the Director grants permission for a later submittal date. The Director will not grant permission to submit the complete application for a new permit later than the permit's expiration date. (40 CFR § 270.10(h), and § 270.30(b))

I.E.3 Permit Expiration

Unless revoked or terminated, this permit and all conditions herein will be effective until December 12, 2008. This permit and all conditions herein will remain in effect beyond the permit's expiration date if you have submitted a timely, complete application (40 CFR § 270.10 and §§ 270.13 through 270.29), and, through no fault of your own, the Director has not made a final determination regarding permit reissuance. (40 CFR §§ 270.50, and 270.51)

I.E.4 Need to Halt or Reduce Activity Not a Defense

In an enforcement action, you are not entitled to a defense that it would have been necessary to halt or reduce the permitted activity to maintain compliance with this permit. (40 CFR § 270.30(c))

I.E.5 Duty to Mitigate

In the event of noncompliance with this permit, you must take all reasonable steps to minimize releases to the environment resulting from the noncompliance and must implement all reasonable measures to prevent significant adverse impacts on human health or the environment. (40 CFR § 270.30(d))

I.E.6 Proper Operation and Maintenance

You must always properly operate and maintain all facilities and treatment and control systems (and related appurtenances) that you install or use to comply with this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires you to operate back-up or auxiliary facilities or similar systems only when necessary to comply with this permit. (40 CFR § 270.30(e))

I.E.7 Duty to Provide Information

You must provide the Director, within a reasonable time, any relevant information that the Director requests to determine whether there is cause to modify, revoke and reissue, or terminate this permit, or to determine permit compliance. You must also provide the Director, upon request, with copies of any records this permit requires. The information you must maintain under this permit is not subject to the Paperwork Reduction Act of 1980, 44 USC §§ 3501 *et seq.* (40 CFR §§ 264.74(a) and 270.30(h))

I.E.8 Inspection and Entry

Upon the presentation of credentials and other legally required documents, and in accordance with 40 CFR § 270.30(i), you must allow the Director or an authorized representative to:

I.E.8.a Enter at reasonable times upon your premises where a regulated activity is located or conducted, or where records must be kept under the conditions of this permit;

I.E.8.b Have access to and copy, at reasonable times, any records that you must keep under the conditions of this permit;

I.E.8.c Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

I.E.8.d Sample or monitor any substances at any location at reasonable times, to ensure permit compliance or as RCRA otherwise authorizes.

Notwithstanding any provision of this permit, U.S. EPA retains the inspection and access authority which it has under RCRA and other applicable laws.

I.E.9 Monitoring and Records

I.E.9.a Samples and measurements taken for monitoring purposes must be representative of the monitored activity. The methods used to obtain a representative sample of the wastes, contaminated media, treatment residue, or other waste to be analyzed must be the appropriate methods from Appendix I of 40 CFR Part 261, or the methods specified in the state-approved waste analysis plan, or an equivalent method approved by the Director. Laboratory methods must be those specified in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (SW-846, latest edition), *Methods for Chemical Analysis of Water and Wastes* (EPA 600/4-79-020), or an equivalent method, as specified in the referenced waste analysis plan. (40 CFR § 270.30(j)(1))

I.E.9.b You must retain, at the facility, all records as specified in 40 CFR § 264.74.

I.E.9.c You must submit all monitoring results at the intervals specified in this permit.

I.E.9.d You must retain all reports, records, or other documents, required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the reports, records, other documents, unless a different period is specified in this permit. The 3-year period may be extended by request of the Director at any time and is automatically extended during the course of any unresolved enforcement action regarding this facility. (40 CFR §§ 270.30(j) and 270.31))

I.E.10 Reporting Planned Changes

You must notify the Director as soon as possible of any planned physical alterations or additions to the permitted facility. (40 CFR § 270.30(l)(1))

I.E.11 Reporting Anticipated Noncompliance

You must notify the Director, in advance, of any planned changes in the permitted facility or activity that may result in permit noncompliance. Advance notice will not constitute a defense for any noncompliance. (40 CFR § 270.30(l)(2))

I.E.12 Transfer of Permits

This permit is not transferable to any person, except after notice to the Director. You must inform the Director and obtain prior approval of the Director before transferring ownership or operational control of the facility (40 CFR § 270.42, Appendix I). Under 40 CFR § 270.40, the Director may require permit modification, or revocation and reissuance to change the Permittee's name and incorporate other RCRA requirements. Before transferring ownership or operation of the facility during its operating life, you must notify the Director and obtain prior approval and notify the new owner or operator in writing of the requirements of this permit and the requirements of 40 CFR Parts 264, 268, and 270. (40 CFR §§ 264.12(c), 270.30(l)(3), and 270.40(a))

I.E.13 Twenty-Four Hour Reporting

I.E.13.a You must report to the Director any noncompliance with this permit that may endanger human health or the environment. Any such information must be promptly reported orally, but no later than 24 hours after you become aware of the noncompliance.

I.E.13.b The report must describe the occurrence of any the following: (1) a release of any hazardous waste that may endanger public drinking water supplies; (2) a release or discharge of hazardous waste; or (3) a fire or explosion from the hazardous waste management facility, that could threaten the environment or human health outside the facility. You must include the following information regarding the incident:

(1) Name, title and telephone number of the person making the report;

(2) Name, address and telephone number of the facility;

(3) Name, address and telephone number of owner or operator;

(4) Date, time and type of incident;

(5) Location and cause of incident;

(6) Identification and quantity of material(s) involved;

(7) Extent of injuries, if any;

(8) Assessment of actual or potential hazards to the environment and human health outside the facility, where applicable;

(9) Description of any emergency action taken to minimize the threat to human health and the environment; and

(10) Estimated quantity and disposition of recovered material that resulted from the incident.

I.E.13.c In addition to the oral notification required under Conditions I.E.13.a and I.E.13.b of this permit, a written report must also be provided within 5 calendar days after you become aware of the circumstances. The written report must include, but is not limited to, the following:

(1) Name, address and telephone number of the person reporting;

(2) Incident description (noncompliance and/or release or discharge of hazardous waste), including cause, location, extent of injuries, if any, and an assessment of actual or potential hazards to the environment and human health outside the facility, where applicable;

(3) Period(s) in which the incident (noncompliance and/or release or discharge of hazardous waste) occurred, including exact dates and times;

(4) Whether the incident's results continue to threaten human health and the environment, which will depend on whether the noncompliance has been corrected and/or the release or discharge of hazardous waste has been adequately cleaned up; and

(5) If the noncompliance has not been corrected, the anticipated period for which it is expected to continue, and the steps taken or planned to reduce, eliminate, and prevent the recurrence of the noncompliance.

The Director may waive the requirement that written notice be provided within 5 calendar days; however, you will then be required to submit a written report within 15 calendar days of the day on which you must provide oral notice, in accordance with Conditions I.E.13.a and I.E.13.b of this permit. (40 CFR § 270.30(l)(6))

I.E.14 Other Noncompliance

You must report all instances of noncompliance not reported under Condition I.E.13 of this permit, when any other reports this permit requires are submitted. The reports must contain the information listed in Condition I.E.13. (40 CFR § 270.30(l)(10))

I.E.15 Other Information

I.E.15.a Whenever you become aware that you failed to submit or otherwise omitted any relevant facts in the permit application or other submittal, or submitted incorrect information in the permit application or other submittal, you must promptly notify the Director of any incorrect information or previously omitted information, submit the correct facts or information, and explain in writing the circumstances of the incomplete or inaccurate submittal. (40 CFR § 270.30(l)(11))

I.E.15.b All other requirements contained in 40 CFR § 270.30 not specifically described in this permit are incorporated into this permit and you must comply with all those requirements.

I.F SIGNATORY REQUIREMENT

You must sign and certify all applications, reports, or information this permit requires, or which are otherwise submitted to the Director, in accordance with 40 CFR § 270.11. (40 CFR § 270.30(k))

I.G REPORTS, NOTIFICATIONS AND SUBMITTALS TO THE DIRECTOR

Except as otherwise specified in this permit, all reports, notifications, or other submittals that this permit requires to be submitted to the Director should be sent by certified mail or hand-delivered to the U.S. Environmental Protection Agency, Region 5, at the following address:

Waste Management Branch, DW-8J
Waste, Pesticides and Toxics Division
U.S. EPA
77 West Jackson Boulevard
Chicago, Illinois 60604

I.H CONFIDENTIAL INFORMATION

In accordance with 40 CFR Part 2 Subpart B, you may claim any information this permit requires, or is otherwise submitted to the Director, as confidential. You must assert any such claim at the time of submittal in the manner prescribed on the application form or instructions, or, in the case of other submittals, by stamping the words "Confidential Business Information" on each page containing such information. If you made no claim at the time of submittal, the Director may make the information available to the public without further notice. If you assert a claim, the information will be treated in accordance with the procedures in 40 CFR Part 2. (40 CFR § 270.12)

I.I DOCUMENTS TO BE MAINTAINED AT THE FACILITY

You must maintain at the facility, until closure is completed and certified by an independent registered professional engineer, the following documents and all amendments, revisions, and modifications to them.

I.I.1 Operating Record

You must maintain in the facility's operating record the documents required by this permit.

I.I.2 Notifications

You must maintain notifications from generators accompanying initial incoming shipments of wastes subject to 40 CFR Part 268 Subpart C, that specify treatment standards, as required by 40 CFR §§ 264.73 and 268.7, and this permit.

I.I.3 Copy of Permit

You must keep a copy of this permit on site, including all the documents listed in any attachments, and you must update it as necessary to incorporate any official permit modifications.

I.J ATTACHMENTS AND DOCUMENTS INCORPORATED BY REFERENCE

I.J.1 All attachments and documents that this permit requires to be submitted, if any, including all plans and schedules are, upon the Director's approval, incorporated into this permit by reference and become an enforceable part of this permit. Since required items are essential elements of this permit, failure to submit any of the required items or submission of inadequate or insufficient information may subject you to enforcement action under Section 3008 of RCRA. This action may include fines, or permit suspension or revocation.

I.J.2 This permit also includes the documents attached hereto, all documents cross-referenced in these documents, and the applicable regulations contained in 40 CFR Parts 124, 260, 261, 262, 264, 268, 270, and the applicable provisions of RCRA, all of which are incorporated herein by reference.

I.J.3 Any inconsistency or deviation from the approved designs, plans and schedules is a permit noncompliance. The Director may grant written requests for extensions of due dates for submittals required in this permit.

I.J.4 If the Director determines that actions beyond those provided for, or changes to what is stated herein, are warranted, the Director may modify this permit according to procedures in Condition I.B of this permit.

I.J.5 If any documents attached to this permit are found to conflict with any of the Conditions in this permit, the Condition will take precedence.

I.K COORDINATION WITH THE CLEAN AIR ACT

You must fully comply with all applicable Clean Air Act (CAA) and RCRA permit limits. Where two or more operating limitations apply, the most stringent operating limitations take precedence.

SECTION II --HAZARDOUS WASTE CODES

You are authorized to manage the following U.S. EPA hazardous waste codes in addition to those included in the Michigan RCRA License: K174, K175, K176, and K177. In managing these wastes, you must comply with the applicable provisions of RCRA, its implementing regulations, and the RCRA permit. Management of any hazardous waste not listed in the Michigan License or the U.S. EPA RCRA Permit is prohibited except as provided in 40 CFR § 270.42(g) which describes the procedures for managing newly listed hazardous wastes.

Appendix A- 5: Formal Determination of Compliance with Local Zoning

City of Detroit
Buildings and Safety Engineering Department

Fourth Floor City-County Building
Detroit, Michigan 48226

April 2, 1996

B&SE Case No.: 13-96 - 1947 E. Kirby (aka 1923 Frederick)
Decision Date: April 2, 1996
Effective Date: April 17, 1996

City Environmental, Inc.
1923 Frederick Street
Detroit, Michigan 48211

Your Request To: Operate a Hazardous Waste Treatment Facility

AT: 1947 E, Kirby (aka 1923 Frederick), between Dequindre (GTWRR) and St. Aubin

Which Property Is Zoned M-4 And Legally Described As:

Lots 11-22 in Secor & Davis Subdivision of the South 273 20/100 feet of Out Lot 54, as recorded in Liber 9, Page 41 of Plats, Wayne County Records, and Lots 25-42 in Phillis Beaubiens Subdivision of Out Lot 51, St. Aubin Farm. Detroit, Wayne County, Michigan as recorded in Liber 9, Page 16 of Plats, Wayne County Records, and the portion of Outlot 28 lying North of Frederick Ave., of the subdivision of Private Claim 90, Witherell Farm, Liber 34, Page 1 of Deeds, Wayne County Records, and all of Outlot 29 of the Subdivision of Private Claim 90, Witherell Farms, Liber 34, Pages 1 & 2 of Deeds, Wayne County Records, more particularly as described on the attached one (1) sheet "Sketch and Description"

Has been processed (as were your earlier B&SE Case No's. 156-91 and 147-95) in accord with the provisions of Section(s) 65.0000,67.0400, 104.0300 and 105.0300 of the Zoning Ordinance and conditionally approved, provided you comply with all conditions stated on the last pages of this letter and subject to periodic review and possible revocation should the conditions not be fulfilled.

This conditional approval will become effective April 17, 1996.

APPENDIX A-6

PROOF OF FINANCIAL CAPABILITY

DEQ Michigan Department of Environmental Quality, Waste and Hazardous Materials Division

HAZARDOUS WASTE MANAGEMENT FACILITY AMENDATORY ENDORSEMENT
POLLUTION LEGAL LIABILITY - SUDDEN AND ACCIDENTAL

This endorsement (the "Endorsement") changes the Pollution Legal Liability Policy (the "Policy") effective on the inception date of the Policy. This Endorsement is attached to the Policy to fulfill the insurance requirements of Section 11123 of the State of Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and R 299.9710 of the Michigan Administrative Code (MAC).

INSURER: American International Specialty Lines Insurance Co			INSURED: EQ Holding Company		
INSURER'S ADDRESS: 300 S. Riverside, Ste 2100			INSURED'S ADDRESS: 36255 Michigan Ave		
CITY: Chicago	STATE: IL	ZIP CODE: 60606	CITY: Wayne	STATE: MI	ZIP CODE: 48184
POLICY NUMBER: PLS 2673560	POLICY PERIOD: FROM:8/01/2008		TO:8/01/2009		

COVERED FACILITY: **(Attach additional page if necessary to list multiple Facilities covered)**

FACILITY NAME: EQ Detroit, Inc.			FACILITY ADDRESS: 1923 Frederick St.
CITY: Detroit	STATE: MI	ZIP CODE: 48211	EPA ID NUMBER: 980991566

DEFINITIONS

As used in this Endorsement:

The term "Contaminant" means any hazardous waste defined in MAC R 299.9203, and any hazardous waste or hazardous constituent listed in Appendix VIII of Part 261 or Appendix IX of Part 264 of Title 40 of the Code of Federal Regulations; and

The term "Sudden and Accidental Occurrence" means the unintentional and unexpected discharge, dispersal, release, or escape of a contaminant in a noncontinuous and nonrepetitive manner, into or upon the land, the atmosphere, or any watercourse or body of water, which results in bodily injury or property damage.

DECLARATIONS

The insurance afforded with respect to Sudden and Accidental Occurences is subject to all of the terms and conditions of the Policy provided however that any provisions of the Policy inconsistent with Sections A through F of this Endorsement are hereby amended to conform with Sections A through F.

A. The limits of liability as respects bodily injury and property damage are provided in an amount not less than $1,000,000.00 per occurrence with an annual aggregate of not less than $2,000,000.00, exclusive of legal defense costs.

B. The Insurer is liable for the payment of amounts within any deductible applicable to the Policy, with a right of reimbursement by the Insured for any such payment made by the Insurer.

C A Notice of Violation or Order issued by the MDEQ or other environmental agency shall not be deemed in and of itself sufficient evidence of an insured's intentional, knowing, willful, or deliberate noncompliance with a legal requirement so as to preclude coverage under this Policy.

D. The Insurer will provide the Waste Management Division at the address below with at least 30 days advance written notice of cancellation, termination, or material change to the Policy which affects the coverage required by MAC R 299.9710. Such notices shall be provided no matter which party initiates the cancellation, termination, or material change, and whether or not nonpayment of premium is involved.

E. The following are the only specific pre-existing soil and groundwater conditions (defined in the referenced assessments or reports) that are excluded from coverage under the Policy (Attach additional pages if necessary):n/a

F. No condition, provision, stipulation, limitation, or exclusion contained in the Policy, or any other endorsement thereon, or any violation thereof, shall relieve the insurer from liability or from the payment of any claim, within the stated limits of liability in this Endorsement, for bodily injury and property damage to a third party caused by a sudden and accidental occurence.

The Insurer hereby certifies that it has issued the Insured the Policy to provide financial assurance and responsibility for bodily injury and property damage caused by Sudden and Accidental Occurrences arising from operation of the covered facility(ies), and that the Insurer is licensed to transact the business of insurance, or is eligible to provide insurance as an excess or surplus lines insurer, in the State of Michigan.

Filing of this Endorsement is required by Law (MAC R299.9710)

Submit one original signed Endorsement to:

HAZARDOUS WASTE SECTION
WASTE AND HAZARDOUS MATERIALS DIVISION
DEPARTMENT OF ENVIRONMENTAL QUALITY
PO BOX 30241
LANSING MI 48909-7741

Name of Authorized Agent: Adrien Robinson	
Street Address or PO Box: 300 S. Riverside, Ste 2100	
City, State and Zip Code: Chicago, IL 60606	
Signature of Authorized Agent	Date: 7/31/2008

INVOICE NUMBER	INVOICE DATE	DESC. VOUCHER	DUE DATE	GROSS AMOUNT	DISCOUNT	NET AMOUNT
2008 PART III LI	05/29/2008	Vchr: VO026200		500.00	0.00	500.00

06/06/2008 014348

374 MISTMI5 STATE OF MICHIGAN

500.00

#709099

WARNING: DO NOT ACCEPT THIS DOCUMENT UNLESS YOU SEE A GHOSTMARK ON THE BACK WHEN HELD AT A 45 DEGREE ANGLE TO THE LIGHT

EQ Detroit, Inc.
36255 Michigan Avenue
Wayne, MI 48184

Comerica Bank
Detroit MI

9-9/720

PAY Five hundred and 00 / 100 Dollars Only **

DATE 06/06/2008 CHECK NUMBER 014348

TO THE ORDER OF STATE OF MICHIGAN

500.00

NOT VALID AFTER 90 DAYS

WARNING: THIS DOCUMENT IS PRINTED ON PAPER WITH INVISIBLE FLUORESCENT FIBERS, IS CHEMICALLY REACTIVE AND HAS A MULTI LANGUAGE VOID

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Appendix A-8

EQD CLOSURE COST ESTIMATE

A. TRANSPORTATION AND DISPOSAL OFF-SITE	Volume	Unit of Measure	Unit Cost	Unit of Measure	Extended Cost	
Listed Hazardous Waste - Tanks/Containers (274,600 gallons)						
Treatment & Disposal Cost	274,600	gal	$ 0.19	$/gal	$ 52,174.00	
Transportation Cost	21	trips	$ 500.00	each	$ 10,815.00	
Empty Drum Disposal	1,480	drums	$ 15.00	each	$ 22,866.00	
Listed Hazardous Waste - Vaults (418 cubic yards)						
Treatment & Disposal Cost	418	cu.yd.	$ 54.00	each	$ 23,249.16	
Transportation	11	trips	$ 750.00	each	$ 8,497.50	
Subtotal						***$ 117,601.66***
Characteristic Hazardous Waste - Tanks/Containers (518,855 gallons)						
Treatment & Disposal Cost	518,855	gal	$ 0.11	$/gal	$ 58,786.27	
Transportation Cost	55	trips	$ 500.00	each	$ 28,325.00	
Empty Drum Disposal	5,921	drums	$ 15.00	each	$ 91,479.45	
Characteristic Hazardous Waste - Vaults (1,672 cubic yards)						
Treatment and Disposal Cost	1,672	cu.yd.	$ 22.00	each	$ 37,887.52	
Transportation Cost	35	trips	$ 300.00	each	$ 10,815.00	
Subtotal						***$ 227,293.24***
Waste Characterization (32 waste management units)	32	samples	$ 500.00	each	$ 16,480.00	
Subtotal						***$ 16,480.00***

EQD CLOSURE COST ESTIMATE

B. DECONTAMINATION ACTIVITIES	Volume	Unit of Measure	Unit Cost	Unit of Measure	Extended Cost	
Loading/Unloading and Container Storage Areas						
Labor, 5 workers	750	total hours	$ 35.00	hour	$ 27,037.50	
Absorbent	100	bags	$ 5.00	each	$ 515.00	
Empty drums	30	drums	$ 15.00	each	$ 463.50	
Disposal of contaminated absorbent (including trans)	30	drums	$ 125.00	each	$ 3,862.50	
Pressure steam unit rental (2 units including detergent)	15	days	$ 250.00	day	$ 3,862.50	
Lab testing of second rinsewaters	10	samples	$ 500.00	each	$ 5,150.00	
Off-site treatment/disposal of wash/rinse waters	50,000	gallons	$ 0.35	$/gal	$ 18,025.00	
Transportation of wash/rinse waters	5	load	$ 500.00	each	$ 2,575.00	
Subtotal						***$ 61,491.00***
Tanks, Vaults, Conveyors, Pugmill, etc.						
Labor, 13 workers	1,950	total hours	$ 35.00	hour	$ 70,297.50	
Pressure steam unit rental (2 units including detergent)	15	days	$ 250.00	day	$ 3,862.50	
Lab testing of rinse samples following decon	64	samples	$ 500.00	each	$ 32,960.00	
Off-site treatment/disposal of wash/rinse waters	110,000	gallons	$ 0.35	$/gal	$ 39,655.00	
Transportation of wash/rinse waters	11	load	$ 500.00	each	$ 5,665.00	
Disposal of Contaminated PPE	25	drums	$ 65.00	each	$ 1,673.75	
Subtotal						***$ 154,113.75***

Appendix A-8

EQD CLOSURE COST ESTIMATE

C. SOIL SAMPLING / VERIFICATION SAMPLING	Volume	Unit of Measure	Unit Cost	Unit of Measure	Extended Cost	
Soil boring installaton & sampling	32	borings	$ 500.00	each	$ 16,480.00	
Soil sampling & analysis	32	samples	$ 600.00	each	$ 19,776.00	
Soil excavation, labor, 5 workers	250	total hours	$ 35.00	hour	$ 9,012.50	
Soil excavation, misc. equipment	50	total hours	$ 100.00	hour	$ 5,150.00	
Soil transportation cost (volume = 221,000 sq. ft. x 2 ft. x 10% = 1,637 cu. yd.)	35	trips	$ 500.00	each	$ 18,025.00	
Soil disposal cost	1,637	cu.yd.	$ 22.00	$/cu. yd.	$ 37,094.42	
Verification sampling	30	samples	$ 600.00	each	$ 18,540.00	
Subtotal						***$ 124,077.92***

D. RAIL SECONDARY CONTAINMENT	Volume	Unit of Measure	Unit Cost	Unit of Measure	Extended Cost	
Waste characterization	1	sample	$ 500.00	each	$ 515.00	
Soil transportation cost (volume = 81,520 gallons or 405 cu.yd.)	8	trips	$ 500.00	each	$ 4,120.00	
Soil disposal cost	405	cu.yd.	$ 22.00	$/cu. yd.	$ 9,177.30	
Subtotal						***$ 4,635.00***

E. CERTIFICATION BY REGISTERED ENGINEER	Volume	Unit of Measure	Unit Cost	Unit of Measure	Extended Cost	
Periodic inspections during closure activities by an independent engineer	20	weeks	$ 3,000.00	week	$ 61,800.00	
Closure certification	75	hours	$ 95.00	hour	$ 7,338.75	
Subtotal						***$ 69,138.75***

TOTAL	***$774,831.32***

APPENDIX A-9

OPERATING LICENSE APPLICATION
"SIGNED AND CERTIFIED"

X. Type of Regulated Waste Activity - CONTINUED
Mark 'X' in the appropriate box(es) for the activity on-site as of the date signed or the date entered in comment section XII.

C. Used Oil Activities **at this location**, check all that apply: (used oil generator only - go to E.) [see comments for additional information]

1. Used Oil Fuel Marketer
   - ☒ a. Marketer who directs shipments of off-specification used oil to used oil burner.
   - ☐ b. Marketer who first claims the used oil meets the specifications.
- ☐ 2. Off-specification Used Oil Burner
3. Used Oil Transporter (check one only)
   - ☐ a. Transporter only
   - ☐ b. Transporter with transfer facility **[requires a permit & registration]**
- ☒ 4. Used Oil Processor
- ☐ 5. Used Oil Re-refiner
- ☒ 6. Used Oil Collection or Aggregation Point
- ☒ 7. Collection Center or Aggregation Point that accepts DIY Used Oil

D Universal Waste Activities **at this location**, check all that apply:

1. Large Quantity Handler: check the box(es) for the universal wastes generated or accumulated

type of universal waste	generating	accumulating over 5,000kg
a. Batteries	☐	☐
b. Thermostats	☐	☐
c. Mercury Thermometers	☐	☐
d. Devices containing elemental mercury	☐	☐
e. Mercury Switches	☐	☐
f. Pesticides	☐	☐
g. Electric Lamps	☐	☐
h. Pharmaceuticals	☐	☐
i. Consumer Electronics	☐	☐

☐ 2. Destination Facility of Universal Waste (a hazardous waste permit may be required for this activity)

E. Liquid Industrial Waste Activities **at this location**, check all that apply: (not hazardous waste activity)

- ☐ 1. Liquid Industrial Waste Transporter **[requires a permit & registration]**
- ☐ 2. Transporting own waste
- ☒ 3. Liquid Industrial Waste Generator
- ☒ 4. Liquid Industrial Waste Designated Facility

F. All generation of waste has ceased at this location and/or any other regulated waste activity specified in Section X. Check one box and enter in a date using this format (mm/dd/yyyy):

- ☐ 1. still in business at this location
- ☐ 2. out of business at this location

Date ceased:______________________

XI. Certification: I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Signature of owner, operator, or authorized representative	Name and Official Title (type or print)	Date Signed (mm-dd-yyyy)
	Timothy M Tilott Name V. P. Title	09/08/2008

APPENDIX A-10

ADMINISTRATIVE COMPLETENESS CHECKLIST
AND
LOCATION OF INFORMATION

Hazardous Waste Waste Management Facility

Operating License Application

Administrative Completeness Checklist

Facility Name: EQ Detroit, Inc. **EQP ID Number: MID 980 991 566**

Required Information **R 299.9504 and R 299.9508**	**Yes**	**No**	**Comments/Location in Application**
Table of Contents	**X**		Section A
Application for Hazardous Waste Treatment, Storage or Facility Operating License R 299.9508(1)(a)	**X**		Appendix A-2
Part A Hazardous Waste Permit Application, including Facility Photographs of Treatment Storage and Disposal Areas R 299.9504(1)(b); 270.13	**X**		Appendix A-1
$500.00 Application Fee R 299.9508(1)(h)	**X**		Appendix A-7
Certification and Signature R 299.9508(3); 270.11 -Owner -Operator -Titleholder of Land	**X** **X** **X** **X**		Appendix A-9
Proof of Issuance (Copies) of all Necessary State Environmental Permits (e.g. Air Use; Surface Water, Sewer Discharge R299.9508(1)(f)	**X**		Appendix A-4
Part B General Information **R 299.9504(1)(c); 270.14(b) and (d)**			
General Facility Description 270.14(b)(1)	**X**		Sections A & B
Chemical and Physical Analyses 270.14(b)(2)	**X**		Section C

Required Information **R 299.9504 and R 299.9508**	**Yes**	**No**	**Comments/Location in Application**
Waste Analysis Plan 270.14(b)(3); 264.13(b) and (c); R 299.9605	**X**		Section C
Security Procedures and Equipment 270.14(b)(4); 264.14; R299.9605	**X**		Section F
Inspection Schedule 270.14(b)(5); 264.15(b); R 299.9605	**X**		Section O & M
Request for Waiver of Preparedness and Prevention Requirements 270.14(b)(6); Part 264 Subpart C;R 299.9606		**X**	
Contingency Plan 270.14(b)(7); Part 264 Subpart D; R 299.9607	**X**		Section G
Hazard Prevention 270.14(b)(8)	**X**		Section F
Precautions to Prevent Accidental Ignition or Reaction of Ignitable, Reactive or Incompatible Wastes 270.24(b)(9); 264/17; R 299.9605	**X**		Section F
Traffic Information 270.14(b)(10)	**X**		Section N
Facility Location Information 100-Year Floodplain Information 270.14(b)(11)(iii – v); R 299.9603(4)	**X**		Section L
Personnel Training Program 270.14(b)(12); 264.16; R 299.9605	**X**		Section H
Closure/Post Closure Plan(s) 270.14(b)(13); 264.112;264.118; 264.197; R 299.9613	**X**		Section I
Post-Closure Notices 270.14(b)(14); 264,119; R 299.9613	**X**		Section I and A
Closure Cost Estimate 270.14(b)(15);264.142; R 299.9702	**X**		Appendix A-8

Required Information R 299.9504 and R 299.9508	Yes	No	Comments/Location in Application
Topographic Map (Scale 1 inch <200 feet) 270,14(b)(19)	X		Drawing Package/Drawing CD
Compliance with Other Federal Laws 270.14(b)(20); 270.3	X		Section K
For Land Disposal Facilities: Copy of Approval of 268.6 Petition 270.14(b)(21)		X (NA)	
Corrective Action 270.14(d)(1-3); R 299.9504(16); Section 15a	X		Section E
Waste Management Unit Information; Location (Topo Map), Type, Size, Operation Dates & Wastes Managed 270.14(d)(1)(i-v)	X		Table A-1, Table A-2, Table D-1, Drawing Package/Drawing CD
Contaminant Release Information 270.14(D)(2)	X		Section G
Results of Environmental Sampling and Analysis 270.14(d)(3)	X		Section E Appendices E-1, E-2, E-3
Summary/Status of Facility Corrective Action Activities to Date R 299.9504(16); Section 15a	X		Section E
Hydrogeological Report R 299.9504(1)(d); R 299.9506,or	X		Section E Appendices E-1, E-2
Justification for a Waiver of R 299.9504(1)(d) and/or R 299.9506 Hydrogeological Report Requirements R 299.9506(7); R 299.9508(2)	X		Section E
Environmental Assessment R 299.9504(1)(e) Including Failure Mode Assessment and Exposure Information Report (Land Disposal Facilities Only)	X		Section J

Required Information **R 299.9504 and R 299.9508**	**Yes**	**No**	**Comments/Location in Application**
Environmental Monitoring Program R 299.9504(1)(f); R 299.9611(2-5)	**X**		Section E
Sampling and Analysis Plan for each Environmental Monitoring Program R 299.9611(2)(a)	**X**		Section E
Groundwater Monitoring Program R299.9611(2)(b); R 299.9612		**X**	Section E
Ambient Air Monitoring Program R. 299.9611(2)(c)	**X**		Section E
Annual Soil Monitoring Program R 299.9611(2)(d)		**X**	Section E
Monitoring Waiver Demonstration R 299.9611(3 and 4)	**X**		Section E
Other Monitoring Programs (e.g. Sewer Effluent, Surface Water) R 299.9611(5)	**X**		Section E
Engineering Plans of Facility Process Equipment and Containment Structures (signed/sealed by a Registered P.E.) R 299.9504(1)(g)	**X**		Section D Drawing Package/Drawing CD
Plan Views, Elevations, Sections, Supplementary Views and General Layout Drawings R 299.9504(1)(g)(i)	**X**		Section D Drawing Package/Drawing CD
Specifications for all Construction Materials and Installation Methods R 299.9504(1)(g))ii)	**X**		Section D Drawing Package/Drawing CD
Basis of Design for all Process Equipment and Containment Structures R 299.9504(1)(g)(iii)	**X**		Section D Drawing Package/Drawing CD
Flow Diagram of All Process(es) R 299.9504(1)(g)(iv)	**X**		Section D Drawing Package/Drawing CD

Required Information R 299.9504 and R 299.9508	Yes	No	Comments/Location in Application
	X		
Design Capacity of Each Process R 299.9504(1)(g)(v)	X		Section D Drawing Package/Drawing CD Table D-1
Container Storage Information R 299.9504(2); 270.15; Part 264 Subpart I; R 299.9614	X		Section D Drawing Package/Drawing CD Table D-5
Tank Storage/Treatment Information R 299.9504(3); 270.16; Part 264 Subpart J; R 299.9615	X		Section D Drawing Package/Drawing CD Table D-1
Incinerator/Thermal Treatment Information R 299.9504(4); 270.62(b)(2) or 270.19(c); Part 264 Subpart O; R 299.9623 – R 299.9626		X (NA)	
Treatment Information R 299.9504(5)	X		Sections C and D
Surface Impoundment Storage/Treatment Information R 299.9504(6); R 299.9505 (new or upgraded units); 270.17; Part 264 Subpart K; R 299.9620- R 200.9622		X (NA)	
Waste Pile Storage Treatment Information R 299.9504(7); R 299.9505 (new or upgraded units); 270.18; Part 264 Subpart L; R 299.9620- R 200.9622		X (NA)	
Landfill Information R 299.9504(8); R 299.9505 (new cells); 270.21; Part 264 Subpart N; R 299.9619- R 200.9622		X (NA)	
Land Treatment Information R 299.9504(9);; 270.20; Part 264 Subpart M; R 299.9618		X (NA)	

Required Information **R 299.9504 and R 299.9508**	**Yes**	**No**	**Comments/Location in Application**
Miscellaneous Units Treatment/Storage/Disposal and Underground Mine or Cave Storage/Disposal Information R 299.9504(10-11); R 299.9628; 270.23; Part 264 Subpart X		**X** **(NA)**	
Air Emissions from Equipment Leaks Information R 299.9504(12); R 299.9630; 270.24; Part 264 Subpart AA	**X**		Section E
Air Emissions from Process Vents Information R 299.9504(13); R 299.9631; 270.25; Part 264 Subpart BB	**X**		Section E
Drip Pads Treatment/Storage/Disposal Information R 299.9504(14); R 299.9632; 270.26; Part 264 Subpart W		**X** **(NA)**	
Environmental and Human Health Standards Generally R 299.9504(16); R 299.9602	**X**		Section J
Act 451 Facility Location Standards R 299.9504(16); R 299.9603 (1-3)(5)	**X**		Sections A
Facility Design and Operating Standards R 299.9504(16); R 299.9604	**X**		Sections A
Run-on Control System 24-hour, 25-year Storm R 299.9504(1)(a)	**X**		Section J Drawing Package/Drawing CD
Run-Off Management System 24-hour, 100-year Storm R 299.9604(1)(b)	**X**		Section J Drawing Package/Drawing CD
Systems to Prevent Release of Hazardous Waste Constituents into Soil, Surface Water, Groundwater, Drains and Sewers 24-hour, 25-year Storm R 299.9604(1)(c)	**X**		Section J Drawing Package/Drawing CD

Required Information **R 299.9504 and R 299.9508**	**Yes**	**No**	**Comments/Location in Application**
Waiver of R 299.9504(1)(a) and (b) for Existing Non-Land disposal Facilities R 299.9504(2)		**X** **(NA)**	
Procedures to Insure that Proper Transport Vehicles and other Containers are Empty before Leaving the Facility R 299.9504(16); R 299.9605(2)	**X**		Section O
Manifest System R 299.9504(16); R 299.9605(2)	**X**		Section M

Section A: Operation License Application Form and General Information	**Act 451**	**RCRA**
Application form provided by the director: names addresses of owner, operator and land title holder	R508(1)a	270.13
Provide all general information for a construction permit application	R508(1)b	270.13
RCRA Activities	R504(1)b	270.13
Name, mailing address, location including longitude and latitude	R504(1)b	270.13
SIC Codes	R504(1)b	270.13
Operator’s name, address phone number and private corporation status	R504(1)b	270.13
Owner’s name, address and phone number	R504(1)b	270.13
Statement that the facility is not on Indian land	R504(1)b	270.13
Statement that this is an existing facility and this is a revised application	R504(1)b	270.13
Scaled drawing of the facility showing present TAD areas	R504(1)b	270.13
Facility Photographs	R504(1)b	270.13
Processes and their design capacity to treat, store or dispose of hazardous waste	R504(1)b	270.13
Hazardous waste types and quantities to be treated, stored or disposed at facility annually and processes used for each	R504(1)b	270.13
Permit or construction approvals received or applied for:	R504(1)b	270.13
RCRA		
UIC		
NPDES under CWA		
PSD under CAA		
Non-attainment program under CAA		
NESHAPS preconstruction application under CAA Ocean dumping under MPRSA		

Section A: Operation License Application Form and General Information	**Act 451**	**RCRA**
Dredge or Fill Permits under CWA 404		
Other relevant environmental permits		
Topographic Map to one mile beyond the property boundary of source	R504(1)b	270.13
Nature of the Business	R504(1)b	270.13
Description of hazardous debris categories and contaminant categories	R504(1)b	270.13
Topographic map showing 1,000 feet around facility	R504(1)c	270.14(b)
Proof of issuance of all necessary State environmental Permits	R508(1)f	270.14(k)
License Fee Proof of Payment	R508(1)h	
Signed and certified applications, including land title holder	R508(3)	270.11

	Act 451	**RCRA**
Section B: Facility Site Description	R504(1)c	270.14b
General Description of Facility		
Section C: Waste Analysis Plan	R504(1)c	270.14b
Chemical and physical analysis of wastes and debris to be handled		
Section D: Engineering Plans	R504(1)g	
Engineering Plans: Plan Views, elevations and sections Specifications on all construction materials Basis of Design for all process equipment and containment strucures Flow diagram of entire process Design Capacity Container Storage Information Treatment or Storage in Tanks	R504(2 R504(3) R504(5)	270.15 270.16

Treatment of Hazardous Waste	R504(5)a	
Demonstration of how method will do all the following:		
Change of physical, chemical or biological character/composition of waste		
Neutralization of waste		
Recovery of energy or material resources from waste		
Render the waste non-hazardous	R504(5)b	
Toxicity Characteristic of waste		
Demonstration that constituents are chemically bound or rendered non-hazardous	R504(5)c	
Proper treatment techniques	R504(5)d	
Statement that treatment chemicals do not damage construction	R504(5)e	
Statement that no interference occurs with hazardous waste constituents	R504(5)f	
Statement that no hazardous waste constituents/contaminants release toxic gases during treatment	R504(5)g	
Statement that no hazardous waste constituents/contaminants might form toxic constituents during treatment	R504(5)h	
Trial tests, bench scale, pilot plant scale on each type of hazardous waste	R504(1)c	270.14d
Information for each Solid Waste Unit		
Unit location on Topographic Map		
Type of Unit		
General dimensions and structural description		
When unit was operated		
List of all wastes managed at unit		
Hazardous waste or hazardous waste constituents released from such units		
RCRA Facility Assessment		
Section E: Environmental Monitoring Program		
Environmental Monitoring R611		
Ambient Air Monitoring	R611	
Groundwater Monitoring	R611	
Surface Water Monitoring	R611	
Soil Monitoring	R611	
Hydrological Report	R504(1)d	

Section F: Procedures to Prevent Hazards		
Security Procedures and Equipment	R504(1)c	264.14
Preparedness and Prevention	R504(1)c	264C
Procedures, Structures and equipment used at the facility Prevent hazards in unloading operations Prevent runoff from hazardous waste areas Prevent contamination of water supplies Mitigate effects of equipment failure and power outages Prevent undue exposure to personnel to hazardous waste Prevent releases to the atmosphere	R504(1)c	270.14(b)
Precautions to prevent accidental ignition or reaction of ignitable, reactive or incompatible wastes	R504(1)c	264/17
Section G: Contingency Plan		
Contingency Plan and Emergency Procedures	R504(1)c	264D
Section H: Personnel Training		
Training programs sto operate and maintain TSDF	R504(1)c	270.14(b), 264.16
Section I: Closure/Post Closure Plan		
Closure/Post Closure Plans	R504(1)c	270.14(b), 264.112
Notices filed for hazardous waste units closed	R504(1)c	270.14(b)
Closure Cost Estimate	R504(1)c	264.142
Proof of Financial Assurance	R504(1)c	264.143
Post Closure Cost Estimate	R504(1)c	264.144
Proof of Financial Assurance	R504(1)c	264.145
Proof of Insurance	R504(1)c	264.147
Coverage by State Financial Mechanism	R504(1)c	264.149, 264.150
Closure/Post Closure Cost Estimate and Certificate of Construction	R508(1)c	

Proof of Financial Assurance	R508(1)e	
Section J: Environmental Assessment		
Environmental Assessment including Failure Mode Assessment with: Foreseeable potential release Pathways of human exposure Magnitude and nature of human exposure	R504(1)e	
Section K: Compliance with Other Federal Laws		
Other federal laws		
Section L: Facility Location Information		
Facility Location information Applicability of seismic standard per political jusrisdiction Demonstration of compliance with seismic standard Whether facility is in 100 year flood plain	R504(1)c	270.14(b)
Section M: Operating Records		
Operating Records reports procedures		
Section N: Traffic Information		
Traffic Pattern, estimated volume and control, access road surface and load bearing capacity	R504(1)c	170.14(b)
Section O: Inspection Schedule		
General Inspection Schedule	R504(1)c	264/15(b)

APPENDIX A-11

NATURE OF THE BUSINESS

NATURE OF THE BUSINESS

EQ Detroit, Inc. (EQD) is a Treatment, Storage and Disposal Facility (TSDF). EQD accepts hazardous and non-hazardous wastes as described in Section C; waste codes accepted at this facility are found in Table C-4 of this permit application. Details on storage, treatment and process capacity are found in Appendices A-13 through A-15 of this section.

EQD will accept wastes in bulk (gallon, yard, ton) or containers such as drums, roll-offs, totes and dump trailers, 5-gallon buckets, glass jars and vials and railcars. Waste treatment technologies include, but are not limited to, chemical fixation/stabilization, chemical oxidation, chemical reduction chemical precipitation, corrosive acid/base treatment, deactivation and oil treatment processing.

Appendix A- 12: Certificate of Capability to Dispose

R 299.9508(1)d

CERTIFICATION STATEMENT

CAPABILITY TO DISPOSE OF HAZARDOUS WASTE

EQ Detroit
1923 Frederick Street
Detroit, MI

I, Michael A. Olson, P.E, have directed the inspection and review of existing conditions, equipment and material specifications at the above site. My duties were to review the use and current condition of the facility and certify that it is capable of disposing of hazardous waste.

I hereby certify that the facility meets the minimum requirements of Part 111 of the Natural Resources and Environmental Protection Act PA 451, and of the Resource Conservation and Recovery Act, and is capable of storing and treating hazardous waste. This certification is per the requirements of Michigan Regulations (R 299.9508) Rule 508(d), which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act 40 CFR 264.

I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Certifier: M.A. Olson

Name of Certifier: Michael A. Olson, P.E.

Date of Certification: September 10, 2008

Professional Engineer Registration No: 34978

State of Registration: Michigan

APPENDIX A-13
PERMITS OR CONSTRUCTION APPROVALS

R 299.9504(1)B
AND
40 CFR 270..13(K)

Refer to Appendix A-3 “List of Environmental Permits”

APPENDIX 14

DESCRIPTION OF HAZARDOUS DEBRIS CATEGORIES AND CONTAMINANT CATEGORIES

R 2999504.(1)b

and

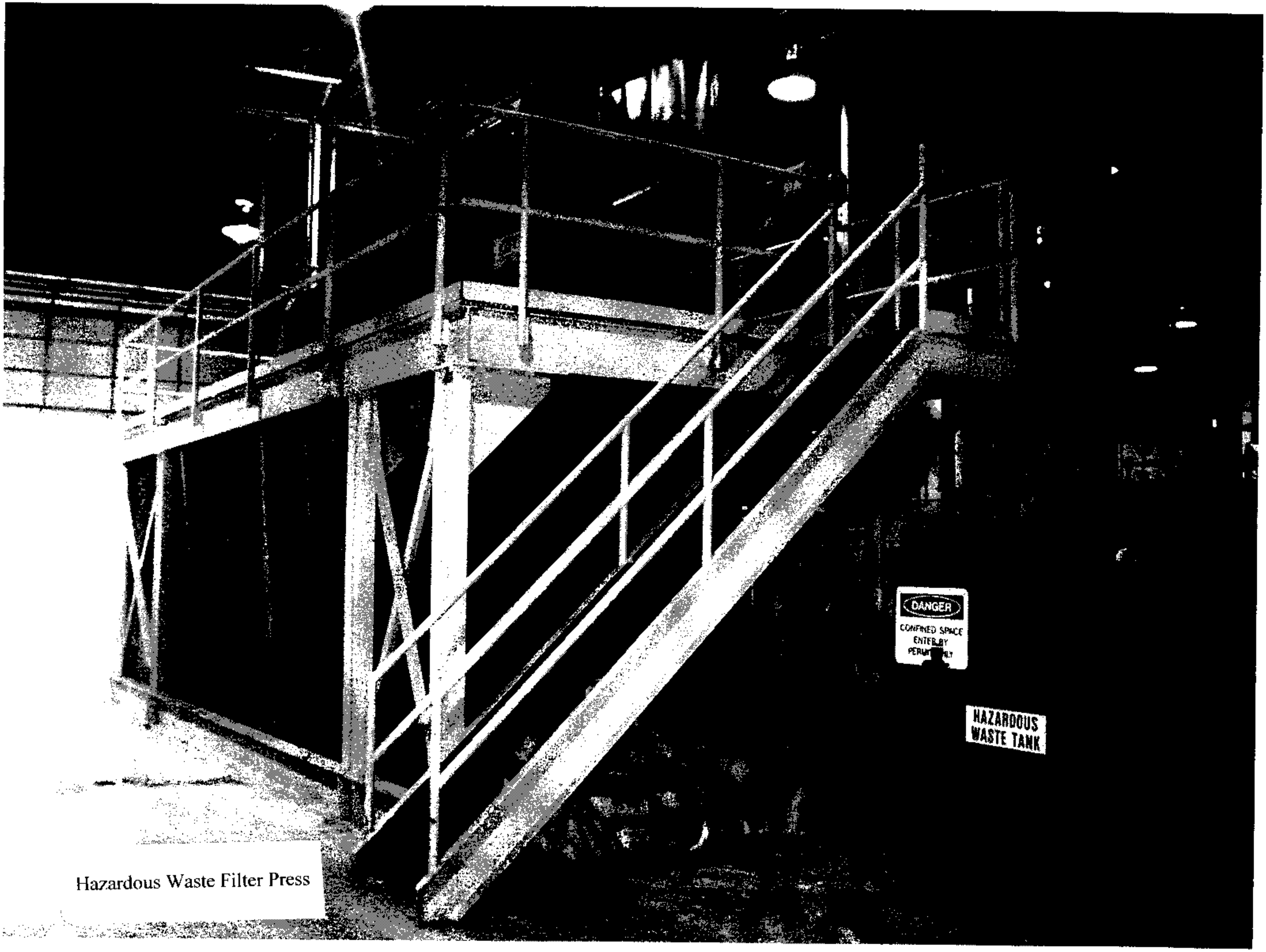
40 CFR 270.13

Hazardous Debris must be treated prior to Land Disposal, unless the debris is no longer contaminated with hazardous waste, or the debris is treated to the specific treatment standards specified in 40 CFR 268.5 using technologies identified in Table I of 268.45. Treated hazardous Debris will be managed as specified in 268.45(c). Contaminant categories in debris may include those contaminants identified in Table UTS of 40 CFR

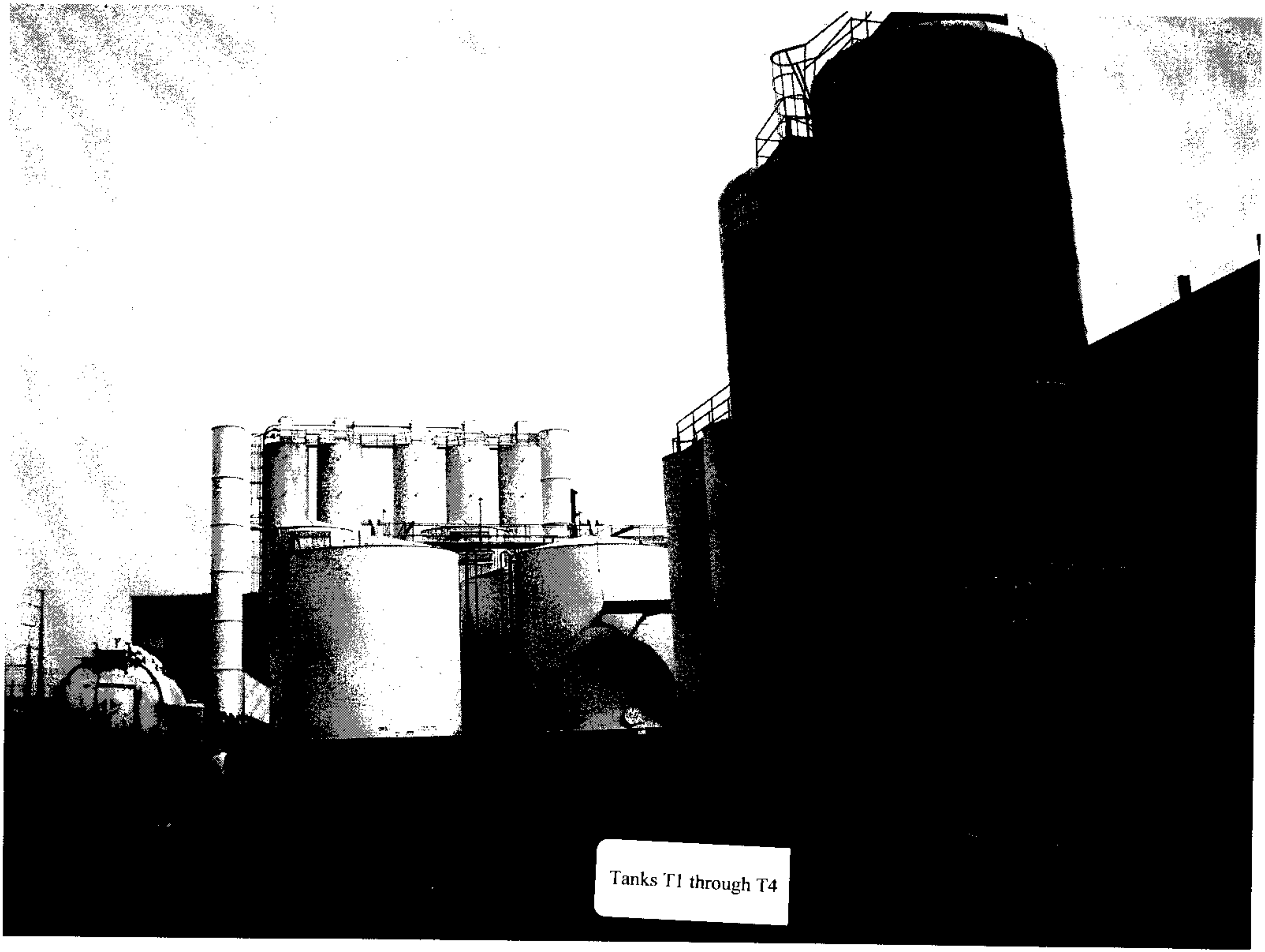
This information is found in Section C: Waste Analysis Plan of this Application

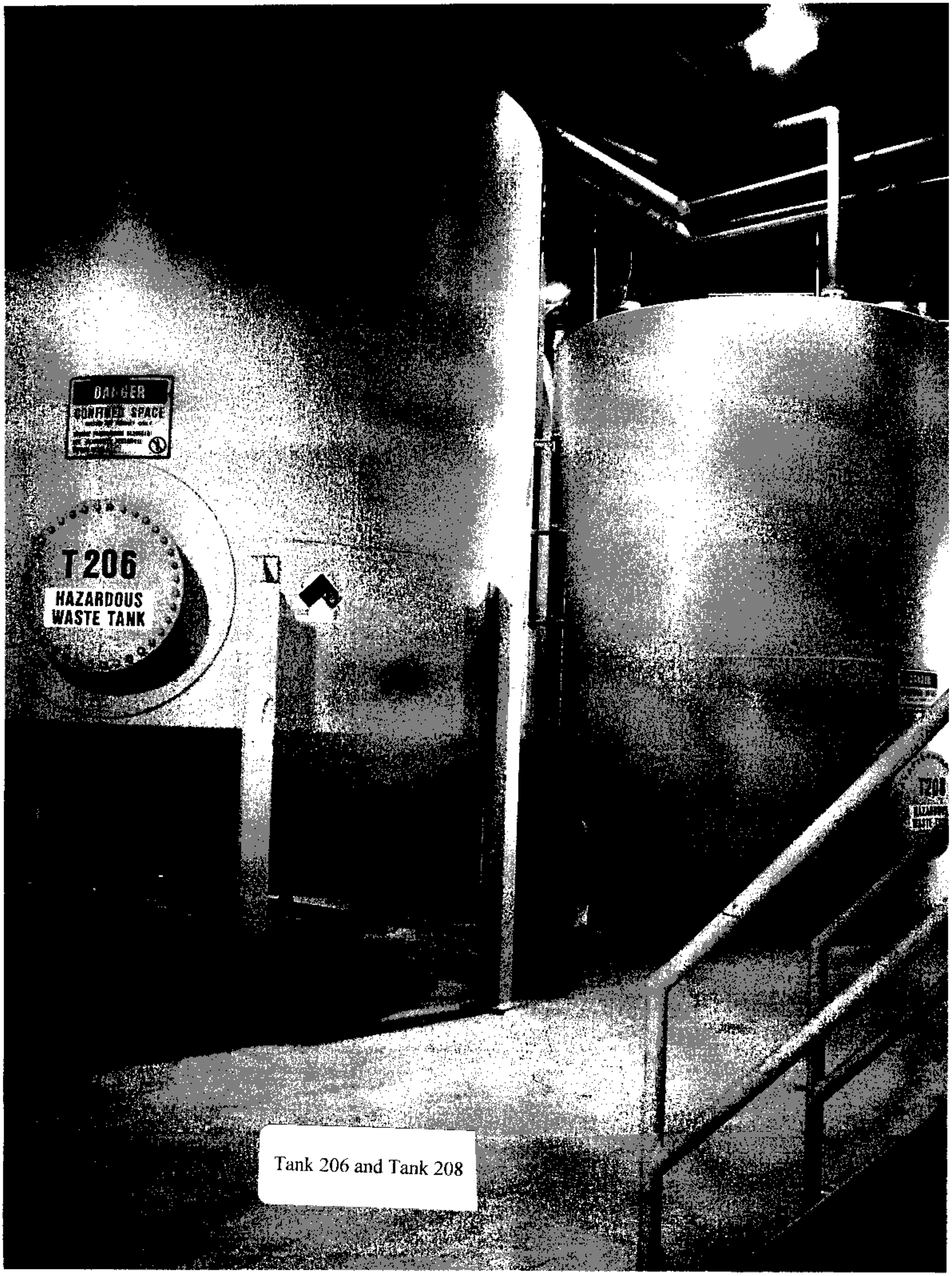
APPENDIX A-15
FACILITY PHOTOGRAPHS

Squirt Protection Rail Cars Area

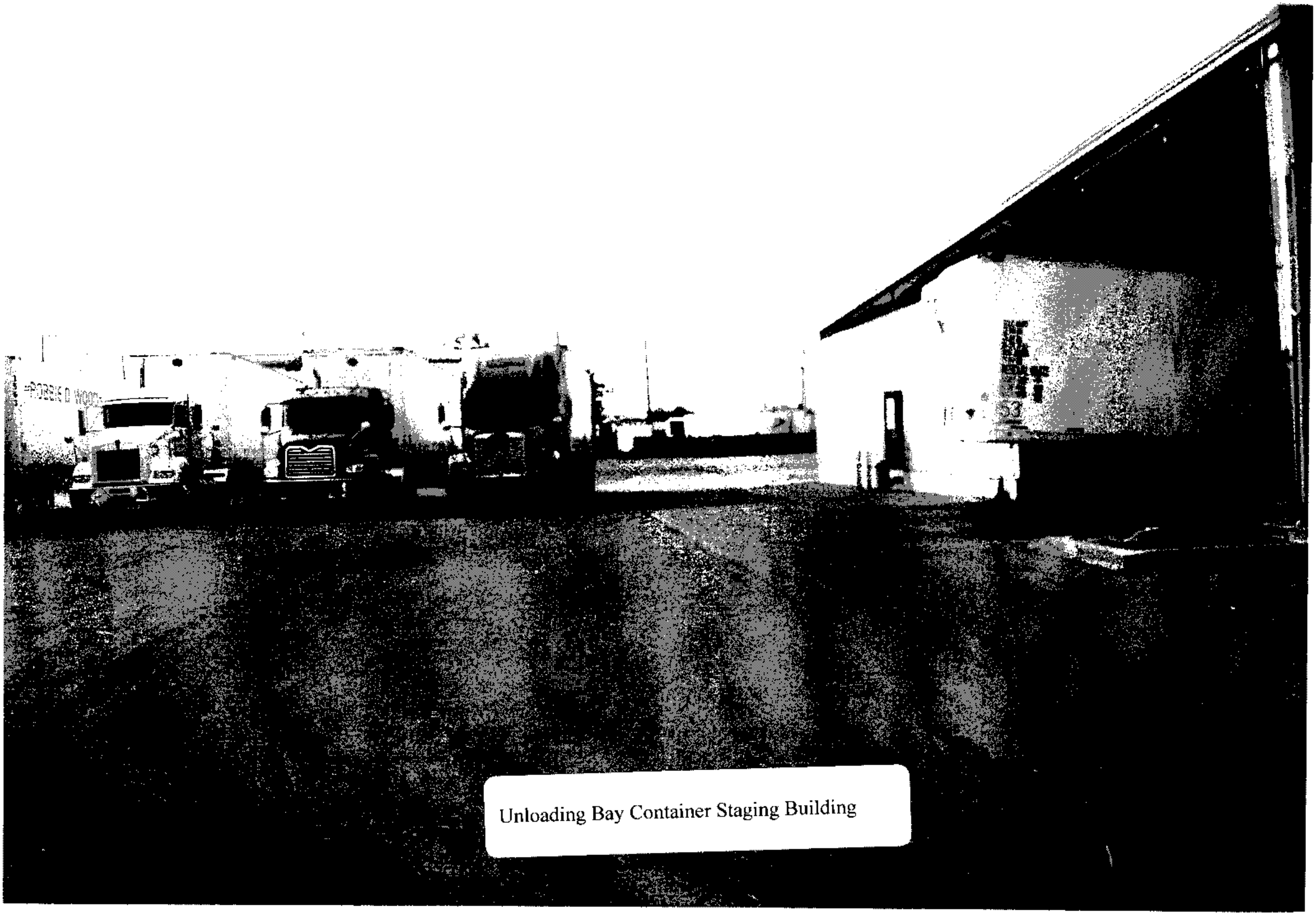


Hazardous Waste Filter Press

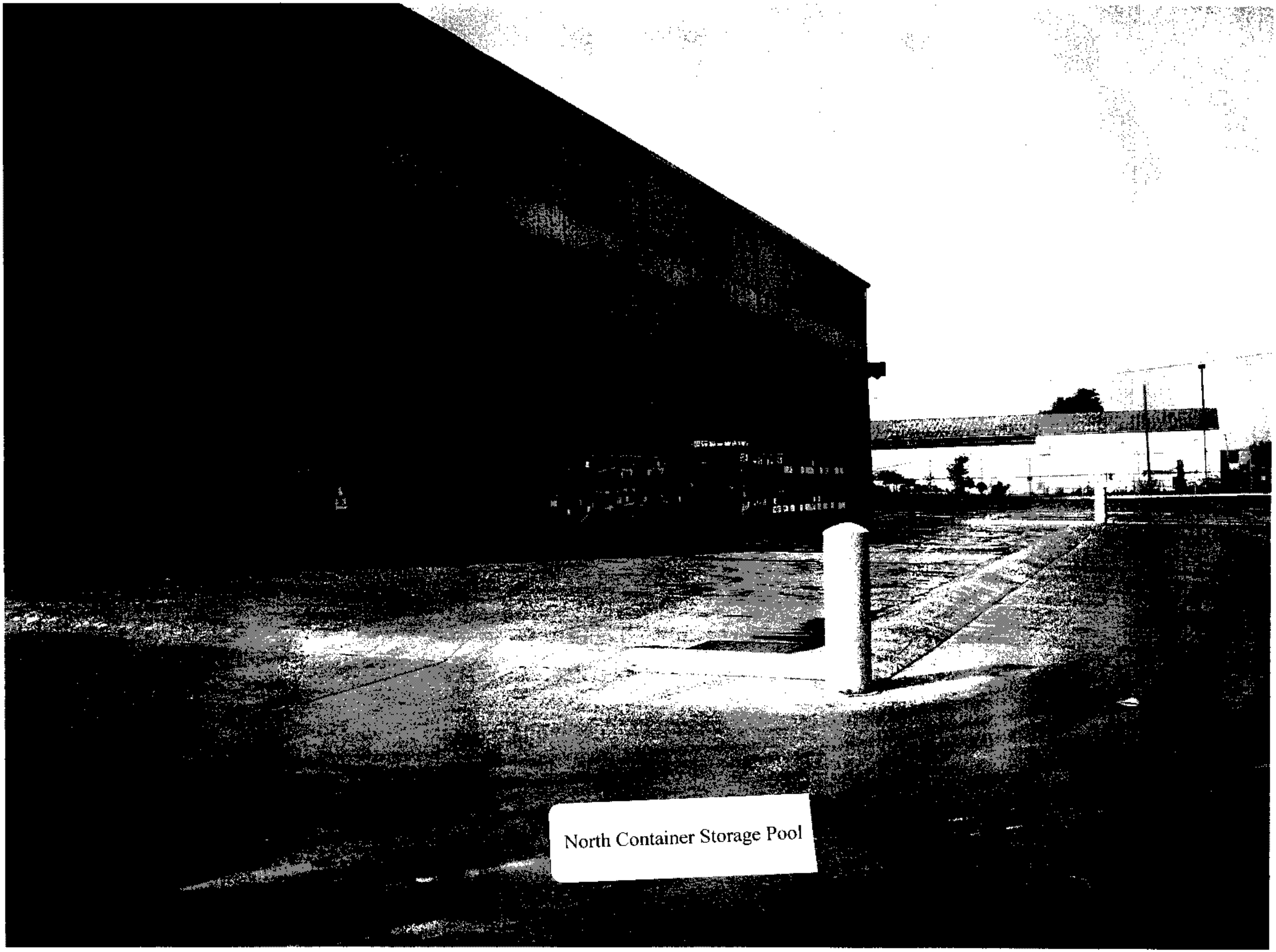

Tanks T1 through T4

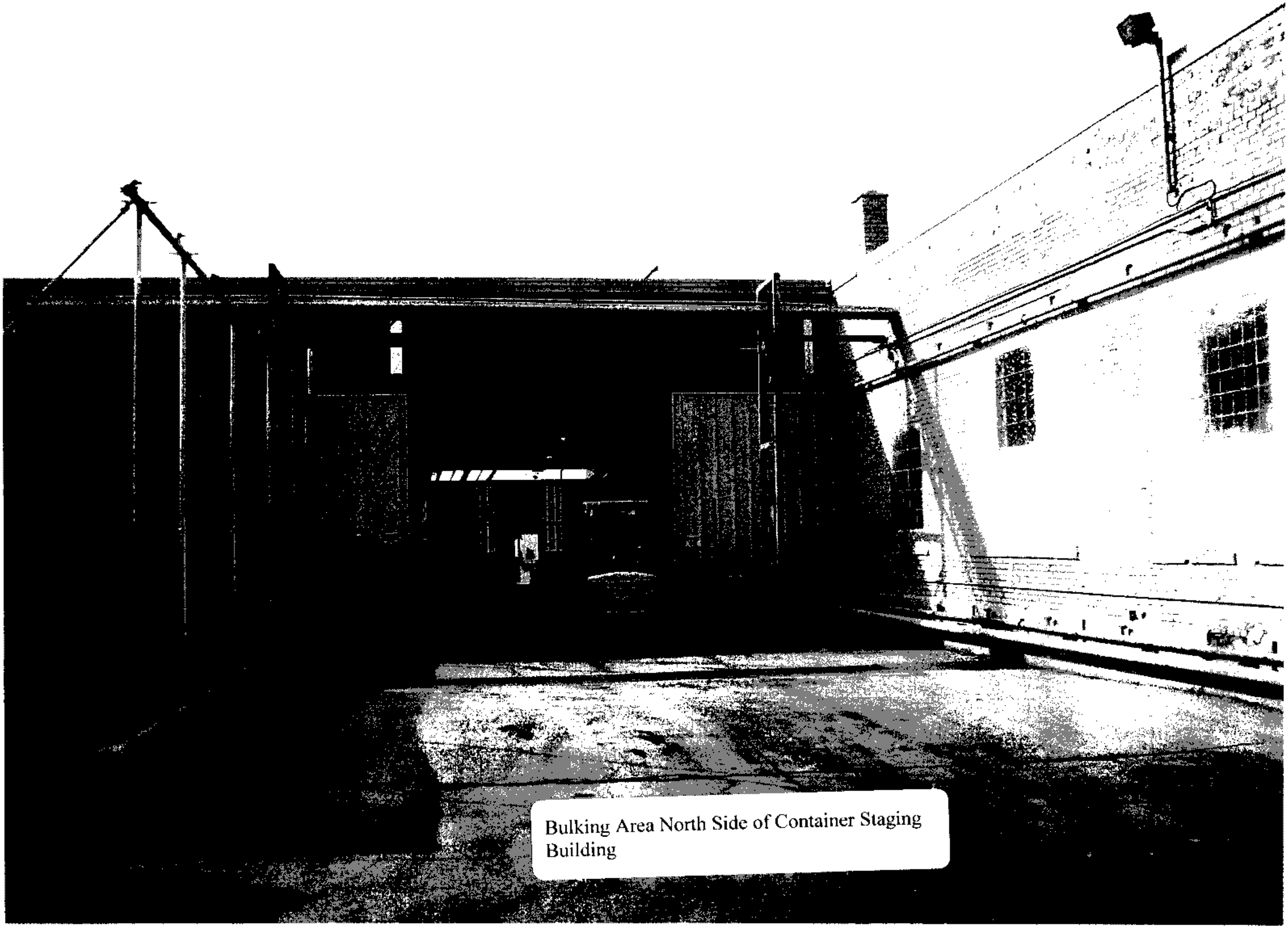


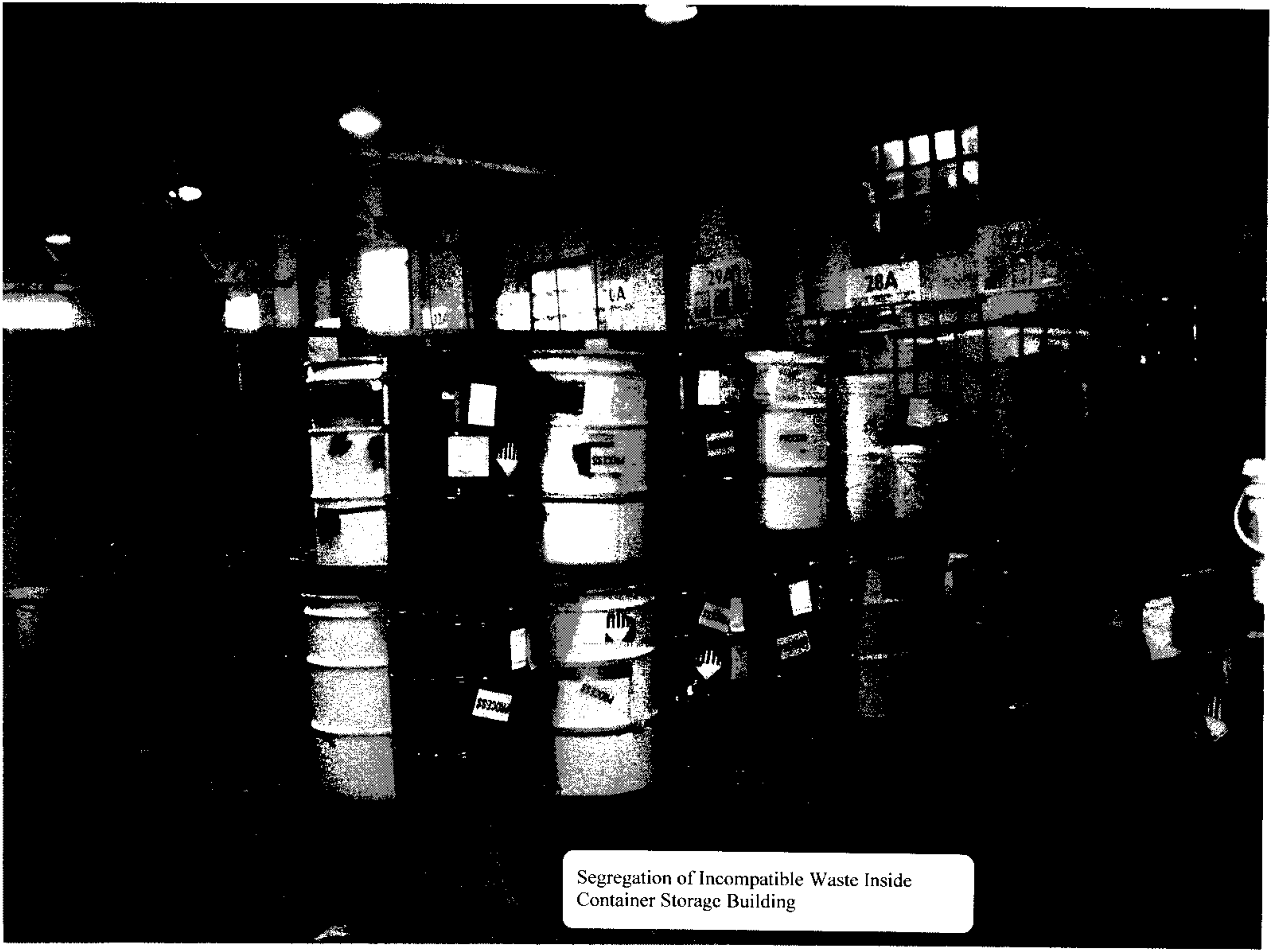
Tank 206 and Tank 208



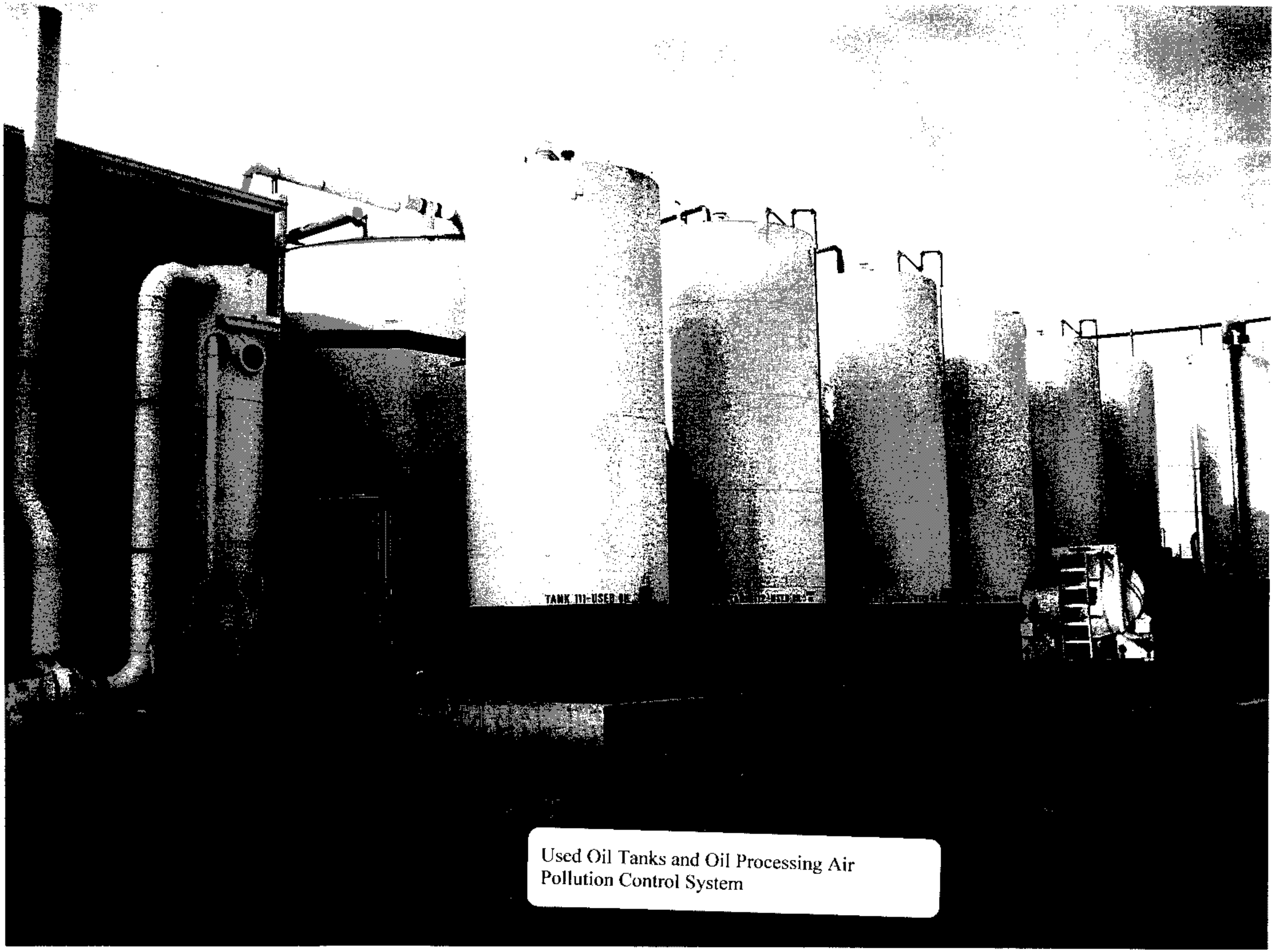
Unloading Bay Container Staging Building


North Container Storage Pool

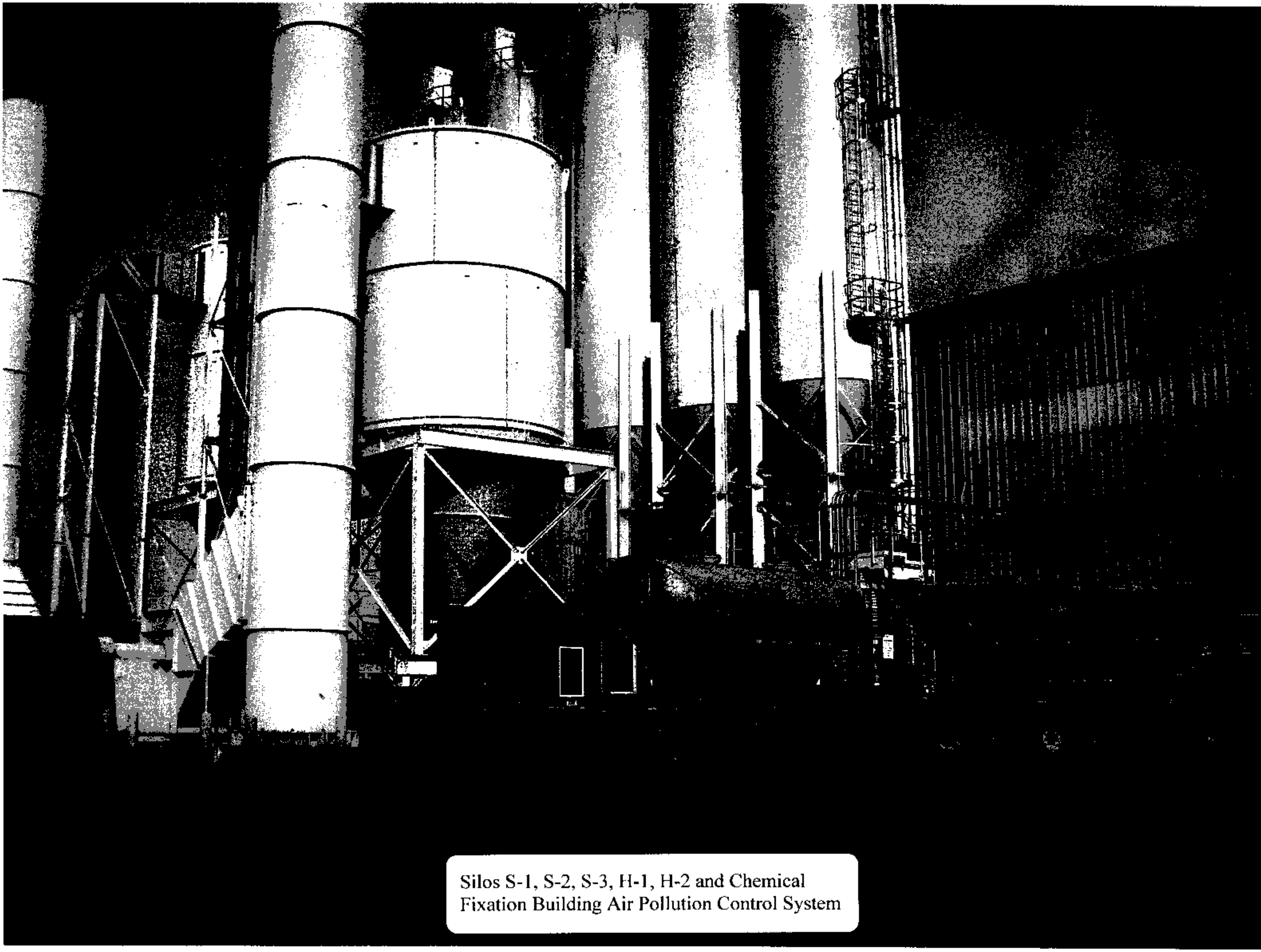

Bulking Area North Side of Container Staging Building



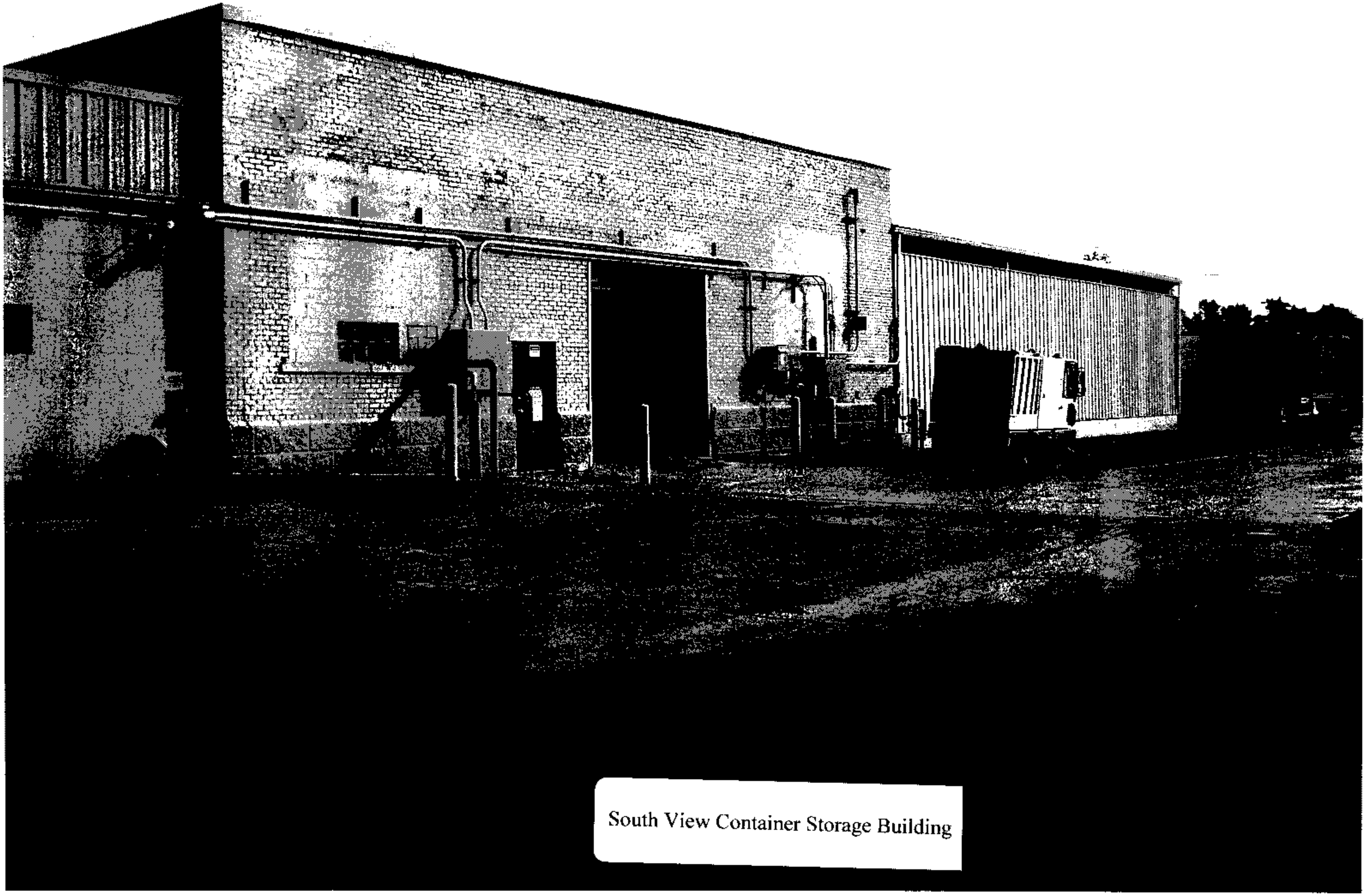
Segregation of Incompatible Waste Inside
Container Storage Building



Used Oil Tanks and Oil Processing Air Pollution Control System

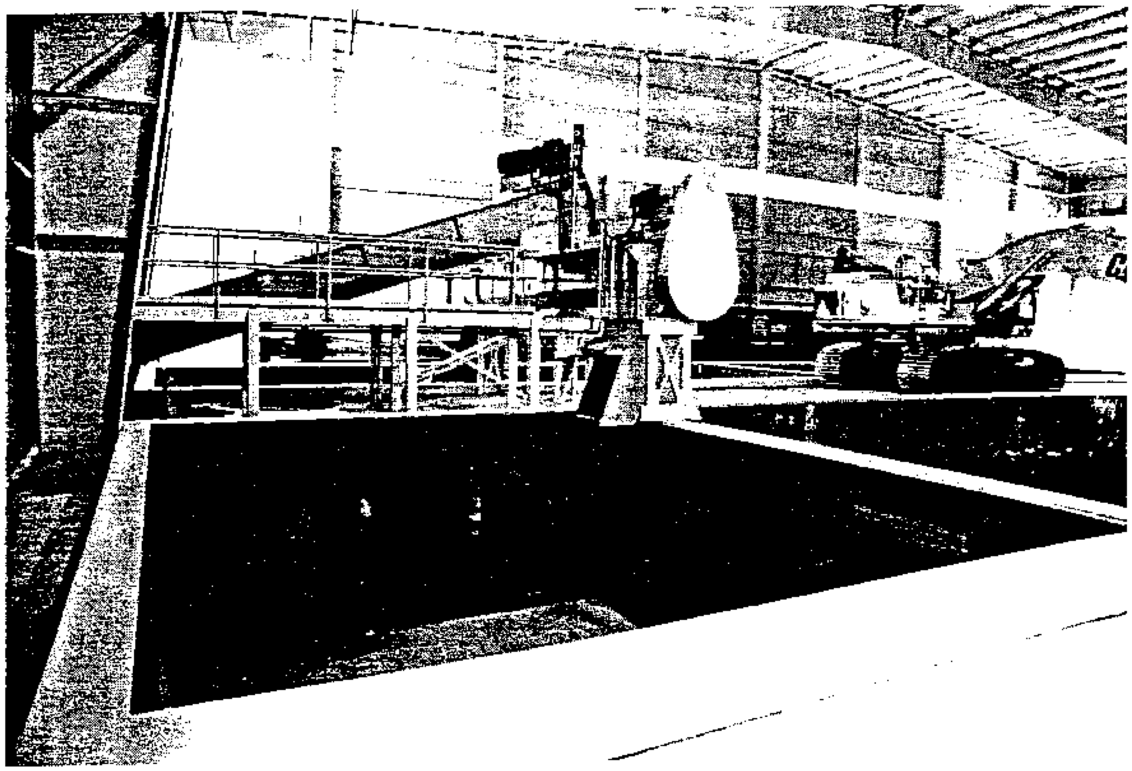


Silos S-1, S-2, S-3, H-1, H-2 and Chemical
Fixation Building Air Pollution Control System

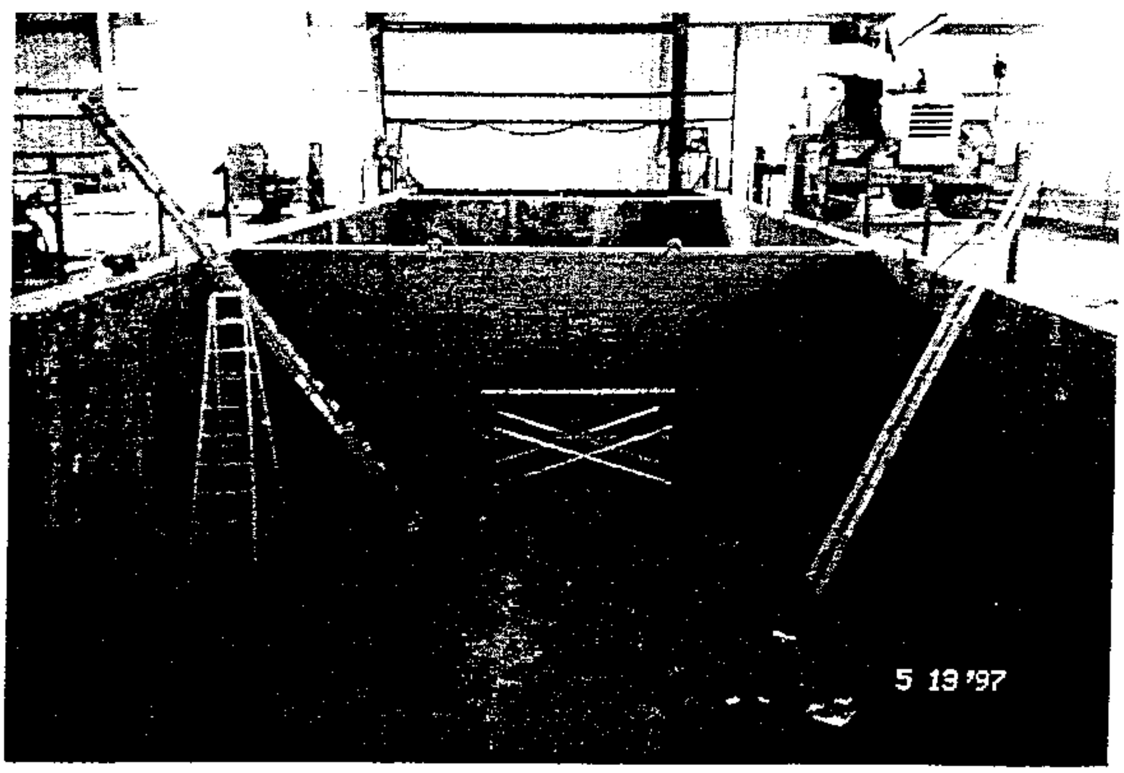


South View Container Storage Building

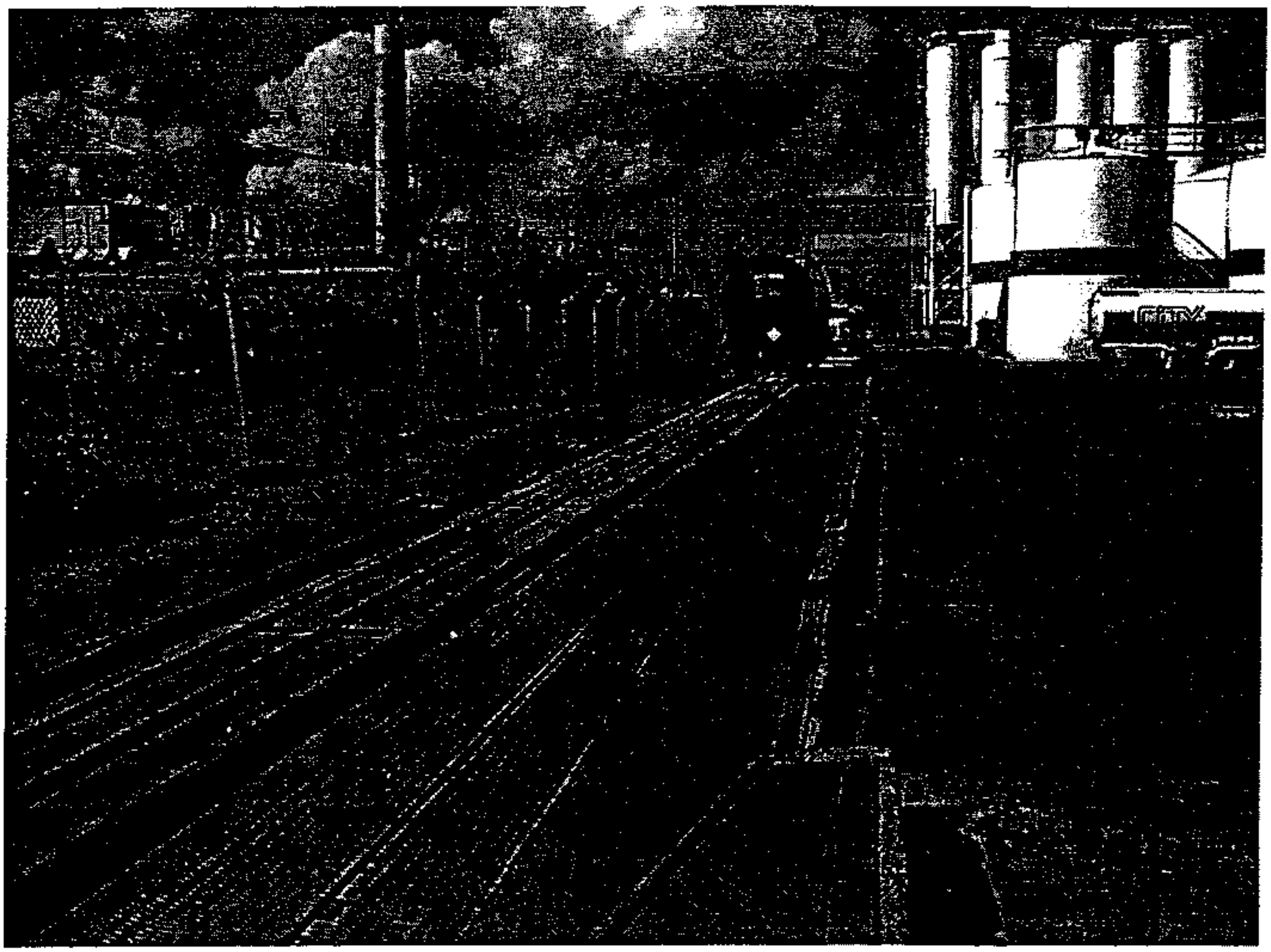
Tank 203



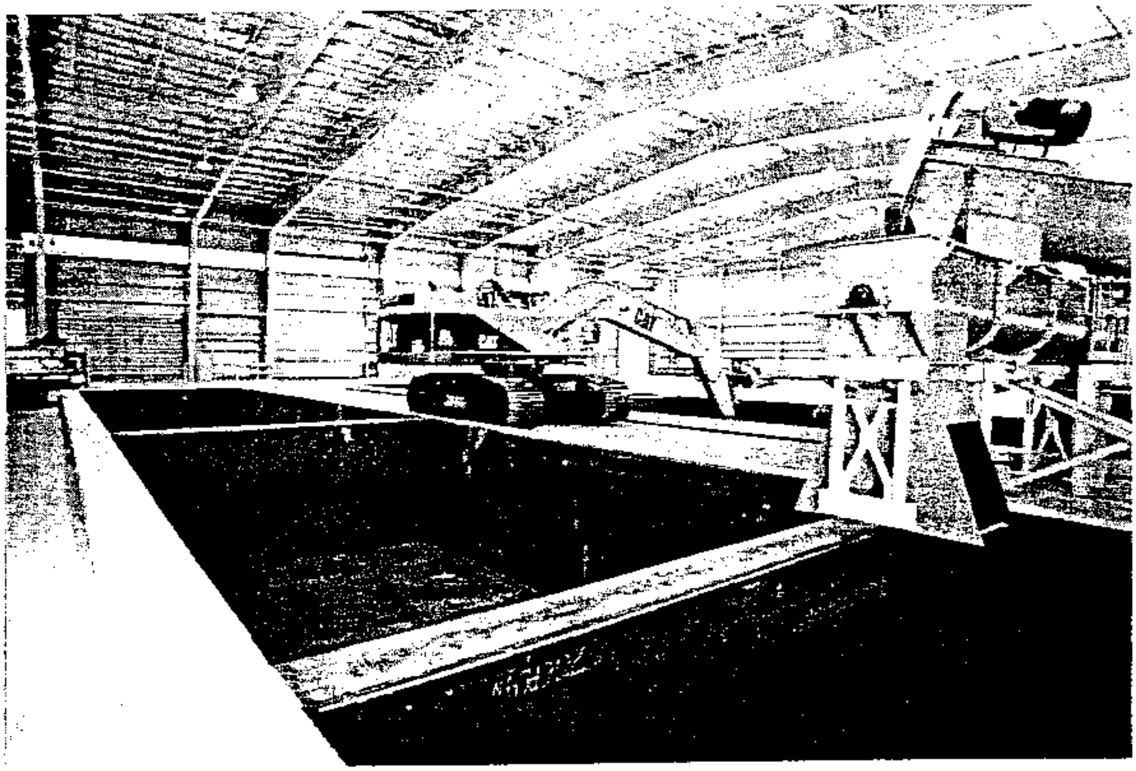
Vault 701



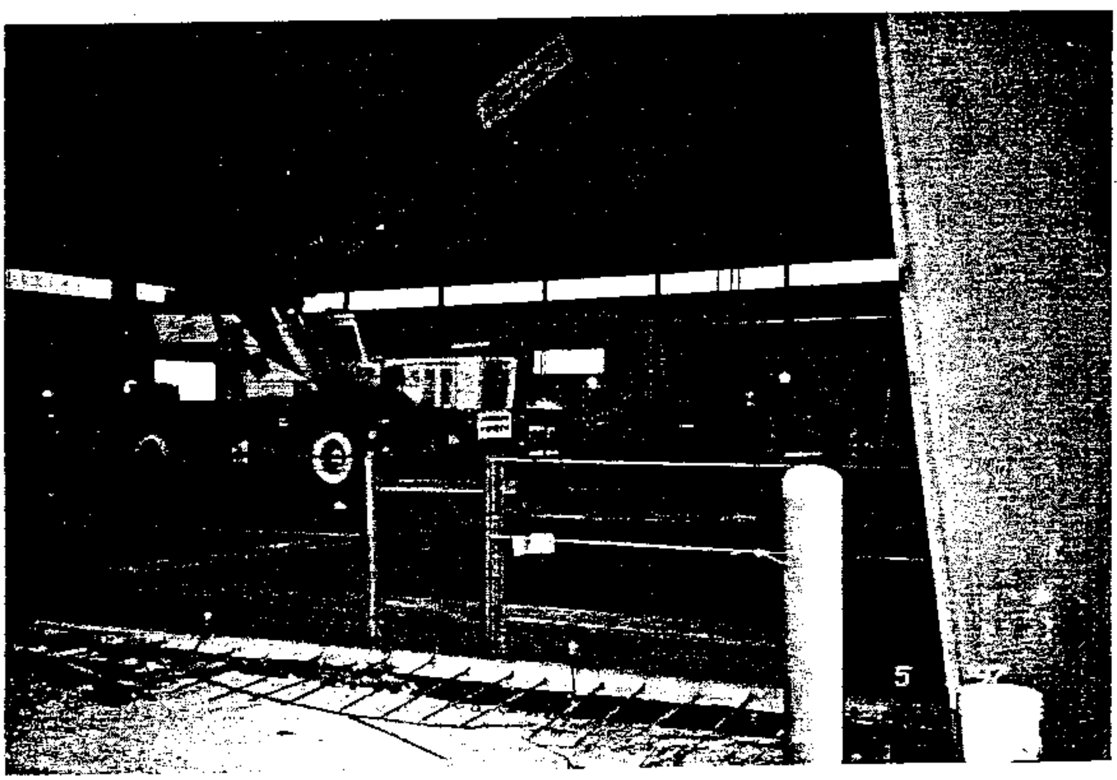
Vault 702



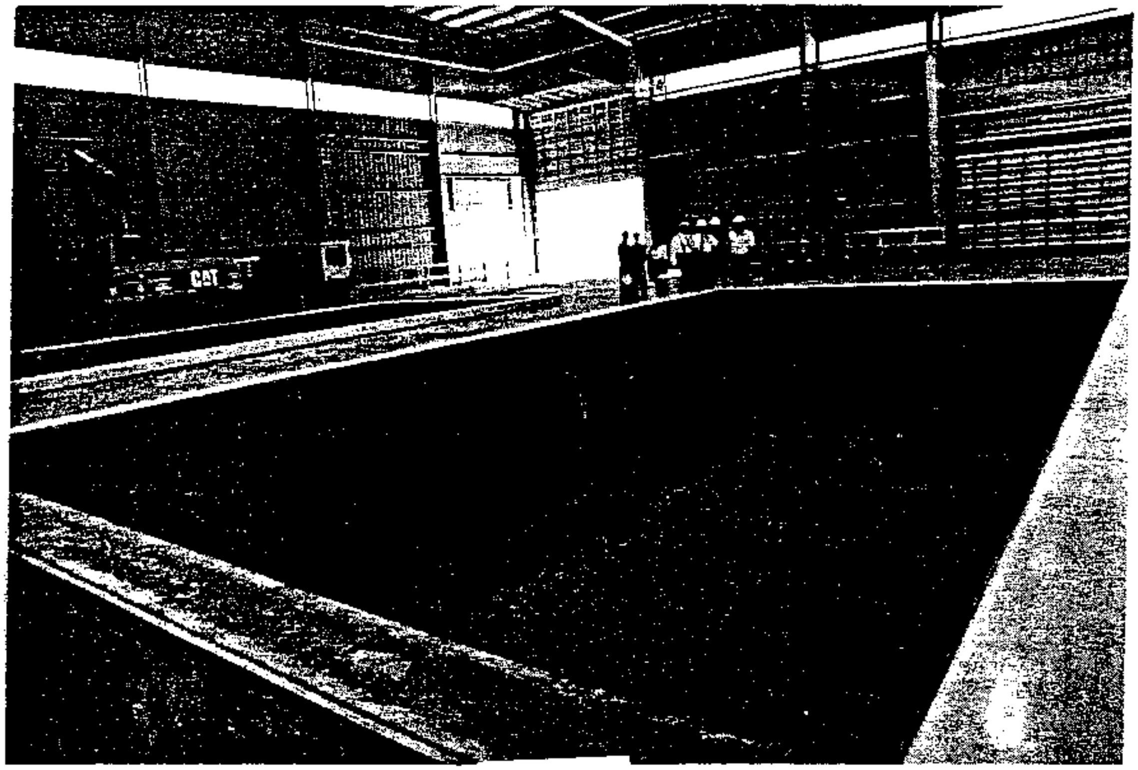
Railroad Unloading Area



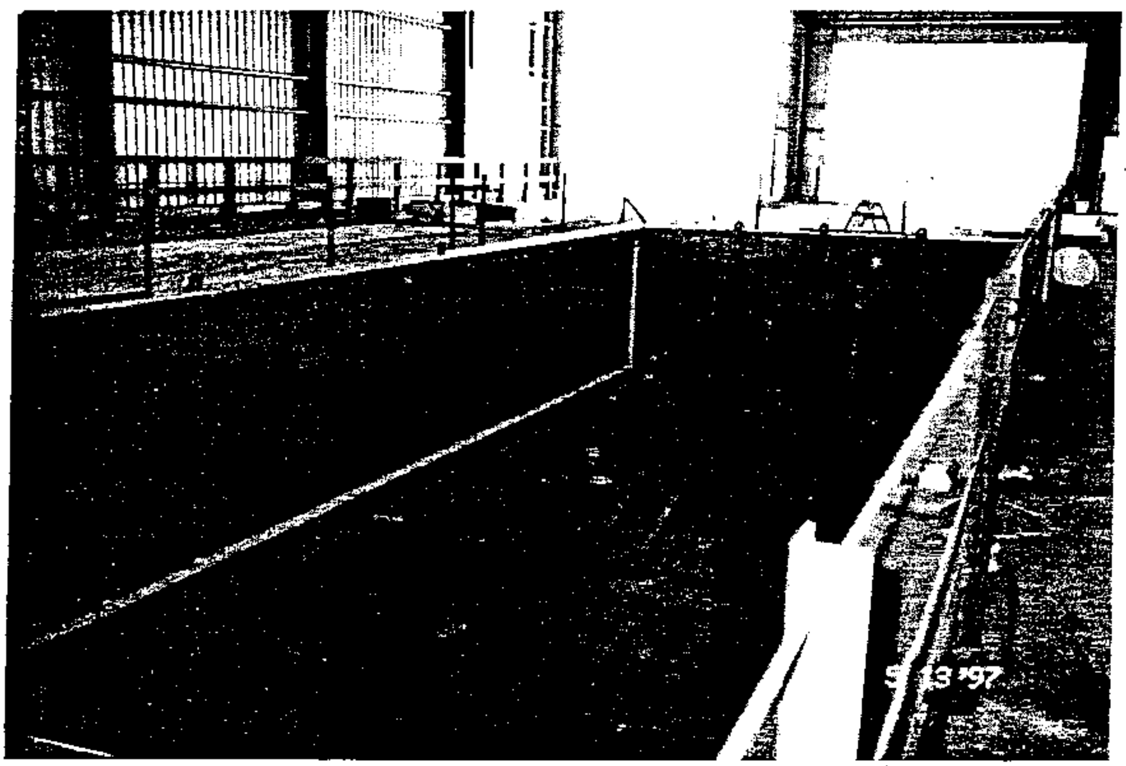
Vault 705



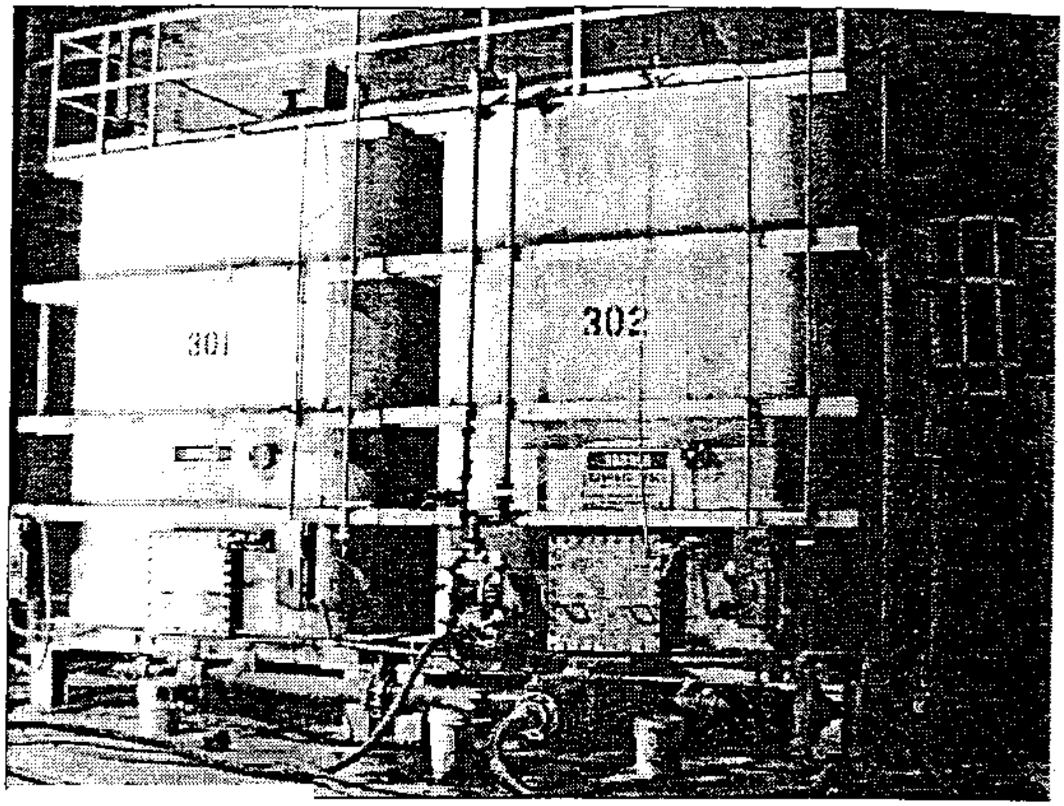
Vault 706



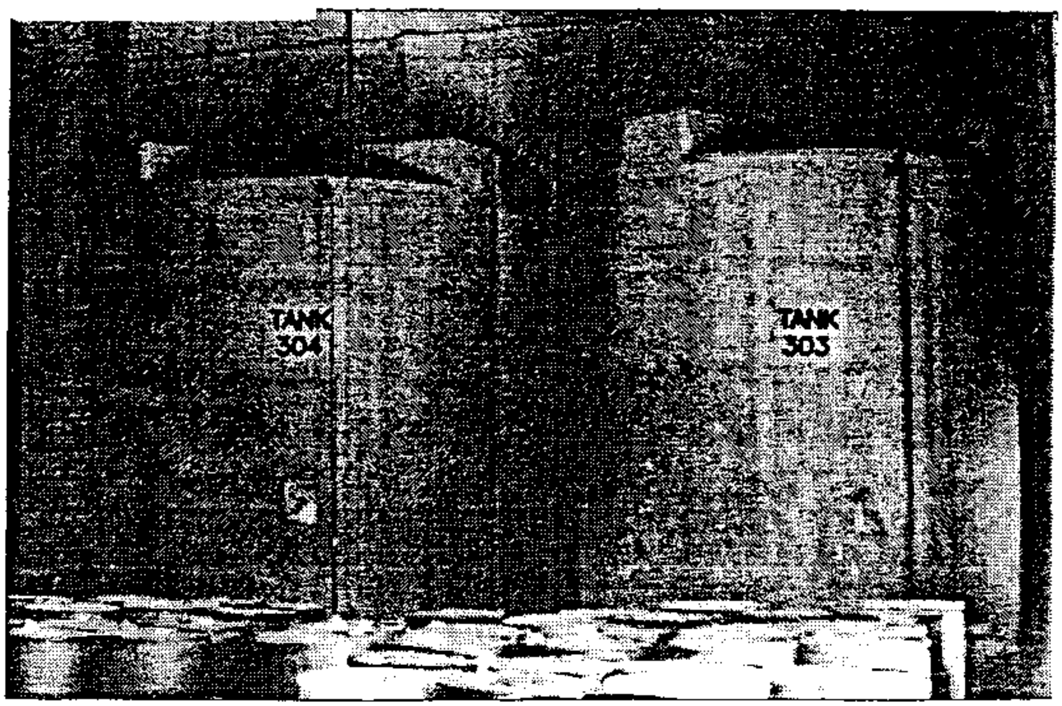
Vault 703



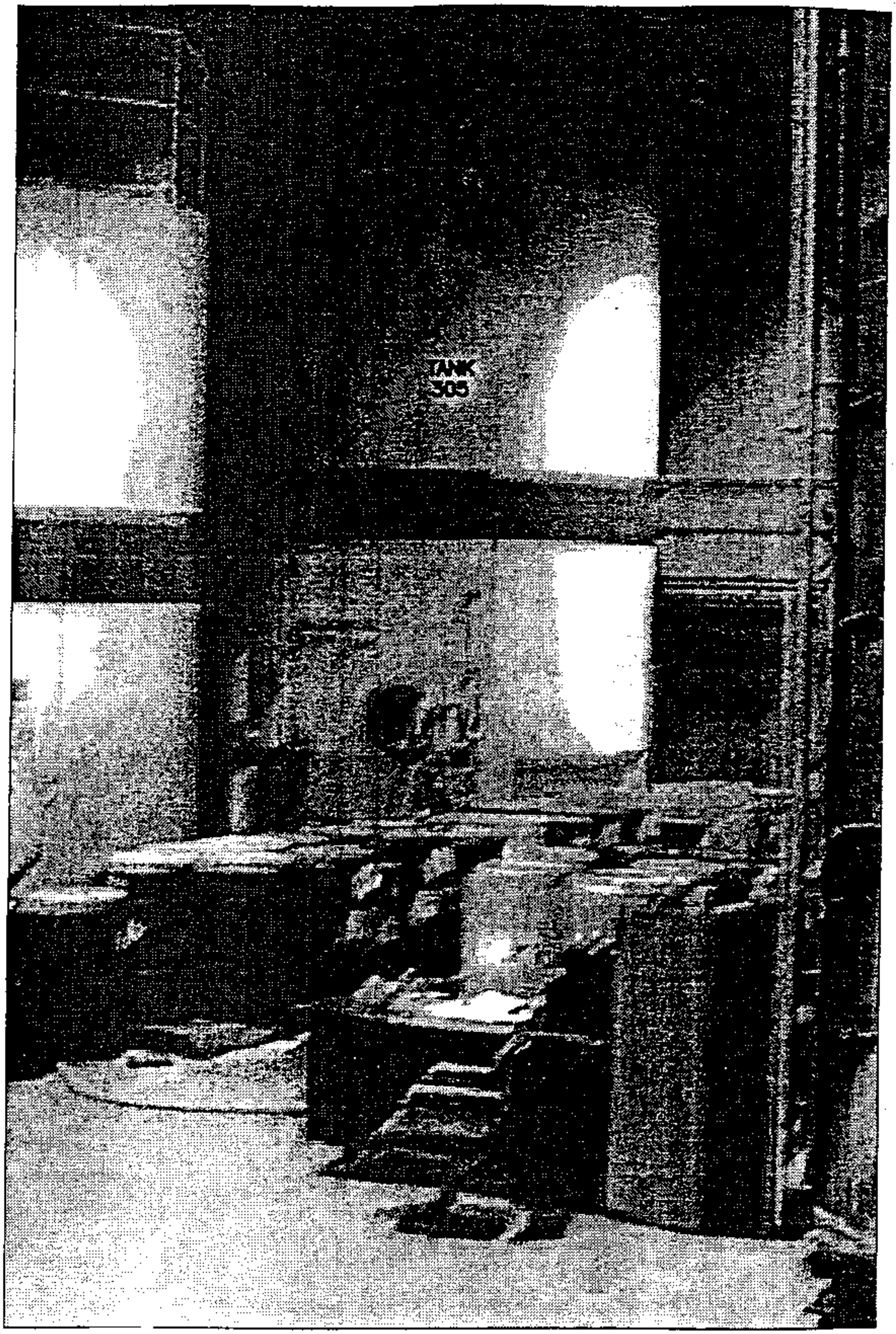
Vault 704



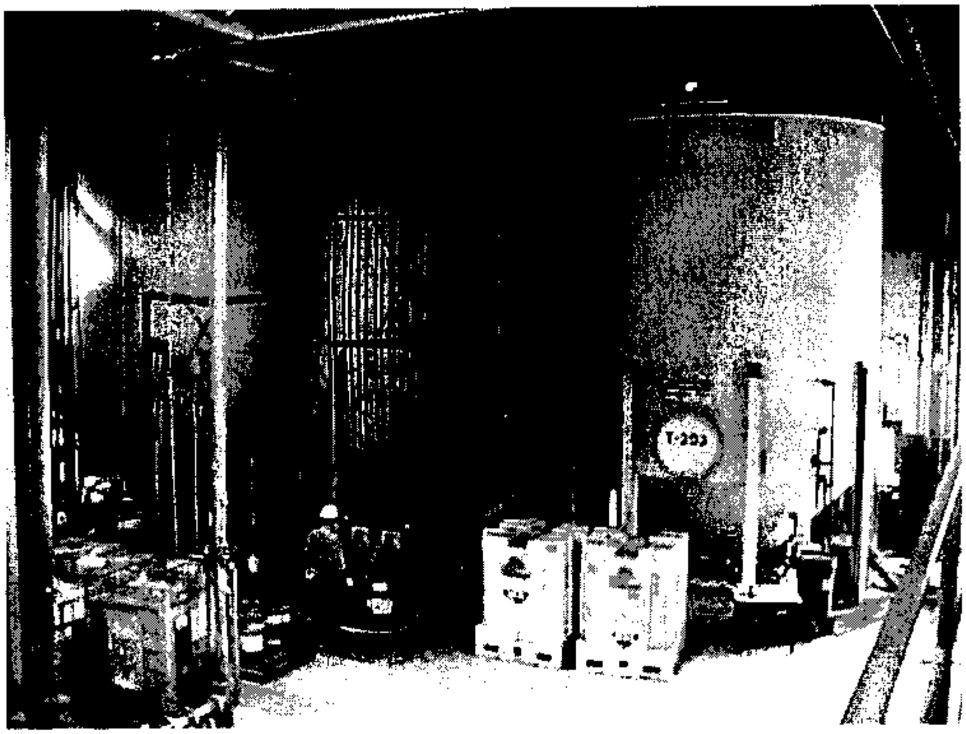
Tanks 301 and 302



Tanks 304 and 303



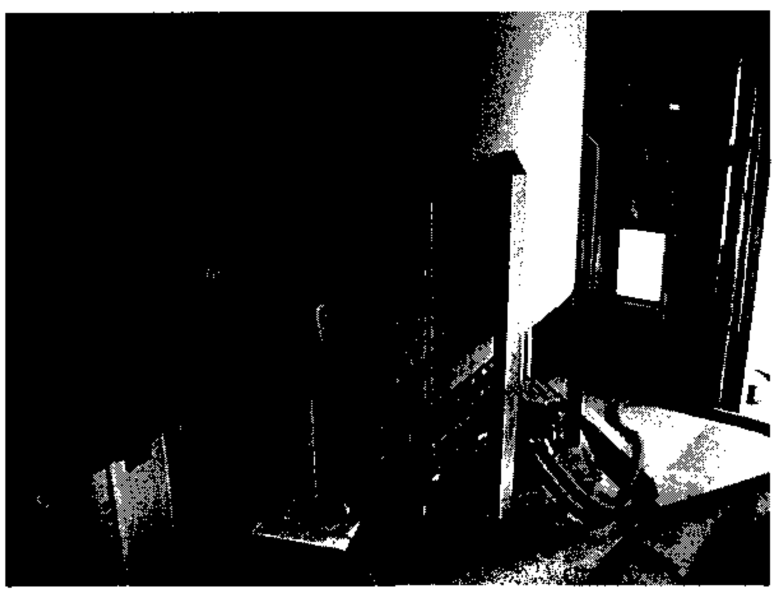
Tank 305



Tanks 201, 202, and 203

Tank 201

Tank 202



Tank 203

Appendix D- 1: Tank Certification

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 201

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 201, located in the Northwest corner of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 202

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 202, located in the Northwest corner of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E.
NAVARRE
ENGINEER
No.
22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 203

I, David E. Navarre, P.E., have reviewed design and installation specifications regarding Tank 203, to be installed in the Northwest corner of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the proposed use and certify that it is suitable for the proposed service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.192 and 264.193. This certification specifically covers 40 CFR 264.192, paragraphs (a) through (g), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Certifier:	David E. Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	November 19, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No.
22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

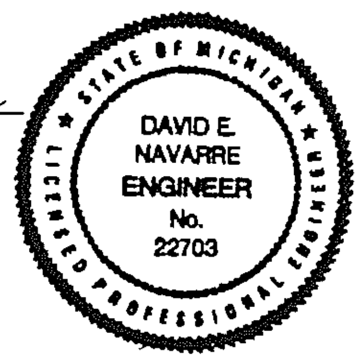
CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 204

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 204, located at the South end of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan



Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 205

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 205, located at the South end of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 206

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 206, located at the South end of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

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Signature of Certifier:	
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 207

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 207, located East of the filter press in Building B at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

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Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 301

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 301, located in the Acid Treat Room of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

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Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE ENGINEER No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 302

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 302, located in the Acid Treat Room of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

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Signature of Certifier:	
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 303

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 303, located in the Acid Treat Room of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

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Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 304

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 304, located in the Acid Treat Room of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

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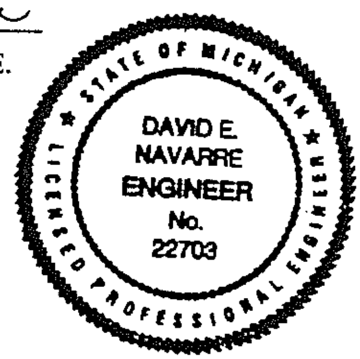
Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan



Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 305

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 305, located in the Acid Treat Room of Building B of the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b), (c), and (d), and 40 CFR 264.193 paragraphs (a), (b), (c)(1) – (c)(4), and (d) – (h).

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Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 701

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 701, located in Southeast corner of Building D at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b)(1) – (b)(4), (b)(5)(ii), (c), and (d), and 40 CFR 264.193 paragraphs (a) – (h).

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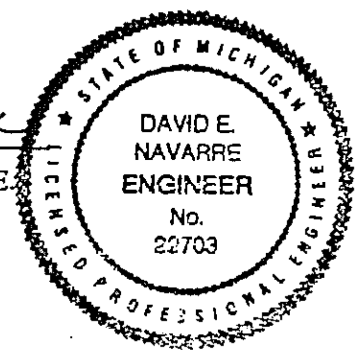
Signature of Certifier:	
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan



Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 702

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 702, located in Southeast corner of Building D at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b)(1) – (b)(4), (b)(5)(ii), (c), and (d), and 40 CFR 264.193 paragraphs (a) – (h).

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Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 703

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 703, located in Southeast corner of Building D at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b)(1) – (b)(4), (b)(5)(ii), (c), and (d), and 40 CFR 264.193 paragraphs (a) – (h).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Certifier:	David E Navarre
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E.
NAVARRE
ENGINEER
No.
22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 704

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 704, located in Southeast corner of Building D at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b)(1) – (b)(4), (b)(5)(ii), (c), and (d), and 40 CFR 264.193 paragraphs (a) – (h).

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Signature of Certifier:	
Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No.
22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 705

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 705, located in Southeast corner of Building D at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b)(1) – (b)(4), (b)(5)(ii), (c), and (d), and 40 CFR 264.193 paragraphs (a) – (h).

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Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 706

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 706, located in Southeast corner of Building D at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b)(1) – (b)(4), (b)(5)(ii), (c), and (d), and 40 CFR 264.193 paragraphs (a) – (h).

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Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

CERTIFICATION STATEMENT

HAZARDOUS WASTE TANK 901

I, David E. Navarre, P.E., have reviewed inspection data regarding Tank 901, located East of Building D at the City Environmental, Inc., Hazardous Waste Processing Facility at 1923 Frederick Street in Detroit, Michigan. My duties were to review the use and current condition of the tank and certify that it is suitable for continued service. This certification is per the requirements of Michigan Regulations (R299.9615) Rule 615, which incorporates U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act CFR 264.191 and 264.193. This certification specifically covers 40 CFR 264.191, paragraphs (a), (b)(1) – (b)(4), (b)(5)(ii), (c), and (d), and 40 CFR 264.193 paragraphs (a) – (h).

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Name of Certifier:	David E. Navarre, P.E.
Date of Certification:	September 27, 1999
Professional Engineer Registration No:	22703
State of Registration:	Michigan

STATE OF MICHIGAN
DAVID E. NAVARRE
ENGINEER
No. 22703
LICENSED PROFESSIONAL ENGINEER

Prepared by: McNamee Industrial Services, Inc.

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

April 23, 2007

CERTIFIED MAIL

Ms. Kristen Rachwal, CHMM
Regulatory Specialist
EQ Detroit, Inc.
1923 Frederick Street
Detroit, Michigan 48211

Dear Ms. Rachwal:

SUBJECT: Tanks T-204, T-205, and T-206 Partial Closure Report and Certification; EQ Detroit, Inc. (EQD); MID 980 991 566

Thank you for your February 7, 2007, letter to the Department of Environmental Quality (DEQ), Waste and Hazardous Materials Division (WHMD), regarding EQD's Partial Closure Report and Certification for tanks T-204, T-205, and T-206 (Certification).

The WHMD has reviewed the Certification. Based on that review, the WHMD has determined the Certification is acceptable. The WHMD understands that this partial closure and certification was a result of EQD replacing tanks T-204, T-205, and T-206 with three new tanks to be used for the same purposes. The new replacement tanks were approved as part of a modification to the hazardous waste management facility operating license issued pursuant to Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

This acceptance of the certification of partial closure does not constitute a release from any facility-wide corrective action responsibilities EQD may have under Part 111. In addition to the responsibility to close regulated hazardous waste management units, EQD is responsible to conduct corrective actions for all releases of hazardous waste from the facility, regardless of when the hazardous waste may have been placed in, or released from, the facility.

Should you have any questions regarding this acceptance, please contact Mr. Richard Conforti, Hazardous Waste Section, WHMD, at 517-241-2108.

Sincerely,

George W. Bruchmann, Chief
Waste and Hazardous Materials Division
517-373-9523

cc: Mr. Scott Maris, EQD
Mr. John Barta, EQD
Mr. Scott Binder, EQD
Mr. Timothy Tilotti, EQD
Mr. Steve Buda, DEQ
Mr. Richard Conforti/HWS-C&E File, DEQ
Ms. Jeanette Noechel, DEQ

DETROIT, Inc.
1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • TEL 800 495 6059 • FAX 313 923 3375 • www.eqonline.com

VIA OVERNIGHT DELIVERY

February 7, 2007

Mr. George Bruchmann, Chief
Waste & Hazardous Materials Division
Michigan Department of Environmental Quality
525 West Allegan
Lansing, Michigan 48909-7741

SUBJECT: EQ Detroit, Inc.; MID 980 991 566
Tanks T-204, T-205 and T-206 Partial Closure Report and Certification

Dear Mr. Bruchmann:

EQ Detroit, Inc. (EQD) has completed the partial closure of three regulated tanks, T-204, T-205, and T-206. Partial closure activities, following the closure procedure for aboveground storage tanks found in section 5 (Appendix I-3 of the Application) of EQD's Operating License Attachments, were initiated on January 16, 20074 and were completed January 18, 2007. EQD intends to replace the three tanks with three new tanks to be used for the same purposes. The new T-204 and T-205 will be used for batch treatment/storage, the new T-206 for listed waste filtrate holding. These tanks were approved through the modification of Items 14 and 15 of Operating License Condition VII.A, Compliance Schedule.

Tank and Waste Description
Tanks T-204 and T-205 were vertical, 9,000 gallon steel aboveground tanks, which were utilized for batch treatment of hazardous waste. Tank T-206 was a vertical, 10,500 gallon steel aboveground tank used for listed waste filtrate holding in the sludge dewatering process. They were located in the western section of the Main Plant Building. The tanks last contained hazardous wastewaters and listed filtrate.

Waste Removal
All of the waste that had been stored in tanks T-204, T-205 and T-206 was processed onsite prior to beginning partial closure.

Decontamination
All three tanks were rinsed under high pressure in accordance with EQD's closure plan referenced above. Approximately 16,000 gallons of liquid/sludge material was collected. The piping, pumps and valves associated with the three tanks were cleaned and dismantled. The tanks were originally installed on 6" high concrete platforms, which were removed. EQD personnel visually inspected the remainder of the floor around the tanks and no evidence of spills or leaks was found.

Characterization
Because the waste in the three tanks was assumed to be listed based on generator knowledge, and because the waste was to be stabilized on-site, laboratory characterization was not performed. Batch analysis performed on the treated vault, however, shows no detectable constituents. The concrete was analyzed and proved to be non-hazardous. Copies of the laboratory analysis are attached.

Disposal
The residue and combined rinseate from the three tanks was stabilized in a vault dedicated for treatment of listed waste in the Chemical Fixation Building. The batch was ultimately disposed at the Envirosafe Landfill located in Oregon, Ohio. The piping, pumps and valves associated with the three tanks were dismantled, and the tanks were removed and cut into pieces to be disposed of at a local steel scrap yard. The concrete will be disposed of in a non-hazardous vault in the Chemical Fixation Building.

Certification
An independent Professional Engineer was contracted to review EQD's partial closure activities and provide certification that tanks T-204, T-205 and T-206 have been closed in accordance with the specifications in the referenced closure plan. The certification is attached.

Should you need further information or if there are any questions that arise as a result of this notification, please contact me at 313-347-1328.

Sincerely,

Kristen C Rachwal

Kristen Rachwal, CHMM
Regulatory Specialist
EQ Detroit, Inc.

Enclosures

cc: Jeanette Noechel, DEQ
Richard Conforti, DEQ
Scott Maris, EQ
Tim Tilotti, EQ
Scott Binder, EQD
John Barta, EQD

Abletech, Inc.
6449 Lintons Way
Ann Arbor, MI 48105
Tel. 734.677.2420
Fax. 734-222-7556

February 12, 2007

Ms. Kristen Rachwall, CHMM
EQ Detroit, Inc.
1923 Frederick St.
Detroit, MI 48211

Re: Partial Closure of Tanks T-204, T-205, and T-206
EQ Detroit, Inc.; MID 980 991 566

Dear Ms. Rachwall:

Pursuant to your request I have reviewed the partial Closure Procedure for Tanks T-204, T-205, and T-206 at your facility.[1] I have also visually inspected the subject tanks after completion of the partial closure. During this visit I have interviewed Mr. John Barta of EQ Detroit regarding the partial closure activities with respect to the Procedure. Lastly I have reviewed your written Summary of the partial closure [2]. From my familiarity and knowledge of the project, I hereby certify that EQ Detroit, Inc. has completed the partial closure of the tanks in substantial accordance with the Procedure.

I certify under penalty of law that your Summary and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please let me know if I can be of further assistance. Thank you for retaining Abletech, Inc. for these services.

Sincerely,

M. A. Olson

Michael A. Olson, P.E.
Principal

---

[1] Appendix I-3, [partial] Closure Procedure No. 1, Above Ground Storage Tanks
[2] Letter, Kristen Rachwall, EQ Detroit, Inc. to George Bruchmann, Michigan Department of Environmental Quality, February 7, 2007

The Environmental Quality Company
Detroit Laboratory
1923 Frederick Street
Detroit, MI 48211-2603

LAB SAMPLE RESULTS

Sample ID: DD26175

Generator: Chem Fix Vault 705

Reference Number: 13068

JAMES TYLER

PRIME

Report Date : 01/17/2007

F039 SEMIVOLATILES

Analyte Name	Result	Units	EQL	Analysis Date
1,2,4,5-TETRACHLOROBENZENE	Less Than	PPM	14	01/15/2007
1,4-DINITROBENZENE	Less Than	PPM	2.3	01/15/2007
2,3,4,6-TETRACHLOROPHENOL	Less Than	PPM	7.4	01/15/2007
2,4,5-TRICHLOROPHENOL	Less Than	PPM	7.4	01/15/2007
2,4,6-TRICHLOROPHENOL	Less Than	PPM	7.4	01/15/2007
2,4-DICHLOROPHENOL	Less Than	PPM	14	01/15/2007
2,4-DIMETHYL PHENOL	Less Than	PPM	14	01/15/2007
2,4-DINITROPHENOL	Less Than	PPM	160	01/15/2007
2,4-DINITROTOLUENE	Less Than	PPM	140	01/15/2007
2,6-DICHLOROPHENOL	Less Than	PPM	14	01/15/2007
2,6-DINITROTOLUENE	Less Than	PPM	28	01/15/2007
2-ACETYLAMINOFLUORENE	Less Than	PPM	140	01/15/2007
2-CHLORONAPHTHALENE	Less Than	PPM	5.6	01/15/2007
2-CHLOROPHENOL	Less Than	PPM	5.7	01/15/2007
2-SEC-BUTYL-4,6-DINITROPHENYL	Less Than	PPM	2.5	01/15/2007
CHLOROPROPYLENE	Less Than	PPM	28	01/15/2007
METHYLCHOLANTHRENE	Less Than	PPM	15	01/15/2007
4,4-METHYLENE-BIS-(2-CHLOROANILINE)	Less Than	PPM	30	01/15/2007
4,6-DINITRO-o-CRESOL	Less Than	PPM	160	01/15/2007
4-BROMOPHENYL PHENYL ETHER	Less Than	PPM	15	01/15/2007
4-NITROPHENOL	Less Than	PPM	29	01/15/2007
5-NITRO-o-TOLUIDINE	Less Than	PPM	28	01/15/2007
ACENAPHTHENE	Less Than	PPM	3.4	01/15/2007
ACENAPHTHYLENE	Less Than	PPM	3.4	01/15/2007
ACETOPHENONE	Less Than	PPM	9.7	01/15/2007
ANILINE	Less Than	PPM	14	01/15/2007
ANTHRACENE	Less Than	PPM	3.4	01/15/2007
BENZ(a)ANTHRACENE	Less Than	PPM	3.4	01/15/2007
BENZO(a)PYRENE	Less Than	PPM	3.4	01/15/2007
BENZO(b)FLUORANTHENE	Less Than	PPM	3.4	01/15/2007
BENZO(ghi)PERYLENE	Less Than	PPM	1.5	01/15/2007
BENZO(k)FLUORANTHENE	Less Than	PPM	3.4	01/15/2007
bis(2-CHLOROETHOXY) METHANE	Less Than	PPM	7.2	01/15/2007
bis(2-CHLOROETHYL) ETHER	Less Than	PPM	6.0	01/15/2007
bis(2-CHLOROISOPROPYL) ETHER	Less Than	PPM	7.2	01/15/2007
bis-(2-ETHYLHEXYL)PHTHALATE	Less Than	PPM	28	01/15/2007
BUTYL BENZYL PHTHALATE	Less Than	PPM	7.9	01/15/2007
CHRYSENE	Less Than	PPM	3.4	01/15/2007
CRESOL (M- AND P-ISOMERS)	Less Than	PPM	3.2	01/15/2007
DIBENZ(a,h)ANTHRACENE	Less Than	PPM	8.2	01/15/2007
DIETHYL PHTHALATE	Less Than	PPM	28	01/15/2007
DIMETHYL PHTHALATE	Less Than	PPM	28	01/15/2007
n-BUTYL PHTHALATE	Less Than	PPM	28	01/15/2007

DI-n-OCTYL PHTHALATE	Less Than	PPM	[illegible]	01/15/2007
DI-n-PROPYLNITROSOAMINE	Less Than	PPM	14	01/15/2007
FLUORANTHENE	Less Than	PPM	3.4	01/15/2007
FLUORENE	Less Than	PPM	3.4	01/15/2007
HEXACHLOROBENZENE	Less Than	PPM	10	01/15/2007
HEXACHLOROBUTADIENE	Less Than	PPM	5.6	01/15/2007
HEXACHLOROCYCLOPENTADIENE	Less Than	PPM	2.4	01/15/2007
HEXACHLOROETHANE	Less Than	PPM	28	01/15/2007
HEXACHLOROPROPYLENE	Less Than	PPM	28	01/15/2007
INDENO(1,2,3-c,d)PYRENE	Less Than	PPM	3.4	01/15/2007
METHAPYRILENE	Less Than	PPM	1.5	01/15/2007
METHYLPARATHION	Less Than	PPM	4.6	01/15/2007
NAPHTHALENE	Less Than	PPM	3.1	01/15/2007
NITROBENZENE	Less Than	PPM	14	01/15/2007
N-NITROPIPERIDINE	Less Than	PPM	35	01/15/2007
N-NITROSODIETHYLAMINE	Less Than	PPM	28	01/15/2007
N-NITROSO-DI-N-BUTYLAMINE	Less Than	PPM	2.3	01/15/2007
N-NITROSOMETHYLETHYLAMINE	Less Than	PPM	2.3	01/15/2007
N-NITROSOMORPHOLINE	Less Than	PPM	2.3	01/15/2007
N-NITROSOPYRROLIDINE	Less Than	PPM	35	01/15/2007
o-CRESOL	Less Than	PPM	5.6	01/15/2007
p-CHLOROANILINE	Less Than	PPM	16	01/15/2007
p-CHLORO-m-CRESOL	Less Than	PPM	14	01/15/2007
PENTACHLOROBENZENE	Less Than	PPM	37	01/15/2007
PENTACHLORONITROBENZENE	Less Than	PPM	4.8	01/15/2007
PENTACHLOROPHENOL	Less Than	PPM	7.4	01/15/2007
PHENACETIN	Less Than	PPM	16	01/15/2007
PHENANTHRENE	Less Than	PPM	3.1	01/15/2007
PHENOL	Less Than	PPM	6.2	01/15/2007
p-NITROANILINE	Less Than	PPM	28	01/15/2007
PYRENE	Less Than	PPM	8.2	01/15/2007
PYRIDINE	Less Than	PPM	16	01/15/2007

F039 VOLATILE ORGANICS

Analyte Name	Result	Units	EQL	Analysis Date
1,1,1,2 TETRACHLOROETHANE	Less Than	PPM	6	01/15/2007
1,1,1-TRICHLOROETHANE	Less Than	PPM	5.6	01/15/2007
1,1,2,2 TETRACHLOROETHANE	Less Than	PPM	6	01/15/2007
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	Less Than	PPM	28	01/15/2007
1,1,2-TRICHLOROETHANE	Less Than	PPM	5.6	01/15/2007
1,1-DICHLOROETHANE	Less Than	PPM	7.2	01/15/2007
1,1-DICHLOROETHYLENE	Less Than	PPM	6	01/15/2007
1,2,3-TRICHLOROPROPANE	Less Than	PPM	28	01/15/2007
1,2,4-TRICHLOROBENZENE	Less Than	PPM	19	01/15/2007
1,2-DIBROMO-3-CHLOROPROPANE	Less Than	PPM	15	01/15/2007
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	Less Than	PPM	15	01/15/2007
1,2-DICHLOROETHANE	Less Than	PPM	6	01/15/2007
1,2-DICHLOROPROPANE	Less Than	PPM	18	01/15/2007
1,4-DIOXANE	Less Than	PPM	170	01/15/2007
ACETONE	Less Than	PPM	160	01/15/2007
ACETONITRILE	Less Than	PPM	1.8	01/15/2007
ACRYLONITRILE	Less Than	PPM	84	01/15/2007
BENZENE	Less Than	PPM	10	01/15/2007
bis(2-CHLOROISOPROPYL) ETHER	Less Than	PPM	7.2	01/15/2007
BROMODICHLOROMETHANE	Less Than	PPM	15	01/15/2007
BROMOFORM(TRIBROMOMETHANE)	Less Than	PPM	15	01/15/2007
BROMOMETHANE	Less Than	PPM	15	01/15/2007
CARBON TETRACHLORIDE	Less Than	PPM	5.6	01/15/2007
CHLOROBENZENE	Less Than	PPM	5.7	01/15/2007
CHLORODIBROMOMETHANE	Less Than	PPM	15	01/15/2007
CHLOROETHANE	Less Than	PPM	6.0	01/15/2007

CHLOROMETHANE (METHYL CHLORDE)	Less Than	PPM	30	01/15/2007
cis-1,3-DICHLOROPROPYLENE	Less Than	PPM	18	01/15/2007
DIBROMOMETHANE	Less Than	PPM	15	01/15/2007
DICHLORODIFLUOROMETHANE	Less Than	PPM	7.2	01/15/2007
ETHYL ACETATE	Less Than	PPM	33	01/15/2007
ETHYL BENZENE	Less Than	PPM	6.0	01/15/2007
ETHYL CYANIDE	Less Than	PPM	360	01/15/2007
ETHYL ETHER	Less Than	PPM	160	01/15/2007
ETHYL METHACRYLATE	Less Than	PPM	160	01/15/2007
IODOMETHANE	Less Than	PPM	65	01/15/2007
ISOBUTANOL	Less Than	PPM	170	01/15/2007
m-DICHLOROBENZENE	Less Than	PPM	6.0	01/15/2007
METHACRYLONITRILE	Less Than	PPM	84	01/15/2007
METHYL ETHYL KETONE	Less Than	PPM	36	01/15/2007
METHYL ISOBUTYL KETONE	Less Than	PPM	33	01/15/2007
METHYL METHACRYLATE	Less Than	PPM	160	01/15/2007
METHYLENE CHLORIDE	Less Than	PPM	30	01/15/2007
n-BUTYL ALCOHOL	Less Than	PPM	2.6	01/15/2007
o-DICHLOROBENZENE	Less Than	PPM	6.0	01/15/2007
p-DICHLOROBENZENE	Less Than	PPM	6.0	01/15/2007
TETRACHLOROETHYLENE	Less Than	PPM	5.6	01/15/2007
TOLUENE	Less Than	PPM	10	01/15/2007
TRANS-1,2-DICHLOROETHYLENE	Less Than	PPM	30	01/15/2007
trans-1,3-DICHLOROPROPYLENE	Less Than	PPM	18	01/15/2007
TRICHLOROETHYLENE	Less Than	PPM	5.6	01/15/2007
TRICHLOROMONOFLUOROMETHANE	Less Than	PPM	30	01/15/2007
VINYL CHLORIDE	Less Than	PPM	6.0	01/15/2007
XYLENE	Less Than	PPM	28	01/15/2007

Sulfide Spot Test

Analyte Name	Result	Units	EQL	Analysis Date
Sulfide Spot Test	Passed			01/15/2007

Total and Amenable Cyanide

Analyte Name	Result	Units	EQL	Analysis Date
Amenable Cyanide	Less Than	mg/Kg	30	01/15/2007
Total Cyanide	8	mg/Kg	1	01/15/2007

Vault TCLP Metals

Analyte Name	Result	Units	EQL	Analysis Date
Antimony	Less Than	ppm	1.15	01/15/2007
Arsenic	Less Than	ppm	5.0	01/15/2007
Barium	Less Than	ppm	21	01/15/2007
Beryllium	Less Than	ppm	1.22	01/15/2007
Cadmium	Less Than	ppm	0.11	01/15/2007
Chromium	Less Than	ppm	0.60	01/15/2007
Lead	Less Than	ppm	0.75	01/15/2007
Mercury	Less Than	ppm	0.025	01/15/2007
Nickel	Less Than	ppm	11	01/15/2007
Selenium	Less Than	ppm	1.0	01/15/2007
Silver	Less Than	ppm	0.14	01/15/2007
Thallium	Less Than	ppm	0.20	01/15/2007
Zinc	Less Than	ppm	4.3	01/15/2007

Validated By:

Raymond D. Landsberg
Manager, Lab Services

The Environmental Quality Company
Detroit Laboratory
1923 Frederick Street
Detroit, MI 48211-2603

LAB SAMPLE RESULTS

Sample ID: DD26296

Generator: Chem-Pre

Reference Number: 1-17-07

CONCRETE UNDER LIST TANK

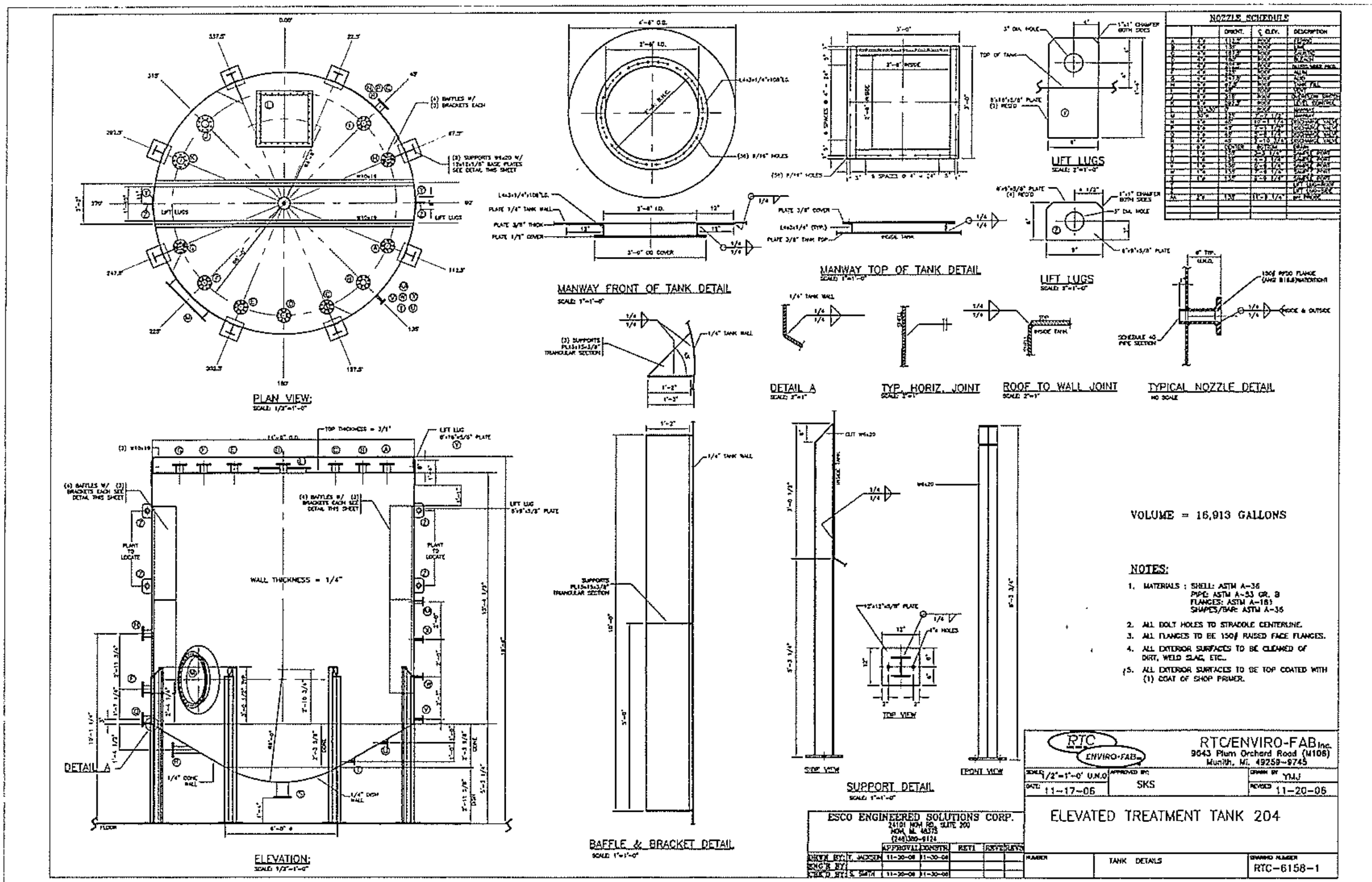
Report Date : 01/18/2007

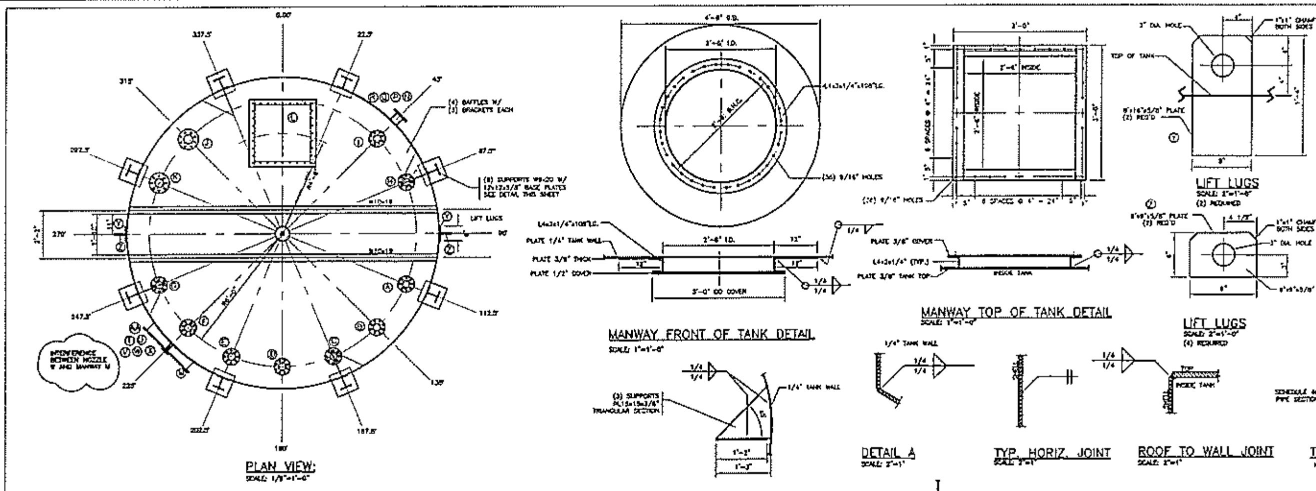
TCLP Metals for Chem Fix

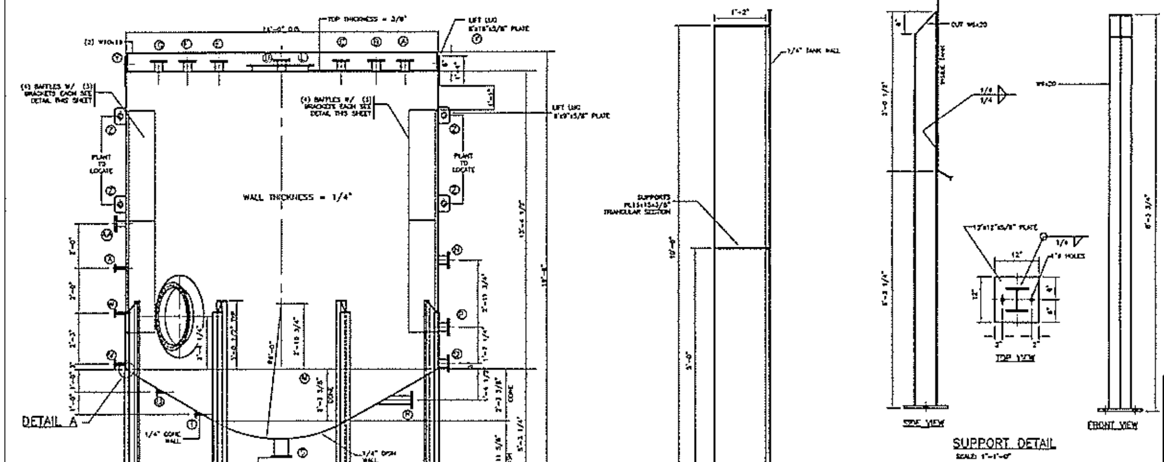
Analyte Name	Result	Units	EQL	Analysis Date
Antimony	Less Than	ppm	0.50	01/17/2007
Arsenic	Less Than	ppm	0.50	01/17/2007
Barium	1.0	ppm	0.50	01/17/2007
Beryllium	Less Than	ppm	0.50	01/17/2007
Cadmium	Less Than	ppm	0.10	01/17/2007
Chromium	Less Than	ppm	0.50	01/17/2007
Lead	Less Than	ppm	0.50	01/17/2007
Mercury	Less Than	ppm	0.025	01/17/2007
Nickel	Less Than	ppm	0.50	01/17/2007
Selenium	Less Than	ppm	0.50	01/17/2007
Silver	Less Than	ppm	0.10	01/17/2007
Thallium	Less Than	ppm	0.10	01/17/2007

Validated By:

Raymond D. Landsberg
Manager, Lab Services


PLAN VIEW:
SCALE: 1/2"=1'-0"
MANWAY FRONT OF TANK DETAIL
SCALE: 1"=1'-0"
MANWAY TOP OF TANK DETAIL
SCALE: 1"=1'-0"
LIFT LUGS
LIFT LUGS
NOZZLE SCHEDULE
DETAIL A
TYP. HORIZ. JOINT
ROOF TO WALL JOINT
TYPICAL NOZZLE DETAIL
NO SCALE
WALL THICKNESS = 1/4"
TOP THICKNESS = 3/1"
ELEVATION:
SCALE: 1/2"=1'-0"
BAFFLE & BRACKET DETAIL
SCALE: 1"=1'-0"
SIDE VIEW
TOP VIEW
FRONT VIEW
SUPPORT DETAIL
VOLUME = 16,913 GALLONS
NOTES:
1. MATERIALS : SHELL: ASTM A-36
PIPE: ASTM A-53 GR. B
FLANGES: ASTM A-181
SHAPES/BAR: ASTM A-36
2. ALL BOLT HOLES TO STRADDLE CENTERLINE.
3. ALL FLANGES TO BE 150# RAISED FACE FLANGES.
4. ALL EXTERIOR SURFACES TO BE CLEANED OF DIRT, WELD SLAG, ETC..
5. ALL EXTERIOR SURFACES TO BE TOP COATED WITH (1) COAT OF SHOP PRIMER.
ESCO ENGINEERED SOLUTIONS CORP.
RTC
ENVIRO-FAB
RTC/ENVIRO-FAB Inc.
9043 Plum Orchard Road (M106)
Munith, MI. 49259-9745
SCALE 1/2"=1'-0" U.N.O
APPROVED BY: SKS
DRAWN BY YMJ
DATE 11-17-06
REVISED 11-20-06
ELEVATED TREATMENT TANK 204
TANK DETAILS
DRAWING NUMBER RTC-6158-1





NOZZLE SCHEDULE

		ORIENT.	℄ ELEV.	DESCRIPTION
A	4"	[illegible]	[illegible]	[illegible]
B	4"	[illegible]	[illegible]	[illegible]
C	4"	[illegible]	[illegible]	[illegible]
D	4"	[illegible]	[illegible]	[illegible]
E	4"	[illegible]	[illegible]	[illegible]
F	4"	[illegible]	[illegible]	[illegible]
G	4"	[illegible]	[illegible]	[illegible]
H	4"	[illegible]	[illegible]	[illegible]
I	4"	45°	[illegible]	[illegible]
J	4"	[illegible]	[illegible]	[illegible]
K	4"	[illegible]	[illegible]	LEVEL CONTROL
L	[illegible]	[illegible]	[illegible]	MANWAY
M	[illegible]	[illegible]	[illegible]	MANWAY
N	4"	45°	10'-1 1/4"	[illegible]
P	4"	[illegible]	[illegible]	[illegible]
Q	4"	[illegible]	[illegible]	[illegible]
R	4"	[illegible]	[illegible]	[illegible]
S	[illegible]	[illegible]	[illegible]	[illegible]
T	[illegible]	[illegible]	[illegible]	[illegible]
U	[illegible]	[illegible]	[illegible]	[illegible]
V	[illegible]	[illegible]	[illegible]	[illegible]
W	[illegible]	[illegible]	[illegible]	[illegible]
X	[illegible]	[illegible]	[illegible]	[illegible]
Y				LIFT LUG – [illegible]
Z				LIFT LUG – [illegible]
AA	[illegible]	[illegible]	11'-4 1/2"	[illegible]

VOLUME = 16,613 GALLONS

NOTES:

1. MATERIALS : SHELL: ASTM A-36
   PIPE: ASTM A-53 GR. B
   FLANGES: ASTM A-181
   SHAPES/BAR: ASTM A-36
2. ALL BOLT HOLES TO STRADDLE CENTERLINE.
3. ALL FLANGES TO BE 150# RAISED FACE FLANGES.
4. ALL EXTERIOR SURFACES TO BE CLEANED OF DIRT, WELD SLAG, ETC.
5. ALL EXTERIOR SURFACES TO BE TOP COATED WITH (1) COAT OF SHOP PRIMER.

ESCO ENGINEERED SOLUTIONS CORP.
24181 NOVI RD., SUITE 200
NOVI, MI. 48375
(248)380-9124

		APPROVAL	CONSTR.	REV1	REV2	REV3
DRWN BY:	Y. JACKSON	11-20-06	11-30-06			
ENG'R BY:						
CHCD BY:	S. SMITH	11-20-06	11-30-06			

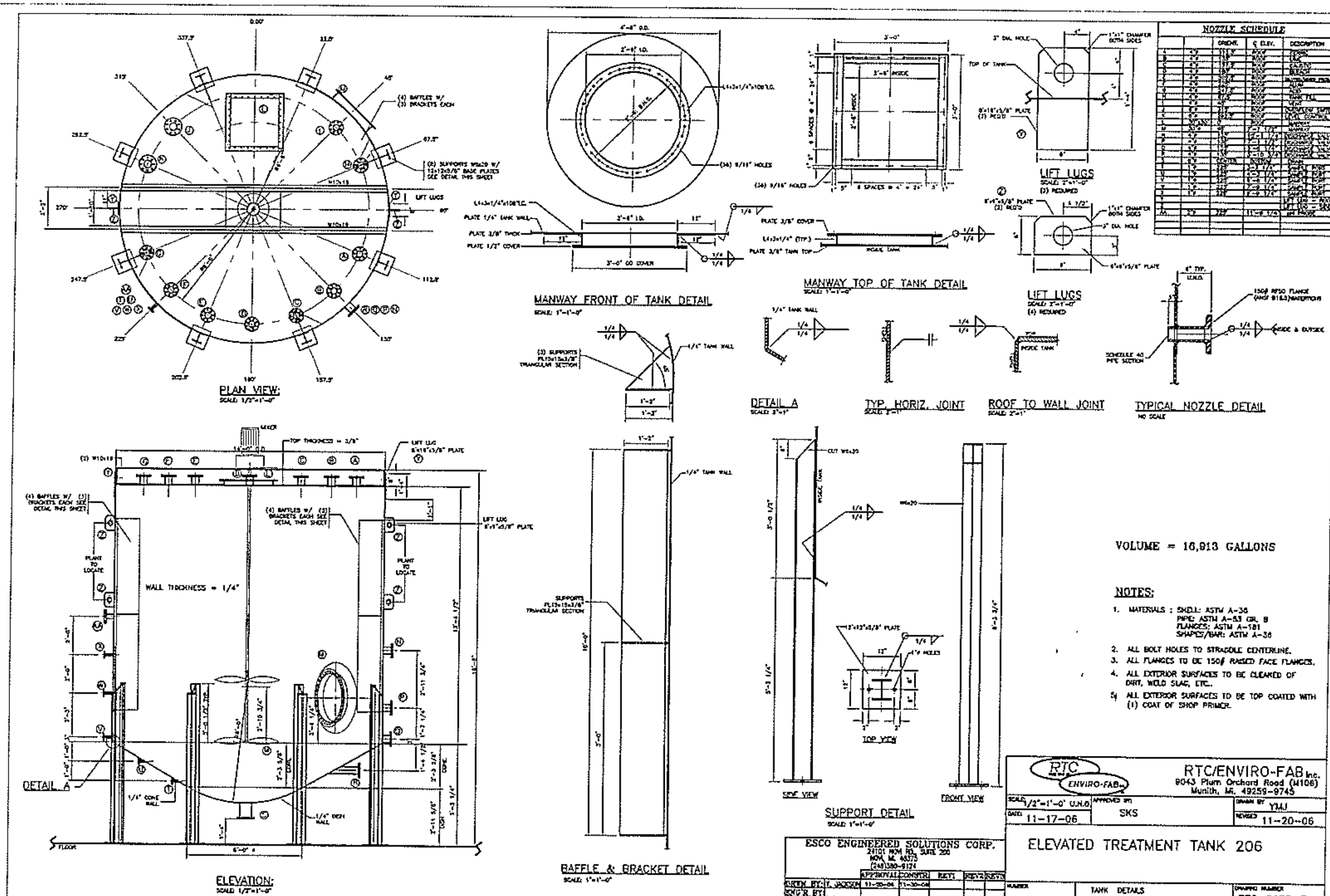
RTC ENVIRO-FAB

RTC/ENVIRO-FAB Inc.
9043 Plum Orchard Road (M106)
Monith, Mi. 49259-9745

SCALE: 1/2"=1'-0" U.N.O.	APPROVED BY: SKS	DRAWN BY: YMJ
DATE: 11-17-06		REVISED: 11-20-06

ELEVATED TREATMENT TANK 205

NUMBER		DRAWING NUMBER
	TANK DETAILS	RTC-6158-2



PLAN VIEW
SCALE: 1/2"=1'-0"
MANWAY FRONT OF TANK DETAIL
SCALE: 1"=1'-0"
MANWAY TOP OF TANK DETAIL
SCALE: 1"=1'-0"
LIFT LUGS
(3) REQUIRED
LIFT LUGS
(4) REQUIRED
NOZZLE SCHEDULE
DETAIL A
SCALE: 3"=1'
TYP. HORIZ. JOINT
SCALE: 3"=1'
ROOF TO WALL JOINT
SCALE: 2"=1'
TYPICAL NOZZLE DETAIL
NO SCALE
WALL THICKNESS = 1/4"
TOP THICKNESS = 3/8"
DETAIL A
ELEVATION
SCALE: 1/2"=1'-0"
BAFFLE & BRACKET DETAIL
SCALE: 1"=1'-0"
SIDE VIEW
FRONT VIEW
TOP VIEW
SUPPORT DETAIL
VOLUME = 16,913 GALLONS
NOTES:
1. MATERIALS : SHELL: ASTM A-36
PIPE: ASTM A-53 GR. B
FLANGES: ASTM A-181
SHAPES/BAR: ASTM A-36
2. ALL BOLT HOLES TO STRADDLE CENTERLINE.
3. ALL FLANGES TO BE 150# RAISED FACE FLANGES.
4. ALL EXTERIOR SURFACES TO BE CLEANED OF DIRT, WELD SLAG, ETC.
5. ALL EXTERIOR SURFACES TO BE TOP COATED WITH (1) COAT OF SHOP PRIMER.
ESCO ENGINEERED SOLUTIONS CORP.
24101 NOVI RD. SUITE 200
NOVI, MI. 48375
(248)380-9174
APPROVAL CONSTR. REV1 REV2 REV3
DRWN BY: T. JACKSON 11-20-06 11-20-06
ENG'R BY:
CHK'D BY: A. SMITH 11-20-06 11-20-06
RTC ENVIRO-FAB
RTC/ENVIRO-FAB Inc.
9043 Plum Orchard Road (M106)
Munith, MI. 49259-9745
SCALE 1/2"=1'-0" U.N.O.
APPROVED BY SKS
DRAWN BY YMJ
DATE 11-17-06
REVISED 11-20-06
ELEVATED TREATMENT TANK 206
NUMBER
TANK DETAILS
DRAWING NUMBER RTC-6158-3

DETROIT, Inc.
1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • TEL 800 495 6059 • FAX 313 923 3375 • www.eqonline.com

VIA OVERNIGHT DELIVERY

January 12, 2007

Mr. George Bruchmann, Chief
Waste & Hazardous Materials Division
Michigan Department of Environmental Quality
525 West Allegan
Lansing, Michigan 48909-7741

SUBJECT: EQ Detroit, Inc.; MID 980 991 566
Tanks T-204, T-205 and T-206 Closure Notification

Dear Mr. Bruchmann:

EQ Detroit, Inc. (EQD) wishes to provide notification of the partial closure of three regulated tanks, T-204, T-205 and T-206. These tanks will be removed from service on January 16, 2007 and decontaminated as detailed in the attached closure procedure for aboveground storage tanks found in Section 5 (Appendix I-3 of the Application) of EQD's Operating License Attachments.

A certification for the closure of Tanks T-204 and T-205 will be provided within 60 days of the completed closure. Should you need further information or if there are any questions that arise as a result of this notification, please contact me at 313-347-1300.

Sincerely,

Kristen C Rachwal

Kristen Rachwal, CHMM
Regulatory Specialist
EQ Detroit, Inc.

Enclosure

cc: Jeanette Noechel, DEQ
Richard Conforti, DEQ
Scott Maris, EQD
Scott Binder, EQD
John Barta, EQD

APPENDIX I-3

CLOSURE PROCEDURES

CLOSURE PROCEDURE NO. 1

ABOVE GROUND STORAGE TANKS

Closure procedures for above ground storage tank closure has been divided into the following phases:

- Inspection;
- Preparation;
- Decontamination;
- Removal;
- Secondary containment structure characterization; and
- Secondary containment structure removal and remediation (if necessary).

For the purpose of developing the closure cost estimate, it is assumed that a third party will complete the closure and that the hazardous waste inventory would be removed for treatment and/or disposal at permitted off-site facilities. During any planned partial or final closure, the hazardous waste inventory of any unit scheduled for closure would be processed on-site to the extent possible prior to initiating closure procedures.

Each phase of closure is detailed in the following sections.

A. INSPECTION

The manway cover/access point of each tank will be removed and the air present in the tank will be tested for potentially explosive levels of vapors, oxygen content, and organic vapors. Piping and ancillary equipment will be identified and marked. Piping and ancillary equipment will be inspected for any evidence of release. Each tank will be visually inspected for sludge. If sludge is present, tank entry will be conducted, as necessary, if adequate cleaning cannot be conducted from outside the tank. Tank entry, if necessary, will be performed using facility confined space entry procedures.

B. PREPARATION

Prior to removal of each tank, all waste and waste residues will be removed from the tank and ancillary piping. Pumps, valves, and level indicators will be de-energized and disconnected. Prior to pumping, the approximate volume of waste will be determined and appropriate storage containers (i.e. tanker truck, 55-gallon drums) staged in the vicinity of the tank. Liquids will be pumped into a tanker truck or 55-gallon drums pending characterization and off-site disposal. Ancillary equipment which can not be readily decontaminated will be characterized and disposed of at an off-site facility. Open ends of piping and associated ancillary equipment will be plugged prior to moving. Piping will be disconnected and removed at all tank openings.

All piping, pumps, valves, flowmeters, pressure indicators, and level indicators will be stored in a designated covered area on plastic sheeting (6-mil polyethylene or equivalent) within one of the process buildings, staging areas, or within a plastic lined roll-off box. The lined roll-off box would be covered.

Spill control equipment consisting of absorbent, brooms, and shovels will be readily available near the tank in the event of inadvertent spills occurring during decontamination activities.

C. DECONTAMINATION

To remove potentially hazardous constituents which may still remain inside the tank, a hot water high pressure steam cleaner will be used. The tanks will be cleaned in place, if possible, and/or after removal. An industrial detergent/cleaning agent will be used to aid in decontaminating the tanks. Wash waters will be removed by pumping. Wash waters will be containerized at the facility in appropriate shipping containers or in another storage tank. Wash waters will be characterized and transported off site for disposal at a permitted facility, if they are determined to be hazardous. The wash water, if determined to be non-hazardous, will be transported off site for treatment and disposal. If clean closure criteria cannot be achieved or if USL Detroit determines that cleaning of the tank is not practical, the tanks(s) and ancillary equipment will be transported and disposed of at a permitted disposal facility with an appropriate waste classification.

D. REMOVAL

The visually cleaned tanks will be removed whole and staged pending re-use or scrapping, or may be cut up in place if removal is difficult.

E. SECONDARY CONTAINMENT STRUCTURE CHARACTERIZATION

The secondary containment structure will be visually inspected for evidence of spills, stains, and cracks and/or expansion joints. If no stains, cracks, or expansion joints are observed, the structure will be pressure washed and then the structure and surrounding soils will be determined to be clean and no decontamination or confirmatory sampling will be performed beyond those proposed locations associated with existing sumps as defined in the Sampling and Analysis Plan (SAP).

In the event that staining is observed, the secondary containment structure will be pressure washed. Prior to pressure washing cracks or expansion joints will be sealed with grout or cement. The wash waters will be collected and disposed as described in Section C. Concrete chip samples will then be collected from the concrete surface as described in the Sampling and Analysis Plan.

In the event that stains and cracks/expansion joints are observed to be present in the secondary containment pad, samples of the soils underlying the structure will be collected as described in the Sampling and Analysis Plan.

F. SECONDARY CONTAINMENT SYSTEM REMOVAL AND SOIL REMEDIATION

In the event that the secondary containment structure and/or the soils underlying the structure are determined to be impacted at final closure, the structure will be demolished, removed, and soils may potentially be excavated.

The secondary containment structure will be demolished using a hydraulic jack hammer. Concrete debris will be transferred from the area to a waiting lined roll-off box using an excavator. A representative concrete chip sample will be collected from the concrete rubble prior to loading the concrete in to the roll-off box. The composite chip sample will be collected as a five point composite sample from five visually impacted rubble locations. The lined roll-off box(es) will covered once filled.

Impacted soils (if any) will be excavated and loaded into lined roll-off boxes. Depending on the visual extent of soil impact, USL Detroit may elect to conduct additional sampling to define the extent of soil contamination prior to excavating contaminated soils. Delineation sampling will consist of a grid sampling strategy over the impacted area including "step out" samples in all four directions from the area(s) of visible impact. The size of the sampling grid and the grid interval will be determined based on the visual extent of impact. Samples will be collected from a variety of depth intervals based on the visual extent of impact. Additional delineation (vertical or in one or more horizontal directions) may be required base don the results of the initial delineation sampling or, if no delineation sampling was done, by visual evidence of impact. Soil samples to verify remediation will be collected according to the sampling strategy described in Section 1.3.1 of the Michigan Department of Environmental Quality's Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria (2002). A five point composite sample will be collected from each roll-off box loaded with impacted soils for the purpose of waste characterization for disposal (see the Sampling and Analysis Plan for sampling details).

Once verified clean, the excavation will be backfilled and compacted with clean certified fill material from a local source. The clean fill source and associated analytical data will be documented in the final closure certification.

CLOSURE PROCEDURE NO. 2

STEEL-LINED CONCRETE VAULTS

Closure procedures for above the closure of the steel lined concrete vaults have been divided into the following phases:

- Inspection;
- Preparation;
- Decontamination;
- Steel lining inspection/characterization; and
- Secondary containment structure removal and remediation (if necessary).

For the purpose of developing the closure cost estimate, it is assumed that a third party will complete the closure and that the hazardous waste inventory would be removed for treatment and/or disposal at permitted off-site facilities. During any planned partial or final closure, the hazardous waste inventory of any unit scheduled for closure would be processed on-site to the extent possible prior to initiating closure procedures.

Each phase of closure is detailed in the following sections.

A. INSPECTION

Piping and ancillary equipment associated with each vault will be identified and marked. Piping and ancillary equipment will be inspected for any evidence of release. Each vault will be visually inspected for sludge. If sludge is present, vault entry will be conducted, as necessary, if adequate cleaning cannot be conducted from the ground surface. Vault entry, if necessary, will be performed using facility confined space entry procedures.

B. PREPARATION

Prior to closure of each vault, all waste and waste residues will be removed from the vault and ancillary piping. Prior to pumping, the approximate volume of waste will be determined and appropriate storage containers (i.e. tanker truck, 55-gallon drums) staged in the vicinity of the vault. Liquids will be pumped into a tanker truck or 55-gallon drums pending characterization and off-site disposal. Ancillary equipment will be characterized and disposed of at an off site facility and not be decontaminated, since this is not practical.

Spill control equipment consisting of absorbent, brooms, and shovels will be readily available near the vault in the event of inadvertent spills occurring during decontamination activities.

C. DECONTAMINATION

To remove potentially hazardous constituents which may still remain inside the vault, a hot water high pressure steam cleaner will be used to clean the steel lining of the vault. An industrial detergent/cleaning agent will be used to aid in decontaminating the vaults. Wash waters will be removed by pumping. Wash waters will be containerized at the facility in appropriate shipping containers or in another storage tank. Wash waters will be characterized and transported off site for disposal at a permitted facility, if they are determined to be hazardous. The wash water, if determined to be non
hazardous, will be transported off site for treatment and disposal. Cleaning will be conducted until the steel lining is visually as clean as practicable.

D. STEEL LINING INSPECTION/CHARACTERIZATION

The steel lining of the vaults will be visually inspected for evidence of potential leaks through cracks/joints. A total of three locations will then be selected in proximity to steel joints. At these locations, a two-foot square portion of the steel lining will be cut away and removed for a visual inspection of the underlying concrete secondary containment. If no evidence of leaks are observed, the vault and surrounding concrete secondary containment system will be pressure washed and then determined to be clean and no further decontamination or confirmatory sampling will be performed.

In the event that staining is observed on the concrete behind the steel lining material, the entire steel lining will be removed and the concrete secondary containment structure will be pressure washed. Prior to pressure washing cracks or expansion joints will be sealed with grout or cement. The wash waters will be collected and disposed as described in Section C. Concrete chip samples will then be collected from the concrete surface as described in the Sampling and Analysis Plan (SAP).

In the event that stains and cracks/expansion joints are observed to be present in the concrete secondary containment structure, samples of the soils underlying the structure will be collected as described in the SAP.

E. SECONDARY CONTAINMENT SYSTEM REMOVAL AND SOIL REMEDIATION

The secondary containment structure will be visually inspected for evidence of spills, stains, and cracks and/or expansion joints. If no stains, cracks, or expansion joints are observed, the structure and surrounding soils will be determined to be clean and no confirmatory sampling will be performed beyond those proposed locations associated with the existing Sampling and Analysis Plan. In the event that the secondary containment structure and/or the soils underlying the structure are determined to be impacted at final closure, the structure will be demolished, removed, and soils may potentially be excavated.

The secondary containment structure will be demolished using a hydraulic jack hammer.

Concrete debris will be transferred from the area to a waiting lined roll-off box using an excavator. A representative concrete chip sample will be collected from the concrete rubble prior to loading the concrete in to the roll-off box. The composite chip sample will be collected as a five point composite sample from five visually impacted rubble locations. The lined roll-off box(es) will covered once filled.

Impacted soils (if any) will be excavated and loaded into lined roll-off boxes. Depending on the visual extent of soil impact, USL Detroit may elect to conduct additional sampling to define the extent of soil contamination. The delineation sampling will consist of a grid sampling strategy over the impacted area, including sample locations outside of the visual impacted area. The size of the sampling grid and the grid interval will be determined based on the visual extent of impact. Samples will be collected at a variety of depth intervals which will be established based on the visual extent of impact. The horizontal and vertical extent of the delineation will be further evaluated based on the results of the initial delineation sampling. A five point composite soil sample will be collected from each roll-off box loaded with impacted soils (see the Sampling and Analysis Plan for sampling details). The extent of soil excavation will be initially delineated by visual evidence. One discrete soil sample will be collected from each side-wall and the base of the excavation. The soil sample locations will be biased towards visually stained areas. Specific sampling procedures are presented in the SAP.

Once verified clean, the excavation will be backfilled and compacted with clean certified fill material from a local source. The clean fill source and associated analytical data will be documented in the final closure certification.

CLOSURE PROCEDURE NO. 3

DRUM/CONTAINER STORAGE/STAGING AREA/UNLOADING AREAS

This closure procedure has been developed for the various container storage/staging, loading/unloading, and other secondary containment areas. These units include:

- North drum storage area
- North drum staging/storage area
- Corrosive treatment drum storage area
- Chemical precipitation drum storage area
- Roll-off container storage area
- Rail yard containment system
- Miscellaneous Structures

Closure procedures for these units have been divided into the following phases:

- Inspection;
- Decontamination;
- Secondary containment structure characterization; and
- Secondary containment system removal and soil remediation.

For the purpose of developing the closure cost estimate, it is assumed that a third party will complete the closure and that the hazardous waste inventory would be removed for treatment and/or disposal at permitted off-site facilities. During any planned partial or final closure, the containerized hazardous waste inventory of any container storage area scheduled for closure would be processed on-site to the extent possible prior to initiating closure procedures.

Each phase of closure is detailed in the following sections

A. INSPECTION

After removal of any hazardous waste inventory, the drum/container storage/staging area will be thoroughly inspected for evidence of spills, stains, and cracks and/or expansion joints. A visual assessment of all miscellaneous building structures that will be subject to closure and all evidence of dust collection and/or staining will be noted. If no stains, cracks, or expansion joints are observed, the decontamination can proceed. If evidence of possible spills/leakage exists, the area will be sealed prior to proceeding with decontamination. Subsequently sampling of the underlying soils will be conducted in accordance with the Sampling and Analysis Plan (SAP).

B. DECONTAMINATION

The concrete or bituminous floor surface and walls (as appropriate), up to a height of 4 feet above the floor surface elevation, will be dry sweeped and the materials collected and containerized in 55 gallon steel drums for characterization and off site disposal.

After sweeping the floor surface and walls, these surfaces will be power washed using a detergent and hot water.

Wash water will be containerized in a temporary storage tank or 55-gallon drum(s) for characterization and subsequent disposal at an off site permitted facility if determined to be hazardous. The wash water, if determined to be non-hazardous, will be transported off site for treatment and disposal. A sample of the final wash waters will be collected and analyzed for the disposal characterization parameters, as necessary, to determine the appropriate disposition mode. The disposition of wash water will be documented in the Closure Certification Report.

Miscellaneous building structures that will be subject to closure will be dry vacuumed to remove accumulations of dust with appropriate containerization, characterization, and disposal. Any visible staining will be addressed through cleaning in the same manner as the storage areas.

C. SECONDARY CONTAINMENT STRUCTURE CHARACTERIZATION

The secondary containment structure will be visually inspected for evidence of spills, stains, and cracks and/or expansion joints. If no stains, cracks, or expansion joints are observed, the structure will be pressure washed and then the structure and surrounding soils will be determined to be clean and no decontamination or confirmatory sampling will be performed beyond those proposed locations associated with existing sumps as defined in Section E (Environmental Monitoring).

In the event that staining is observed, the secondary containment structure will be pressure washed. Prior to pressure washing cracks or expansion joints will be sealed with grout or cement. The wash waters will be collected and disposed as described in Section B. Concrete chip samples will then be collected from the concrete surface as described in the SAP.

In the event that stains and cracks/expansion joints are observed to be present in the secondary containment pad, samples of the soils underlying the structure will be collected as described in the Sampling and Analysis Plan.

D. SECONDARY CONTAINMENT SYSTEM REMOVAL AND SOIL REMEDIATION

The secondary containment structure will be visually inspected for evidence of spills, stains, and cracks and/or expansion joints. If no stains, cracks, or expansion joints are observed, the structure and surrounding soils will be determined to be clean and no confirmatory sampling will be performed beyond those proposed locations associated with the existing Sampling and Analysis Plan. In the event that the secondary containment structure and/or the soils underlying the structure are determined to be impacted at final closure, the structure will be demolished, removed, and soils may potentially be excavated.

The secondary containment structure will be demolished using a hydraulic jack hammer. Concrete debris will be transferred from the area to a waiting lined roll-off box using an excavator. A representative concrete chip sample will be collected from the concrete rubble prior to loading the concrete in to the roll-off box. The composite chip sample will be collected as a five point composite sample from five visually impacted rubble locations. The lined roll-off box(es) will covered once filled.

Impacted soils (if any) will be excavated and loaded into lined roll-off boxes. Depending on the visual extent of soil impact, USL Detroit may elect to conduct additional sampling to define the extent of soil contamination. The delineation sampling will consist of a grid sampling strategy over the impacted area, including sample locations outside of the visual impacted area. The size of the sampling grid and the grid interval will be determined based on the visual extent of impact. Samples will be collected at a variety of depth intervals which will be established based on the visual extent of impact. The horizontal and vertical extent of the delineation will be further evaluated based on the results of the initial delineation sampling. A five point composite soil sample will be collected from each roll-off box loaded with impacted soils (see the Sampling and Analysis Plan for sampling details). The extent of soil excavation will be initially delineated by visual evidence. One discrete soil sample will be collected from each side wall and the base of the excavation. The soil sample locations will be biased towards visually stained areas. Specific sampling procedures are presented in the Sampling and Analysis Plan.

Once verified clean, the excavation will be backfilled and compacted with clean certified fill material from a local source. The clean fill source and associated analytical data will be documented in the final closure certification.

CLOSURE PROCEDURE NO. 5

VARIOUS/MISCELLANEOUS PROCESS EQUIPMENT

This closure procedure has been developed for the various other hazardous waste management units and associated process equipment. These units/equipment include but are not limited to:

- Chemical fixation roll-offs
- Railcar container
- Carbon columns (B-1, B-2)
- Silo (H-1)
- Pugmill
- Screw conveyors
- Shredder
- Drum hopper
- Air emission control equipment
- Filter press

Closure procedures for these types of units/equipment have been divided into the following phases:

- Inspection;
- Preparation;
- Decontamination;
- Verification; and
- Removal.

Each phase of closure is detailed in the following Sections.

A. INSPECTION

Each piece of equipment that is scheduled for closure will be thoroughly inspected for presence of residual hazardous waste materials or for evidence of spills or leaks. As necessary, any piping, electrical, or ancillary equipment will be carefully marked, de-energized and disconnected.

B. PREPARATION

All waste and waste residues will be removed from the equipment and ancillary piping. Prior to removal, the approximate volume of waste will be determined and appropriate storage containers (i.e. 55-gallon drums) staged in the vicinity of the equipment. Residuals will be placed (shovel, brush, vacuum) in 55-gallon drums pending characterization and off-site disposal.

Equipment of a portable nature may be moved to a pre-designated temporary containment area prior to decontamination. Such an area will be established with an existing container storage area or other area with suitable secondary containment.

For fixed equipment, precautions will be taken through the placement of polyethylene or other suitable containment material to facilitate the collection of residue and waste material an/or decontamination waters.

C. DECONTAMINATION

To remove potentially hazardous constituents which may still remain, a hot water high pressure steam cleaner will be used. The equipment will be cleaned in place and/or after removal to a designated and prepared area. An industrial detergent/cleaning agent will be used to aid in decontaminating. Wash waters will be removed by pumping. Wash waters will be containerized at the facility in appropriate shipping containers or in another storage tank. Wash waters will be characterized and transported off site for disposal at a permitted facility, if they are determined to be hazardous. The wash water, if determined to be non-hazardous, will be transported off site for treatment and disposal. If clean closure criteria cannot be achieved or if USL Detroit determines that cleaning of the equipment is not practical, the equipment will be transported and disposed of at a permitted disposal facility with an appropriate waste classification.

D. REMOVAL

The visually cleaned equipment will be removed whole and staged pending re-use or scrapping, or may be cut up in place if removal is difficult.

E. SECONDARY CONTAINMENT STRUCTURE CHARACTERIZATION

The secondary containment structure will, if present, be visually inspected for evidence of spills, stains, and cracks and/or expansion joints. If no stains, cracks, or expansion joints are observed, the structure and surrounding soils will be determined to be clean and no decontamination or confirmatory sampling will be performed beyond those proposed locations associated with existing sumps as defined in the Sampling and Analysis Plan (SAP).

In the event that staining is observed, the secondary containment structure will be pressure washed. Prior to pressure washing cracks or expansion joints will be sealed with grout or cement. The wash waters will be collected and disposed as described in Section C. Concrete chip samples will then be collected from the concrete surface as described in the SAP.

In the event that stains and cracks/expansion joints are observed to be present in the secondary containment pad, samples of the soils underlying the structure will be collected as described in the SAP.

F. SECONDARY CONTAINMENT SYSTEM REMOVAL AND SOIL REMEDIATION

In the event that the secondary containment structure and/or the soils underlying the structure are determined to be impacted at final closure, the structure will be demolished, removed, and soils may potentially be excavated.

The secondary containment structure will be demolished using a hydraulic jack hammer. Concrete debris will be transferred from the area to a waiting lined roll-off box using an excavator. A representative concrete chip sample will be collected from the concrete rubble prior to loading the concrete in to the roll-off box.

The composite chip sample will be collected as a five point composite sample from five visually impacted rubble locations. The lined roll-off box(es) will covered once filled.

Impacted soils (if any) will be excavated and loaded into lined roll-off boxes. Depending on the visual extent of soil impact, USL Detroit may elect to conduct additional sampling to define the extent of soil contamination prior to excavating contaminated soils. Delineation sampling will consist of a grid sampling strategy over the impacted area including "step out" samples in all four directions from the area(s) of visible impact. The size of the sampling grid and the grid interval will be determined based on the visual extent of impact. Samples will be collected from a variety of depth intervals based on the visual extent of impact. Additional delineation (vertical or in one or more horizontal directions) may be required base don the results of the initial delineation sampling or, if no delineation sampling was done, by visual evidence of impact. Soil samples to verify remediation will be collected according to the sampling strategy described in Section 1.3.1 of the Michigan Department of Environmental Quality's Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria (2002). A five point composite sample will be collected from each roll-off box loaded with impacted soils for the purpose of waste characterization for disposal (see the Sampling and Analysis Plan for sampling details).

Once verified clean, the excavation will be backfilled and compacted with clean certified fill material from a local source. The clean fill source and associated analytical data will be documented in the final closure certification.

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

DEQ

STEVEN E. CHESTER
DIRECTOR

April 23, 2007

CERTIFIED MAIL

Ms. Kristen Rachwal, CHMM
Regulatory Specialist
EQ Detroit, Inc.
1923 Frederick Street
Detroit, Michigan 48211

Dear Ms. Rachwal:

SUBJECT: Tanks T-204, T-205, T-206, and T-208 Certification; EQ Detroit, Inc. (EQD); MID 980 991 566

Thank you for your March 13, 2007, letter to the Department of Environmental Quality (DEQ), Waste and Hazardous Materials Division (WHMD), regarding EQD's installation certification for tanks T-204, T-205, T-206, and T-208 (Certification). The WHMD received the March 13, 2007, letter on March 21, 2007.

The WHMD has reviewed the Certification for compliance with Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Based on that review, the WHMD has determined the Certification is acceptable. Therefore, tanks T-204, T-205, T-206, and T-208 can be used for storage of hazardous waste.

EQD must revise drawing P-9 to remove the references to tanks T-240, T-241, and T-242 and include in the tables the applicable information specific to tanks T-204, T-205, T-206, and T-208. EQD must submit the revised drawing P-9 to the WHMD for inclusion in the hazardous waste management facility operating license.

Should you have any questions regarding this acceptance, please contact Mr. Richard Conforti, Hazardous Waste Section, WHMD, at 517-241-2108.

Sincerely,

George W. Bruchmann, Chief
Waste and Hazardous Materials Division
517-373-9523

cc: Mr. Scott Maris, EQD
Mr. John Barta, EQD
Mr. Scott Binder, EQD
Mr. Steve Buda, DEQ
Mr. Richard Conforti/HWS-C&E File, DEQ
Ms. Jeanette Noechel, DEQ

DETROIT, Inc.
1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • TEL 800 495 6059 • FAX 313 923 3375 • www.eqonline.com

VIA OVERNIGHT DELIVERY

March 13, 2007

Mr. Richard Conforti
Waste & Hazardous Materials Division
Michigan Department of Environmental Quality
525 West Allegan
Lansing, Michigan 48909-7741

SUBJECT: EQ Detroit, Inc.; MID 980 991 566
Tanks T-204, T-205, T-206 and T-208 Certification

Dear Mr. Conforti:

EQ Detroit, Inc. (EQD) wishes to submit assessments for new tanks T-204, T-205, T-206 and T-208. The tanks are above grade and are installed on support legs or wide flanges in the Main Plant Building to ensure that no external metal component is in contact with soil or water. Each tank is approximately 17,000 gallons in capacity and will be used for wastewater batch treatment holding and storage. The tanks will be labeled in accordance with NFPA 704 before being put into service. The following table summarizes the regulatory requirements for the design and installation of new tank systems and provides a key to the enclosed supporting documentation.

Federal Regulation 40 CFR...	Michigan Regulation R 299.9...	Assessment Parameter	Documentation Location
264.192(a)	615(1)	Foundation & Structural Support	Ruby & Assoc. 2/16/07 Letter
264.192(a)(1)	615(1)	Design Standards	RTC/Enviro-Fab Drawings Notes #1 and #6
264.192(b)	615(1)	Installation Procedures	Abletech 03/20/07 Certification Letter
264.192(d)	615(1)	Tightness Testing	RTC/Enviro-Fab Drawings Note #7
264.192(e)	615(1)	Protection of Ancillary Equipment	Abletech 03/20/07 Certification Letter
264.193(b)-(f)	615(2)	Containment Requirements	Operating License Drawing P-9
	615(4)	Act 207 R 29.4101-R 29.4504 Requirements	Not Applicable
264.192	615(1)	PE Certification per 270.11(d)	Abletech 03/20/07 Certification Letter

Should you need further information or if there are any questions that arise as a result of this notification, please contact me at 313-347-1300.

Sincerely,

Kristen C Rachwal

Kristen Rachwal, CHMM
Regulatory Specialist
EQ Detroit, Inc.

Enclosures

cc: Jeanette Noechel, DEQ
Scott Maris, EQD
Scott Binder, EQD
John Barta, EQD

Abletech Inc.
6449 Lintons Way
Ann Arbor, MI 48105
Tel. 734.677.2420
Fax. 734-677-2445

Via Email Attachment

March 20, 2007

Ms. Kristen Rachwal, CHMM
EQ Detroit, Inc.
1923 Frederick St.
Detroit, MI 48211
Email: kristen.rachwal@eqonline.com

Ref: Letter, Ms. Kristen Rachwal, CHMM, EQ Detroit to Mr. Richard Conforti, Michigan Department of Envionmental March 13, 2006

Dear Ms. Rachwal:

Pursuant to your request I have reviewed the above-referenced letter and supporting documents referenced therein. I have also personally inspected the subject tank installation(s) in the presence of Mr. John Barta of EQ Detroit on March 6, 2007. From my review of your letter and supporting documents, inspection of the tank installation(s), and discussion with Mr. Barta, I certify that above-referenced letter is true, accurate, and complete, to the best of my knowledge and belief. Also, the systems appear to be free from any visible evidence of weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, or other structural damage or inadequate construction or installation that would impair proper functioning of these systems.

I certify under penalty of law that the above-referenced letter and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please let me know if I can be of further assistance. Thank you for retaining Abletech, Inc. for these services.

Sincerely,

M. A. Olson

Michael A. Olson, P.E.
Principal

February 16, 2007

Mr. Cedric Gibson
Environmental Quality Company
49350 N. I-94 Service Drive
Belleville, MI 48111

RE: Evaluation of Existing Concrete Slab-on-Grade for Installation of 4 Liquid Storage Tanks
Environmental Quality – Detroit, Michigan
Ruby 07-043 (07-043Letter)

Dear Mr. Gibson:

At your request, Ruby+Associates, PC (Ruby) has analyzed the existing concrete slab-on-grade at the EQ facility on St. Aubin Street in Detroit, MI. We understand that four new liquid storage tanks will be placed on the existing concrete slab-on-grade. Three of the tanks, numbers 204, 205, and 206, will replace similar tanks. A fourth tank, number 208, is new. Ruby further understands that there is little design information available for the existing slab-on-grade, and there is no data on the underlying materials beneath the slab. Holes drilled through the slab in a number of locations indicate that the slab thickness varies from between 6 inches and 13 inches, with an average thickness at the 10 test locations of 9.35". The slab is currently in good condition, with no observed cracks or evidence of distress. The facility is located on land with a long history of industrial usage, with one former usage being a rendering plant.

Ruby performed its analysis based on several assumptions. We conservatively used a concrete thickness of 7". We also did not take into account any steel reinforcement that may have been incorporated into the slab at the time of construction. We assumed a concrete strength f'_c = 3000 psi, which typically has been the minimum strength specified in Detroit area industrial construction for the past several decades. We used the tank weights received via email January 30, 2007: Tanks 204, 205, 206, 157,980 lbs; tank 208, 156,980 lbs. These weights include tank contents.

Based on these assumptions and the configurations of the tanks, Ruby has determined that at locations where the concrete thickness is as little as 7", the slab is capable of sustaining the concentrated load applied at a tank leg, provided that the soil beneath the slab has sufficient bearing capacity. We calculated a bearing pressure of 4200 psf directly beneath the slab at Tanks 204, 205 and 206. Because of its construction, Tank 208 distributes loads over larger areas of the slab, resulting in a calculated bearing pressure of 3400 psf directly beneath a 7" slab. Bearing pressure on the underlying soil varies inversely with the square of the slab thickness, so bearing pressures decrease significantly as concrete thickness increases. For instance, where concrete is 10" thick, the calculated bearing pressure on the soil at Tanks 204, 205 and 206 is reduced from 4200 psf to 3000 psf. As depth increases, bearing pressures decrease rapidly, so the potential for settlement is confined to a relatively small stratum of material, and the magnitude of settlement is limited.

In addition to this quantitative analysis, Ruby considered existing conditions to form its opinion. These conditions are as follows:

1. Tanks 204, 205 and 206 are very close in size and weight and will occupy the same area as three tanks to be removed. The removed tanks have been in service for a number of years with no adverse effect on the slab.

2. Typical construction practice for industrial facilities is to provide a compacted base beneath a concrete slab. It is also common to place steel reinforcement in the concrete to aid in distributing loads.

Ruby must qualify its opinion due to the lack of information regarding the soil load bearing capacity and concrete properties. Using conservative assumptions based on the available information and the analysis conducted, Ruby concludes that the tank's foundation is most likely adequate for the intended service. If some of our assumptions prove not to be valid, the result would likely be hairline cracking of the slab as opposed to significant cracking and/or major settlement. If there are concerns regarding this opinion, additional field testing should be performed to determine concrete strength, the presence of steel reinforcement, and the depth and type of materials under the slab.

Should you have questions regarding the content of this report, please contact us. We thank you for this opportunity to be of service.

Sincerely,

Ruby+Associates, PC

Bruce Burt

Bruce Burt, PE
Associate,
General Manager

NO.	DESCRIPTION	BY	DATE	CHK'D
	FOR PERMIT		7-31-02	
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CHEMICAL PRECIPITATION (200 SERIES)

ENGINEERING PLANS
PROCESS EQUIPMENT & CONTAINMENT STRUCTURES
RULE 504 (1) (G)

DESCRIPTION OF ITEM	WASTE TYPE	BASIS OF DESIGN INFO.	NOTES:
T-201 MIXER	WASTEWATER	LIGHTNIN COULD NOT ACCESS NAMEPLATE.	
T-202 MIXER	WASTEWATER	PHILADELPHIA SERIAL NO.: 307858 SIZE: PTERO-08-250	
T-203 MIXER	WASTEWATER	EMI, INC. MODEL NO.: XTO-8 SERIAL NO.: 9925	
T-240 MIXER PROPOSED	WASTEWATER	EMI, INC. MODEL NO.: XTO-8 SERIAL NO.: 9925	
T-241 MIXER PROPOSED	WASTEWATER	EMI, INC. MODEL NO.: XTO-8 SERIAL NO.: 9925	
T-242 MIXER PROPOSED	WASTEWATER	EMI, INC. MODEL NO.: XTO-8 SERIAL NO.: 9925	
PUMP 1EP01 SLUDGE TRANSFER	SLUDGE CHARACTERISTIC	~500 GPM CAST IRON	VERIFLOW 20HP 4X4
PUMP 1EP02 EFFLUENT TRANSFER	WATER CHARACTERISTIC	~500 GPM CAST IRON	VERIFLOW 20HP 4X4
PUMP 1EP03 EFFLUENT TRANSFER	WATER LISTED	~500 GPM CAST IRON	VERIFLOW 20HP 4X4
PUMP 1EP04 SLUDGE TRANSFER	SLUDGE LISTED	~500 GPM CAST IRON	VERIFLOW 20HP 4X4
1AP01 TANK 201-203 FEED	DRUM WASTE	~20 GPM POLYPROPYLENE	WARREN RUPP SAND PIPER III
1AP02 TANK FEED PROPOSED	CHEMICAL FEED	~20 GPM POLYPROPYLENE	WARREN RUPP SAND PIPER III
1AP03 TANK FEED PROPOSED	CHEMICAL FEED	~20 GPM POLYPROPYLENE	WARREN RUPP SAND PIPER III
1AP04 TANK FEED PROPOSED	METALS	~20 GPM POLYPROPYLENE	WARREN RUPP SAND PIPER III

SPECIFIC PART B INFORMATION
REQUIREMENTS FOR CONTAINERS
40 CFR 270.15

DESCRIPTION	DESIGN PARAMETERS	DIMENSIONS	MATERIALS OF CONSTRUCTION	DRAINAGE OR KEPT FROM STANDING WATER	CAPACITY	PREVENTION/ MANAGING RUN-ON	METHOD OF ANALYSIS & REMOVAL OF ACCUMULATED WASTE TO PREVENT OVERFLOW
EXISTING CHEMICAL PRECIPITATION AREA	STORAGE OF 120 METALS WASTE DRUMS	2 AREAS, APPROX. 45 FT. x 65 FT. AND 29 FT. x 102 FT. 7" HIGH CURB	LINED CONCRETE[1]	FLOOR AREA DRAINS TO BLIND SUMP	TOTAL VOLUME = 25,670 GAL.	CONTAINER STORAGE AREA IN COVERED BUILDING	ACCUMULATED WASTE IS PUMPED TO TANK 201, 202, OR 203 VIA PUMP P-220.
ROLL OFF BOX FILTER CAKE	1 EA. PRESS	SEE DWG. P-1	LINED CONCRETE[1]	FLOOR AREA DRAINS TO BLIND SUMP	TOTAL VOLUME = 25,670 GAL.	CONTAINER STORAGE AREA IN COVERED BUILDING	ACCUMULATED WASTE IS PUMPED TO TANK 201, 202, OR 203 VIA PUMP P-220.
PROPOSED CHEMICAL PRECIPITATION AREA	STORAGE OF 120 METAL WASTE DRUMS	2 AREAS, APPROX. 69 FT. x 81 FT. AND 86 FT. x 77 FT. 7" HIGH CURB	LINED CONCRETE[1]	FLOOR AREA DRAINS TO BLIND SUMP	TOTAL VOLUME = 57,670 GAL.	CONTAINER STORAGE AREA IN COVERED BUILDING	ACCUMULATED WASTE IS PUMPED TO TANK 201, 202, OR 203 VIA PUMP P-220.

FOOTNOTE 1. 1ST COAT: DUR-A-GLAZE EPOXY #4, 2ND COAT: DUR-A-GARD EPOXY COATING WITH ANTI-SKID MEDIA.

SPECIFIC PART B INFORMATION
REQUIREMENTS FOR TANK SYSTEMS
40 CFR 270.16

TANK	DIMENSIONS/ CAPACITY	SAFETY CUT-OFF	BYPASS SYSTEM	PRESSURE CONTROL (VENT)	WASTE TYPE / MATERIAL OF CONSTRUCTION	EQUIP. FOR EXTERNAL CORROSION PROTECTION	LEVEL ELEMENTS
201	14' DIAMETER 20,000 GAL.	PROPOSED PNEUMATIC BUTTERFLY ON SUCTION ALARM ON HIGH LEVEL	COMMON HEADER WITH MANUAL BUTTERFLY VALVES TO ALL TANKS IN PROCESS	OPEN VENT TO ATMOSPHERE	HAZARDOUS COATED STEEL	PAINTED	YES
202	14' DIAMETER 20,000 GAL.	PROPOSED PNEUMATIC BUTTERFLY ON SUCTION ALARM ON HIGH LEVEL		OPEN VENT TO ATMOSPHERE	HAZARDOUS COATED STEEL	PAINTED	YES
203	14' DIAMETER 20,000 GAL.	PROPOSED PNEUMATIC BUTTERFLY ON SUCTION ALARM ON HIGH LEVEL		OPEN VENT TO ATMOSPHERE	HAZARDOUS COATED STEEL	PAINTED	YES
240 PROPOSED	14' DIAMETER 20,000 GAL.	PROPOSED PNEUMATIC BUTTERFLY ON SUCTION ALARM ON HIGH LEVEL		OPEN VENT TO ATMOSPHERE	HAZARDOUS COATED STEEL	PAINTED	YES
241 PROPOSED	14' DIAMETER 20,000 GAL.	PROPOSED PNEUMATIC BUTTERFLY ON SUCTION ALARM ON HIGH LEVEL		OPEN VENT TO ATMOSPHERE	HAZARDOUS COATED STEEL	PAINTED	YES
242 PROPOSED	14' DIAMETER 20,000 GAL.	PROPOSED PNEUMATIC BUTTERFLY ON SUCTION ALARM ON HIGH LEVEL		OPEN VENT TO ATMOSPHERE	HAZARDOUS COATED STEEL	PAINTED	YES

CONTAINMENT & DETECTION OF RELEASES
40 CFR 264.193

DESCRIPTION	CAPABLE OF DETECTING & COLLECTING RELEASES UNTIL REMOVED	COMPATIBLE MATERIAL OF CONSTRUCTION OR LINED	LEAK DETECTION SYSTEM	SLOPED TO DRAIN OR REMOVE LIQUIDS	LARGEST TANKS WITHIN BOUNDARY	DIMENSIONS & CAPACITY	PREVENTION OF RUN-ON OF INFILTRATION OR PRECIPITATION	FREE OF GAPS & CRACKS	CHEM. RESISTANT WATER STOP AT ALL JOINTS
EXISTING CHEMICAL PRECIPITATION AREA	RELEASES COLLECTED IN CURBED AREA.	LINED CONCRETE[1]	VISUAL	SEE PREVIOUS CHART THIS SHEET	LARGEST TANK IS 20,000 GAL.	TOTAL VOLUME = 25,670 GALLONS	INSIDE BUILDING	YES	PROPOSE ALL JOINTS SEALED AT SURFACE WITH CHEM RESISTANT SEALER/COATING
PROPOSED CHEMICAL PRECIPITATION AREA	RELEASES COLLECTED IN CURBED AREA.	LINED CONCRETE[1]	VISUAL	SEE PREVIOUS CHART THIS SHEET	LARGEST TANK IS 20,000 GAL.	7" CONCRETE CURB AREA 13,215 SQ. FT. = 57,670 GAL. W/O PROCESS SUMP	INSIDE BUILDING	YES	PROPOSE TO SEAL ALL SURFACES
EXISTING CHEMICAL PRECIPITATION NORTH UNLOAD STATION	RELEASES COLLECTED IN SLOPED AREA TRENCH AND BLDG. SUMP	CONCRETE	VISUAL	SLOPED TO TRENCH	10,000 GALLON TRUCK	TRENCH 2'x2'x40' SUMP 8.76'x7'x3' TOTAL VOLUME= 2560 GAL.	NO COVER SLIGHT SLOPE AWAY FROM AREA	PROPOSE TO REPLACE CONCRETE	PROPOSE TO SEAL ALL SURFACES
EXISTING CHEMICAL PRECIPITATION SOUTH UNLOAD STATION	RELEASES COLLECTED IN SLOPED AREA AND BLIND SUMP	CONCRETE	VISUAL	SLOPED TO SUMP	10,000 GALLON TRUCK	TRENCH 2'x2'x2' SLAB AREA= 72'x60'x0.5' TOTAL VOLUME= 16,000 GAL.	NO COVER ROLL CURB TO THE SOUTH	PROPOSE TO REPLACE CONCRETE	PROPOSE TO SEAL ALL SURFACES

FOOTNOTE 1. 1ST COAT: DUR-A-GLAZE EPOXY #4, 2ND COAT: DUR-A-GARD EPOXY COATING WITH ANTI-SKID MEDIA.

RAIL CAR UNLOAD

CONTAINMENT & DETECTION OF RELEASES
40 CFR 264.175

DESCRIPTION	CAPABLE OF DETECTING & COLLECTING RELEASES UNTIL REMOVED	COMPATIBLE MATERIAL OF CONSTRUCTION OR LINED	LEAK DETECTION SYSTEM	SLOPED TO DRAIN OR REMOVE LIQUIDS	LARGEST TANKS WITHIN BOUNDARY	DIMENSIONS & CAPACITY	PREVENTION OF RUN-ON OF INFILTRATION OR PRECIPITATION	FREE OF GAPS & CRACKS
RAIL CAR UNLOAD AREA (LIQUID UNLOAD) NORTH	RELEASES COLLECTED IN LINER AND SUMP.	LINER: HDPE DRIP PAN: GALV. STEEL SUMP: CONCRETE.	VISUAL	SLOPED TO BLIND SUMP	23,000 GAL. RAIL CAR AND 100 YR. RAIN = 4.8" OVER 6400 SQ. FT. = 19,100 GAL.	250 FT. X 20 FT. X 3 FT. DEEP HDPE LINED AREA WITH 2,000 GAL. BLIND SUMP TOTAL CONT. VOLUME : 30,000 GAL.	NO COVER/ CANOPY, SUMP PERIODICALLY PUMPED OUT.	YES
PROPOSED RAIL CAR UNLOAD AREA (LIQUID UNLOAD) SOUTH	RELEASES COLLECTED IN LINER AND SUMP.	LINER: HDPE DRIP PAN: GALV. STEEL SUMP: CONCRETE.	VISUAL	SLOPED TO BLIND SUMP	23,000 GAL. RAIL CAR AND 100 YR. RAIN = 4.8" OVER 19,600 SQ. FT. = 81,520 GAL.	CATCH = 19,600 SQ.FT. 15 FT. DEEP HDPE LINED AREA WITH 81,520 GAL. BLIND SUMP TOTAL CONT. VOLUME : 81,520 GAL.	CURBED	YES
RAIL CAR UNLOAD AREA CHEMICAL FIXATION AREA	RELEASES COLLECTED IN CURBED AREA AND SUMP.	CONCRETE	VISUAL	SLOPED TO BLIND SUMP	23,000 GALLON RAIL CAR	AREA S.E. OF BLDG. 64,000 GAL. BLDG INTERIOR 49,500 GAL. N.W. OF BLDG. 14,500 GAL.	PARTIAL COVER OUTSIDE AREAS PERIODICALLY PUMPED OUT.	YES

SPECIFIC PART B INFORMATION
REQUIREMENTS FOR CONTAINERS
40 CFR 270.15

DESCRIPTION	DESIGN PARAMETERS	DIMENSIONS	MATERIALS OF CONSTRUCTION	DRAINAGE OR KEPT FROM STANDING WATER	CAPACITY	PREVENTION/ MANAGING RUN-ON	METHOD OF ANALYSIS & REMOVAL OF ACCUMULATED WASTE TO PREVENT OVERFLOW
EX. RAIL CAR UNLOAD AREA (LIQUID UNLOAD) NORTH 1	CONTAINMENT FOR 23,000 GALLON RAIL CAR	250 FT. X 20 FT. X 3 FT. DEEP HDPE LINED AREA WITH 2,000 GAL. BLIND SUMP.	LINER: HDPE DRIP PAN: GALV. STEEL SUMP: CONCRETE	CONTAINMENT AREA DRAINS TO BLIND SUMP.	TOTAL CONT. VOLUME : 30,000 GAL.	NO COVER/ CANOPY, SUMP PERIODICALLY PUMPED OUT.	ACCUMULATED WASTE DRAINED TO TRENCH WHERE IT IS PERIODICALLY PUMPED OUT.
PROPOSED RAIL CAR UNLOAD AREA (LIQUID UNLOAD) SOUTH 1	CONTAINMENT FOR 23,000 GALLON RAIL CAR	SEE SHEET P-5A	LINER: HDPE DRIP PAN: GALV. STEEL SUMP: CONCRETE	CONTAINMENT AREA DRAINS TO BLIND SUMP.	TOTAL CONT. VOLUME : 81,520 GAL.	NO COVER/ CANOPY, SUMP PERIODICALLY PUMPED OUT.	ACCUMULATED WASTE DRAINED TO TRENCH WHERE IT IS PERIODICALLY PUMPED OUT.
RAIL CAR UNLOAD AREA CHEMICAL FIXATION AREA 1	CONTAINMENT FOR 23,000 GALLON RAIL CAR	SEE DRAWINGS	CONCRETE	CONTAINMENT AREA DRAINS TO BLIND SUMP.	AREA S.E. OF BLDG. 64,000 GAL. BLDG INTERIOR 49,500 GAL. N.W. OF BLDG. 14,500 GAL.	PARTIAL COVER OUTSIDE AREAS PERIODICALLY PUMPED OUT.	ACCUMULATED WASTE DRAINED TO TRENCH WHERE IT IS PERIODICALLY PUMPED OUT.

FOOTNOTE 1. A MAXIMUM NUMBER OF 9 HAZARDOUS WASTE RAILCARS CAN BE STORED ON THE PREMISES AT ONE TIME

710 Avis Drive
Ann Arbor MI 48108

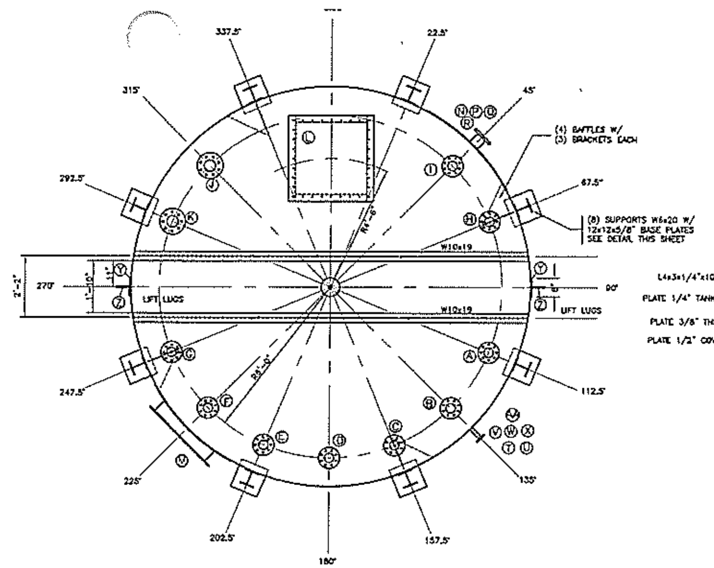
DESIGNED J. BELL | CHECKED D. NAVARRE
SCALE NONE

US LIQUIDS OF DETROIT, INC.
DETROIT TREATMENT FACILITY
RCRA PART B APPLICATION

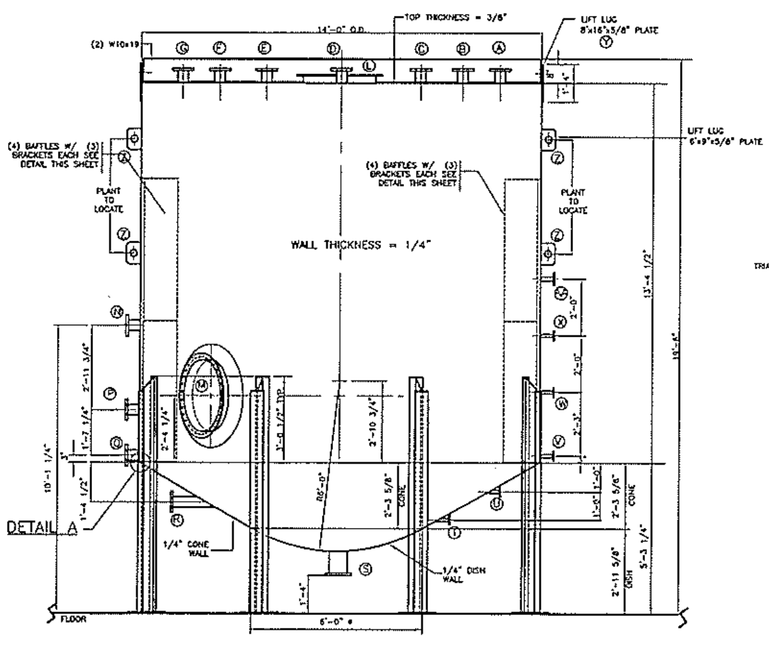
PROCESS

CHEMICAL PRECIPITATION SCHEDULE

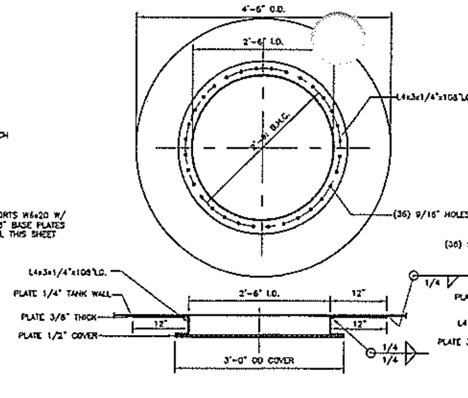
SHEET P-9



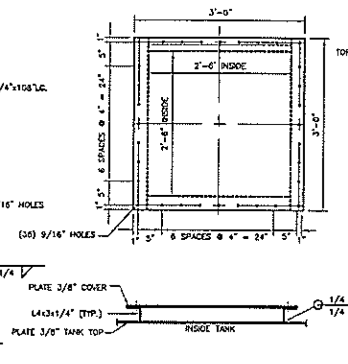
PLAN VIEW:
SCALE: 1/2"=1'-0"



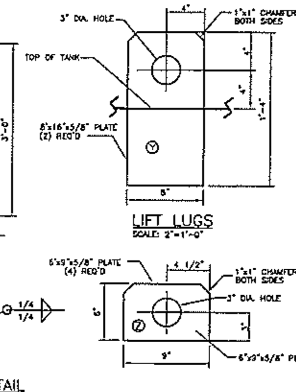
ELEVATION:
SCALE: 1/2"=1'-0"



MANWAY FRONT OF TANK DETAIL
SCALE: 1"=1'-0"

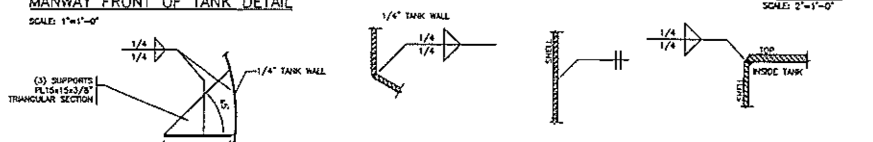


MANWAY TOP OF TANK DETAIL
SCALE: 1"=1'-0"



LIFT LUGS
SCALE: 2"=1'-0"

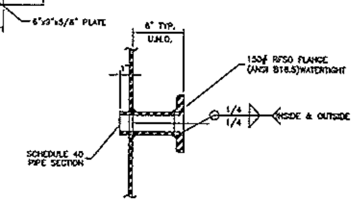
LIFT LUGS
SCALE: 2"=1'-0"



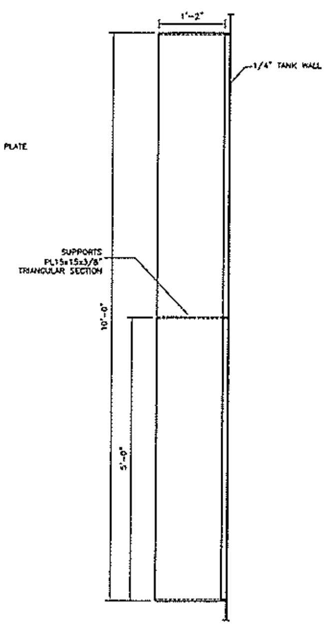
DETAIL A
SCALE: 2"=1"

TYP. HORIZ. JOINT
SCALE: 2"=1"

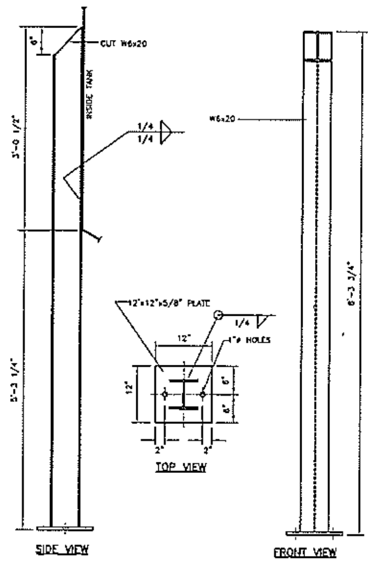
ROOF TO WALL JOINT
SCALE: 2"=1"



TYPICAL NOZZLE DETAIL
NO SCALE



BAFFLE & BRACKET DETAIL
SCALE: 1"=1'-0"



SUPPORT DETAIL
SCALE: 1"=1'-0"

NOZZLE SCHEDULE

			℄ ELEV.	DESCRIPTION
A	4"⌀	[illegible]	ROOF	FERRIC
B	4"⌀	[illegible]	ROOF	LIME
C	4"⌀	[illegible]	ROOF	CAUSTIC
D	4"⌀	180°	ROOF	BLEACH
E	4"⌀	202.5°	ROOF	[illegible]
F	4"⌀	225°	ROOF	ALUM
G	4"⌀	247.5°	ROOF	ACID
H	4"⌀	67.5°	ROOF	TANK FILL
I	4"⌀	45°	ROOF	VENT
J	6"⌀	315°	ROOF	OVERFLOW SWITCH
K	6"⌀	292.5°	ROOF	LEVEL CONTROL
L	30"x30"	0°	ROOF	MANWAY
M	30"⌀	225°	7'-7 1/2"	MANWAY
N	4"⌀	45°	10'-1 1/4"	DISCHARGE VALVE
P	4"⌀	45°	7'-1 1/2"	DISCHARGE VALVE
Q	4"⌀	45°	5'-6 1/4"	DISCHARGE VALVE
R	4"⌀	45°	3'-10 3/4"	DISCHARGE VALVE
S	6"⌀	CENTER	BOTTOM	DRAIN
T	1"⌀	135°	3'-3 1/4"	SAMPLE PORT
U	1"⌀	135°	4'-3 1/4"	SAMPLE PORT
V	1"⌀	135°	5'-6 1/4"	SAMPLE PORT
W	1"⌀	135°	7'-9 1/4"	SAMPLE PORT
X	1"⌀	135°	9'-9 1/4"	SAMPLE PORT
Y				LIFT LUG-ROOF
Z				LIFT LUG-SIDE
AA	2"⌀	135°	11'-9 1/4"	pH PROBE

VOLUME = 16,913 GALLONS
WEIGHT = 15,000 LBS.

NOTES:

1. MATERIALS : SHELL: ASTM A-36
   PIPE: ASTM A-53 GR. B
   FLANGES: ASTM A-181
   SHAPES/BAR: ASTM A-36
2. ALL BOLT HOLES TO STRADDLE CENTERLINE.
3. ALL FLANGES TO BE 150# RAISED FACE FLANGES.
4. ALL EXTERIOR SURFACES TO BE CLEANED OF DIRT, WELD SLAG, ETC..
5. ALL EXTERIOR SURFACES TO BE TOP COATED WITH (1) COAT OF SHOP PRIMER.
6. TANK DESIGNED AND BUILT IN ACCORDANCE WITH API 650.
7. PRESSURE TEST TANK TO 7 PSI.

ESCO ENGINEERED SOLUTIONS CORP.
24101 NOVI RD. SUITE 200
NOVI, MI. 48375
(248)380-9124

	APPROVAL	CONSTR.	REV1	REV2	REV3
DRWN BY: Y. JACKSON	11-20-06	11-30-06	1-8-07	2/07	
ENG'R BY:					
CHK'D BY: S. SMITH	11-20-06	11-30-06	1-8-07	2/07	

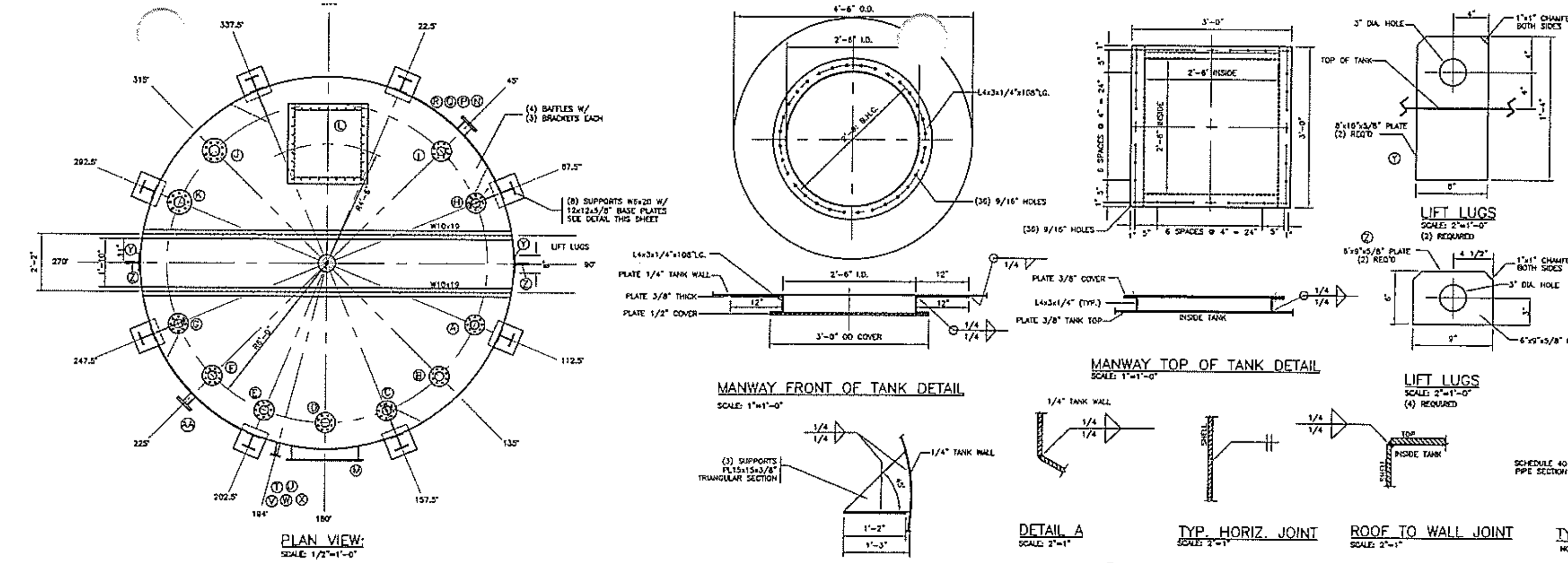
RTC ENVIRO-FAB

RTC/ENVIRO-FAB Inc.
9043 Plum Orchard Road (M106)
Munith, MI. 49259-9745

SCALE: 1/2"=1'-0" U.N.O. | APPROVED BY: SKS | DRAWN BY: YMJ
DATE: 11-17-06 | REVISED: 11-20-06

ENVIRONMENTAL QUALITY
ELEVATED TREATMENT TANK 204
PROVIDED BY WAGNER ENTERPRISES

NUMBER | TANK DETAILS | DRAWING NUMBER: RTC-6158-1



PLAN VIEW:
SCALE: 1/2"=1'-0"

MANWAY FRONT OF TANK DETAIL
SCALE: 1"=1'-0"

MANWAY TOP OF TANK DETAIL
SCALE: 1"=1'-0"

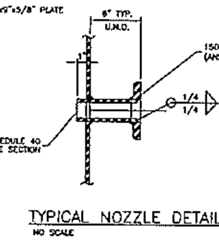
LIFT LUGS
SCALE: 2"=1'-0"
(2) REQUIRED

LIFT LUGS
SCALE: 2"=1'-0"
(4) REQUIRED

DETAIL A
SCALE: 2"=1'

TYP. HORIZ. JOINT
SCALE: 2"=1'

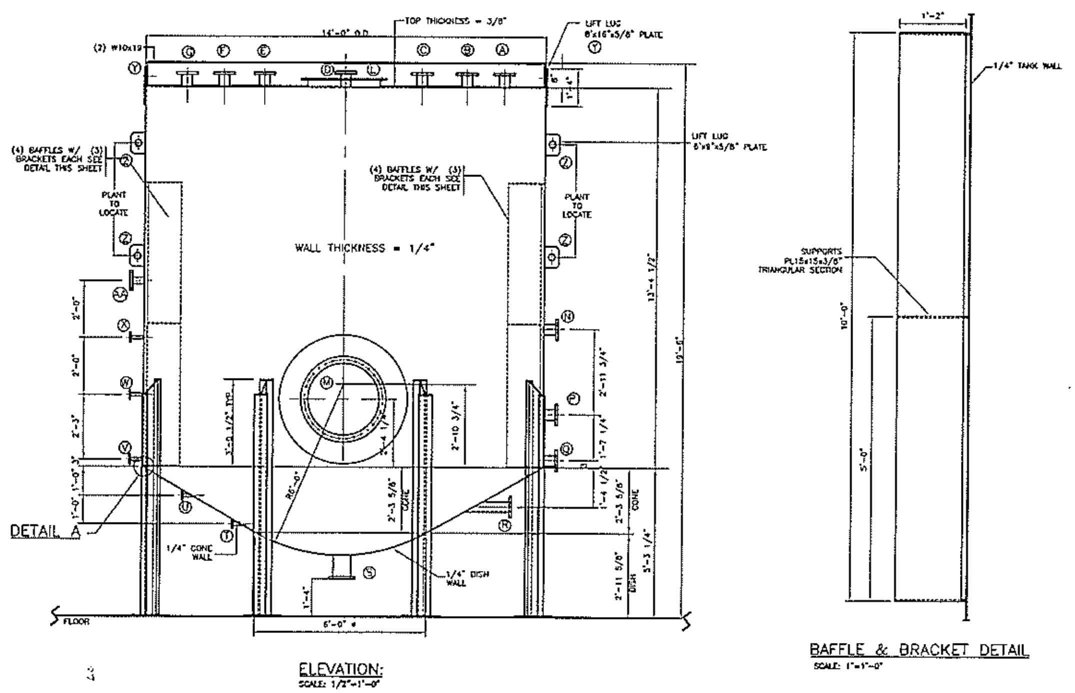
ROOF TO WALL JOINT
SCALE: 2"=1'



TYPICAL NOZZLE DETAIL
NO SCALE

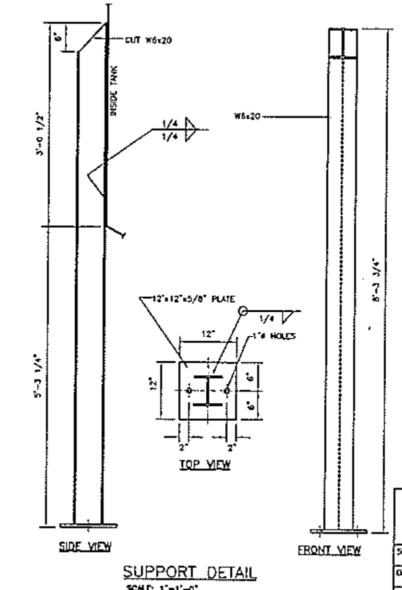
NOZZLE SCHEDULE

			℄ ELEV.	DESCRIPTION
A	4"ø	[illegible]	ROOF	FERRIC
B	4"ø	[illegible]	ROOF	LIME
C	4"ø	[illegible]	ROOF	CAUSTIC
D	4"ø	180°	ROOF	BLEACH
E	4"ø	202.5°	ROOF	[illegible]
F	4"ø	225°	ROOF	ALUM
G	4"ø	247.5°	ROOF	ACID
H	4"ø	67.5°	ROOF	TANK FILL
I	4"ø	45°	ROOF	VENT
J	6"ø	315°	ROOF	OVERFLOW SWITCH
K	6"ø	292.5°	ROOF	LEVEL CONTROL
L	30"x30"	0°	ROOF	MANWAY
M	30"ø	180°	7'-7 1/2"	MANWAY
N	4"ø	45°	10'-1 1/4"	DISCHARGE VALVE
P	4"ø	45°	7'-1 1/2"	DISCHARGE VALVE
Q	4"ø	45°	5'-6 1/4"	DISCHARGE VALVE
R	4"ø	45°	3'-10 3/4"	DISCHARGE VALVE
S	8"ø	CENTER	BOTTOM	DRAIN
T	1"ø	194°	3-3 1/4"	SAMPLE PORT
U	1"ø	194°	4'-3 1/4"	SAMPLE PORT
V	1"ø	194°	5'-8 1/4"	SAMPLE PORT
W	1"ø	194°	7'-8 1/4"	SAMPLE PORT
X	1"ø	194°	9'-8 1/4"	SAMPLE PORT
Y				LIFT LUG – ROOF
Z				LIFT LUG – SIDE
AA	2"ø	225°	11'-9 1/4"	pH PROBE



ELEVATION:
SCALE: 1/2"=1'-0"

BAFFLE & BRACKET DETAIL
SCALE: 1"=1'-0"



SUPPORT DETAIL
SCALE: 1"=1'-0"

VOLUME = 16,913 GALLONS
WEIGHT = 15,000 LBS.

NOTES:

1. MATERIALS : SHELL: ASTM A-36
   PIPE: ASTM A-53 GR. B
   FLANGES: ASTM A-181
   SHAPES/BAR: ASTM A-36
2. ALL BOLT HOLES TO STRADDLE CENTERLINE.
3. ALL FLANGES TO BE 150# RAISED FACE FLANGES.
4. ALL EXTERIOR SURFACES TO BE CLEANED OF DIRT, WELD SLAG, ETC..
5. ALL EXTERIOR SURFACES TO BE TOP COATED WITH (1) COAT OF SHOP PRIMER.
6. TANK DESIGNED AND BUILT IN ACCORDANCE WITH API 650.
7. PRESSURE TEST TANK TO 7 PSI.

ESCO ENGINEERED SOLUTIONS CORP. 24101 NOVI RD. SUITE 200 NOVI, MI. 48375 (248)380-9124					
	APPROVAL	CONSTR	REV1	REV2	REV3
DRWN BY: Y. JACKSON	11-20-06	11-30-06	1-05-07	2/07	
ENG'R BY:					
CHK'D BY: S. SMITH	11-20-06	11-30-06	1-05-07	2/07	

RTC ENVIRO-FAB

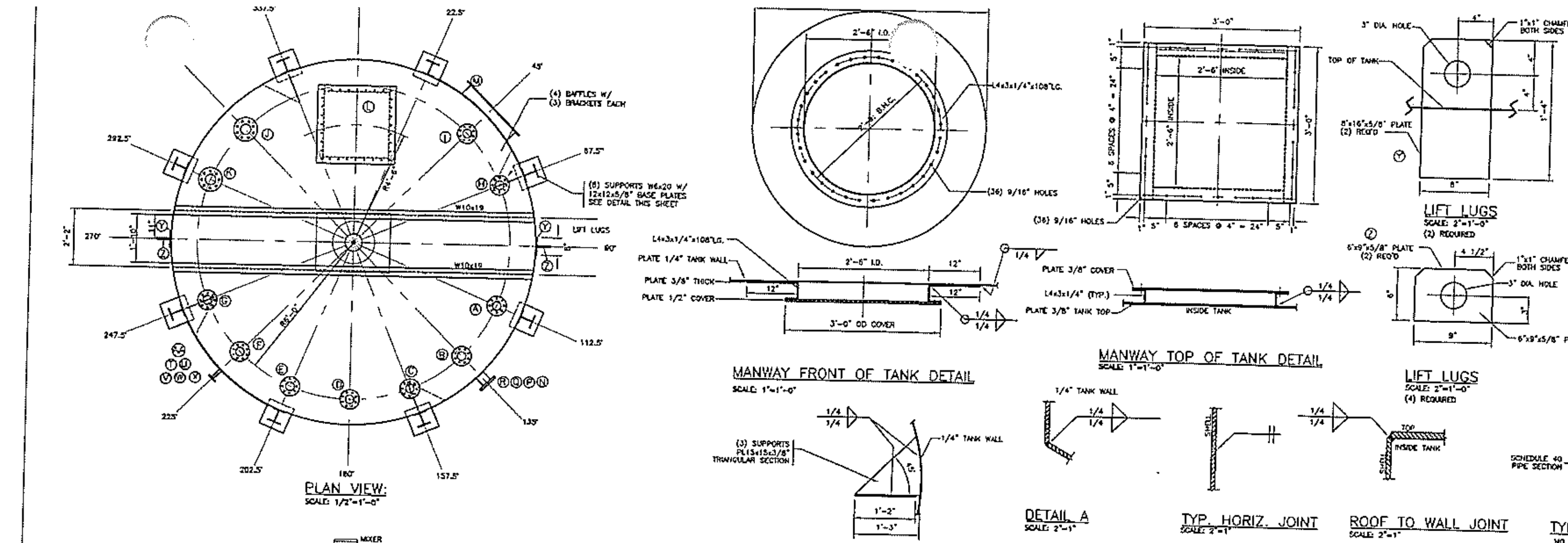
RTC/ENVIRO-FAB Inc.
9043 Plum Orchard Road (M106)
Munith, Mi. 49259-9745

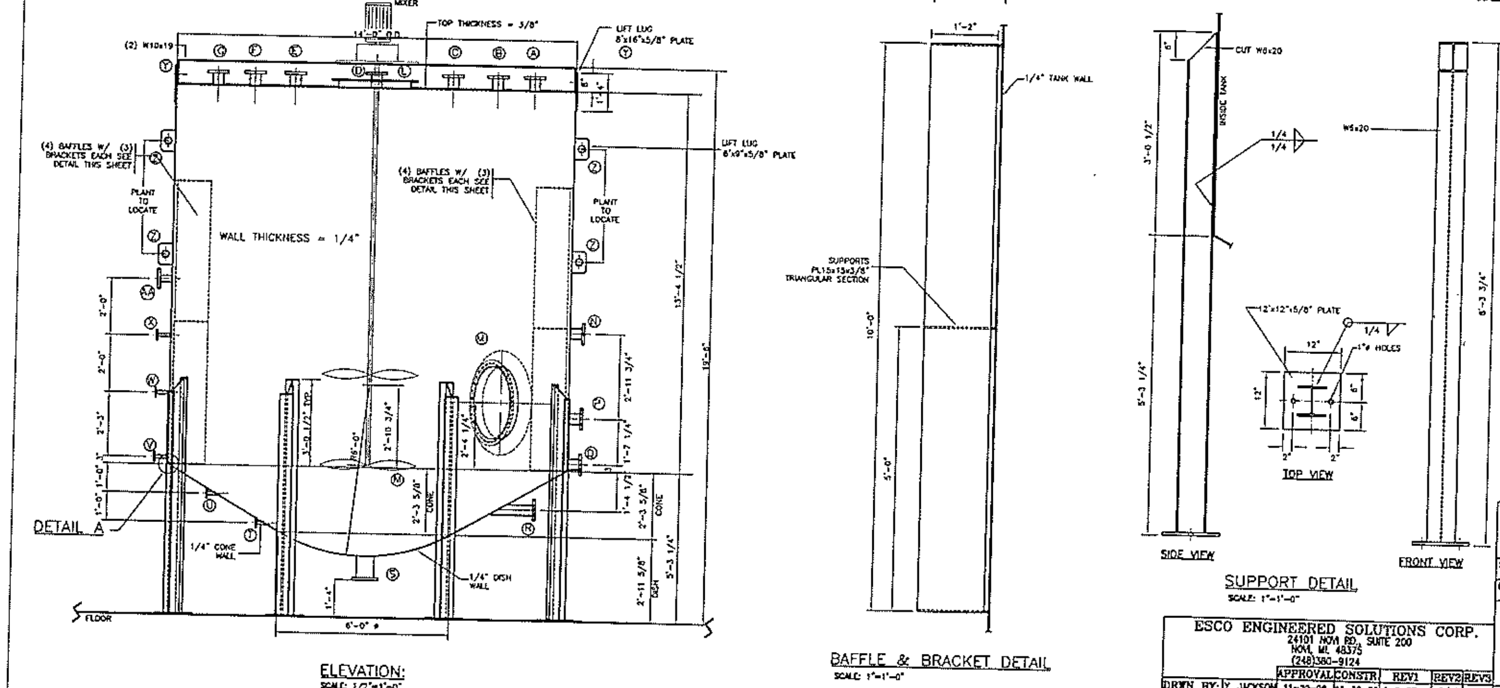
SCALE 1/2"=1'-0" U.N.O.	APPROVED BY: SKS	DRAWN BY YMJ
DATE 11-17-06		REVISED 11-20-06

ENVIRONMENTAL QUALITY
ELEVATED TREATMENT TANK 205
PROVIDED BY WAGNER ENTERPRISES

NUMBER	TANK DETAILS	DRAWING NUMBER RTC-6158-2

3





NOZZLE SCHEDULE

	[illegible]	[illegible]NT.	℄ ELEV.	DESCRIPTION
A	4"	[illegible]	ROOF	FERRIC
B	4"	[illegible]	ROOF	LIME
C	4"ø	[illegible]7.5°	ROOF	CAUSTIC
D	4"ø	180°	ROOF	BLEACH
E	4"ø	202.5°	ROOF	[illegible]
F	4"ø	225°	ROOF	ALUM
G	4"ø	247.5°	ROOF	ACID
H	4"ø	67.5°	ROOF	TANK FILL
I	4"ø	45°	ROOF	VENT
J	6"ø	315°	ROOF	OVERFLOW SWITCH
K	6"ø	292.5°	ROOF	LEVEL CONTROL
L	30"x30"	0°	ROOF	MANWAY
M	30"ø	45°	7'-7 1/2"	MANWAY
N	4"ø	135°	10'-1 1/4"	DISCHARGE VALVE
P	4"ø	135°	7'-1 1/2"	DISCHARGE VALVE
Q	4"ø	135°	5'-6 1/4"	DISCHARGE VALVE
R	4"ø	135°	3'-10 3/4"	DISCHARGE VALVE
S	6"ø	CENTER	BOTTOM	DRAIN
T	1"ø	225°	3'-3 1/4"	SAMPLE PORT
U	1"ø	225°	4'-3 1/4"	SAMPLE PORT
V	1"ø	225°	5'-6 1/4"	SAMPLE PORT
W	1"ø	225°	7'-9 1/4"	SAMPLE PORT
X	1"ø	225°	9'-9 1/4"	SAMPLE PORT
Y				LIFT LUG – ROOF
Z				LIFT LUG – SIDE
AA	2"ø	225°	11'-9 1/4"	pH PROBE

VOLUME = 16,913 GALLONS
WEIGHT = 15,000 LBS. + MIXER

NOTES:

1. MATERIALS : SHELL: ASTM A-36
   PIPE: ASTM A-53 GR. B
   FLANGES: ASTM A-181
   SHAPES/BAR: ASTM A-36
2. ALL BOLT HOLES TO STRADDLE CENTERLINE.
3. ALL FLANGES TO BE 150# RAISED FACE FLANGES.
4. ALL EXTERIOR SURFACES TO BE CLEANED OF DIRT, WELD SLAG, ETC..
5. ALL EXTERIOR SURFACES TO BE TOP COATED WITH (1) COAT OF SHOP PRIMER.
6. TANK DESIGNED AND BUILT IN ACCORDANCE WITH API 650.
7. PRESSURE TEST TANK TO 7 PSI.

ESCO ENGINEERED SOLUTIONS CORP.
24101 NOVI RD, SUITE 200
NOVI, MI. 48375
(248)380-9124

		APPROVAL	CONSTR.	REV1	REV2	REV3
DRWN BY:	Y. JACKSON	11-20-06	11-30-06	1-8-07	2/07	
ENG'R BY:						
CHK'D BY:	S. SMITH	11-20-06	11-30-06	1-8-07	2/07	

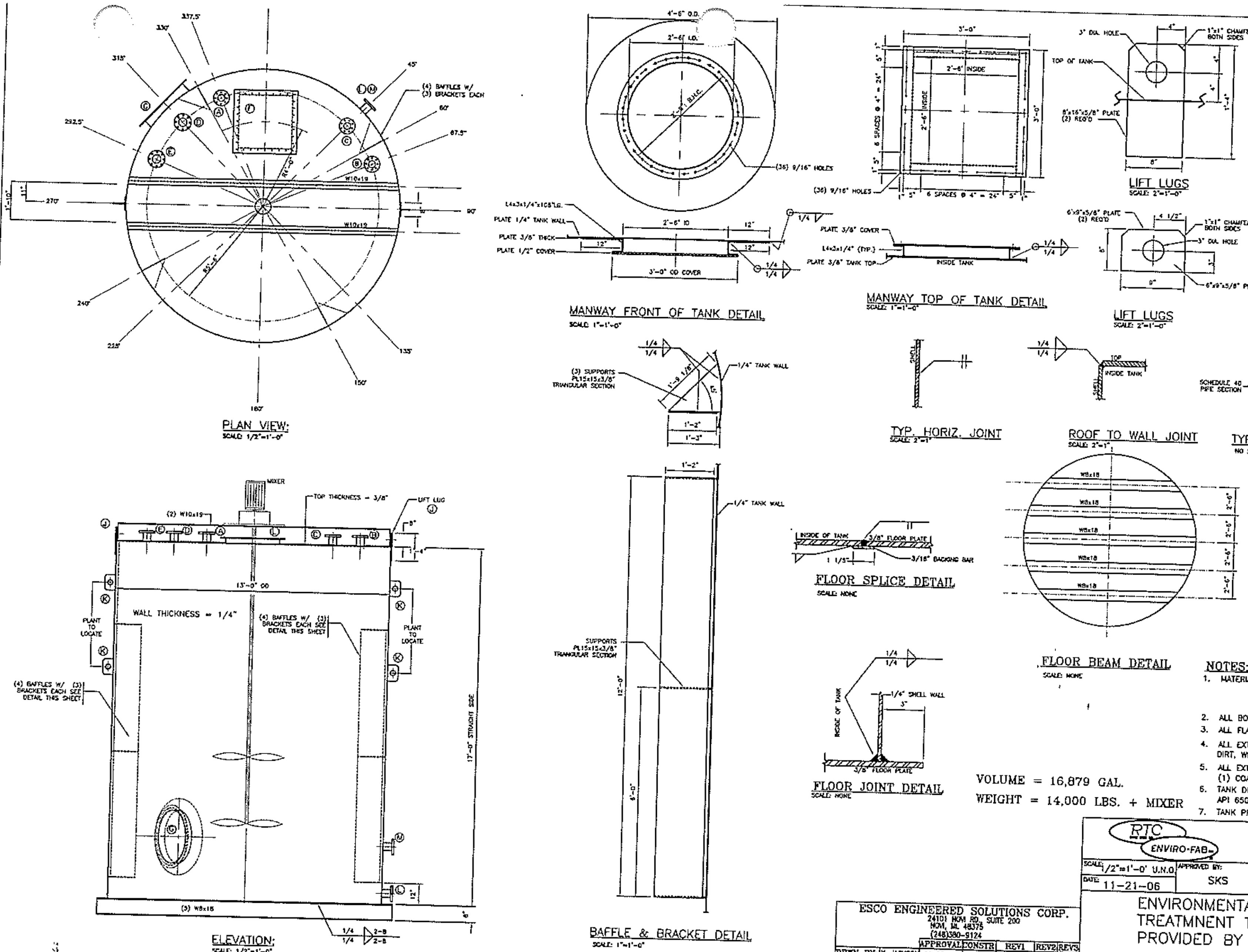
RTC ENVIRO-FAB

RTC/ENVIRO-FAB Inc.
9043 Plum Orchard Road (M106)
Munith, MI. 49259-9745

SCALE: 1/2"=1'-0" U.N.O. | APPROVED BY: SKS | DRAWN BY: YMJ
DATE: 11-17-06 | REVISED: 11-20-06

ENVIRONMENTAL QUALITY
ELEVATED TREATMENT TANK 206
PROVIDED BY WAGNER ENTERPRISES

NUMBER | TANK DETAILS | DRAWING NUMBER: RTC-6158-3



E SCHEDULE

		ENT.	℄ ELEV.	DESCRIPTION
A	4"ø	337.5°	ROOF	LIME
B	4"ø	67.5°	ROOF	TANK FILL
C	4"ø	45°	ROOF	VENT
D	8"ø	315°	ROOF	OVERFLOW SWITCH
E	8"ø	292.5°	ROOF	LEVEL CONTROL
F	30"x30"	0°	ROOF	MANWAY
G	30"ø	315°	3'-0"	MANWAY
H	1"ø	135°	3'-3 1/4"	SAMPLE PORT
I	1"ø	135°	4'-3 1/4"	SAMPLE PORT
J				LIFT LUG ROOF
K				LIFT LUG-SIDES
L	4"ø	45°	0'-5 1/2"	FILTER PRESS FEED A
M	4"ø	45°	3'-11 1/2"	FILTER PRESS FEED B

VOLUME = 16,879 GAL.
WEIGHT = 14,000 LBS. + MIXER

NOTES:
1. MATERIALS : SHELL: ASTM A-36
   PIPE: ASTM A-53 GR. B
   FLANGES: ASTM A-181
   SHAPES/BAR: ASTM A-36
2. ALL BOLT HOLES TO STRADDLE CENTERLINE.
3. ALL FLANGES TO BE 150# RAISED FACE FLANGES.
4. ALL EXTERIOR SURFACES TO BE CLEANED OF DIRT, WELD SLAG, ECT..
5. ALL EXTERIOR SURFACES TO BE TOP COATED WITH (1) COAT OF SHOP PRIMER.
6. TANK DESIGNED AND BUILT IN ACCORDANCE WITH API 650.
7. TANK PRESSURE TESTED TO 7 PSI.

ESCO ENGINEERED SOLUTIONS CORP.
24101 NOVI RD. SUITE 200
NOVI, MI. 48375
(248)380-9124

	APPROVAL	CONSTR	REV1	REV2	REV3
DRWN BY: Y. JACKSON	11-20-06	11-30-06	1-8-07	2/07	
ENG'R BY:					
CHK'D BY: S. SMITH	11-20-06	11-30-06	1-8-07	2/07	

RTC ENVIRO-FAB
RTC/ENVIRO-FAB Inc.
9043 Plum Orchard Road (M106)
Munith, MI. 49259-9745

SCALE 1/2"=1'-0" U.N.O. | APPROVED BY: SKS | DRAWN BY YMJ
DATE 11-21-06 | REVISED 11-20-06

ENVIRONMENTAL QUALITY
TREATMNENT TANK 208
PROVIDED BY WAGNER ENTERPRISES

NUMBER | TANK DETAILS | DRAWING NUMBER RTC-6158-4

ENVIRONMENTAL QUALITY DETROIT
1923 FREDERICK STREET
DETROIT, MI 48211

PO # 21001092
INSPECTION & RE-CERTIFICATION
TANK NO. FVF-168-20726-P

TRI-CLOR
1012 ENTERPRISE DRIVE
PO BOX 371
HASTINGS, MI 49058
APRIL 6, 2006

TRI-CLOR
"Full Fiberglass Service Specialist"
Fabrication Repair Inspections Installations Maintenance

4/21/06

Mr. Lew Kryk
Environmental Quality Detroit
1923 Frederick St.
Detroit, Mi 48211

Re: Fiberglass tank inspection and certification

Dear Mr. Kryk

On April 6th 2006 Tri-Clor technicians performed an inspection on fiberglass tank serial number 106515. Below please find the results of that inspection. Also included is a letter from the resin manufacturer stating that the resin used to manufacture the tank is capable of handling the new product that will be introduced into the tank.

Specifications of the vessel:

168" diameter x 219" over-all length, flattop, flat bottom, equipped with an agitator rail. The bottom is fully supported, sitting on 2" thick foam. The tank has various fittings ranging from 1" diameter all the way up to 24" diameter. Design temp. 200 degrees F, design pressure –10 W.C., specific gravity 1.36. Resin of construction; CORVE 8300 with a MEKP cure.

Inspection results:

The corrosion barrier (nexus (2) 1.5 oz. mat) is in very good condition with no sign of degradation, delamination, cracks or crazes. All secondary bonds are in good condition, again no sign of degradation or delamination. There is no chemical penetration into the corrosion barrier visible at this time.

The structural layers of the tank are in tact, again no sign of wear or abuse.

The overall condition of the tank is very good.

The tank was manufactured to the specifications noted in the letter issued by the resin manufacturer, and has passed the on-site inspection. At this time the tank is cleared to introduce the hazardous leachate water with minute, trace amounts of metals and organics as described in the letter received April 5th 2006.

Ph# 269-948-9310 Fax# 269-948-9306
TRI-CLOR, INC. - 1012 Enterprise Drive - Hastings, MI 49058

Notes of importance:

The integrity of the tank is not at risk, but it is worth noting that several holes have been drilled in the flat top of the vessel. This has taken the (leak proof) ability, or the ability of the tank to contain its product away. These holes are not factory installed flanges or modified in the field by fiberglass technicians, and have been added by just creating a hole in the top. If the vessel were to fill to the top these holes become the first area of *penetration for the product escaping the vessel.*

It is also important that the vessel be mounted to the floor by the lugs so that the bottom knuckle is supported, during filling and emptying. There should also be a clear tank "vent" port larger then the largest fill or exit port, and a clear "overfill" port, to keep the vent clear, and functioning properly.

If you have any other questions please feel free to contact me at anytime.

Sincerely,

Timothy C. Schoessel

Timothy C. Schoessel

INTERPLASTIC CORPORATION
Thermoset Resins Division

INTERPLASTIC CORPORATION
Thermoset Resins Division

2015 Northeast Broadway Street
Minneapolis, Minnesota 55413-1775
(651) 481-6860 Fax (612) 331-4235

April 18, 2006

Mr. Timothy Schoessel
Tri-Clor, Inc.
1012 Enterprise Drive
Hastings, MI 49058

Dear Mr. Schoessel:

Fax #269-948-9306

We have reviewed your chemical environment and feel that CORVE8300 is suitable for this application with the maximum operating temperature of 180°F. C glass surfacing veil and dry heat post cure are recommended.

The inner corrosion liner should be manufactured according to ASME RTP-1, ASTM D3299, or ASTM D4097 with a resin-rich layer of surfacing veil as an inner surface followed by a fiberglass laminate that is a minimum of 0.10" thick. The structural portion of the vessel should be manufactured to design specifications and the resin sufficiently cured to ensure maximum service life.

In addition, I will be your first point of contact for future corrosion recommendations and inquires.

If you have any questions regarding this information or any of Interplastic Corporation's products, please contact us.

Sincerely,

Bankim Desai

Bankim Desai, Senior Chemist
Corrosion and Specialty Resins

BND:alk

cc: T Bennett, D Herzog, M Kastl,
T McCabe, W Rogers

Tri-Clor CORVE8300 Schoessel, T BND 041806.doc

TRI-CLOR INC.
"Fiberglass Field Service Specialist"

TRI-CLOR, INC. - 1012 Enterprise Drive, Hastings, MI 49058
Phone 269-948-9310 ▼ Fax 269-948-9306
▼ Repair ▼ Inspections ▼ Installations ▼ Maintenance

FIELD SERVICES
TIME & MATERIAL DAILY REPORT

DATE: 4-6-06

CLIENT: EQ Detroit INC

CLIENT CONTACT: Lew Kryk

PHONE: 313-923-0080

PURCHASE ORDER NO.

JOB NO.

DESCRIPTION OF WORK PERFORMED

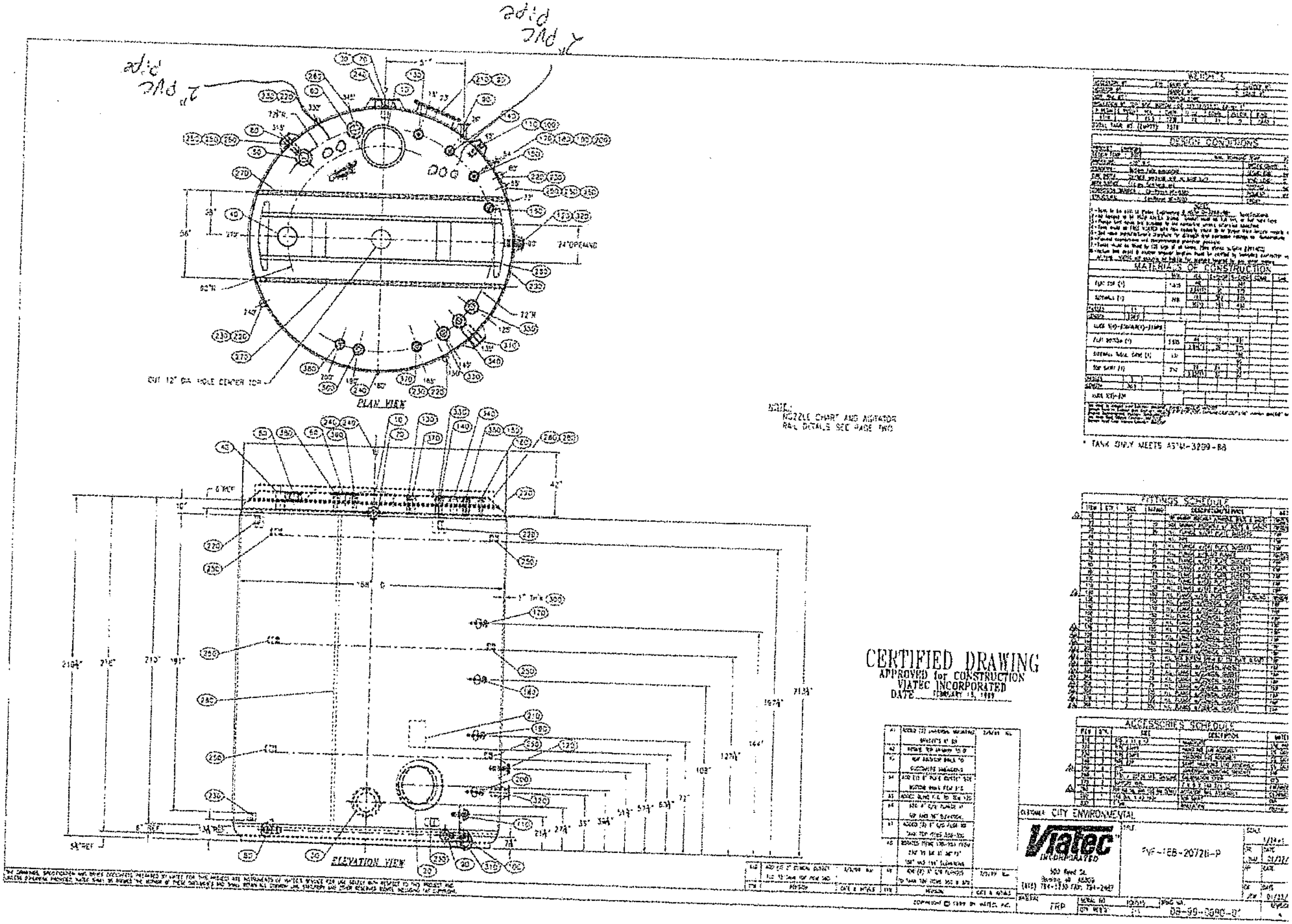
- TRAVEL TO AND FROM
- TANK INSPECTION (TANK LOOKS GOOD, NO SIGNS of CRACKS)
- VERIFY TANK ORIENTATION AND DIMENSIONS

Employee	Class	Number of Hours		Travel	Time-In	Time-Out
		Reg.	Overtime			
WAYNE MEADE	FS	1 HR		5½ HRS	7:00AM	1:30 PM
DON ASPINALL	FT					

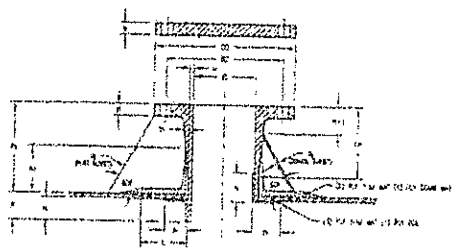
MATERIALS & EQUIPMENT

Quantity	Item	Quantity	Item

☐ JOB COMPLETE ☒ JOB INCOMPLETE



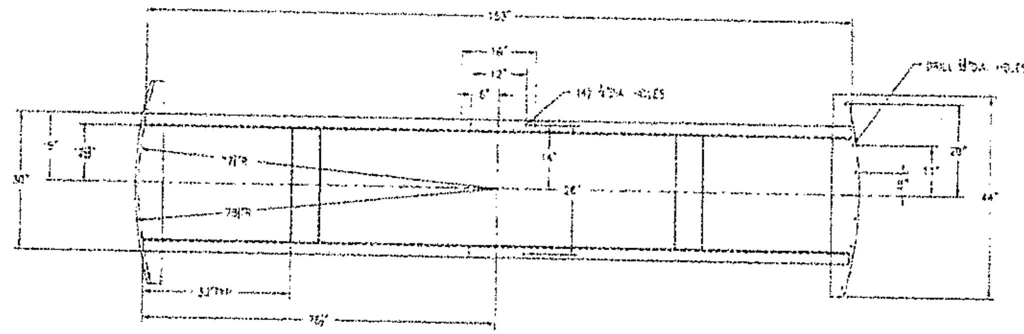
TANK IS NOT ANCHORED DOWN

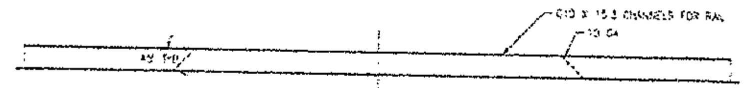


	ID	OD	BC	No HOLES	HOLE SIZE	tf	tc	tn	tn	Lh	Po	Pi	to	hi	L	ho	X	Y	BOLT DIA	BOLT LENGTH	BOLT TORQUE
A10	24"	28"	26[illegible]"	8	[illegible]	[illegible]	[illegible]	[illegible]	2"	1"	6"	0"	NR	2"	3"	3"	6	0	[illegible]	[illegible]	5
A20	24"	32"	29[illegible]"	20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3"	6"	0"	NR	2"	12"	4"	7	3	[illegible]	3[illegible]"	20
A30	12"	19"	17"	12	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	0"	[illegible]	11"	5"	4"	7	3	[illegible]	3[illegible]"	20
A50	6"	11"	9[illegible]"	8	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	0"	[illegible]	11"	3"	3"	6	0	1"	3[illegible]"	20
A60	6"	11"	9[illegible]"	8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3"	6"	0"	NR	11"	3"	3"	6	0	1"	3[illegible]"	30
A70	4"	9"	7[illegible]"	8	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	0	[illegible]	3[illegible]"	15
A80	4"	9"	7[illegible]"	8	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	1"	11"	3"	3"	6	2	[illegible]	3[illegible]"	15
A90AA100	3"	7[illegible]"	6"	4	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	2	[illegible]	3[illegible]"	30
A110	2"	6"	4[illegible]"	4	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	7	0	[illegible]	3[illegible]"	25
A120	2"	6"	4[illegible]"	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	0	[illegible]	3[illegible]"	25
A130AA140AA150AA160	2"	6"	4[illegible]"	4	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	0	[illegible]	3[illegible]"	25
A170AA180AA190AA200	1"	4[illegible]"	3[illegible]"	4	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	0	[illegible]	3[illegible]"	15
A310	6"	11"	9[illegible]"	8	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	4[illegible]"	8	3	1"	3[illegible]"	20
A320	4"	9"	7[illegible]"	8	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	2	[illegible]	3[illegible]"	15
A330AA340AA350	4"	9"	7[illegible]"	8	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	0	[illegible]	3[illegible]"	15
A380	2"	6"	4[illegible]"	4	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	0	[illegible]	3[illegible]"	25
A360AA370	3"	7[illegible]"	6"	4	[illegible]	[illegible]	NR	[illegible]	[illegible]	3"	6"	6"	[illegible]	11"	3"	3"	6	0	[illegible]	3[illegible]"	30

NR: NOT REQUIRED

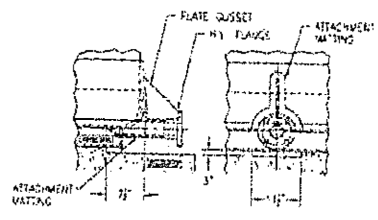
NOZZLE CHART



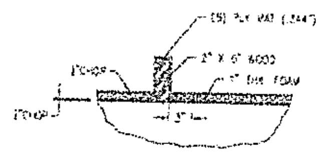


AGITATOR RAIL DETAIL

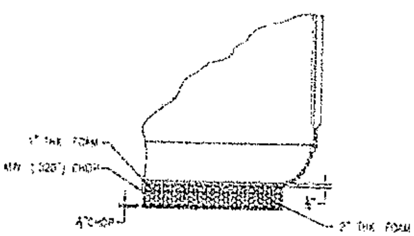
NOTE:
AGITATOR LOADINGS:
DOWNWARD 1500 LBS
TORQUE: 14350 IN/LBS
BENDING 34000 IN/LBS



PAD CUTOUT DETAIL FOR ITEM 310



TOP HEAD DETAIL



BOTTOM HEAD DETAIL

CERTIFIED DRAWING
APPROVED for CONSTRUCTION
VIATEC INCORPORATED
DATE FEBRUARY 16, 1995

CUSTOMER CITY ENVIRONMENTAL

Viatec INCORPORATED

FVF-165-20726-P

FRP

DB-99-0080-02

THE ENVIRONMENTAL QUALITY COMPANY ®

PURCHASE ORDER

BILL TO:	**EQ Detroit, Inc.** Attn: Accounts Payable 36255 Michigan Avenue Wayne, MI 48184	PO NUMBER: AWARD DATE: PO CATEGORY: FROM: TO: NOT TO EXCEED:	**21001092** **04/07/06** Time and Materials 4/6/2006 4/26/2006 $1,525.00
VENDOR:	**TRI-CLOR INC.** 1012 ENTERPRISE DR HASTINGS MI 49058	**PO SHIP TO:**	**EQ DETROIT, INC.** 1923 Frederick Street Detroit, MI 48211
CONTACT: VENDOR PH: VENDOR FAX: E-MAIL: VENDOR ACCT #:	Jackie Dye (269) 948-9310 Ext. (269) 948-9306	ATTENTION:	Lew Kryk

CARRIER	F.O.B.	S/O OR CONFIRMATION #	TERMS	REQUISITION #
Not Applicable	Not Applicable		NET 45 DAYS	50022
MAKE / MODEL / FLEET #	VIN / SN	EQUIPMENT #	SHIPPER #	

	Description	*Vendor Part #*	*U/M*	*Qty*	*Unit Price*	*Extended Price*
1	Labor, Services and Travel Exp To re-certify tank FVF-168-20726-P for Hazardous Liquids **Due Date:** 04/06/2006	NOT TO EXCEED	Lump Sum	1	$1,525.00	$1,525.00

Subtotal:	$1,525.00
NO Tax:	$0.00
Total:	$1,525.00

Jodi Dinnan, Senior Buyer

Authorized Purchasing Approval

DETROIT, Inc.

1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • TEL 800 495 6059 • FAX 313 923 3375 • www.eqonline.com

April 5, 2006

Tim Schoessel
TRI-Chlor, Inc.
1012 Enterprise Drive
Hastings, MI 49058

Subject: Re-certification of Tank FVF-168-20726-P

Dear Mr. Schoessel:

EQ Detroit, Inc. (EQD) is planning to convert a 20,000-gallon fiberglass tank, T-306, from non-hazardous service to hazardous service. Tri-Clor personnel have been scheduled to inspect and re-certify the tank on April 6, 2006.

The tank was purchased in 1998, but was not installed at the EQD facility until 2002. The tank was not in active use until 2003 and since that time, has been used for the storage of non-hazardous landfill leachate. This leachate is water that contains very minute, trace amounts of metals and organics. Future use of this tank is intended to be for the storage of hazardous landfill leachate. This wastestream is also water with very minute amounts of metals and organics.

A copy of the RCRA regulations (40 CFR 264.192) regarding tank inspection and certification is enclosed. Please feel free to contact me at 313-923-0080 with any further questions you may have.

Sincerely,

Kristen C Rachwal

Kristen Rachwal, CHMM
Regulatory Specialist

Enclosure

Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter.

* * * * *

§ 264.191 Assessment of existing tank system's integrity.

(a) For each existing tank system that does not have secondary containment meeting the requirements of § 264.193, the owner or operator must determine that the tank system is not leaking or is unfit for use. Except as provided in paragraph (c) of this section, the owner or operator must obtain and keep on file at the facility a written assessment reviewed and certified by an independent, qualified registered professional engineer, in accordance with § 270.11(d), that attests to the tank system's integrity by January 12, 1988.

(b) This assessment must determine that the tank system is adequately designed and has sufficient structural strength and compatibility with the waste(s) to be stored or treated, to ensure that it will not collapse, rupture, or fail. At a minimum, this assessment must consider the following:

(1) Design standard(s), if available, according to which the tank and ancillary equipment were constructed;

(2) Hazardous characteristics of the waste(s) that have been and will be handled;

(3) Existing corrosion protection measures;

(4) Documented age of the tank system, if available (otherwise, an estimate of the age); and

(5) Results of a leak test, internal inspection, or other tank integrity examination such that:

(i) For non-enterable underground tanks, the assessment must include a leak test that is capable of taking into account the effects of temperature variations, tank end deflection, vapor pockets, and high water table effects, and

(ii) For other than non-enterable underground tanks and for ancillary equipment, this assessment must include either a leak test, as described above, or other integrity examination, that is certified by an independent, qualified, registered professional engineer in accordance with § 270.11(d), that addresses cracks, leaks, corrosion, and erosion.

[NOTE: The practices described in the American Petroleum Institute (API) Publication, Guide for Inspection of Refinery Equipment, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks," 4th edition, 1981, may be used, where applicable, as guidelines in conducting other than a leak test.]

(c) Tank systems that store or treat materials that become hazardous wastes subsequent to July 14, 1986, must conduct this assessment within 12 months after the date that the waste becomes a hazardous waste.

(d) If, as a result of the assessment conducted in accordance with paragraph (a), a tank system is found to be leaking or unfit for use, the owner or operator must comply with the requirements of § 264.196.

[51 FR 25472, July 14, 1986; 51 FR 29430, Aug. 15, 1986]

§ 264.192 Design and installation of new tank systems or components.

(a) Owners or operators of new tank systems or components must obtain and submit to the Regional Administrator, at time of submittal of part B information, a written assessment, reviewed and certified by an independent, qualified registered professional engineer, in accordance with § 270.11(d), attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. The assessment must show that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the waste(s) to be stored or treated, and corrosion protection to ensure that it will not collapse, rupture, or fail. This assessment, which will be used by the Regional Administrator to review and approve or disapprove the acceptability of the tank system design, must include, at a minimum, the following information:

(1) Design standard(s) according to which tank(s) and/or the ancillary equipment are constructed;

(2) Hazardous characteristics of the waste(s) to be handled;

(3) For new tank systems or components in which the external shell of a metal tank or any external metal component of the tank system will be in contact with the soil or with water, a determination by a corrosion expert of:

(i) Factors affecting the potential for corrosion, including but not limited to:

(A) Soil moisture content;

(B) Soil pH;

(C) Soil sulfides level;

(D) Soil resistivity;

(E) Structure to soil potential;

(F) Influence of nearby underground metal structures (e.g., piping);

(G) Existence of stray electric current;

(H) Existing corrosion-protection measures (e.g., coating, cathodic protection), and

(ii) The type and degree of external corrosion protection that are needed to ensure the integrity of the tank system during the use of the tank system or component, consisting of one or more of the following:

(A) Corrosion-resistant materials of construction such as special alloys, fiberglass reinforced plastic, etc.;

(B) Corrosion-resistant coating (such as epoxy, fiberglass, etc.) with cathodic protection (e.g., impressed current or sacrificial anodes); and

(C) Electrical isolation devices such as insulating joints, flanges, etc.

[NOTE: The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP–02–85)—Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," and the American Petroleum Institute (API) Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems," may be used, where applicable, as guidelines in providing corrosion protection for tank systems.]

(4) For underground tank system components that are likely to be adversely affected by vehicular traffic, a determination of design or operational measures that will protect the tank system against potential damage; and

(5) Design considerations to ensure that:

(i) Tank foundations will maintain the load of a full tank;

(ii) Tank systems will be anchored to prevent flotation or dislodgment where the tank system is placed in a saturated zone, or is located within a seismic fault zone subject to the standards of § 264.18(a); and

(iii) Tank systems will withstand the effects of frost heave.

(b) The owner or operator of a new tank system must ensure that proper handling procedures are adhered to in order to prevent damage to the system during installation. Prior to covering, enclosing, or placing a new tank system or component in use, an independent, qualified installation inspector or an independent, qualified, registered professional engineer, either of whom is trained and experienced in the proper installation of tank systems or components, must inspect the system for the presence of any of the following items:

(1) Weld breaks;

(2) Punctures;

(3) Scrapes of protective coatings;

(4) Cracks;

(5) Corrosion;

(6) Other structural damage or inadequate construction/installation.

All discrepancies must be remedied before the tank system is covered, enclosed, or placed in use.

(c) New tank systems or components that are placed underground and that are backfilled must be provided with a backfill material that is a noncorrosive, porous, homogeneous substance and that is installed so that the backfill is placed completely around the tank and compacted to ensure that the tank and piping are fully and uniformly supported.

(d) All new tanks and ancillary equipment must be tested for tightness prior to being covered, enclosed, or placed in use. If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) in the system must be performed prior to the tank system being covered, enclosed, or placed into use.

(e) Ancillary equipment must be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

[NOTE: The piping system installation procedures described in American Petroleum Institute (API) Publication 1615 (November 1979), "Installation of Underground Petroleum Storage Systems," or ANSI Standard

B31.3, "Petroleum Refinery Piping," and ANSI Standard B31.4 "Liquid Petroleum Transportation Piping System," may be used, where applicable, as guidelines for proper installation of piping systems.]

(f) The owner or operator must provide the type and degree of corrosion protection recommended by an independent corrosion expert, based on the information provided under paragraph (a)(3) of this section, or other corrosion protection if the Regional Administrator believes other corrosion protection is necessary to ensure the integrity of the tank system during use of the tank system. The installation of a corrosion protection system that is field fabricated must be supervised by an independent corrosion expert to ensure proper installation.

(g) The owner or operator must obtain and keep on file at the facility written statements by those persons required to certify the design of the tank system and supervise the installation of the tank system in accordance with the requirements of paragraphs (b) through (f) of this section, that attest that the tank system was properly designed and installed and that repairs, pursuant to paragraphs (b) and (d) of this section, were performed. These written statements must also include the certification statement as required in §270.11(d) of this chapter.

[51 FR 25472, July 14, 1986; 51 FR 29430, Aug. 15, 1986]

§264.193 Containment and detection of releases.

(a) In order to prevent the release of hazardous waste or hazardous constituents to the environment, secondary containment that meets the requirements of this section must be provided (except as provided in paragraphs (f) and (g) of this section):

(1) For all new tank systems or components, prior to their being put into service;

(2) For all existing tank systems used to store or treat EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027, within two years after January 12, 1987;

(3) For those existing tank systems of known and documented age, within two years after January 12, 1987 or when the tank system has reached 15 years of age, whichever comes later;

(4) For those existing tank systems for which the age cannot be documented, within eight years of January 12, 1987; but if the age of the facility is greater than seven years, secondary containment must be provided by the time the facility reaches 15 years of age, or within two years of January 12, 1987, whichever comes later; and

(5) For tank systems that store or treat materials that become hazardous wastes subsequent to January 12, 1987, within the time intervals required in paragraphs (a)(1) through (a)(4) of this section, except that the date that a material becomes a hazardous waste must be used in place of January 12, 1987.

(b) Secondary containment systems must be:

(1) Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, ground water, or surface water at any time during the use of the tank system; and

(2) Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

(c) To meet the requirements of paragraph (b) of this section, secondary containment systems must be at a minimum:

(1) Constructed of or lined with materials that are compatible with the wastes(s) to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions, and the stress of daily operation (including stresses from nearby vehicular traffic).

(2) Placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift;

(3) Provided with a leak-detection system that is designed and operated

Process Results®
THE ART OF ENGINEERING

May 30, 2006

Mr. Lew Kryk
Environmental Quality
1923 Frederick Street
Detroit, MI 48211

Dear Mr. Kryk;

Process Results, Inc. reviewed and assessed the suitability of Tank T-306 at the EQ Detroit, Inc., Detroit, Michigan, facility, and we are providing a certification for Tank T-306.

Tank T-306 is an existing 20,726 gallon atmospheric tank, constructed with reinforced fiberglass plastic. The tank is above ground, supported on a steel grate and beam structure. Viatec Process Storage Systems manufactured the tank in February, 1999. Little information could be obtained from the manufacturer because they are no longer in business. All information was determined by the tank nameplate, visual observations, and engineering judgement.

The interior corrosion barrier of Tank T-306 is a polyester resin (Co-Rezyn VE-8300) manufactured by Interplastics Corporation. It is our understanding that EQ Detroit, Inc. will operate the tank within the limits of the materials of construction as specified in the attached tank drawing and resin manufacturer's chemical resistance guidelines. The resin coating is resistant and compatible with the wastes to be stored in the tank as described in the facility's Michigan Act 451 Hazardous Waste Operators License.

The tank exterior was inspected on May 9, 2006, while it was out of service. The tank and ancillary equipment appear to be in good working order and no leaks were evident at that time. On April 6, 2006, the tank interior was inspected by Tri-Clor technicians and was found to be in good condition (see attached report). Based on our knowledge of the the industry, the original tank manufacturer, and our visual observations, it is our opinion that this tank is structurally sound. This conclusion is based on the lack of structural damage or fatigue observed, length of time the tank has been in service, and our best engineering judgement.

The existing concrete foundation, supports and liquid containment appear to be adequate for the Tank however a review of these items are outside the scope of this assessment.

Process Results®

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge or belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Very truly yours,
Process Results, Inc.

William H. Roleson

STATE OF MICHIGAN
WILLIAM H. ROLESON
ENGINEER
No. 43162
LICENSED PROFESSIONAL ENGINEER

William H. Roleson, P.E.
Principal

Registration No. 43162
State: Michigan

Enclosures

WHR/sre

File: 12049.01lt01.Wagner Enterprise Tank Cert.doc

ENVIRONMENTAL QUALITY DETROIT
1923 FREDERICK STREET
DETROIT, MI 48211

PO # 21001092
INSPECTION & RE-CERTIFICATION
TANK NO. FVF-168-20726-P

TRI-CLOR
1012 ENTERPRISE DRIVE
PO BOX 371
HASTINGS, MI 49058
APRIL 6, 2006

TRI-CLOR
"Full Fiberglass Service Specialist"
Fabrication Repair Inspections Installations Maintenance

4/21/06

Mr. Lew Kryk
Environmental Quality Detroit
1923 Frederick St.
Detroit, Mi 48211

Re: Fiberglass tank inspection and certification

Dear Mr. Kryk

On April 6th 2006 Tri-Clor technicians performed an inspection on fiberglass tank serial number 106515. Below please find the results of that inspection. Also included is a letter from the resin manufacturer stating that the resin used to manufacture the tank is capable of handling the new product that will be introduced into the tank.

Specifications of the vessel:

168" diameter x 219" over-all length, flattop, flat bottom, equipped with an agitator rail. The bottom is fully supported, sitting on 2" thick foam. The tank has various fittings ranging from 1" diameter all the way up to 24" diameter. Design temp. 200 degrees F, design pressure –10 W.C., specific gravity 1.36. Resin of construction; CORVE 8300 with a MEKP cure.

Inspection results:

The corrosion barrier (nexus (2) 1.5 oz. mat) is in very good condition with no sign of degradation, delamination, cracks or crazes. All secondary bonds are in good condition, again no sign of degradation or delamination. There is no chemical penetration into the corrosion barrier visible at this time.

The structural layers of the tank are in tact, again no sign of wear or abuse.

The overall condition of the tank is very good.

The tank was manufactured to the specifications noted in the letter issued by the resin manufacturer, and has passed the on-site inspection. At this time the tank is cleared to introduce the hazardous leachate water with minute, trace amounts of metals and organics as described in the letter received April 5th 2006.

Ph# 269-948-9310 Fax# 269-948-9306
TRI-CLOR, INC. - 1012 Enterprise Drive - Hastings, MI 49058

Notes of importance:

The integrity of the tank is not at risk, but it is worth noting that several holes have been drilled in the flat top of the vessel. This has taken the (leak proof) ability, or the ability of the tank to contain its product away. These holes are not factory installed flanges or modified in the field by fiberglass technicians, and have been added by just creating a hole in the top. If the vessel were to fill to the top these holes become the first area of penetration for the product escaping the vessel.

It is also important that the vessel be mounted to the floor by the lugs so that the bottom knuckle is supported, during filling and emptying. There should also be a clear tank "vent" port larger then the largest fill or exit port, and a clear "overfill" port, to keep the vent clear, and functioning properly.

If you have any other questions please feel free to contact me at anytime.

Sincerely,

Timothy C. Schoessel

Timothy C. Schoessel

INTERPLASTIC CORPORATION
Thermoset Resins Division

INTERPLASTIC CORPORATION
Thermoset Resins Division

2015 Northeast Broadway Street
Minneapolis, Minnesota 55413-1775
(651) 481-6860 Fax (612) 331-4235

April 18, 2006

Mr. Timothy Schoessel
Tri-Clor, Inc.
1012 Enterprise Drive
Hastings, MI 49058

Dear Mr. Schoessel: Fax #269-948-9306

We have reviewed your chemical environment and feel that CORVE8300 is suitable for this application with the maximum operating temperature of 180°F. C glass surfacing veil and dry heat post cure are recommended.

The inner corrosion liner should be manufactured according to ASME RTP-1, ASTM D3299, or ASTM D4097 with a resin-rich layer of surfacing veil as an inner surface followed by a fiberglass laminate that is a minimum of 0.10" thick. The structural portion of the vessel should be manufactured to design specifications and the resin sufficiently cured to ensure maximum service life.

In addition, I will be your first point of contact for future corrosion recommendations and inquires.

If you have any questions regarding this information or any of Interplastic Corporation's products, please contact us.

Sincerely,

Bankim Desai

Bankim Desai, Senior Chemist
Corrosion and Specialty Resins

BND:alk

cc: T Bennett, D Herzog, M Kastl,
T McCabe, W Rogers

Tri-Clor CORVE8300 Schoessel, T BND 041806.doc

TRI-CLOR INC.
"Fiberglass Field Service Specialist"

TRI-CLOR, INC. - 1012 Enterprise Drive, Hastings, MI 49058
Phone 269-948-9310 ▼ Fax 269-948-9306
▼ Repair ▼ Inspections ▼ Installations ▼ Maintenance

FIELD SERVICES
TIME & MATERIAL DAILY REPORT

DATE: 4-6-06

CLIENT: EQ Detroit INC

CLIENT CONTACT: Lew Kryk

PHONE: 313-923-0080

PURCHASE ORDER NO. ____________

JOB NO. ____________

DESCRIPTION OF WORK PERFORMED

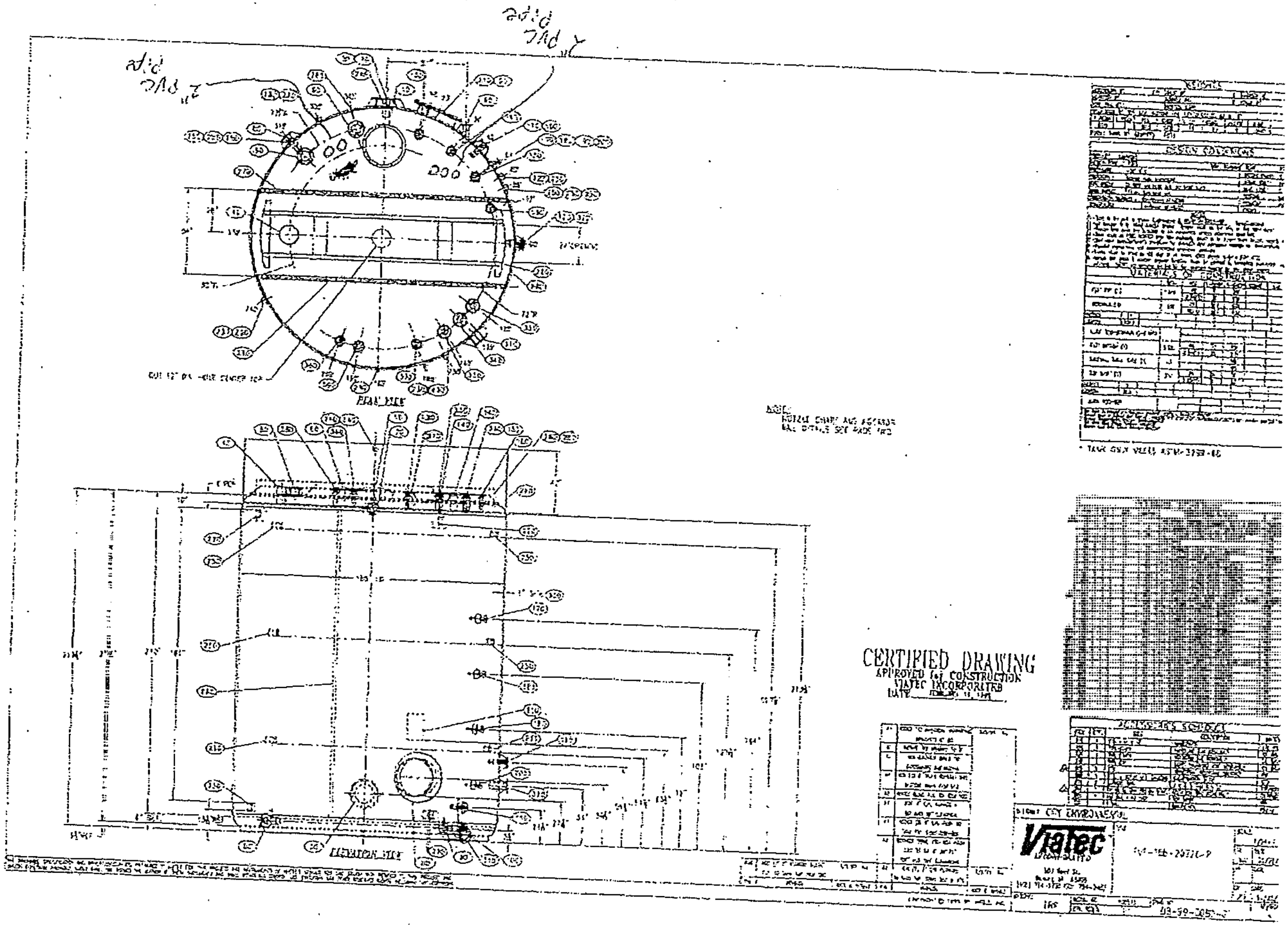
- TRAVEL TO AND FROM
- TANK INSPECTION (TANK LOOKS GOOD, NO SIGNS OF CRACKS)
- VERIFY TANK ORIENTATION AND DIMENSIONS

Employee	Class	Number of Hours Reg.	Overtime	Travel	Time-In	Time-Out
WAYNE MEADE	FS	1 HR.		5½ HRS	7:00AM	1:30PM
DON ASPINALL	FT					

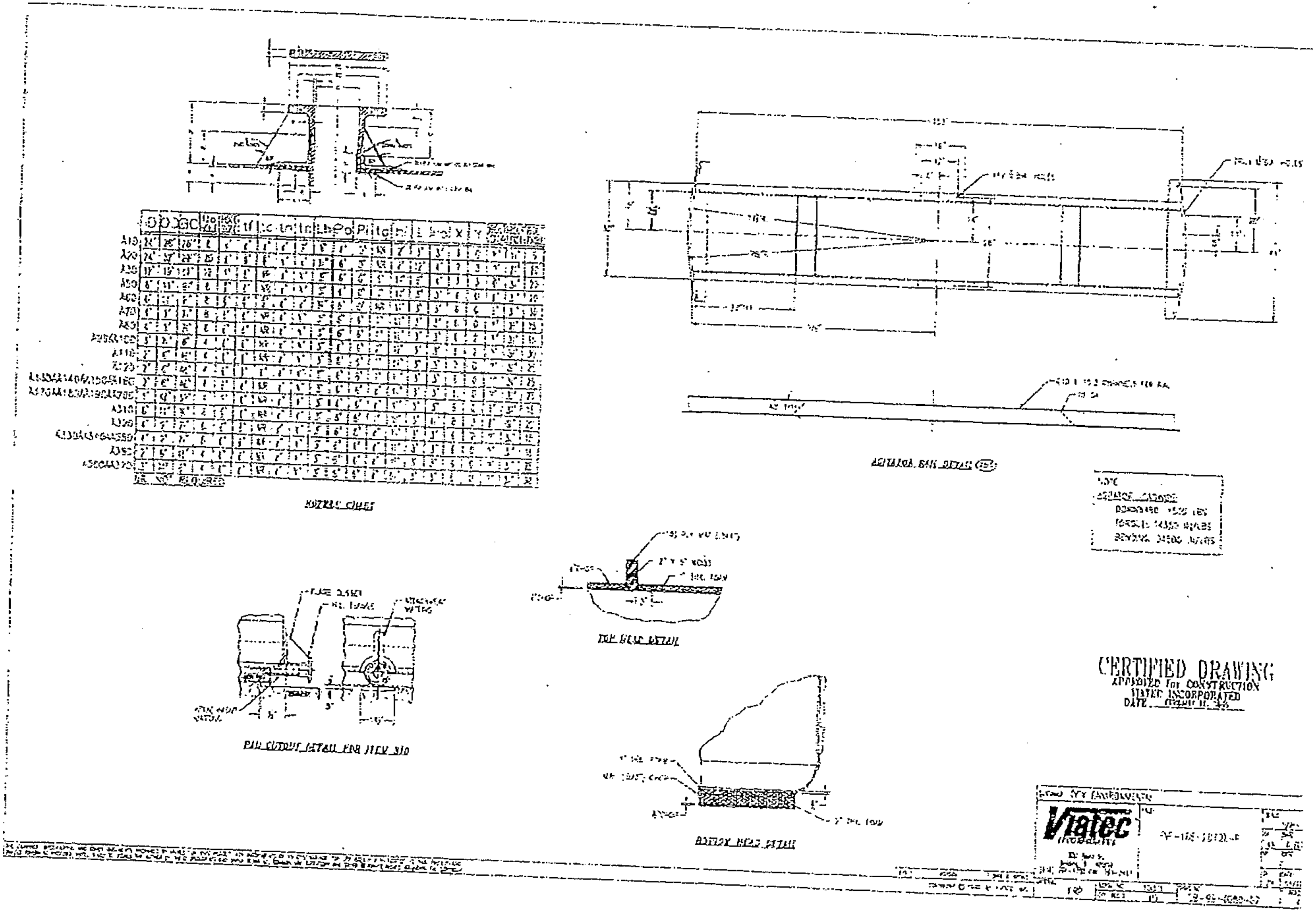
MATERIALS & EQUIPMENT

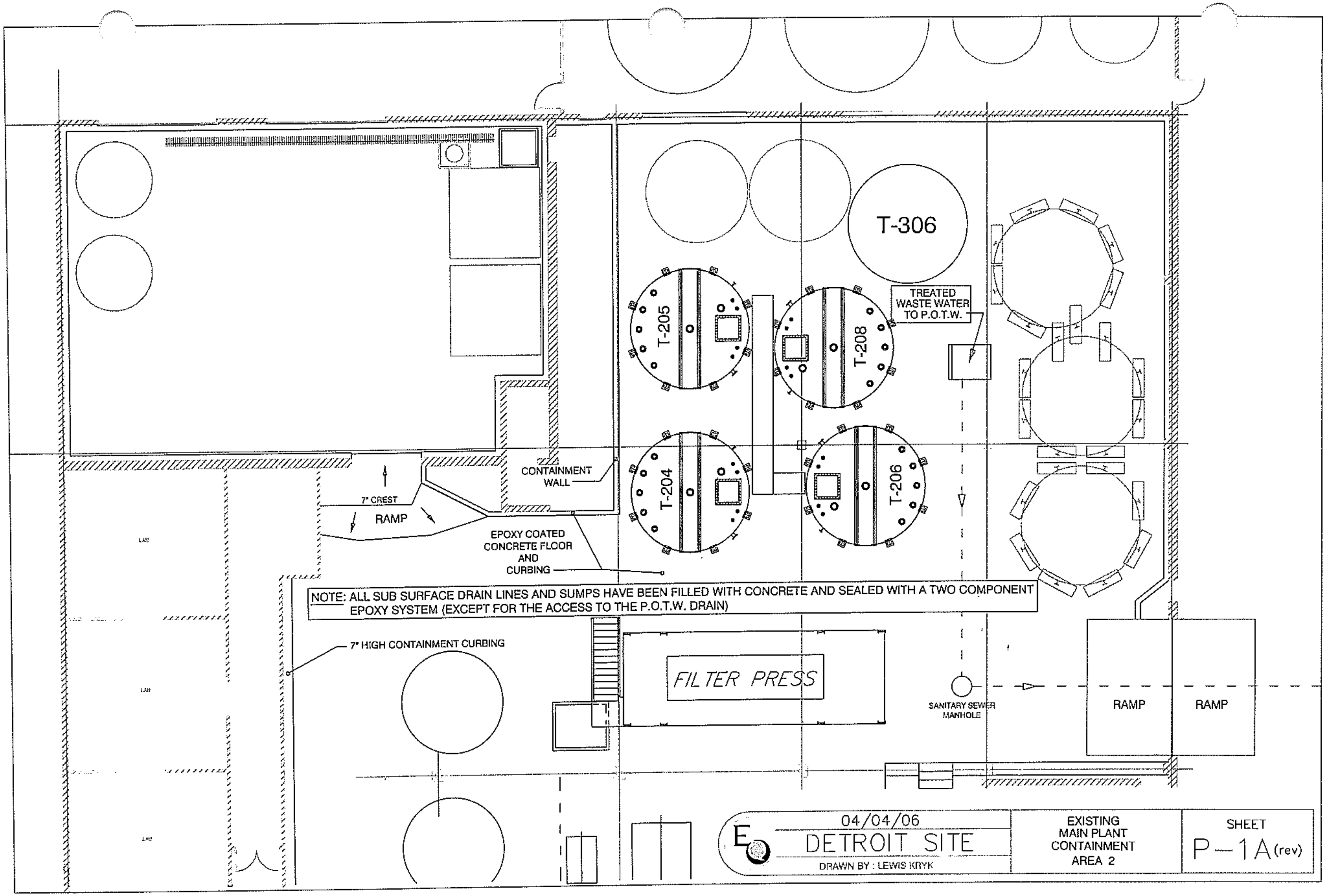
Quantity	Item	Quantity	Item

☐ JOB COMPLETE ☑ JOB INCOMPLETE

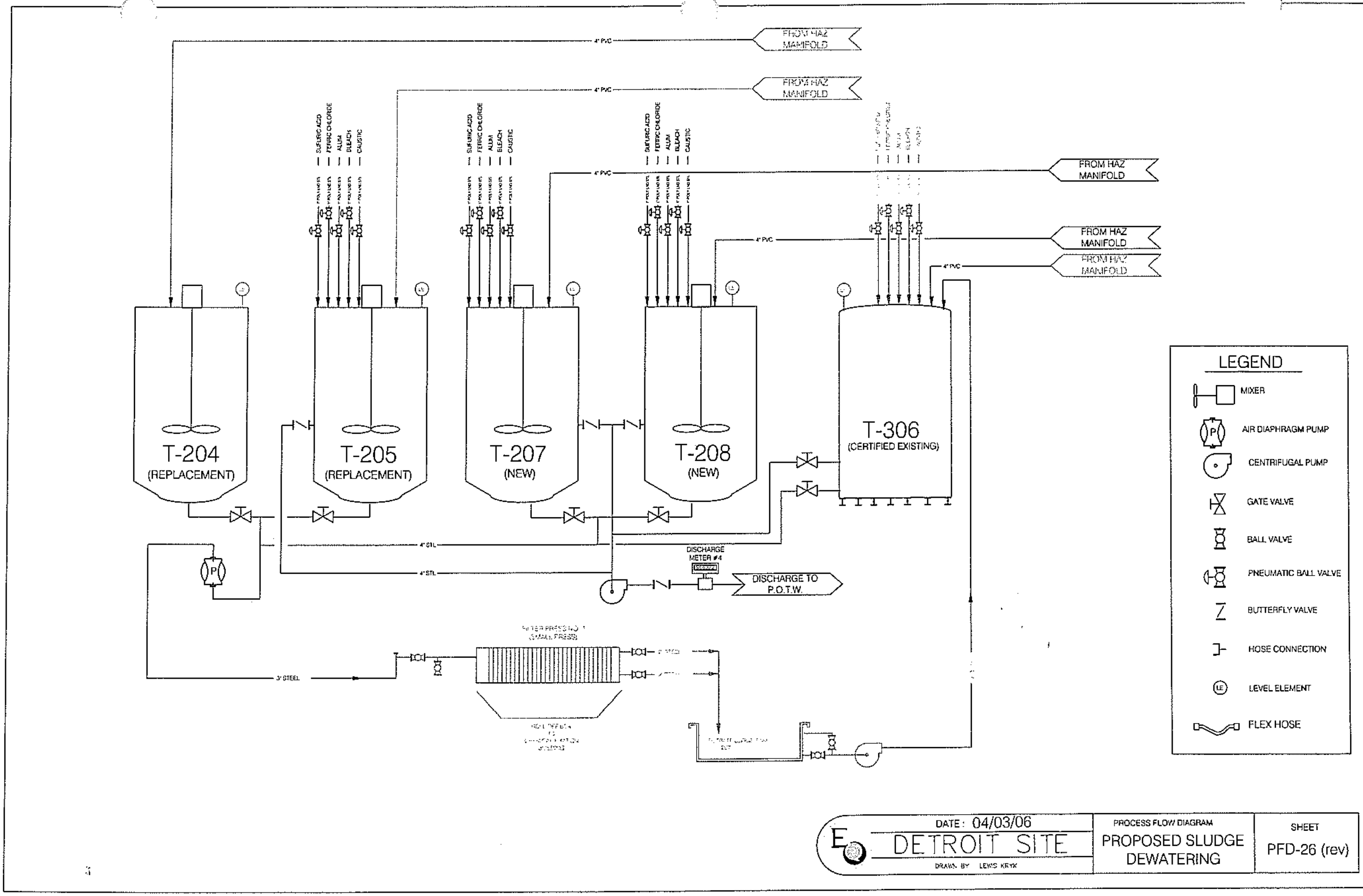


TANK IS NOT ANCHORED DOWN


NOZZLE CHART
AGITATOR BAR DETAIL
TOP HEAD DETAIL
PAD CUTOUT DETAIL FOR ITEM
BOTTOM HEAD DETAIL
CERTIFIED DRAWING
APPROVED for CONSTRUCTION
VIATEC INCORPORATED
DATE
Viatec



T-306
T-205
T-208
T-204
T-206
TREATED WASTE WATER TO P.O.T.W.
CONTAINMENT WALL
7" CREST
RAMP
EPOXY COATED CONCRETE FLOOR AND CURBING
NOTE: ALL SUB SURFACE DRAIN LINES AND SUMPS HAVE BEEN FILLED WITH CONCRETE AND SEALED WITH A TWO COMPONENT EPOXY SYSTEM (EXCEPT FOR THE ACCESS TO THE P.O.T.W. DRAIN)
7" HIGH CONTAINMENT CURBING
FILTER PRESS
SANITARY SEWER MANHOLE
RAMP
RAMP
04/04/06
DETROIT SITE
DRAWN BY : LEWIS KRYK
EXISTING MAIN PLANT CONTAINMENT AREA 2
SHEET
P—1A (rev)


FROM HAZ MANIFOLD
FROM HAZ MANIFOLD
FROM HAZ MANIFOLD
FROM HAZ MANIFOLD
FROM HAZ MANIFOLD
4" PVC
SULFURIC ACID
FERRIC CHLORIDE
ALUM
BLEACH
CAUSTIC
T-204
(REPLACEMENT)
T-205
(REPLACEMENT)
T-207
(NEW)
T-208
(NEW)
T-306
(CERTIFIED EXISTING)
4" STL
DISCHARGE METER #4
DISCHARGE TO P.O.T.W.
3" STEEL
LEGEND
MIXER
AIR DIAPHRAGM PUMP
CENTRIFUGAL PUMP
GATE VALVE
BALL VALVE
PNEUMATIC BALL VALVE
BUTTERFLY VALVE
HOSE CONNECTION
LEVEL ELEMENT
FLEX HOSE
DATE: 04/03/06
DETROIT SITE
DRAWN BY LEWIS KRYK
PROCESS FLOW DIAGRAM
PROPOSED SLUDGE DEWATERING
SHEET
PFD-26 (rev)

Abletech Inc.
6449 Lintons Way
Ann Arbor, MI 48105
Tel. 734.677.2420
Fax. 734-677-2445

Via Email Attachment
File: "Certification 08071501.pdf"

July 15, 2008

Ms. Mary Peterson
QEHS Engineer
EQ Detroit, Inc.
1923 Frederick St.
Detroit, MI 48211
Email: mary.peterson@eqonline.com

Re: Certification of Hazardous Waste Tank 706
Southeast Corner of Chem-Fix Building

Dear Ms. Peterson:

Pursuant to your request I have personally inspected the above-referenced tank on July 9, 2008. This tank has recently been restored to its original condition, as described in the Hazardous Waste Tank Assessment[1], by American Steel Fabricators of Farmington, Michigan. Restoration work included re-lining the tank with welded 1-inch thick steel plate. From my inspection and review of the Hazardous Waste Tank Assessment, the current restored condition of this tank is suitable for continued service. This certification is made in accordance with the requirements of R 299.9615 of the Michigan Administrative Rules, and with 40 CFR 264.191 and 264.193.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please let me know if I can be of further assistance. Thank you for retaining Abletech, Inc. for these services.

Sincerely,

M.A. Olson

Michael A. Olson, P.E.
Principal, Abletech Inc.

---

[1] USL City Environmental, Inc., Hazardous Waste Tank Assessment, September 27, 1999.

Appendix D- 2: Manufacturer's Specification Sheets

Another Quality
Dur-A-Flex® Product

DUR-A-GARD™
HIGH BUILD EPOXY COATING

If you are looking for a high build epoxy floor coating that's as practical as it is attractive, Dur-A-Gard™ has you covered.

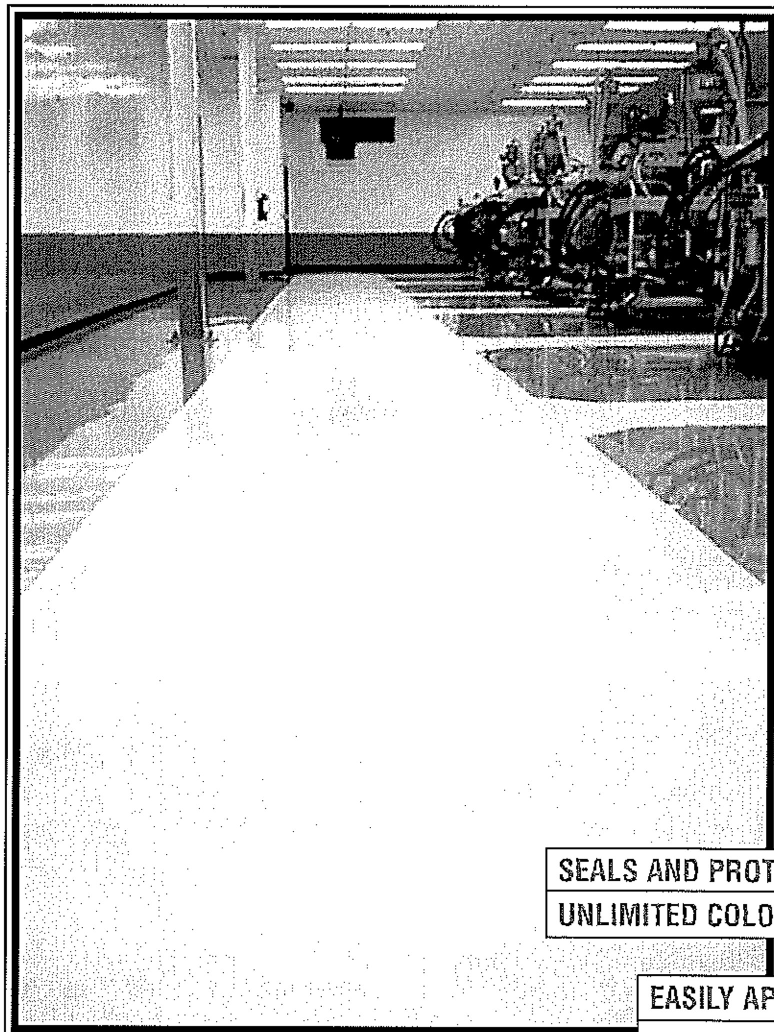
Dur-A-Gard™—part of the Dur-A-Flex® family of flooring systems—is a two-component, 100 percent solids, colored epoxy designed for flooring applications subjected to moderate traffic and chemical exposure.

This high-gloss, tile-like finish is stain resistant and formulated to deter oil, grease, gasoline, strong detergents and salt. Dur-A-Gard™ can be easily rolled out as a coating, or when fillers are added, screeded out as a self-leveling floor system.

Dur-A-Gard™ is available in standard colors, and can be custom mixed to fit your special requirements.

A Poly-Thane™ topcoat is often specified to increase chemical and stain resistance.

Dur-A-Gard™ is easy to clean, has good color stability, and with its low viscosity, is easy to apply. It cures blush-free even at high humidity levels, and is available with an optional fast-curing hardener when you need to minimize down time.



SEALS AND PROTECTS
UNLIMITED COLORS
EASILY APPLIED
FAST CURING

Typical uses:
- clean rooms
- laboratories
- light assembly areas
- laundries
- marine uses
- pharmaceutical plants
- warehouses

Another special formulation, Dur-A-Gard OPF™, is designed to be used as the first or second topcoat to yield a uniform "orange peel" finish. Also, OPF formula offers a low-glare finish, making it perfect for applications where light sensitivity or reflections are an issue.

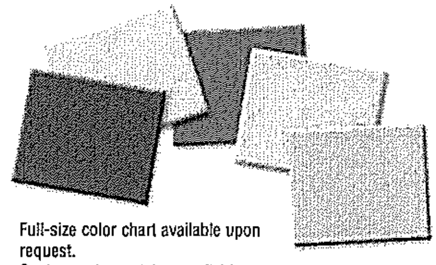
Dur-A-Gard SL™ is a self-leveling version of Dur-A-Gard™ coating, and is installed up to 1/8" thick. It consists of a prime coat, a self-leveling matrix coat, and a performance topcoat.

PERFORMANCE FLOORING SOLUTIONS
DUR-A-FLEX® Inc.
EPOXIES • MMA • URETHANES
COLORED QUARTZ AGGREGATES

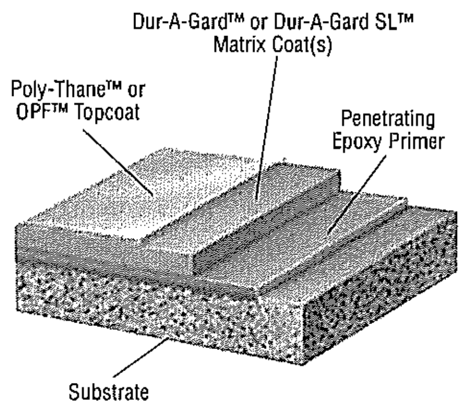
Dur-A-Gard™ High Build Epoxy Coating

Physical Properties

	Test Method	Nominal 1/8"
Hardness (Shore D)	ASTM D-2240	70-80
Compressive Strength	ASTM D-695	16,000 psi
	ASTM C-579	10,500 psi
Tensile Strength	ASTM D-638	3,000 psi
	ASTM C-307	1,950 psi
Tensile Elongation	ASTM D-638	7.50%
Flexural Strength	ASTM D-790	4,000 psi
	ASTM C-580	2,900 psi
Flexural Modulus of Elasticity	ASTM D-790	5.5×10^5
Linear Expansion	ASTM D-696	2×10^{-5}
Bond Strength to Concrete	ASTM D-4541	400 psi substrate fails
Indentation	ML D-3134	.025 MAX
Impact Resistance	ML D-3134	Pass
Water Absorption	ASTM D-570	0.04%
Heat Resistance Limitation		140°F-200°F
Flammability	ASTM D-635	Self Extinguishing
Flame Spread/NFPA 101	ASTM E-84	Class A
Abrasion Resistance	ASTM D-4060	
CS17 Wheel 1000 GM Load 1000 Cycles		35 mg loss
Coefficient of Friction	ASTM D-2047	
Orange Peel		0.8
Smooth		0.7
VOC Content		Regular, Fast, Crete Gard and Gard SH = 3.45 g/l Dur-A-Gard OPF = 59 g/l



Full-size color chart available upon request.
Custom color matches available.



TYPICAL DUR-A-GARD™ APPLICATION

Chemical Resistance Guide

Legend: R=Recommended, S=Splash and Spill, N=Not Recommended

Reagent*	Reg. or Fast	OPF	Reagent*	Reg. or Fast	OPF
Acetic Acid 10%	R	R	Hydrofluoric Acid 40%	N	N
Acetone	N	N	Hydraulic Fluid	R	R
Acetic Acid Glacial 100%	N	N	Isopropyl Alcohol	S	S
Ammonium Hydroxide 28%	R	R	Lactic Acid 20%	R	R
Benzene	N	N	Methyl Isobutyl Ketone	N	N
Brake Fluid	R	R	Methylene Chloride	N	N
Calcium Chloride 30%	R	R	Mineral Spirits	S	S
Clorox (Full Strength)	R	R	Motor Oil	R	R
Coca Cola	R	R	Mustard	R	R
Cottage Cheese	R	R	Nitric Acid 10%	N	N
Chromic Acid 10%	S	S	Phosphoric Acid 85%	N	N
Citric Acid 30%	S	S	Salt Water	R	R
Ethyl Alcohol 95%	N	N	Spic and Span 30%	R	R
Ethylene Glycol	R	R	Syrup	R	R
Ethylene Dichloride 10%	R	R	Sulfuric Acid 30%	S	S
Ferric Chloride	**R**	**R**	Sodium Hydroxide 30%	R	R
Gasoline	R	R	Silver Nitrate	R	R
Glycerin	R	R	Tide Detergent	R	R
Hydrogen Peroxide 6%	R	R	Trichloroethylene	N	N
Hydrochloric Acid 30%	R	R	Tri-sodium Phosphate	R	R

*Reagents listed in bold may stain. Chemical and stain resistance can be improved by using Poly-Thane™ as a topcoat(s).
Note: Testing should not be conducted until coating cures 7-10 days at 70°F.

DUR-A-FLEX Inc. 95 Goodwin Street East Hartford, CT 06108
Tel 800-253-3539 Fax 860-528-2802 www.dur-a-flex.com

PERFORMANCE FLOORING SOLUTIONS
DUR-A-FLEX® Inc.
EPOXIES • MMA • URETHANES
COLORED QUARTZ AGGREGATES

PRODUCT DATA SHEET

95 Goodwin Street
East Hartford, CT 06108

Tel: 860-528-9838 • Toll Free 800-253-3539 • Fax: 860-528-2802 • Internet: www.dur-a-flex.com • E-Mail: info@dur-a-flex.com

DUR-A-GARD

DESCRIPTION
DUR-A-GARD Epoxy Coating is a pigmented, two component, low odor, 100% solids, thermosetting epoxy designed especially for flooring applications subjected to moderate traffic and chemicals. DUR-A-GARD Epoxy Coating is ideally suited for application on concrete, wood and metal. This coating is extremely durable, sanitary and easy to clean. The high gloss, tile-like finish is stain-resistant and virtually unaffected by oil, grease, gasoline, strong detergents and salt.

BENEFITS
- Stain Resistant
- Easy to Clean
- Good Color Stability
- Durable
- Low Viscosity

COLORS
Dur-A-Gard is available in standard colors. Refer to the Standard Color Chart for actual colors. Custom colors are also available. See limitations for certain colors.

TYPICAL USES
- Laboratories
- Garages
- Pharmaceutical Plants
- Clean Rooms
- Hospitals
- Laundries
- Kennels

PACKAGING
DUR-A-GARD Epoxy Coating is packaged in 1-gallon cans, 5-gallon pails and 50-gallon drums. Shelf life is one year in unopened containers.

CHEMICAL RESISTANCE
This product is resistant to most common chemicals. Please refer to the master **"Chemical Resistance Chart"** for actual resistance to specific chemicals/reagents.

SURFACE PREPARATION
This product requires preparation in order to perform as expected. Substrate must be profiled, clean, sound, and dry. Substrate must be primed with DUR-A-SHIELD, DUR-A-POXY HIGH GLOSS, or DUR-A-GLAZE TIE-COAT. Please refer to the master **"Surface Preparation Guide"** for more information.

APPLICATION METHOD /SPREAD RATES
DUR-A-GARD is typically applied with a roller at approximately 100-200 Sq Ft per gallon, depending on substrate type and condition. See DUR-A-GARD Application Instruction Sheet for complete instructions.

LIMITATIONS
This product is best suited for application in temperatures between 55°F and 95°F. Substrate must be clean, sound, and dry. Some light colors may require multiple coats for adequate hiding power. Certain colors appear white when scratched. Smoke Blue should be top coated with POLY-THANE 2 HIGH SOLIDS with ADD-A-COLOR reduce the "White" appearance of scratches.

CLEANING
This product is considered to be a low maintenance flooring solution, however, certain textures and service environments require specific procedures. Please refer to the master **"Cleaning Guide"**.

"SPECIAL PURPOSE" FORMULATIONS
1. **DUR-A-GARD "Regular"** has good color stability and a fairly low viscosity so it is easy to apply. However, it is very sensitive to water and moisture during its curing period. The surface must be perfectly dry during application.
2. **DUR-A-GARD "Fast"** is a fast curing hardener designed for fast curing intermediate coats.
3. **DUR-A-GARD "OPF"** is designed to be used as the first and / or second topcoat to yield a uniform "orange peel" finish.
4. **CRETE-GARD** is designed as a topcoat for DUR-A-CRETE, and to achieve a heavy orange peel texture.
5. **DUR-A-GARD "SH"** is designed to withstand super high shear loads found in high lift areas.
6. **DUR-A-GARD "SL"** is a filler enhanced 100% solids epoxy designed to yield a thicker (35-100 Mils) finish.

DUR-A-GARD

TECHNICAL INFORMATION

Color	Available In All Standard Colors
Mix Ratio (by volume)	1 Part Hardener to 2 Parts Resin
Viscosity at 70° F	700 cps
Pot life at 70° F	20 – 25 Minutes
Cure Time, Touch Dry at 70° F	4 – 6 Hours
Cured Film Thickness	16 Mils at 100 Sq. Ft. / Gallon Spread Rate
Toxicity	Non – Toxic, USDA Approved

Physical Property	Test Method	Result
Hardness (Shore D)	ASTM D-2240	70-80
Compressive Strength	ASTM D-695 ASTM C-579	16,000 psi 10,500 psi
Tensile Strength	ASTM D-638 ASTM C-307	3,000 psi 1,950 psi
Tensile Elongation	ASTM D-638	7.50%
Flexural Strength	ASTM D-790 ASTM C-580	4,000 psi 2,900 psi
Flexural Modulus of Elasticity	ASTM D-790	5.5×10^{5}
Linear Expansion	ASTM D-696	2×10^{-5}
Bond Strength to Concrete	ASTM D-4541	400 psi substrate fails
Indentation	MIL D-3134	.025 MAX
Impact Resistance	MIL D-3134	Pass
Water Absorption	ASTM D-570	0.04%
Heat Resistance Limitation		140°F - 200°F
Flammability	ASTM D-635	Self Extinguishing
Flame Spread/NFPA 101	ASTM E-84	Class A
Abrasion Resistance CS17 Wheel 1000 GM Load 1000 Cycles	ASTM D-4060	 35 mg loss
Coefficient of Friction Orange Peel Smooth	ASTM D-2047	 0.8 0.7
VOC Content		Regular, Fast, Crete Gard and Gard SH = 3.45 g/l Dur-A-Gard OPF = 59 g/l

DRAWINGS AND DETAILS
Standard CAD drawings and details are available for coves, drains, breaches, transitions, etc. Please contact DUR-A-FLEX for actual drawings.

MOISTURE CONCERNS
Moisture vapor transmission in the slab should be measured prior to application of polymeric systems to ensure a long lasting, durable installation. Please refer to the master "**Moisture Guidelines**" for more information.

GUIDE SPECIFICATIONS
This product is part of the DUR-A-FLEX family of polymer systems. Please contact DUR-A-FLEX for complete three part guide specs.

CAUTION
Slight batch-to-batch color variations may occur. When ordering to match a previous color, inquire if the same batch number or quality control number is still available. **Follow the Hazardous Materials Identification System labeling guide for proper personal protective equipment to use when handling this product. Use only as directed. KEEP OUT OF REACH OF CHILDREN.**

Before using any DUR-A-FLEX, Inc. product, be sure the Material Safety Data Sheet is read and understood.

PERFORMANCE FLOORING SOLUTIONS
DUR-A-FLEX® Inc.
EPOXIES • MMA • URETHANES
COLORED QUARTZ AGGREGATES

PRODUCT DATA SHEET

95 Goodwin Street
East Hartford, CT 06108

Tel: 800-253-3539 • Fax: 860-528-2802 • Internet: http://www.dur-a-flex.com • E-Mail: info@dur-a-flex.com

DUR-A-GLAZE NOVOLAC

DESCRIPTION

DUR-A-GLAZE NOVOLAC epoxy is a two component, 100% solids, premium quality protective coating and aggregate binder designed to provide optimum protection against chemicals, acids, solvents, and high temperatures. (Intermittent exposure up to 250°F (122°C) has little effect.).

BENEFITS

Low odor, no VOCs
Superior Chemical Resistance
Superior Solvent Resistance
Superior Stain Resistance
High Heat Distortion Temperature

COLORS

DUR-A-GLAZE NOVOLAC is available in all standard colors. Refer to the DUR-A-FLEX Standard Color Chart.

DO NOT PIGMENT THIS PRODUCT WITH DUR-A-GARD.

TYPICAL USES

DUR-A-GLAZE NOVOLAC is primarily recommended as a grout coat over Dur-A-Quartz, Shop Floor and Poly-Crete MDB systems. It can also be used as a coating in secondary containment applications to provide improved chemical resistance at the surface. Some typical areas of application are:

- Kitchens
- Pharmaceutical Plants
- Chemical Storage Warehouses
- Metal Plating and Pickling Rooms
- Acid Cleaning Bath Areas
- Pulp & Paper Mills
- Battery Storage

CHEMICAL RESISTANCE

Please refer to master **"Chemical Resistance Chart"** for actual resistance to specific chemicals/reagents.

SURFACE PREPARATION

This product requires preparation in order to perform as expected. Substrate must be profiled, clean, sound, and dry. Substrate must be primed with DUR-A-SHIELD, DUR-A-POXY HIGH GLOSS, or DUR-A-GLAZE TIE COAT. Please refer to the master **"Surface Preparation Guide"** for more information.

APPLICATION METHOD

Mixing

DUR-A-GLAZE NOVOLAC Resin and Hardener should be pre mixed prior to combining. Mix 1 part hardener to 2 parts Resin by volume. Scrape the sides of the Hardener and Resin containers to ensure a proper reaction occurs. Use a slow speed 450 RPM drill with a jiffler paddle. Keep the paddle below the surface to avoid air entrapment. Mix for 2 minutes to ensure proper mix.

Application As a Coating

1. Pour a 6 inch ribbon of material across the floor.
2. Use a Notch squeegee to spread material at desired spread rate. The typical spread rate is between 100 and 200 SF/gal
3. Back roll the material against the squeegee lines with a high quality 3/8" nap roller
4. Cross roll the material side to side overlapping the previous pass with half the roller width.

Application As A Grout Coat

1. Pour a 6 inch ribbon of material across the floor.
2. Use a Flat squeegee to spread material at desired spread rate. The typical spread rate is 90 SF/gal over Q28 & Flintshot and 50 SF/gal over Q11 & Q-Rok
3. Back roll the material against the squeegee lines with a high quality 3/8" nap roller
4. Cross roll the material side to side overlapping the previous pass with half the roller width.

LIMITATIONS

This product is best suited for application in temperatures between 55°F and 95°F. Substrate must be clean, sound, and dry.

DUR-A-GLAZE NOVOLAC

TECHNICAL INFORMATION

Solids Content, clear no pigment	100%
Mix ratio, by volume	1 part hardener to 2 parts resin
Pot Life at 70°F	30 minutes
Tack Free Time at 70°F (ready for re-coat)	8-10 hours
Cure Time at 70°F	24 hours
Full Cure Time (full chemical resistance)	7 days @ 70°F
Minimum Temperature for Application	55°F
Cured Film Thickness	8mils @ 200 sq.ft./gallon - 16 mils @ 100 sq. ft./gallon
Hardness, Shore D	86 – 90
Heat Resistance Limitation	250°F (122°F)

Physical Property	Test Method	Result
Compressive Strength	ASTM C-579	14,000 psi
Flexural Strength	ASTM C-580	5,500 psi
Tensile Strength	ASTM C-307	2,500 psi
Flexural Modulus of Elasticity	ASTM D-790	1.95×10^6 psi
Bond Strength	ACI-403-PP	420 psi (concrete fails)
Indentation	MIL-D 3134-F	No Indentation
Water Absorption	ASTM D-570 ASTM D-696	0.05%, 24 hours in water 2.2×10^{-5} in/in/°F
Abrasion Resistance C-10 Wheel, 1,000 gm load, 1,000 cycles	ASTM D-1044	0.075 gm weight loss
Flammability	ASTM D-635	Self-Extinguishing. Extent of burning less than 0.35 in.

LIMITATIONS (cont)
DUR-A-GLAZE NOVOLAC is not recommended as a topcoat for light colored DUR-A-QUARTZ floors because it will amber under UV light.
DUR-A-GLAZE NOVOLAC is meant to be a final topcoat and should not be top coated with any other Performance Topcoat.

PACKAGING
DUR-A-GLAZE NOVOLAC EPOXY is available in 1 gallon cans, 5 gallon pails, and 50 gallon drums.

STORAGE
Store in a dry area at or above 55°F. Avoid excessive heat. The shelf life is 1 year in unopened original containers.

CLEANING
This product is considered a low maintenance flooring solution; however, certain textures and service environments do require certain procedures. Please refer to master **"Cleaning Guide"**.

GUIDE SPECIFICATIONS
This product is part of the DUR-A-FLEX family of polymer systems. Please refer to the master **"Specifier's Guide"** for complete three part guide specs.

MOISTURE CONCERNS
Moisture vapor transmission in the slab should be measured prior to application of polymeric systems to ensure a long lasting, durable installation. Please refer to the master **"Moisture Assessment Guide"** for more information.

CAUTION
Follow the Hazardous Materials Identification System labeling guide for proper personal protective equipment to use when handling this product. Use only as directed. KEEP OUT OF REACH OF CHILDREN.

Before using any DUR-A-FLEX, Inc. product, be sure the Material Safety Data Sheet is read and understood.

Spec Data: Description

SPEC DATA

1. PRODUCT NAME

XYPEX Concrete Waterproofing by Crystallization™

2. MANUFACTURER

XYPEX Chemical Corporation
13731 Mayfield Place
Richmond, BC, Canada V6V 2G9
Tel: (800) 961-4477
Tel: (604) 273-5265
Fax: (604) 270-0451
E-mail: enquiry@xypex.com

3. PRODUCT DESCRIPTION

BASIC USE

Xypex is a unique chemical treatment for the waterproofing and protection of concrete. Among its many uses, Xypex is suitable for waterproofing reservoirs, sewage and water treatment tanks, tunnels, manholes, underground vaults, foundation walls and parking decks. It can be used on either poured-in-place concrete or concrete block and can be applied to either the interior or exterior surface with equal results.

CHARACTERISTICS

Xypex waterproofs underground structures from the inside against hydrostatic pressure. By the process of diffusion and because the chemicals in Xypex have an affinity with water, the crystalline formation migrates throughout the pores and capillary tracts of concrete even against strong hydrostatic pressure.

Xypex protects concrete and reinforcing steel. The Xypex treatment is highly resistant to most aggressive substances, pH 3 - 11 constant contact, pH 2 - 12 periodic contact. By preventing the intrusion of chemicals, salt water, sewage and other harmful materials, Xypex protects concrete and reinforcing steel from deterioration and oxidation. The concrete is also protected against spalling, efflorescence, popouts and other damages caused by weathering, bleeding of the salts and internal expansion and contraction during the freeze/thaw cycle.

Xypex permits concrete to breathe. The Xypex crystalline formation has fixed-size air spaces so small that water cannot pass through. It does allow the passage of air and vapor, thus the concrete is able to breathe and become thoroughly dry, preventing moisture vapor build-up.

Xypex products are nontoxic. They have been approved by NSF International, US Environmental Protection Agency, Agriculture Canada and many other government health agencies throughout the world for use on concrete structures that hold potable water or are in contact with foodstuffs.

ADVANTAGES

- Not just a surface coating - Not dependent upon continuity of membrane for waterproofing action
- Seals hairline cracks up to 1/64 in. (0.4 mm)
- No surface priming or leveling required
- Cannot puncture, tear or come apart at the seams
- Does not require protection during back-filling or during placement of steel, wire mesh or other materials
- Can be applied to moist or green concrete
- Less costly to apply than most other waterproofing methods

COMPOSITION & MATERIALS

Xypex is manufactured in the form of a dry powder compound consisting of portland cement, very fine treated silica sand and various active proprietary chemicals.
When mixed with water and applied as a cementitious coating, the active chemicals in Xypex cause a catalytic reaction which generates a nonsoluble crystalline formation of dendritic fibers within the pores and capillary tracts of concrete. Thus, the concrete itself becomes permanently sealed against the penetration of water or liquids from any direction.

TYPES

Xypex crystalline waterproofing technology is available in three forms:

- As a coating - for new or existing structures
- As an admixture - included in the concrete mix at the time of batching
- As a dry shake material - for new horizontal surfaces

XYPEX CONCENTRATE

Used as a single coating on above or below-grade concrete, or as the first of a 2 coat application where two coats are required. See Xypex Specification Manual. Also used as a Dry-Pac for sealing construction joints and for repair of cracks, faulty construction joints and honeycombing. Xypex Concentrate is the most chemically potent of the Xypex crystalline waterproofing materials.

XYPEX MODIFIED

Used as a second coat to reinforce Xypex Concentrate where two coats are required and as a single coat for exterior damp-proofing.

XYPEX ADMIX C-1000 AND C-2000

Used as an integral waterproofing admixture which is included in the concrete mix at the time of batching.

XYPEX CONCENTRATE DS-1 AND DS-2

Dry shake formulations designed for application on fresh horizontal concrete prior to finishing operations.

XYPEX PATCH 'N PLUG

Fast setting, nonshrink, high-bond-strength hydraulic cement compound for concrete repairs. Stops flowing water in seconds. Patch'n Plug seals cracks and tie holes. It is also used for the general repair or patching of concrete. Patch'n Plug can be used in conjunction with Xycrylic-Admix to increase the compressive strength and bond strength of existing concrete.

XYPEX FCM

Xypex FCM is specifically designed for repairing cracks subject to movement, sealing construction joints, restoring deteriorated concrete, and waterproofing concrete structures. FCM has exceptional adhesive and elongation characteristics and is often used in conjunction with the Xypex Crystalline Concrete Waterproofing and Protection System. FCM is a two component product consisting of a specialized liquid polymer dispersionand a cementitious powder. These ingredients are mixed just prior to application.

XYCRYLIC-ADMIX

An acrylic polymer formulation specifically designed for use as an admix to fortify portland cement mixes. Xycrylic-Admix increases hardness, durability, bonding capability and chemical resistance.

XYPEX GAMMA CURE

Can be used as an alternative to water curing for certain Xypex applications. Contact the manufacturer for further information.

LIMITATIONS

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). The shelf life is one year when stored under proper conditions.

Xypex is not designed for use in expansion joints or chronically moving cracks.

See Next Section

Description | Technical Data | Application Procedures | General

Back to top

APPENDIX E- 1: AIR MONITORING REPORT

TABLE 1

TOTAL PLANT EMISSIONS

TABLE 1
Total Plant Emissions
CEI-Frederick Facility
Detroit, Michigan

POLLUTANT	EMISSIONS LB/HOUR							TOTAL
	Chemical Precipi-tation 1*	Oil & Grease Treatment 2*	600 Series Tank Farm 3*	LUWA** 4*	Hammer Mill Process 5*	Household TRANSFER ROOM 6*	Hazardous CAN CRUSHER 7*	
Benzene	2.00E-04 (4.00E-04)	1.00E-05 (5.58E-06)	5.03E-04 (1.12E-04)					7.00E-04 (5.00E-04)
Carbon Tetra-chloride	4.39E-05 (1.00E-04)		5.04E-04 (1.12E-04)					5.00E-04 (2.00E-04)
Chloro-benzene	8.08E-06 (1.65E-05)	1.49E-07 (8.26E-08)	3.72E-05 (8.26E-06)					4.54E-05 (2.48E-05)
Chloform	3.00E-04 (6.00E-04)	8.89E-07 (4.94E-07)	8.90E-04 (1.98E-04)					1.20E-03 (8.00E-04)
1,4-Dichloro-benzene	3.53E-06 (7.22E-06)	3.24E-08 (1.80E-08)						3.56E-06 (7.24E-06)
1,2-Dichloro-ethane	1.00E-04 (1.00E-04)	5.87E-07 (3.26E-07)	2.94E-04 (6.53E-05)					4.00E-04 (2.00E-04)
1,1-Dichloro-ethane	2.00E-04 (3.00E-04)	3.06E-06 (1.70E-06)						2.00E-04 (3.00E-04)
Methyl Ethyl Ketone	1.30E-03 (2.60E-03)	5.86E-05 (3.26E-05)	2.51E-03 (5.59E-04)			1.39E-03 (8.65E-03	1.39E-03 (9.25E-03)	6.60E-03 (2.11E-02)
Pyridine	1.27E-05 (2.60E-05)							1.27E-05 (2.60E-05)
Tetra-chloro-Ethylene	1.85E-05 (3.77E-05)	1.69E-06 (9.41E-07)	8.40E-05 (1.88E-05)			6.83E-04 (4.27E-03)	6.83E-04 (4.56E-03)	1.50E-03 (8.90E-03)
Trichloro-ethylene	1.00E-04 (1.00E-04)	3.13E-06 (1.74E-06)	3.13E-04 (6.94E-05)					4.00E-04 (2.00E-04)

TABLE 1: Continued - Page 2
Total Plant Emissions
CEI-Frederick Facility
Detroit, Michigan

POLLUTANT	EMISSIONS LB/HOUR							TOTAL
	Chemical Precipi-tation 1*	Oil & Grease Treatment 2*	600 Series Tank Farm 3*	LUWA** 4*	Hammer Mill Process 5*	Household TRANSFER ROOM 6*	Hazardous CAN CRUSHER 7*	
Vinyl Chloride	7.43E-06 (1.52E-05)		1.99E-04 (4.42E-05)					2.00E-04 (1.00E-04)
Cresol	1.67E-07 (3.40E-07)	3.82E-08 (2.12E-08)	6.12E-06 (1.36E-06)					6.33E-06 (1.72E-06)
2,4-Dinitro-Tolune	1.23E-08 (2.51E-08)							1.23E-08 (2.51E-08)
Hexa-chloro-benzene	1.27E-08 (2.60E-08)							1.27E-08 (2.60E-08)
Hexachlor-1,3-Butadiene	8.08E-09 (1.65E-08)							8.08E-09 (1.65E-08)
Hexa-chloro-ethane	3.38E-09 (6.89E-09)							3.38E-09 (6.89E-09)
Nitro-benzene	1.92E-09 (3.97E-09)							1.92E-09 (3.97E-09)
Methanol			5.56E-03 (1.24E-03)					5.56E-03 (1.24E-03)
Toluene			2.80E-04 (6.21E-05)			9.36E-04 (5.85E-03)	9.36E-04 (6.25E-03)	2.20E-03 (1.22E-02)
Ethyl Benzene			1.04E-04 (2.30E-05)					1.04E-04 (2.30E-05)
Xylene			9.45E-05 (2.10E-05)			6.13E-04 (3.83E-03)	6.13E-04 (4.09E-03)	1.30E-03 (7.90E-03)

TABLE 1: Continued - Page 3
Total Plant Emissions
CEI-Frederick Facility
Detroit, Michigan

POLLUTANT	EMISSIONS LB/HOUR							TOTAL
	Chemical Precipi-tation 1*	Oil & Grease Treatment 2*	600 Series Tank Farm 3*	LUWA** 4*	Hammer Mill Process 5*	Household Hazardous TRANSFER ROOM 6*	CAN CRUSHER 7*	
MTBE			1.99E-06 (4.43E-07)					1.99E-06 (4.43E-07)
Ethanol				9.70E-01 (2.83E-02)	9.70E-01 (6.06E-02)			1.94 (8.89E-02)
N-Amyl-acetate						1.43E-04 (8.95E-04)	1.43E-04 (9.55E-04)	3.00E-04 (1.90E-03)
Aromatic Hydro-carbon						3.24E-04 (2.03E-03)	3.24E-04 (2.16E-03)	6.00E-04 (4.20E-03)
Benzyl Chloride						3.48E-05 (2.18E-04)	3.48E-05 (2.32E-04)	1.00E-04 (5.00E-04)
N-Butyl Acetate						2.55E-04 (1.60E-03)	2.55E-04 (1.70E-03)	5.00E-04 (3.30E-03)
N-Butyl Alcohol						1.12E-04 (7.00E-04)	1.12E-04 (7.45E-04)	2.00E-04 (1.40E-03)
Ethyl Acetate						1.74E-03 (1.09E-02)	1.74E-03 (1.16E-02)	3.40E-03 (2.25E-02)
Ethyl Glycol n-Butyl Ether						1.95E-05 (1.22E-04)	1.95E-05 (1.30E-04)	3.90E-05 (3.00E-04)
Ethyl Glycol n-Butyl Ether Acetate						1.32E-05 (8.25E-05)	1.32E-05 (8.80E-05)	2.64E-05 (2.00E-04)
2-Ethyl Hexyl Acetate						1.89E-05 (1.19E-04)	1.89E-05 (1.26E-04)	3.78E-05 (2.00E-04)

TABLE 1: Continued - Page 4
Total Plant Emissions
CEI-Frederick Facility
Detroit, Michigan

POLLUTANT	EMISSIONS LB/HOUR							TOTAL
	Chemical Precipi-tation 1*	Oil & Grease Treatment 2*	600 Series Tank Farm 3*	LUWA** 4*	Hammer Mill Process 5*	Household TRANSFER ROOM 6*	Hazardous CAN CRUSHER 7*	
Heptane						1.10E-03 (6.90E-03)	1.10E-03 (7.35E-03)	2.20E-03 (1.43E-02)
IsoButyl Acetate						5.11E-04 (3.19E-03)	5.11E-04 (3.41E-03)	1.00E-03 (6.60E-03)
IsoButyl Alcohol						2.04E-04 (1.28E-03)	2.04E-04 (1.36E-03)	4.00E-04 (2.60E-03)
IsoPropyl Alcohol						5.11E-04 (3.20E-03)	5.11E-04 (3.41E-03)	1.00E-03 (6.60E-03)
Methyl Alcohol						8.80E-04 (5.50E-03)	8.80E-04 (5.85E-03)	1.80E-03 (1.14E-02)
Methyl Amyl Ketone						6.90E-04 (4.32E-04)	6.90E-04 (4.60E-04)	1.40E-03 (9.00E-04)
Methylene Chloride						8.87E-03 (5.55E-02)	8.87E-03 (5.90E-02)	1.77E-02 (1.15E-01)
Methyl IsoButyl Ketone						4.40E-04 (2.75E-03)	4.40E-04 (2.94E-03)	9.00E-04 (5.70E-03)
Mineral Spirits-Arom.Cont.						3.24E-04 (2.03E-03)	3.24E-04 (2.16E-03)	6.00E-04 (4.20E-03)
Naptha, Heavy						9.34E-04 (5.85E-03)	9.34E-04 (6.25E-03)	1.90E-03 (1.21E-02)
Pro. Gly. m- Meth. Ether Ace.						1.34E-04 (8.40E-04)	1.34E-04 (8.95E-04)	3.00E-04 (1.70E-03)

TABLE 1: Continued - Page 5
Total Plant Emissions
CEI-Frederick Facility
Detroit, Michigan

POLLUTANT	EMISSIONS LB/HOUR							TOTAL
	Chemical Precipi-tation	Oil & Grease Treatment	600 Series Tank Farm	LUWA**	Hammer Mill Process	Household	Hazardous	
	1*	2*	3*	4*	5*	TRANSFER ROOM 6*	CAN CRUSHER 7*	
Tetra-hydrofuran						2.57E-03 (1.61E-02)	2.57E-03 (1.72E-02)	5.10E-03 (3.33E-02)
VM & P Naptha						1.22E-04 (7.65E-04)	1.22E-04 (8.15E-04)	2.00E-04 (1.60E-03)
				TOTAL	VOCs			2.001 (0.393)

Footnotes:

* -- Stack Number
** -- Thin Film Evaporator
() -- Tons/Year

APPENDIX E- 2: GROUNDWATER EVALUATION REPORTS

Groundwater Evaluation Report 21st Century Resources, March 1999.

Hydrogeologic Evaluation, GZA GeoEnvironmental Inc., February 1991

GROUNDWATER EVALUATION

USL CITY ENVIRONMENTAL, INC.

Frederick Facility
1923 Frederick Street
Detroit, Michigan 48211
Wayne County

Prepared For:

USL CITY ENVIRONMENTAL, INC.
1923 Frederick Street
Detroit, Michigan

Prepared by:

21ST CENTURY RESOURCES, INC.
18977 West Ten Mile Road
Suite 100
Southfield, Michigan 48075

Project No. 98-137

March 5, 1999

21st Century Resources

Environmental Consulting & Management

March 5, 1999

Mr. Mark Fletcher
USL CITY ENVIRONMENTAL, INC.
1923 Frederick Street
Detroit, Michigan 48211

Subject: **Groundwater Evaluation**
USL City Environmental, Inc.
CEI-Frederick Street Facility
1923 Frederick Street, Detroit, Michigan

Dear Mr. Fletcher:

Pursuant to your request, 21ST Century Resources, Inc. (21ST CR) has completed a groundwater evaluation for the above subject site in accordance with the Michigan Department of Environmental Quality (MDEQ) requirements.

The groundwater evaluation began on December 29, 1998 and was completed by February 9, 1999. The recent evaluation included the following steps:

1. Gauging existing wells, to determine depth to groundwater and the quantity of water in each well.

2. Purging each well of three to five volumes of water, or until the well ran dry, prior to sampling. Monitoring wells MW-15 and MW-2A were re-sampled on February 2nd and 4th respectively.

3. Sampling each well, using a disposal, bottom filling bailer.

4. Submitting samples from each well to USL CEI-Laboratory for environmental analysis.

5. Summarizing the information gathered during the preliminary evaluation and issue a report.

39500 W. 14 Mile Road, Suite 395 • Commerce Township, MI 48390 • Ph. (248) 592-9950 • Fax. (248) 592-9951

INTRODUCTION

The study area is located in Detroit, Michigan, southeast of the intersection of Interstate Routes 94 and 75, refer to **Attachment I, Figures**. The site and surrounding areas are relatively flat based on a site survey and area reconnaissance.

SITE GEOLOGY

Although neither the surficial nor the bedrock geology of the CEI-Frederick site have been mapped in detail, the site has been included on a general surficial geology map made by Farrand[1] and on the bedrock maps prepared by Mozola[2] and Western Michigan University[3]. Findings made during previous (GZA) exploration study phase were in general agreement with these reported conditions. The following Subsections, therefore, provide a description of the geologic setting underlying the site based on conditions encountered during recent subsurface explorations and on the literature reviewed.

Geologic Setting

Present subsurface features of the CEI-Frederick site and surrounding areas were formed during the Wisconsin stage of pleistocene glacial advances depositing sediments over the Dundee Limestone and Traverse Group rock formations. The position and succession of deposit features found are related to the advance and withdrawal of the Eric-Huron ice lobe. The site and surrounding areas is covered in general by lacustring clays; however, early alluvium deposits of limited extent are interspersed Glacial Features of Wayne County, Michigan.

Surficial Geology

Near-Surface Fills

The near-surface soils at the site consist mainly of disturbed sand fill with intermittent clay layers and urban rubble, to include demolition debris. These fill soils range in thickness from 7 to 9 feet. Perched groundwater was only occasionally encountered in the fill soils and is considered to be localized and limited in extend.

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1 Farrand, W.R., Quaternary Geology of Michigan. State of Michigan Department of Natural Resources, Geological Survey, 1982.

2 Mozola, Andrew J., Geology for Land and Groundwater Development in Wayne County, Michigan. State of Michigan Department of Natural Resources Geological Survey Report No. 3, 1969.

3 Western Michigan University, Hydrogeology for Underground Injection Control in Michigan. Department of Geology, 1981.

Clays

Silty clay material was found below the near-surface fills. This material contained variable amounts of sand and gravel and was continuous to a depth of about 32 to 36 feet. The silty clay strata ranged in consistency from medium stiff to hard and is typically referred to as lacustrine clay.

According to previous studies made by GZA GeoEnvironmental, Inc., test borings were advanced through the clays to a depth more than 50 feet below the lowermost sand lens. Based on literature review, it is anticipated that these or similar clayey soils continue to depths of about 150 to 200 feet below the site.

Bedrock Geology

The site reportedly lies above two formations which form the bedrock surface, those being the Dundee Limestone and Traverse Group formations. Geologic maps indicate the bedrock surface boundary between these formations runs at or near the site.

The Traverse Group is a thick, 100 to 800 foot, sequence of alternating shales, limestones and dolomite. The shales in this group are not considered water-bearing aquifers; however, the limestone units may supply large volumes of water locally. Shales in the Traverse Group serve as excellent confining layers having low effective porosity.

The limestone units are relatively impermeable, but have local porous zones, particularly at the surface of the formation.

The Dundee Limestone formation is a fossiliferous limestone that is locally dolomitized. It ranges from about 50 to more than 350 feet thick in the eastern portion of Michigan's Lower Peninsula. Although the Dundee has a relatively low affective porosity, "selective" porous and permeable zones associated with fractures and bedding planes are considered water bearing aquifers. Because of the presence of these fractures, the Dundee is limited as a confining layer.

SITE HYDROLOGY

A review of the Detroit Department of Health and U.S. Environmental Protection Agency (EPA) Underground Injection Control Program revealed no domestic, municipal, industrial, oil, gas or injection wells within a one mile radius of the site. The following Sections concentrate of the climatic conditions, surface water and groundwater flow regimes identified specifically for the CEI-Frederick site.

Climatology

Inasmuch as groundwater recharge is gained primarily through precipitation events and snow/ice melt, a general review of climatic conditions of the Metropolitan Detroit area is appropriate. The following climatological summary has been derived from data collected at weather stations at the City of Detroit Airport and Detroit Metropolitan Airport.

Local climatic variations are due largely to the immediate effect of Lake St. Clair and the urban heat island effect. The average daily temperatures peak in July at 71.8°F and are at the lowest in January at 22.1°F. Average annual precipitation is about 32.1 inches of rain and 41.2 inches of snowfall.

The climate of Detroit is influenced by its location with respect to major storm tracks and influence of the Great Lakes. The normal wintertime storm track is south of the city whereas in the summer, most storms pass to the north. The most pronounced lake effect occurs in the winter when Arctic air moving across the lake is warmed and moistened. This procedures an excess of cloudiness but a moderation of cold wave temperatures. On the average, the last freezing temperatures occur in late April, while the average first freezing temperature occurs in late October.

Surface Water Hydrology

Surface water run-off of the site area is controlled by the storm sewers owned and operated by the City of Detroit.

Review of the Federal Emergency Management Agency, National Flood Insurance Program, shows that Detroit River, located approximately 2.7 miles south of the site, to be the closest potential flood risk in the surrounding area. Based on this mapping, CEI-Frederick lies within a Zone C area and is not considered subject to flooding.

Site and Regional Hydrology

Domestic water for the entire City of Detroit and portions of the surrounding locale are supplies by the Great Lakes. Supplies of groundwater of usable quantities near the site may be found within the deep alluvial deposits or in the underlying bedrock. Although the alluvial deposits do not appear to be continuous over large distances, their contact surface with the surrounding saturated soils may be of sufficient area to generate large quantities of water locally.

Groundwater from the lacustrine clays underlying the site are not considered useable as a source of water because of the inability of the clays to transmit significant quantities of water (i.e., very low permeability).

Based on review of published literature and on the observations made during the subsurface exploration program, it does not appear that any local groundwater resources will be developed within the immediate site area.

Groundwater flow in the site area will be toward the Detroit River and adjacent lakes. As described by Mozola, groundwater will occur under both water table and semi-confined to confined conditions, constituting a complex single system rather than totally independent flow regimes.

HYDROGEOLOGIC CHARACTERISTICS

Due to the complex geologic nature of the soil and bedrock conditions underlying the CEI site and the generally continuous clay soils reported and observed below a depth of about 40 to 60 feet, where previous studies was concentrated on those subsurface strata that could be directly affected by the proposed facility operation. As such, analysis of hydrogeologic conditions included those soil layers within 30 feet of ground surface, subsequently labeled as the "upper aquifer" (MW's 2A, 7, 11 & 15), and a second subsurface previous zone at a depth approximately 40 to 60 feet below ground surface, referred to as the "lower aquifer" (MW's 3, 6, 8, 9, 10, 20, 22 & 24).

The more previous sand seams in these layers will largely control groundwater movement at the site. These zones are separated by what appears to be a continuous layer of clay soil that will act to retard groundwater movement between the two zones. The following Subsections address specific hydraulic characteristics of the soil layers explored during GZA's study. Of particular interest are the soils hydraulic conductivity, hydraulic gradient, porosity and groundwater transport velocity.

Hydraulic Conductivity

The hydraulic conductivity ("permeability") of a soil mass is a measure of the rate at which water ("fluid") flows through the soil. As GZA noted in its report, a total of 15 field and 18 laboratory permeability tests were performed to establish representative values of the individual layer permeabilities. These values may be summarized as follows:

"Upper Aquifer"	10^{-7} cm/sec
Intermediate Clay Layer	10^{-8} cm/sec
"Lower Aquifer"	10^{-5} to 10^{-6} cm/sec
Underlying Clay Layer	10^{-8} cm/sec

As indicated, the permeabilities measured are considered as relatively low. Additionally, no distinction between the horizontal and vertical permeability is shown because variations, even on the order of one magnitude, will not significantly affect groundwater transport velocities described in GZA Report.

Hydraulic Gradient and Flow Direction

Based on past and recent evaluations, groundwater flow direction interpreted for both the "upper and lower aquifers" appears to be consistent with the published area data. A general easterly flow direction appears to coincide with the axis of the deep bedrock valley and thick glacial deposits reported for the immediate site vicinity.

GROUNDWATER EVALUATION/MONITORING (December 1998)

On December 29, 1998, 21ST CR visited CEI-Frederick for the purpose of gauging the monitoring wells. Depth to water measurements were made in each of the existing monitoring wells, using a Keck Instruments, Inc. Model KIR 89, electronic interface probe. Groundwater flow direction map is presented in **Attachment I, Figures**. Depth to water measurements were made from the top of casing and are summarized on the following table:

GROUNDWATER ELEVATION SUMMARY TABLE
City Environmental Inc. - Frederick
29- December 1998

Well ID	Gd. Elev.	DTW	GW Elev.
MW-1		10.56	
MW-2	No longer in existence		
MW-2a		1.89	628.09
MW-3		9.27	623.34
MW-4	Damaged		
MW-5	No longer in existence		
MW-6		4.72	627.46
MW-7		4.36	627.86
MW-8		6.52	
MW-9		6.56	
MW-10		5.73	626.44
MW-11		4.28	627.92
MW-12	No longer in existence		
MW-13	No longer in existence		
MW-14	No longer in existence		
MW-15		4.62	627.59
MW-16	No longer in existence		
MW-17	No longer in existence		
MW-18	No longer in existence		
MW-18a	No longer in existence		
MW-19	No longer in existence		
MW-20		8.42	622.36
MW-21	No longer in existence		
MW-22		6.62	625.66
MW-23	No longer in existence		
MW-24		8.94	623.91

Notes: GW. Elev.: Groundwater Elevation
DTW: Depth to Water, from TOC
All measurements recorded in feet

Prior to sampling, the monitoring wells were purged of three to five volumes of water or until they were pumped dry. The wells were purged using a Keck Instruments Model SP-84 sampling pump. the wells were purged at a rate of approximately one gallon per minute. All wells were pumped dry at less than three times the volume of water in the well. The monitoring wells were purged on December 29, 1998. The following table summarizes the volume of water purged from each well.

PURGED GROUNDWATER SUMMARY
City Environmental Inc. - Frederick
29 December 1998

Well ID	3x Volume	Quantity Purged	Dry?
MW-1	46	15	Y
MW-2	No longer in existence		
MW-2a	13	8	Y
MW-3	28	7	Y
MW-4	Damaged		
MW-5	No longer in existence		
MW-6	24	9.5	Y
MW-7	9	4.5	Y
MW-8	18	8.5	Y
MW-9	23	7	Y
MW-10	26	10	Y
MW-11	17	8	Y
MW-12	No longer in existence		
MW-13	No longer in existence		
MW-14	No longer in existence		
MW-15	4	3	Y
MW-16	No longer in existence		
MW-17	No longer in existence		
MW-18	No longer in existence		
MW-18a	No longer in existence		
MW-19	No longer in existence		
MW-20	22	14	Y
MW-21	No longer in existence		
MW-22	...	6.5	Y
MW-23	No longer in existence		
MW-24	...	7	Y

Notes:
3x Volume: 3 x the quantity of water in the well, rounded off.
Quantity Purged: Volume of water removed from the well, estimated.
Dry?: Well pumped dry, Yes or No.

After purging the wells, the groundwater was allowed to recharge to allow collection of representative groundwater samples.

The monitoring wells were sampled on December 29, 1998. The groundwater samples were collected using bottoming filling, single use, disposable PVC bailers. Samples for volatiles were collected from the top of the water column, while samples for semi-volatiles and the MDEQ 10 Metals were collected from the screened interval of the monitoring well.

Groundwater samples were placed into laboratory supplied, individually labeled, glass sample containers and capped with screw-on type lids. The samples were kept cold and later submitted, along with Chain-of-Custody documentation to USL CEI laboratory for environmental analyses. The samples were analyzed for the presence of Volatile Organics (VOC's), Semi-Volatile Organics (SVOC's), and the MDEQ 10 Metals including Iron, Sodium, Manganese, Chloride, and Nitrates.

VOCs and SVOCs were not detected in any of the analyzed samples except for the samples collected form MW-2A and MW-15. SVOCs: Chrysene, Phenanthrene, Pyrene, Benzo(a)anthracene, Benzo(a)pyrene, and Fluoranthene were detected in the water sample collected MW-2A while Benzo (b)fluoranthene, Benzo(k)fluoranthene, and Benzo (ghi)perylene were detected in the MW-15 water sample in addition to the contaminants detected in MW-2A sample. Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, and Silver were also not detected. The following Inorganic compounds were detected as follows:

- Zinc was detected in all of the analyzed water samples below its respective regulatory Residential Drinking Water Criteria (RDWC - 2400 ug/l);

- Barium was detected in MW-2A, MW-8, and MW-15 water samples below its respective regulatory RDWC (2000 ug/l);

- Iron was detected in MW-15 only, below its respective regulatory RDWC (300 ug/l);

- Sodium was detected in all of the water samples, however, below its regulatory RDWC (160000 ug/l);

- Manganese was detected in MW-1, MW-2A, MW-7, MW-10, MW-15, and MW-20 above its respective regulatory RDWC (50 ug/l). These levels, however, are levels affecting taste, odor, and/or appearance;

- Chloride was detected in all of the analyzed water samples below its respective regulatory RDWC (250000 ppb);

- Nitrate was detected in all of the water samples (except for MW-8 and MW-20) below its respective regulatory MCL (10000 ppb);

Since MW-2A and MW-15 are located within an area where heavy trucks (trailers) are parked in, it was decided to re-sample both wells. Therefore, on February 2, 1999, 21ST CR visited CEI-Frederick for the purpose re-sampling MW-2A and MW-15. Prior to sampling, the monitoring wells were purged, however, due to heavy rain, it was noted that surface runoff enters both wells due to puddling within the vicinity. Approximately 60 gallons of water was pumped form MW-15 prior to sampling for analysis of contaminants detected in the earlier episode. MW-2A was sampled on February 4, 1999 after purging approximately 50 gallons. Both samples (MW-15 and MW-2A) were submitted to USL CEI laboratory for environmental analyses.

SVOCs, detected in the December 1998 sampling episode, were not detected in the MW-2A and MW-15 water samples collectd in February 1999.

All December 1998 and February 1999 laboratory results are tabulated and presented in **Attachment II** including copies of the published laboratory reports.

Based on the sampling and analyses performed during the groundwater evaluation, at the USL CEI-Frederick site, it appears that the site groundwater has not been impacted by plant activities despite the detection of manganese in some of the water samples above regulatory levels.

21ST CR recommends to replace damaged and no longer in existence wells especially the wells within and adjacent to processes, loading, and unloading areas. Also, MW-2A and MW-15 monitoring wells should be equipped with risers to prevent surface runoff from entering these wells.

It has been a pleasure working with you on this project. Should questions arise, please feel free to call our office at (248) 592-9950.

Sincerely,
21ST CENTURY RESOURCES, INC.

Gus A. George
Sr. Engineer

File: 98-137

ATTACHMENT I

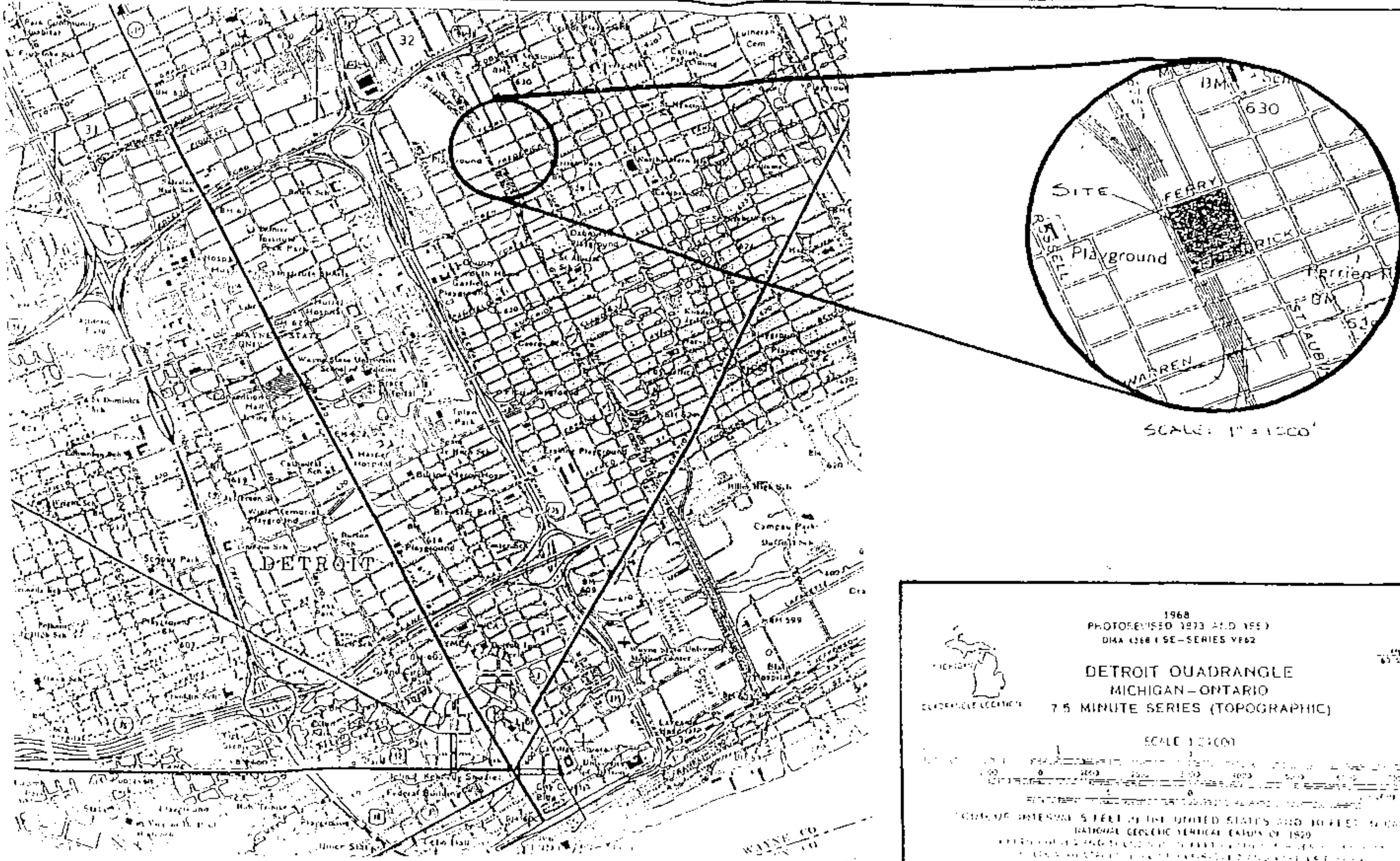
"FIGURES"

MAPS

SITE LOCATION
AND
SITE PLAN WITH MONITORING WELLS

21st Century Resources

Environmental Consulting & Management



1968
PHOTOREVISED 1973 AND 1983
DMA 4268 I SE—SERIES V862

DETROIT QUADRANGLE
MICHIGAN—ONTARIO
7.5 MINUTE SERIES (TOPOGRAPHIC)

SCALE 1:24000

PROJECT: CITY ENVIRONMENTAL, INC. - FREDERICK : SITE LOCATION	DATE: 1995	SCALE: AS SHOWN

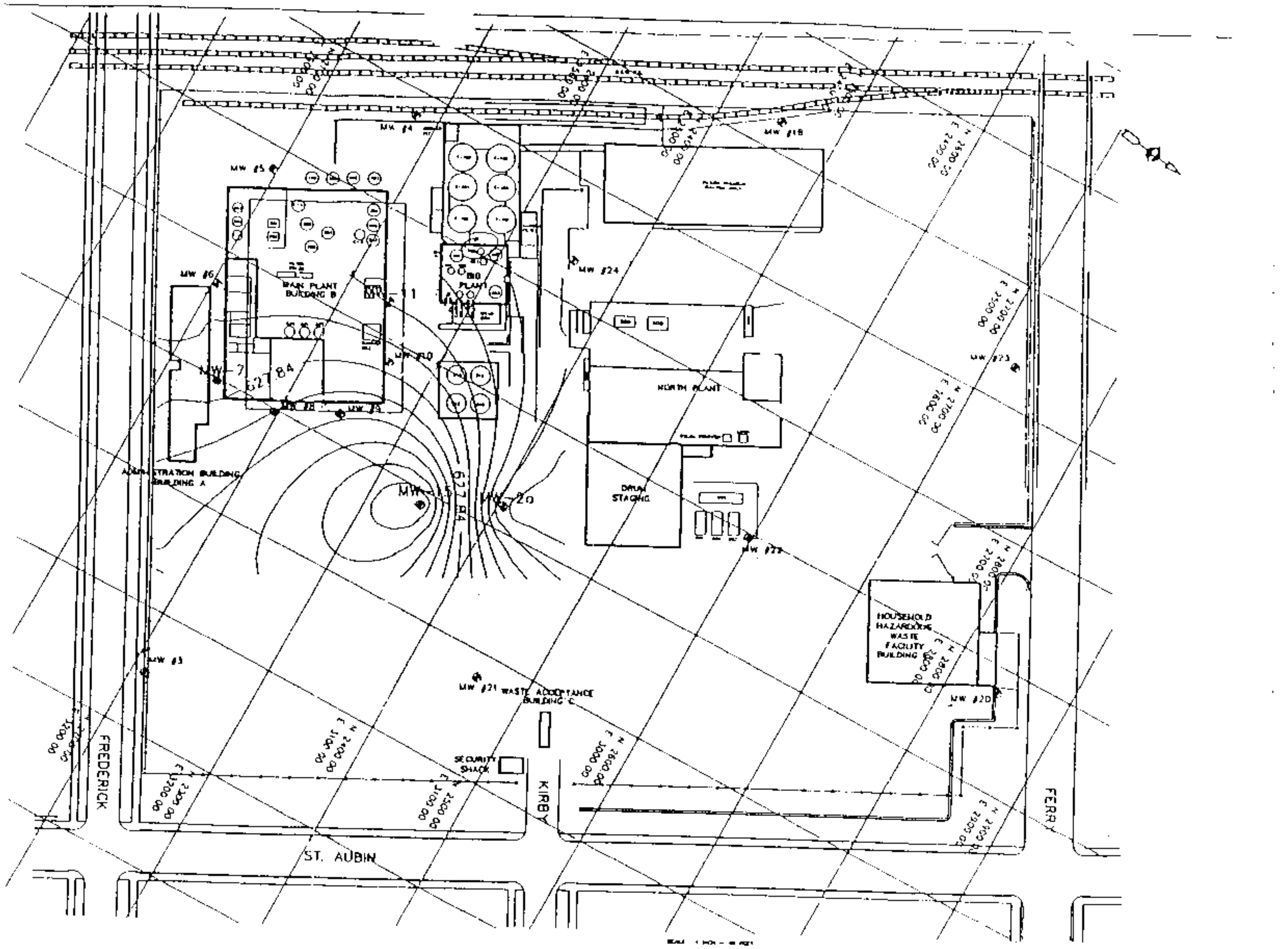
PZIEOMETRIC SURFACE

UPPER AQUIFER
&
LOWER AQUIFER

TANK #	TREATMENT/HOLDING	CAPACITY GALLONS	DIAMETER FEET
101	AERATION	150 000	[illegible]
102	AERATION	400 000	[illegible]
103	HOLDING	150 000	[illegible]
104	EQUALIZATION	100 000	[illegible]
105	HOLDING	150 000	[illegible]
106	HOLDING	100 000	[illegible]
107	HOLDING	20 000	[illegible]
108	HOLDING	20 000	[illegible]
109	HOLDING	18 000	[illegible]
110	HOLDING	28 000	16.67
201	TREATMENT	41 000	[illegible]
202	TREATMENT	45 000	[illegible]
203	TREATMENT	17 000	[illegible]
204	TREATMENT	8 000	10.50
205	TREATMENT	8 000	[illegible]
206	HOLDING	10 000	[illegible]
301	TREATMENT	8 000	17.06
302	TREATMENT	8 000	[illegible]
303	HOLDING	10 000	[illegible]
304	HOLDING	10 000	[illegible]
401	CLARIFIER	13 000	13.06
402	CLARIFIER	17 000	13.06
403	SLUDGE THICKENER	28 000	[illegible]
404	SELECTOR	2 500	8.01
405	AERATION FILTER	500	3.00
406	DECANT	500	5.00
407	SELECTOR OVERFLOW	5 000	6.00
408	FILTER	660	-
[illegible]	HOLDING	30 000	-
[illegible]	HOLDING	45 000	-
[illegible]	EFFLUENT HOLDING	18 000	[illegible]
514	EFFLUENT HOLDING	18 000	[illegible]
[illegible]	EFFLUENT HOLDING	28 000	[illegible]
[illegible]	EFFLUENT HOLDING	28 000	[illegible]
520	PRODUCT	15 000	N/A
521	PRODUCT	15 000	N/A
522	PRODUCT	10 000	N/A
601	HOLDING	10 000	10.50
602	HOLDING	10 000	10.50
603	HOLDING	10 000	10.50
604	HOLDING	10 000	10.50
[illegible]	PRODUCT	[illegible]	[illegible]
[illegible]	PRODUCT	11 500	12.00
[illegible]	PRODUCT	10 000	10.50

MONITORING WELLS

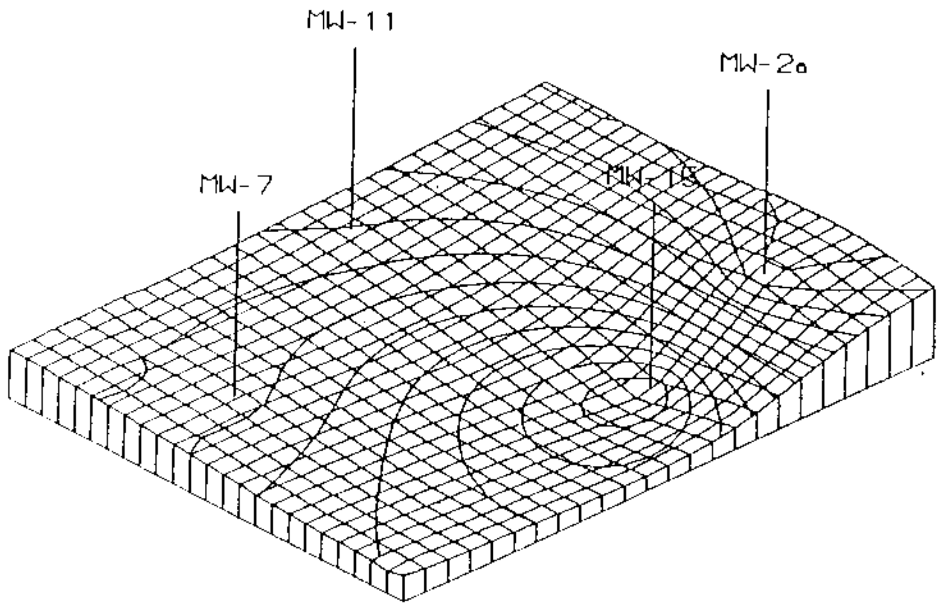
CURRENT COORDINATE LISTING				
MW#	NORTHING	EASTING	GRND. ELEV.	TOP OF CASING
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW 3	[illegible]	[illegible]	[illegible]	[illegible]
MW 4	[illegible]	[illegible]	[illegible]	[illegible]
MW 5	[illegible]	[illegible]	[illegible]	[illegible]
MW [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW 7	[illegible]	[illegible]	[illegible]	[illegible]
MW 8	[illegible]	[illegible]	[illegible]	[illegible]
MW 6	[illegible]	[illegible]	[illegible]	[illegible]
MW 10	[illegible]	[illegible]	[illegible]	[illegible]
MW 11	[illegible]	[illegible]	[illegible]	[illegible]
MW [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW 20	[illegible]	[illegible]	[illegible]	[illegible]
MW 21	[illegible]	[illegible]	[illegible]	[illegible]
MW 22	[illegible]	[illegible]	[illegible]	[illegible]
MW 23	[illegible]	[illegible]	[illegible]	[illegible]
MW 24	[illegible]	[illegible]	[illegible]	[illegible]

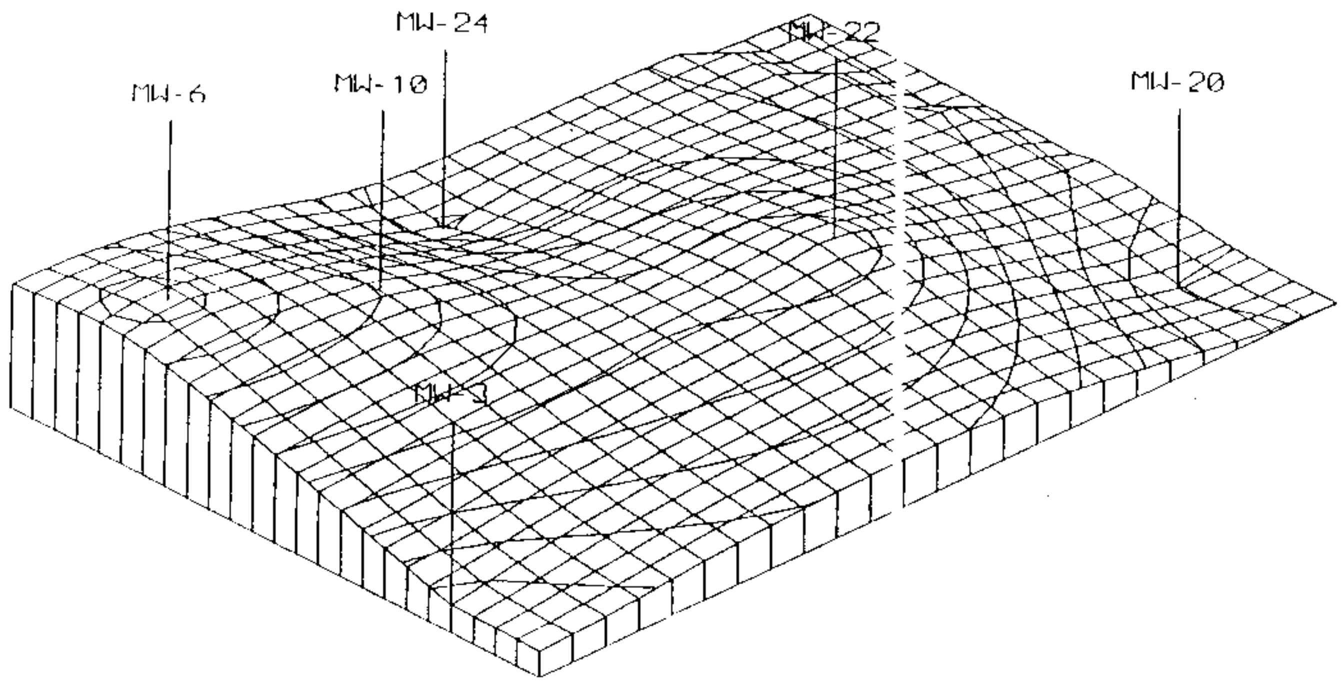


CITY ENVIRONMENTAL, INC.
WASTE HANDLING FACILITY

SITE PLAN (PRESENT)
WITH MONITORING WELLS

92934-01

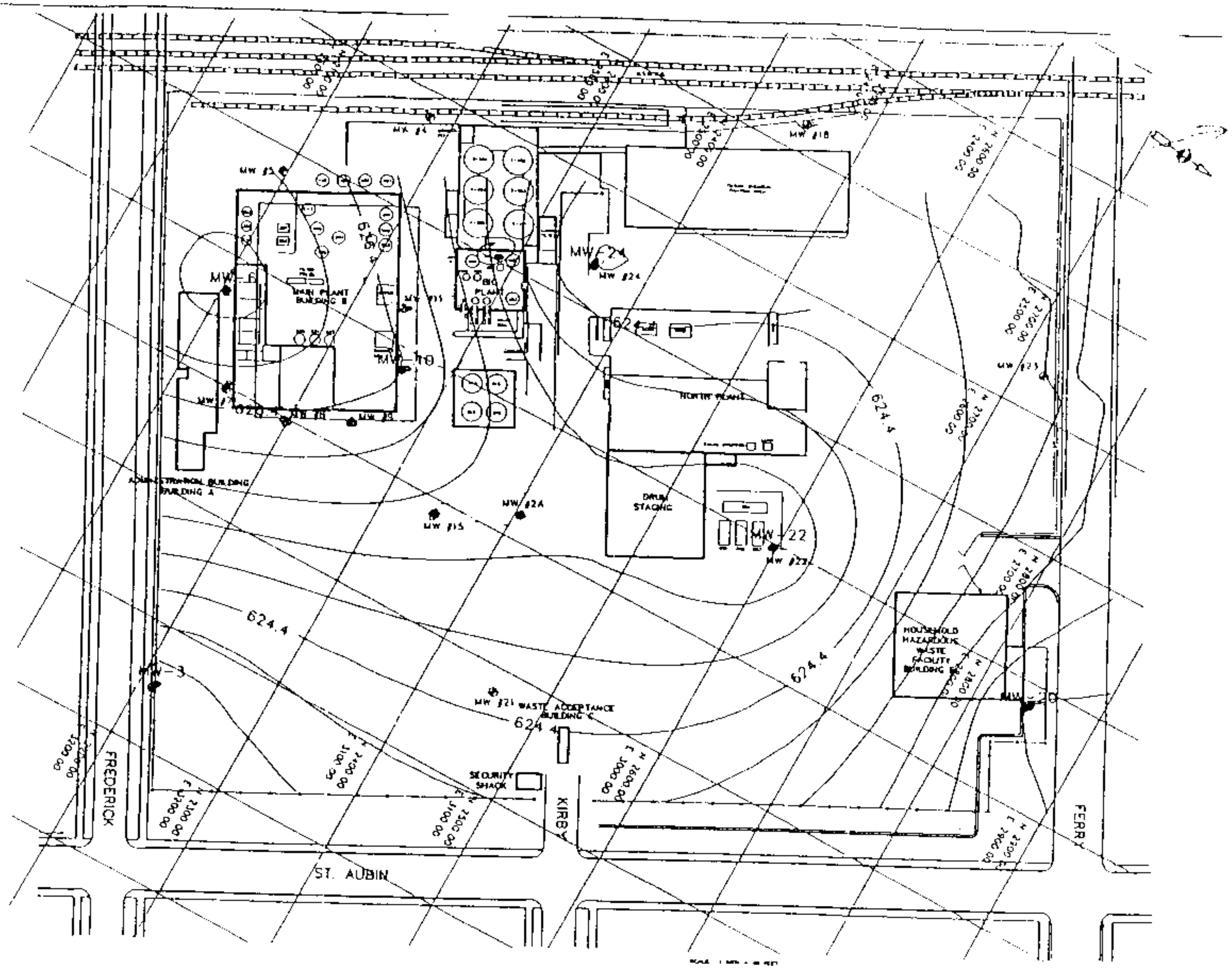

MW-11
MW-2a
MW-7


MW-24
MW-22
MW-6
MW-10
MW-20
MW-3

TANK #	TREATMENT/HOLDING	CAPACITY GALLONS	DIAMETER FEET
101	AERATION	150 000	28.87
102	AERATION	100 000	23.88
103	HOLDING	150 000	28.87
104	EQUALIZATION	400 000	23.88
105	HOLDING	150 000	28.81
106	HOLDING	400 000	23.88
107	HOLDING	20 000	10.13
108	HOLDING	20 000	10.43
109	HOLDING	78 000	16.87
110	HOLDING	78 000	16.87
201	TREATMENT	17 000	12.78
202	TREATMENT	17 000	12.78
203	TREATMENT	17 000	12.78
204	TREATMENT	8 000	10.50
205	TREATMENT	8 000	10.33
206	HOLDING	10 100	[illegible]
301	TREATMENT	8 000	12.08
302	TREATMENT	8 000	12.04
303	HOLDING	10 000	10.05
304	HOLDING	10 000	10.05
401	CLARIFIER	12 000	13.08
402	CLARIFIER	17 000	17.08
403	SLUDGE THICKENER	24 000	[illegible]
404	SELECTOR	2 500	8.01
405	AERATION FEED	500	5.00
406	DECANT	500	5.00
407	SELECTOR OVERFLOW	5 000	4.00
408	FILTER	440	-
508	HOLDING	70 000	-
509	HOLDING	45 000	-
513	EFFLUENT HOLDING	78 000	16.87
514	EFFLUENT HOLDING	78 000	16.87
515	EFFLUENT HOLDING	78 000	[illegible]
516	EFFLUENT HOLDING	78 000	16.87
520	PRODUCT	15 000	N/A
521	PRODUCT	15 000	N/A
522	PRODUCT	10 000	N/A
601	HOLDING	10 000	10.50
602	HOLDING	10 000	10.50
603	HOLDING	10 000	10.50
604	HOLDING	10 000	10.50
[illegible]	PRODUCT	[illegible]	10.05
C-1	PRODUCT	11 500	12.00
C-2	PRODUCT	10 000	10.50

MONITORING WELLS

	CURRENT COORDINATE LISTING			
MW #	NORTHING	EASTING	GRND ELEV	TOP OF CASING
MW 2A	[illegible]	[illegible]	[illegible]	[illegible]
MW 3	[illegible]	[illegible]	[illegible]	[illegible]
MW 4	[illegible]	[illegible]	[illegible]	[illegible]
MW 5	[illegible]	[illegible]	[illegible]	[illegible]
MW 6	[illegible]	[illegible]	[illegible]	[illegible]
MW 7	[illegible]	[illegible]	[illegible]	[illegible]
MW 8	[illegible]	[illegible]	[illegible]	[illegible]
MW 9	[illegible]	[illegible]	[illegible]	[illegible]
MW 10	[illegible]	[illegible]	[illegible]	[illegible]
MW 11	[illegible]	[illegible]	[illegible]	[illegible]
MW 15	[illegible]	[illegible]	[illegible]	[illegible]
MW 18	[illegible]	[illegible]	[illegible]	[illegible]
MW 20	[illegible]	[illegible]	[illegible]	[illegible]
MW 21	[illegible]	[illegible]	[illegible]	[illegible]
MW 22	[illegible]	[illegible]	[illegible]	[illegible]
MW 23	[illegible]	[illegible]	[illegible]	[illegible]
MW 24	[illegible]	[illegible]	[illegible]	[illegible]



CITY ENVIRONMENTAL, INC.
WASTE HANDLING FACILITY

SITE PLAN (PRESENT)
WITH MONITORING WELLS

92934-01

ATTACHMENT II

"SUMMARY TABLES"
AND
"ANALYTICAL LABORATORY REPORTS"

SUMMARY TABLES

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW1 890	MW2A 889	MW3 886	MW6 893	MW7 892	MW8 894	MDL
Metals (ppb)							
Copper	ND	ND	ND	ND	ND	ND	25
Zinc	570	577	205	294	224	208	20
Arsenic	ND	ND	ND	ND	ND	ND	5
Barium	ND	286	ND	ND	ND	203	200
Cadmium	ND	ND	ND	ND	ND	ND	0.5
Chromium	ND	ND	ND	ND	ND	ND	50
Lead	ND	ND	ND	ND	ND	ND	3
Mercury	ND	ND	ND	ND	ND	ND	0.2
Selenium	ND	ND	ND	ND	ND	ND	5
Silver	ND	ND	ND	ND	ND	ND	0.5
Iron	ND	ND	ND	ND	ND	ND	100
Sodium	155000	64700	144000	104000	110000	91700	0.5
Manganese	139	930	ND	ND	114	35	20
Chloride	<8%	<8%	<8%	<8%	<8%	<8%	10000
Nitrate	5110	ND	4120	3360	ND	ND	100
Volatiles (ppb)							
2-Hexanone	ND	ND	ND	ND	ND	ND	50
Benzene	ND	ND	ND	ND	ND	ND	5
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	ND	ND	ND	1
Chloroform	ND	ND	ND	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	1
Methyl Ethyl Ketone	ND	ND	ND	ND	ND	ND	50
Tetrachloroethene	ND	ND	ND	ND	ND	ND	1
Vinyl Chloride	ND	ND	ND	ND	ND	ND	1
Acetone	ND	ND	ND	ND	ND	ND	100
Bromodichloromethane	ND	ND	ND	ND	ND	ND	1
Bromoform	ND	ND	ND	ND	ND	ND	1
Bromomethane	ND	ND	ND	ND	ND	ND	1
Carbon Disulfide	ND	ND	ND	ND	ND	ND	50
Chloroethane	ND	ND	ND	ND	ND	ND	1
Chloromethane	ND	ND	ND	ND	ND	ND	1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	1
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	1
Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	1
cis-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
trans-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Ethylbenzene	ND	ND	ND	ND	ND	ND	1
Methylene Chloride	ND	ND	ND	ND	ND	ND	5
Methyl Isobutyl Ketone	ND	ND	ND	ND	ND	ND	50
Styrene	ND	ND	ND	ND	ND	ND	1
Trichloroethene	ND	ND	ND	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	1
Toluene	ND	ND	ND	ND	ND	ND	1
Vinyl Acetate	ND	ND	ND	ND	ND	ND	50
Xylenes	ND	ND	ND	ND	ND	ND	3

Continued,..........

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

	MW1	MW2A	MW3	MW6	MW7	MW8	MDL
USL CEI Sample # 19___	890	889	886	893	892	894	
Semi-Volatiles (ppb)							
Acenaphtene	ND	ND	ND	ND	ND	ND	5
Acenaphthylene	ND	ND	ND	ND	ND	ND	5
Anthracene	ND	ND	ND	ND	ND	ND	5
Benzidine	ND	ND	ND	ND	ND	ND	50
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	5
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Chrysene	ND	15	ND	ND	ND	ND	5
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	5
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	5
Diethyl phthalate	ND	ND	ND	ND	ND	ND	5
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	5
Fluorene	ND	ND	ND	ND	ND	ND	5
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	5
Hexachloro-1,3-butadiene	ND	ND	ND	ND	ND	ND	5
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	5
Hexachloroethane	ND	ND	ND	ND	ND	ND	2
Isophorone	ND	ND	ND	ND	ND	ND	5
Naphthalene	ND	ND	ND	ND	ND	ND	5
Nitrobenzene	ND	ND	ND	ND	ND	ND	5
n_Nitroso-dimethylamine	ND	ND	ND	ND	ND	ND	40
n_Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	ND	5
n_Nitroso-diphenylamine	ND	ND	ND	ND	ND	ND	5
P-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	20
Pentachlorophenol	ND	ND	ND	ND	ND	ND	20
Phenanthrene	ND	9	ND	ND	ND	ND	5
Phenol	ND	ND	ND	ND	ND	ND	5
Pyrene	ND	13	ND	ND	ND	ND	5
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	5
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	5
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Benzo(a)anthracene	ND	6	ND	ND	ND	ND	5
Benzo (a) pyrene	ND	7	ND	ND	ND	ND	5
Benzo (b) fluoranthene	ND	ND	ND	ND	ND	ND	5
Benzo (k) fluoranthene	ND	ND	ND	ND	ND	ND	5
Benzo (ghi) perylene	ND	ND	ND	ND	ND	ND	5
Dibenzo (a,h) anthracene	ND	ND	ND	ND	ND	ND	5
Indeno (1,2,3-cd) pyrene	ND	ND	ND	ND	ND	ND	5
3,3-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	20
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	5
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
2-Nitrophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	50
4,6-Dinirto-o-cresol	ND	ND	ND	ND	ND	ND	50
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
Fluoranthene	ND	12	ND	ND	ND	ND	5
Hexachlorocyclopentadine	ND	ND	ND	ND	ND	ND	5
2-Nitroaniline	ND	ND	ND	ND	ND	ND	50
3-Nitroaniline	ND	ND	ND	ND	ND	ND	50
4-Nitroaniline	ND	ND	ND	ND	ND	ND	20
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Ethyl hexyl phthalate	ND	ND	ND	ND	ND	ND	5

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW9 895	MW10 896	MW11 897	MW15 888	MW20 887	MW22 898	MDL
Metals (ppb)							
Copper	ND	ND	ND	ND	ND	ND	25
Zinc	107	133	311	378	307	168	20
Arsenic	ND	ND	ND	ND	ND	ND	5
Barium	ND	ND	ND	325	ND	ND	200
Cadmium	ND	ND	ND	ND	ND	ND	0.5
Chromium	ND	ND	ND	ND	ND	ND	50
Lead	ND	ND	ND	ND	ND	ND	3
Mercury	ND	ND	ND	ND	ND	ND	0.2
Selenium	ND	ND	ND	ND	ND	ND	5
Silver	ND	ND	ND	ND	ND	ND	0.5
Iron	ND	ND	ND	117	ND	ND	100
Sodium	112000	124000	140000	93600	135000	84500	0.5
Manganese	45	75	ND	188	86	ND	20
Chloride	<8%	8%	<8%	<8%	<8%	<8%	10000
Nitrate	3880	3750	ND	2560	2820	ND	100
Volatiles (ppb)							
2-Hexanone	ND	ND	ND	ND	ND	ND	50
Benzene	ND	ND	ND	ND	ND	ND	5
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	ND	ND	ND	1
Chloroform	ND	ND	ND	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	1
Methyl Ethyl Ketone	ND	ND	ND	ND	ND	ND	50
Tetrachloroethene	ND	ND	ND	ND	ND	ND	1
Vinyl Chloride	ND	ND	ND	ND	ND	ND	1
Acetone	ND	ND	ND	ND	ND	ND	100
Bromodichloromethane	ND	ND	ND	ND	ND	ND	1
Bromoform	ND	ND	ND	ND	ND	ND	1
Bromomethane	ND	ND	ND	ND	ND	ND	1
Carbon Disulfide	ND	ND	ND	ND	ND	ND	50
Chloroethane	ND	ND	ND	ND	ND	ND	1
Chloromethane	ND	ND	ND	ND	ND	ND	1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	1
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	1
Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	1
cis-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
trans-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Ethylbenzene	ND	ND	ND	ND	ND	ND	1
Methylene Chloride	ND	ND	ND	ND	ND	ND	5
Methyl Isobutyl Ketone	ND	ND	ND	ND	ND	ND	50
Styrene	ND	ND	ND	ND	ND	ND	1
Trichloroethene	ND	ND	ND	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	1
Toluene	ND	ND	ND	ND	ND	ND	1
Vinyl Acetate	ND	ND	ND	ND	ND	ND	50
Xylenes	ND	ND	ND	ND	ND	ND	3

Continued,..........

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW9 895	MW10 896	MW11 897	MW15 888	MW20 887	MW22 898	MDL
Semi-Volatiles (ppb)							
Acenaphtene	ND	ND	ND	ND	ND	ND	5
Acenaphthylene	ND	ND	ND	ND	ND	ND	5
Anthracene	ND	ND	ND	ND	ND	ND	5
Benzidine	ND	ND	ND	ND	ND	ND	50
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	5
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Chrysene	ND	ND	ND	27	ND	ND	5
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	5
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	5
Diethyl phthalate	ND	ND	ND	ND	ND	ND	5
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	5
Fluorene	ND	ND	ND	ND	ND	ND	5
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	5
Hexachloro-1,3-butadiene	ND	ND	ND	ND	ND	ND	5
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	5
Hexachloroethane	ND	ND	ND	ND	ND	ND	2
Isophorone	ND	ND	ND	ND	ND	ND	5
Naphthalene	ND	ND	ND	ND	ND	ND	5
Nitrobenzene	ND	ND	ND	ND	ND	ND	5
n_Nitroso-dimethylamine	ND	ND	ND	ND	ND	ND	40
n_Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	ND	5
n_Nitroso-diphenylamine	ND	ND	ND	ND	ND	ND	5
P-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	20
Pentachlorophenol	ND	ND	ND	ND	ND	ND	20
Phenanthrene	ND	ND	ND	9	ND	ND	5
Phenol	ND	ND	ND	ND	ND	ND	5
Pyrene	ND	ND	ND	34	ND	ND	5
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	5
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	5
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Benzo(a)anthracene	ND	ND	ND	12	ND	ND	5
Benzo (a) pyrene	ND	ND	ND	10	ND	ND	5
Benzo (b) fluoranthene	ND	ND	ND	17	ND	ND	5
Benzo (k) fluoranthene	ND	ND	ND	20	ND	ND	5
Benzo (ghi) perylene	ND	ND	ND	16	ND	ND	5
Dibenzo (a,h) anthracene	ND	ND	ND	ND	ND	ND	5
Indeno (1,2,3-cd) pyrene	ND	ND	ND	ND	ND	ND	5
3,3-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	20
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	5
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
2-Nitrophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	50
4,6-Dinirto-o-cresol	ND	ND	ND	ND	ND	ND	50
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
Fluoranthene	ND	ND	ND	11	ND	ND	5
Hexachlorocyclopentadine	ND	ND	ND	ND	ND	ND	5
2-Nitroaniline	ND	ND	ND	ND	ND	ND	50
3-Nitroaniline	ND	ND	ND	ND	ND	ND	50
4-Nitroaniline	ND	ND	ND	ND	ND	ND	20
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Ethyl hexyl phthalate	ND	ND	ND	ND	ND	ND	5

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW24 891	MDL
Metals (ppb)		
Copper	ND	25
Zinc	321	20
Arsenic	ND	5
Barium	ND	200
Cadmium	ND	0.5
Chromium	ND	50
Lead	ND	3
Mercury	ND	0.2
Selenium	ND	5
Silver	ND	0.5
Iron	ND	100
Sodium	90000	0.5
Manganese	ND	20
Chloride	<8%	10000
Nitrate	3950	100
Volatiles (ppb)		
2-Hexanone	ND	50
Benzene	ND	5
Carbon Tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroform	ND	1
1,2-Dichloroethane	ND	1
1,1-Dichloroethylene	ND	1
Methyl Ethyl Ketone	ND	50
Tetrachloroethene	ND	1
Vinyl Chloride	ND	1
Acetone	ND	100
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	1
Carbon Disulfide	ND	50
Chloroethane	ND	1
Chloromethane	ND	1
Dibromochloromethane	ND	1
Dichlorodifluoromethane	ND	1
Dichloroethane	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-dichloropropene	ND	1
trans-1,3-dichloropropene	ND	1
Dichlorobenzene	ND	1
Ethylbenzene	ND	1
Methylene Chloride	ND	5
Methyl Isobutyl Ketone	ND	50
Styrene	ND	1
Trichloroethene	ND	1
1,1,1-Trichloroethane	ND	1
1,1,2,2-Trichloroethane	ND	1
1,1,2-Trichloroethane	ND	1
Trichlorofluoromethane	ND	1
Toluene	ND	1
Vinyl Acetate	ND	50
Xylenes	ND	3

Continued,..........

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW24 891	MDL
Semi-Volatiles (ppb)		
Acenaphtene	ND	5
Acenaphthylene	ND	5
Anthracene	ND	5
Benzidine	ND	50
Bis(2-chloroethoxy)methane	ND	5
Bis(2-chloroethyl)ether	ND	5
Bis(2-chloroisopropyl)ether	ND	5
Bis(2-ethylhexyl)phthalate	ND	5
Butyl benzyl phthalate	ND	5
Chrysene	ND	5
Di-n-butyl phthalate	ND	5
Di-n-octyl phthalate	ND	5
Diethyl phthalate	ND	5
Dimethyl phthalate	ND	5
Fluorene	ND	5
Hexachlorobenzene	ND	5
Hexachloro-1,3-butadiene	ND	5
Hexachlorocyclopentadiene	ND	5
Hexachloroethane	ND	2
Isophorone	ND	5
Naphthalene	ND	5
Nitrobenzene	ND	5
n_Nitroso-dimethylamine	ND	40
n_Nitroso-di-n-propylamine	ND	5
n_Nitroso-diphenylamine	ND	5
p-Chloro-m-cresol	ND	20
Pentachlorophenol	ND	20
Phenanthrene	ND	5
Phenol	ND	5
Pyrene	ND	5
1,2,4-Trichlorobenzene	ND	5
2-Chloronaphthalene	ND	5
2,4,6-Trichlorophenol	ND	5
1,2-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
Benzo(a)anthracene	ND	5
Benzo (a) pyrene	ND	5
Benzo (b) fluoranthene	ND	5
Benzo (k) fluoranthene	ND	5
Benzo (ghi) perylene	ND	5
Dibenzo (a,h) anthracene	ND	5
Indeno (1,2,3-cd) pyrene	ND	5
3,3-Dichlorobenzidine	ND	20
2,4-Dichlorophenol	ND	5
2,4-Dimethylphenol	ND	5
4-Chlorophenyl phenyl ether	ND	5
4-Bromophenyl phenyl ether	ND	5
2-Nitrophenol	ND	5
2,4-Dinitrophenol	ND	50
4,6-Dinirto-o-cresol	ND	50
2,4-Dinitrotoluene	ND	5
2,6-Dinitrotoluene	ND	5
Fluoranthene	ND	5
Hexachlorocyclopentadine	ND	5
2-Nitroaniline	ND	50
3-Nitroaniline	ND	50
4-Nitroaniline	ND	20
Butyl benzyl phthalate	ND	5
Ethyl hexyl phthalate	ND	5

SUMMARY OF THE ANALYZED WATER SAMPLES
USL CEI-Frederick - Detroit, Michigan

February 1999

USL CEI Sample # 20___	MW2A 235	MW15 205	MDL
Metals (ppb)			
Zinc	ND	193	20
Barium	ND	ND	200
Sodium	132000	93500	0.5
Manganese	ND	ND	20
Semi-Volatiles (ppb)			
Benzo(a)anthracene	ND	ND	5
Benzo (a) pyrene	ND	ND	5
Benzo (b) fluoranthene	NA	ND	5
Benzo (k) fluoranthene	NA	ND	5
Benzo (ghi) perylene	NA	ND	
Dibenzo (a,h) anthracene	NA	ND	5
Fluoranthene	ND	ND	5
Chrysene	ND	ND	5
Phenanthrene	ND	ND	5
Phenol	ND	ND	5
Pyrene	ND	ND	5

NA = Not Analyzed

ANALYTICAL LABORATORY REPORTS

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313) 923-0080
FAX: (313) 923-0217
SALES FAX: (313) 923-3375

January 06, 1999

Sample Number: 19890

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-1 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	155	ppm	
Manganese	0.139	ppm	
% Chloride	< 0.008	%	
Nitrate	5.11	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19890

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.005	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.020	ppm
	< 0.005	ppm

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January 06, 1999

Sample Number: 19890

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.005	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.050	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.005	ppm	
N-Nitrosodi-n-propylamine	< 0.050	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.005	ppm	
Phenanthrene	< 0.020	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.005	ppm	
Zinc	< 0.025	ppm	001D
Arsenic	0.570	ppm	003D
Barium	< 0.005	ppm	D004
Cadmium	< 0.200	ppm	D005
Chromium	< 0.0005	ppm	D006
Lead	< 0.005	ppm	D007
Mercury	< 0.003	ppm	D008
Selenium	< 0.0002	ppm	D009
Silver	< 0.005	ppm	D010
	< 0.0005	ppm	D011

Reviewed By: Daniel Konzal

Manager:

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FAX: (313) 923-0217
SALES FAX: (313) 923-[illegible]

January 06, 1999

Sample Number: 19889

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-2A - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	64.7	ppm	
Manganese	0.930	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.001	ppm	
Chlorobenzene	< 0.050	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.001	ppm	
Methyl ethyl ketone	< 0.100	ppm	
	< 0.100	ppm	

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January 06, 1999

Sample Number: 19889

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	0.006	ppm
Benzo(b)fluoranthene	0.007	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	0.015	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.005	ppm
	< 0.005	ppm

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January 06, 1999

Sample Number: 19889

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	0.012	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	0.009	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	0.013	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.577	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	0.286	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Kongal

Manager:

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SALES FAX: (313) 923-3375

January 18, 1999

Sample Number: 19886

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-3 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	≤ 0.100	ppm	
Sodium	144	ppm	
Manganese	≤ 0.020	ppm	
% Chloride	≤ 0.008	%	
Nitrate	4.12	ppm	
Acetone	≤ 0.100	ppm	
Benzene	≤ 0.005	ppm	D018
Bromodichloromethane	≤ 0.001	ppm	
Bromomethane	≤ 0.001	ppm	
Bromoform	≤ 0.001	ppm	
Carbon tetrachloride	≤ 0.001	ppm	
Carbon disulfide	≤ 0.050	ppm	
Chlorobenzene	≤ 0.001	ppm	
Chloroethane	≤ 0.001	ppm	
Chloroform	≤ 0.001	ppm	
Chloromethane	≤ 0.001	ppm	
1,1-Dichloroethene	≤ 0.001	ppm	
trans-1,2-Dichloroethene	≤ 0.001	ppm	
Dibromochloromethane	≤ 0.001	ppm	
Dichlorodifluoromethane	≤ 0.001	ppm	
1,1-Dichloroethane	≤ 0.001	ppm	
1,2-Dichloroethane	≤ 0.001	ppm	
1,2-Dichloropropane	≤ 0.001	ppm	
cis-1,3-Dichloropropene	≤ 0.001	ppm	
trans-1,3-Dichloropropene	≤ 0.001	ppm	
Ethyl benzene	≤ 0.001	ppm	
2-Hexanone	≤ 0.050	ppm	
Methyl ethyl ketone	≤ 0.100	ppm	

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January 06, 1999

Sample Number: 19886

Methylene chloride	< 0.001	ppm
Methyl Isobutyl Ketone	< 0.001	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.005	ppm
	< 0.005	ppm

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January 06, 1999

Sample Number: 19886

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.005	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.050	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.005	ppm	
N-Nitrosodi-n-propylamine	< 0.050	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.005	ppm	
Phenanthrene	< 0.020	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorophenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.005	ppm	
Zinc	< 0.025	ppm	001D
Arsenic	0.205	ppm	003D
Barium	< 0.005	ppm	D004
Cadmium	< 0.200	ppm	D005
Chromium	< 0.0005	ppm	D006
Lead	< 0.005	ppm	D007
Mercury	< 0.003	ppm	D008
Selenium	< 0.0002	ppm	D009
Silver	< 0.005	ppm	D010
	< 0.0005	ppm	D011

Reviewed By: Daniel Konya

Manager: — —

USL CITY Environmental, Inc.

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FAX: (313) 923-0217
SALES FAX: (313) 923-3

January 06, 1999

Sample Number: 19893

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-6 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	104	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	3.36	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.001	ppm	
Chlorobenzene	< 0.050	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.001	ppm	
Methyl ethyl ketone	< 0.050	ppm	
	< 0.050	ppm	

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January 06, 1999

Sample Number: 19893

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19893

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorophenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.294	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	< 0.200	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: David Kongal

Manager:

USL CITY Environmental, Inc.

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FAX: (313) 923-0217
SALES FAX: (313) 923-3375

January 06, 1999

Sample Number: 19892

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Customer # 108839

Sample Identification: MW-7 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	110	ppm	
Manganese	0.114	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19892

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19892

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.224	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	< 0.200	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Konczal

Manager:

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January 06, 1999

Sample Number: 19894

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Customer # 108839

Sample Identification: MW-8 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	91.7	ppm	
Manganese	0.035	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19894

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	0.006	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19894

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.208	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	0.203	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Konsal

Manager: Zc

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January 06, 1999

Sample Number: 19895

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Customer # 108839

Sample Identification: MW-9 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	112	ppm	
Manganese	0.045	ppm	
% Chloride	< 0.008	%	
Nitrate	3.88	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999 Sample Number: 19895

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Strycene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19895

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.107	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	< 0.200	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Konczal

Manager:

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January 06, 1999

Sample Number: 19896

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-10 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	124	ppm	
Manganese	0.075	ppm	
% Chloride	< 0.008	%	
Nitrate	3.75	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19896

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Styrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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SALES FAX: (313) 923-[illegible]

January 06, 1999

Sample Number: 19896

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorophenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.133	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	< 0.200	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Kangal

Manager: [illegible]

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SALES FAX: (313) 923-3375

January 06, 1999

Sample Number: 19897

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-11 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	140	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19897

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Styrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19897

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorophenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	
Zinc	0.311	ppm	001D
Arsenic	< 0.005	ppm	003D
Barium	< 0.200	ppm	D004
Cadmium	< 0.0005	ppm	D005
Chromium	< 0.005	ppm	D006
Lead	< 0.003	ppm	D007
Mercury	< 0.0002	ppm	D008
Selenium	< 0.005	ppm	D009
Silver	< 0.0005	ppm	D010
			D011

Reviewed By: Daniel Kongal

Manager:

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FAX: (313) 923-0217
SALES FAX: (313) 923-3[illegible]

January 18, 1999

Sample Number: 19888

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-15 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	0.117	ppm	
Sodium	93.6	ppm	
Manganese	0.188	ppm	
% Chloride	< 0.008	%	
Nitrate	2.56	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.100	ppm	

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January 06, 1999

Sample Number: 19888

Methylene chloride	< 0.001	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Styrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.100	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	0.012	ppm
Benzo(a)pyrene	0.010	ppm
Benzo(b)fluoranthene	0.017	ppm
Benzo(g,h,i)perylene	0.016	ppm
Benzo(k)fluoranthene	0.020	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	0.027	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorophenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.005	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19888

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	0.011	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.005	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	0.009	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	0.034	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorophenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.378	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	0.325	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Konsal

Manager:

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SALES FAX: (313) 923-3375

January 18, 1999

Sample Number: 19887

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-20-Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron			
Sodium	< 0.100	ppm	
Manganese	135	ppm	
% Chloride	0.086	ppm	
Nitrate	< 0.008	%	
Acetone	2.82	ppm	
Benzene	< 0.100	ppm	
Bromodichloromethane	< 0.005	ppm	D018
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.001	ppm	
Chlorobenzene	< 0.050	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.001	ppm	
Methyl ethyl ketone	< 0.100	ppm	
	< 0.050	ppm	

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January 06, 1999

Sample Number: 19887

Methylene chloride	< 0.001	ppm
Methyl Isobutyl Ketone	< 0.001	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19887

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.307	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	< 0.200	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Kemesal

Manager:

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January 06, 1999

Sample Number: 19898

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-22 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	84.5	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19898

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19898

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorophenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.168	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	< 0.200	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Kenzal

Manager: [illegible]

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January 06, 1999

Sample Number: 19891

Date Received: December 29,1998
Date Completed: January 05,1999

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-24 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Iron	< 0.100	ppm	
Sodium	90.0	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	3.95	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D018
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19891

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19891

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	001D
Zinc	0.321	ppm	003D
Arsenic	< 0.005	ppm	D004
Barium	< 0.200	ppm	D005
Cadmium	< 0.0005	ppm	D006
Chromium	< 0.005	ppm	D007
Lead	< 0.003	ppm	D008
Mercury	< 0.0002	ppm	D009
Selenium	< 0.005	ppm	D010
Silver	< 0.0005	ppm	D011

Reviewed By: Daniel Kongal

Manager:

Metals Batch Quality Control

Digested Date: 12-30-98

Sample Numbers: 19886-91

Parameter	MDL (mg/L)	Method Blank (mg/L)	Method STD % Rec.	Method STD QC Lim.	Spike Conc. (mg/L)
As	0.005	0.031	100	90-110	2
Ba	0.200	ND	103	90-110	2
Cd	0.0005	ND	105	90-110	2
Cr	0.005	ND	103	90-110	2
Cu	0.025	ND	98.1	90-110	2
Fe	0.100	ND	99.1	90-110	2
Pb	0.003	ND	99.1	90-110	2
Se	0.005	0.039	105	90-110	2
Zn	0.020	ND	99.0	90-110	2

Parameter	Matrix Spike % Rec.	Matrix Spike Duplicate % Rec.	Precision % RPD	Precision Limit	Accuracy % Rec	Accuracy Limit
As	117	121	3.36	<20	119	75-125
Ba	94.4	103	8.71	<20	98.7	75-125
Cd	100	107	6.73	<20	104	75-125
Cr	104	110	5.61	<20	107	75-125
Cu				<20		75-125
Fe				<20		75-125
Pb	101	108	6.67	<20	105	75-125
Se	107	137	24.6*	<20	122	75-125
Zn				<20		75-125

Initials: RB

Sample Numbers: 19892-8

Parameter	MDL (mg/L)	Method Blank (mg/L)	Method STD % Rec.	Method STD QC Lim.	Spike Conc. (mg/L)
As	0.005	0.055	100	90-110	2
Ba	0.200	ND	103	90-110	2
Cd	0.0005	0.012	105	90-110	2
Cr	0.005	0.007	103	90-110	2
Cu	0.025	ND	98.1	90-110	2
Fe	0.100	ND	99.1	90-110	2
Pb	0.003	0.041	99.1	90-110	2
Se	0.005	ND	105	90-110	2
Zn	0.020	ND	99.0	90-110	2

Initials: RB

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February 19, 1999

Sample Number: 20235

Date Received: February 04,1999
Date Completed: February 09,1999

Customer: USL/CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Customer # 108839

Sample Identification: MW - 2A - Ground water - Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, PCB, 8270, 8260

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Zinc	< 0.020	ppm	003D
Barium	< 0.200	ppm	D005
Sodium	132	ppm	
Manganese	< 2.00	ppm	
Benzo(a)anthracene	< 0.005	ppm	
Benzo(a)pyrene	< 0.005	ppm	
Chrysene	< 0.010	ppm	
Fluoranthene	< 0.005	ppm	
Phenanthrene	< 0.005	ppm	
Pyrene	< 0.005	ppm	
PCB-Total	< 0.0002	ppm	

Reviewed By: Christina A Kroger

Manager:

1

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SALES FAX: (313) 923-3375

February 19, 1999

Sample Number: 20205

Date Received: February 02,1999
Date Completed: February 09,1999

Customer: USL/CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Customer # 108839

Sample Identification: MW - 15 - Ground - Water Grab

Description: Brown Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, PCB, 8270, 8260

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Waste
Zinc	0.193	ppm	003D
Barium	< 0.200	ppm	D005
Iron	17.6	ppm	
Sodium	93.5	ppm	
Manganese	< 2.00	ppm	
Benzo(a)anthracene	< 0.005	ppm	
Benzo(a)pyrene	< 0.005	ppm	
Benzo(b)fluoranthene	< 0.005	ppm	
Benzo(g,h,i)perylene	< 0.005	ppm	
Benzo(k)fluoranthene	< 0.005	ppm	
Chrysene	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Phenanthrene	< 0.005	ppm	
Pyrene	< 0.005	ppm	
PCB-Total	< 0.0002	ppm	

Reviewed By: Christina A Kreger

Manager:

USL CITY Environmental, Inc.

HYDROGEOLOGIC EVALUATION
FREDERICK STREET
LIQUID WASTE DISPOSAL FACILITY
DETROIT, MICHIGAN

Prepared for:

City Environmental, Inc.
1923 Frederick Street
Detroit, Michigan 48211

Prepared by:

GZA GeoEnvironmental, Inc.
38019 Schoolcraft Road
Livonia, Michigan 48150

February 22, 1991
Project No. 60669

DRAFT

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FREDERICK STREET
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APPENDICES

1.00 INTRODUCTION

DRAFT

GZA GeoEnvironmental, Inc. (GZA) is pleased to submit this report presenting the results of our hydrogeological study at the City Environmental, Inc. (CEI) Frederick Street Liquid Waste Treatment Facility ("Site") in Detroit, Michigan. The opinions, conclusions, and recommendations are subject to the Limitations found in Appendix A.

1.10 Site Description

The study area is a 7.0 acre parcel of land located in the City of Detroit, in an area of residential and commercially developed properties, as shown on Drawing No. 1. Immediately east of the Site are residential dwellings on St. Aubin Street. Warehouse and packaging facilities, primarily dealing with the food industry, lie to the north, south and west. The Site and surrounding areas are relatively flat based on a Site survey and area reconnaissance, as depicted on Drawing No. 2.

Existing development at the Site is shown on Drawing No. 3. The main plant is located in the southern third of the Site while the slightly smaller north treatment plant is centrally located on the northern third of the Site. Offices are located along the southeastern side and, storage silos and spill ponds are located on the western side. The balance of the Site is paved, concrete or stone covered. The Site is secured by fencing with access maintained through one gate on Kirby Street.

The study Site is approximately 7.0 acres bounded to the south by Frederick Street, to the east by an alley 100 feet west of St. Aubin Street, to the west by the Grand Trunk Railroad right-of-way, and to the north by Ferry Street, except for an area 130 feet south of Ferry Street and 370 feet east of the railroad right-of-way in the northwest corner of the Site, which is used for parking by facilities north of Ferry Street.

1.20 Study Purpose

The study was performed to evaluate the hydrogeologic conditions at the Site as defined by Code of Federal Regulations, Section 40 (40 CFR) Part 264, and to fulfill the groundwater monitoring requirements as defined in 40 CFR Part 265, Subpart F. In addition, the hydrogeologic study evaluates the potential for migration of hazardous waste from the facility via the uppermost aquifer to water supply wells or surface water. Future licensing may also include applications to the Michigan Department of Natural Resources (MDNR). As such, this submittal has been prepared consistent with the guidelines for hydrogeologic studies, per Michigan Public Act 64 (Act 64), Rule R299.9506. The objectives of this study were as follows:

- Evaluate subsurface soil conditions in areas surrounding the existing facilities and within areas of proposed future development;

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- Assess the hydrogeologic characteristics of subsurface materials of interest and groundwater flow patterns underlying the Site;

- Initiate a groundwater sampling program to evaluate background groundwater quality; and

- Provide engineering recommendations regarding compliance with regulatory requirements and effective facilities management within the context of the hydrogeologic conditions at the Site.

1.30 Scope of Work

To complete the study objectives, the project was completed per the following tasks as discussed with CEI:

- Review of proposed subsurface exploration locations with CEI representatives as well as discussion regarding overall Site plans;

- Collect and review available climatological, geological/hydrogeological and hydrological information from local, state, and federal agencies;

- Execute four soil exploration borings including installation of groundwater monitoring wells at locations on the northern and northwestern portion of the Site;

- Develop and sample the groundwater from the four newly installed and the two existing monitoring wells. Analyze groundwater samples as specified in 40 CFR Part 265.92 (b) [1-3];

- Conduct in-situ permeability testing ("Slug Test") on the four new monitoring wells, to evaluate the hydraulic conductivity of the materials being monitored;

- Complete laboratory classification and permeability tests on representative soil samples recovered from the four additional exploratory borings; and

- Evaluation of the Site hydrogeological conditions including compilation of available data, engineering analysis, and preparation of this report to include conclusions and recommendations.

1.40 Previous Studies

A hydrogeological study was completed by GZA in 1987 and 1988, as part of the Act 64 construction permit application for a proposed Hazardous Liquid Waste Treatment Facility situated on 3.1 acres of the approximately 7 acre Site. The current study represents an expansion from the previous work, to include the entire Site as shown on the Site Plan (Drawing No. 3).

As part of the Act 64 permitting process for the proposed liquid hazardous waste treatment facility, the MDNR requested that Site USTs be removed from service and

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abandoned (closed) in accordance with state guidelines. An UST removal plan was developed and accepted by the MDNR in July, 1989, whereby two 10,000-gallon gasoline/diesel fuel USTs were removed per the requirements of Act 423 of 1984 as amended by Act 151, 1989, the Underground Storage Tank Regulatory Act. A report describing the closure activities completed, including verification sampling and analyses was submitted to the MDNR and Michigan State Police, Fire Marshall Division regarding this closure. A 25,000-gallon fuel oil tank previously used to supply plant-heating boilers was also removed in accordance with Act 206, the Storage of Flammable and Combustible Liquids.

The only on-Site subsurface investigation found prior to the 1987 and 1988 hydrogeologic study was contained in the construction drawings prepared for the Detroit Rendering Company by John G. Hoad and Associates. The location of the test borings completed as part of that study are shown on Drawing No. 3, with reproduction of the boring logs presented in Appendix B.

A review of MDNR records for Wayne County, specifically Applications for Permit in accordance with Act 641 and Act 64, revealed three hydrogeological studies within the immediate vicinity of the Site. The first subsurface study is the hydrogeologic study by GZA for a portion of the Site as previously described; the second contained as Appendix C, was performed for foundation designs and later used as part of an Act 641 Processing Permit Application for the City Disposal facility located at 1550 Harper Street near the intersection of I-94 and I-75. The third study, contained as Appendix D, was the hydrogeologic report and monitoring program and foundation studies for

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the City of Detroit Resource Recovery facility located at Russell and Ferry Streets. Information from these three sources were consulted during the preparation of this report.

2.00 BACKGROUND

The following sub-sections present additional information concerning the Site history and surrounding Site usage.

2.10 Site History

Data sources reviewed were the: Wayne County Records of Deeds; MDNR Sites of Environmental Contamination Priority List, Act 307; and as previously described, Act 641 and Act 64 permit applications, and the construction drawings by John Hoad & Associates of the Detroit Rendering Company that show most of the existing structures on the Site.

The review of deeds for the original parcels comprising the property indicates that Lots 21 through 30 of the Phillis Beaubien's Subdivision were residential prior to the Detroit

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Rendering Company construction of the present facility. Available information indicates that since the removal of residential structures, these lots were used for parking only. Currently, these lots remain undeveloped with the exception of the recent installation of temporary mobile offices.

Review of the remaining deeds, consisting of portions of Outlot 28 and Outlot 29 of the James Witherell Farm, comprise the majority of the Site and indicates that previous owners could have utilized this Site for industrial purposes. The first records of possible commercial ownership date in 1908 when the property was purchased by Leonard Reliable Storage. In 1911, Detroit Foundry Supply acquired the Site and maintained ownership until 1914. From 1914 to 1925, Whitney-Hollinger Company held the deeds. From 1925 to 1927, the deed changed hands many times. Detroit Cleveland Warehouse and Realty Company, Michigan Trust Company, and Whitney-Hollinger Company were among the owners. No information concerning actual Site activity during this period of ownership was found during our review.

On September 10, 1927, the Phoenix Wire Works obtained the Site and presumably operated a business at the Site until September, 1966 when ownership was transferred to the Detroit Rendering Company. In 1967, the Detroit Rendering Company constructed the existing on Site facilities. Their operations reportedly consisted of the processing of animal by-products into tallow and bone meal. This operation continued until July, 1982 when the Site was purchased by Darling and Company, an Illinois Corporation. Reportedly, the Site was dormant until current operations were begun sometime after the CEI's purchase of the property in August,

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1984. Presently, CEI is using a portion of the existing facilities and equipment for non-hazardous industrial wastewater treatment.

2.20 Surrounding Area Usage

A field reconnaissance of the surrounding area was conducted, the results of which are presented in Drawing Nos. 4 and 5. As shown, the general area east of the Site is predominantly residential, while west of the Site is industrial. As tabulated on Drawing No. 5, the major industries/facilities within the general Site area include: Thorne Apple Valley processing facility; Eastern Poultry; Regal Packing; Tamaren Beef; State Sausage; Superior Provision; Metro Detroit Warehouse; Frigid Food Produce; Veseo Oil; and, City of Detroit DPW and DOT maintenance yards.

The MDNR Sites of Environmental Contamination Priority Lists, Act 307, dated 1990 through 1992, indicates two sites, one each from Group 1 and 2, within approximately one mile of the subject Site. Approximately 6,000 feet northwest of the Site is Peloquin Enterprises, St. Aubin, Hamtramck, listed in Group 1, where above-ground storage tanks (AGSTs) are shown as the source of soil and groundwater contamination. The Group 2 listing, approximately 900 feet northwest of the Site, was identified as Palmer Street at railroad tracks where surface discharge from oil storage has contaminated soils. Beyond these two locations, the next closest sites were more than one mile from the CEI site. The locations noted above are shown on Drawing No. 6.

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3.00 SUBSURFACE EXPLORATIONS

Following discussions with CEI representatives, a field exploration and testing program was designed, incorporating information pertaining to existing subsurface information and past and present Site usage. Test boring locations were selected based upon existing Site conditions and those proposed features to include constraints imposed by Site structures and boundaries.

3.10 Test Borings

Nineteen
~~Eighteen~~ test borings had previously been completed on the south and southeastern portions of the Site. In order to establish subsurface soil properties across the entire Site, further explorations were undertaken. Specifically, four test borings were completed by Great Lakes Drilling, Inc. of Allegan, Michigan at the approximate locations shown on Drawing No. 3. The borings were advanced using 4-1/4 inch inside diameter (I.D.) hollow stem augers.

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Soil samples were obtained at about 5-foot intervals throughout the depth of the exploration using one of the following procedures:

1. ASTM D-1586, "Standard Penetration Test and Split-Barrel Sampling of Soils", whereby a 2-inch outside diameter split-spoon sampler is driven 18 inches with a 140 pound hammer falling 30 inches. The number of blows required to advance the sampler each 6-inch segment was recorded and is presented on the Log of Test Boring. Samples obtained using this procedure were designated SSL or SS, depending on whether or not an internal brass liner (L) or no liner was used, respectively.

2. ASTM D-1587, "Thin-Walled Tube Sampling of Soils", whereby a 3-inch outside (O.D.) diameter, thin-walled (0.065-inch thickness) sampler is pressed into the soil using hydraulic pressure. In softer materials, a hydraulic operated piston was utilized in conjunction with the thin-walled tube sampler. Samples obtained by methods employing these thin-walled tubes were designated ST.

Soil samples were visually classified by GZA personnel and stored in labelled, sealed jars and/or tubes. Logs of the borings completed during this study, as well as those completed during studies performed by GZA in March and April 1987, summarizing the subsurface conditions encountered, equipment used, personnel involved and other pertinent information are provided in Appendix E.

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3.20 Monitoring Wells

As noted above, ~~eighteen~~ nineteen groundwater monitoring wells were previously installed as part of the studies performed in 1987 and 1988. Of these, three (MW-13, MW-15 and MW-18) were located within the UST removal areas and as such, were required to be removed or abandoned in-place by grouting during the UST closures.

GZA installed monitoring wells within the four additional boreholes conducted as part of this study. The numbering of the monitoring wells are consecutive to the boring numbers assigned from the previous work starting with the replacement of well number 18 (i.e., SB/MW-~~12~~ 18, 19, 20 and 21). These installations were constructed to monitor groundwater conditions within the more pervious sand strata or sand seams encountered during test drilling. Note that, no instrumentation was installed to monitor groundwater conditions in near surface sands and fills within the upper 6.5 feet of ground surface, since these soils were visually observed to be dry during previous Site excavations and current explorations.

Once each of the borings were completed through the sand and/or silt layer (i.e., about 42 to 57 feet below grade), well equipment was installed to complete the hole. The well material consisted of 2-inch Tri-loc PVC pipe with a 0.010 inch slotted wellscreen. Silica filter sand was placed around the screen to approximately 2 feet above the top of the wellscreen. The sand filter was then sealed from the ground surface with a layer of bentonite pellets and cement/bentonite grout.

Monitoring wells installed outside of traffic areas, were fitted with a 4-inch square by 5 feet long steel protective casing with a locking top placed in concrete. Wells installed through the concrete or asphalt pavements were cut below ground surface and protected with a 7-3/4 inch diameter flush-mounted roadbox.

A summary of well installation details for the existing wells at the Site is presented on Table 1. Individual well installation records and groundwater level measurements are contained in Appendix F. Locations of the monitoring wells are the same as the test boring locations shown on Drawing No. 3.

3.30 Field Permeability Tests

In-situ permeability using "slug tests" were performed on the four new monitoring wells (~~SE~~ MW-18, 19, 20 and 21). Permeability testing by this method provides information on horizontal hydraulic conductivity of the soil layer being monitored. The data collected was interpreted by standard methods such as those described by Hvorslev (1951) or Bouwer and Rice (1976). Graphical presentations of well recovery during "slug testing" are included in Appendix F. Results of these tests, as well as those previously performed for wells MW-1 through MW-11, are provided on Table 2 and indicate horizontal permeabilities on the order of 10^{-5} to 10^{-6} cm/sec for the silty or clayey sand soils and 10^{-6} to 10^{-7} cm/sec for the silty clay strata with fine sand seams. Note that slug testing of well MW-20

4.00 SOILS LABORATORY TESTING

Physical properties of representative soil samples were evaluated in the laboratory as part of GZA's previous and current studies. Soil tests were conducted to measure natural moisture content, unit weight, grain size, Atterberg Limit, permeability, and strength characteristics. Test procedures used are discussed in the following sections with test results summarized in Appendix G.

4.10 Gradation Analyses

Grain size distribution of representative soil samples were measured from combined sieve and hydrometer analyses in accordance with ASTM D422-72 procedures. The results indicated that the soils at this Site are predominantly silty clays containing a trace to some sand and occasional fine gravel. Grain size analyses were also conducted on the occasional non-cohesive layers separating the clays. These analyses indicated fine sand with up to 50 percent silts and clays. Detailed test results are presented graphically in Appendix G.

4.20 Liquid and Plastic Limits

Plasticity characteristics were evaluated by performing liquid and plastic limit determinations in general accordance with ASTM D-4318 procedures.

Overall, a plasticity index (PI) above 7 percent is representative of a clay, whereas, PI values between 0 and 4 percent represent inorganic silts and very fine sands. Natural moisture contents near the plastic limit can indicate a stiffer, over-consolidated soil, whereas those nearer the liquid limit are often indicative of softer or normally consolidated soils.

Limit measurements indicate generally consistent results, with the majority of the soils being moderately plastic, representative of silty clays. Results of these tests can be summarized as follows:

Liquid Limit Range	(LL)	16 - 34%
Plastic Limit Range	(PL)	11 - 17%
Plasticity Index Range	(PI)	3 - 12%
Natural Moisture Content Range	(W)	11 - 27%

The moisture content test results (ASTM D-2216) indicate a general trend of gradually increasing moisture with depth. The upper 50 feet of soils exhibited a tendency of having a moisture content slightly less than or near the plastic limit. This indicates that these soils are over-consolidated. The near surface clays have become over-consolidated primarily through desiccation whereas the lower clays have been over-consolidated through glacial advances. Limit determinations also indicate that the clays in the upper 20 feet tend to be lower in plasticity, while the lower clays range from low to high plasticity. Limit determinations and moisture content test data are provided on the summary tables contained in Appendix G.

4.30 Permeability Tests

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Permeability tests were performed on "undisturbed", thin-walled tube samples in general accordance with U.S. EPA SW 846 Method 9100, Triaxial Permeability with back pressure. This testing was performed on samples collected from representative depths and locations, to evaluate the hydraulic characteristics of the soils. Permeability test results are tabulated in Appendix G.

Permeabilities of the natural clays were generally on the order of 10^{-8} cm/sec, whereas the lower clayey and silty sand layers were about 10^{-6} cm/sec. Additional discussion summarizing the significance of this data is presented later in this report (Section 7.00).

4.40 Strength Tests

Strength properties for classification purposes were obtained on select samples in general accordance with ASTM D2166 procedures for unconfined compression testing or from pocket penetrometer tests. Pocket penetrometer tests were strictly used for classification purposes of the cohesive soils. Results of such tests are depicted in the consistency classification of soils as described on the test boring logs (see Appendix E).

5.00 SITE GEOLOGY

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Although neither the surficial nor the bedrock geology of the proposed Site have been mapped in detail, the Site has been included on a general surficial geology map by Farrand[1], and on the bedrock maps prepared by Mozola[2] and Western Michigan University[3], portions of which are provided for reference on Drawing Nos. 7 through 10. Findings made during the current exploration study were in general agreement with these reported conditions. The following sections provide a description of the geologic setting underlying the Site based on conditions encountered during the subsurface exploration program and the literature reviewed.

5.10 Geologic Setting

Present subsurface features of the proposed Site and surrounding areas were formed during the Wisconsin stage of pleistocene glacial advances depositing sediments over the Dundee Limestone and Traverse Group rock formations. The position and succession of deposit features found are related to the advance and withdrawal of the Eric-Huron ice lobe. The Site and surrounding area is covered in general by lacustrine clays; however, early alluvium deposits of limited extent are interspersed as depicted on Drawing No. 10, Glacial Features of Wayne County, Michigan.

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1 Farrand, W.R., Quaternary Geology of Michigan. State of Michigan Department of Natural Resources, Geological Survey, 1982.

2 Mozola, Andrew J., Geology for Land and Groundwater Development in Wayne County, Michigan. State of Michigan Department of Natural Resources Geological Survey Report No. 3, 1969.

3 Western Michigan University, Hydrogeology for Underground Injection Control in Michigan, Department of Geology, 1981.

5.20 Surficial Geology

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Although somewhat shallow and idealized, the soil conditions observed are essentially the same as described in the literature. The following subparagraphs present a subsurface profile at the Site based on conditions encountered.

5.21 Near-Surface Sands and Fills

The near-surface sands occurred as blanket materials underlying pavement and consist primarily of loose to medium dense brown fine sand. These sands were limited in extent to the upper 1 to 2 feet below the pavement surface. Underlying the sands were miscellaneous cohesive fill material to a depth of about 4 to 5 feet.

5.22 Desiccated Near-Surface Clays

Clays encountered below the fill soils to depths of up to 14 feet were predominantly very stiff to hard, silty, brown clays and highly desiccated. Lenses of oxidation were found throughout this upper clay forming both vertical and horizontal planes of separation that generally appear to be discontinuous and limited in extent. Laboratory permeability testing within these clays was not performed since seepage would occur primarily through these channels rather than the normal flow channels between soil particles.

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5.23 Clays

The glacial clays found below a depth of about 14 feet were medium stiff to hard, silty to sandy, gray clays. Clayey or silty sand layers within this clay were found to be on the order of about 2 to 15 feet thick between the depths of 40 to 60 feet. Similar soil layers were also found sporadically at a depth of about 25 feet but were limited to less than 3 feet in thickness. Hydrogeological reports for the surrounding area indicate that these layers are a common occurrence and appear to be generally continuous within individual Site boundaries. Due to their random nature, however, the layers are not considered to be continuous regionally.

Previous test boring MW-1 was advanced through the clays to a depth more than 50 feet below the lowermost sand lens. Five additional test borings (MW-2, 3, 4, 6 and 10) were also previously advanced through the clays to depths in excess of 24 feet below the lowermost sand lens to verify the continuity of this clay layer. Based on our literature review, it is anticipated that these or similar clayey soils continue to depths of about 150 to 200 feet below the Site.

5.30 Bedrock Geology

Although not encountered during our exploration program, the Site reportedly lies above two formations that form the bedrock surface, specifically, the Dundee Limestone and Traverse Group formations. Geologic maps indicate that the bedrock surface boundary between these formations exist at or near the Site. A portion of the Mozola bedrock map is provided on Drawing No. 7 for general reference. Maps showing the thickness of the Dundee and Traverse formations are provided on Drawing Nos. 11 through 13.

The Traverse Group is a thick, 100 to 800 foot, sequence of alternating shales, limestone and dolomites. The shales in this group are not considered water bearing aquifers, however, the limestone units may supply large volumes of water locally. Shales in the Traverse Group serve as excellent confining layers having low effective porosity. The limestone units are relatively impermeable, but have local porous zones, particularly at the surface of the formation.

The Dundee Limestone formation is a fossiliferous limestone that is locally dolomitized. It ranges from about 50 to more than 350 feet thick in the eastern portion of Michigan's Lower Peninsula.

Although the Dundee has a relatively low effective porosity, "selective" porous and permeable zones associated with fractures and bedding planes are considered water bearing aquifers. Due to the presence of these fractures, the Dundee is limited as a confining layer.

6.00 SITE HYDROLOGY

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MDNR [illegible] and Geological Survey Division, U.S. Geological Survey

A review of the Detroit Department of Health and U.S. Environmental Protection Agency Underground Injection Control Program indicated no domestic, municipal, industrial, oil, gas or injection wells within a one mile radius of the Site. As such, the following sections present the climatic conditions, surface water and groundwater flow regimes specific to the CEI Site.

6.10 Climatology

Inasmuch as groundwater recharge is gained primarily through precipitation events and snow/ice melt, a general review of climatic conditions of the Metropolitan Detroit area is appropriate. The following climatological summary has been derived from data collected at weather stations at the City of Detroit Airport and Detroit Metropolitan Airport.

Local climatic variations are due largely to the immediate effect of Lake St. Clair and the urban heat island effect. The average daily temperatures peak in July at 71.8° F and are at the lowest in January at 22.1° F. Average annual precipitation is about 32.1 inches of rain and 41.2 inches of snowfall.

The climate of Detroit is influenced by its location with respect to major storm tracks and influence of the Great Lakes. The normal wintertime storm track is south of the city whereas in the summer, most storms pass to the north. The most pronounced lake effect occurs in the winter when Arctic air moving across the lake is warmed and moistened. This produces an excess of cloudiness but a moderation of cold wave temperatures. On the average, the last freezing temperatures occur in late April, while the average first freezing temperature occurs in late October.

6.20 Surface Water Hydrology

Surface water run-off at the Site and surrounding area is maintained by the sewer system owned and operated by the City of Detroit. Kirby and Frederick Streets have curb inlet structures that collect surface water.

A review of the Federal Emergency Management Agency, National Flood Insurance Program, shows the Detroit River, located approximately 2.7 miles south of the Site, to be the closest potential flood risk. Based on this mapping, the CEI Site lies within a Zone C area and is not considered subject to flooding.

6.30 Site and Regional Hydrology

Domestic water for the entire City of Detroit and portions of the surrounding locale are supplied by the Great Lakes. Usable source quantities of groundwater located near the Site may be found within the deep alluvial deposits or in the underlying bedrock. Although the alluvial deposits do not appear to be continuous over large distances their contact surface with the surrounding saturated soils may be of sufficient area to generate large quantities of water locally.

Groundwater from the lacustrine clays underlying the Site are not considered usable as a source of water because of the inability of the clays to transmit significant quantities of water (i.e., very low permeability). Based on our review of published literature and on the observations made during the subsurface exploration program, it does not appear that any local groundwater resources will be developed within the immediate Site area.

Groundwater flow in the Site area is expected to be toward the Detroit River and adjacent lakes. As described by Mozola, groundwater will occur under unconfined and semi-confined to confined conditions, constituting a complex single system rather than totally independent flow regimes. Groundwater elevation measurements obtained at the CEI Site generally confirm this condition, even at relatively shallow depths.

7.00 HYDROGEOLOGIC CHARACTERISTICS

Due to the complex geologic nature of the soil and bedrock conditions underlying the CEI Site and the generally continuous clay soils reported and observed below a depth of about 40 to 60 feet, our current study was concentrated on those subsurface strata that could be directly affected by the proposed facility operation. As such, analysis of hydrogeologic conditions included those soil layers within 30 feet of ground surface, subsequently labelled as the "upper aquifer", and a second subsurface pervious zone at a depth of approximately 40 to 60 feet below ground surface, referred to as the "lower aquifer".

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The more pervious sand seams in these layers will largely control groundwater movement at the Site. These zones are separated by what appears to be a continuous layer of clay soil that will act to retard groundwater movement between the two zones. The following sections address specific hydraulic characteristics of the soil layers explored during our study. Of particular interest are the soils hydraulic conductivity, hydraulic gradient, porosity, and groundwater transport velocity.

7.10 Hydraulic Conductivity

The hydraulic conductivity ("permeability") of a soil mass is a measure of the rate at which water ("fluid") flows through the soil. As previously described, a total of 15 field and 18 laboratory permeability tests were performed to establish representative values of the individual layer permeabilities. These values may be summarized as follows:

"Upper Aquifer"	10^{-7} cm/sec
Intermediate Clay Layer	10^{-8} cm/sec
"Lower Aquifer"	10^{-5} to 10^{-6} cm/sec
Underlying Clay Layer	10^{-8} cm/sec

As indicated, the permeabilities measured are considered as relatively low. Additionally, no distinction between the horizontal and vertical permeability is shown because variations, even on the order of one magnitude, will not significantly affect

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groundwater transport velocities described later in this report.

7.20 Hydraulic Gradient and Flow Direction

Groundwater will flow in the direction of the steepest hydraulic gradient, i.e., perpendicular to the equipotential ("contour") lines. For the purpose of this study, the hydraulic gradient may be taken as the slope of the water table, or as in the case of the semi-confined "lower aquifer", the slope of the potentiometric surface.

Drawing No. 14 presents the groundwater elevation contours as interpreted from monitoring well readings obtained in 1987 for the "upper aquifer". Drawing No. 15 presents the groundwater elevation contours as interpreted from monitoring well readings obtained on December 10, 1990 for the "lower aquifer" (refer to Appendix F). Based on these measurements, a hydraulic gradient of about 0.01 ft/ft is calculated for the "upper aquifer" with an apparent flow direction toward the east or east-northeast. Similarly, a hydraulic gradient on the order of 0.015 ft/ft is calculated for the "lower aquifer" with an apparent flow direction toward the north or northeast.

Groundwater flow direction interpreted for both the "upper and lower aquifers" appears to be consistent with the published area data. As shown on Drawing Nos. 14 and 15, a general easterly flow direction appears to coincide with the axis of the deep bedrock valley and thick glacial deposits reported for the immediate Site vicinity.

A vertical hydraulic gradient also exists between the "upper and lower aquifers" as

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measured by the difference between the potentiometric elevations in each of these soil zones. Based on the previous groundwater elevation measurements and an average distance between these layers of about 15 feet, a vertical hydraulic gradient of about 0.15 ft/ft is calculated. It should be noted, however, that the "upper aquifer" is not continuous across the Site as demonstrated by recent test borings MW-18 through MW-21. These borings did not encounter groundwater at shallow depths representative of an "upper aquifer".

7.30 Porosity

Porosity of an unconsolidated porous medium is defined as the ratio of the volume of void space of the soil mass to the total volume of the soil mass. While no direct measurements of porosity were made in the field, published literature and our experience with similar hydrogeologic settings, suggest values on the order of 25 to 35 percent (or 0.25 to 0.35 expressed as a fraction) for the typical soils encountered during our field studies.

7.40 Groundwater Transport Velocity

The above described hydraulic characteristic can be utilized to approximate the rate of groundwater flow. The velocity at which groundwater moves between two points may be estimated by a form of Darcy's Equation as shown below:

$$v = \frac{k\,i}{n}$$

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Where v = transport velocity

k = hydraulic conductivity (permeability)

i = hydraulic gradient

n = porosity

Substituting values presented previously, groundwater transport velocities for both the "upper and lower aquifers" are calculated to be significantly less than 0.001 feet per day. Similarly, groundwater transport velocities between the "upper and lower aquifers" are calculated to be significantly less than 0.001 feet per day. These estimates may not be valid as the equation is not rigorous for values less than about 0.01 ft/day. Soil and water chemistries and flow paths become an important part of the groundwater transport relationship at these low velocities, particularly for clayey soils. However, this estimate does indicate that groundwater transport velocity underlying the CEI Site will be very low.

8.00 GROUNDWATER QUALITY ANALYSIS

Groundwater samples have been collected and tested as part of previous and our current studies. To supplement the existing data, groundwater from two existing (MW-3 and 4) and the four new monitoring wells (MW-18 through MW-21) were sampled and analyzed as part of the current study to assess groundwater quality of the "lower aquifer". As previously mentioned in Section 7.20, an "upper aquifer" was not identified during test boring of wells MW-18 through MW-21. Therefore, our current studies have concentrated on groundwater quality of the "lower aquifer" in the north-northwest portion of the Site since the "upper aquifer" as defined by previous studies, does not appear to be present.

8.10 Sample Collection

The four new monitoring wells (MW-18 through MW-21) were developed by pumping using a stainless steel submersible pump equipped with Teflon sampling tube or bailed using a Teflon bailer. Prior to development, a static water level was measured. The wells were pumped or bailed until the well was dry.

The new monitoring wells were allowed to stabilize for a minimum 72 hours following development, ~~and~~ prior to sampling. A static water level reading was again measured and the volume of water in the well calculated. The well was then purged of three times the volume of water in the well by manual bailing, using a disposable SingleSample™ bailer or by pumping with a peristaltic pump. If the well pumped/bailed dry, it was allowed to recover prior to sampling. Sampling was completed using the individual bailers at each well location. Groundwater Monitoring Well Sampling Data Sheets are included in Appendix H. These data sheets also indicate field measurements of specific conductance, temperature and pH obtained at the time of sampling.

Groundwater samples were placed in pre-labelled containers prepared by the laboratory

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with proper preservatives. Groundwater samples for metals analyses were filtered through a 40 micron media in the field by GZA personnel prior to preservation. The samples were kept cool and delivered to Analytic & Biological Laboratories, Inc. (A & B Laboratories) of Farmington Hills, Michigan following chain-of-custody protocol.

8.20 Groundwater Quality Analysis

Tables 3 and 4 present a summary of groundwater test results completed during prior Site studies in December, 1988 (Table 3) and April, June and December, 1987 (Table 4). The analyses indicated were selected based upon Site activities and discussions with CEI and the MDNR.

Groundwater samples recovered from monitoring wells MW-3, MW-4, MW-18, MW-19, MW-20 and MW-21 as part of our current studies were tested for the following compounds, as required by 40 CFR 265.92 [B][1-3].

- Primary drinking water standards.
- Parameters establishing groundwater quality.
- Parameters used as indicators of groundwater contamination.

Table 5 contains a list of test parameters for the groundwater samples.

8.30 Groundwater Quality Analytical Test Results

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9.00 CONCLUSIONS

The following is a summary of the major findings of the hydrogeologic study completed at the CEI-Frederick Street facility.

1. The Site and its general area is underlain by silty clay soils to depths of more than 100 feet. Atterberg Limit determinations indicate that these clay soils exhibit a low to high plasticity that generally increases with depth. The clay soils are characterized by a very low hydraulic conductivity with field and laboratory testing indicating values on the order of 10^{-7} to 10^{-8} cm/sec.

2. Two near-surface zones within the clay soils exhibited numerous sand and clayey sand lenses intermixed within the clays. These zones were identified as the "upper and lower aquifers" during previous studies at the Site and were considered the more pervious areas where the predominant groundwater flow would likely occur. Recent studies in the north and northwest portion of Site did not indicate the presence of the "upper aquifer" as defined during previous Site studies. As such, groundwater monitoring wells installed during this study were isolated within the "lower aquifer" for the purpose of obtaining groundwater elevation and quality data.

3. Groundwater flow below the Site was determined to be generally to the north-

northeast. This flow direction is consistent with published data for the area and is controlled by the geologic conditions previously described. It is anticipated that the near surface groundwater flow, as monitored at the CEI Site, will ultimately discharge to Lake St. Clair or the Detroit River, however, the data was insufficient to confirm this expectation.

4. Groundwater transport velocities were determined to be slow because of the low soil hydraulic conductivities. As such, potential contaminant transport will also be low.

5. Water quality data indicates that the existing groundwaters underlying the Site are essentially free of contaminants and generally meet current drinking water standards. Please note that the radium concentrations may exceed the current standard but the gross alpha and beta activities were below regulatory standards. As such, these tests are being repeated and the data re-evaluated.

6. Based on the geologic and hydrogeologic conditions encountered, and the fact that no groundwater users (or potential users) are present in the surrounding areas, it appears that the Site is a favorable location for the proposed facilities.

10.00 RECOMMENDATIONS

DRAFT

The following is a summary of engineering recommendations for the Site based on our current understanding of the hydrogeologic conditions and the proposed Site development.

1. The geology of the Site as presented within the report and our understanding of the facility design, appears to fulfill the requirements of the Code of Federal Regulations, Section 40 (40 CFR) Part 264, Subpart F, Section 264.90 b(4); 40 CFR, Part 265, Subpart F, Section 265.90 C and MDNR Act 64, Rule R299.6911(3)(A and B). As these rules imply, all or part of the groundwater monitoring requirements may be waived if the owner or operator demonstrates that there is a low potential for migration of hazardous waste or constituents from the facility through the upper most aquifer to water supply wells or to surface water. As such, it is suggested that CEI submit a groundwater monitoring plan waiver. In the event that the submittal is denied, it is suggested that a groundwater monitoring plan be developed using the existing monitoring wells installed as a part of this evaluation. The development of such a plan should be consistent with the requirements of 40 CFR Part 264.

2. Groundwater elevation measurements should continue for all wells on a quarterly basis to verify groundwater flow direction during different seasons of the year. These data will aid in selection of well locations for an overall groundwater monitoring plan, should such be required.

3. Facilities management should incorporate a periodic reconnaissance of all

DRAFT

existing and future Site facilities. All observations should be recorded and filed with identified problem areas directed to appropriate personnel. These data would become extremely important in the event of an accidental release at the Site or from adjacent industries, upgradient of the Site.

/60669.RPT

DRAFT

TABLES

Diff. n before revise

~~not consistent with well install report~~

TABLE 1

MONITORING WELL CONSTRUCTION SUMMARY

MONITOR POINT	GROUND SURFACE ELEV	TOP CAS ELEV	CASING STICK-UP (FEET)	TOTAL WELL DEPTH FROM G.S.	BOTTOM WELL PT ELEV	WELL MATERIAL	CASING DIA (INCHES)	LENGTH (FEET)	SCREEN MATERIAL	SCREEN DIA (INCHES)	LENGTH (FEET)	SLOT (INCHES)	SOIL CONDITIONS AT WELL POINT	FILTER MATERIAL	FILTER LENGTH (FEET)	GROUT LENGTH (FEET)
MW1	633.8	633.64	-0.2	111.3	527.5	PVC	2	108.8	PVC	2	5	.010	CLAY W/SAND SEAMS	2NS	41.2	69.5
MW2	632.6	634.29	1.7	70.1	567.6	PVC	2	67.3	PVC	2	5	.010	CLAYEY SAND	2NS	32.0	38.1
MW3	632.8	632.50	-0.3	~~[illegible]~~ 47.9	564.9	PVC	2	~~[illegible]~~ 33.6	PVC	2	5	.010	CLAYEY SAND	2NS	27.9	~~44.0~~ 40.0
MW4	633.4	633.06	-0.3	55.0	583.9	PVC	2	49.8	PVC	2	5	.010	FINE SAND	2NS	15.0	39.5
MW5	633.3	632.95	-0.4	50.5	588.3	PVC	2	45.4	PVC	2	5	.010	FINE SAND	2NS	13.5	36.5
MW6	633.3	632.85	-0.5	55.7	583.1	PVC	2	50.5	PVC	2	5	.010	FINE SAND	2NS	15.7	39.4
MW7	633.3	632.90	-0.4	23.5	613.8	PVC	2	18.4	PVC	2	5	.010	SILTY SAND	2NS	10.5	12.5
MW8	633.6	633.17	-0.4	45.0	590.1	PVC	2	37.8	PVC	2	7	.010	CLAY W/SAND SEAMS	2NS	23.0	21.5
MW9	633.6	633.23	-0.4	54.3	584.8	PVC	2	49.0	PVC	2	5	.010	SANDY SILT	2NS	12.4	41.4
MW10	633.2	632.89	-0.3	60.5	578.2	PVC	2	55.4	PVC	2	5	.010	SANDY CLAY	2NS	21.5	37.7
MW11	633.2	632.99	-0.2	38.5	595.2	PVC	2	33.3	PVC	2	5	.010	CLAY W/SAND SEAMS	2NS	11.5	25.8
MW12	633.0	632.63	-0.4	18.1	615.4	PVC	2	15.6	PVC	2	5	.010	CLAY W/SAND SEAMS	2NS	10.7	7.8
MW13	633.3	632.76	0.5	13.2	620.5	PVC	2	3.0	PVC	2	10	.010	SAND FILL	SAND FILL	11.5	1.0
MW14	632.7 ~~633.1~~	~~634.05~~ 632.05	~~1.9~~ -0.7	~~24.2~~ 23.5	609.5	PVC	2	~~21.1~~ 12.8	PVC	2	5	.010	SILTY SAND	2NS	~~0.9~~ 7.0	15.8
MW15	632.6	632.15	-0.5	13.1	620.0	PVC	2	2.1	PVC	2	10	.010	SAND FILL	SAND FILL	11.1	1.0
MW18	633.6	633.40	-0.2	~~[illegible]~~ 66.3	~~578.0~~ 573.3	PVC	2	~~44.8~~ 50.1	PVC	2	10	.010	CLAY W/SAND SEAMS	SILICA SAND	~~19.0~~ 20.3	39.8
MW19	634.4	634.07	-0.3	55.0	579.4	PVC	2	44.7	PVC	2	10	.010	CLAY W/SAND SEAMS	SILICA SAND	24.0	30.6
MW20	631.5	632.93	1.4	53.5	578.0	PVC	2	44.9	PVC	2	10	.010	FINE SAND	SILICA SAND	20.0	33.5
MW21	632.6	632.34	-0.3	48.0	584.6	PVC	2	42.7	PVC	2	5	.010	SILTY SAND	SILICA SAND	8.0	39.5
MW16	632.8	632.36	-0.7	30.0	602.8	PVC	2	29.1	PVC	2	5	.010	SILTY CLAY	2NS	27.0	2.0
MW17	632.8	632.66	-0.1	30.0	602.8	PVC	2	27.8	PVC	2	10	.010	SILTY CLAY	2NS	24.5	4.5

File: 60669.WK1

Why not in order?
MW installation reports not included

06-Feb-91

Notes: Elevation datum is BM #6 provided by McNeely & Lincoln. located on the ~~[illegible]~~

BM#6 is a RR spike in pole south side of Perry west of Grand Trunk RR line.

(Louis) Dig up stairs

TABLE 2

FIELD PERMEABILITY TEST RESULTS

MONITORING WELL	MONITORED ZONE ELEVATION	MATERIAL MONITORED	IN-SITU PERMEABILITY
MW-1	564-523	Silty CLAY with Fine Sand Seams	2.9×10^{-7} cm/sec
MW-2	595-563	Clayey SAND	7.2×10^{-7} cm/sec
MW-3	587-559	Clayey SAND	4.8×10^{-6} cm/sec
MW-4	593-578	Fine SAND, Little Silt and Clay	3.1×10^{-7} cm/sec
MW-5	596-583	Fine SAND, Little Silt and Clay	2.2×10^{-6} cm/sec
MW-6	593-578	Fine SAND, Little Silt and Clay	1.6×10^{-6} cm/sec
MW-7	620-610	Silty, Fine SAND	6.0×10^{-6} cm/sec
MW-8	612-589	Silty CLAY with Fine Sand Seams	6.5×10^{-7} cm/sec
MW-9	592-579	Fine, Sandy SILT	7.0×10^{-7} cm/sec
MW-10	594-573	Fine, Sandy CLAY with Fine Sand Seams	6.0×10^{-6} cm/sec
MW-11	606-595	Silty CLAY with Fine Sand Seams	2.5×10^{-7} cm/sec
MW-18	594-578	Silty CLAY with Sand Seams, Trace Gravel	1.7×10^{-6} cm/sec
MW-19	603-579	Silty CLAY with Sand Seams, Trace Gravel	1.2×10^{-6} cm/sec
MW-21	593-585	Silty SAND, Little Gravel	1.1×10^{-5} cm/sec

File: 60669.TB2

TABLE 3
CITY ENVIRONMENTAL, INC.
FREDERICK STREET SITE
GROUNDWATER TEST RESULTS
APRIL, JUNE AND DECEMBER, 1987

Monitoring Well No.:	MW-1	MW-1	MW-2	MW-2	MW-3	MW-4	MW-5	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-15	MW-16	MW-17	MW-18
Date Sampled:	4/16/87	6/17/87	4/16/87	6/17/87	4/16/87	4/16/87	4/15/87	6/17/87	4/17/87	4/17/87	4/17/87	4/16/87	4/15/87	4/15/87	4/16/87	4/16/87	4/16/87	4/15/87	6/17/87	12/21/87	12/21/87	12/21/87
Aquifer:	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Upper)	(Lower)	(Lower)	(Lower)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)
Test Parameters (Units)																						
Purgeable Halocarbons	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND
(Scan 1)			Except*	Except*		Except*	Except*															
Chloroform (ug/L)			1.3*	1.3*		0.54*	0.63*															
Purgeable Aromatics	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	See	See	All ND	All ND	All ND
(Scan 2)	Except*		Except*	Except*						Except*					Except*	Except*		Below	Below			
Benzene (ug/L)				13*														110	520			
Ethylbenzene (ug/L)															3.3*			10	<0.5			
Styrene (ug/L)																		11	28			
Toluene (ug/L)	1.0*		0.68*							0.78*					1.5*	0.58*		36	28			
Xylene (ug/L)																		35	64			
Priority Pollutants																						
Base-Neutral/Acids									All ND		All ND		All ND									
PCBs and Pesticides									All ND		All ND		All ND									
Cyanide, Total (mg/L)									<0.01		<0.01		<0.01									
Phenols (mg/L)									<0.01		<0.01		<0.01									
Dissolved Metals																						
Antimony (mg/L)									<0.25		<0.25		<0.25									
Arsenic (mg/L)									0.005		0.006		0.012									
Beryllium (mg/L)									<0.005		<0.005		<0.005									
Cadmium (mg/L)									<0.01		<0.01		<0.01									
Chromium, Total (mg/L)									<0.02		<0.02		<0.02									
Copper (mg/L)									<0.02		<0.02		<0.02									

TABLE 3

CITY ENVIRONMENTAL, INC.

FREDERICK STREET SITE

GROUNDWATER TEST RESULTS

APRIL, JUNE AND DECEMBER, 1987

Monitoring Well No.:		MW-1	MW-1	MW-2	MW-2	MW-3	MW-4	MW-5	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15	MW-15	MW-16	MW-17	MW-18
Date Sampled:		4/16/87	6/17/87	4/16/87	6/17/87	4/16/87	4/16/87	4/15/87	6/17/87	4/17/87	4/17/87	4/17/87	4/16/87	4/15/87	4/15/87	4/16/87	4/16/87	4/16/87	4/15/87	6/17/87	12/21/87	12/21/87	12/21/87
Aquifer:		(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Upper)	(Lower)	(Lower)	(Lower)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)	(Upper)
Test Parameters	(Units)																						
Lead	(mg/L)									<0.05		<0.05		0.05									
Mercury	(mg/L)									<0.0002		<0.0002		<0.0002									
Nickel	(mg/L)									<0.05		<0.05		<0.05									
Selenium	(mg/L)									0.006		0.006		0.004									
Silver	(mg/L)									<0.02		<0.02		<0.02									
Thallium	(mg/L)									0.34		0.33		0.95									
Zinc	(mg/L)									0.11		0.06		0.08									

Notes:

1. Refer to the Hydrogeologic Evaluation Report dated August 27, 1987 (Revision 1 dated February 1, 1988, and Revision 2 dated August 1, 1988) for the Frederick Street site for further detail and laboratory data reports.
2. ND refers to not detected above the laboratory's method detection limit. "All ND" indicates that all compounds listed for the test parameters noted were not detected above the laboratory's method detection limit except for those compounds listed.
3. Note that contaminants identified in the area of MW-13 and MW-15 were removed during UST closures. Refer to the UST closure report dated -------- for additional detail.

TABLE 4
CITY ENVIRONMENTAL, INC.
FREDERICK STREET SITE
GROUNDWATER TEST RESULTS
DECEMBER, 1988

Monitoring Well No.:		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
Date Sampled:		12/ /88											
Aquifer:		(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Lower)	(Upper)	(Lower)	(Lower)	(Lower)	(Upper)	(Upper)
Test Parameters	(Units)												
Purgeable Halocarbons (Scan 1)		All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND
Purgeable Aromatics (Scan 2)		All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND
Dissolved Metals													
Antimony	(mg/L)	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	(mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Beryllium	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	(mg/L)	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium, Total	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	(mg/L)	0.045	0.048	0.054	0.051	0.11	0.056	0.033	0.047	0.053	0.018	0.027	0.021
[illegible]ad	(mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
[illegible]ckel	(mg/L)	0.022	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05
Selenium	(mg/L)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silver	(mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Thallium	(mg/L)	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
Zinc	(mg/L)	0.285	0.471	0.373	0.125	0.469	0.147	0.041	0.172	0.101	0.204	0.415	0.577

Notes:

1. Refer to the Hydrogeologic Evaluation Report dated August 27, 1987 (Revision 1 dated February 1, 1988 and Revision 2 dated August 1, 1988) for the Frederick Street site for further detail and laboratory data reports.
2. ND refers to not detected above the laboratory's method detection limit for the parameters analyzed.

/60669tl4

TABLE 5

GROUNDWATER ANALYTICAL PARAMETERS

1. Primary Drinking Water Standards

Arsenic	Barium
Cadmium	Chromium
Fluoride	Lead
Mercury	Nitrogen, Nitrate
Selenium	Silver
Endrin	Lindane
Methoxychlor	Toxaphene
2,4-D	2,4,5-TP Silvex
Radium	Gross Alpha
Gross Beta	Turbidity
Coliforms, Total	Total Trihalomethanes
Benzene	Vinyl Chloride
Carbon Tetrachloride	1,2-Dichloroethane
~~Trichloroethane~~	1,1-Dichloroethene
1,1,1-Trichloroethane	Para Dichlorobenzene

Not performed! 17 6

2. Parameters Establishing Groundwater Quality

Chloride	Iron, Dissolved
Manganese, Dissolved	Phenols
Sodium, Dissolved	Sulfate

3. Parameters Used as Indicators of Groundwater Contamination

pH	Specific Conductance
Total Organic Carbon	Total Organic Halogen (Chlorine, Bromine, Iodine)

TABLE 6
CITY ENVIRONMENTAL, INC.
FREDERICK STREET SITE
GROUNDWATER TEST RESULTS
NOVEMBER, 1990

Monitoring Well No.: / Date Sampled: / Aquifer:		MW-3 11/21/90 (Lower)	MW-4 11/21/90 (Lower)	MW-4AB Dupl. of MW-4	MW-18 11/21/90 (Lower)	MW-19 11/21/90 (Lower)	MW-20 11/21/90 (Lower)	MW-21 11/21/90 (Lower)	Trip Blank	Primary Drinking Water Standard	Secondary Drinking Water Standard
Test Parameters	(Units)										
Purgeable Halocarbons											
1,1 Dichloroethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	7	
Carbon Tetrachloride	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	5	
1,2 Dichloroethane	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	5	
Trichloroethene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	5	
Vinyl Chloride	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	2	
Purgeable Aromatics											
1,2 Dichlorobenzene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	75	
Benzene	(ug/L)	<1	<1	<1	<1	<1	<1	<1	<1	5	
Chlorinated Hydrocarbons and [illegible]chlorine Pesticides											
[illegible]n	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0002	
Lindane	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.004	
Methoxychlor	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	
Toxaphene	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	
2,4 D	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	
2,4,5-TP (Silvex)	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	
Dissolved Metals											
Arsenic	(mg/L)	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	0.05	
Barium	(mg/L)	0.025	0.054	0.052	0.049	0.044	0.020	0.028	<0.002	1.0	
Cadmium	(mg/L)	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.01	
Chromium, Total	(mg/L)	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.05	
Iron	(mg/L)	0.533	0.066	0.078	0.31	0.07	0.448	0.067	0.145		0.3
Lead	(mg/L)	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	<0.042	0.05	
Manganese	(mg/L)	0.038	0.225	0.297	0.070	0.107	0.098	0.05	0.004		0.05
Mercury	(mg/L)	<0.025	<0.025	<0.025	<0.025	<0.053	<0.025	<0.025	<0.025	0.002	
Selenium	(mg/L)	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	<0.075	0.01	
Silver	(mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	
Coliforms, Total	(/100 ml)	None	None	None	Confluent Growth	Confluent Growth	Confluent Growth	4	None	1	
Chloride	(mg/L)	21.69	66.18	58.18	154	70.18	69.18	75.18	<1.0		250
Fluoride	(mg/L)	1.68	1.25	1.2	1.7	1.28	1.14	1.42	<0.1	4	2
Nitrate (as Nitrogen)	(mg/L)	<0.1	0.85	1.22	0.16	0.31	0.65	0.37	<0.1	10	
S[illegible]	(mg/L)	116	143	131	99.5	67.7	120	74.5	<0.05		
[illegible]s	(mg/L)	0.024	<0.01	0.02	<0.01	0.012	<0.01	0.02	<0.01		

TABLE 6
CITY ENVIRONMENTAL, INC.
FREDERICK STREET SITE
GROUNDWATER TEST RESULTS
NOVEMBER, 1990

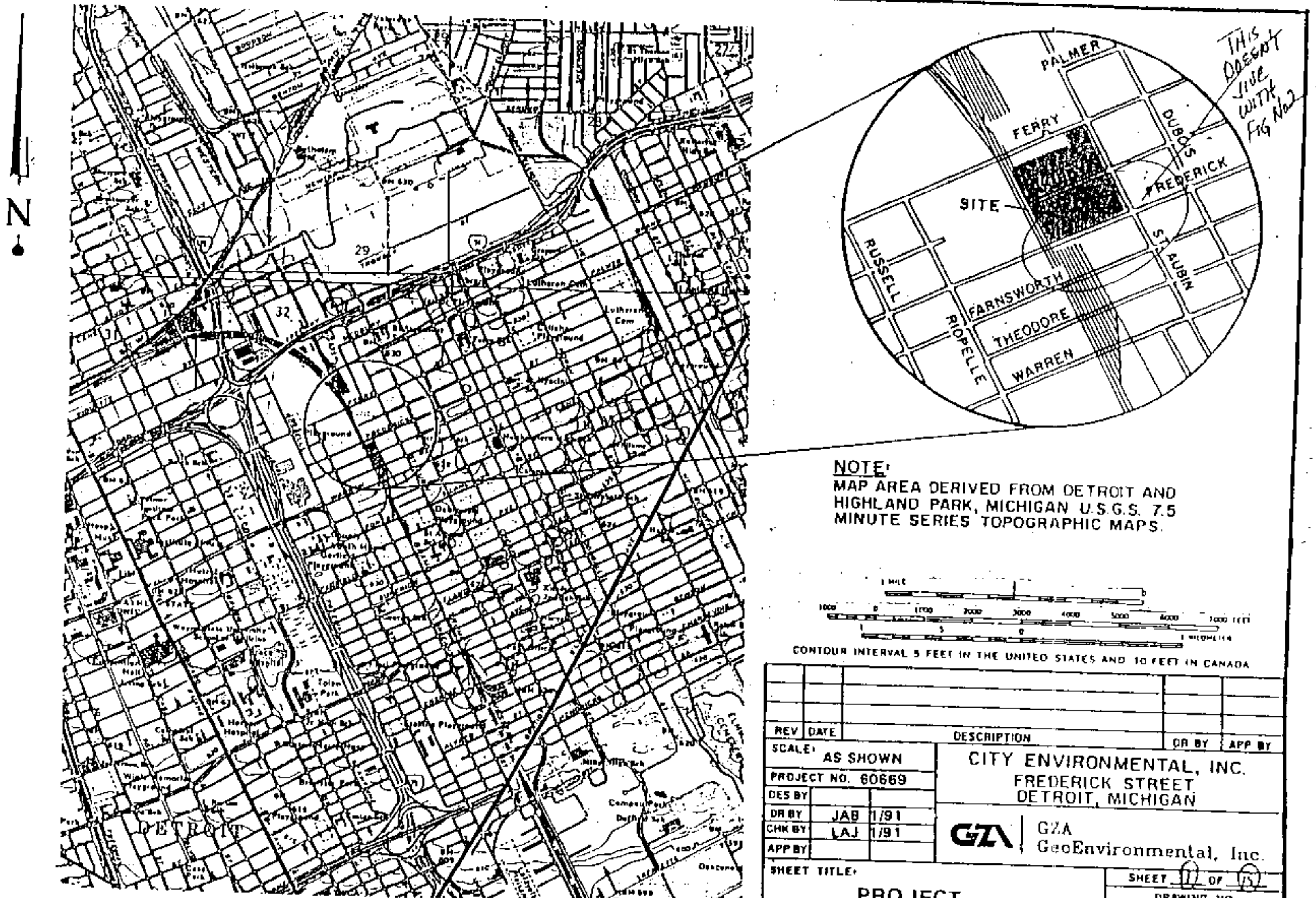
Monitoring Well No.: / Date Sampled: / Aquifer:		MW-3 11/21/90 (Lower)	MW-4 11/21/90 (Lower)	MW-4AB Dupl. of MW-4	MW-18 11/21/90 (Lower)	MW-19 11/21/90 (Lower)	MW-20 11/21/90 (Lower)	MW-21 11/21/90 (Lower)	Trip Blank	Primary Drinking Water Standard	Secondary Drinking Water Standard
Test Parameters	(Units)										
Sulfate	(mg/L)	371.7	618.7	630.9	87.64	127.7	497.5	313.5	<1.0		250
Turbidity	(N.T.U.)	<1	<1	<1	8	2	<1	10	<1		
Total Organic Carbon	(mg/L)	1.37	<1	2.91	1.3	<1	<1	<1	<1		
Gross Alpha	(pCi/L)	<5	<5	<5	<5	8	8	<5	<5	15	
Gross Beta	(pCi/L)	11	14	4	<4	11	<4	14	<4	50*	
Radium	(pCi/L)	<3	<3	<3	4	3	7	7	<3	5	
Organic Chlorine	(mg/L)	<0.01	0.05	0.02	<0.01	0.01	0.03	0.01	0.03		
Organic Bromine	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Organic Iodine	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		

Notes:

1. Laboratory analyses performed by Analytic and Biological Laboratories, Inc. of Farmington Hills, Michigan. Refer to Appendix I for the laboratory test reports and additional detail.
2. Primary and secondary drinking water standards as defined in 40 CFR, Part 141 and 40 CFR, Part 143, respectively.

DRAFT

FIGURES

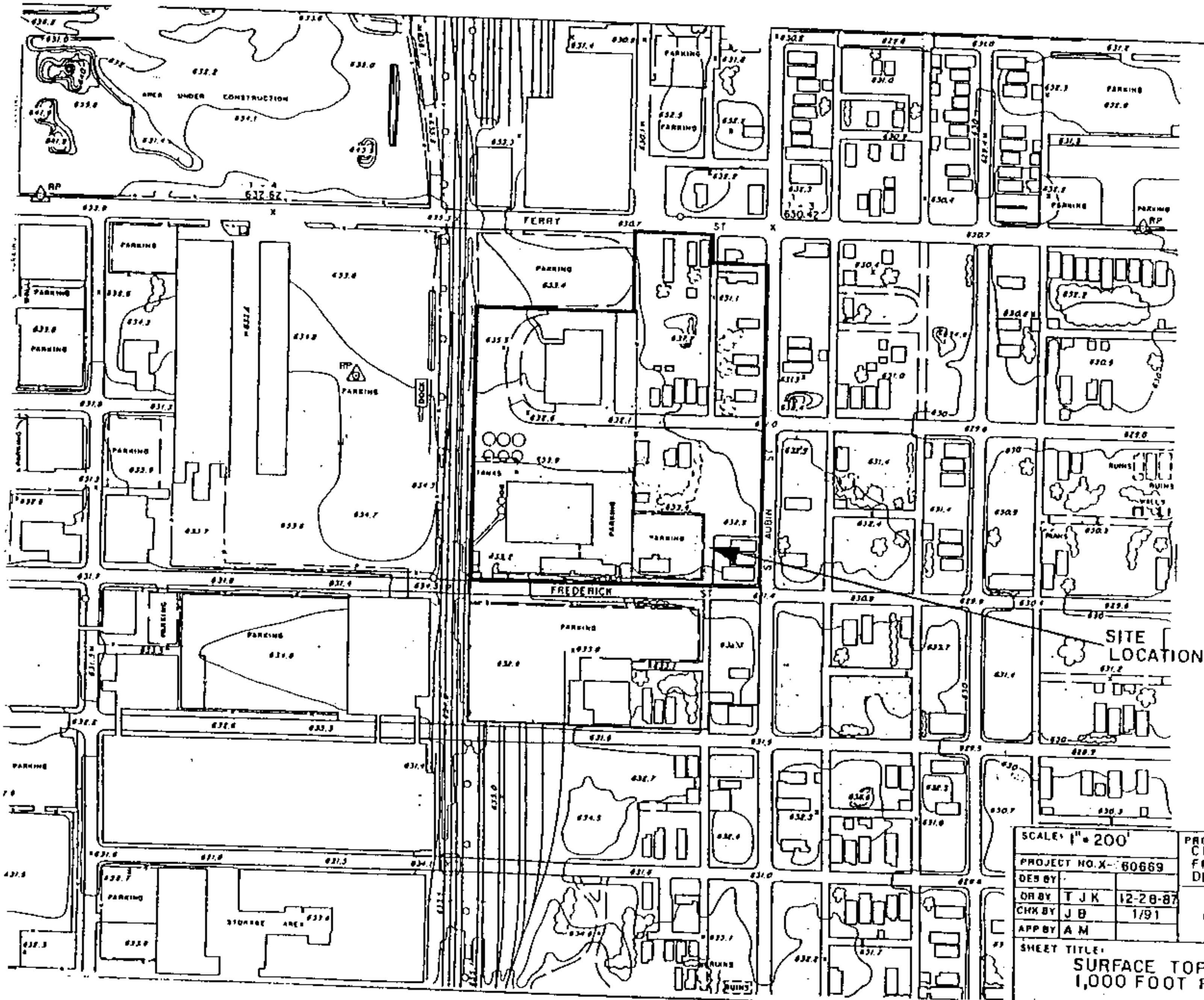


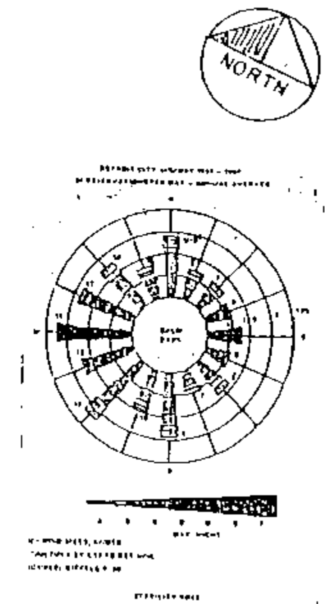
NOTE:
MAP AREA DERIVED FROM DETROIT AND HIGHLAND PARK, MICHIGAN U.S.G.S. 7.5 MINUTE SERIES TOPOGRAPHIC MAPS.

CONTOUR INTERVAL 5 FEET IN THE UNITED STATES AND 10 FEET IN CANADA

REV	DATE	DESCRIPTION	DR BY	APP BY

SCALE: AS SHOWN	CITY ENVIRONMENTAL, INC. FREDERICK STREET DETROIT, MICHIGAN
PROJECT NO. 60669	
DES BY	
DR BY JAB 1/91	GZA GZA GeoEnvironmental, Inc.
CHK BY LAJ 1/91	
APP BY	
SHEET TITLE: PROJECT LOCATION PLAN	SHEET 11 OF 15 DRAWING NO. 1





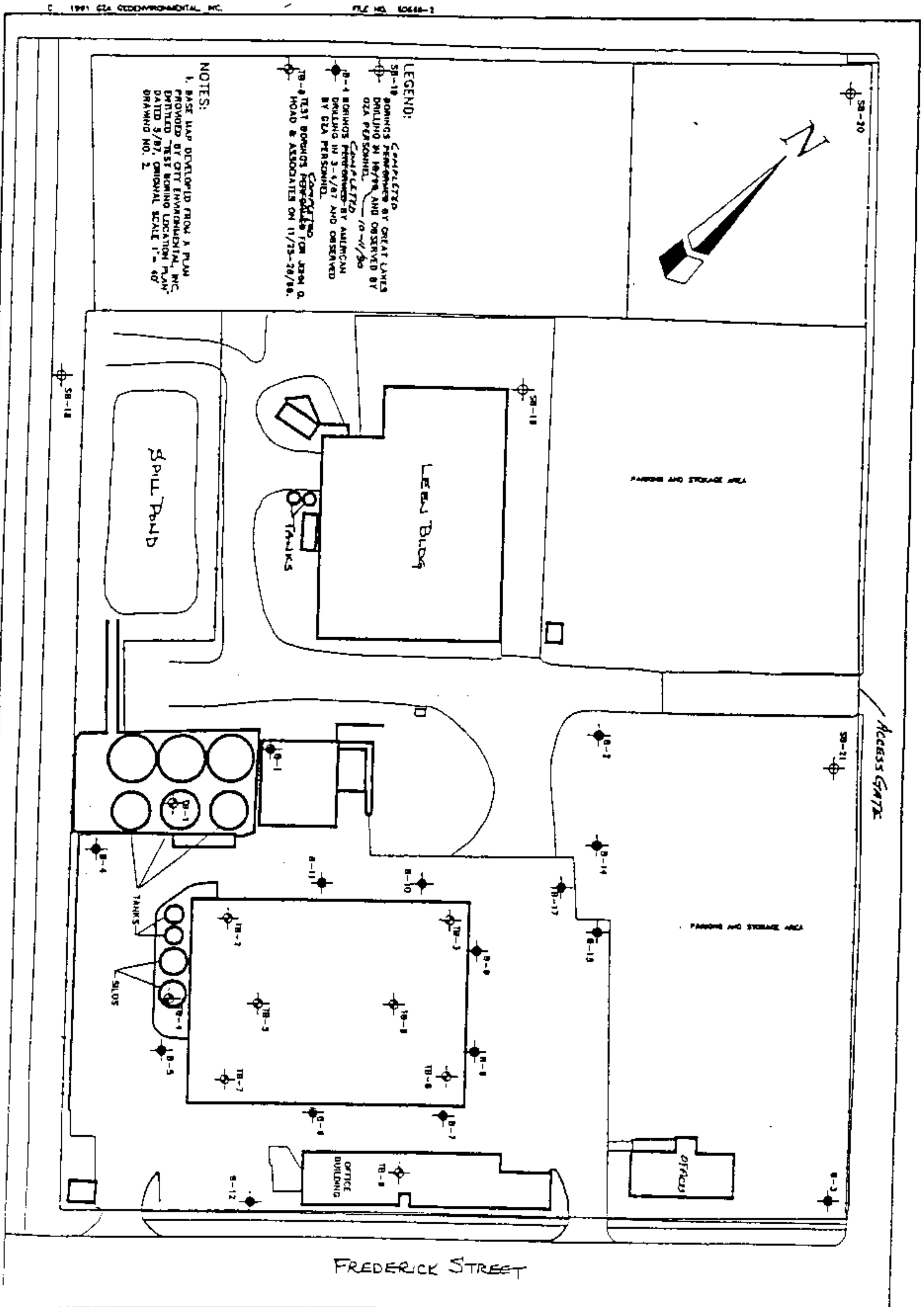
SCALE: 1" = 200'		
PROJECT NO. X-60669		
DES BY		
DR BY	T J K	12-28-87
CHK BY	J B	1/91
APP BY	A M	

PROJECT
CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GZA GeoEnvironmental, Inc.

SHEET TITLE:
SURFACE TOPOGRAPHY
1,000 FOOT RADIUS

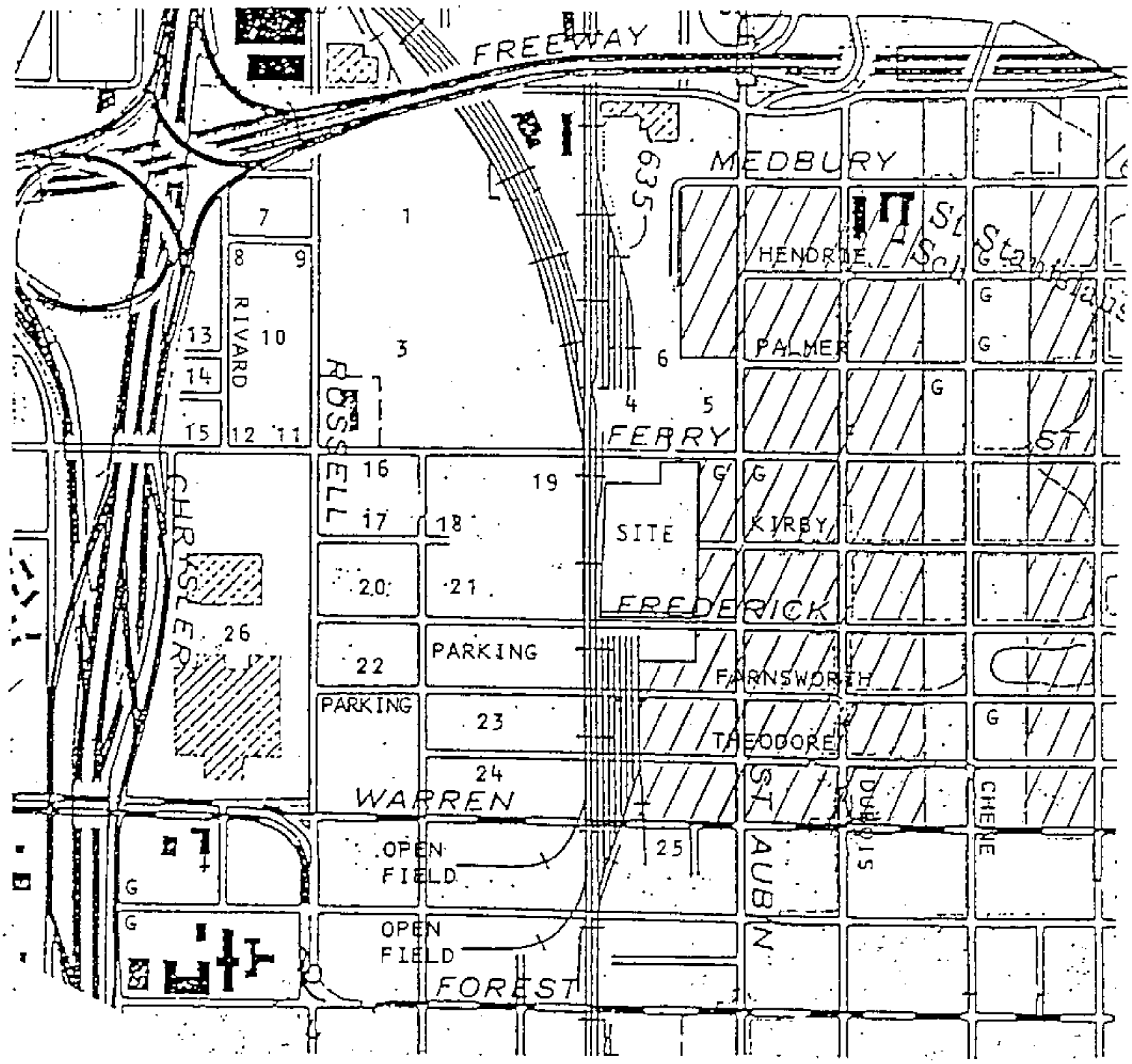
SHEET 2 OF 15
DRAWING NO.
2.



PROJECT NO. 60669	CITY ENVIRONMENTAL, INC. FREDERICK STREET DETROIT, MICHIGAN	REV. NO. / DESCRIPTION / BY / DATE	
FIGURE NO. 2.3	SITE PLAN	SCALE IN FEET 0 30 60 120 APPROXIMATE	DESIGNED BY: CHECKED BY: REVIEWED BY: DRAWN BY: AK SCALE: 1" = 60' DATE: 1/23/91

GZA GeoEnvironmental, Inc.

ESTABLISHMENT LOCATION PLAN



LEGEND

PREDOMINANTLY RESIDENTIAL

G ACTIVE OR FORMER GASOLINE SERVICE STATION

3 INDUSTRIAL ESTABLISHMENT AS LISTED ON TABULATION

GZA
GeoEnvironmental, Inc.

TABULATION OF ESTABLISHMENTS IN SURROUNDING AREA

E CORRIDOR - Small retail developments including bars, lounges, grocery stores, bakery, gas stations, etc.

1 City of Detroit, Environmental Protection and Maintenance Department, DPW, Solid Waste and Vehicle Management Division.

2 City Disposal ~~Management~~ - Solid waste transfer station - Environmental impact obtained and partially included in Appendix D. C ?

3 Greater Detroit Resource Recovery Facility - Foundations, system analysis obtained and partially included in Appendix E. D

4 Former Detroit Mill Supply - ~~Recently converted to offices for Barton-Mellow/Townsend Bottom Joint Venture - Resource recovery~~.

5 Arctic Warehouse and Cold Storage Company.

6 MDNR - Sites of Environmental Contamination Priority Lists Act 307 Group 2 Site - Palmer Street at Railroad Tracks.

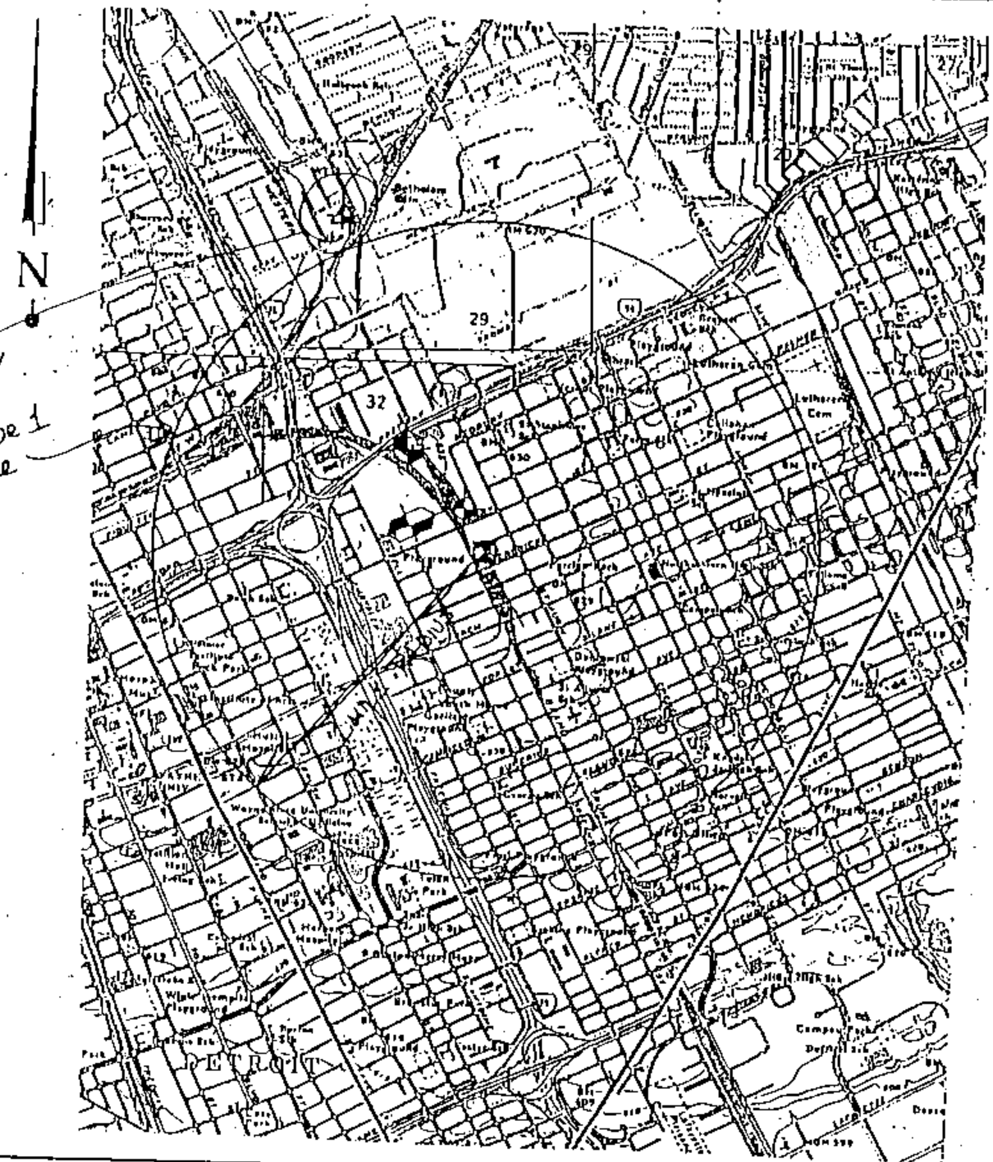
7 FORMERLY FRG Industries, Inc. - Industrial and automotive fasteners.
8 Reed Plating Company
9 Production and Equipment Company, Inc.
10 Montgomery Tank Liners
11 ~~Regal Packing Company~~ SCHLAFER IRON & STEEL CO.
12 Safeway Scaffolds
13 ~~City Window Cleaning and Painting~~ D.C. BYERS CO. - RESTORATION CONTRACTOR
14 General Linen Supply
15 ~~O'Neil and Hoffner Fisheries~~ STANDARD FISH DIST. CO.
16 Eastern Poultry
17 Regal Packing Company
18 Tamaren Beef Company
19 Fisher Body - Plant #40
20 State Sausage Company
21 Superior Provision Company
22 Thorn Apple Valley Processing Plant
23 Metro Detroit Warehouse
24 Frigid Food Produce, Inc.
25 Veseo Oil Corporation
26 City of Detroit-Department of Transportation office and garage complex

Not consistent w/ text

GZA GeoEnvironmental, Inc.

Drawing 5

Text says 5000'
IS this supposed to be 1 mile



LEGEND

- ENVIRONMENTAL IMPACT ASSESSMENT, CITY DISPOSAL INC. - APPENDIX B C
- COMBUSTION ENGINEERING, RESOURCE RECOVERY PROJECT; BLACK AND VEATCH CONSULTING ENGINEERS APPENDIX E D
- MDNR ACT 307, SITES OF ENVIRONMENTAL CONTAMINATION - GROUP 1 LISTINGS
- MDNR ACT 307, SITES OF ENVIRONMENTAL CONTAMINATION - GROUP 2 LISTINGS
- SITE LOCATION

NOTE:
MAP AREA DERIVED FROM DETROIT AND HIGHLAND PARK, MICHIGAN U.S.G.S. 7.5 MINUTE SERIES TOPOGRAPHIC MAPS.

SCALE 1:24000

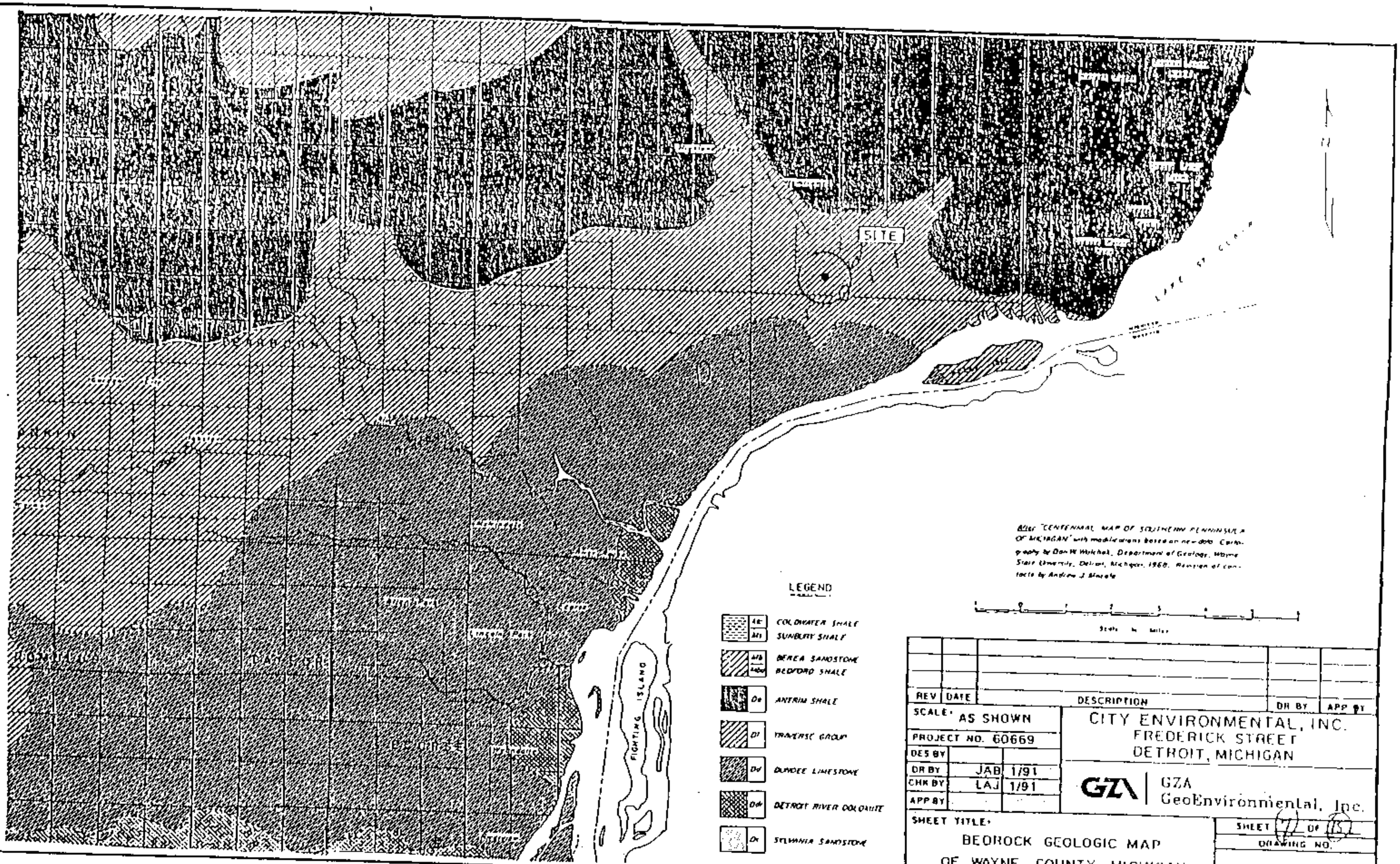
CONTOUR INTERVAL 5 FEET IN THE UNITED STATES AND 10 FEET IN CANADA.

REV	DATE	DESCRIPTION	DR BY	APP BY

SCALE: AS SHOWN			CITY ENVIRONMENTAL, INC. FREDERICK STREET DETROIT, MICHIGAN
PROJECT NO. 60669			
DES BY			
DR BY	JAB	1/91	GZA GeoEnvironmental, Inc.
CHK BY	LAJ	1/91	
APP BY			

SHEET TITLE:
OFF-SITE SOURCE LOCATION PLAN

SHEET 12 OF 15
DRAWING NO.
6



REV	DATE	DESCRIPTION	DR BY	APP BY

SCALE: AS SHOWN

PROJECT NO. 60669

DES BY		
DR BY	JAB	1/91
CHK BY	LAJ	1/91
APP BY		

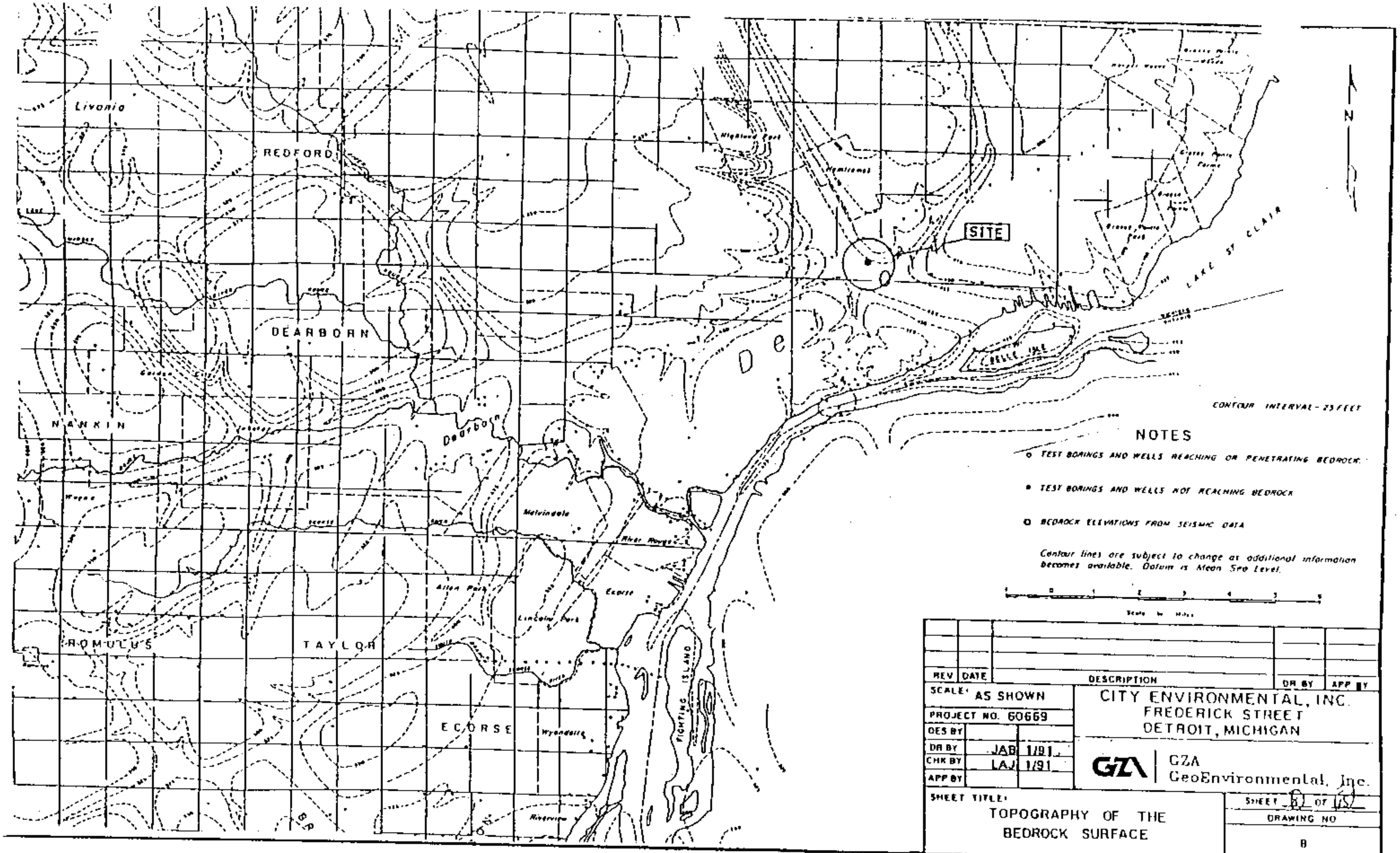
CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GZA
GeoEnvironmental, Inc.

SHEET TITLE:
BEDROCK GEOLOGIC MAP
OF WAYNE COUNTY, MICHIGAN

SHEET 7 OF 15

DRAWING NO.
7



REV	DATE	DESCRIPTION	DR BY	APP BY

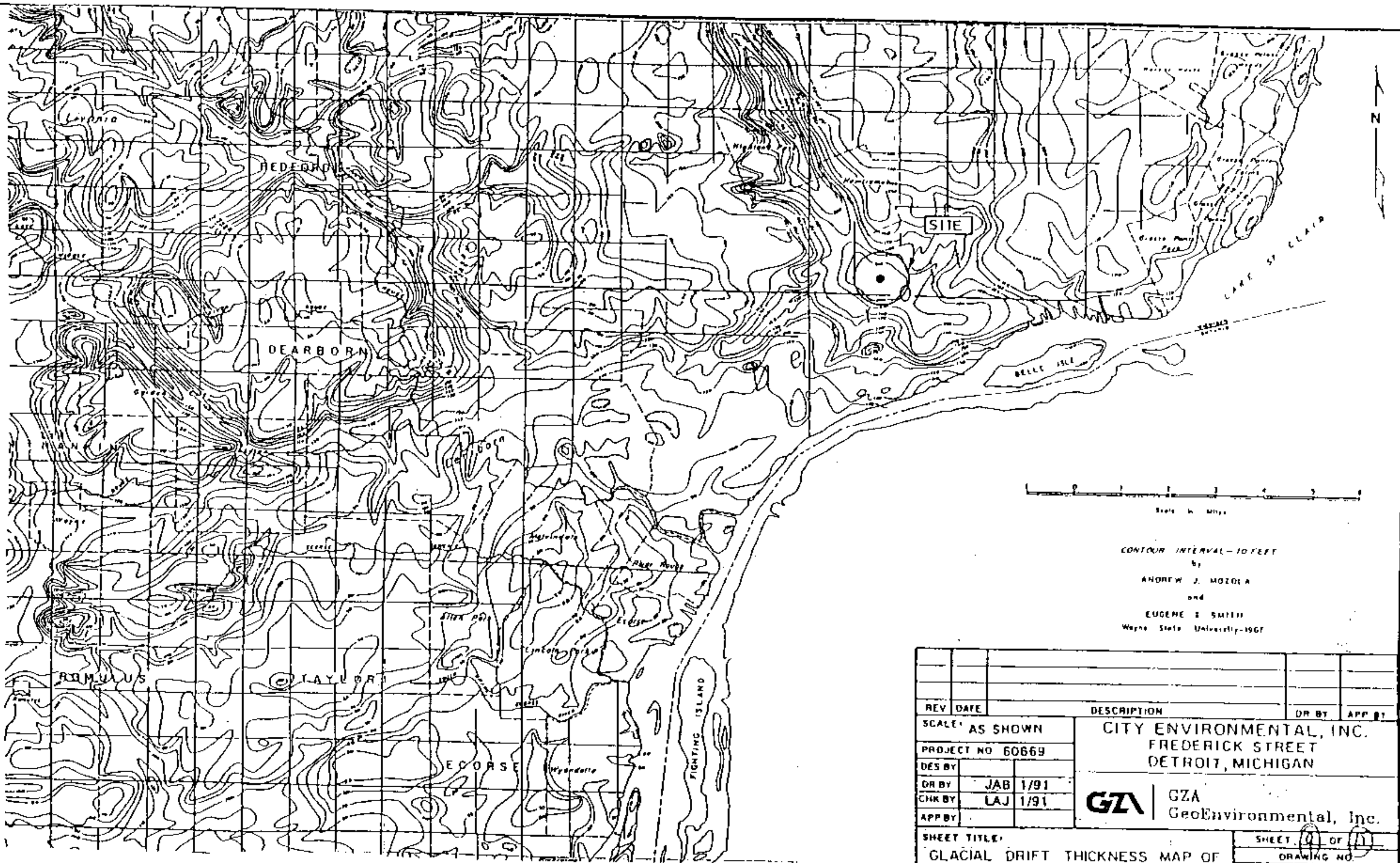
SCALE: AS SHOWN
PROJECT NO. 60669
DES BY
DR BY JAB 1/91
CHK BY LAJ 1/91
APP BY

CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GZA GZA GeoEnvironmental, Inc.

SHEET TITLE:
TOPOGRAPHY OF THE
BEDROCK SURFACE

SHEET 6 OF 10
DRAWING NO
8



REV	DATE	DESCRIPTION	DR BY	APP BY

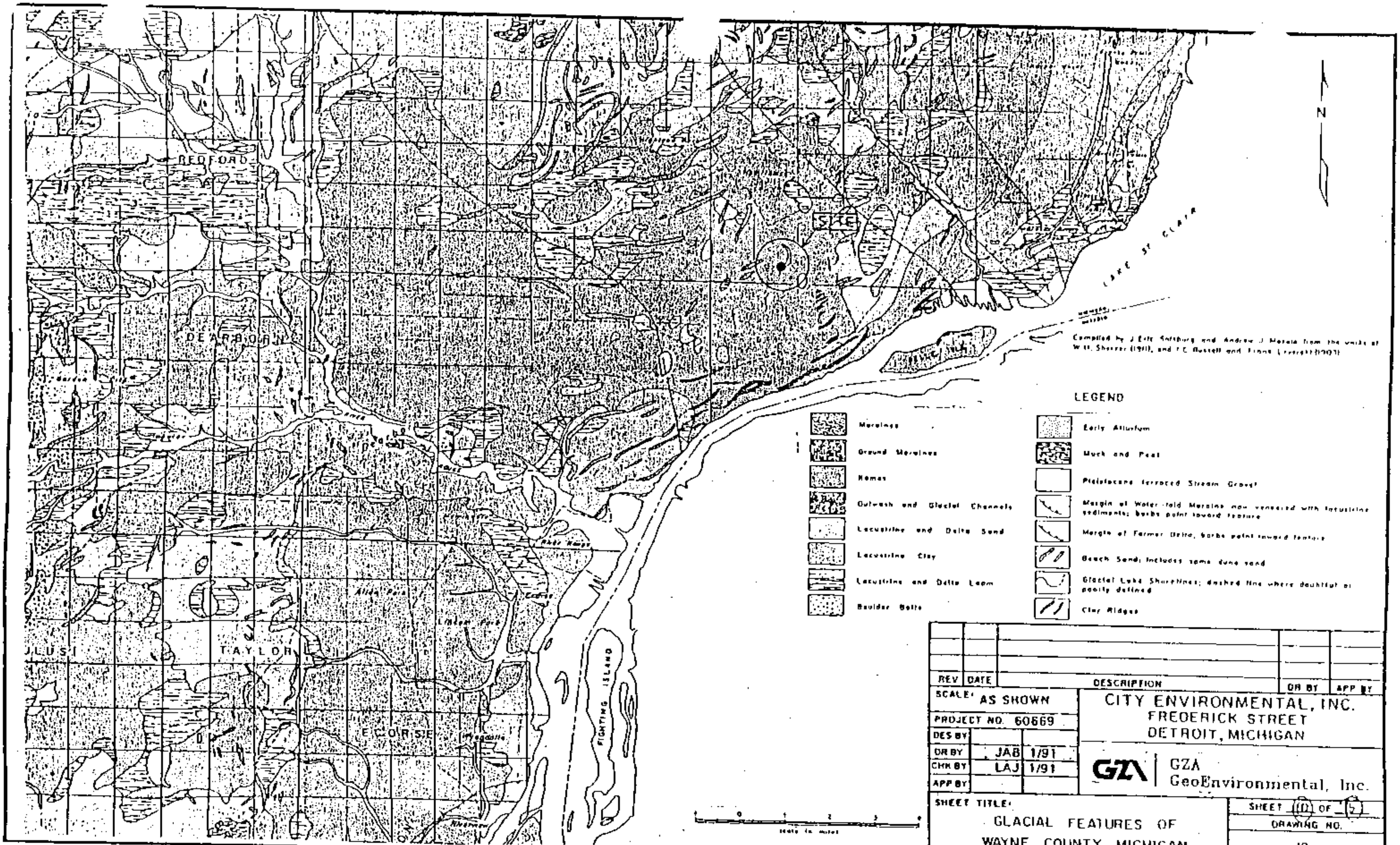
SCALE: AS SHOWN
PROJECT NO 60669
DES BY
DR BY JAB 1/91
CHK BY LAJ 1/91
APP BY

CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GZA
GZA GeoEnvironmental, Inc.

SHEET TITLE:
GLACIAL DRIFT THICKNESS MAP OF
WAYNE COUNTY, MICHIGAN

SHEET 9 OF 11
DRAWING NO
9



REV	DATE	DESCRIPTION	DR BY	APP BY

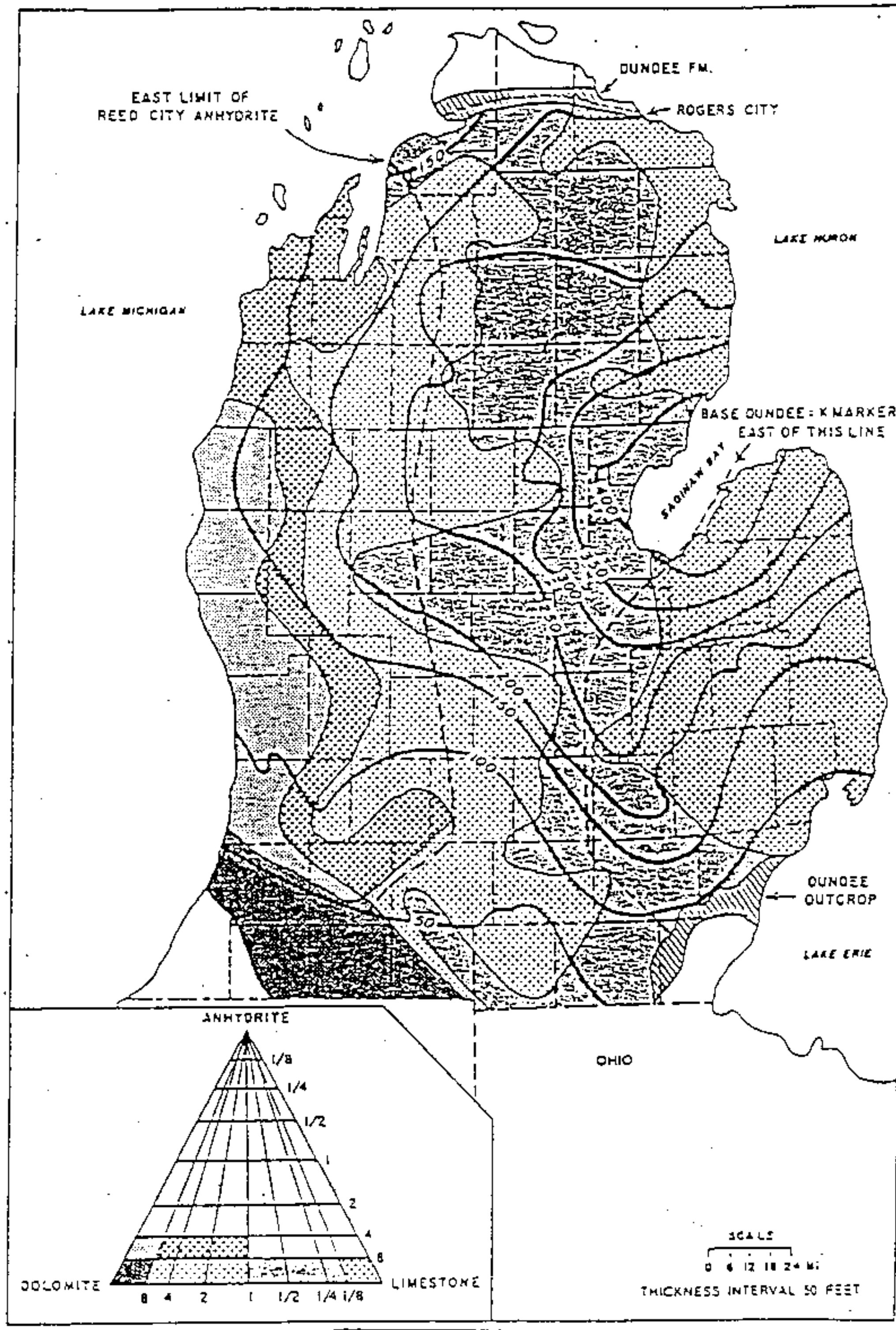
SCALE: AS SHOWN
PROJECT NO. 60669
DES BY:
DR BY: JAB 1/91
CHK BY: LAJ 1/91
APP BY:

CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GZA GeoEnvironmental, Inc.

SHEET TITLE:
GLACIAL FEATURES OF
WAYNE COUNTY, MICHIGAN

SHEET 10 OF 12
DRAWING NO.
10



REFERENCE:

Western Michigan University
[From Gardner, 1974]

HYDROGEOLOGY FOR UNDERGROUND INJECTION CONTROL IN MICHIGAN - PART 1

REV	DATE	DESCRIPTION	DR BY	APP BY

SCALE: AS SHOWN

PROJECT NO. 60669

DES BY

DR BY JAB 1/91

CHK BY LAJ 1/91

APP BY

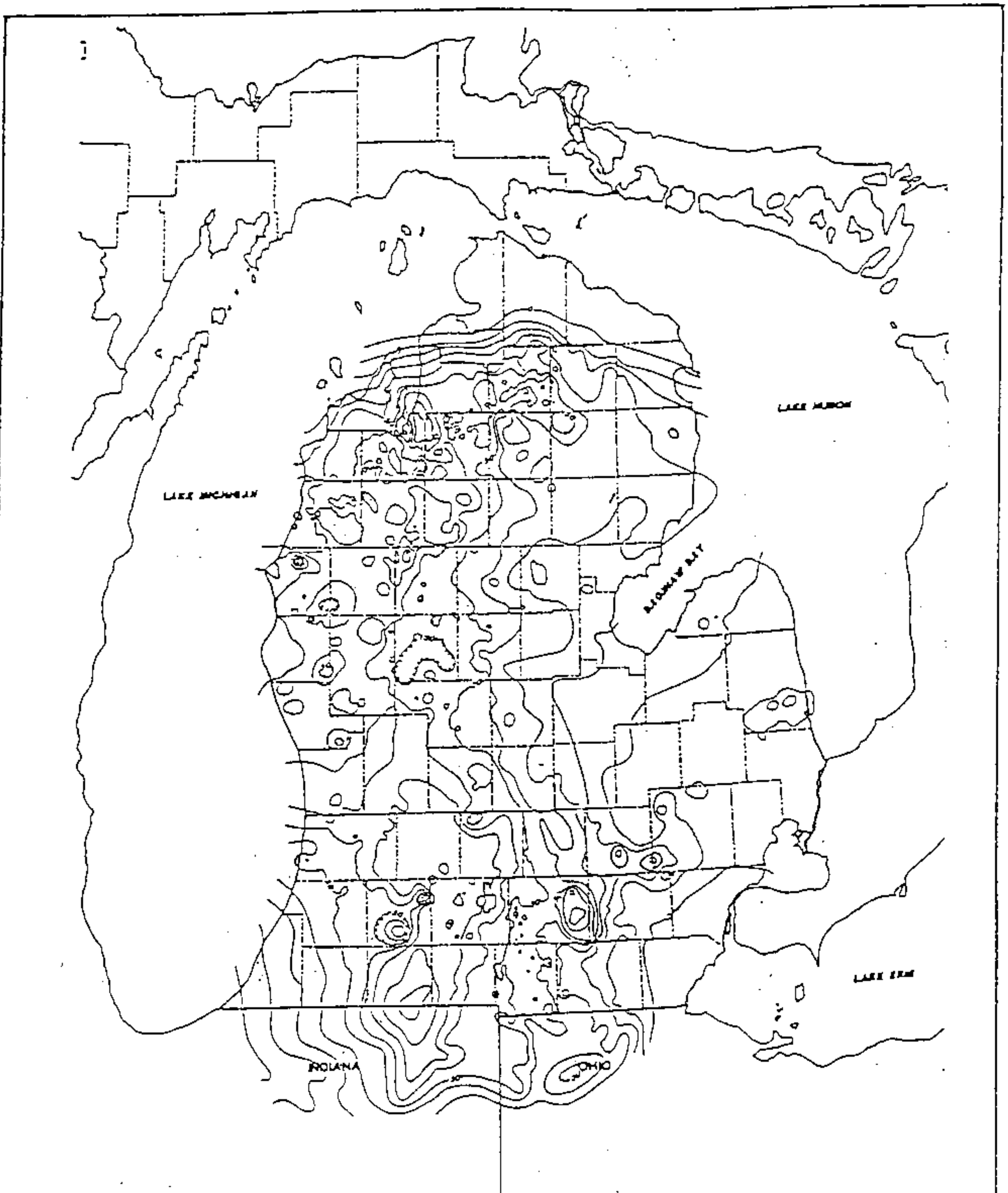
CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GZA
GeoEnvironmental, Inc.

SHEET TITLE:
THICKNESS - LITHOFACIES
MAP OF DUNDEE FORMATION

SHEET 11 OF 15

DRAWING NO.
11



REFERENCE:

Western Michigan University
[From Fisher, 1980]

HYDROGEOLOGY FOR UNDERGROUND INJECTION CONTROL IN MICHIGAN - PART 1

REV	DATE	DESCRIPTION	DR BY	APP BY

SCALE: AS SHOWN

PROJECT NO. 60669

DES BY:

DR BY: JAB 1/91

CHK BY: LAJ 1/91

APP BY:

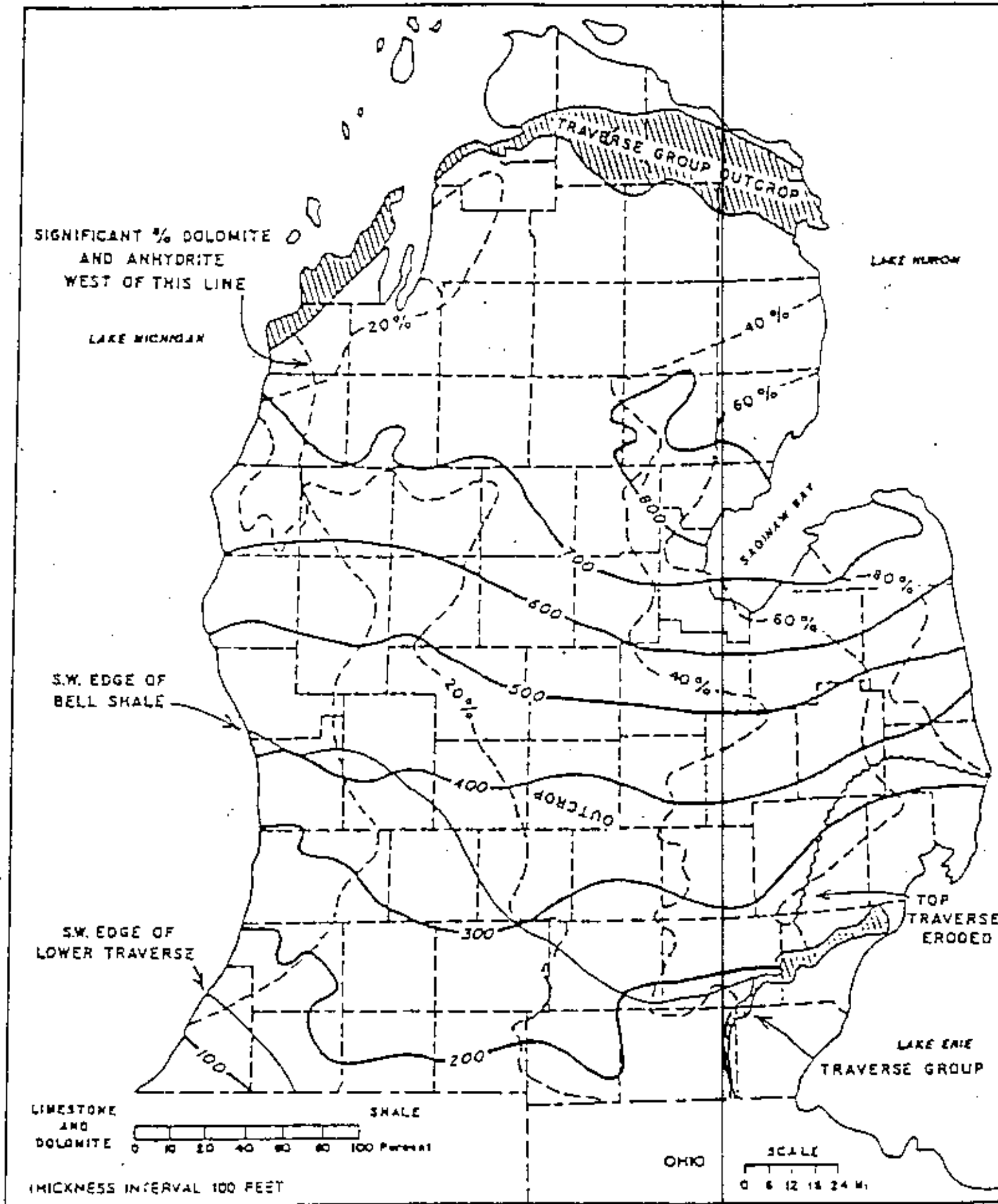
CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GZA
GeoEnvironmental, Inc.

SHEET TITLE: THICKNESS OF TRAVERSE FORMATION

SHEET 12 OF 15

DRAWING NO. 12



REFERENCE:

Western Michigan University
[From Gardner, 1974]

HYDROGEOLOGY FOR UNDERGROUND INJECTION CONTROL IN MICHIGAN - PART 1

REV	DATE	DESCRIPTION	DR BY	APP BY

SCALE: AS SHOWN
PROJECT NO. 60669
DES BY
DR BY JAB 1/91
CHK BY LAJ 1/91
APP BY

CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

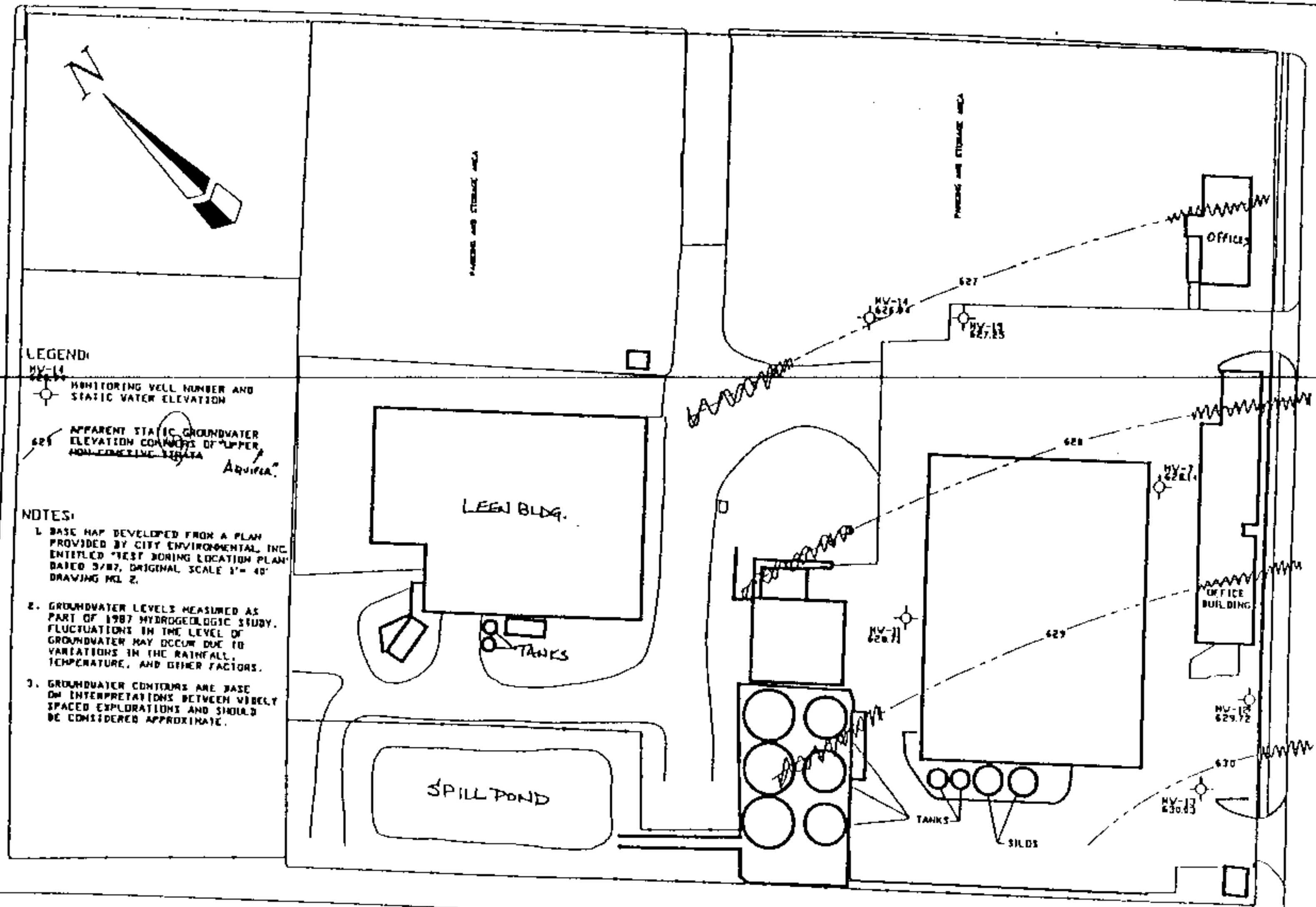
GZA GeoEnvironmental, Inc.

SHEET TITLE: THICKNESS - PERCENT SHALE MAP OF TRAVERSE GROUP

SHEET 13 OF 15

DRAWING NO. 13

FILE NO. 60669-1



REV. NO.	DESCRIPTION	BY	DATE

SCALE IN FEET: 0, 30, 60, 120 — APPROXIMATE

DESIGNED BY:
CHECKED BY:
REVIEWED BY:

DRAWN BY: AK
SCALE: 1" = 60'
DATE: 1/23/91

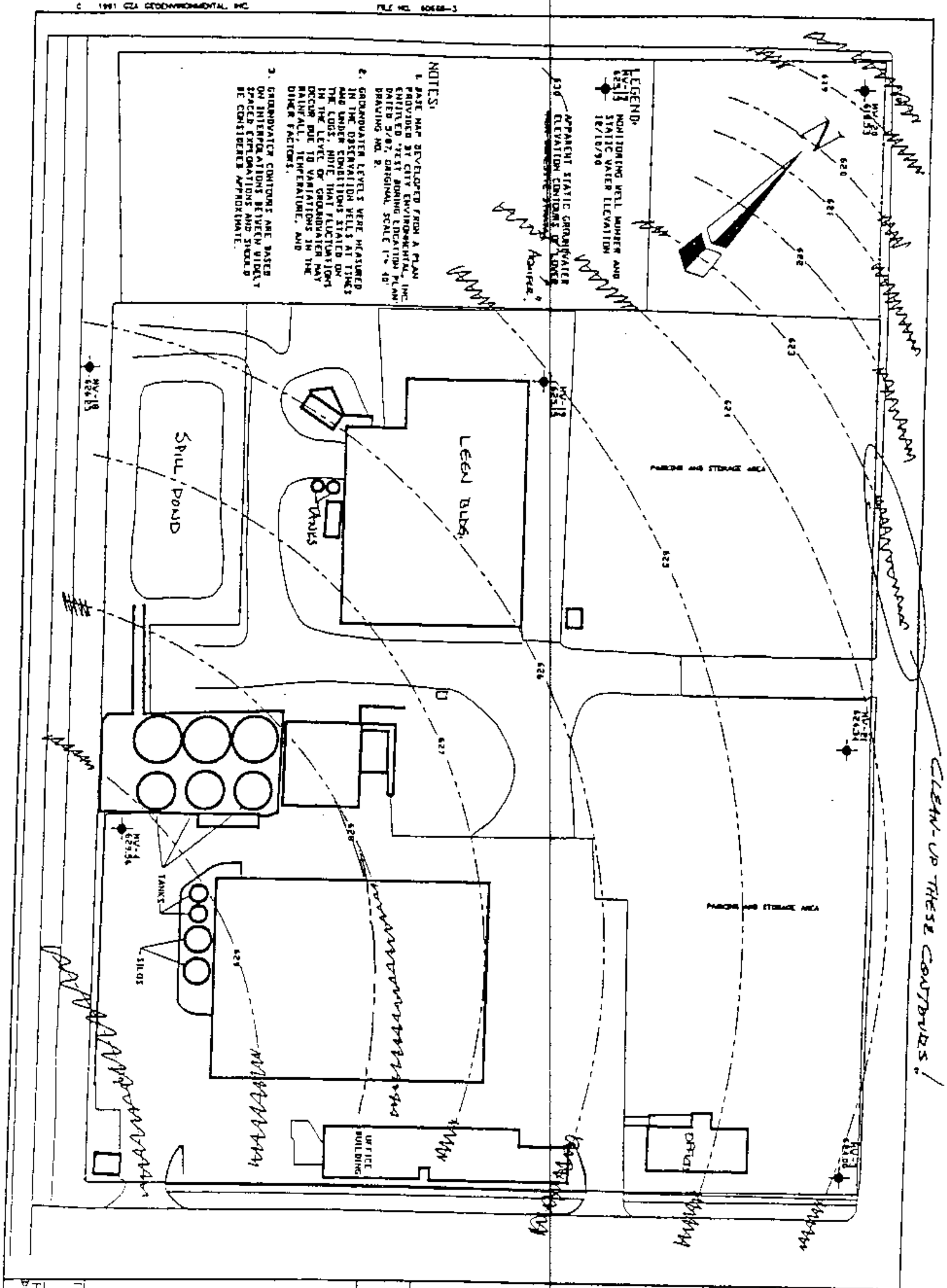
GZA GeoEnvironmental, Inc.

CITY ENVIRONMENTAL, INC.
FREDERICK STREET
DETROIT, MICHIGAN

GROUNDWATER CONTUORS
"UPPER AQUIFER"

PROJECT NO. 60669

FIGURE NO. / DRAWING 14



PROJECT NO. 60669	CITY ENVIRONMENTAL, INC. FREDERICK STREET DETROIT, MICHIGAN	REV. NO.	DESCRIPTION	BY / DATE
FIGURE NO. Drawing 15	GROUNDWATER CONTOURS & LOWER "AQUIFER" ~~STRATA~~	SCALE IN FEET 0 30 60 120 APPROXIMATE	DESIGNED BY: CHECKED BY: REVIEWED BY:	DRAWN BY: AK SCALE: 1" = 60' DATE: 1/23/91

GZA GeoEnvironmental, Inc.

APPENDIX 3A
SUBSURFACE INVESTIGATION

BORING LOGS

EXPLANATION

BORING LOG TERMINOLOGY

GENERAL

PP	- Compressive strength as determined by penetrometer
TV	- Compressive strength as determined by torvane
Gravel	- From 1/4 inch to 3 inches in diameter
Cobble	- From 3 to 12 inches in diameter
Boulder	- Greater than 12 inches in diameter
60°	- Represents 60 degrees measured from a plane perpendicular to the longitudinal axis of the core
Trace	- Represents 0 to 10 per cent by volume
Some	- Represents 10 to 25 per cent by volume
N Value	- Indicates the number of blows required to drive a standard split spoon sampler 12 inches with a 140-pound weight falling 30 inches
REC	- Recovery indicates total amount of core recovered for each run. Expressed as a percentage of the total length of the core run
RQD	- A modified core recovery in which all pieces of sound core over 4 inches in length are counted as recovery. The modified sum of core recovered is then expressed as a percentage of the total length of the core run
---	- Dashed line in classification column indicates approximate or gradational change

WEATHERING

Fresh	- The rock shows no discoloration, loss of strength, or any other effect due to weathering (unweathered rock)
Slightly Weathered	- Rock is slightly discolored with a slightly lower strength than unweathered rock
Moderately Weathered	- Rock is considerably discolored with a significantly lower strength than unweathered rock
Highly Weathered	- Rock is discolored and weakened so intensely that 2-inch diameter rock cores can be broken readily by hand. Wet strength is usually much lower than dry strength

BEDDING

Laminated	- Less than 0.001 foot to 0.01 foot (.1 inch)
Thin Bedded	- 0.01 foot to 0.1 foot (.1 to 1.2 inches)
Medium Bedded	- 0.1 foot to 1.0 foot (1.2 to 12 inches)
Thick Bedded	- Greater than 1.0 foot
Massive	- Denotes no discernible internal bedding structure

SAMPLE SYMBOLS

Bag or Grab Sample	California	Piston	Pitcher	Split Barrel	Thin Wall
					

CLIENT	Combustion Engineering, Inc.
PROJECT	Resource Recovery Project
PROJECT NO.	10031
PROJECT LOCATION	Detroit, Michigan
COORDINATES	
ELEVATION (DATUM)	=155.5 (city)
TOTAL DEPTH	50.0
DATE START	3-1-82
SURFACE CONDITIONS	Flat w/some old fdns & scattered piles of refuse
INSPECTOR	E. W. Meyer
DATE FINISH	3-1-82
CHECKED BY	L. J. Almaleh
APPROVED BY	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	SET 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	1	10	12	6	18	1.1		Cinders; black & light brown; medium dense; fine to gravel size; moist; w/some fine sand; trace coal (Fill)	Boring advanced w/7" diameter continuous flight auger
SPT	2	3	6	8	14	1.0		Sandy Clay; black to olive; stiff; moist; w/some silt [CL] (Top soil)	
SPT	3	8	10	14	24	1.5		Silty Clay; gray & yellowish-brown; stiff; moist; w/trace fine to coarse sand [CL] (Weathered Till) grading very stiff @ 6.5'	
SPT	4	11	16	19	35	1.3	10	Silty Clay; yellowish-brown; hard; moist; w/trace fine to coarse sand & 1/4" to 3/4" gravel; 0.05' sand seam @ 10.2' [CL] (Weathered Till)	Set 4" diameter steel casing to 10.0'
SPT	5	7	10	14	24	1.2		grading gray & yellowish-brown; very stiff; gravel 1/4" to 1"	Boring continued w/3-7/8" diameter tricone roller bit using water as drilling fluid
SPT	6	5	10	13	23	1.2	20	Silty Clay; gray; very stiff; moist; w/trace medium to coarse sand & 1/4" to 1" gravel [CL] (Fresh Till)	
SPT	7	5	9	14	23	1.2		gravel grades 1/4" to 1/2"	
	8					2.4	30		PP=7000 psf

BLACK & VEATCH
CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
roit, Michigan		=155.5 (city)	50.0	3-1-82

SURFACE CONDITIONS	INSPECTOR	DATE FINISH
Flat w/some old fdns & scattered piles of refuse	E. W. Meyer	3-1-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE	SAMPLE NUMBER	1ST 6"	2ND 6"	3RD 6"	N VALUE	SAMPLE RECOV.	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
									Boring advanced w/3-1/8" diameter tricone roller bit using water as drilling fluid
SPT	9	5	9	11	20	1.3			
SPT	10	4	6	10	16	0.8	40		
SPT	11	4	7	11	18	1.1		Clayey Sand; gray; medium dense; fine to coarse grained; moist; w/trace silt & 1/4" gravel [SC]	
								Sand; grayish-brown; medium dense; fine to coarse grained; w/trace clay & 1/4" gravel [SP]	
SPT	12	7	17	11	28	1.4		Clayey Sand; gray; medium dense; fine to coarse grained; moist; w/trace silt & 1/4" gravel [SC]	
							50		Bottom of boring @ 50.0'
									Water level not recorded
									Boring grouted to the ground surface using 2 sacks of cement
							60		

CORING: CORE SIZE | RUN NUMBER | RUN LENGTH | RUN RECOV. | RQD RECOV. | PERCENT RECOV. | RQD

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
roit, Michigan		=154.5 (city)	50.0	2-17-82

ACE CONDITIONS	INSPECTOR	DATE FINISH
rlat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-17-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
								Cinders; black; medium dense; medium to coarse grained; moist (Fill)	Boring advanced w/7" O.D., 3-1/4" I.D., hollow stem auger
SPT	1	2	4	6	10	1.1		Silty Clay; gray & yellowish-brown; stiff; moist; w/trace fine to coarse sand & 1/4" gravel [CL] (Weathered Till)	
SPT	2	4	5	6	11	1.1			
SPT	3	8	12	18	30	1.3		Silty Clay; brown; very stiff; moist; w/trace coarse sand & 1/4" to 3/4" gravel [CL] (Weathered Till)	
SPT	4	12	17	21	38	1.3	10		
SPT	5	11	18	23	41	1.4		Silty Clay; hard; moist; w/trace medium to coarse sand & 1/4" to 3/4" gravel [CL] (Fresh Till)	
SPT	6	6	9	12	21	1.2	20	grading very stiff	
TW	7					2.0			PP=6000 psf
SPT	8	6	9	11	20	1.3	30		

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
Detroit, Michigan		=154.5 (city)	50.0	2-17-82

SURFACE CONDITIONS	INSPECTOR	DATE FINISH
Flat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-17-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE	SAMPLE NUMBER	1ST 6"	2ND 6"	3RD 6"	N VALUE	SAMPLE RECOV.	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	5	7	11	18	1.5			
SPT	10	5	7	9	16	1.3	40		
								Clayey Sand; gray; medium dense; fine to coarse grained; moist; trace 1/4" gravel; interbedded w/ Silty Clay; very stiff; moist; w/trace fine to coarse sand & 1/4" to 1/2" gravel [SC & CL]	
SPT	11	6	9	9	18	1.3			
SPT	12	9	7	7	14	1.4	50		Bottom of boring @ 50.0' Water level not recorded Boring grouted to the ground surface using 5 sacks of cement
							60		

CORING: CORE SIZE, RUN NUMBER, RUN LENGTH, RUN RECOV., RQD RECOV., PERCENT RECOV., RQD

CONSULTING ENGINEERS

LOG OF BORING

CLIENT: Combustion Engineering, Inc.	PROJECT: Resource Recovery Project		PROJECT NO.: 10031
PROJECT LOCATION: Detroit, Michigan	COORDINATES:	ELEVATION (DATUM): =154.4 (city) / TOTAL DEPTH: 50.0	DATE START: 2-26-82
SURFACE CONDITIONS: Flat w/some old fdns & scattered piles of refuse	INSPECTOR: E. W. Meyer		DATE FINISH: 2-26-82
CHECKED BY: L. J. Almaleh	APPROVED BY: R. H. Herzog		

SAMPLE SIZE (CORE SIZE)	SAMPLE NUMBER (RUN NUMBER)	SET 6" (RUN LENGTH)	2ND 6" (RUN RECOV.)	3RD 6" (RQD RECOV.)	N VALUE (PERCENT RECOV.)	SAMPLE RECOV. (RQD)	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	1	2	2	2	4	0.0		Cinders; black & red; very loose; fine to coarse grained; moist; w/some fine to gravel size bricks (Fill)	Boring advanced w/7" diameter continuous flight auger Water encountered @ 3.0'
SPT	2	1	0	1	1	0.0		Silty Clay; greenish-gray; soft; wet [CL] (Fill)	
SPT	3	7	10	14	24	1.2		Silty Clay; mottled gray & yellowish brown; stiff; moist w/trace fine to coarse sand [CL] (Weathered Till)	
SPT	4	7	13	17	30	1.3	10		Set 4" diameter steel casing to 10.0'
								grading very stiff; w/trace 1/4" to 3/4" gravel	Boring continued w/3-7/8" diameter tricone roller bit using water as drilling fluid
SPT	5	9	13	19	32	1.1		grading yellowish-brown	
								grading gray & yellowish-brown; hard	
								Silty Clay; gray; very stiff; moist; w/trace medium to coarse sand & 1/4" to 3/4" gravel [CL] (Fresh Till)	
SPT	6	6	9	15	24	1.2	20		
SPT	7	5	8	12	20	1.1		.01' sand seam @ 25.1'	
SPT	8	4	7	9	16	1.3	30	.01' sand seam @ 30.4'	

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
troit, Michigan		=154.4 (city)	50.0	2-26-82

SURFACE CONDITIONS	INSPECTOR	DATE FINISH
Flat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-26-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

Sample Size	Sample Number	1st 6"	2nd 6"	3rd 6"	N Value	Sample Recov.	Depth in Feet	Classification of Material	Remarks
TW	9					2.4		gravel grades to 1/4" to 1-1/2"	PP=5000 psf Boring continued w/3-1/8" diameter tricone roller bit using water as drilling fluid
SPT	10	5	6	8	14	0.0	40	grading stiff; gravel grades 1/4" to 1/2"	
SPT	11	8	9	13	22	0.8		Clayey Sand; gray; medium dense; fine to gravel size; moist; w/trace silt [SC]	
SPT	12	4	7	8	15	0.0	50	Silty Clay; gray; stiff; moist; w/some sand; trace 1/4" to 1/2" gravel [CL] (Till)	
							60		Bottom of boring @ 50.0' Water level not recorded Boring grouted to the ground surface using 2 sacks of cement

BLACK & VEATCH
CONSULTING ENGINEERS

LOG OF BORING

CLIENT: Combustion Engineering, Inc.			PROJECT: Resource Recovery Project			PROJECT NO.: 10031
PROJECT LOCATION: Detroit, Michigan		COORDINATES:	ELEVATION (DATUM): =155.0 (city)		TOTAL DEPTH: 50.0	DATE START: 2-26-82
SURFACE CONDITIONS: Flat w/some old fdns & scattered piles of refuse			INSPECTOR: E. W. Meyer			DATE FINISH: 2-26-82
		CHECKED BY: L. J. Almaleh		APPROVED BY: R. H. Herzog		

SAMPLE SIZE	SAMPLE NUMBER	1ST 6"	2ND 6"	3RD 6"	N VALUE	SAMPLE RECOV.	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	1	10	13	13/2"	26/8"	1.2		Cinders; black; dense; fine to gravel sized; moist; w/some fine to gravel size red brick (Fill)	Boring advanced w/7" diameter continuous flight auger
SPT	2	6	6	8	14	1.4		Silty Clay; yellowish-brown; stiff; moist mixed w/Cinders; black; medium dense; fine to coarse grained; moist; w/trace red brick [CL & SP] (Fill)	
SPT	3	5	6	7	13	1.2		Brick grades out 6.5'	
SPT	4	3	4	5	9	0.5	10	Cinders grading loose 9.0'	
SPT	5	1	2	3	5	0.7		Silty Clay; greenish gray; firm; moist; w/trace coarse cinders & wood [CL] (Fill)	
SPT	6	5	10	13	23	1.0	20	Silty Clay; gray; very stiff; moist; w/trace medium to coarse sand & 1/4" to 1/2" gravel [CL] (Fresh Till)	Set 4" diameter steel casing to 20.0'
SPT	7	7	11	14	25	0.6		gravel grades 1/4" to 1.5"	High blow counts caused by stone in tip of split spoon Boring continued w/3-7/8" diameter tricone roller bit using water as drilling fluid
SPT	8	5	7	10	17	1.5	30	gravel grades 1/4" to 1/2"	

CORING: CORE SIZE | RUN NUMBER | RUN LENGTH | RUN RECOV. | RQD RECOV. | PERCENT RECOV. | RQD

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
Detroit, Michigan		=155.0 (city)	50.0	2-26-82

[SURF]ACE CONDITIONS	INSPECTOR	DATE FINISH
[illegible]t w/some old fdns & scattered piles of refuse	E. W. Meyer	2-26-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	5	6	9	15	1.4		grading stiff	
TW	10					2.4	40	Sandy Clay; gray; very stiff; moist; w/trace silt & 1/4" to 1/2" gravel; interbedded w/Clayey Sand; gray; fine to coarse grained; moist; w/trace silt & 1/4" to 1/2" gravel [CL & SC] (Till)	PP=5900 psf
								Sand; gray; medium dense; fine to coarse grained; moist; w/trace clay, silt & 1/4" gravel [SP]	
SPT	11	6	9	12	21	1.3			
								Silty Clay; gray; very stiff; moist; w/trace sand & 1/4" to 1/2" gravel [CL] (Till)	—
SPT	12	6	9	11	20	1.3	50		Bottom of boring at 50.0'
									Water level not recorded
									Boring grouted to the ground surface using 3 sacks of cement
							60		

CONSULTING ENGINEERS

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
Detroit, Michigan		=154.4 (city)	150.0	2-17-82

SURFACE CONDITIONS	INSPECTOR	DATE FINISH
. w/some old fdns & scattered piles of refuse	E. W. Meyer	2-23-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLING

SAMPLE SIZE	SAMPLE NUMBER	1ST 6"	2ND 6"	3RD 6"	N VALUE	SAMPLE RECOV.
SPT	1	16	9	7	16	1.1
SPT	2	6	6	6	12	0.9
SPT	3	4	6	8	14	0.8
SPT	4	8	11	15	26	1.3
TW	5					0.0
SPT	6	5	9	14	23	1.2
SPT	7	5	7	10	17	1.1
	8	5	8	10	18	0.0

CORING: CORE SIZE | RUN NUMBER | RUN LENGTH | RUN RECOV. | RQD RECOV. | PERCENT RECOV. | RQD

DEPTH IN FEET: 10, 20, 30

CLASSIFICATION OF MATERIAL	REMARKS
Cinders; black; medium dense; medium to coarse grained; w/trace brick & glass (Fill)	Boring advanced w/7" diameter continuous flight auger
Silty Clay & Clay; brown & gray; stiff; moist; w/trace roots & cinders [CL] (Fill)	
Silty Clay; gray & yellowish-brown; stiff; moist; w/trace roots & 1/2" gravel [CL] (Weathered Till)	
Silty Clay; brown & gray; very stiff; moist; w/trace fine to coarse sand & 1/4" gravel [CL] (Weathered Till)	Boring continued w/3-7/8" diameter tricone roller bit using water as drilling fluid
grading gray & yellowish-brown gravel grades 1/4" to 1/2"	
Silty Clay; gray; very stiff; moist; w/trace medium to coarse sand & 1/4" to 1/2" gravel [CL] (Fresh Till)	
	Used EZ-mud as drilling fluid

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
-roit, Michigan		=154.4 (city)	150.0	2-17-82

CE CONDITIONS	INSPECTOR	DATE FINISH
F.at w/some old fdns & scattered piles of refuse	E. W. Meyer	2-23-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	5	6	10	16	1.4			
							40	Clayey Sand; gray; medium dense; fine to coarse grained; moist; w/ trace silt & cobbles [SC]	
SPT	10	11	13	13	26	1.1			
SPT	11	22	43	-	65	1.0	50	grading very dense	
								Silty Clay; gray; very stiff; moist; w/trace medium to coarse grained sand & 1/4" to 1/2" gravel; 0.2' pocket of gravel [CL] (Till)	
SPT	12	7	10	12	22	0.0			
✓	13					1.8	60		PP=3750 psf

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
troit, Michigan		=154.4 (city)	150.0	2-17-82

FACE CONDITIONS	INSPECTOR	DATE FINISH
flat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-23-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	14	5	6	8	14	1.4		grading gray & light red; stiff; sand grades to some	
TW	15					2.0	70		
SPT	16	6	7	8	15	1.5			
SPT	17	3	5	6	11	0.3	80	sand grades to trace	
SPT	18	4	6	6	12	0.3			
TW	19					2.3	90		PP=3000 psf

CONSULTING ENGINEERS

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
~~troit, Michigan		≈154.4 (city)	150.0	2-17-82

~~ACE CONDITIONS	INSPECTOR	DATE FINISH
~~t w/some old fdns & scattered piles of refuse	E. W. Meyer	2-23-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE	SAMPLE NUMBER	1ST 6"	2ND 6"	3RD 6"	N VALUE	SAMPLE RECOV.	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	20	3	5	7	12	1.7		grading w/trace 1/4" gravel	
SPT	21	3	5	7	12	1.5	100	sand grades medium to coarse grained	Using a mix of EZ-mud & bentonite as drilling fluid
SPT	22	5	8	10	18	0.5		grading very stiff	
									Using bentonite mud as drilling fluid
							110	gravel grades out	
SPT	23	7	9	10	19	0.9			Set 4" diameter steel casing to 56.5'
							120		

CORING columns: CORE SIZE, RUN NUMBER, RUN LENGTH, RUN RECOV., RQD RECOV., PERCENT RECOV., RQD; SAMPLE TYPE; GRAPHIC LOG

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
...roit, Michigan		±154.4 (city)	150.0	2-17-82

...E CONDITIONS	INSPECTOR	DATE FINISH
F... w/some old fdns & scattered piles of refuse	E. W. Meyer	2-23-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	24	8	8	10	18	0.9		grading w/trace 1/4" to 1/2" gravel	
SPT	25	10	11	13	24	1.5			
TW	26					2.2	130		Boring advanced w/3-1/8" diameter tricone roller bit using bentonite mud as drilling fluid
SPT	27	6	7	9	16	1.3			
SPT	28	5	9	10	19	1.5	140		
								Silty Clay; gray; hard; moist; w/trace fine to coarse sand & 1/4" to 1-1/2" gravel (CL) (Till)	High blow counts caused by stone in end of split spoon
SPT	29	70	115	-	185	1.0			
T	30	26	43	64	107	1.4	150	grading w/vertical pocket of coarse sand-0.4' long	

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
Detroit, Michigan		=154.4 (city)	150.0	2-17-82

SITE CONDITIONS	INSPECTOR	DATE FINISH
Flat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-23-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLING: SAMPLE SIZE	SAMPLE NUMBER	SET 6"	2ND 6"	3RD 6"	N VALUE	SAMPLE RECOV.	DEPTH IN FEET	SAMPLE TYPE	GRAPHIC LOG	CLASSIFICATION OF MATERIAL	REMARKS
CORING: CORE SIZE	RUN NUMBER	RUN LENGTH	RUN RECOV.	RQD RECOV.	PERCENT RECOV.	RQD					
											Bottom of boring @ 150.0' Water level not recorded Boring grouted to the ground surface using 4 sacks of cement
							160				
							0				
							0				

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
roit, Michigan		=154.6 (city)	150.0	2-23-82

CE CONDITIONS	INSPECTOR	DATE FINISH
Flat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-25-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLING: SAMPLE SIZE / SAMPLE NUMBER / 1ST 6" / 2ND 6" / 3RD 6" / N VALUE / SAMPLE RECOV.

CORING: CORE SIZE / RUN NUMBER / RUN LENGTH / RUN RECOV. / RQD RECOV. / PERCENT RECOV. / RQD

Sample Size	Sample Number	1st 6"	2nd 6"	3rd 6"	N Value	Sample Recov.	Depth in Feet	Classification of Material	Remarks
SPT	1	15/4"	-	-	15	0.4		Cinders; black; medium dense; fine to coarse grained; moist; w/trace bricks (Fill)	Boring advanced w/7" diameter continuous flight auger
SPT	2	2	2	2	4	1.1		grading w/trace wood	
SPT	3	8	8	2	10	1.0		Silty Clay; yellowish-brown; stiff; moist [CL] (Fill)	
								Cinders; black; loose; medium to coarse grained; wet (Fill)	
SPT	4	8	13	16	29	1.5	10	Sandy Clay; gray; very soft; wet [CL] (Fill)	
								Sand; yellowish-brown; medium dense; fine to coarse grained; moist; w/ trace clay & 1/4" to 1/2" gravel [SP]	
SPT	5	16	22	25	47	1.5		Silty Clay; grayish-brown to yellowish-brown; hard, moist; w/trace coarse sand [CL] (Weathered Till)	
TW	6					1.5	20	Silty Clay; gray; very stiff; moist; w/trace medium to coarse grained sand [CL] (Fresh Till)	PP=5500 psf
									Set 4" diameter steel casing to 22.0'
SPT	7	6	9	12	21	1.2		grading w/trace 1/4" to 1/2" gravel	Boring continued w/3-7/8" diameter tricone roller bit using water as drilling fluid
SPT	8	5	9	11	20	1.1	30		

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
..troit, Michigan		=154.6 (city)	150.0	2-23-82

..CE CONDITIONS	INSPECTOR	DATE FINISH
..t w/some old fdns & scattered piles of refuse	E. W. Meyer	2-25-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	9	4	7	9	16	1.1		gravel grades 1/4" to 1"	
SPT	10	4	7	8	15	1.1	40	grading stiff	
SPT	11	4	7	8	15	1.2		Sandy Clay; gray; stiff; moist; w/trace silt & 1/4" to 1" gravel [CL] (Till)	
TW	12					0.0	50		
SPT	13	5	8	11	19	0.0		grading very stiff	
.PT	14	5	7	10	17	1.5	60		

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
roit, Michigan		=154.6 (city)	150.0	2-23-82

ACE CONDITIONS	INSPECTOR	DATE FINISH
Flat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-25-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	SET 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	15	5	8	10	18	1.5			
SPT	16	6	10	12	22	1.3	70		
SPT	17	9	13	17	30	1.2		Silt; gray; medium dense; fine grained; moist;w/trace coarse sand [ML]	
								Silty Clay; gray; stiff; moist; w/trace to some fine to coarse grained sand; trace 1/4" to 1/2" gravel; 0.2' sand seam @ 79.1' [CL] (Till)	
SPT	18	5	5	7	12	1.5	80		
TW	19					2.4		sand grades to trace	PP=3500 psf
SPT	20	4	6	6	12	1.5	90		

CONSULTING ENGINEERS

LOG OF BORING

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
troit, Michigan		=154.6 (city)	150.0	2-23-82

FACE CONDITIONS	INSPECTOR	DATE FINISH
rlat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-25-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
SPT	21	5	7	7	14	1.5		.05' sand seam at 95.3'	
	22					2.4	100		PP=3500 psf
SPT	23	6	8	11	19	1.5			
SPT	24	6	8	12	20	1.5	110		
SPT	25	6	8	12	20	1.4			
TW	26					2.4	120		PP=4000 psf

CLIENT	PROJECT	PROJECT NO.
Combustion Engineering, Inc.	Resource Recovery Project	10031

PROJECT LOCATION	COORDINATES	ELEVATION (DATUM)	TOTAL DEPTH	DATE START
Detroit, Michigan		=154.6 (city)	150.0	2-23-82

SURFACE CONDITIONS	INSPECTOR	DATE FINISH
Flat w/some old fdns & scattered piles of refuse	E. W. Meyer	2-25-82

CHECKED BY	APPROVED BY
L. J. Almaleh	R. H. Herzog

SAMPLE SIZE / CORE SIZE	SAMPLE NUMBER / RUN NUMBER	1ST 6" / RUN LENGTH	2ND 6" / RUN RECOV.	3RD 6" / RQD RECOV.	N VALUE / PERCENT RECOV.	SAMPLE RECOV. / RQD	DEPTH IN FEET	CLASSIFICATION OF MATERIAL	REMARKS
									Boring advanced w/3-1/8" diameter tricone roller bit using water as drilling fluid
SPT	27	6	9	11	20	1.4		gravel grades 1/4" to 1"	
SPT	28	6	9	14	23	1.5	130		
SPT	29	6	8	11	19	1.5			
SPT	30	7	9	12	21	1.5	140	Hard Till	Based on drilling resistance
								Gravely Sand; light grayish-brown; very dense; fine to 1/2" grain size; moist [SP]	
SPT	31	37	51	52	103	1.0		Sand; light grayish-brown; very dense; fine to medium grained; moist [SP]	Bottom of boring @ 150.0'
								Silty Clay; dark gray; hard; moist; w/trace medium to coarse sand; 1/4" to 1/2" gravel; occasional 0.01' to 0.05' sand seams [CL] (Till)	Water level not recorded
SPT	32	38	76	174	250	0.7	150		Boring grouted to the ground surface using 4 sacks of cement

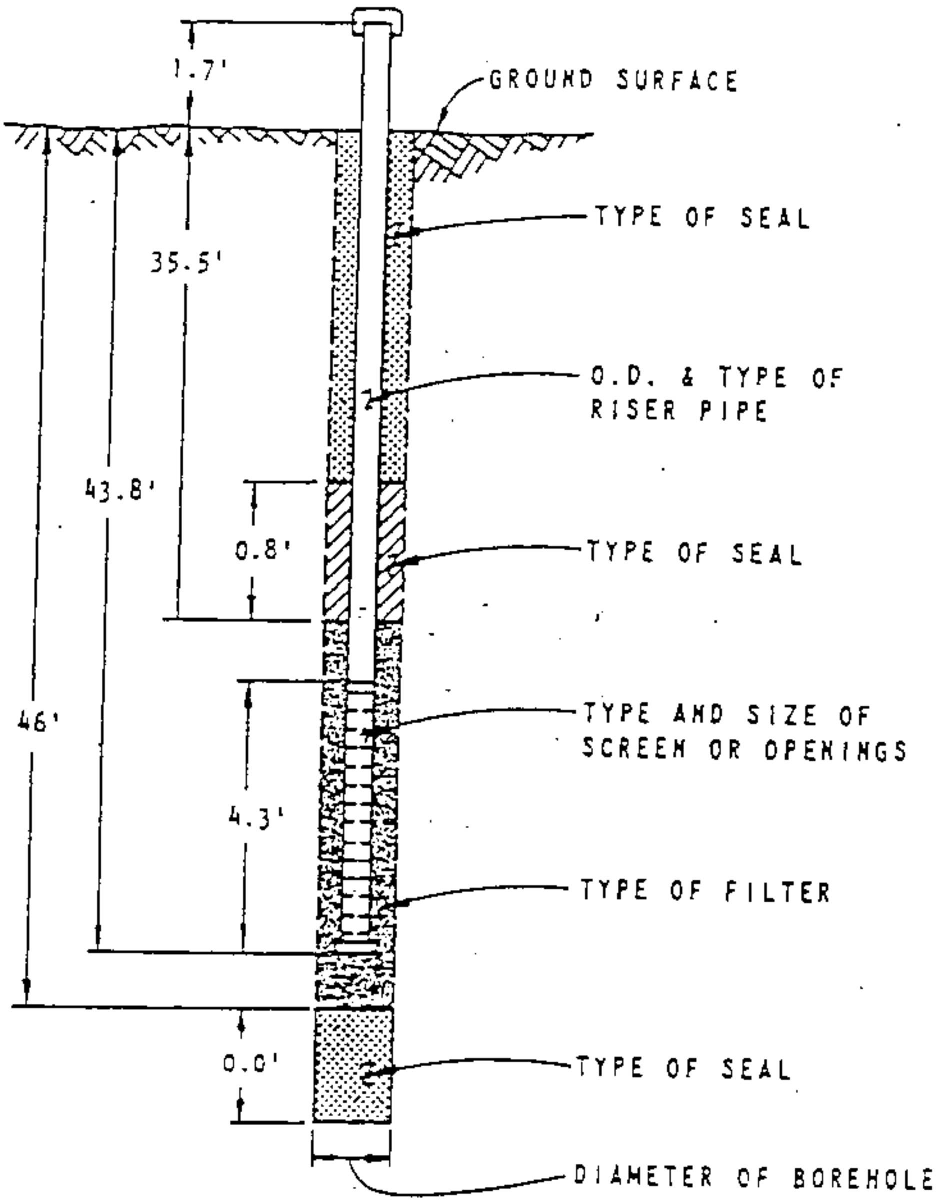
PIEZOMETER LOGS

BLACK & VEATCH
CONSULTING ENGINEERS

PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. 2

CLIENT		PROJECT	PROJECT NO
mbustion Engineering, Inc.		Resource Recovery Project	10031
ECT LOCATION	COORDINATES	GROUND ELEVATION	DATE
oit, Michigan	(offset 10' E)	=154.5 (city)	3-2-82
STRATUM MONITORED		INSPECTOR	
Sand; w/trace to some clay; interbedded w/clay		E. W. Meyer	
CHECKED BY		APPROVED BY	
L. J. Almaleh		R. H. Herzog	



TYPE OF SEAL	Sand-Cement Grout (w/aluminum powder)
O.D. & TYPE OF RISER PIPE	2" PVC
TYPE OF SEAL	Bentonite Pellets
TYPE AND SIZE OF SCREEN OR OPENINGS	0.01" Slots
TYPE OF FILTER	2NS Sand (Michigan Highway Standards)
TYPE OF SEAL	N.A.
DIAMETER OF BOREHOLE	4"

METHOD OF INSTALLATION:
Boring advanced to completion w/4" diameter continuous flight auger; screen & riser pipe placed; sand filter placed; bentonite seal placed; grouted to ground surface.

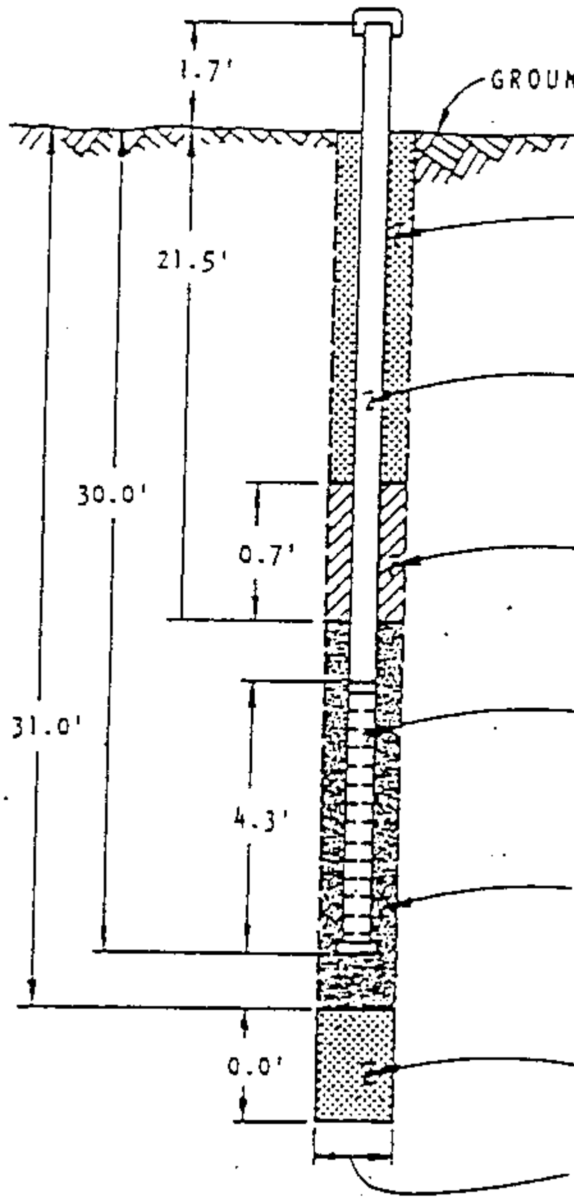
REMARKS

BLACK & VEATCH
CONSULTING ENGINEERS

PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. 3

CLIENT: ~~mbustion Engineering, Inc.		PROJECT: Resource Recovery Project	PROJECT NO: 10031
LOCATION: ~~t, Michigan	COORDINATES: (offset 10' E)	GROUND ELEVATION: =154.4 (city)	DATE: 3-2-82
STRATUM MONITORED: Silty Clay; w/an occasional sand seam		INSPECTOR: E. W. Meyer	
CHECKED BY: .. J. Almaleh		APPROVED BY: R. H. Herzog	



TYPE OF SEAL	Sand-Cement Grout (w/aluminum powder)
O.D. & TYPE OF RISER PIPE	2" PVC
TYPE OF SEAL	Bentonite Pellets
TYPE AND SIZE OF SCREEN OR OPENINGS	0.01" Slots
TYPE OF FILTER	2NS Sand – (Michigan Highway Standards)
TYPE OF SEAL	N.A.
DIAMETER OF BOREHOLE	4"

METHOD OF INSTALLATION: Boring advanced to completion w/4" diameter continuous flight auger; screen & riser pipe placed; sand filter placed; bentonite seal placed; grouted to grout surface; bailed until dry.

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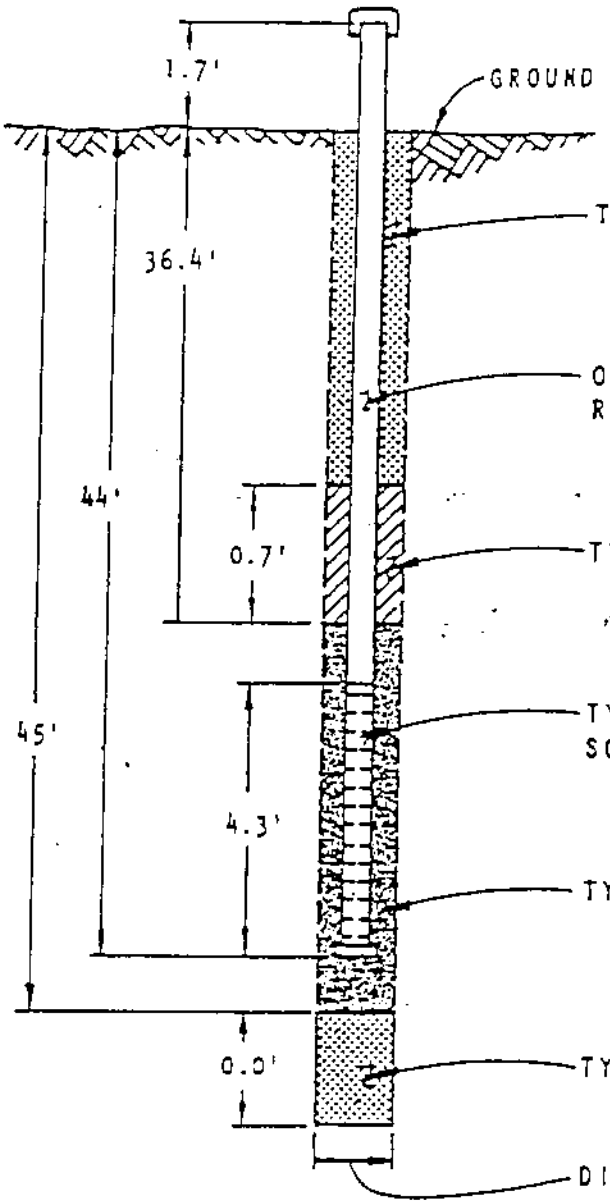
PIEZOMETER INSTALLATION LOG

PIEZOMETER NO. 5

CLIENT: ·mbustion Engineering, Inc.		PROJECT: Resource Recovery Project	PROJECT NO: 10031
··CT LOCATION: [illegible] ·it, Michigan	COORDINATES: (offset 10' SW)	GROUND ELEVATION: ≈154.4 (city)	DATE: 3-1-82
ST. ·UM MONITORED: Sand; w/trace to some clay (top of layer @ 40.5')		INSPECTOR: E. W. Meyer	
CHECKED BY: L. J. Almaleh		APPROVED BY: R. H. Herzog	



TYPE OF SEAL	Sand-Cement Grout (w/aluminum powder)
O.D. & TYPE OF RISER PIPE	2" PVC
TYPE OF SEAL	Bentonite Pellets
TYPE AND SIZE OF SCREEN OR OPENINGS	0.01" Slots
TYPE OF FILTER	2NS Sand (Michigan Highway Standards)
TYPE OF SEAL	N.A.
DIAMETER OF BOREHOLE	4"

METHOD OF INSTALLATION: Boring advanced to completion w/4" diameter continuous flight auger; screen and riser pipe placed; sand filter placed; bentonite seal placed; grouted to ground surface; bailed until water clear.

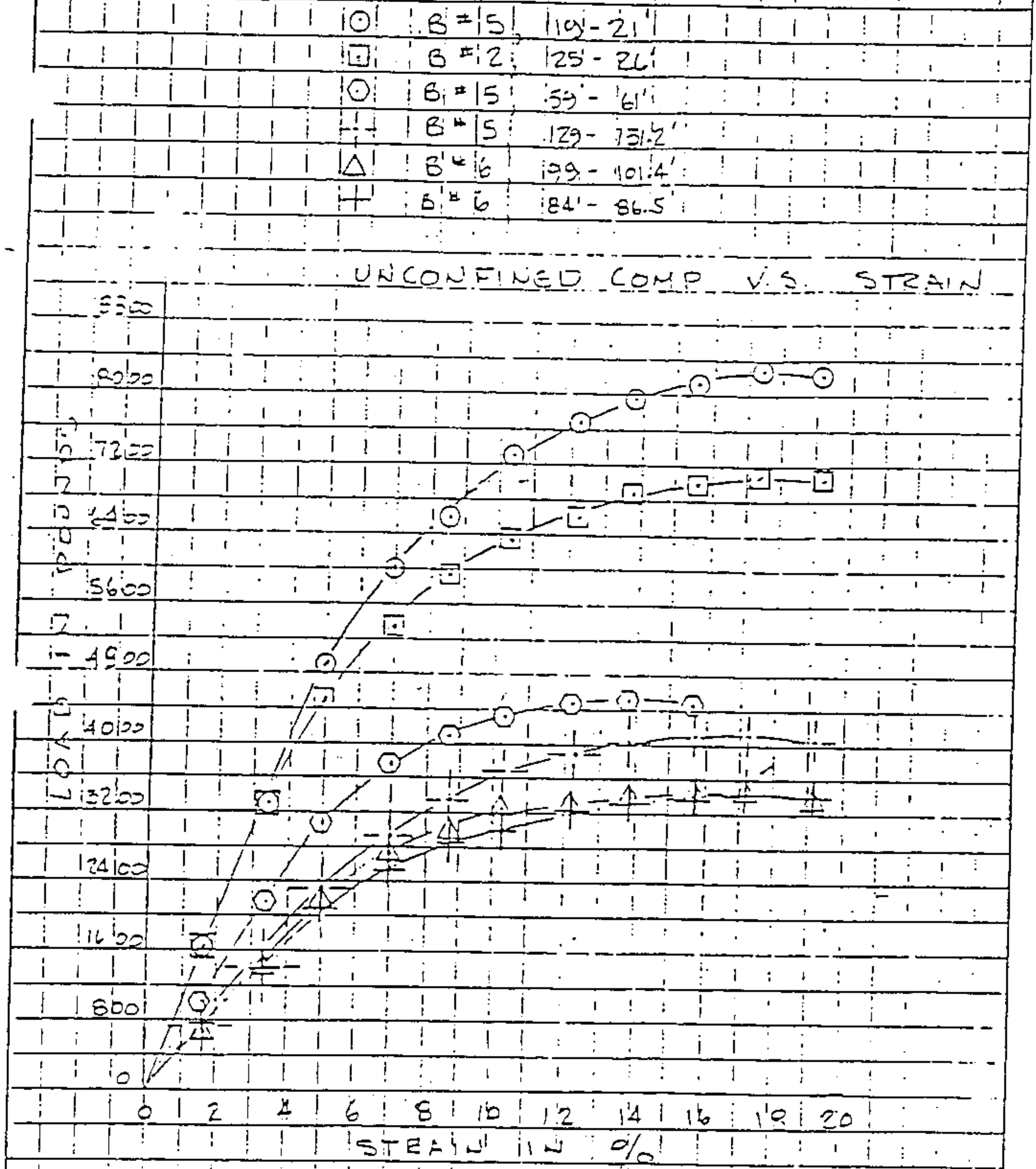
R·· ·KS.

LABORATORY TEST
RESULTS
by
MCDOWELL & ASSOCIATES

LABORATORY TEST RESULTS

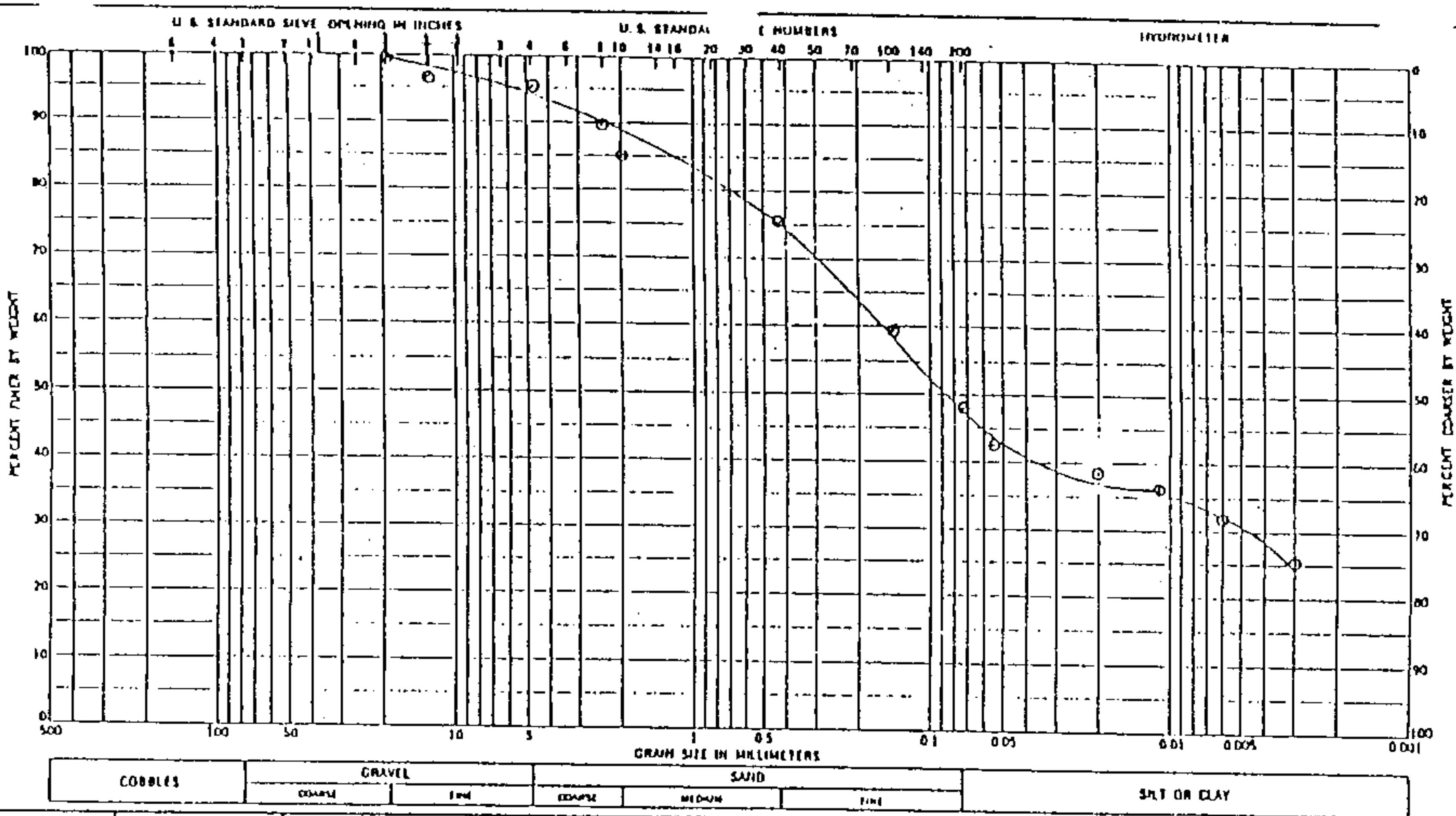
BORING	DEPTH	MOISTURE CONTENT %	DRY UNIT WEIGHT PCF	LIQUID LIMIT	PLASTIC LIMIT	GRAIN SIZE	UNCONFINED COMPRESSION PSF	STRAIN %
2	9'-10½'			27.7	16.2			
2	24'-26'	14.6	121.3				7083*	17.0
2	34'-35½'			26.6	15.7			
3	34'-36.4'	14.8	120.2					
4	39'-41.4'	14.2	120.6					
5	9'-10½'			29.8	17.5			
5	59'-61'	14.2	121.9				4500	13.9
5	104'-105½'			30.8	15.0			
5	129' to 131.2'	25.0	99.7				4133	17.0
6	19'-21'	13.5	122.1				8283	17.0
6	64'-65½'			25.3	15.4			
6	84'-86.4'	18.6	109.4				3433	17.0
6	89'-90½'			23.7	14.4			
6	99'-101.4'	19.2	110.8				3450	17.0
6	129' to 130½'			35.5	19.8			

* Checked with two (2) other samples - 6863 psf at 19%, 5817 psf at 17%.



McDOWELL & ASSOCIATES	
PROJECT:	Resource Recovery Russell and Ferry Detroit, Michigan
Job: 82-17	Date: 3-8-82

MTE-01

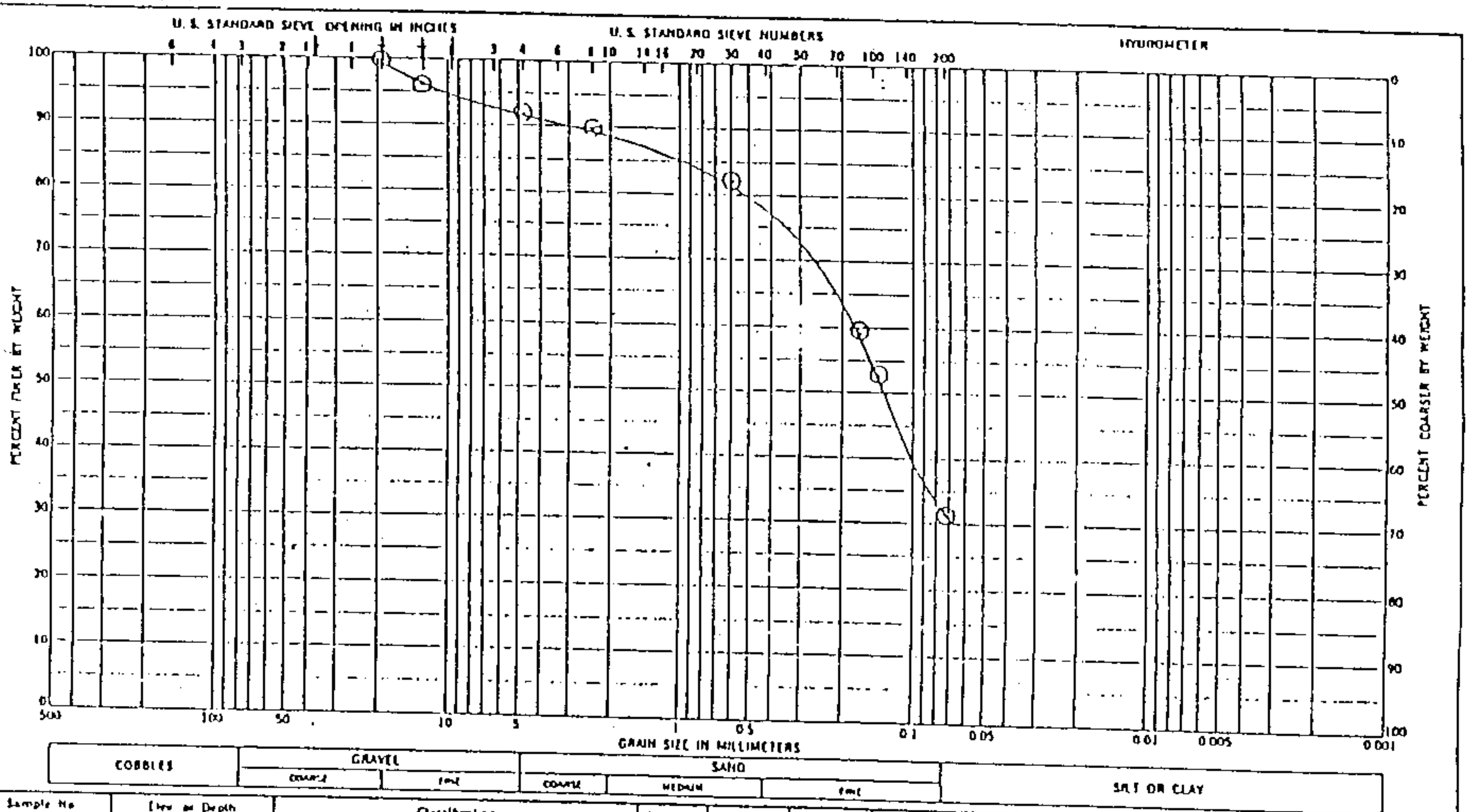


Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
Boring 3	44-45.5					

Project Resource Recovery
Russell and Ferry
Area Detroit, Michigan
Boring No. 3
Date 3-8-82 JOB NO. 82-17

GRADATION CURVES

ENG FORM 1 MAY 63 2087

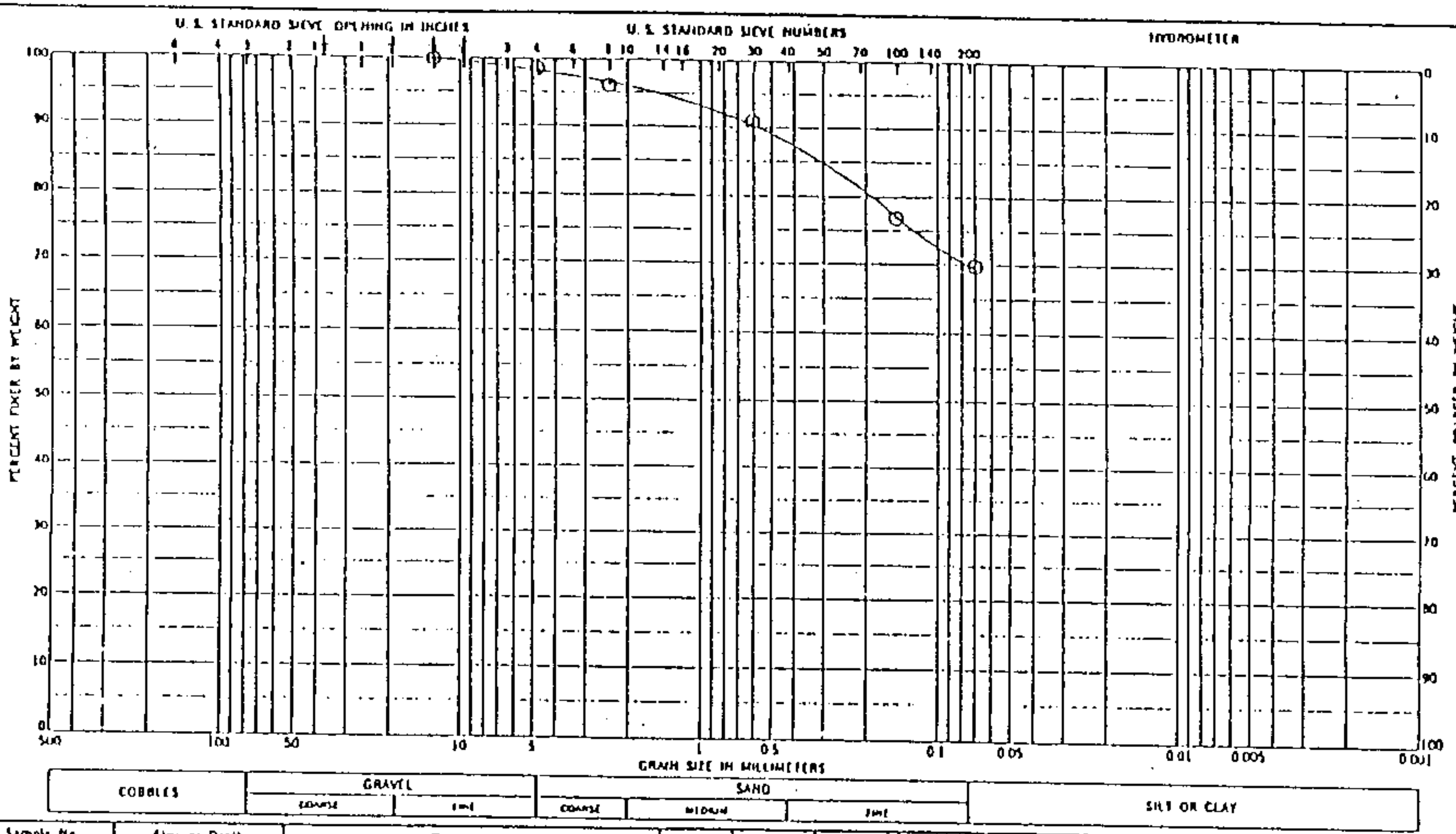


Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
Boring 5	44-45.5					

Project: Resource Recovery
Russell and Ferry
Area: Detroit, Michigan
Boring No. 5
Date: 3-8-02 JOB NO. 82-17

GRADATION CURVES

ENG FORM 2087



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
Boring 6	54-55.5					

Project: Resource Recovery
Russell and Ferry
Area: Detroit, Michigan
Boring No. 6
Date 3-8-82 JOB NO. 82-17

GRADATION CURVES

ENG FORM 1 MAY 63 2087

TRIAXIAL TEST

PROJECT : RESOURCE RECOVERY | JOB No : MA 82-17 (E?V 1CC??(S1)

LOCATION : DETROIT, MI | BORING No. : 51 | SAMPLE No. : 29-31

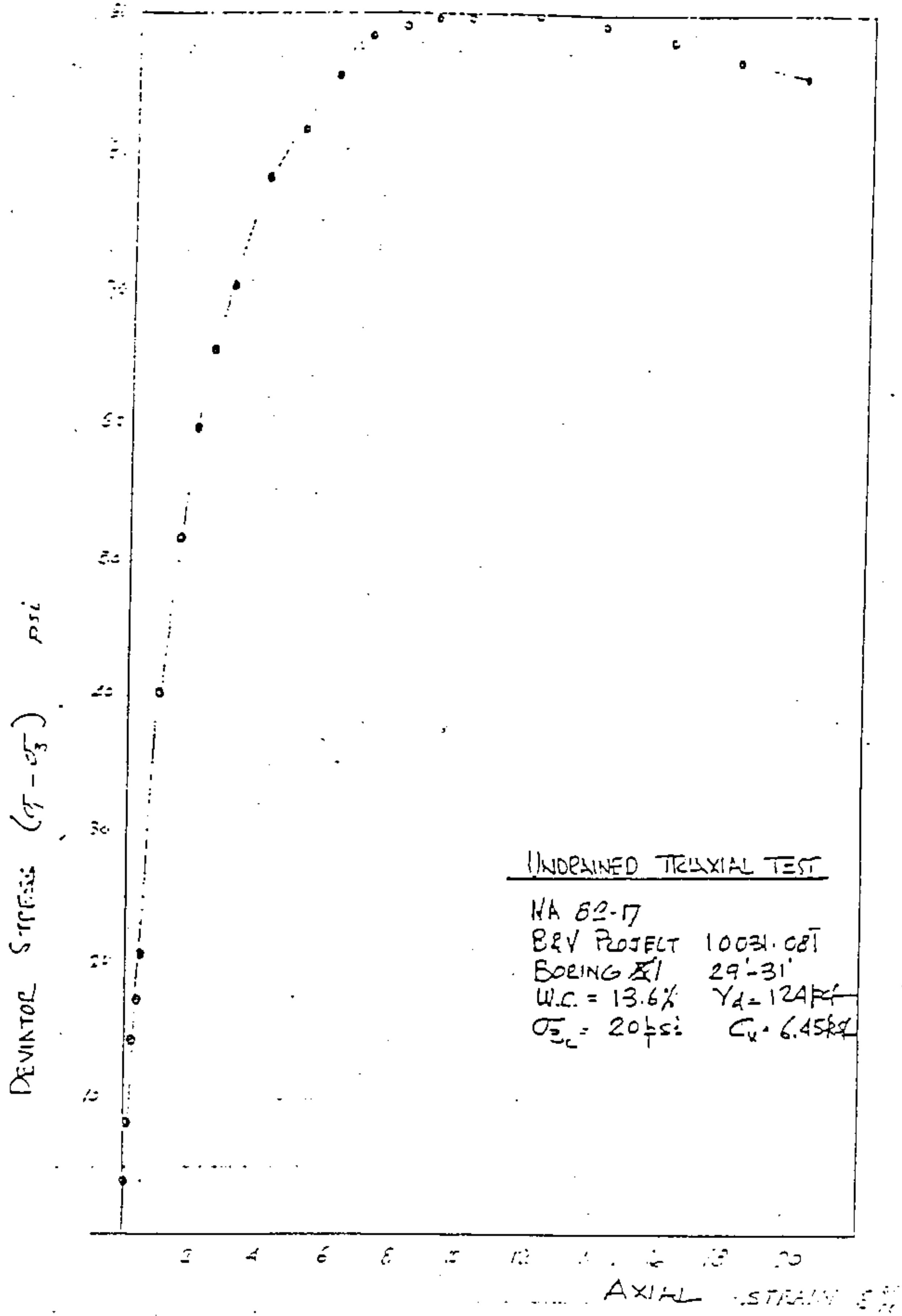
TYPE OF TEST : UU | DEPTH OF SAMPLE : 29'-31'

CELL PRESSURE : 20psi | DATE : 4/7/82 | BY : CES/AN

AREA A_o : [illegible] in^2 | LENGTH L_o : [illegible] | ε_f = 10%

ELAPSED TIME min.	STRAIN ε %	STRAIN DIAL READING in x 10^{-3}	ΔL in	PROVING RING READING DIV.	CORRECTED AREA A_c in^2	DEVIATOR STRESS $\sigma_1 - \sigma_3$ psi	UNDRAINED SHEAR STR.	REMARKS
	0	0	0.00	0		0		
	0.1	6.3	.0063	27		4.12		
	0.2	12.6	.0126	55		8.39		
	0.3	18.8	.0187	96		14.63		
	0.4	25.2	.0252	115		17.51		
	0.5	31.4	.0314	142		21.59		
	1.0	63	.0630	267		40.45		
	1.5	94.9	.0949	34-		51.79		
	2.0	125.7	.1256	[illegible]		59.91		
	2.5	157.3	.1573	[illegible]		65.57		
	3.0	178.8	.1886	[illegible]		70.42		
	4.0	251.[illegible]	.251[illegible]	[illegible]		78.[illegible]		
	5.0	314.6	.3146	57[illegible]		[illegible]		
	6.0	377.6	.3776	[illegible]		85.6[illegible]		
	7.0	440.5	.4405	621		85.27		
	8.0	503.4	.5034	633		89.[illegible]		
	9.0	566.3	.5663	64[illegible]		[illegible]		
	10.0	629.3	.6293	651	6.98	89.72	44.76	Cu 6.45 ksf
	12.0	755.1	.7551	66[illegible]		89.71		
	14.0	[illegible]	.88[illegible]	[illegible]		89.11		
	16.0	1008.7	1.0087	[illegible]		88.07		
	18.0	[illegible]	1.132	[illegible]		86.[illegible]		
	20.0	[illegible]	1.252	6[illegible]		85.3[illegible]		

STRAIN RATE : 1%/min | PROVING RING : 1 DIV = 0.966



DEVIATOR STRESS $(\sigma_1 - \sigma_3)$ psi
AXIAL STRAIN
UNDRAINED TRIAXIAL TEST
NA 82-17
B&V PROJECT 10031.08T
BORING A1 29'-31'
W.C. = 13.6% γ_d = 124 pcf
σ_{3c} = 20 psi C_u = 6.45 ksf

TRIAXIAL TEST

SEV 10031.031

PROJECT : RESOURCE RECOVERY JOB. No : MA 8247

LOCATION : DETROIT, MI BORING No.: 5 SAMPLE No.: 69-71

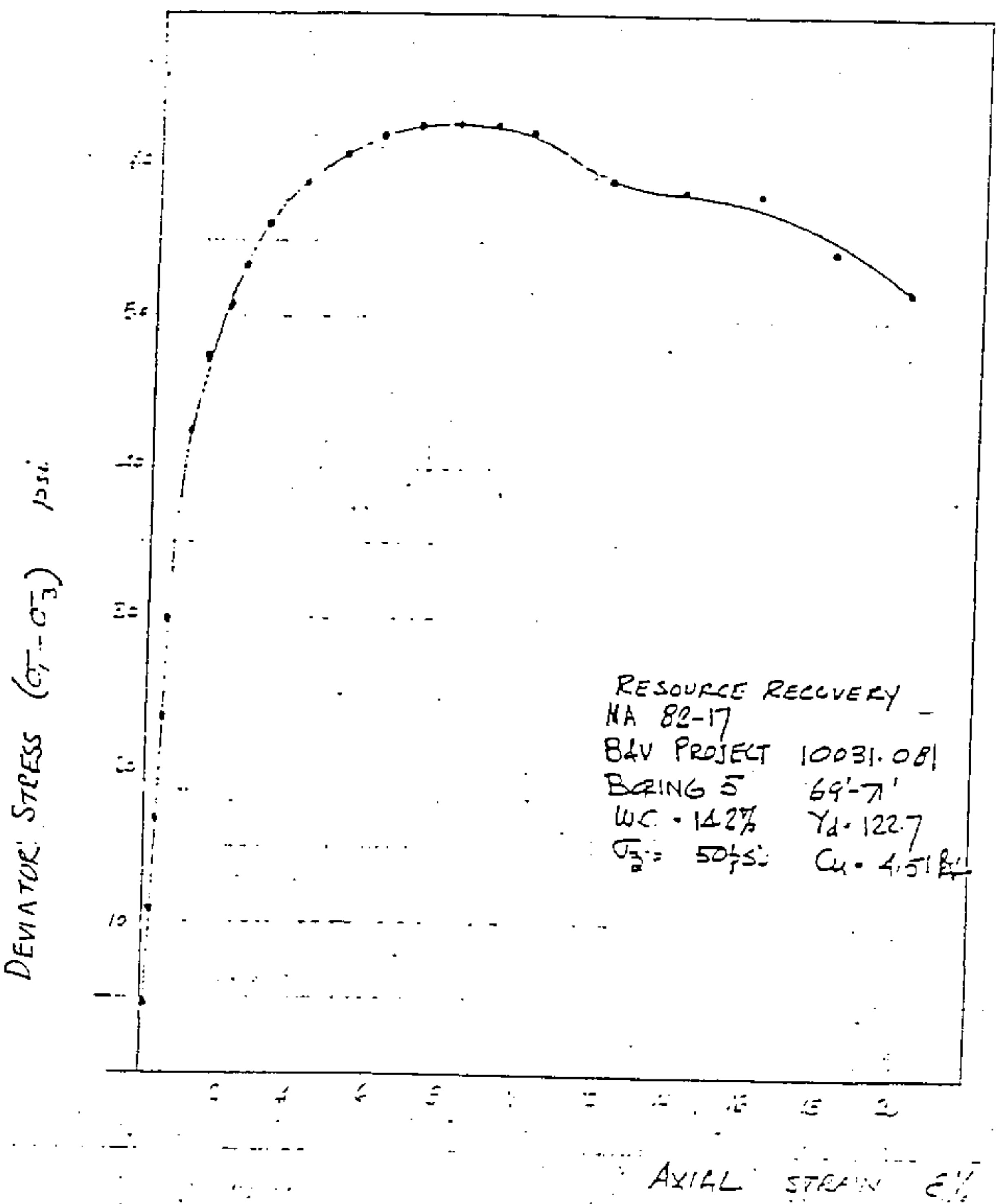
TYPE OF TEST : UU DEPTH OF SAMPLE: 69'-71'

CELL PRESSURE: 50 psi DATE: 4/7/82 BY: CCE/[illegible]

AREA A_o: 6.305 in² LENGTH L_o: 6.298" S_r = 95%

ELAPSED TIME min.	STRAIN ε %	STRAIN DIAL READING in x 10^{-3}	ΔL in	PROVING RING READING Div.	CORRECTED AREA A_c in²	DEVIATOR STRESS $\sigma_1 - \sigma_3$ psi	UNDRAINED SHEAR STR.	REMARKS
	0	0	0	0				
	0.1	6.3	.0063	29		4.73		
	0.2	12.6	.0126	73		11.02		
	0.3	18.5	.0189	114		16.85		
	0.4	25.2	.0252	155		23.46		
	0.5	31.4	.0314	190		30.00		
	1.0	63	.0630	271		42.16		
	1.5	94.9	.0949	313		45.42		
	2.0	125.8	.1258	340		50.78		
	2.5	157.3	.1573	362		53.85		
	3.0	188.8	.1888	374		56.30		
	4.0	251.7	.2517	406		59.02		—
	5.0	314.6	.3146	423		60.85		
	6.0	377.6	.3776	434		62.03		
	7.0	440.5	.4405	443		62.43		
	8.0	503.4	.5034	449		62.76		
	9.0	566.3	.5663	453	6.931	62.87	31.41	C_u = 4.51 ksf
	10.0	629.3	.6293	454		62.46		
	12.0	755.1	.7551	440		59.20		
	14.0	881	.5810	445		58.51		
	16.0	1006.8	1.0068	456		58.44		
	18.0	1132	1.132	434		54.54		
	20.0	1258	1.258	425		52.00		

STRAIN RATE : 1%/min PROVING RING: 1 Div. = 0.96 lb



DEVIATOR STRESS ($\sigma_1 - \sigma_3$) psi
10
RESOURCE RECOVERY
HA 82-17
B&V PROJECT 10031.081
BORING 5 69'-71'
W.C. - 14.2% γ_d - 122.7
σ_3 = 50 psi C_u - 4.51
AXIAL STRAIN ε%

TRIAXIAL TEST

E=V. 1002.081

PROJECT : RESOURCE RECOVERY   JOB. No : NA 82-17

LOCATION : DETROIT, MI   BORING No.: 5 SAMPLE No.: 89-91

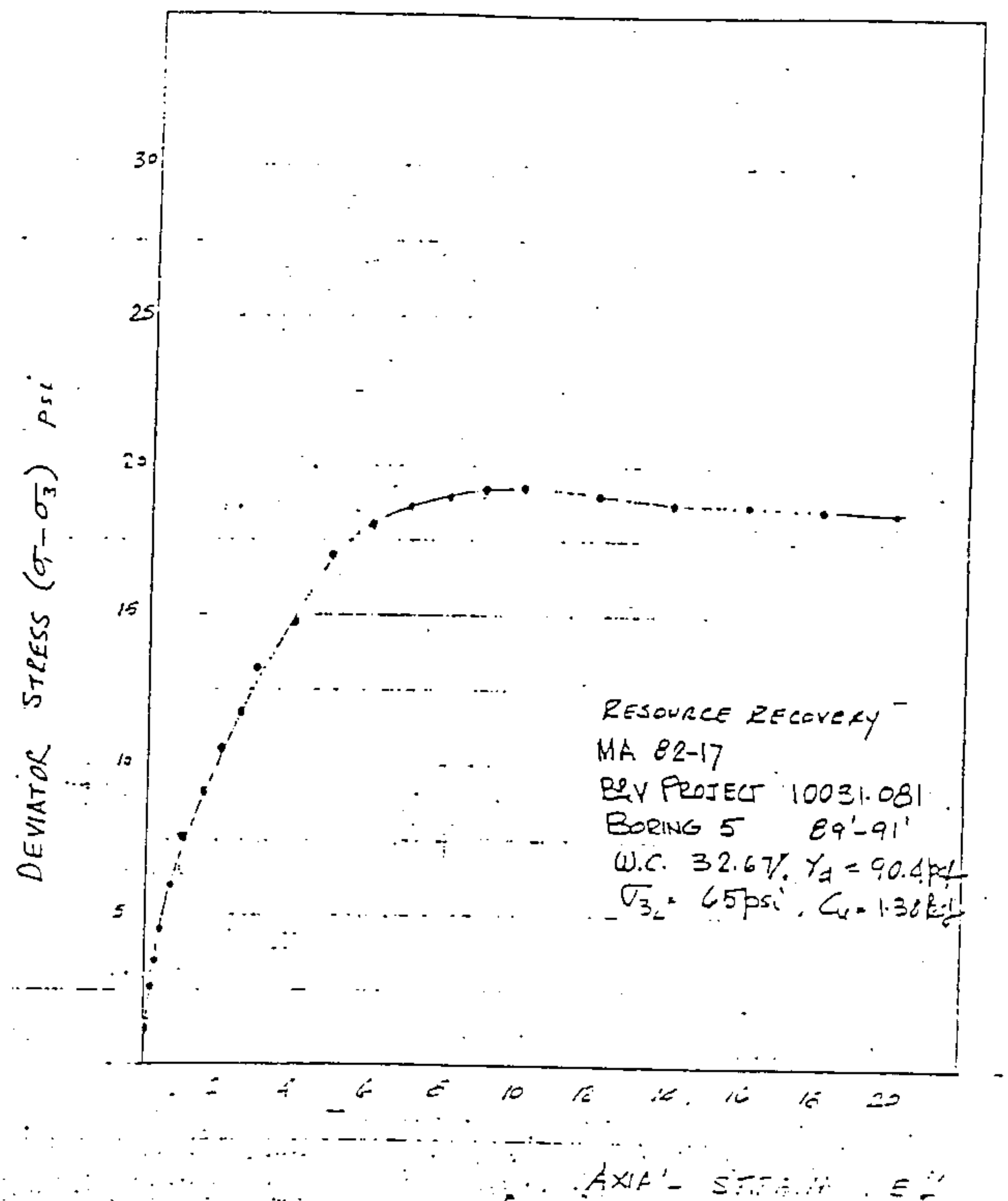
TYPE OF TEST : UU   DEPTH OF SAMPLE: 89'-91'

CELL PRESSURE: 65 psi   DATE: 4/7/82 BY: CRG/AN

AREA A_o: 6.219 in²   LENGTH L_o: 6.29 in S_i = 10.7%

ELAPSED TIME min.	STRAIN ε %	STRAIN DIAL READING in x 10^{-3}	ΔL in	PROVING RING READING DIV.	CORRECTED AREA A_c in²	DEVIATOR STRESS $\sigma_1-\sigma_3$ psi	UNDRAINED SHEAR STR. psi	REMARKS
	0		0.0	0		0		
	0.1	6.3	.0063	8		1.23		
	0.2	12.6	.0126	13		[illegible]		
	0.3	18.8	.0188	17		3.48		
	0.4	25.2	.0252	21		4.50		
	0.5	31.4	.0314	26		6.05		
	1.0	63.0	.0630	[illegible]		7.56		
	1.5	[illegible]	.0941	59		9.07		
	[illegible]	[illegible]	.1258	68		10.38		
	[illegible]	157.3	.1573	77		11.68		
	[illegible]	178.8	.1856	87		13.20		
	[illegible]	251.7	.2517	101		14.62		
	[illegible]	314.6	.3146	115		17.05		
	[illegible]	377.6	[illegible]	125		18.12		
	[illegible]	440.5	[illegible]	130		18.64		
	[illegible]	503.4	.5034	[illegible]		19.01		
	9.0	566.3	.5663	134		19.22		
	10	629.3	.6293	138	6.91	19.26	9.63	C_u = 1.38
	12	755.1	.7551	140		19.10		psi
	[illegible]	881.0	.8810	142		18.89		
	[illegible]	1006.8	1.0068	[illegible]		18.76		
	[illegible]	1132	1.132	[illegible]		18.70		
	[illegible]	1258	1.258	[illegible]		18.55		

STRAIN RATE : ~1%/min.   PROVING RING : 1 DIV = 0.965



DEVIATOR STRESS $(\sigma_1 - \sigma_3)$ psi
30
25
20
15
10
5
2
4
6
8
10
12
14
16
18
20
RESOURCE RECOVERY
MA 82-17
B&V PROJECT 10031.081
BORING 5 89'-91'
W.C. 32.6%, γ_d = 90.4pcf
σ_{3c} = 65psi, C_u = 1.30ksf
AXIAL STRAIN, ε %

TRIAXIAL TEST

PROJECT : RESOURCE RECOVERY — JOB. No : MA 82-17 BLV 10031.081

LOCATION : DETROIT, MI — BORING No.: 6 SAMPLE No.: 119-121

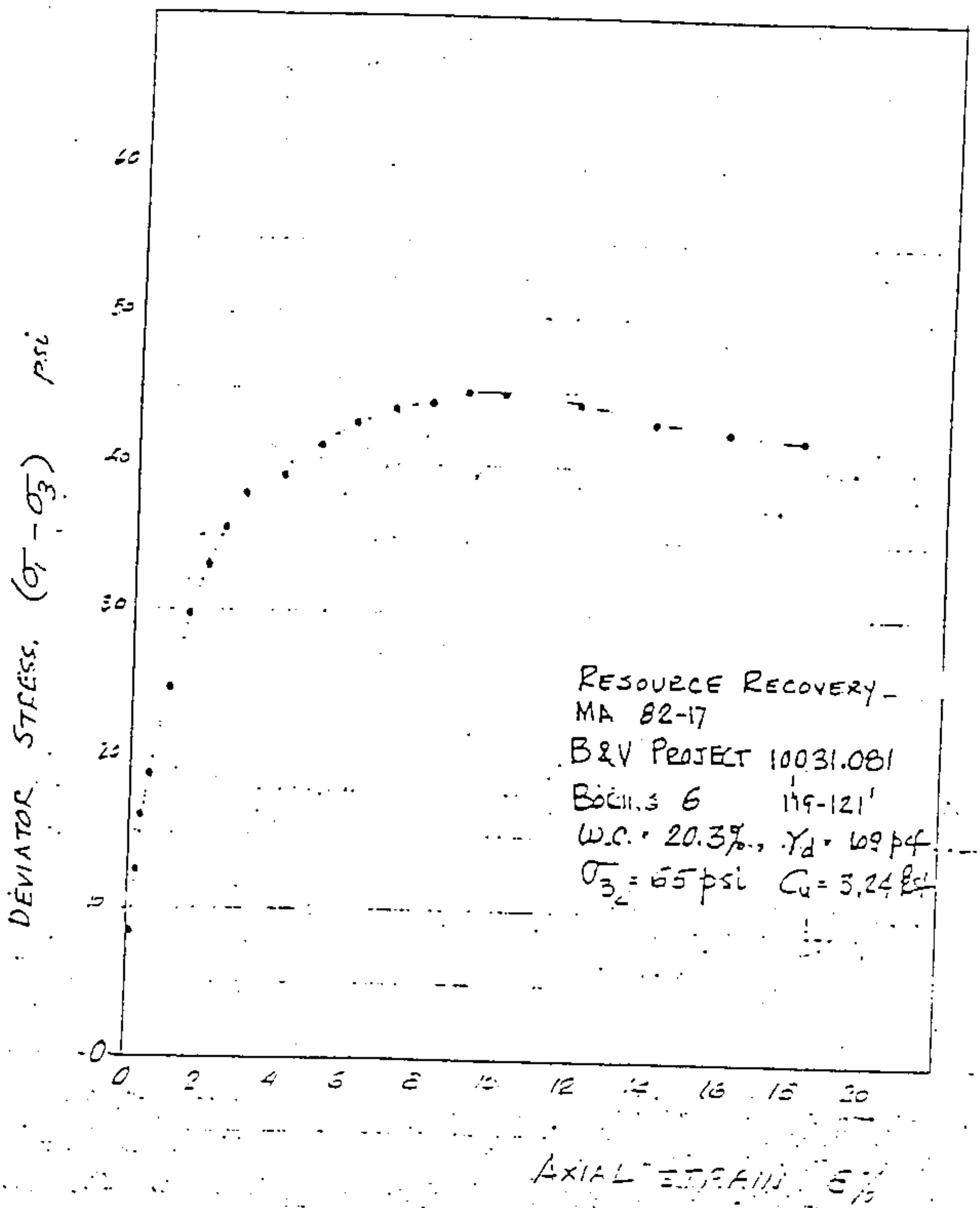
TYPE OF TEST : UU — DEPTH OF SAMPLE: 119-121'

CELL PRESSURE : 65 psi — DATE: 4/7/82 BY: CRG/[illegible]

AREA A_o: 6.455 in² — LENGTH L_o: 6.29" S_r=100%

ELAPSED TIME min.	STRAIN ε %	STRAIN DIAL READING in x 10^{-3}	ΔL in	PROVING RING READING DIV.	CORRECTED AREA A_c in²	DEVIATOR STRESS $\sigma_1 - \sigma_3$ psi	UNDRAINED SHEAR STR. psi	REMARKS
	.0		0	0		0		
	0.1	6.3	.0063	57		8.456		
	0.2	12.6	.0126	85		12.60		
	0.3	18.9	.0189	101		16.33		
	0.4	25.2	.0252	[illegible]		16.86		
	0.5	31.4	.0314	126		18.62		
	1.0	63	.0630	[illegible]		24.89		
	1.5	94.9	.0949	204		29.54		
	2.0	125.8	.1258	228		33.18		
	2.5	157.3	.1573	246		35.62		
	3.0	188.8	.1888	264		38.03		
	4.0	251.7	.2517	273		38.92		
	5.0	314.6	.3146	293		41.33		
	6.0	[illegible]	[illegible]	306		42.71		
	7.0	440.3	.4403	316		43.62		
	8.0	503.4	.5034	324		44.26		
	9.0	566.3	.5663	332		44.36		
	10.0	629.3	.6293	330	7.183	45.05	22.53	C_u = 3.24
	12.0	755.1	.7551	330		44.43		ksf
	14.0	881	.8810	337		43.04		
	16.0	1006.5	1.0065	342		42.66		
	18.0	1132	1.132	345		42.01		
	20.0	1258	1.258	346	—	41.34		

STRAIN RATE : 1% [illegible] — PROVING RING : 1 [illegible] = [illegible]


DEVIATOR STRESS, $(\sigma_1 - \sigma_3)$ psi
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20
AXIAL STRAIN, ε %
RESOURCE RECOVERY
MA 82-17
B&V PROJECT 10031.081
BORING 6 119-121'
W.C. = 20.3%, γ_d = 109 pcf
σ_{3c} = 65 psi C_u = 3.24 psi

CONSOLIDATION TEST

Project Name: Resource Recovery

Job No.: NCE 82-17 BEV 10031.CF1

Boring No.:

Sample No.: 29-31'

Depth: 29-31'

Date: 4-6-82 By: CCG/NJ Chkd: CRG

TEST DATA

Height of Sample = 1 inch

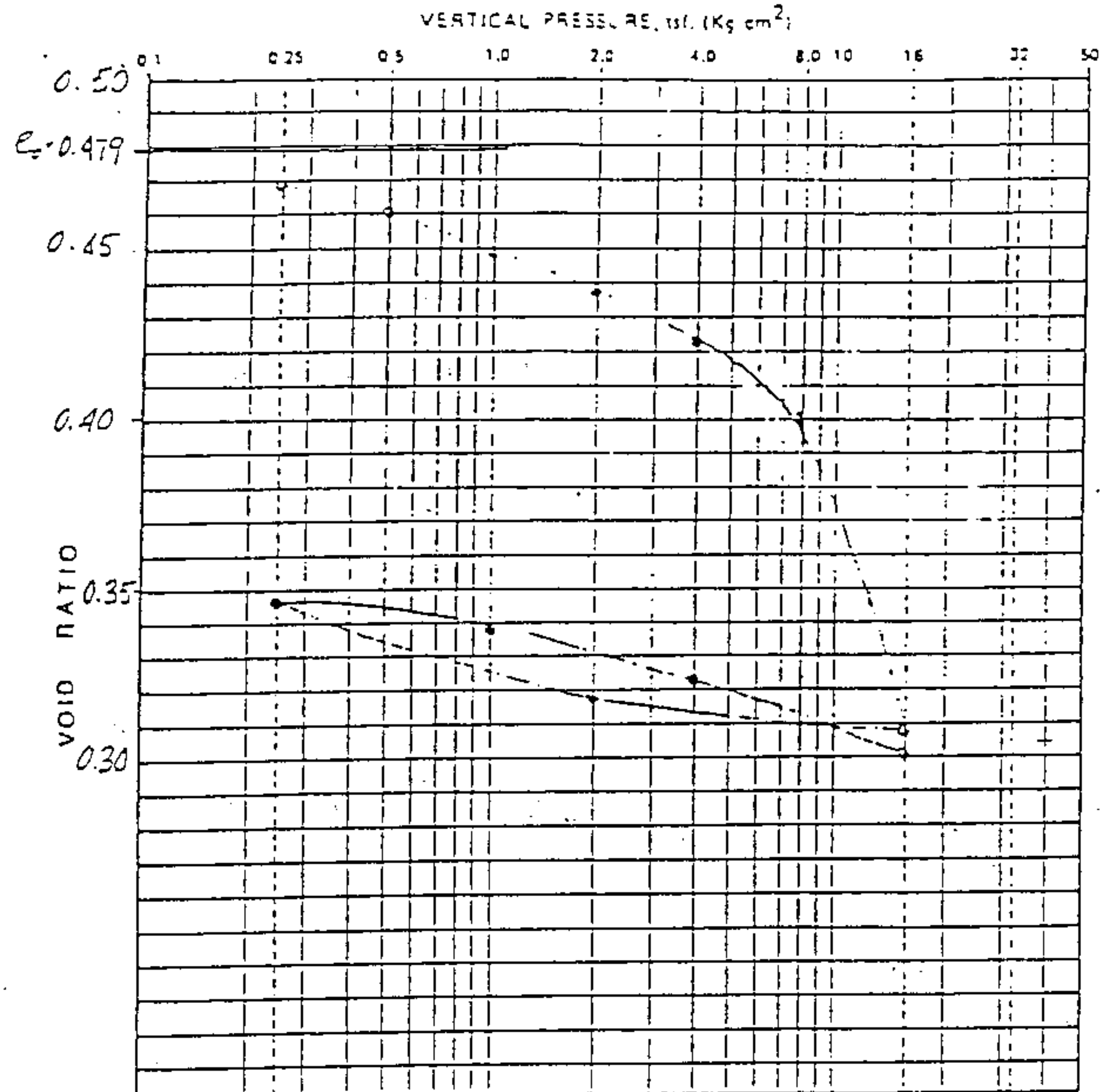
Diameter of Sample = 2.5 inch

Unit Dry Wt.: Before 121 pcf After 131.7 pcf

Water Content: Before 13.3 % After %

LL = PL =

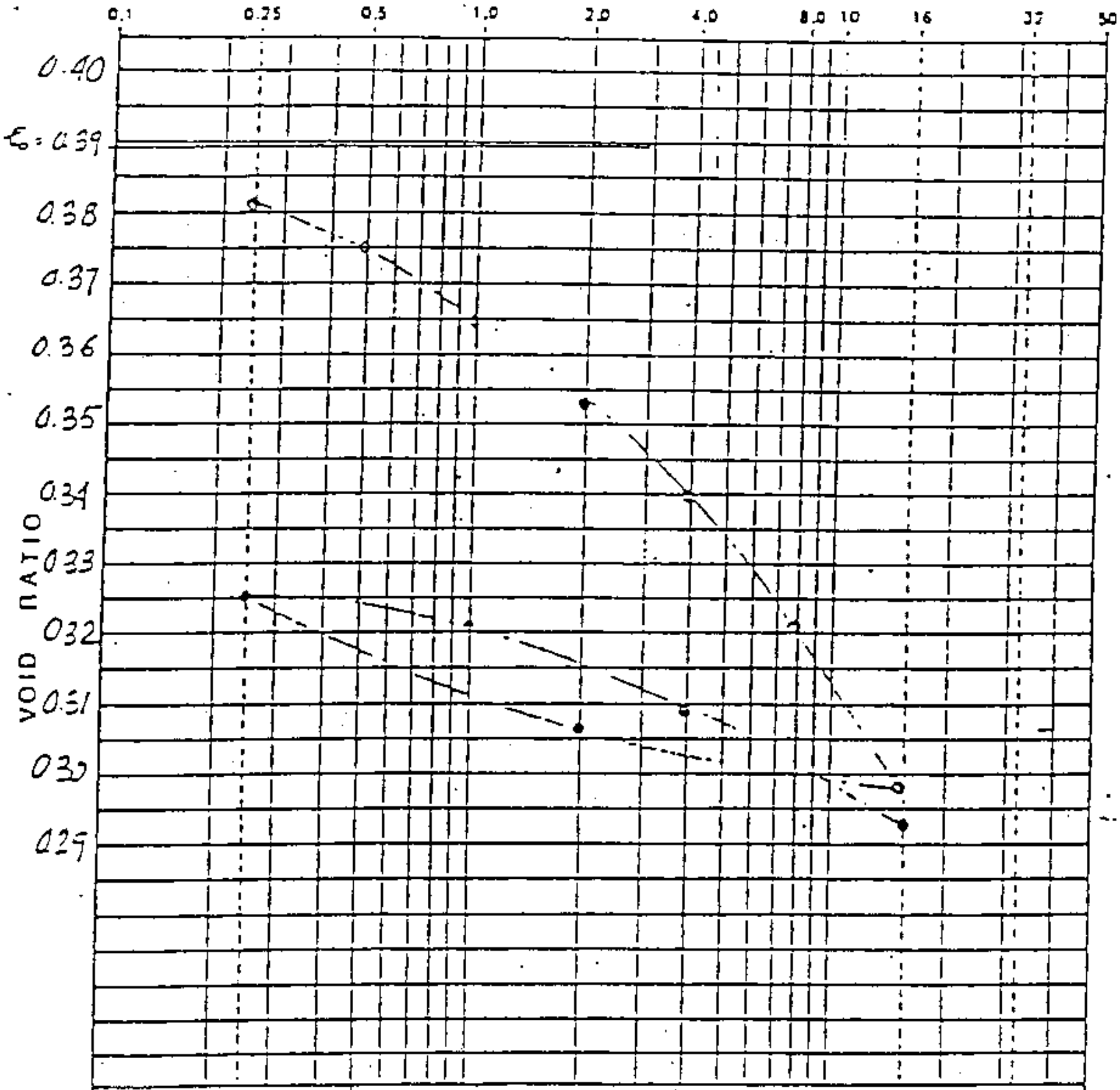
Soil Classification: Silty clay - Trace Gravel (CL)



P_o = kg/cm² P_c = 7.5 kg/cm² $C_c = \frac{C_c}{1+e_o}$ = $C_r = \frac{C_r}{1+e_o}$ =	LOAD (tsf)	C_v (cm²/sec)

CONSOLIDATION TEST

Project Name	RESOURCE RECOVERY	**TEST DATA**	
Job No.	MEA 82-17	Height of Sample =	1 inch
Boring No.	5	Diameter of Sample =	2.5 inch
Sample No.	69-71	Unit Dry Wt.	Before 122.6 Wet After 127 pcf
Depth	69'-71'	Water Content	Before 11.7% After ___ %
		LL =	PL =
Date 4/6/82 By	CEG/LN Chkd. CEG	Soil Classification	SILTY CLAY – SOME SAND

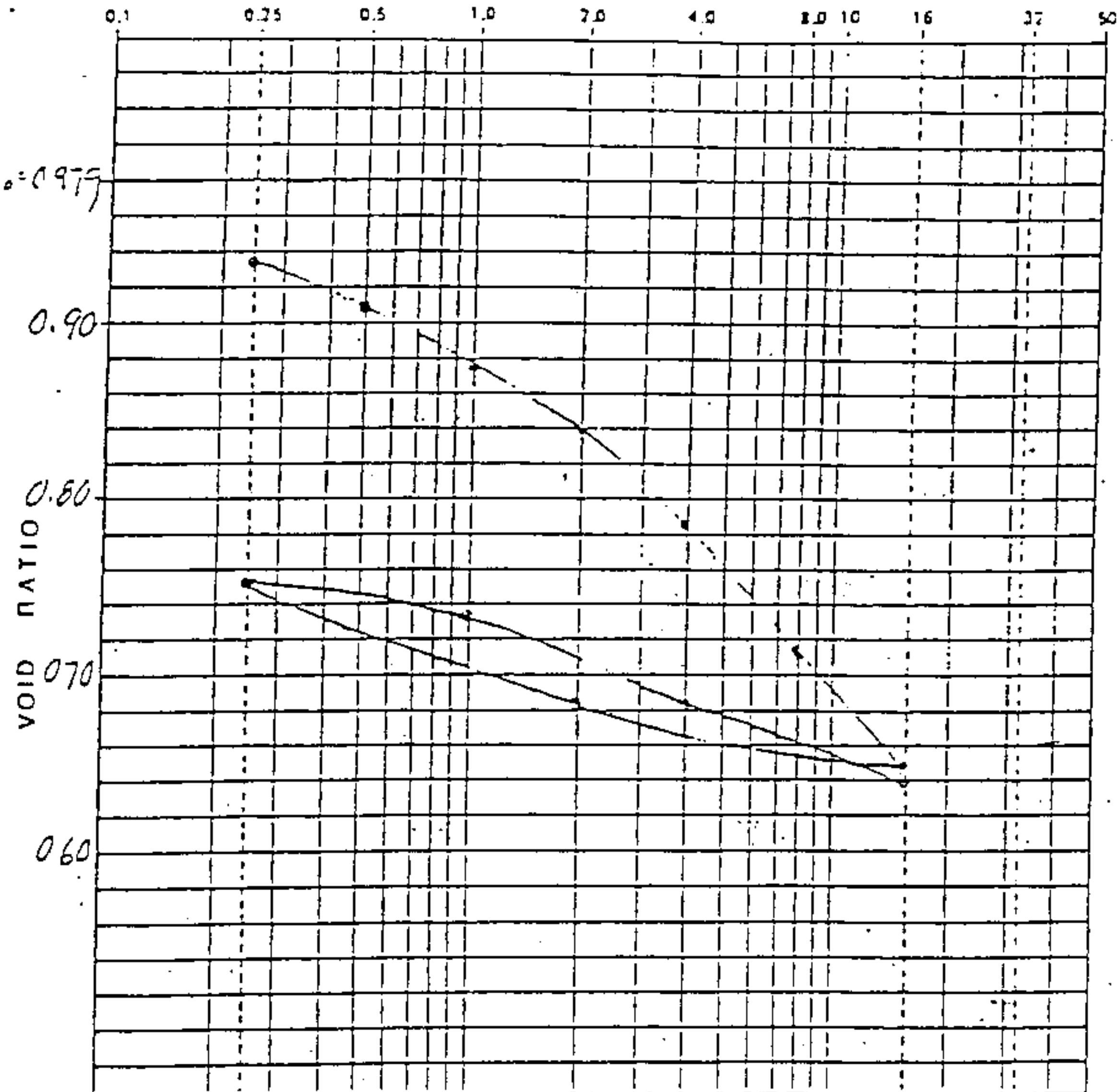


P_o = kg/cm²	LOAD (tsf)	C_v (cm²/sec)
P_c = 4.30 kg/cm²		
CR = $\frac{C_c}{1+e_o}$ =		
RR = $\frac{C_r}{1+e_o}$ =		

CONSOLIDATION TEST

Project Name: Resource Recovery	**TEST DATA**
Job No. KEA 52-15 621 10021.08	Height of Sample = 1"
Boring No. 5	Diameter of Sample = 2.5"
Sample No. 89-91	Unit Dry Wt.: Before 86 After 93 pcf
Depth 89'-91'	Water Content: Before 38.5% After ___ %
Date ___ By ___ Chkd. ___	LL = ___ PL = ___
	Soil Classification: CLAY (CH)

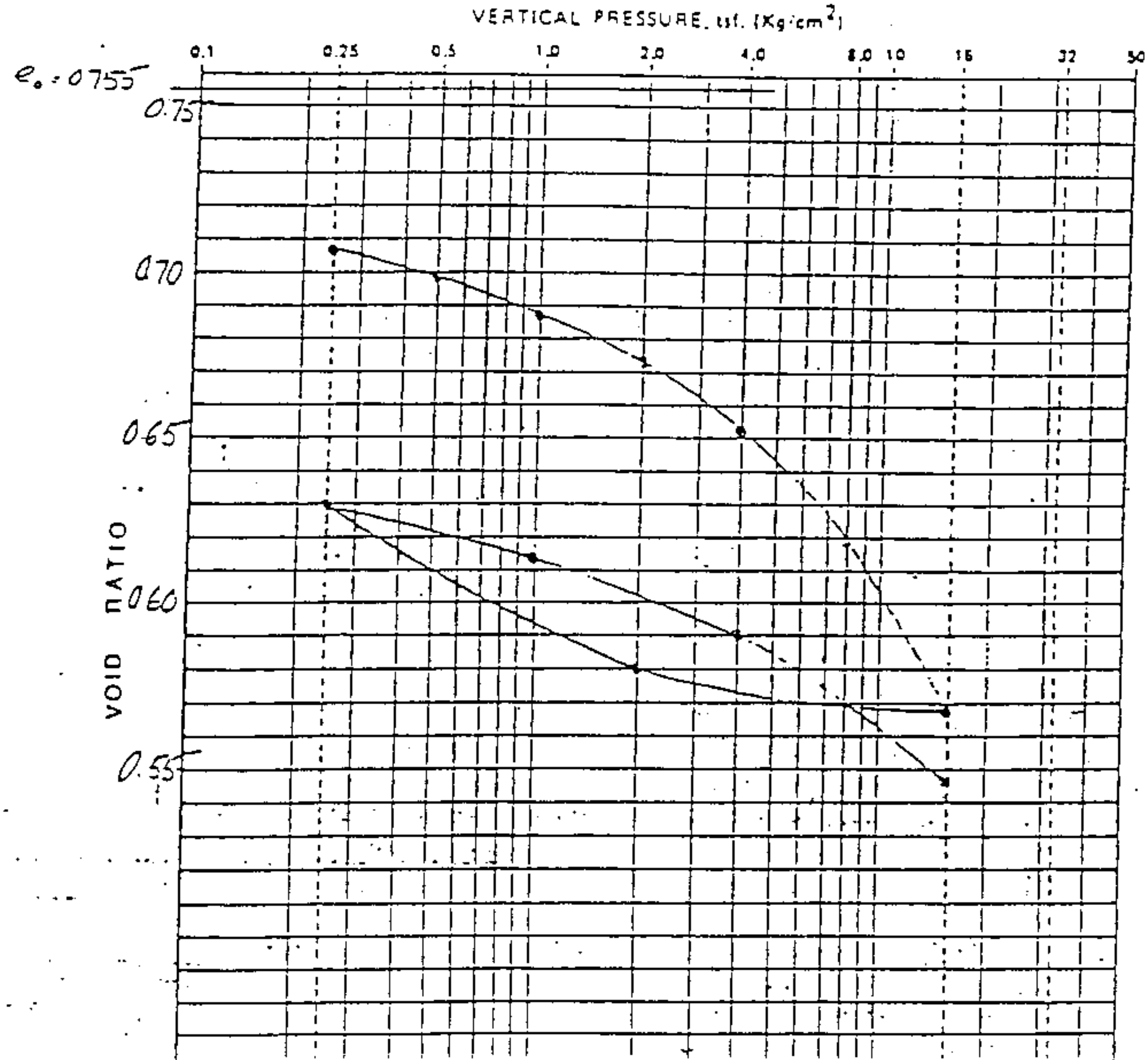
VERTICAL PRESSURE, tsf. (Kg/cm²)



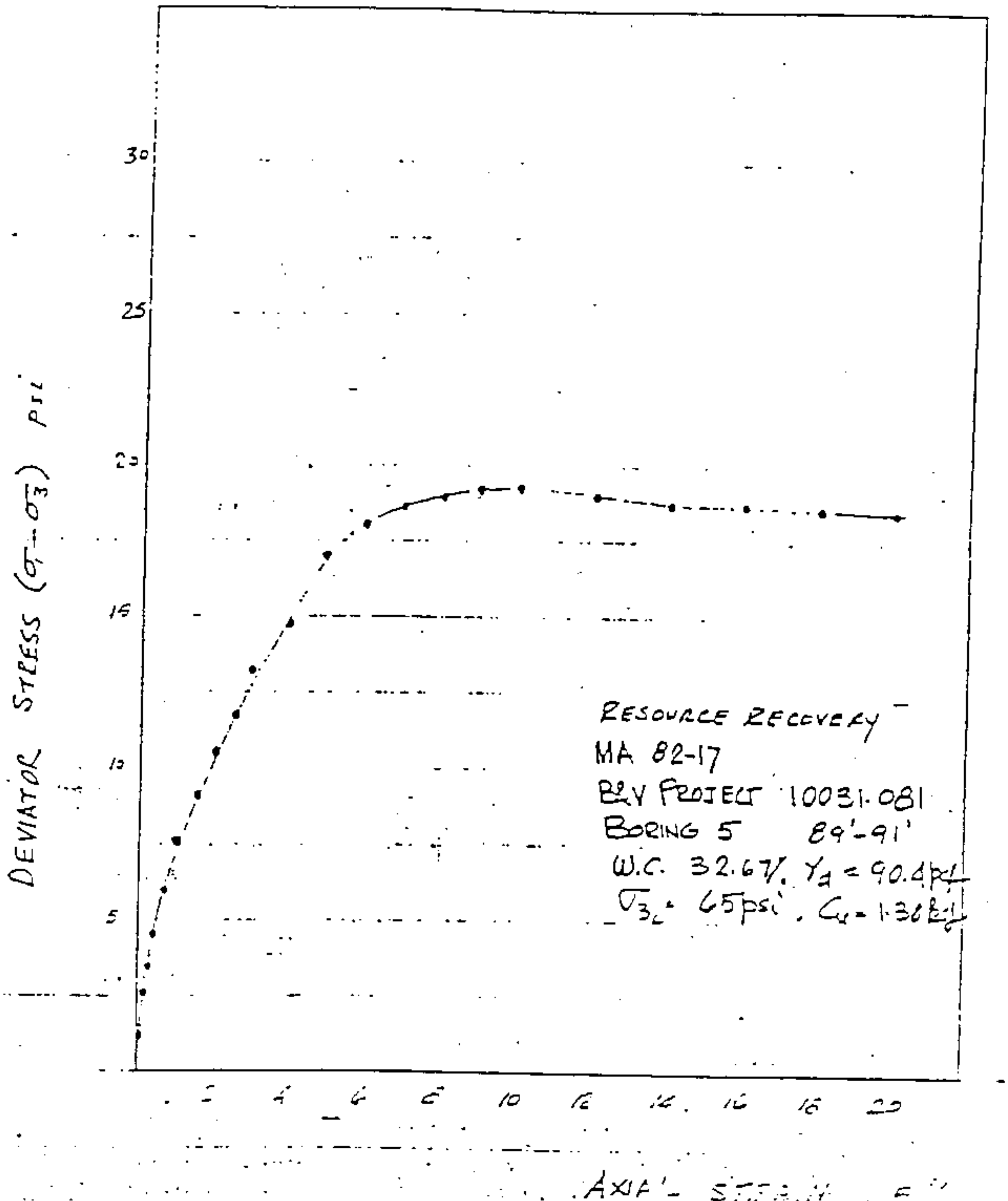
	LOAD (tsf)	C_v (cm²/sec)
P_o = kg/cm² P_c = kg/cm² $CR = \frac{C_c}{1+e_o}$ = $RR = \frac{C_r}{1+e_o}$ =		

CONSOLIDATION TEST

Project Name	[illegible]	TEST DATA	
Job No.	HSA 82-17 [illegible]	Height of Sample	1"
Boring No.	[illegible]	Diameter of Sample	2.5'
Sample No.	119-121	Unit Dry Wt.	Before 105 After 117 pcf
Depth	119'-121'	Water Content:	Before 21.5% After ___ %
Date [illegible] By CRG/LN Chkd CRG		LL = ___ PL = ___	
		Soil Classification	SILTY CLAY - TR. GRAVEL (CL)



P_o = kg/cm² P_c = kg/cm² $C\alpha = \frac{C_c}{1+e_o}$ = $RR = \frac{C_r}{1+e_o}$ =	LOAD (tsf)	C_v (cm²/sec)



DEVIATOR STRESS $(\sigma_1 - \sigma_3)$ psi
30
25
20
15
10
5
2
4
6
8
10
12
14
16
18
20
AXIAL STRAIN ε %
RESOURCE RECOVERY
MA 82-17
B&V PROJECT 10031.081
BORING 5 89'-91'
W.C. 32.67%, γ_d = 90.4pcf
σ_{3c} = 65psi

TRIAXIAL TEST

PROJECT : RESOURCE RECOVERY JOB. No : MA 82-17
BCY 10031.081

LOCATION : DETROIT, MI BORING No.: 6 SAMPLE No.: 119-[illegible]

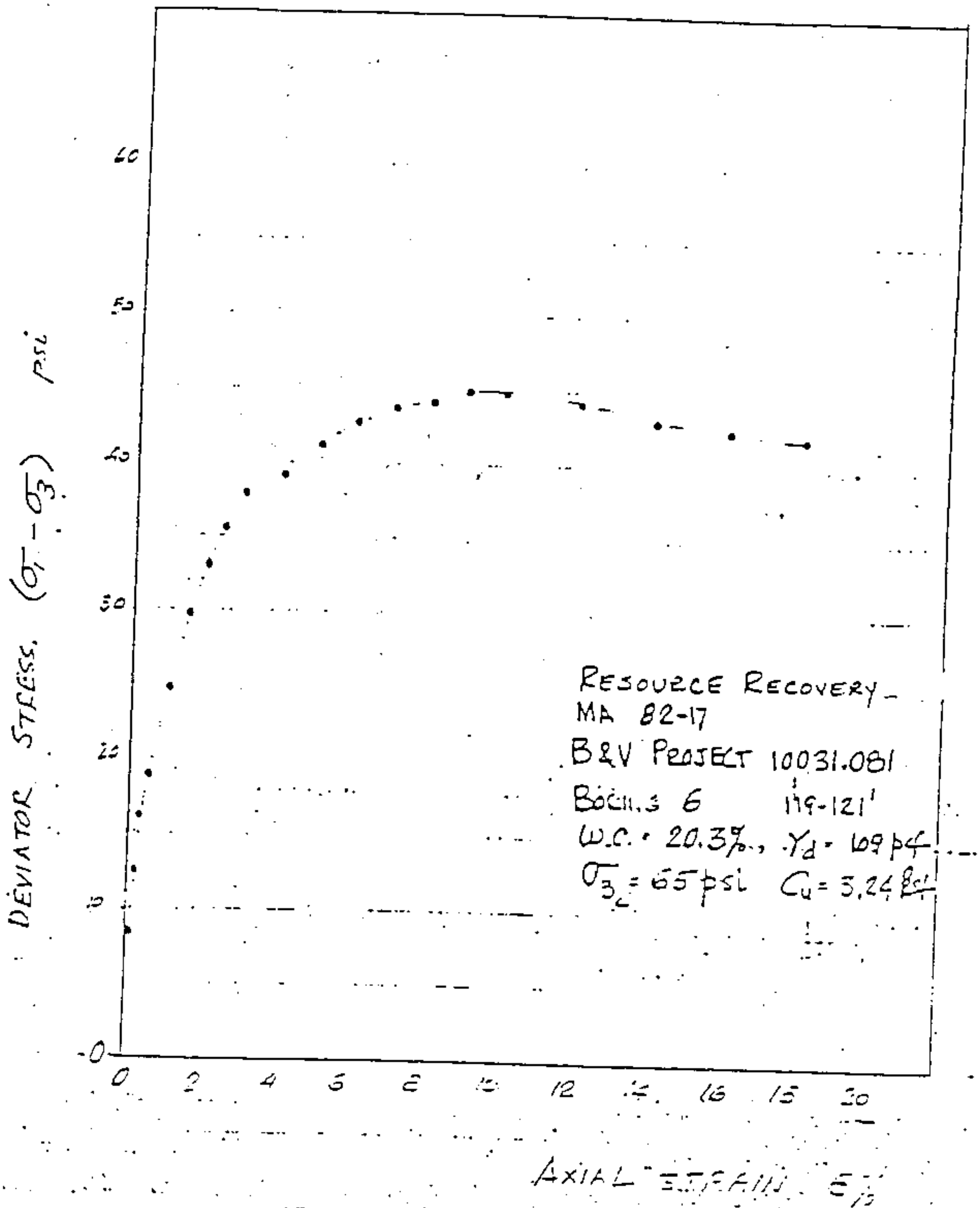
TYPE OF TEST : UU DEPTH OF SAMPLE: 119'-121'

CELL PRESSURE: 65 psi DATE: 4/7/82 BY: CRG/[illegible]

AREA A_o: 6.455 in² LENGTH L_o: 6.29" S_r = 100%

ELAPSED TIME min.	STRAIN ε %	STRAIN DIAL READING in x 10^{-3}	ΔL in	PROVING RING READING DIV.	CORRECTED AREA A_c in.²	DEVIATOR STRESS $\sigma_1 - \sigma_3$ psi	UNDRAINED SHEAR STR. psi	REMARKS
	.0		0	0		0		
	0.1	6.3	.0063	57		8.456		
	0.2	12.6	.0126	85		12.60		
	0.3	18.5	.0155	101		16.73		
	0.4	25.2	.0252	[illegible]		16.86		
	0.5	31.4	.0314	126		18.62		
	1.0	63	.0630	[illegible]		24.69		
	1.5	94.9	.0949	204		29.54		
	2.0	125.8	.1258	228		33.18		
	2.5	157.3	.1573	246		35.63		
	3.0	188.8	.1888	264		38.03		
	4.0	251.7	.2517	273		38.42		
	5.0	314.6	.3146	293		41.33		
	6.0	[illegible]	.37[illegible]	306		42.71		
	7.0	440.5	.4405	316		43.62		
	8.0	503.4	.5034	324		44.26		
	9.0	566.3	.5663	332		44.36		
	10.0	629.3	.6293	330	7.183	45.05	22.53	C_u = 3.24
	12.0	755.[illegible]	.7551	330		44.43		tsf
	14.0	88[illegible]	.8810	337		43.04		
	16.0	1006.5	1.0068	342		42.66		
	18.0	1132	1.132	345		42.01		
	20.0	1258	1.258	348		41.34		

STRAIN RATE : 1% [illegible] PROVING RING : [illegible]



DEVIATOR STRESS, $(\sigma_1 - \sigma_3)$ psi
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
18
20
AXIAL STRAIN ϵ %
RESOURCE RECOVERY
MA 82-17
B&V PROJECT 10031.081
BORING 6 119-121'
W.C. = 20.3%, γ_d = 109 pcf
σ_{3c} = 65 psi C_u = 3.24 psi

CONSOLIDATION TEST

TEST DATA

Project Name: Resource Recovery

Job No: HLE 82-17 B&V 10651.CFI

Boring No:

Sample No: 29-31'

Depth: 29-31'

Date: 4-6-82 By: CCG/AN Chkd: CRG

Height of Sample = 1 inch

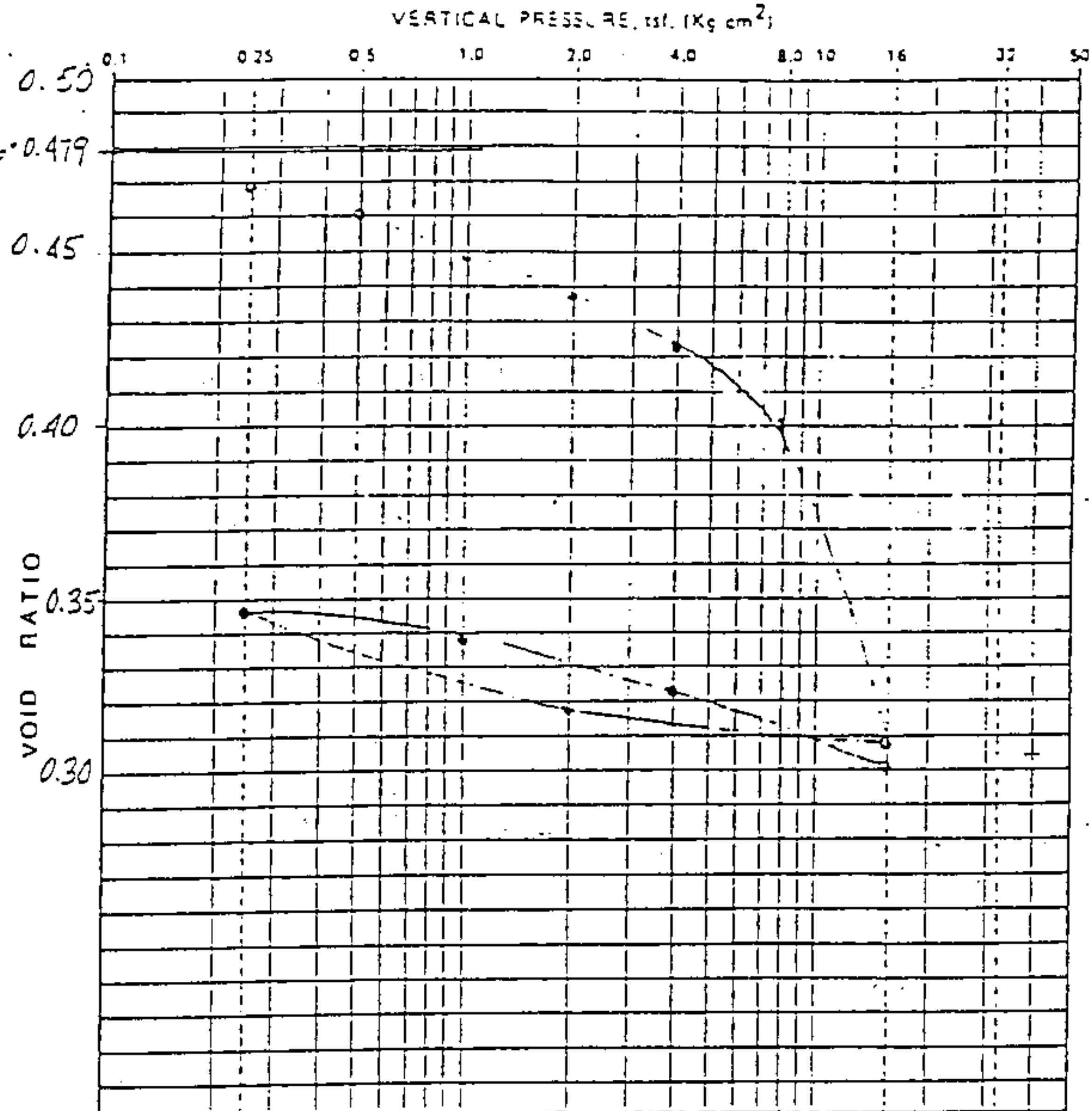
Diameter of Sample = 2.5 inch

Unit Dry Wt.: Before 121 pcf After 131.7 pcf

Water Content: Before 13.5 % After

LL = PL =

Soil Classification: Silty clay - Trace Gravel (CL)



P_o = kg/cm²

P_c = 7.5 kg/cm²

$C^\alpha = \frac{C_c}{1+e_o}$ =

$\alpha\alpha = \frac{C_r}{1+e_o}$ =

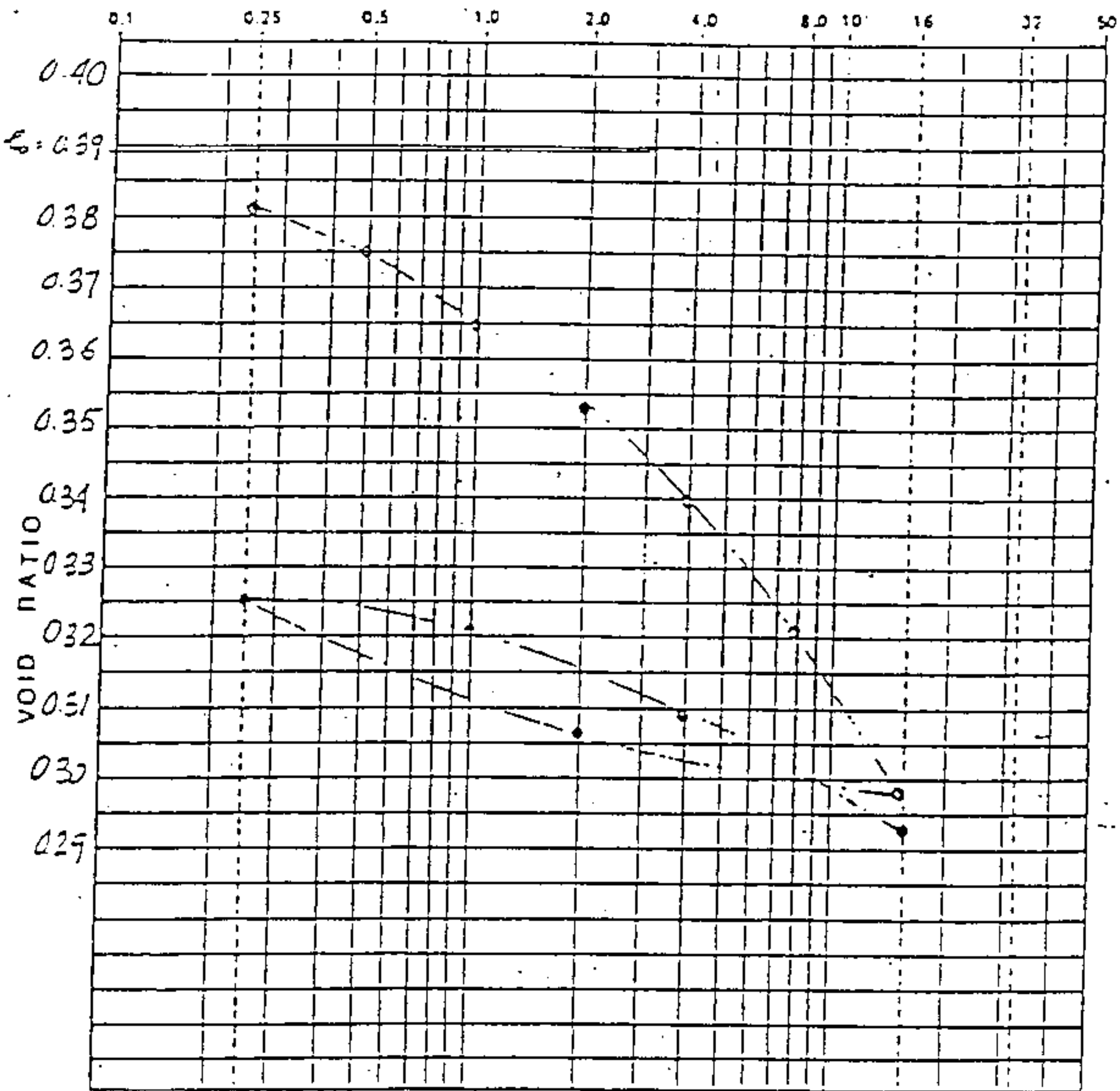
LOAD (tsf)	C_v (cm²/sec)

CONSOLIDATION TEST

Project Name: Resource Recovery
Job No.: MEA 82-17, 6:V 1503...
Boring No.: 5
Sample No.: 69-71
Depth: 69'-71'
Date: 4/6/82 By: CG(/LW) Chkd.: CG

TEST DATA

Height of Sample = 1 inch
Diameter of Sample = 2.5 inch
Unit Dry Wt.: Before 125.6 lb After 127 pcf
Water Content: Before 11.7 % After ____ %
LL = ____ PL = ____
Soil Classification: Silty Clay - Some Sand



P_o = ____ kg/cm²
P_c = 4.30 kg/cm²
$CR = \frac{C_c}{1+e_o}$ =
$RR = \frac{C_r}{1+e_o}$ =

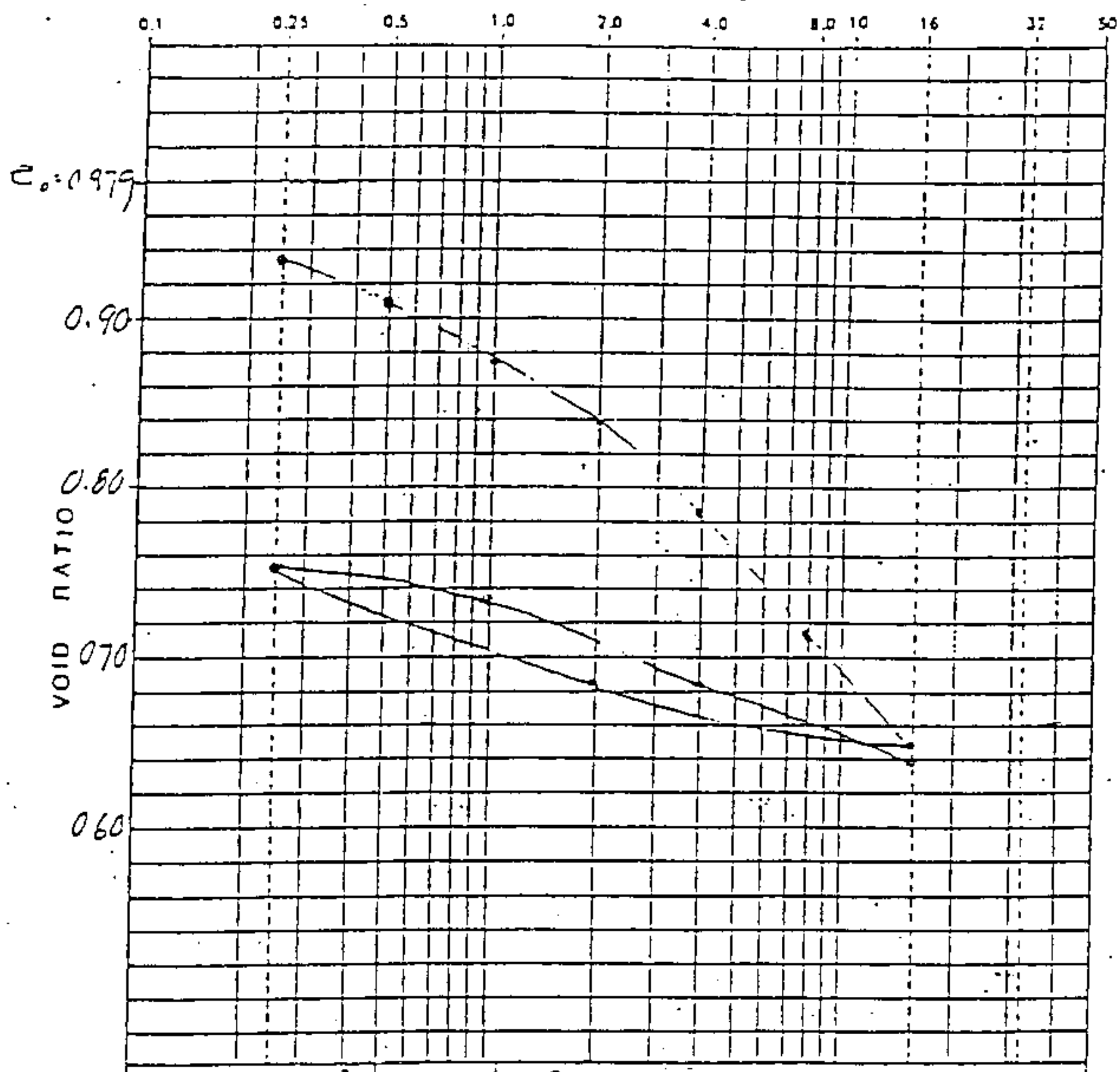
LOAD (tsf)

C_v (cm²/sec)

CONSOLIDATION TEST

Project Name	RESOURCE · RECOVERY	Height of Sample	= 1"
Job No.	HSA 5217 B2/ 10021.05	Diameter of Sample	= 2.5"
Boring No.	5	Unit Dry Wt.	Before 84 After 93 pcf
Sample No.	89-91	Water Content:	Before 38.5% After ___ %
Depth	89'-91'	LL =	PL =
Date 1/1/?? By (2G/LJ) Chkd. CGS		Soil Classification	CLAY (CH)

TEST DATA



P_o = kg/cm²	LOAD (tsf)	C_v (cm²/sec)
P_c = kg/cm²		
$CR = \frac{C_c}{1+e_o}$ =		
$RR = \frac{C_r}{1+e_o}$ =		

CONSOLIDATION TEST

TEST DATA

Project Name [illegible]

Job No. [illegible]

Boring No. [illegible]

Sample No. 119-121

Depth [illegible]

Date [illegible] By CRG/[illegible] Chkd CRG

Height of Sample = 1"

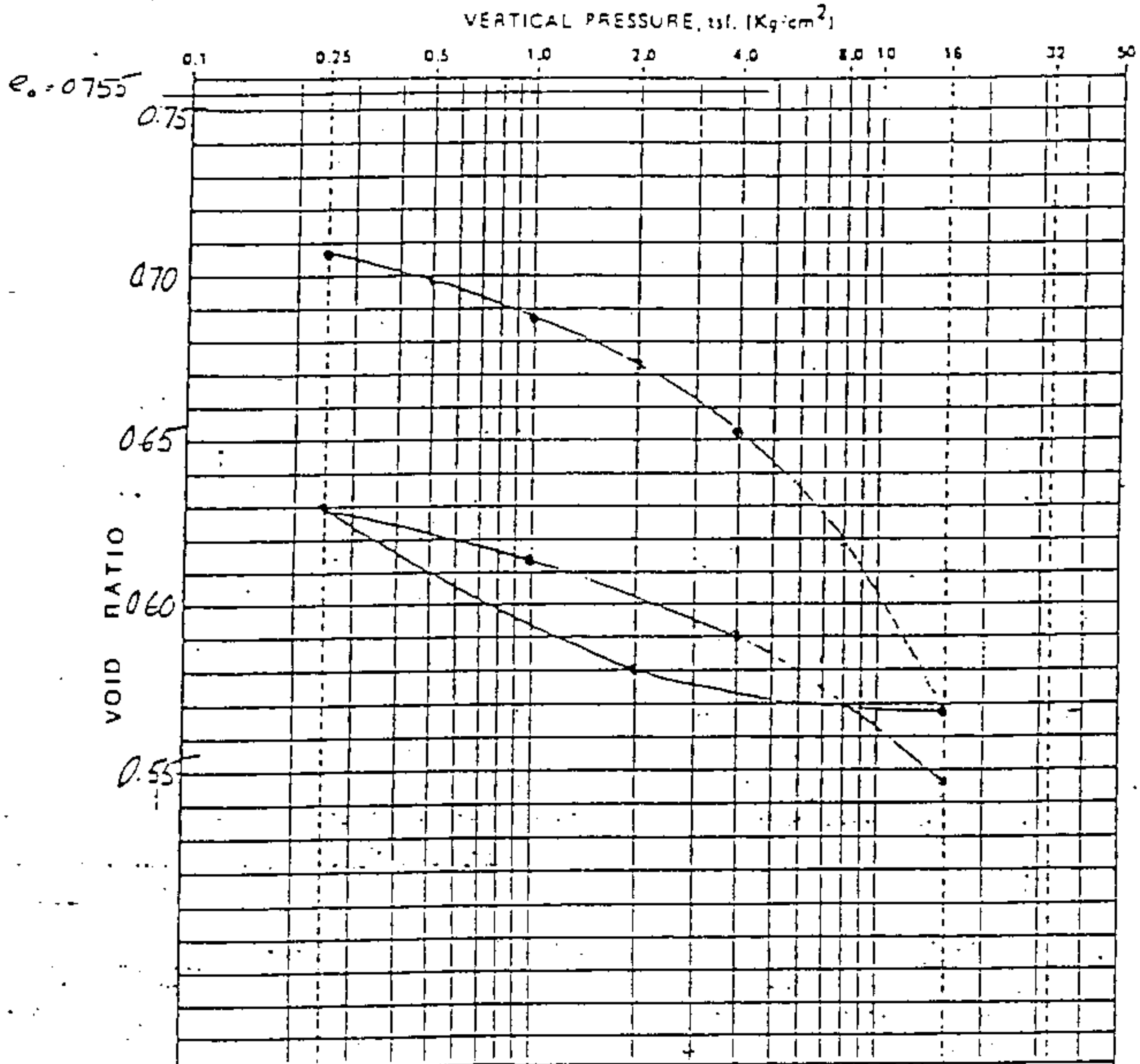
Diameter of Sample = 2.5"

Unit Dry Wt., Before 105 After 112 pcf

Water Content: Before 21.5% After ______ %

LL = ______ PL = ______

Soil Classification SILTY CLAY-TR. [illegible] (CL)



P_o = kg/cm² P_c = kg/cm² $CR = \frac{C_c}{1+e_o}$ = $RR = \frac{C_r}{1+e_o}$ =	LOAD (tsf)	C_v (cm²/sec)

DRAFT

APPENDIX B

BORING LOGS FOR DETROIT RENDERING CO.

Elev.	Depth	Description	Blows
100	0'-00"	FILL CLAY, T/DEBRIS. 4" CONCRETE TOP	8
	4'-0"	MED. V. COLOR CLAY SOME SAND & GRAVEL	6, 16
90	8'-6"	HARD BROWN CLAY. SOME SAND GRAVEL	35
	13'-6"	HARD GREY CLAY, SOME SAND & GRAVEL	33
80	17'-0"	HARD GREY CLAY. SEAMS OF FINE GREY SAND.	23, 23
W.L. 20'-2"	27'-0"		
70			

BORING COMPLETED 11.28.1966.
BORING ADVANCED BY AUGER.
W.L. 20'-2" @ COMPLETION

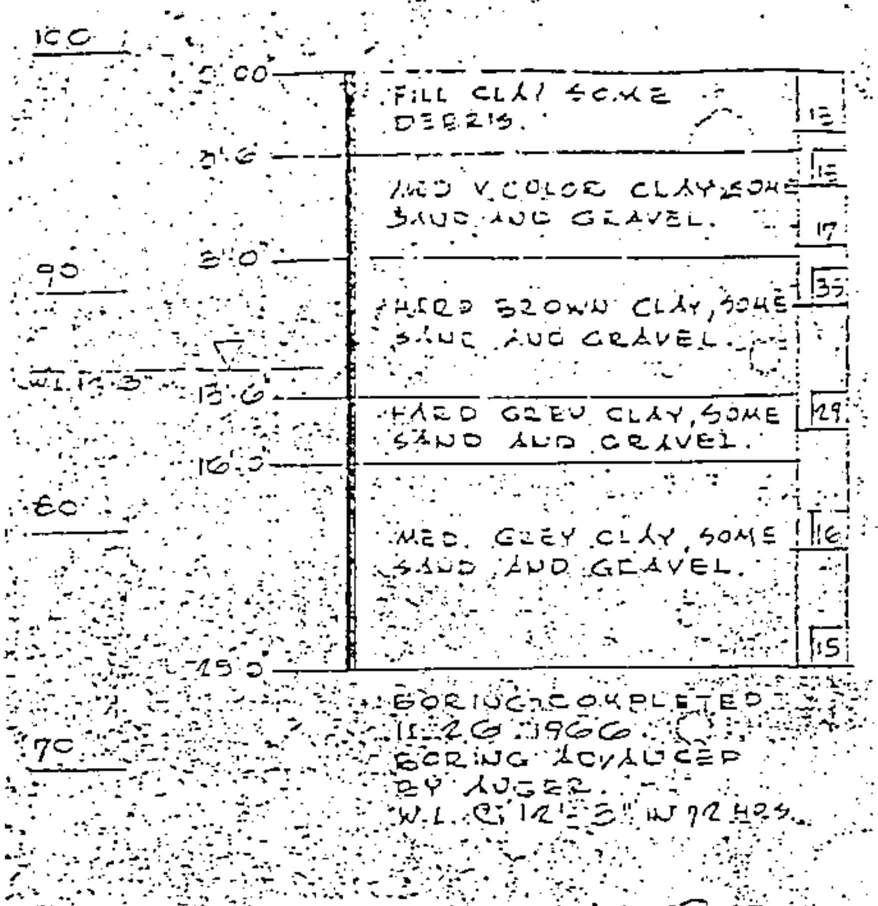
BORING No. 1

Depth	Description	Blows
0'-00"	FILL CLAY T/DEBRIS.	3
3'-0"	SOFT V. COLORED CLAY SOME SAND & GRAVEL.	15
5'-6"	MED. BRN. CLAY SOME SAND AND GRAVEL.	16
8'-6"	HARD BROWN CLAY, SOME SAND & GRAVEL.	35
13'-6"	HARD GREY CLAY, SOME SAND AND GRAVEL.	33, 19
21'-0"	MED. GREY CLAY, SOME SAND AND GRAVEL.	15
25'-0"		

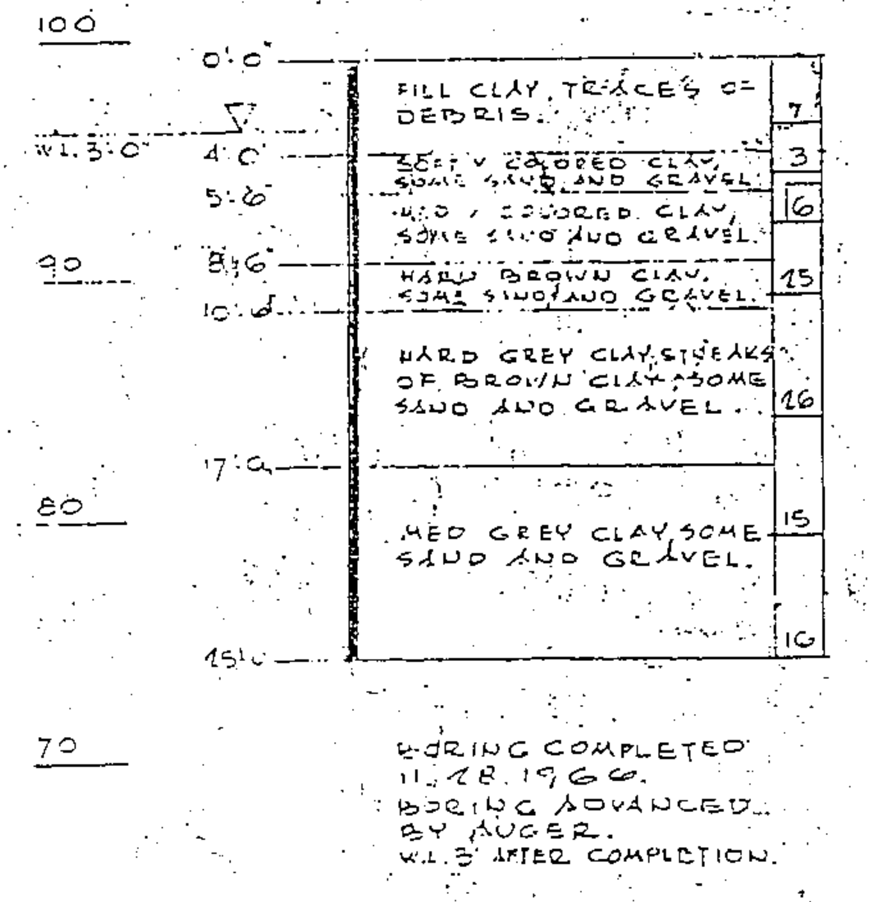
BORING COMPLETED 11.28.1966
BORING ADVANCED BY AUGER. BORING DRY @ COMPLETION

BORING No. 2

REPRODUCED FROM DRAWING #SB-1-D BY JOHN G. HOAD & ASSOCIATES FOR THE DETROIT RENDERING COMPANY.

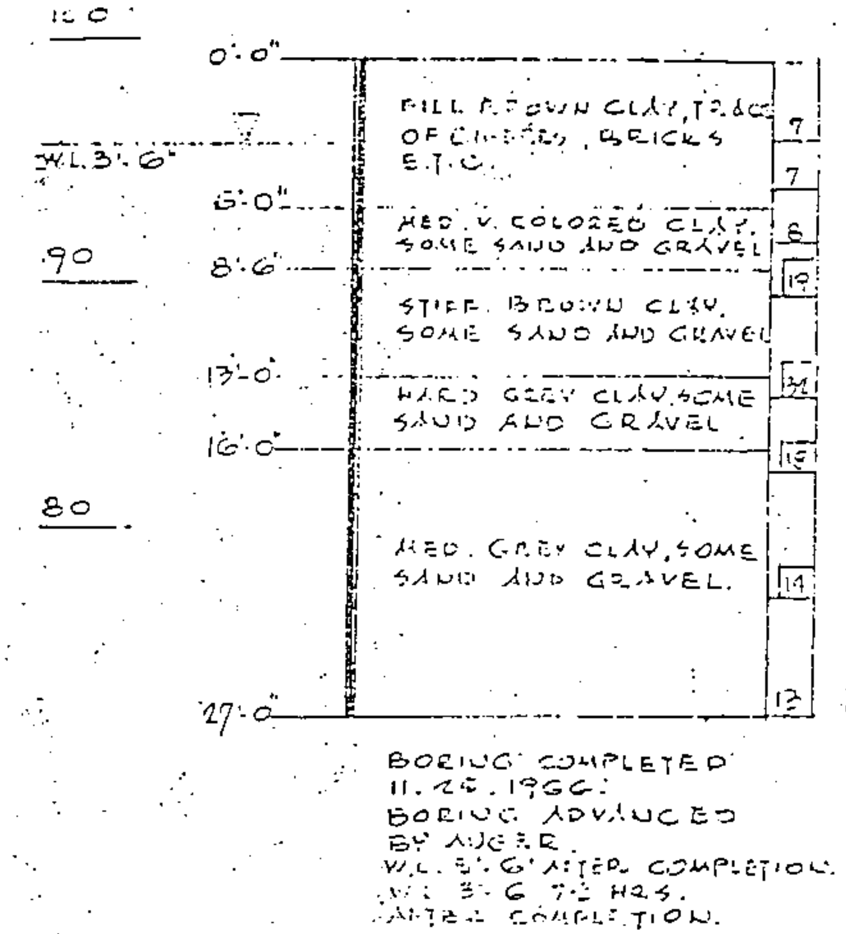


BORING No. 3

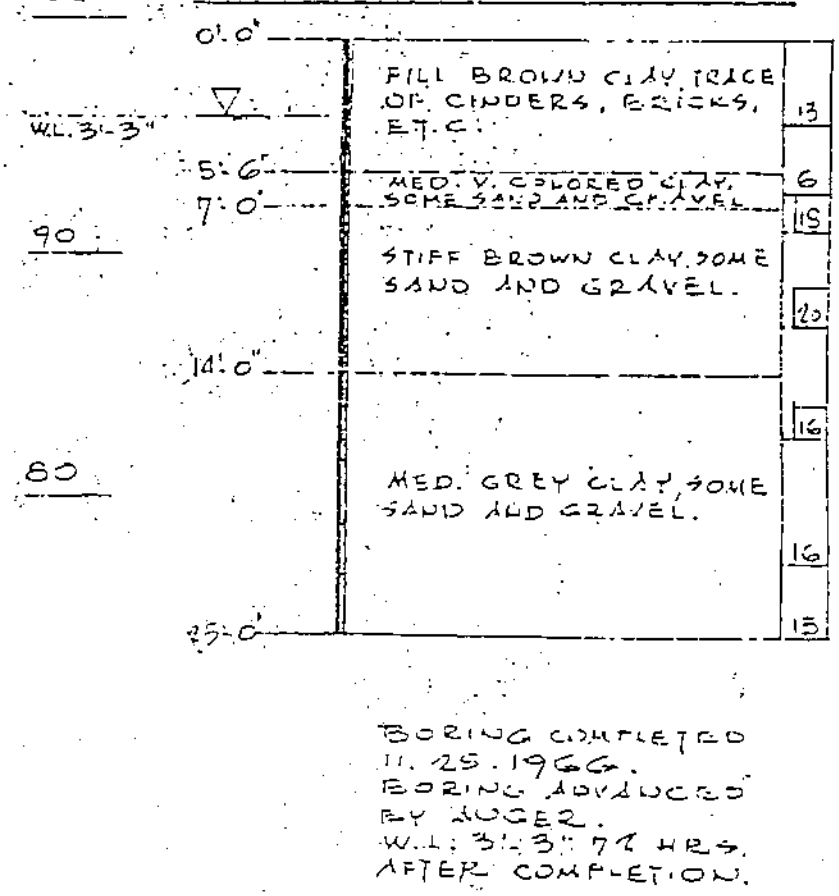


BORING No. 4

REPRODUCED FROM DRAWING #SB-1-D BY JOHN G. HOAD & ASSOCIATES FOR THE DETROIT RENDERING COMPANY.

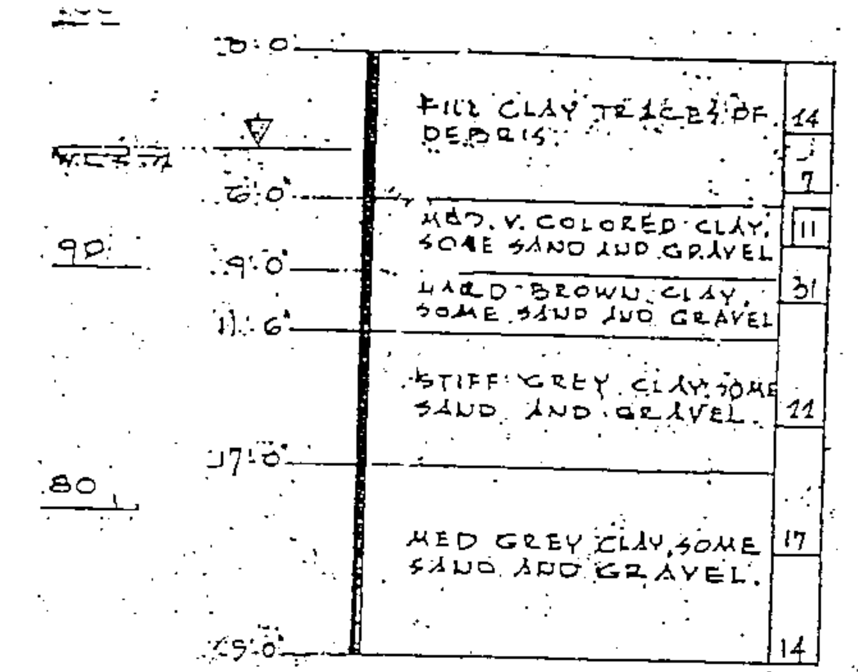


BORING No. 5



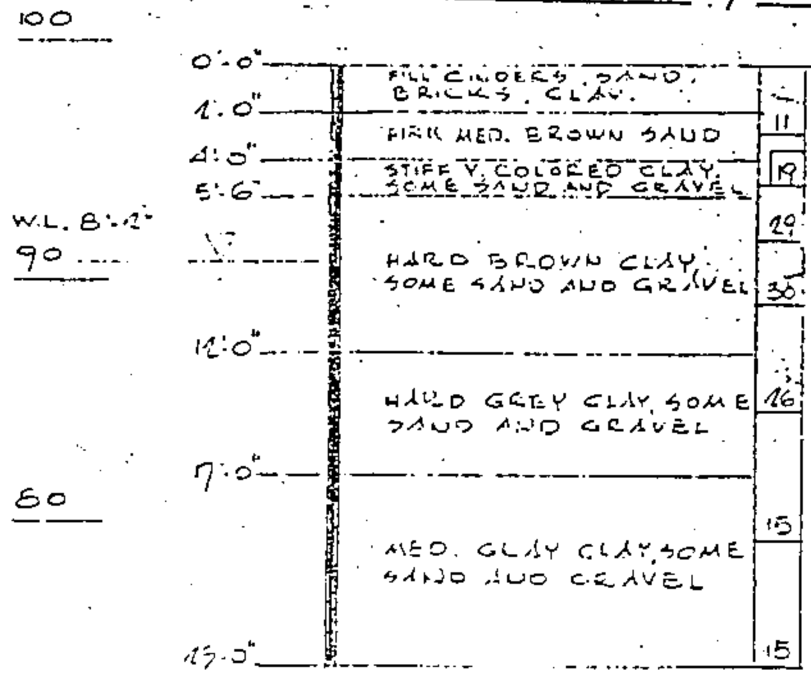
BORING No. 6

REPRODUCED FROM
DRAWING #SB-1-D
BY JOHN G. HOAD &
ASSOCIATES FOR THE
DETROIT RENDERING
COMPANY.



BORING COMPLETED 11.28.1966.
BORING ADVANCED BY AUGER. W.L. 4'-2". @ COMPLETION

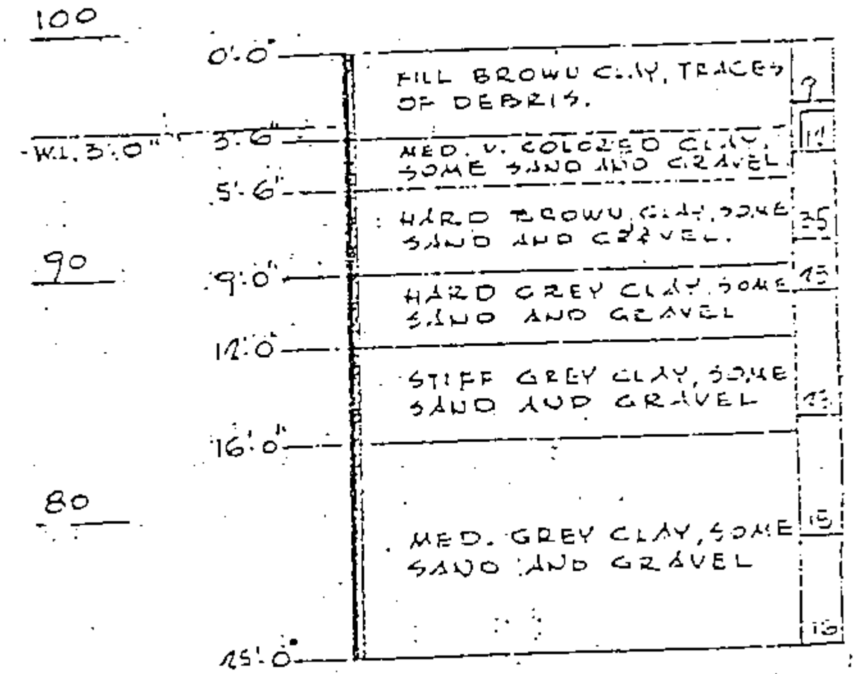
BORING No. 7



BORING COMPLETED 11.26.1966.
BORING ADVANCED BY AUGER.
BORING DRY @ COMPLETION. W.L. 8'-2" 72 HRS. AFTER COMPLETION.

BORING No. 8

REPRODUCED FROM DRAWING #SB-1-D BY JOHN G. HOAD & ASSOCIATES FOR THE DETROIT RENDERING COMPANY.



BORING COMPLETED
11.26.1966.
BORING ADVANCED
BY AUGER.
W.L. 21.5' @ COMPLETION
W.L. 3'.0" 72 HRS.
AFTER COMPLETION.

BORING No. 9

REPRODUCED FROM
DRAWING #SB-1-D
BY JOHN G. HOAD &
ASSOCIATES FOR THE
DETROIT RENDERING
COMPANY.

DRAFT

APPENDIX C

HYDROGEOLOGIC REPORT AND MONITORING PROGRAM, CITY DISPOSAL PROCESSING FACILITY OBTAINED FROM THE MDNR FILE, LIVONIA, MICHIGAN DISTRICT OFFICE

HYDROGEOLOGIC REPORT

&

MONITORING PROGRAM

GEOLOGY

The general geology of Wayne County has been well documented in a report entitled, "Geology for Land and Groundwater Development in Wayne County, Michigan, 1969" by Dr. Andrew Mazola from Wayne State University. From that report, it can be seen that the general features are lacustrine clay overlying limestone bedrock. The glacial drift thickness in the vicinity of the site varies between 100 - 120 feet. Both the bedrock and overlying glacial drift have poor potential for potable water supplies. However, public water supply is available throughout the Detroit area.

SURFACE SOILS

Several soil borings have been taken on the site for structural design purposes when the transfer facility was constructed in 1973. Those borings are attached together with location plans. Additional borings were taken on December of 1980 when office additions were considered. Those borings, together with an analytical soils report are attached as an appendix to this section of the application.

MONITORING PROGRAM

The existing solid waste transfer facility has no established monitoring program. All operations are in an enclosed building and on a concrete work area. The applicant proposes no further monitoring requirements. The City of Detroit Water & Sewage Department, Industrial Waste Control section requires a "self-monitoring program" in conjunction with its industrial waste ordinance. We will comply with their requirements as they fit our operations.

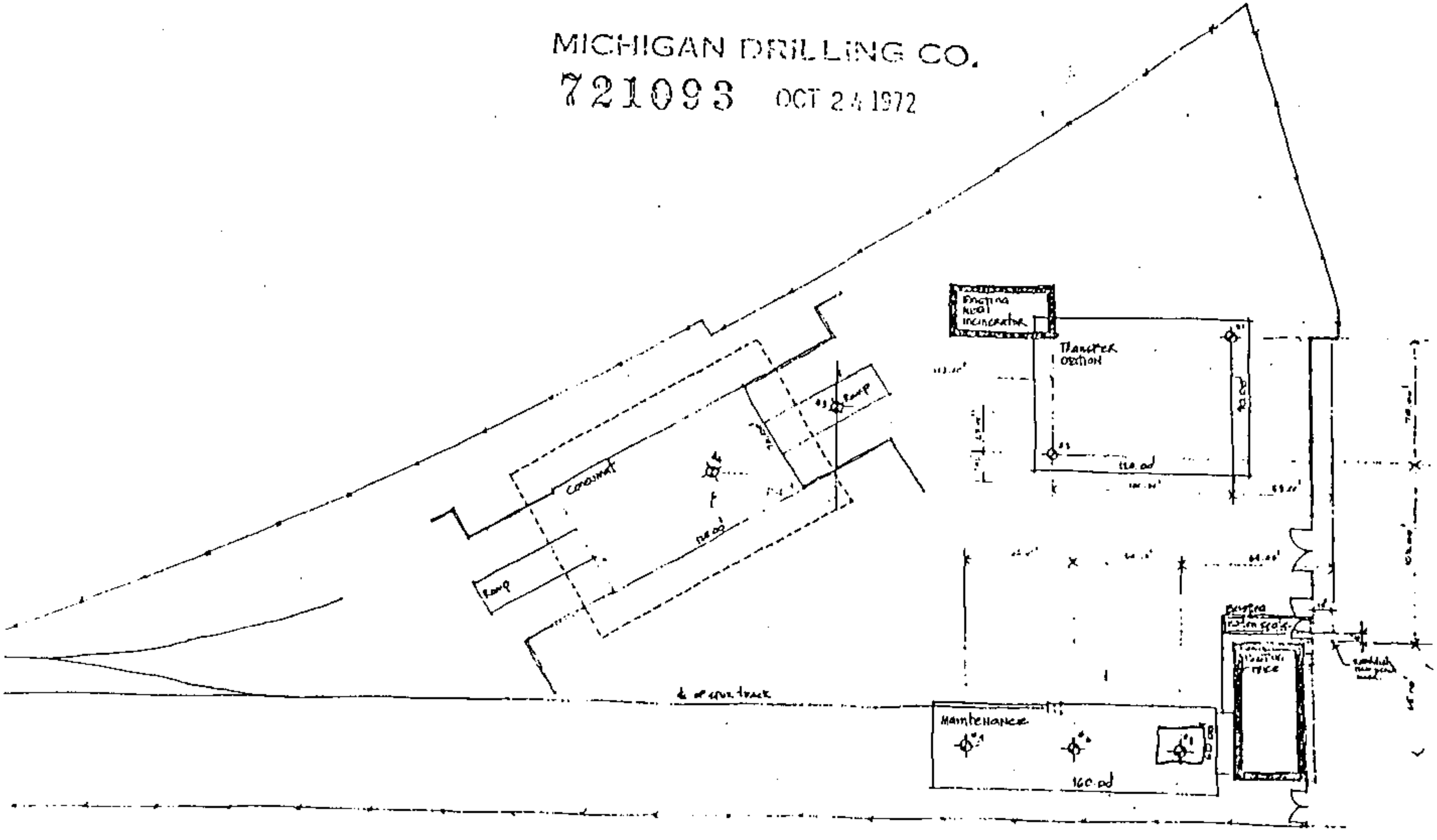
Process control will consist of in-house testing for solids and pH on representative samples when continuous processing occurs. When batch processing takes place, a representative sample for each batch waste treated will be done for solids and pH. Minimum solids will be 30% and pH is to be between 6 - 8 except for municipal sewage sludge which is to be at least 11.5pH. Mixing of sludges with the refuse mass will not require testing. It is presumed that all users will be licensed by the MDNR and that manifests will be provided by the transporter when required.

APPENDIX

Soil Borings

MICHIGAN DRILLING CO.

721093 OCT 24 1972



Location of new soil boring
Solid Waste Disposal Center
Detroit, Michigan
Central Waste Control Corporation
Smith, Hinchman & Grylls Associates, Inc.
Architects Engineers Planners
3107 West Grand Blvd.
Detroit, Michigan 48202
Oct 1972 Job No. 10176

MICHIGAN DRILLING
CONSULTING ENGINEERS IN SOILS & FOUNDATIONS

JOB NO. 72-1093 LOG OF SOIL BORING NO. 1

PROJECT Proposed Building

LOCATION 1550 Harper
Detroit, Michigan

DATE 11-9-72 SURFACE ELEV. ______

Sample Type	Depth	Strata	Soil Description	Penetration Blows Per 6"			Moisture %	Natural Wt. P.C.F.	Unc. Comp. Strength PSF	Str. %
	1		Very compact moist cinders, crushed stone, concrete, miscellaneous fill							
1A UL	2–3			7	11	13				
	4	3'6"	Medium compact wet sand, cinder, fill							
1B UL	5	4'6"	Firm moist topsoil	3	4	6	20.7	130.0		
	6	5'0"	Stiff moist silty brown clay, sand and pebbles							
1C UL	7			4	5	6	18.2			
	9	8'6"	Extremely stiff moist silty variegated clay, sand and pebbles							
1D UL	10			8	13	21	12.7	141.3	13791	
	13	13'0"	Very stiff moist silty blue clay, sand and pebbles							
1E UL	15			7	10	13	13.9	142.6	6300	
1F UL	20			7	10	14	13.9	143.1	8108	
1G UL	25	25'0"		6	9	12	15.2	142.6	5618	
	30									

TYPE OF SAMPLE
D. – DISTURBED
U.L. – UNDIST. LINER
S.T. – SHELBY TUBE
S.S. – SPLIT SPOON
R.C. – ROCK CORE
OTHER –

PLUGGING PROCEDURE
HOLE SEALED WITH ______ BETWEEN
DEPTHS OF ______ AND ______.
Standard Penetration Test – Driving 2" OD Sampler 1' With 140 # Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT 3 FT. 6 INS.
G.W. ENCOUNTERED AT __ FT. __ INS.
G.W. AFTER COMPLETION NONE FT. __ INS.
G.W. AFTER __ HRS. __ FT. __ INS.
G.W. VOLUMES LIGHT

MICHIGAN DRILLING

CONSULTING ENGINEERS IN SOILS & FOUNDATIONS

JOB NO. ______

PROJECT PROPOSED BUILDING

LOCATION 1550 HARPER

DETROIT, MICHIGAN

DATE 11-9-72 SURFACE ELEV. ______

Sample	Depth	Soil Description	Penetration Blows For 6"			Moisture %	Natural Wt. P.C.F.	Unc. Comp. Strength PSF	Str. %
	0–1'6"	COMPACT MOIST CRUSHED CONCRETE AND FILL							
2A UL	1'6"–3'6"	VERY COMPACT MOIST COAL, CLAY, CINDERS, MISCELLANEOUS FILL	6	10	13				
2B UL	3'6"–6'0"	FIRM MOIST CLAY, TOPSOIL, FILL	2	3	4				
2C UL	6'0"–9'6"	FIRM MOIST SILTY BROWN CLAY, SAND AND PEBBLES	3	3	4	26.3	123.2	1149	
2D UL	9'6"–13'6"	EXTREMELY STIFF MOIST SILTY BROWN CLAY, SAND AND PEBBLES	6	14	23	13.1	139.5	17027	
2E UL	13'6"–17'6"	EXTREMELY STIFF MOIST SILTY BLUE CLAY, SAND AND PEBBLES	7	13	17	11.9	142.1	11684	
2F UL	17'6"–25'0"	VERY STIFF MOIST SILTY BLUE CLAY, SAND AND PEBBLES	6	10	14	13.5	139.8	7561	
2G UL			6	9	14	14.6	141.3	6321	
	25'0"								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
OTHER -

PLUGGING PROCEDURE

HOLE SEALED WITH ______ BETWEEN

DEPTHS OF ______ AND ______.

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 3 FT. 0 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 4 FT. 8 INS.
G.W. AFTER HRS. FT. INS.
G.W. VOLUMES HEAVY

MICHIGAN DRILLING

CONSULTING ENGINEERS IN SOILS & FOUNDATIONS

JOB NO. [illegible]

PROJECT PROPOSED BUILDING

LOCATION 1550 HARPER

DETROIT, MICHIGAN

DATE 11-8-72 SURFACE ELEV. ____

Sample Type	Depth	Soil Description	Penetration Blows Per 6"			Moisture %	Natural Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
		COMPACT MOIST CINDER, CLAY, MISCELLANEOUS FILL							
5A UL			4	4	5				
	3'0"	SLIGHTLY COMPACT WET SAND, MISCELLANEOUS FILL							
5B UL			1	1	1				
	5'6"	VERY STIFF MOIST SILTY VARIEGATED CLAY, SAND AND PEBBLES							
5C UL			5	8	14	12.4	141.3	17788	
	8'0"	EXTREMELY STIFF MOIST SILTY BROWN CLAY, SAND AND PEBBLES							
5D UL			9	14	20	12.0	140.8	14974	
	14'0"	VERY STIFF MOIST SILTY BLUE CLAY, SAND AND PEBBLES							
5E UL			7	12	16	11.7	142.4	15126	
5F UL			7	10	12	12.9	141.1	9513	
5G UL			5	9	11	13.8	139.8	7406	
	25'0"								

TYPE OF SAMPLE
D. -DISTURBED
U.L.-UNDIST. LINER
T. -SHELBY TUBE
S. -SPLIT SPOON
R.C.-ROCK CORE
OTHER-

PLUGGING PROCEDURE

HOLE SEALED WITH ____ BETWEEN

DEPTHS OF ____ AND ____

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 3 FT. 0 INS.
G.W. ENCOUNTERED AT ____ FT. ____ INS.
G.W. AFTER COMPLETION 2 FT. 8 INS.
G.W. AFTER 24 HRS. 1 FT. 10 INS.
G.W. VOLUMES HEAVY

MD-111

MICHIGAN DRILLING

CONSULTING ENGINEERS IN SOILS & FOUNDATIONS

JOB NO. 72-1055 LOG OF SOIL BORING NO. ____

PROJECT Proposed Building

LOCATION 1550 Harper

Detroit, Michigan

DATE 11-9-72 SURFACE ELEV. ________

Sample	Depth	Strata change	Soil Description	Penetration Blows For 6"			Moisture %	Natural Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Medium compact wet cinder, clay, miscellaneous fill							
6A UL	2–3			2	2	3				
6B UL	5			2	3	2				
	6	6'0"	Firm moist silty brown clay, sand and pebbles							
6C UL	7–8			3	3	4	27.0	120.6	2458	
	9	9'0"	Extremely stiff moist silty brown clay, sand and pebbles							
6D UL	10			5	14	21	19.7	130.8	13791	
	13	13'0"	Very stiff moist silty blue clay, sand and pebbles							
6E UL	15			7	10	15	11.3	141.6	13855	
6F UL	20			6	10	14	10.9	141.1	9194	
6G UL	25	25'0"		6	9	11	13.8	139.6	5565	

TYPE OF SAMPLE
D. –DISTURBED
U.L.–UNDIST. LINER
T. –SHELBY TUBE
S.S. –SPLIT SPOON
R.C.–ROCK CORE
OTHER–

PLUGGING PROCEDURE

HOLE SEALED WITH ____________ BETWEEN

DEPTHS OF ______ AND ______.

Standard Penetration Test – Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 1 FT. 0 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 2 FT. 9 INS.
G.W. AFTER HRS. FT. INS.
G.W. VOLUMES (HEAVY)

MICHIGAN DRILLING

[illegible]

CONSULTING ENGINEERS IN SOILS & FOUNDATIONS

[illegible] WYOMING AVENUE • DETROIT, MICHIGAN [illegible]

JOB NO. ____

PROJECT: PROPOSED BUILDING

LOCATION: 1550 HARPER
DETROIT, MICHIGAN

DATE: 11-8-72 SURFACE ELEV. ____

Sample No. & Type	Depth	Legend	Soil Description	Penetration Blows Per 6"			Moisture %	Natural Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
7A UL	2–3		COMPACT MOIST CONCRETE, CINDERS, METAL, BRICK, MISCELLANEOUS FILL	5	5	5				
7B UL	5	4'0"	SOFT MOIST CLAY, CINDER, FILL	1	2	2				
7C UL	7			1	1	2				
7D UL	10			2	2	2				
7E UL	15	13'6"	STIFF MOIST SILTY BLUE CLAY, SAND AND PEBBLES	5	7	9	12.8	140.6	12291	
7F UL	20	18'0"	COMPACT WET COARSE GRAY SAND, GRAVEL	5	4	6	14.2	135.2		
		20'6"	STIFF MOIST SILTY BLUE CLAY, SAND AND PEBBLES							
7G UL	25	25'0"		5	7	8	15.4	138.5	4565	

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
OTHER -

PLUGGING PROCEDURE

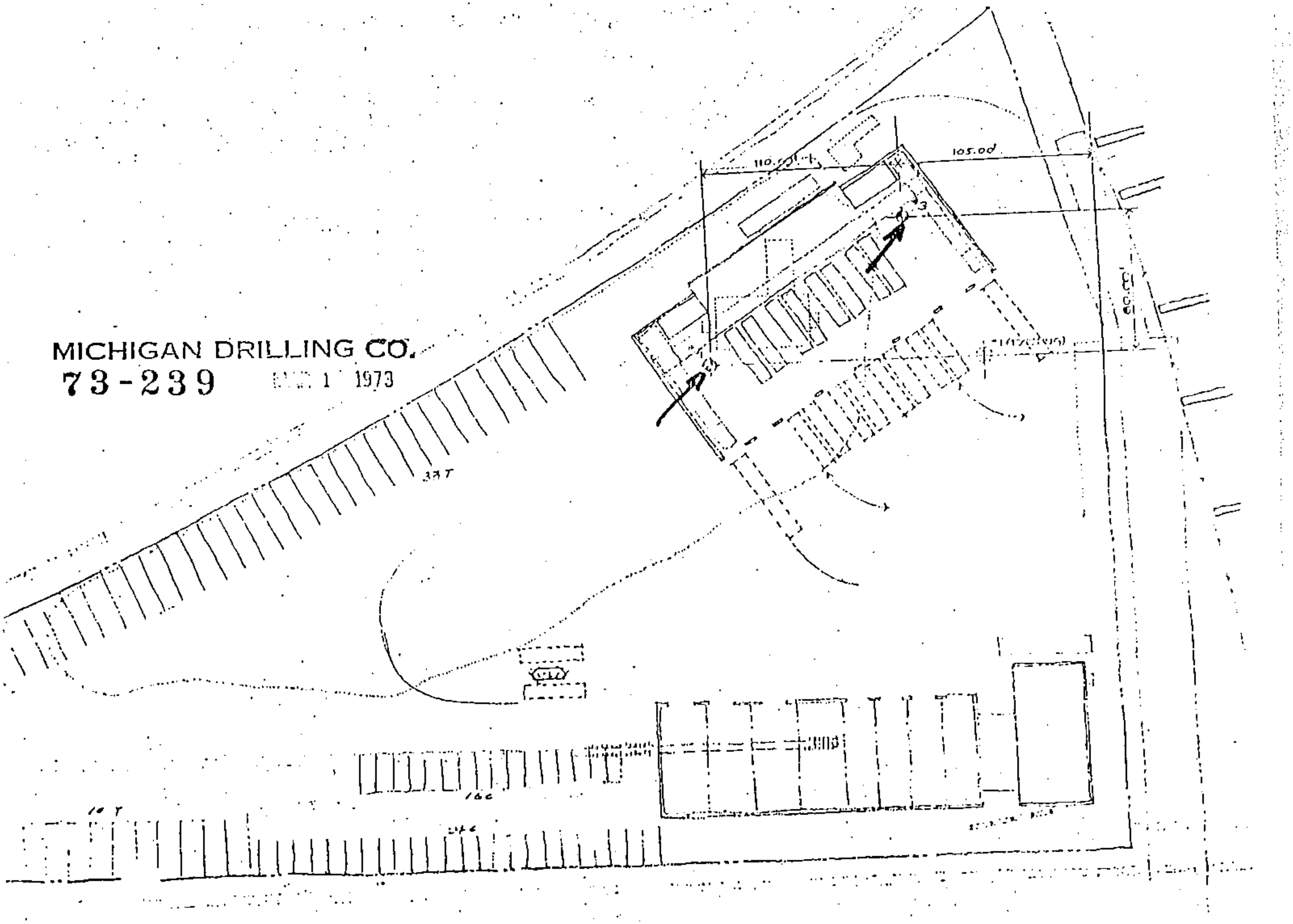
HOLE SEALED WITH ____ BETWEEN DEPTHS OF ____ AND ____.

Standard Penetration Test – Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	1	FT.	6	INS.
G.W. ENCOUNTERED AT	18	FT.	0	INS.
G.W. AFTER COMPLETION		FT.		INS.
G.W. AFTER	HRS.	FT.		INS.
G.W. VOLUMES	(HEAVY)			

MICHIGAN DRILLING CO.
73-239 ... 1 1973



MICHIGAN DRILLING

CONSULTING ENGINEERS IN SOILS & FOUNDATIONS

JOB NO. 73-239 LOG OF SOIL BORING NO. 3

PROJECT Pro. Sanitas Waste Disposal

LOCATION 1550 Harper Avenue

Detroit, Michigan

DATE 3-15-73 SURFACE ELEV. 99.1

Sample & Type	Depth	Soil Description	Penetration Blows For 6"			Moisture %	Natural Wt. P.C.F.	Unc.-Comp. Strength PSF.	Str. %
	0'–1'6"	Firm moist variegated sandy clay, bricks							
3A UL	1'6"–3'4"	Very stiff wet sandy variegated clay, fill, high organic content	6	8	10	20.1	148.8		
3B UL	3'4"–5'7"	Compact wet highly organic sand, clay content, fill	5	6	6	18.6			
3C UL	5'7"–15'0"	Extremely stiff moist brown clay, oxidized streaks, layers of silt, sand & pebbles	10	18	19	15.4	138.3	13408	
3D UL			14	19	24	11.1	146.5	3958	
3E UL	15'0"–17'10"	Extremely stiff moist blue clay, sand & pebbles	10	15	19	12.8	140.6	16191	
3F UL	17'10"–25'0"	Very stiff moist blue clay, sand & pebbles	9	11	13	14.1	138.8	6384	
3G UL	25'0"		10	12	13	14.5	140.0	5842	

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
OTHER -

PLUGGING PROCEDURE

HOLE SEALED WITH ________ BETWEEN
DEPTHS OF ____ AND ____.

Standard Penetration Test = Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 1 FT. 3 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 22 FT. 4 INS.
G.W. AFTER HRS. FT. INS.
G.W. VOLUMES Medium

MICHIGAN DRILLING

CONSULTING ENGINEERS IN SOILS & FOUNDATIONS

JOB NO. 73-239 LOG OF SOIL BORING NO. 4

PROJECT PRO. SANITAS WASTE DISPOSAL

LOCATION 1550 HARPER AVENUE DETROIT, MICHIGAN

DATE 3-15-73 SURFACE ELEV. 99.4

Sample & Type	Depth	Soil Description	Penetration Blows For 6"			Moisture %	Natural Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1'6"	FIRM MOIST VARIEGATED SANDY CLAY, FILL							
4A UL	4'3"	STIFF MOIST VARIEGATED CLAY, SAND, FILL	3	3	5	24.8			
4B UL	6'5"	STIFF MOIST VARIEGATED CLAY, WOOD, FILL, HIGH ORGANIC CONTENT	4	5	6	29.3	118.8		
4C UL	9'0"	EXTREMELY STIFF MOIST BROWN CLAY, OXIDIZED STREAKS, LAYERS OF SILT, SAND, PEBBLES	5	10	17	14.8	139.5	5906	
4D UL	13'10"	VERY STIFF MOIST SANDY CLAY, PEBBLES	8	12	11	14.0	138.0	19005	
	16'9"	EXTREMELY STIFF MOIST BLUE CLAY, OXIDIZED STREAKS, SAND & PEBBLES	10	12	14	13.1	141.6	11333	
4F UL		VERY STIFF MOIST BLUE CLAY, SAND & PEBBLES	10	12	13	14.6	139.0	6161	
4G UL	25'0"		10	12	13	16.0	135.7	4661	

TYPE OF SAMPLE
- -DISTURBED
- U.L.-UNDIST. LINER
- S.T.-SHELBY TUBE
- S.S.-SPLIT SPOON
- R.C.-ROCK CORE
- OTHER-

PLUGGING PROCEDURE

HOLE SEALED WITH ____ BETWEEN

DEPTHS OF ____ AND ____.

Standard Penetration Test – Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 1 FT. 4 INS.
G.W. ENCOUNTERED AT FT. INS.
G.W. AFTER COMPLETION 10 FT. 0 INS.
G.W. AFTER HRS. FT. INS.
G.W. VOLUMES

CTI
CONSTRUCTION TESTING & INSPECTION INC.
Ann Arbor Office - 607 South Maple Street - Ann Arbor, Michigan 48103 - Telephone: (313) 995-3777
Detroit Office - 21537 Telegraph Road - Southfield, Michigan 48034 - Telephone: (313) 353-0810

December 3, 1980

City Sand & Landfill, Inc.
1550 Harper
Detroit, Michigan 48211
Attn: Mr. Tom Handyside

RE: Proposed Building Additions
CTI File D-5576

Gentlemen:

Per your request, we have performed two (2) soil test borings, each to a depth of twenty feet (20') below the existing ground surface.

Enclosed you will find the engineering report, prepared by Mr. M. Krishnappa, Geotechnical Consultant, alongwith the soil boring logs with the laboratory test data.

The soil samples will be retained in our laboratory for a period of sixty (60) days, and may be examined upon request.

We have been pleased to be of service to you on this project. If you have any questions, please do not hesitate to call at your convenience.

Sincerely,

CONSTRUCTION TESTING & INSPECTION, INC.

Jeffrey J. Hurley

Jeffrey J. Hurley,
Southfield Manager

/je

cc: file

1. EXISTING SOIL AND GROUND WATER CONDITIONS:

Logs of two (2) soil test borings numbered one and two (1 & 2) together with a copy of the site plan showing the locations where the borings were drilled were provided. The borings have been extended to a depth of twenty feet (20'0") each below the existing ground surface.

The logs indicate the presence of "fill" materials extending to depths of three feet and three feet six inches (3'0" & 3'6") below the existing grade, and consisting of mainly sand, coal and coal dust. Logs of boring number one (1) indicates four inch (4") thick asphalt placed over a six inch (6") thick layer of "slag".

Below the fill, a layer of fine brown sand with traces of pebble was found extending to depths of four feet six inches and five feet six inches (4'6" & 5'6") in the locations of borings one and two (1 & 2) respectively.

Underlying the fill materials and the layer of sand, predominantly cohesive soils consisting of brown to gray clay with varying amounts of sand and pebble were encountered extending to and beyond the bottom of the borings.

Detailed descriptions of the soils encountered in the borings are shown on the logs of the borings provided.

While ground water was encountered at a depth of four feet six inches (4'6") in boring number two (2) none was encountered in boring number one (1), during the investigation.

2. SOIL TESTS AND RESULTS:

Number of blows recorded while performing standard penetration tests in the borings in accordance with the current A.S.T.M. D-1452 and D-1586 procedures are shown on the boring logs.

Results of laboratory tests performed on the soil samples obtained from the borings are also shown on the logs of the borings and laboratory data sheet accompanying the boring logs.

3. ANALYSES, CONCLUSIONS AND RECOMMENDATIONS:

3.1 Design Data Provided:

It is understood that it is proposed to construct additions on the east and west sides of the existing office building. It is further understood that the existing office building consists of one story and that it is intended to construct a second story on its top, in addition to the extensions on the east and west sides.

While it is understood that the existing building is about 25 years old, additional information regarding the existing foundations, and type and magnitudes of loads from the proposed additions are not known at present.

3.2 Foundation Types and Bearing Capacities:

The existing "fill" soils are unsuitable for supporting building foundations. Continuous strip and/or individual spread footings could be used to support the proposed extensions on the east and west sides of the existing building, providing that they can be designed and constructed within the limitations imposed by the existing structures, surrounding facilities and subsoil conditions.

The depths at which footings could be placed below the existing ground surface and the corresponding allowable bearing pressures which could be used in the design of these footings are presented in Table I which accompanies this report.

All exterior footings must be placed at least below a frost penetration depth of three feet six inches (3'6"), and all interior footings shoudl be supported on the natural soil deposits found below the fill soils.

It is recommended that continuous footings be suitably reinforced to resist bending moments due to slight differential movements.

Where footings are to be constructed in the layer of sand found below the fill materials, care should be exercised to insure that they are not placed at an elevation whereby there would be less than twelve inches (12") of sand between the bottom of the footings and the clay deposit immediately beneath the sand, inasmuch as rapidly draining ground water above the clay might induce scouring of the sand, thus promoting conditions where by settlement could occur.

At the junctions of the existing and new foundation systems, a construction joint should be incorporated in the super-structure. Suitable measures should be taken in order to insure that the proposed construction will not affect the stability of any existing foundations.

In view of the proximity of the existing railroad tracks, it is recommended that suitable measures be undertaken, considering the possibility of vibrations being transmitted to the foundations of the proposed additions.

Prior to the design of the intended first floor addition, the adequacy of the existing foundations to support loads from the addition should be investigated. In order to do this, it will be necessary to determine the sizes and depth of the existing foundation and the bearing capacities of the soils upon which these foundations are placed. If the existing foundations do not have the required capacities to support the additional loads, alternate methods of supporting these loads will have to be developed.

When preliminary plans showing the design of foundations for the proposed additions are available, a consultation should be arranged to review the designs and insure their adequacies.

3.3 Construction Procedures:

Ground Water Control: Although ground water was encountered only in boring number two (2) during the investigation, ground water should be anticipated in the excavations, expecially if construction is started during the late spring months, or after a prolonged period of precipitation in the area. While it should be possible to maintain the excavations in a virtually dry and workable condition by normal pumping procedures, care should be exercised not to cause excessive disturbance of the bearing fine grained soils prior to placing concrete for the footings.

Concrete Floor Slabs: Where concrete floors are to be placed at or near the present grade, the existing asphalt, pockets of topsoil and other organic materials must be completely removed, and the resulting subgrade thoroughly proof-compacted to obtain maximum uniform densification.

Where fill or backfill is required to raise the subgrade for concrete floors, the fill material should consist of clean, well-graded granular soils that are reasonably free from roots, wood or other organic substances. The fill should be deposited in horizontal layers, not exceeding nine inches (9") in loose thickness, and should be compacted uniformly to a density of ninety-five percent (95%) of an A.A.S.H.O. T-180 value.

The slabs should be suitably reinforced and separated from the foundation system by a suitable joint which would permit independent movement.

4. INSPECTION AND TESTING DURING CONSTRUCTION:

In view of the presence of fill soils on the site, the bearing soils should be carefully examined and field tested utilizing the services of an experienced soils engineer, in order to insure that all footings supporting the proposed additions bear upon good natural soils with adequate bearing capacities.

It is recommended that proper supervision and controls be exercised in preparing the subgrade, placing and compacting new fill, where required.

CONSTRUCTION TESTING & INSPECTION, INC.

M. Krishnappa

M. Krishnappa, P. E.
Geotechnical Consultant

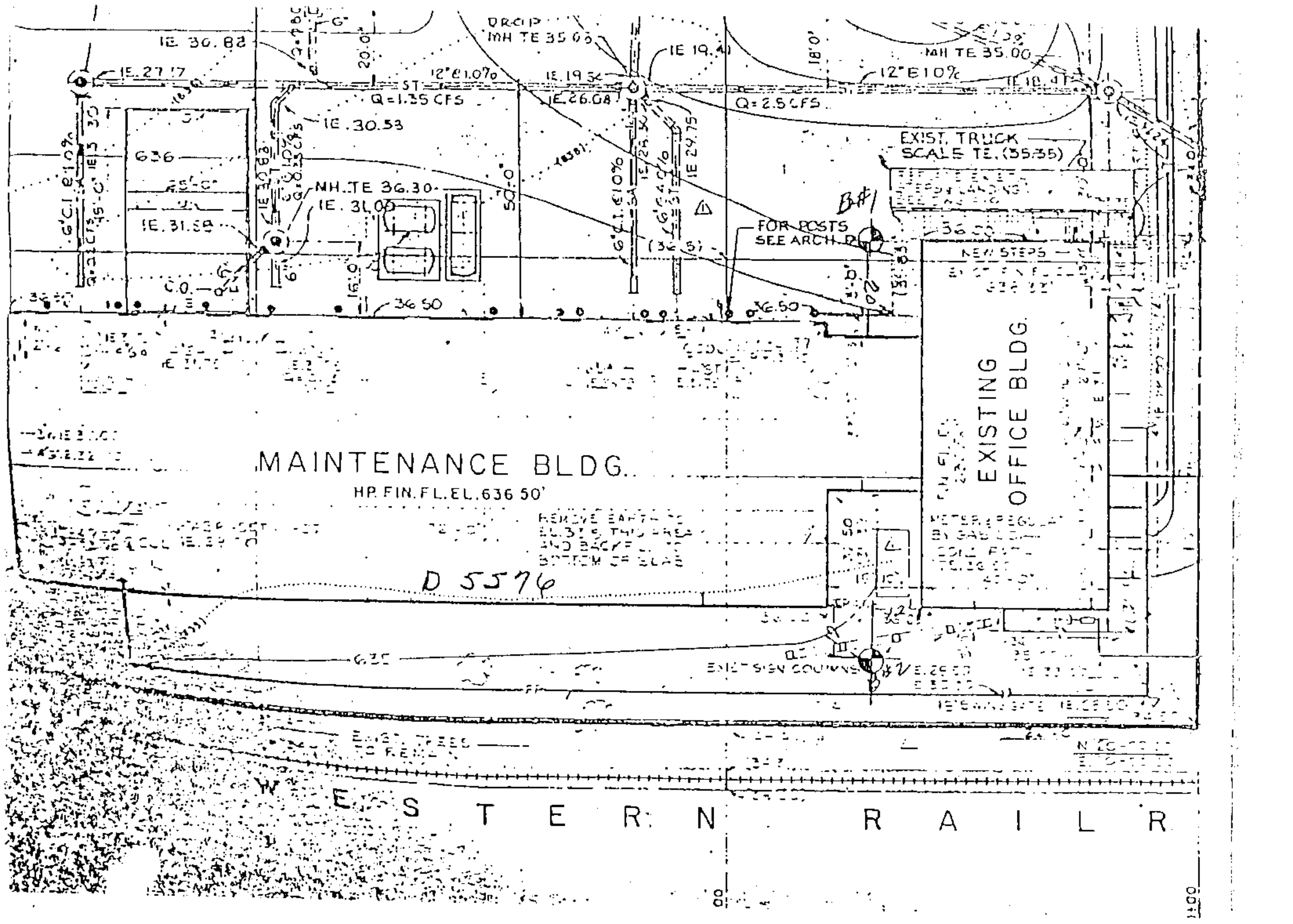
/je

cc: file

TABLE I

ALLOWABLE SOIL BEARING PRESSURES

Boring Number	Depth Below Existing Grade From	To	Bearing Pressure (PSF)	
1	0'0"	3'0"	--	Fill
	3'0"	4'6"	2000	
	4'6"	9'0"	3000	
	9'0"	12'0"	6000	
2	0'0"	3'6"	--	Fill
	3'6"	5'6"	2000	
	5'6"	7'0"	3000	
	7'0"	12'0"	6000	


MAINTENANCE BLDG.
HP. FIN. FL. EL. 636 50'
REMOVE EARTH TO
EL.31.5 THIS AREA
AND BACKFILL TO
BOTTOM OF SLAB
D 5576
EXISTING
OFFICE BLDG.
EXIST. TRUCK
SCALE TE. (35.35)
NEW STEPS
FOR POSTS
SEE ARCH.
B#1
MH. TE 36.30
IE. 31.00
IE. 31.58
IE. 30.53
IE. 30.83
IE. 27.17
IE. 30.82
Q=1.35 CFS
12" @ 1.0%
IE. 19.54
IE. 26.08
IE. 19.41
DROP
MH TE 35.05
Q=2.5 CFS
12" @ 1.0%
MH TE 35.00
IE 18.41
IE 25.30
IE 24.75
6" C.I. @ 1.0%
6" C.I. @ 1.0%
6" @ 4.0%
Q=.21 CFS
45'-0"
636
25'-0"
50'-0"
16'0"
20'0"
18'0"
36 50
36.50
(36.5)
635
EXIST SIGN COLUMNS
#2
EXIST. TREES
TO REMAIN
W E S T E R N   R A I L R

Ann Arbor Office - 607 South Maple Street - Ann Arbor, Michigan 48103 - Telephone: (313) 995-3777
Detroit Office - 21537 Telegraph Road - Southfield, Michigan 48034 - Telephone: (313) 353-0810

B-1

DATE 11-19-80

JOB NO. D-5576 PROJECT City Sand & Landfill Building Addition SURFACE ELEV.

	SOIL DESCRIPTION	Sample & Type	Depth	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	~~ASPHALT~~							
1'0"	SLAG		1					
	Medium compact moist GRAVEL, COAL, COAL DUST, FILL		2	15				
		1		9	20.5	124.0		
3'0"		UL	3	10				
	Medium comapct moist fine brown SAND trace of pebble		4					
4'6"				3				
	Medium stiff moist variegated CLAY, little sand, trace of pebble	2	5	4	19.8	125.5	2392	
		UL		6				
			6					
			7	4				
		3		7	17.4	139.6	3020	
		UL	8	12				
9'0"			9					
	Very stiff moist brown CLAY, trace of sand & pebble			9				
		4	10	15	13.9	141.9		
		UL		20				
			11					
			12					
			13					
14'0"			14					
	Very stiff moist gray CLAY, trace of sand, pebble & stone			7				
		5	15	15	14.4	135.0		
		UL		20				
			16					
			17					
18'0"			18					
	Stiff moist gray CLAY, trace of sand pebble & stone		19					
				6				
20'0"		6	20	10	14.3	136.1		
		UL		14				
	End of Boring							

TYPE OF SAMPLE
D. -DISTURBED
U.L.-UNDIST. LINER
S.T. -SHELBY TUBE
S.S. -SPLIT SPOON

REMARKS:
Hole plugged with natural material
Driller: R.Near; Helper: R.Near
Standard Penetration Test – Driving 2" OD Sampler 1' With ... At 6" Intervals

GROUND WATER OBSERVATIONS
G.W. ENCOUNTERED AT None FT. INS.
G.W. AFTER COMPLETION None FT. INS.
G.W. AFTER HRS. FT. INS.

... Detroit Office - 21537 Telegraph Road - Southfield, Michigan 48034 - Telephone (313) 353-0810 DATE 11-19-80

OB NO. D-5576 PROJECT City Sand & Landfill Building Addition SURFACE ELEV.

	SOIL DESCRIPTION	Sample & Type	Depth	Penetration Blows For 6"	Moisture %	Natural Wt. P.C.F	Unc Comp. Strength PSF	Str. %
	Medium compact moist SLAG, TOPSOIL, Sand, coal, coal dust		1					
			2	7				
	FILL	1		5	16.3			
		UL	3	6				
3'6"			4					
	Loose moist fine brown SAND, trace of pebble			5				
		2	5	2	21.3	118.9		
5'6"		UL		3				
	Moist variegated CLAY, trace of sand and pebble		6					
7'0"			7	4				
	Very stiff moist brown CLAY, trace of sand & pebble	3		10	16.3	136.3	15865	
		UL	8	20				
			9					
				8				
		4	10	15	15.5	137.8	16149	
		UL		20				
			11					
			12					
			13					
			14					
				7				
14'6"		5	15	12	14.9	136.1		
	Stiff moist gray CLAY, trace of sand pebble & stone	UL		16				
			16					
			17					
			18					
			19					
				6				
20'0"		6	20	11	13.0	135.2	9538	
		UL		14				
	End of Boring							

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
HSA

REMARKS:
Hole plugged with natural material
Driller: R.Near; Helper: R.Near

Standard Penetration Test - Driving 2" OD Sampler 1' With 140 # Hammer Falling 30", Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 4 FT 6 INS
G.W. AFTER COMPLETION None FT INS
G.W. AFTER HRS FT INS

truction Testing & Inspection, Inc.
7 Telegraph Road
hfield, MI 48034

Date: 11-21-80

Project: City Sand & Landfill
Building Addition

PARTIAL SIEVE ANALYSES ON GRANULAR SOILS

ing ber	Sample Number	No. 40 Sieve % Retained	No. 40 Sieve % Passing	No. 200 Sieve % Retained	No. 200 Sieve % Passing
4	1	18.4	81.6	76.7	23.3
	1	6.6	93.4	93.3	6.7
	2	8.6	91.4	89.7	10.3

DRAFT

APPENDIX D

HYDROGEOLOGIC REPORT AND MONITORING PROGRAM AND FOUNDATION STUDIES, RESOURCE RECOVERY FACILITY OBTAINED FROM THE MDNR FILE, LIVONIA, MICHIGAN DISTRICT OFFICE

a. HYDROGEOLOGICAL REPORT AND MONITORING PROGRAM

The bedrock geology in the vicinity of the site consists of sedimentary formations of the Michigan Basin. These formations contain limestones, shales, and sandstones which were deposited in an island sea during the Paleozoic era. In the Detroit area the Basin dips gently to the northwest. There are no bedrock outcrops at the site. In fact, outcrops are rare in all of Wayne County.

The area is mantled by Pleistocene glacial deposits with an average thickness of 100 feet or more. The unconsolidated deposits include heterogeneous tills and moraines consisting of unsorted clays, sands, gravels and coarser materials and water-sorted drift consisting primarily of sands and gravels. The deposits vary considerably with depth and at a single location may represent the results of several successive glaciations. Data developed from subsurface borings taken at the intersection of the Chrysler Expressway and Ferry Street, two blocks west of the site, show 30 feet of firm to hard clays with traces of sand and pebbles underlain by irregularly alternating layers of silty sand, clay and coarse sand with trace materials ranging from clay to cobbles. While these deposits may exhibit lateral variation, the Chrysler-Ferry data provide some indication of surficial geology in the vicinity of the site.

The nearest body of water to the proposed site is the Detroit River, approximately three miles to the southeast. No involvement with surface water systems, floodplains, or wetlands has been found or is anticipated in the site area.

Groundwater resources in the region are more commonly associated with surficial deposits than with bedrock. The best aquifers are water-sorted sand and gravel deposits. Tills and surficial deposits with high clay content yield small to moderate amounts of mineralized water. Data from test borings taken in the vicinity of the site indicate deposits of generally low to moderate water yield to a depth of 100 feet or more.

A hydrogeologic subsurface investigation program was conducted at the proposed site of the Resource Recovery Facility during February and March of 1982. The program consisted of drilling six borings located uniformly across the site, and the installation of three piezometers. The locations of the six borings and three piezometers are shown, with respect to the preliminary site arrangement, on Figure A-1 contained in Appendix A of this permit application. Borings 1 through 4 were drilled to a depth of 50 feet below the existing ground surface, and Borings 5 and 6 were drilled to a depth of 150 feet. Piezometers 2 and 5 were installed to a depth of 45 feet below the existing ground surface, while Piezometeer 3 was installed to a depth of 30 feet. Six stratigraphic layers were identified during the investigation program. A description of each of the stratigraphic layers and a discussion of the ground water conditions is presented in the following paragraphs. Subsurface profiles through Borings 1, 2, and 3 and Borings 4, 5 and 6 are shown in Figures A-2 and A-3, respectively, presented in Appendix A.

Subsurface Profile

The surficial material on the site is a fill unit which consists of black cinders, with layers of brown and gray silty clays. The consistency of the cinders ranges from very loose to dense, while the consistency of the silty clay ranges from soft to stiff. Crushed brick fragments and organics were observed in several of the borings. The thickness of the layer ranges from 2 to 18 feet with an average thickness of 7.5 feet.

The first cohesive layer underlies the fill and is present in all boring locations, except Boring 4. At Boring 4 the first cohesive layer is not present and the fill overlies the second cohesive layer. The first cohesive layer is a desiccated, weathered glacial till and consists of brown, and mottled gray and yellowish-brown silty clay with a trace of sand and gravel. The consistency of the silty clay ranges from stiff to hard. The thickness of the layer ranges from 8.5 to 14.5 feet with an average thickness of 11.5 feet, where present.

The second cohesive layer is a fresh (unweathered) glacial till that consists of gray silty clay with a trace of sand and gravel, and an occasional thin sand seam. The consistency of the silty clay ranges from stiff to hard. The thickness of the layer ranges from 22 to 28.5 feet with an average thickness of 25 feet.

The granular layer underlies the second cohesive layer and consists of interbedded layers of grayish-brown sand, and gray sandy clay and clayey sand. The consistency of the sand and clayey sand is medium dense, while the consistency of the sandy clay ranges from stiff to very stiff. A trace of gravel is present throughout this layer, and cobbles were encountered in Boring 5 in this layer. This layer was not present in Boring 6 and was not completely penetrated by Borings 1 or 2. The thickness of the layer ranges from 4.5 to 11 feet and the average thickness is 6.5 feet, where present.

The third cohesive layer underlies the granular layer. This layer is a fresh glacial till and consists of gray silty clay and sandy clay. Both units of this layer have a trace of gravel and occasional thin sand seams. The consistency of this layer ranges from stiff to very stiff. The moist unit weight of this layer decreases below elevation 69.5 feet (85 feet deep). The thickness of the layer ranges from 90 to 98.5 feet with an average thickness of 94 feet.

The fourth cohesive layer is a glacial till that consists of gray silty clay with a trace of sand and gravel, and an occasional grayish-brown sand layer. The consistency of the cohesive portion is extremely hard and the consistency of the sand is very dense. The top of this layer was encountered at a depth of 142 feet and was partially penetrated by the borings.

Ground Water Conditions

The piezometric ground water levels at the Resource Recovery Facility were measured in the three piezometers which were installed in February and March of 1982. The locations of the piezometers are shown in Figure A-1. Piezometers 2 and 5 are set in the granular layer, while Piezometer 3 is set in the second cohesive layer. The piezometric levels measured on May 4, 1982, are at elevation 146.7, 150.5, and 145.2 feet in Pizezometers 2, 3 and 5, respectively.

Construction Program

The proposed facility will not change the hydrogeological conditions on the site. Site elevations would be essentially maintained with only moderate restructuring to insure proper site drainage. All site drainage during construction and operations will be collected and discharged to the City's sanitary sewer system.

Based on the findings of the hydrogeological soils investigation program, all heavily loaded and settlement sensitive structures will be supported on piles. All foundations for the proposed structures will be located at approximately existing ground elevation.

All process wastewater will be collected, treated as required, and discharged to the sanitary sewer system. There will be no discharge of process wastewaters or sanitary wastewater into the groundwater table or surface water bodies.

COMBUSTION ENGINEERING

RESOURCE RECOVERY PROJECT

FOUNDATIONS

FILE NO. 10031.41.0607
SYSTEM ANALYSIS

BLACK & VEATCH CONSULTING ENGINEERS

May 26, 1982

COMBUSTION ENGINEERING
RESOURCE RECOVERY PROJECT

FOUNDATIONS

FILE NO. 10031.41.0607
SYSTEM ANALYSIS

Black & Veatch
Consulting Engineers

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LIST OF FIGURES AND TABLE

COMBUSTION ENGINEERING
RESOURCE RECOVERY PROJECT
SYSTEM ANALYSIS
PROJECT 10031

FOUNDATIONS

1.0 INTRODUCTION

The purpose of this analysis is to determine the most advantageous type of Foundation System for support of structures at the Resource Recovery Project site located on the northeast corner of the intersection of Russell and Ferry streets in Detroit, Michigan. This study is based on information obtained from the Phase I hydrogeologic subsurface investigation and the results of laboratory tests performed on soil samples recovered during the subsurface investigation program.

2.0 SUMMARY

2.1 SUMMARY OF IMPORTANT INFORMATION

(1) The Phase I hydrogeologic subsurface investigation consisted of six borings located uniformly across the site. The results of the Phase I subsurface investigation indicate that the stratigraphic layers are consistant across the site and are predominantly stiff compressible cohesive soils to a depth of 142 feet where a hard, incompressible, cohesive soil is encountered. The site is covered by fill that varies in thickness, consistency, and composition across the site. The piezometric ground water level was measured in the piezometers and was at elevations ranging from 145 to 150.5 feet (all elevations presented are based on the city datum) in May, 1982.

(2) Three alternative foundation systems were considered for support of the structures of the Resource Recovery Project.

   (a) Structural mat foundation system supported on engineered fill.

   (b) Spread footings founded on engineered fill.

   (c) Deep foundation system consisting of piling supporting a system of pile caps and a structural slab.

(3) A cap and slab system supported on piles driven to the hard silty clay layer at a depth of approximately 142 feet provides the best foundation system for supporting heavily loaded structures and settlement sensitive structures. This system will limit settlements to acceptable levels and is capable of resisting all foundation loadings. Pile types analyzed include steel pipe piles and steel H-piles. Comparative costs for the pile types analyzed are presented in Section 3.5.

(4) Spread footings supported on engineered fill may be a suitable foundation system for lightly loaded structures and nonsettlement sensitive structures. The feasibility of supporting a

structure on spread footings must be verified on an individual structure basis.

2.2 CONCLUSION

The results of the Phase I hydrogeologic soils investigation program, laboratory tests, and preliminary design indicate that the most acceptable foundation system for heavily loaded and settlement sensitive structures is a cap and slab system supported on piles.

It may be possible to support lightly loaded and nonsettlement sensitive structures on spread footings founded on engineered fill. It will be necessary to verify that a spread footing system will be suitable on an individual structure basis.

A detailed Phase II subsurface investigation is required at the location of all structures to verify design criteria and to determine if a spread footing foundation system is suitable. It is also recommended that a pile load test program be conducted during initial pile installation to verify the preliminary pile design capacities.

3.0 ANALYSIS
FOUNDATIONS

3.1 OBJECTIVE

The objective of this analysis is to determine the most appropriate type of foundation system for the support of structures for the Resource Recovery Project.

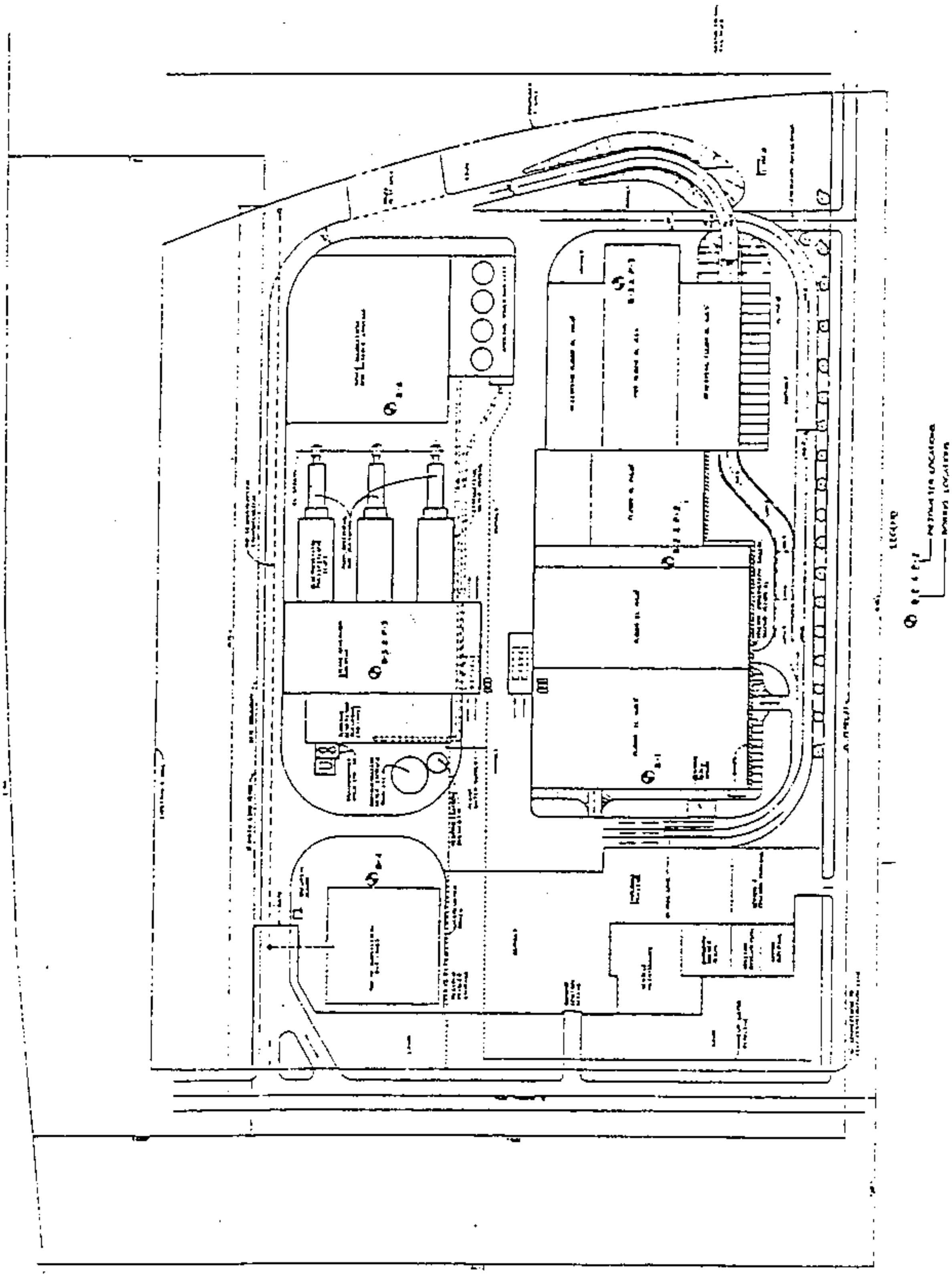
3.2 REQUIREMENTS

(1) This analysis will utilize data from the Phase I hydrogeologic subsurface investigation and laboratory test results which have been completed by McDowell & Associates under the direction of Black & Veatch.

(2) The total and differential settlements of all structures will be maintained within acceptable limits such that damage will not occur to the structures or utilities during the life of the project. The total settlement for the power generation structures will not exceed 1 inch and the differential settlement between adjacent columns will not exceed 0.25 inch.

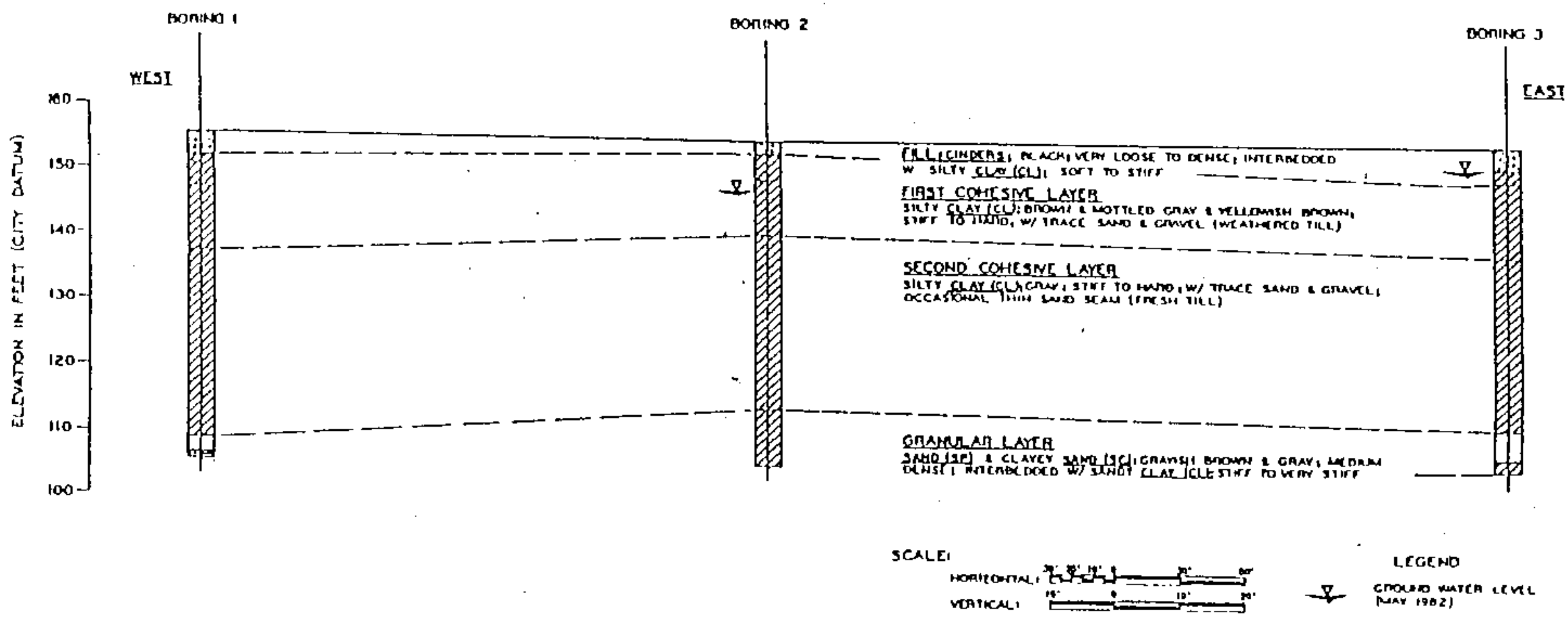
3.3 SUBSURFACE CONDITIONS

A Phase I hydrogeologic subsurface investigation program was conducted at the proposed site of the Resource Recovery Project during February and March of 1982. The Phase I program consisted of drilling six borings located uniformly across the site, and the installation of three piezometers. The locations of the six borings and three piezometers are shown, with respect to the preliminary site arrangement, on Figure 3-1. Borings 1 through 4 were drilled to a depth of 50 feet below the existing ground surface, and Borings 5 and 6 were drilled to a depth of 150 feet. Piezometers 2 and 5 were installed to a depth of 45 feet below the existing ground surface, while Piezometer 3 was installed to a depth of 30 feet. Six stratigraphic layers were identified during the investigation program. A description of each of the stratigraphic layers and a discussion of the ground water conditions is presented in the following paragraphs. Subsurface profiles through Borings 1, 2, and 3 and Borings 4, 5, and 6 are shown in Figures 3-2 and 3-3, respectively.



BORING & PIEZOMETER LOCATIONS

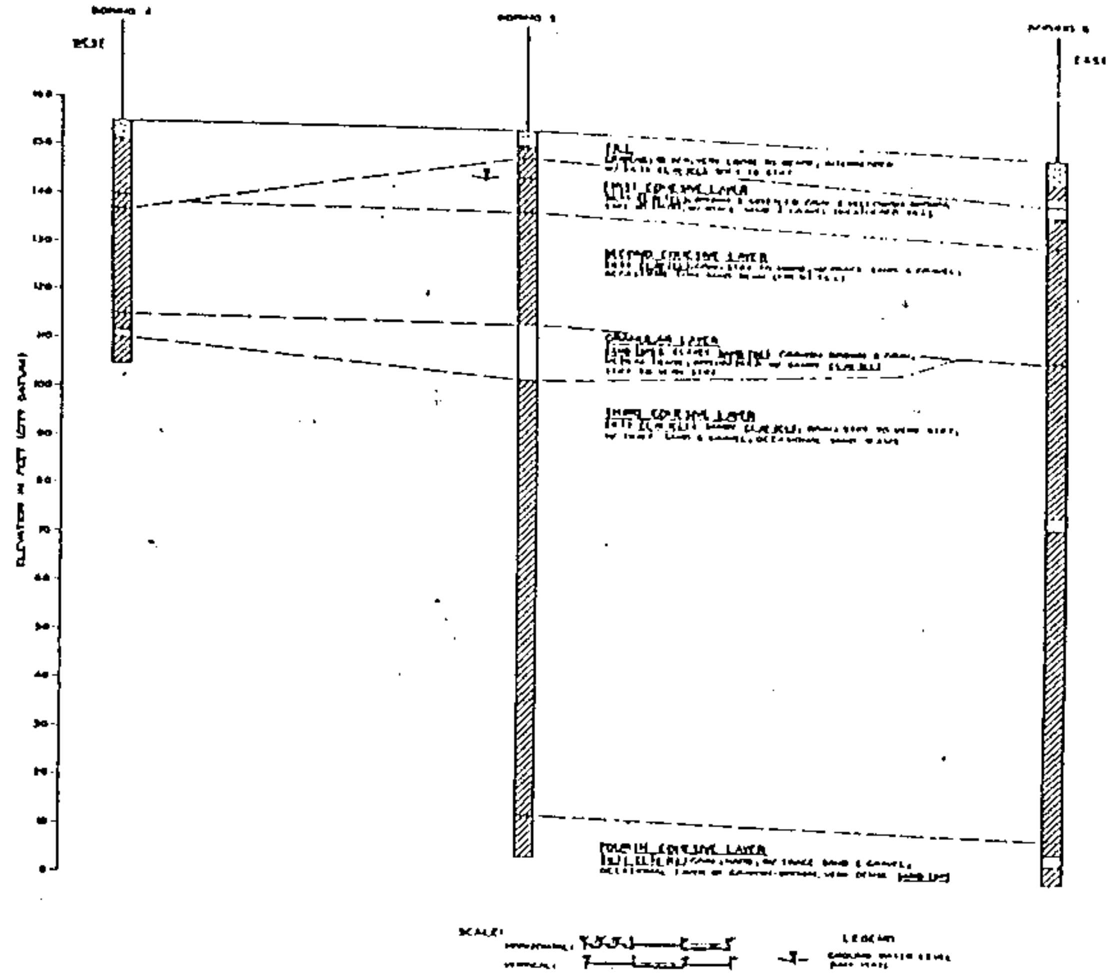
	SYSTEM ANALYSIS	FILE NO. 14031.41.0607
	FOUNDATIONS	CK 052782



SUBSURFACE PROFILE THROUGH BORING 1,2, AND 3

FIGURE 3-2

	SYSTEM ANALYSIS	FILE NO.	.41.0601
	FOUNDATIONS	CE 052782	



SUBSURFACE PROFILE THROUGH BORINGS 4, 5, AND 6

The Boring Logs, Piezometer Logs, and laboratory test results are presented in Appendix 3A.

3.3.1 Fill

The surficial material on the site is a fill unit which consists of black cinders, with layers of brown and gray silty clays. The consistency of the cinders ranges from very loose to dense, while the consistency of the silty clay ranges from soft to stiff. Crushed brick fragments and organics were observed in several of the borings. The thickness of the layer ranges from 2 to 18 feet with an average thickness of 7.5 feet.

3.3.2 First Cohesive Layer

The first cohesive layer underlies the fill and is present in all boring locations, except Boring 4. At Boring 4 the first cohesive layer is not present and the fill overlies the second cohesive layer. The first cohesive layer is a dessicated, weathered glacial till and consists of brown, and mottled gray and yellowish-brown silty clay with a trace of sand and gravel. The consistency of the silty clay ranges from stiff to hard. The thickness of the layer ranges from 8.5 to 14.5 feet with an average thickness of 11.5 feet, where present.

3.3.3 Second Cohesive Layer

The second cohesive layer is a fresh (unweathered) glacial till that consists of gray silty clay with a trace of sand and gravel, and an occasional thin sand seam. The consistency of the silty clay ranges from stiff to hard. The thickness of the layer ranges from 22 to 28.5 feet with an average thickness of 25 feet.

3.3.4 Granular Layer

The granular layer underlies the second cohesive layer and consists of interbedded layers of grayish-brown sand, and gray sandy clay and clayey sand. The consistency of the sand and clayey sand is medium dense, while the consistency of the sandy clay ranges from stiff to very stiff. A trace of gravel is present throughout this layer and cobbles were encountered in Boring 5 in this layer. This layer was not present in Boring 6 and was not completely penetrated by Borings 1 or 2. The thickness of the layer ranges from 4.5 to 11 feet and the average thickness is 6.5 feet, where present.

3.3.5 Third Cohesive Layer

The third cohesive layer underlies the granular layer. This layer is a fresh glacial till and consists of gray silty clay and sandy clay. Both units of this layer have a trace of gravel and occasional thin sand seams. The consistency of this layer ranges from stiff to very stiff. The moist unit weight of this layer decreases below elevation 69.5 feet (85 feet deep). The thickness of the layer ranges from 90 to 98.5 feet with an average thickness of 94 feet.

3.3.6 Fourth Cohesive Layer

The fourth cohesive layer is a glacial till that consists of gray silty clay with a trace of sand and gravel, and an occasional grayish-brown sand layer. The consistency of the cohesive portion is extremely hard and the consistency of the sand is very dense. The top of this layer was encountered at a depth of 142 feet and was partially penetrated by the borings.

3.3.7 Ground Water Conditions

The piezometric ground water levels at the Resource Recovery Project were measured in the three piezometers which were installed in February and March of 1982. The locations of the piezometers are shown in Figure 3-1. Piezometers 2 and 5 are set in the granular layer, while Piezometer 3 is set in the second cohesive layer. The piezometric levels measured on May 4, 1982, are at elevation 146.7, 150.5, and 145.2 feet in Pizeometers 2, 3, and 5, respectively. 6469 630.36 650 [illegible]

3.4 ALTERNATIVE SYSTEMS

Alternative systems considered for the foundations of the structures at the Resource Recovery Project site are as follows.

(1) Structural mat foundation system supported on engineered fill.

(2) Spread footings founded on engineered fill.

(3) Deep foundation system consisting of piling supporting a system of pile caps and a structural slab.

The generalized soil profile and design parameters used in the foundation analysis are presented on Figure 3-4. The parameters shown on Figure 3-4 were developed using the information obtained during the Phase I subsurface exploration and laboratory test program. In the analysis of the foundation alternatives it was assumed that the fill would be removed and replaced, that the granular layer has a unit weight of 120 pounds per cubic foot, and that the design parameters of the first and second cohesive layers are equal.

3.4.1 Structural Mat Foundation System

A structural mat foundation system would consist of a reinforced concrete mat founded on an engineered structural fill. The engineered structural fill material and the upper portions of the existing soil profile must be of adequate compressive strength to carry the loads while providing sufficient stability to limit total and differential settlement. Due to the variable consistency and thickness of the existing fill, all of the existing fill overlying the first or second cohesive layers would have to be removed and replaced with an engineered structural fill.

An analysis of a structural mat foundation system, using the soil design parameters developed from the results of the Phase I subsurface exploration program, was performed for the Turbine Generator Building, the Steam Generator Building and the electrostatic precipitators (see Figure 3-1). The analysis indicates that the settlement at the center of the Steam Generation Building would be approximately 9 inches. The settlement is a result of immediate or elastic deformation and long-term movement due to consolidation of the cohesive soil. The majority of the predicted settlement is due to consolidation of the cohesive soils and will occur over a long period of time. These settlements do not satisfy the requirements of Section 3.2, making this foundation unsuitable for supporting the power generation structures. Due to the magnitude of calculated settlements obtained for the power generation structures, a structural mat foundation system is also considered inadequate for supporting other heavily loaded structures and settlement sensitive structures.

3.4.2 Spread Footing System

A spread footing system would consist of reinforced concrete footings founded on engineered structural fill. The engineered structural fill material must exhibit an adequate bearing capacity to carry the loads

DEPTH (FT.)	DESCRIPTION	W	γ_t	LL	PI	S_u	OCR	C_r	C_c	e_o	
0	CINDERS; DENSE TO LOOSE & SILTY CLAY (CL): STIFF TO SOFT										FILL
10	SILTY CLAY (CL): GRAY & YELLOWISH BROWN; STIFF TO HARD (WEATHERED TILL)			27.3	11.0						FIRST COHESIVE LAYER
20–40	SILTY CLAY (CL): GRAY: STIFF TO VERY STIFF; W/ TRACE SAND & GRAVEL; (FRESH TILL)	14	139	27.3	11.0	3500	4	.023	.417	.46	SECOND COHESIVE LAYER
	CLAYEY SAND (SC) & SANDY CLAY (CL)										GRANULAR LAYER
50–80	SILTY CLAY (CL): GRAY; STIFF TO VERY STIFF; W/ TRACE SAND & GRAVEL; (FRESH TILL)	14	139	27.3	11.0	2100	1		.221	.71	
90–140	SILTY CLAY (CL): GRAY; VERY STIFF; W/ TRACE SAND & GRAVEL; (FRESH TILL)	25.1	129	27.3	11.0	2100	1		.221	.71	THIRD COHESIVE LAYER
150	SILTY CLAY (CL): GRAY; HARD; W/ TRACE SAND & GRAVEL; (TILL)	9.1	149			11,550					FOURTH COHESIVE LAYER

LEGEND	
W	WATER CONTENT, PERCENT
γ_t	MOIST UNIT WEIGHT, PCF
LL	LIQUID LIMIT
PI	PLASTIC INDEX
S_u	UNDRAINED SHEAR STRENGTH PSF
OCR	OVER CONSOLIDATION RATIO
C_r	RECOMPRESSION INDEX
C_c	COMPRESSION INDEX
e_o	INITIAL VOID RATIO

GENERALIZED SOIL PROFILE AND DESIGN PARAMETERS

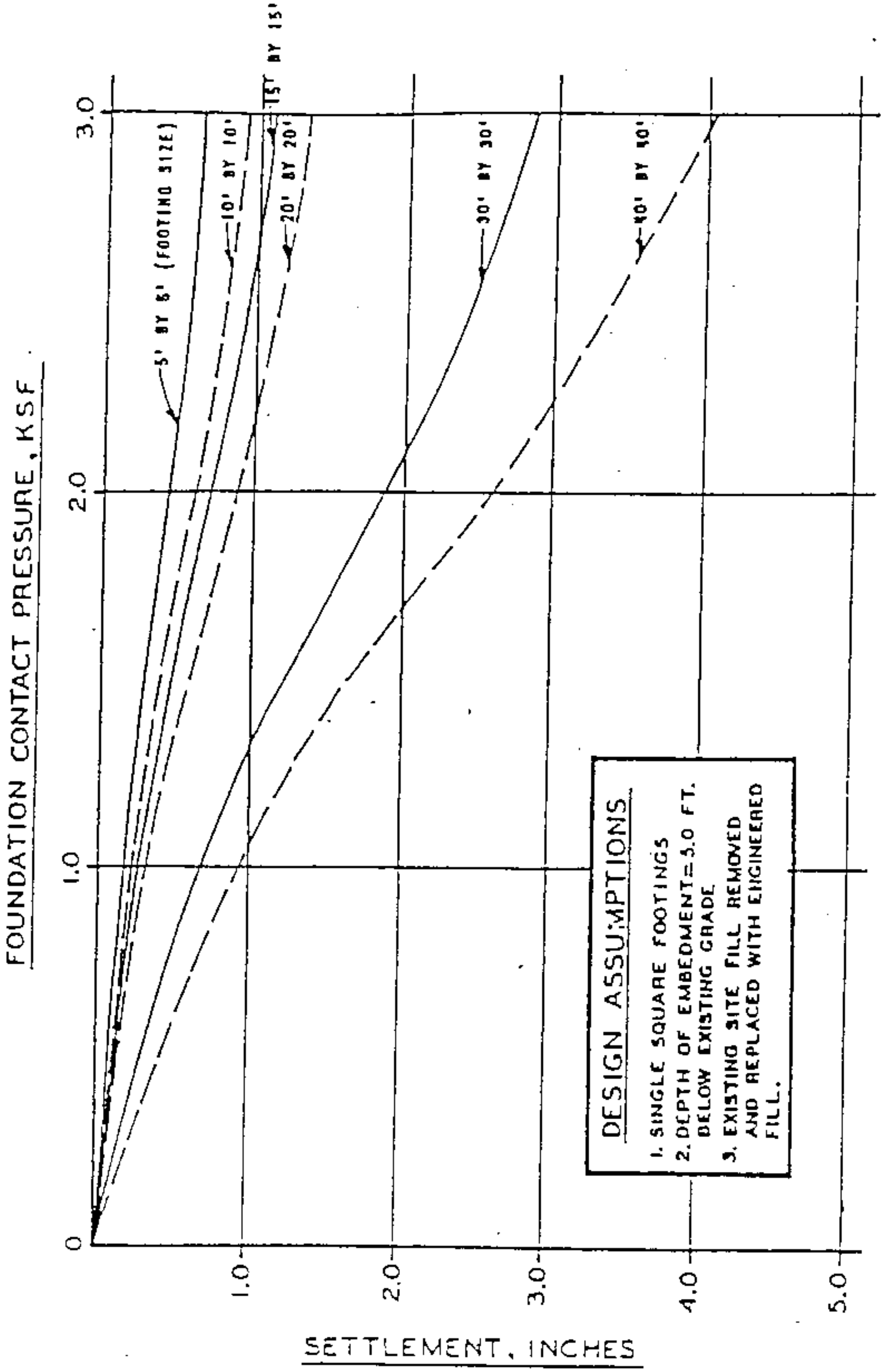
FIGURE 3-4

while providing sufficient stability to limit the total and differential settlement between adjacent footings. Due to the variable consistency and thickness of the existing fill material, it will be necessary to remove all of the existing fill overlying the first or second cohesive layer and replace it with an engineered structural fill.

An analysis of individual (the influence of adjacent footings on one another was not included) square footings was performed for several footing sizes. The foundation pressures considered in the analysis were 1.0, 2.0, and 3.0 kips per square foot (ksf). To account for potential frost heave, the base of the footings were assumed to be located 5 feet below existing grade. Figure 3-5 presents settlement curves for the various sizes of individual footings considered in the analysis. The settlement curves presented on Figure 3-5 indicate that spread footings may be acceptable for supporting lightly loaded and nonsettlement sensitive structures. It will be necessary to verify the spread footing design for each individual structure, to ensure that a spread footing system will have an adequate bearing capacity and limit the total and differential settlements to acceptable levels.

3.4.3 Deep Foundation System

A deep foundation system would consist of piles supporting a system of pile caps and structural slab. Steel H-piles and steel pipe piles were considered to be the most suitable pile types for this site due to the installation length of pile that would be required. The analysis considered HP 12 x 53 and HP 12 x 74 H-piles and 12.75 inch outside diameter (O.D.) driven pipe piles (mandrel and top driven). The allowable capacity of the HP 12 x 53 H-pile would be 93 tons, while the allowable capacity of the HP 12 x 74 H-pile and the 12.75 inch O.D. pipe piles would be 100 tons. The allowable capacity of the HP 12 x 53 H-pile is 7 tons less than the capacity of the other piles because the maximum allowable steel structural capacity of this H-pile section is 93 tons. The piles can develop the full allowable capacity through skin friction at the pile soil interface without relying on any tip resistance, however, to control settlement it will be necessary to drive the piles to the hard silty clay (Fourth Cohesive Layer) located at a depth of approximately 142 feet. In order to ensure that the piles



SETTLEMENT CURVES FOR
INDIVIDUAL SPREAD FOOTINGS

FIGURE 3-5

will be able to be driven to the required depth it may be necessary to predrill for a considerable depth at each pile location. The total and differential settlements of this system would be negligible.

3.5 COMPARATIVE PILE COSTS

A comparative cost analysis was made to determine the approximate cost of each type of pile. The analysis was based on the assumption that 100 feet of predrilling would be required and the pile would be 142 feet in length. Table 3-1 lists the approximate cost for one pile of each type of pile evaluated.

TABLE 3-1. PILE COSTS (1982 Dollars)

Pile Type	Allowable Design Capacity (tons)	Cost* $	Differential Cost $
Pipe Piles			
(a) Mandrel driven**	100	3,408	Base
(b) Top driven***	100	4,118	710
Steel H-Pile			
HP 12 x 74	100	4,544	1,136
HP 12 x 53	93	3,692	284

*Pile estimate costs were provided by Mr. Ronald Lawson, Canonie Construction Company; South Haven, Michigan.

**12.75 O.D. x 0.312 inch wall.

***12.75 O.D. x 0.250 inch wall lower 30 feet, 12.75 O.D. x 0.188 inch wall 112 feet.

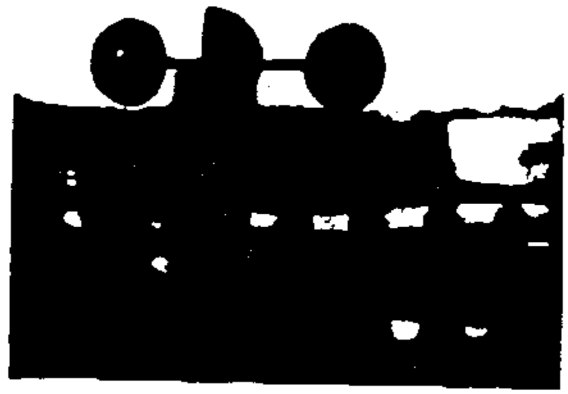
APPENDIX D

METEOROLOGICAL (Wind Direction) DATA

WIND

Wind data for Michigan are available from a number of National Weather Service, airport, and Air Force stations. The Pacific Northwest Laboratory (Battelle Memorial Institute, Richland, Washington) assembled wind data for a number of Michigan stations into a computerized data base that was utilized in the production of a Wind Energy Resource Atlas for the Great Lakes area. The data base for this atlas was archived on microfiche and magnetic tape. The microfiche for seven Michigan stations were obtained from the National Climatic Data Center and the data used in the construction of maps and graphs for the wind section which follows.

The seven stations include Detroit (Metro-Wayne Airport) 1961–1978, Gwinn (K. I. Sawyer AFB) 1958–1970, Lansing (Capital City Airport) 1963–1978, Muskegon (County Airport) 1961–1978, Traverse City (Cherry Cap Airport) 1962–1978, Sault Ste. Marie (Municipal Airport) 1966–1978, and Houghton (County Airport) 1954–1964.



Cup anemometer.

Average Annual Wind Directional Frequency and Speed

Michigan lies within the belt of westerlies, and winds prevail from this general direction. During the summer months winds are predominantly from the southwest due to the location over the southeastern United States of the semipermanent Bermuda High. During the winter winds prevail from the west or northwest, although they change frequently for short periods as migrating cyclones and anticyclones move through the area.

There can be considerable variation from station to station, however, depending upon location and exposure. Winds at Sault Ste. Marie and Houghton show a strong component of east and east-southeast winds in addition to large frequencies from the west-northwest. Winds at Gwinn prevail from both the south and north while winds at Traverse City prevail from the south. Wind velocities are highest at most stations with directions between west and north, with the exception of Muskegon, where the highest velocities occur with south and north winds.

Average Monthly Wind Speed and Wind Power

Wind power (watts m^2) was computed by researchers at the Battelle Memorial Institute and is a measure of wind as a power source. It is based on the distribution of wind speeds and the density of air in Kg/m^3, computed from station temperature and pressure. Winter is the season of greatest wind speed and power, while summer has the least wind speed and power, with August normally the month of lowest wind speed. In general, the more southerly stations show a greater seasonal variation in wind speed and power. Gwinn and Houghton, in the Upper Peninsula, show spring maxima of wind speed and a tendency towards a secondary maximum in spring occurs at the other stations. The average annual wind speed at anemometer height is greatest at Muskegon, along the Lake Michigan shoreline, with 4.9 meters per second (10.9 mph). Average annual wind speeds are least at Gwinn, with 3.8 mps (8.5 mph).

Average Annual Diurnal Wind Speeds

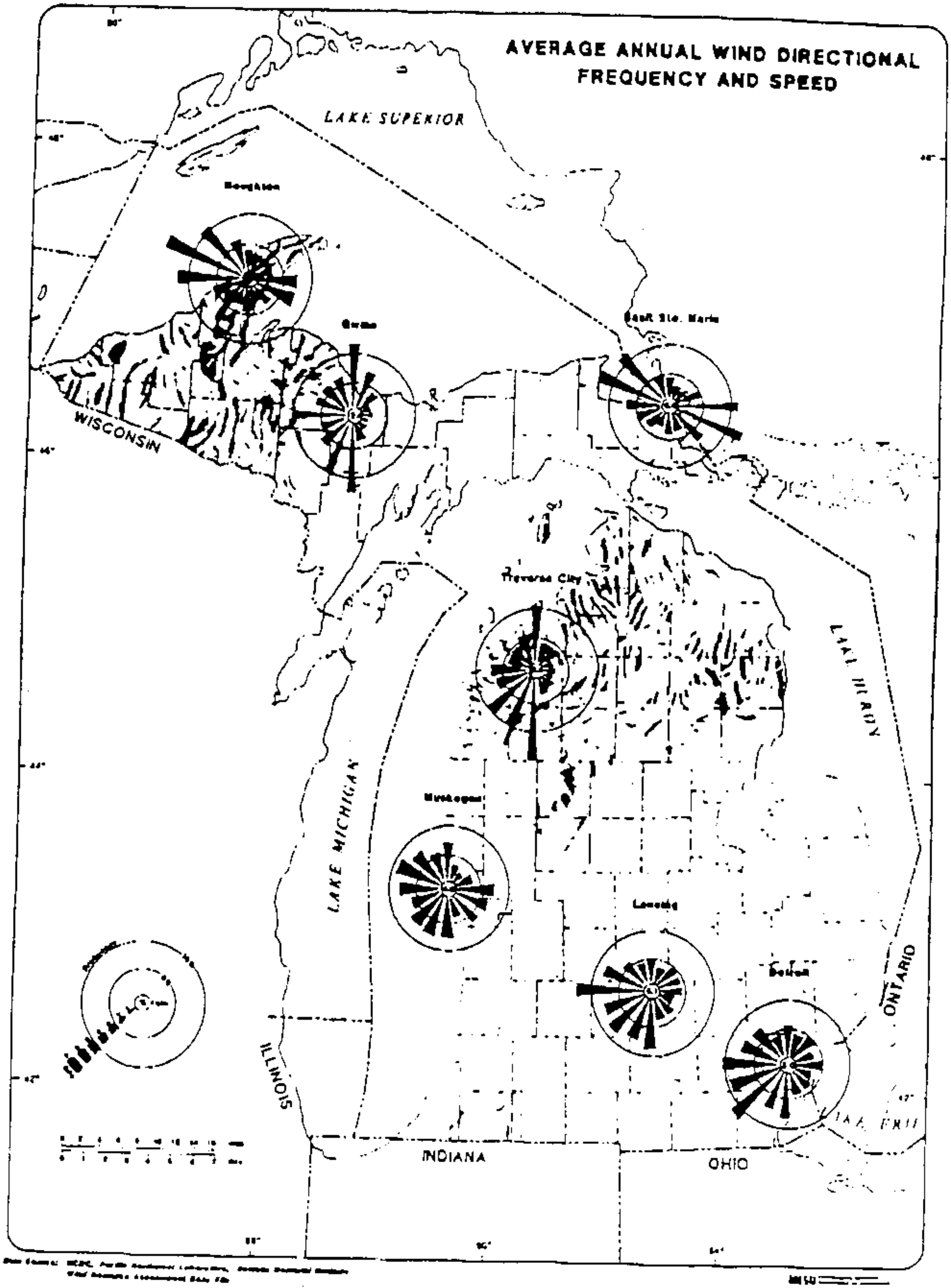
Maximum wind speeds occur between noon and 3:00 p.m., or during the afternoon when surface heating is at a maximum and turbulence is greatest. The diurnal variation is largest in summer and least in winter when surface heating during the day is minimal.

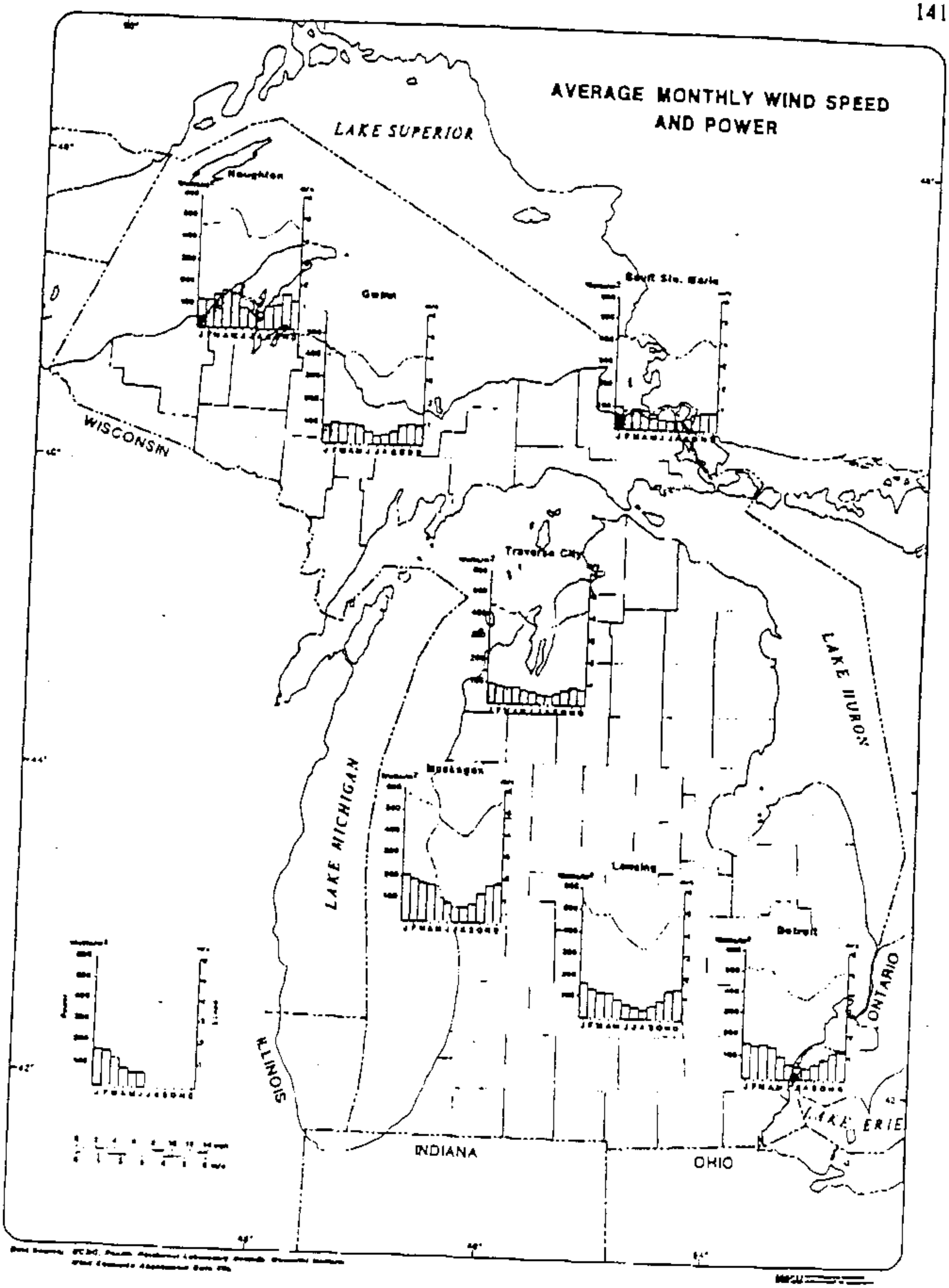
Average Annual Wind Speed Frequency

Winds at the majority of the stations have peak frequencies at speeds of about 4 mps (8.9 mph). The peak frequency at Sault Ste. Marie is 3 mps (6.7 mph). Observer bias may play a role in causing the apparent sharp changes of frequency from one speed to the next.

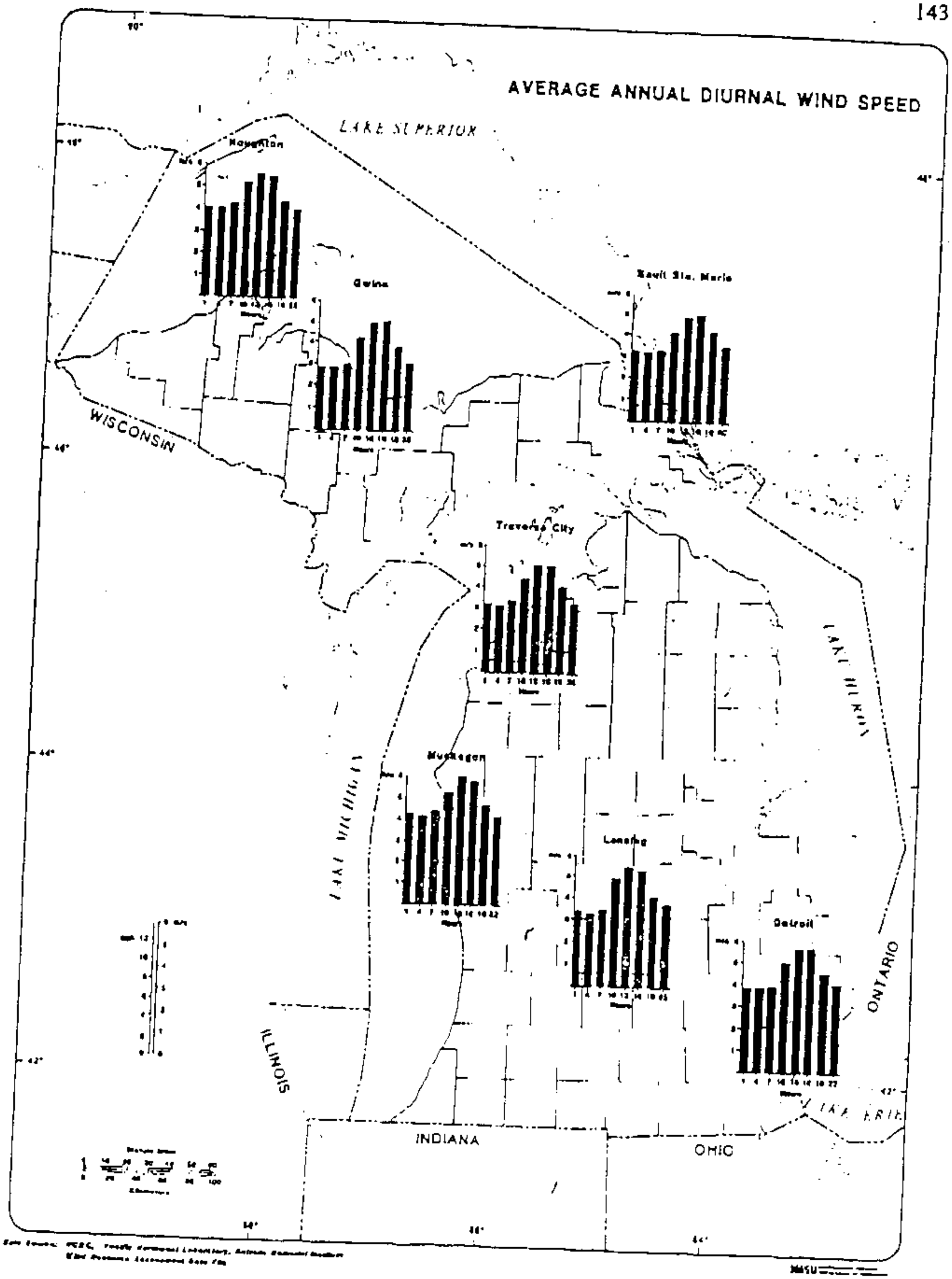
Average Annual Wind Speed Duration

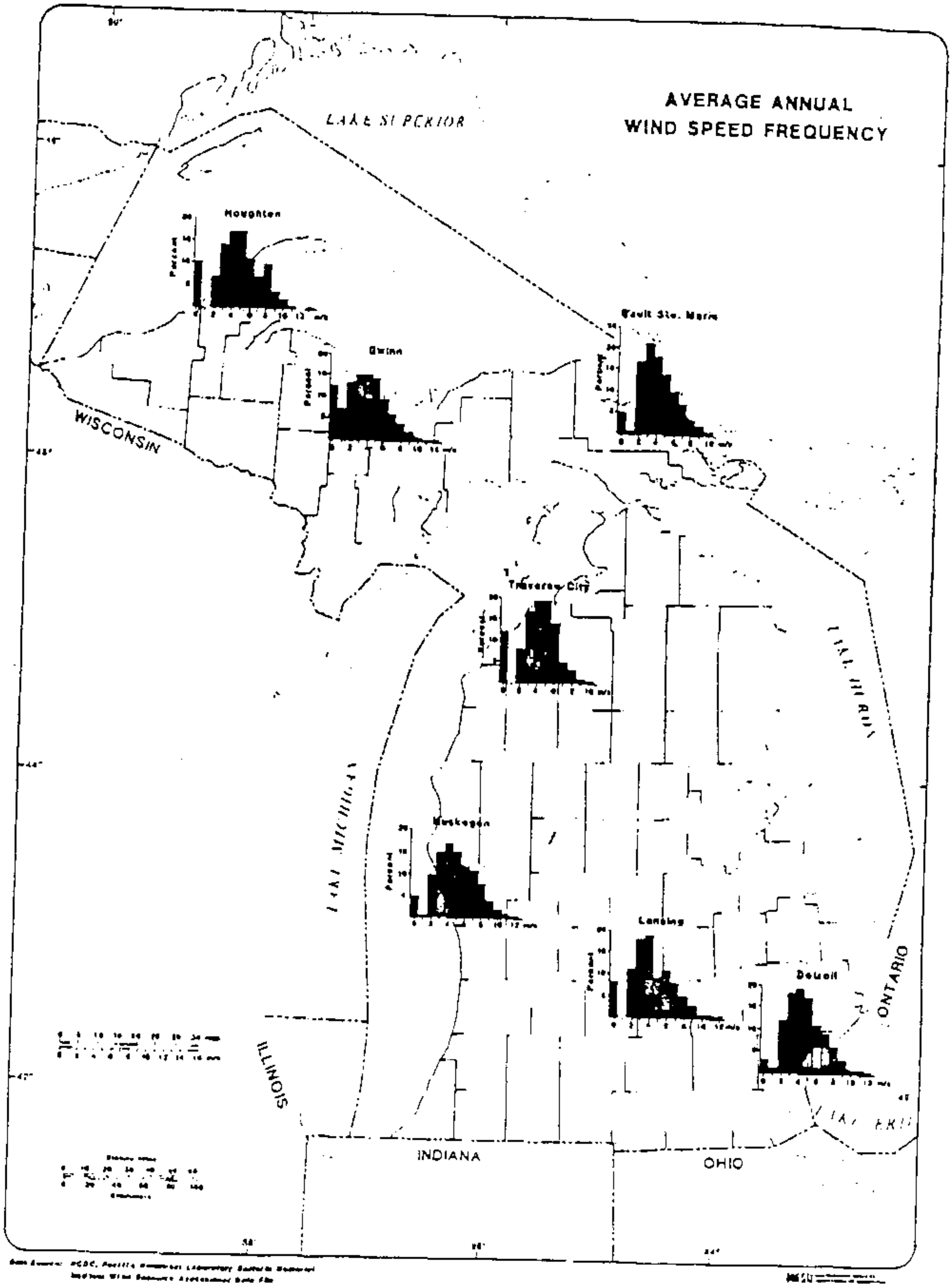
The graphs show the percent of time the indicated wind speed value is equaled or exceeded. Sharp changes in percent from one speed to the next may again indicate some bias in wind observations.

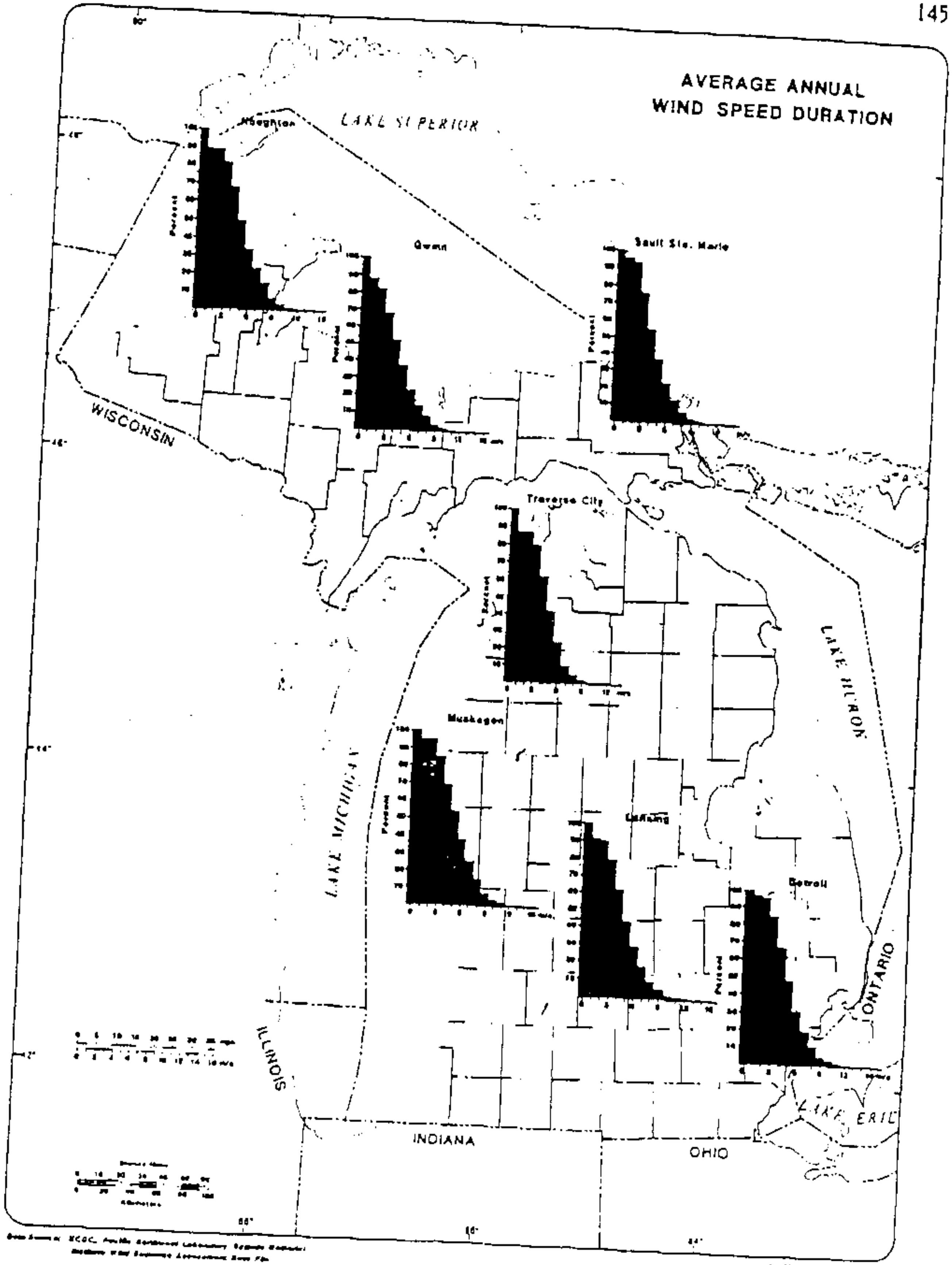

AVERAGE ANNUAL WIND DIRECTIONAL
FREQUENCY AND SPEED
LAKE SUPERIOR
Houghton
Sault Ste. Marie
WISCONSIN
Traverse City
LAKE MICHIGAN
LAKE HURON
Muskegon
Lansing
Detroit
ONTARIO
ILLINOIS
INDIANA
OHIO
LAKE ERIE

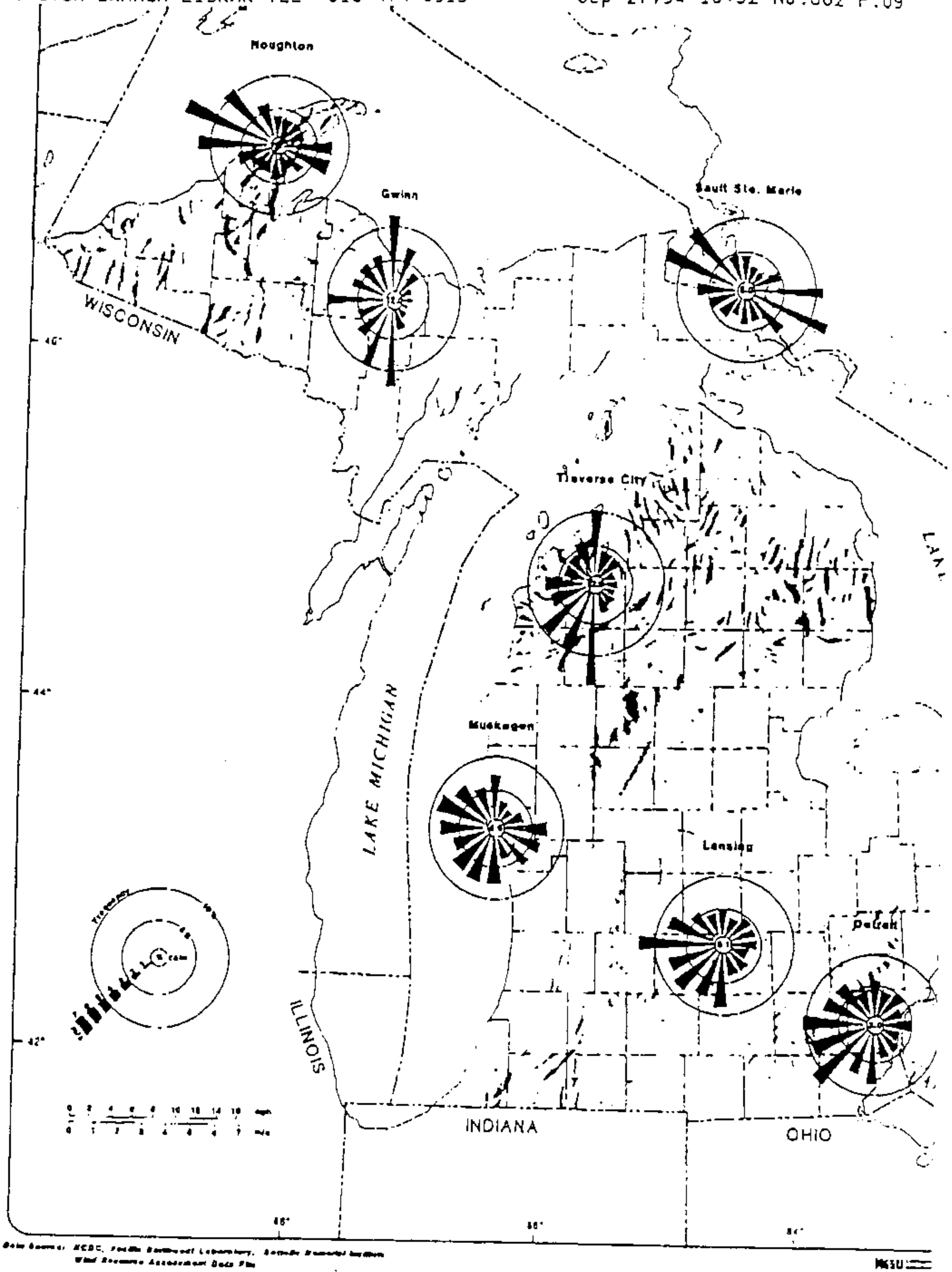


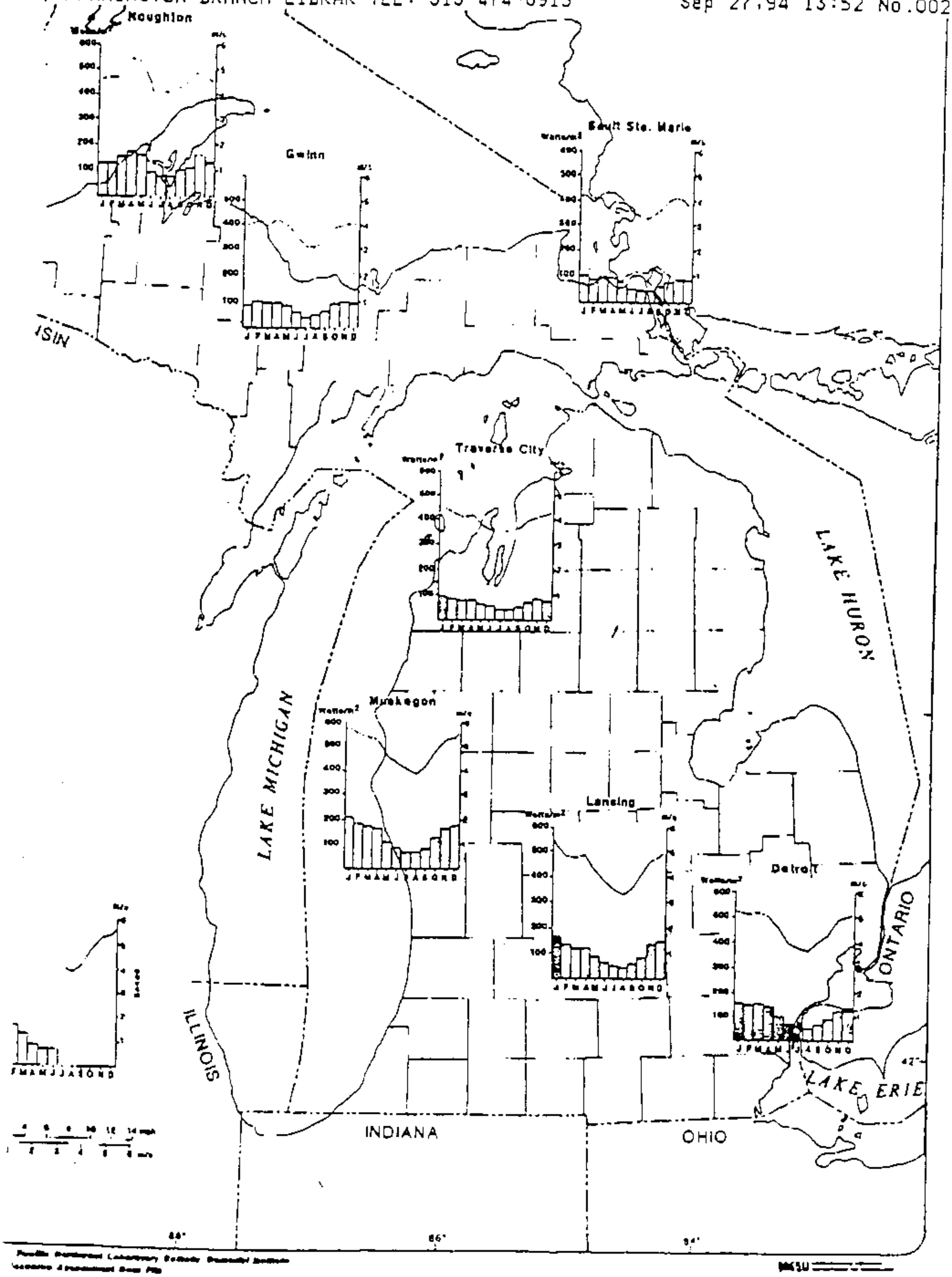
AVERAGE MONTHLY WIND SPEED AND POWER
LAKE SUPERIOR
Houghton
Gwinn
Sault Ste. Marie
WISCONSIN
Traverse City
LAKE HURON
LAKE MICHIGAN
Muskegon
Lansing
Detroit
ONTARIO
ILLINOIS
INDIANA
OHIO
LAKE ERIE


AVERAGE ANNUAL DIURNAL WIND SPEED
LAKE SUPERIOR
Houghton
Gwinn
Sault Ste. Marie
WISCONSIN
Traverse City
LAKE HURON
LAKE MICHIGAN
Muskegon
Lansing
Detroit
ONTARIO
ILLINOIS
INDIANA
OHIO
LAKE ERIE
Hours


AVERAGE ANNUAL
WIND SPEED FREQUENCY
LAKE SUPERIOR
Houghton
Sault Ste. Marie
Gwinn
WISCONSIN
Traverse City
LAKE HURON
LAKE MICHIGAN
Muskegon
Lansing
Detroit
ONTARIO
ILLINOIS
INDIANA
OHIO
LAKE ERIE


AVERAGE ANNUAL
WIND SPEED DURATION
LAKE SUPERIOR
Houghton
Gwinn
Sault Ste. Marie
Traverse City
Muskegon
Lansing
Detroit
Percent
WISCONSIN
LAKE MICHIGAN
LAKE HURON
ONTARIO
ILLINOIS
INDIANA
OHIO
LAKE ERIE


Houghton
Gwinn
Sault Ste. Marie
WISCONSIN
Traverse City
LAKE MICHIGAN
Muskegon
Lansing
Detroit
ILLINOIS
INDIANA
OHIO


Houghton
Gwinn
Sault Ste. Marie
Traverse City
Muskegon
Lansing
Detroit
LAKE MICHIGAN
LAKE HURON
LAKE ERIE
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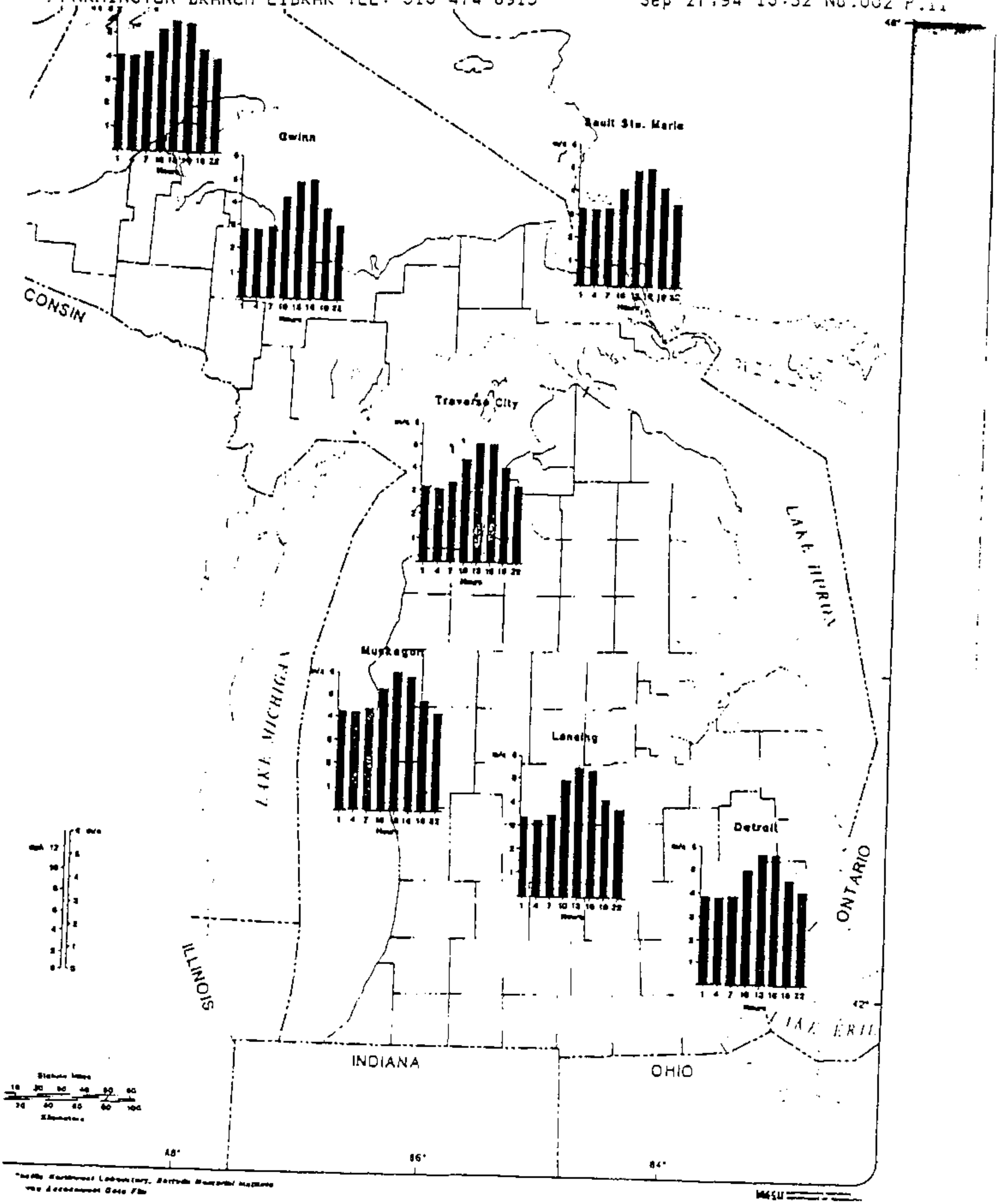
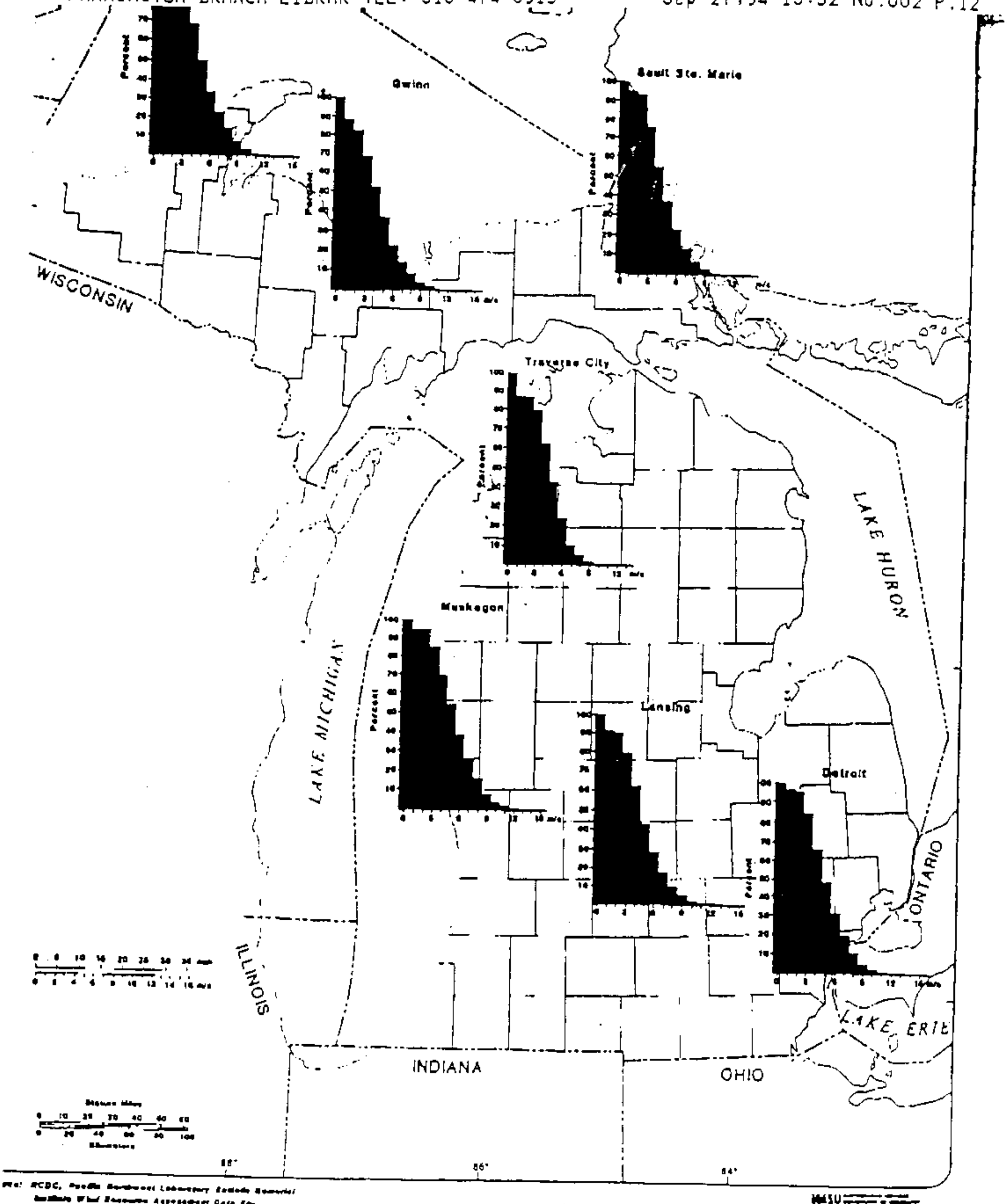
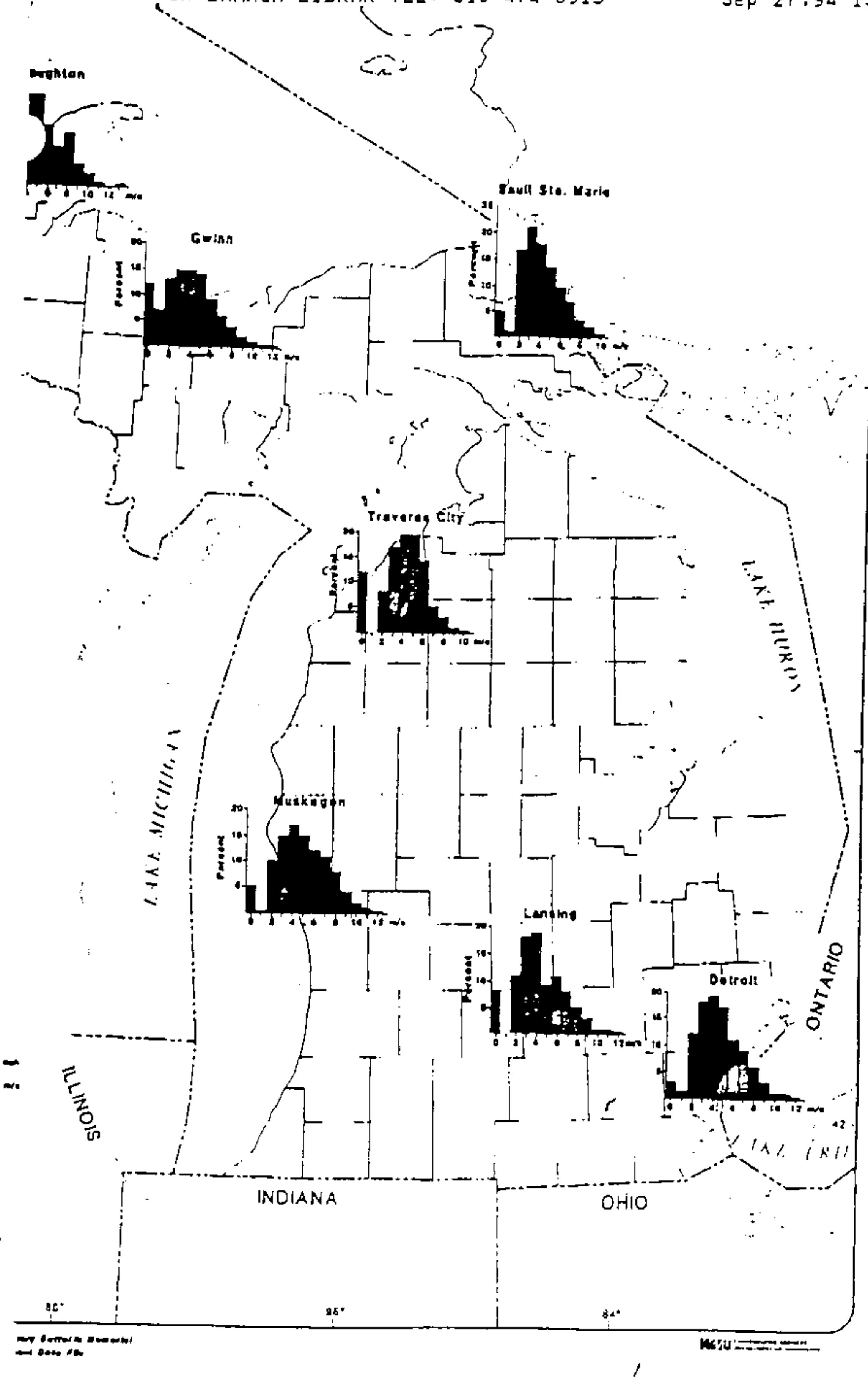
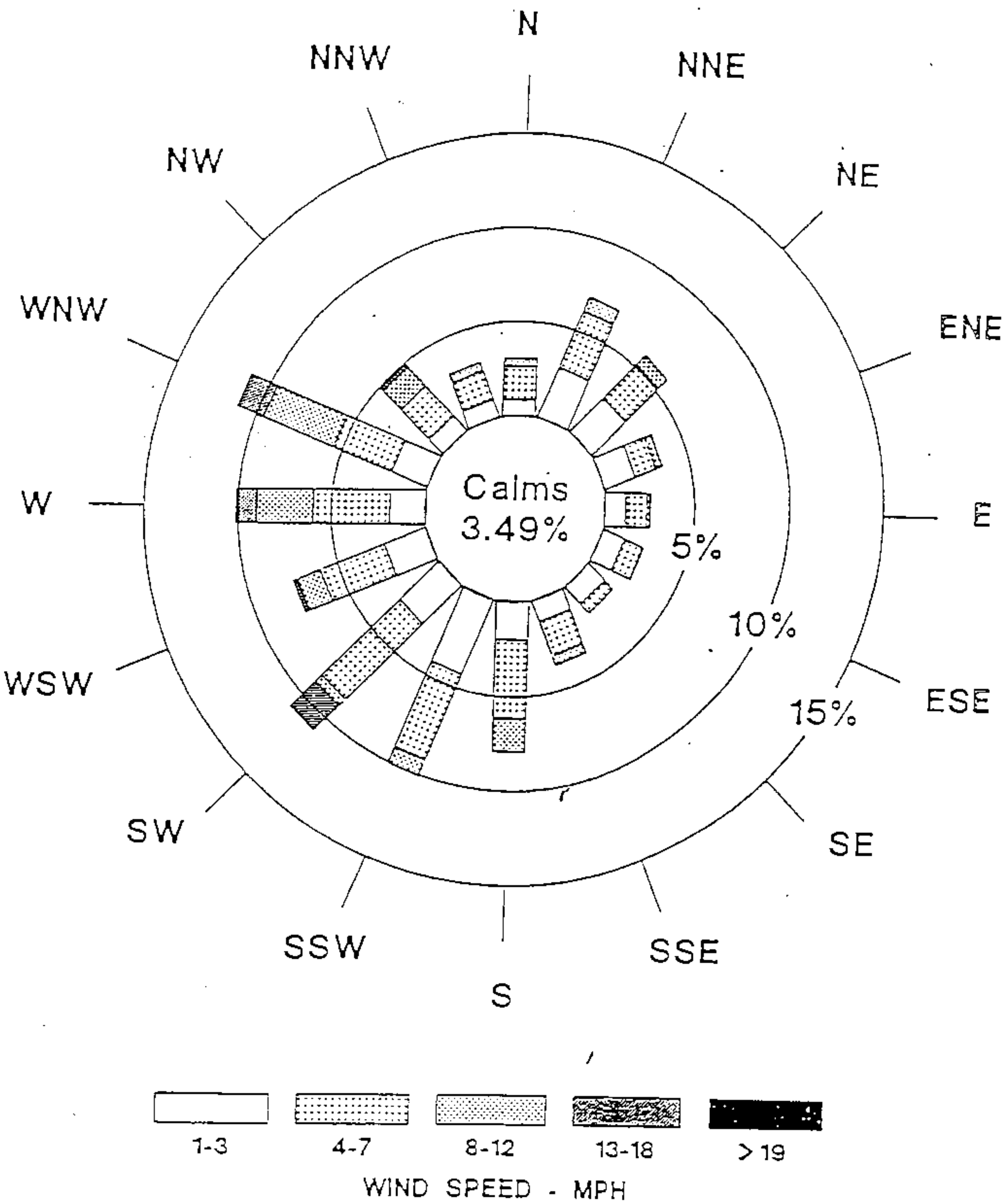
J F M A M J J A S O N D

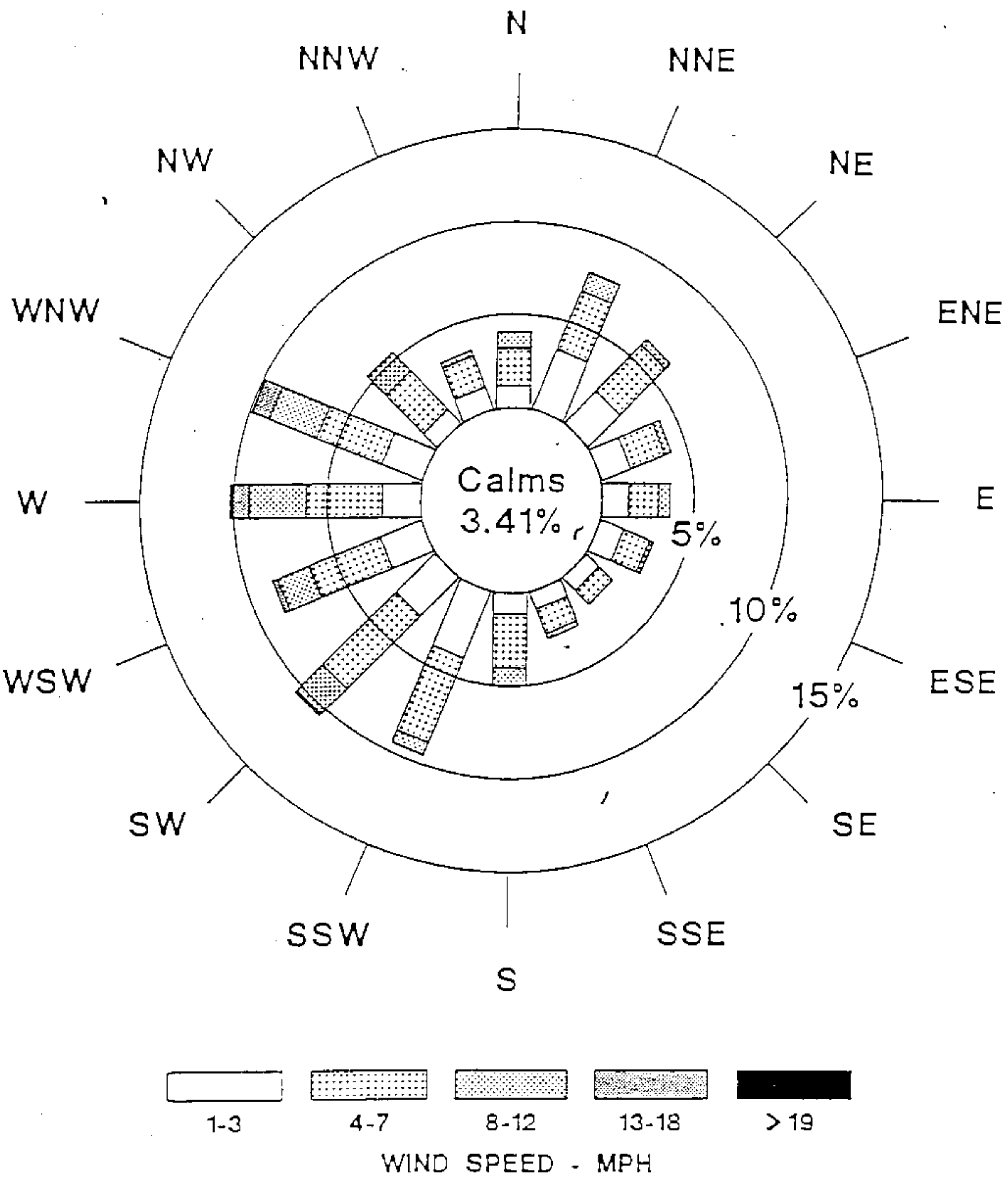

Gwinn
Sault Ste. Marie
Traverse City
Muskegon
Lansing
Detroit
CONSIN
LAKE MICHIGAN
LAKE HURON
ONTARIO
ILLINOIS
INDIANA
OHIO
LAKE ERIE
Hours


Gwinn
Sault Ste. Marie
Traverse City
Muskegon
Lansing
Detroit
Percent
WISCONSIN
LAKE HURON
LAKE MICHIGAN
ILLINOIS
INDIANA
OHIO
ONTARIO
LAKE ERIE


Saull Ste. Marie
Gwinn
Traverse City
Muskegon
Lansing
Detroit
LAKE MICHIGAN
LAKE HURON
ONTARIO
ILLINOIS
INDIANA
OHIO
Percent
m/s



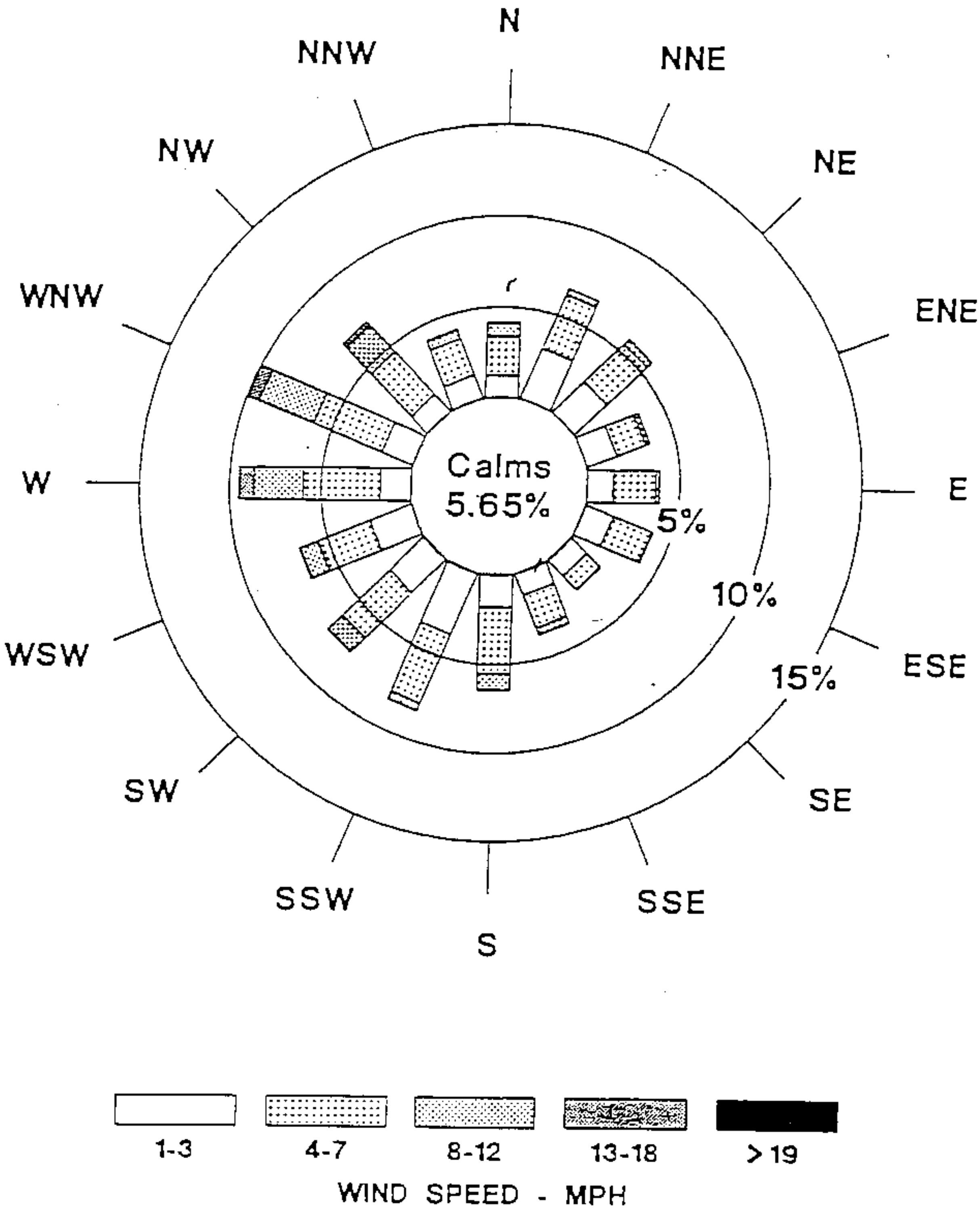
OAK PARK
1990
(26-125-0001)



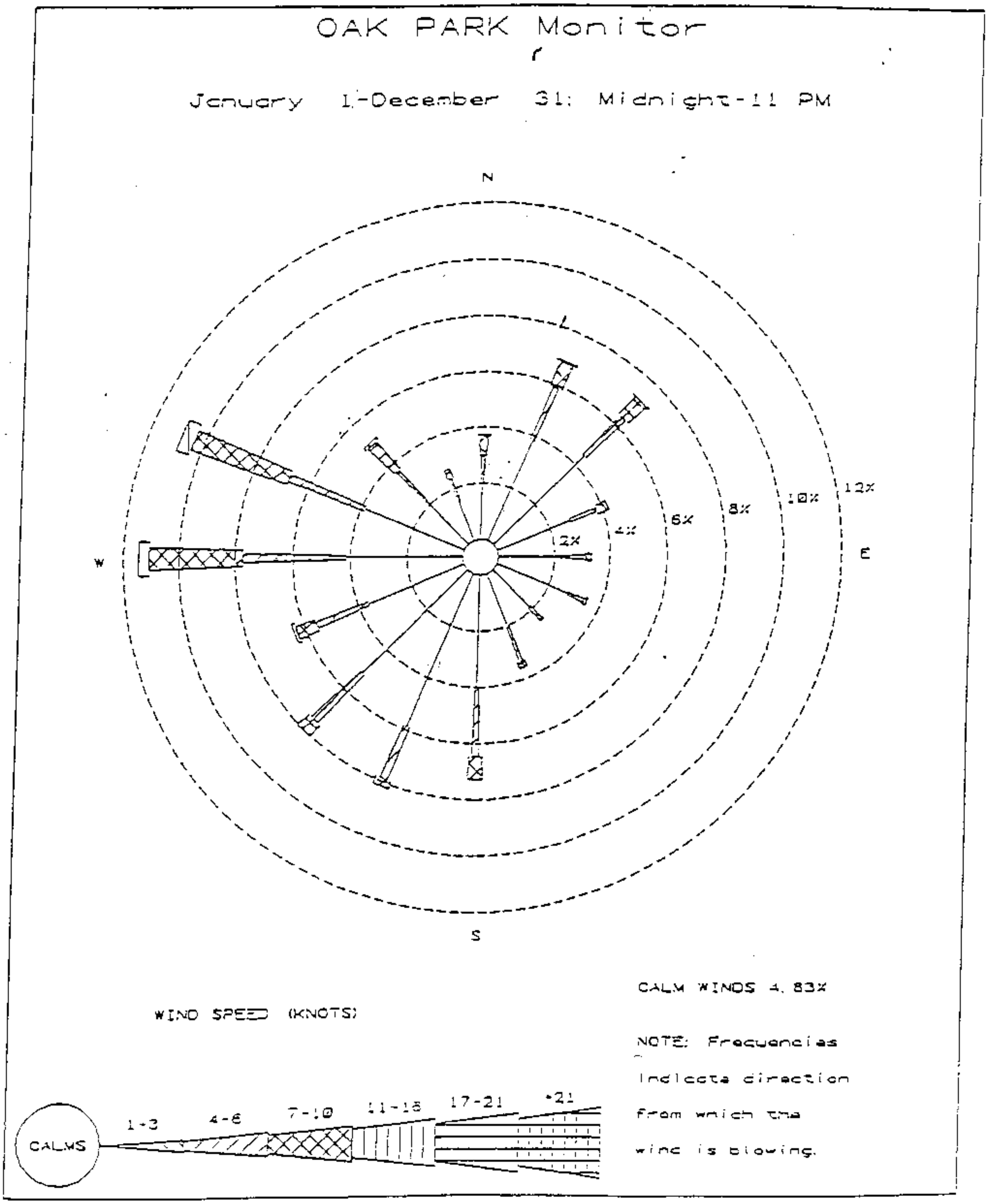
OAK PARK

1991

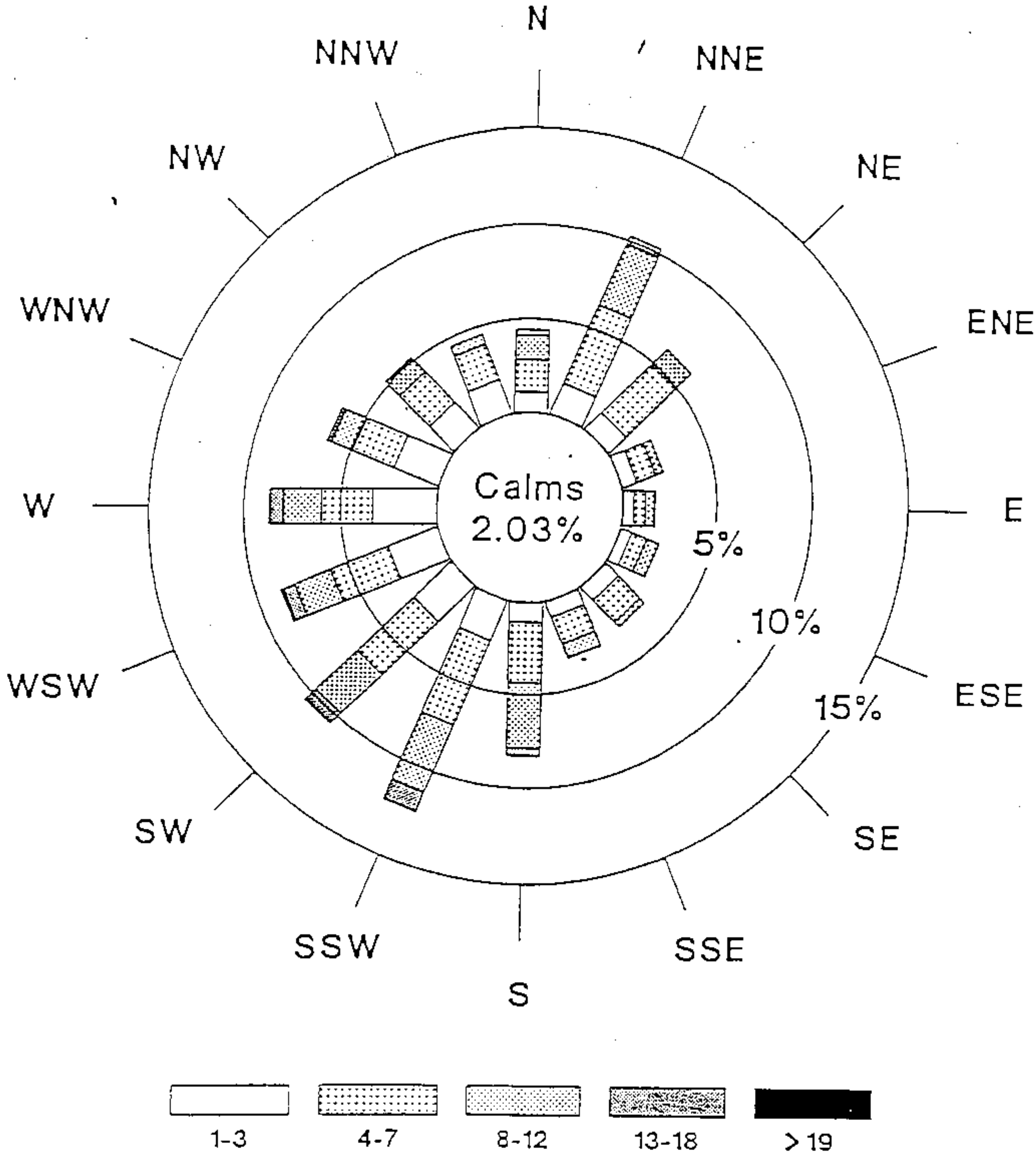
(26-125-0001)



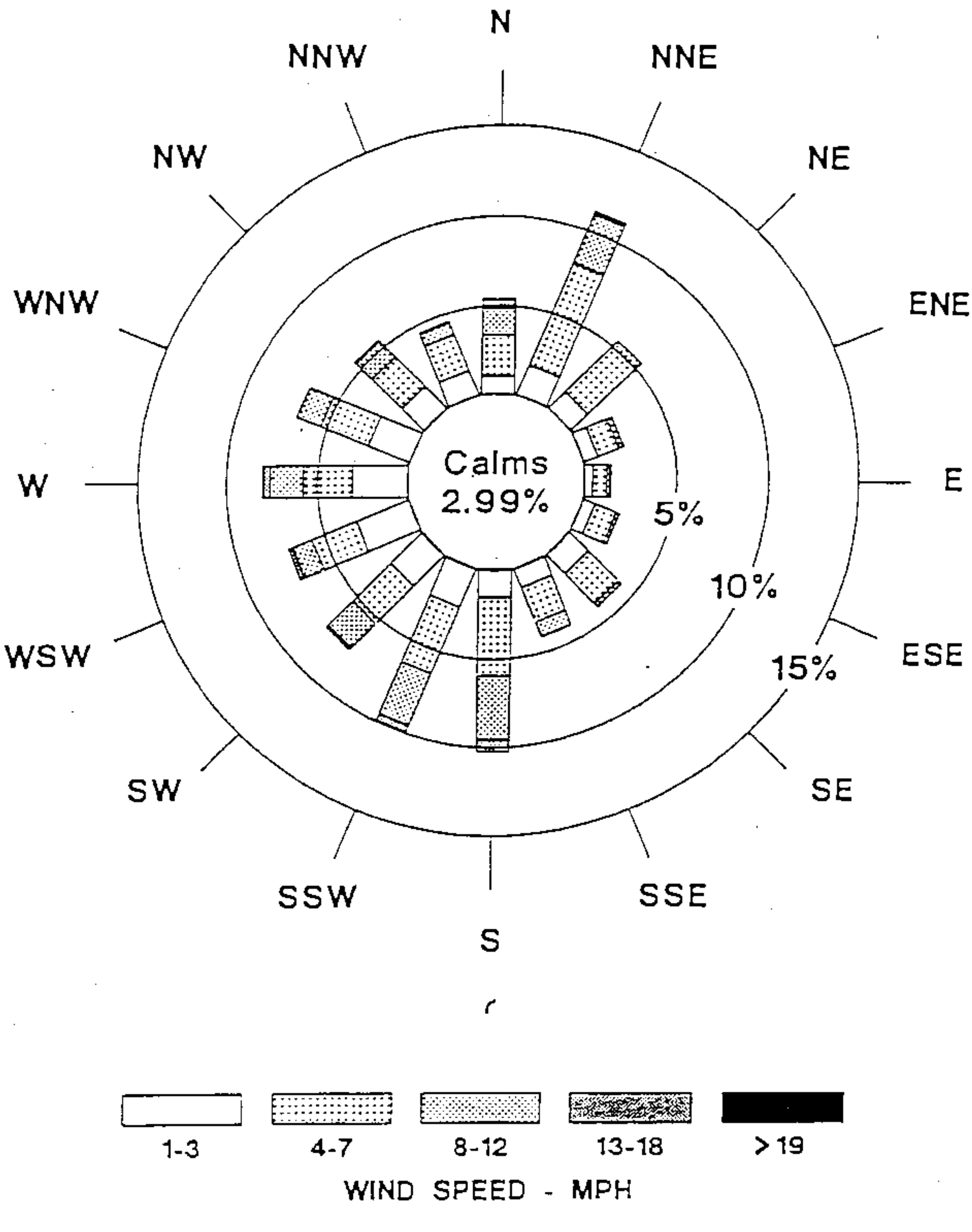
OAK PARK
1992
(26-125-0001)


OAK PARK Monitor
January 1-December 31: Midnight-11 PM
N
W
E
S
2%
4%
6%
8%
10%
12%
CALM WINDS 4.83%
WIND SPEED (KNOTS)
NOTE: Frequencies
indicate direction
from which the
wind is blowing.
CALMS
1-3
4-6
7-10
11-16
17-21
+21

1993



PORT HURON
1991
(26-147-0005)

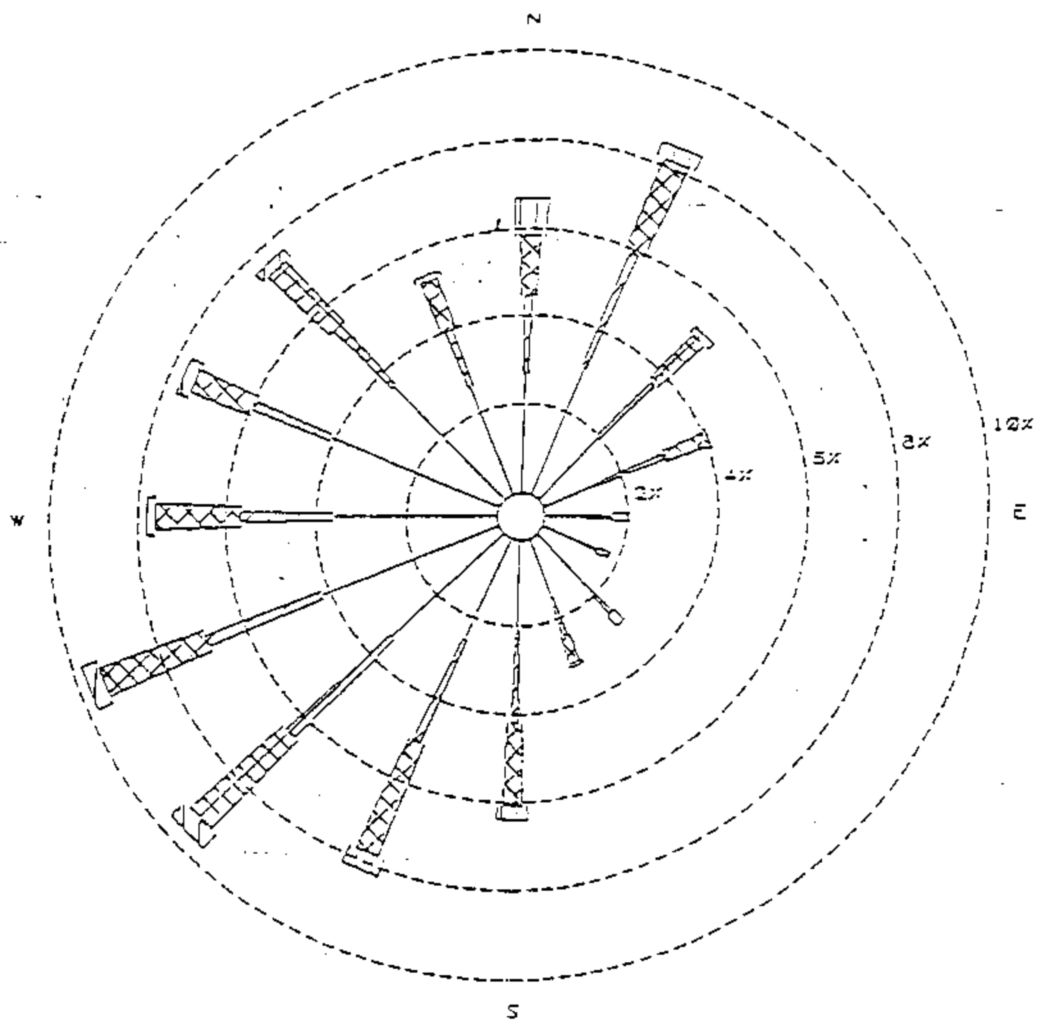


PORT HURON
1992
(26-147-0005)

SIDHU, A. OCT 03 1994

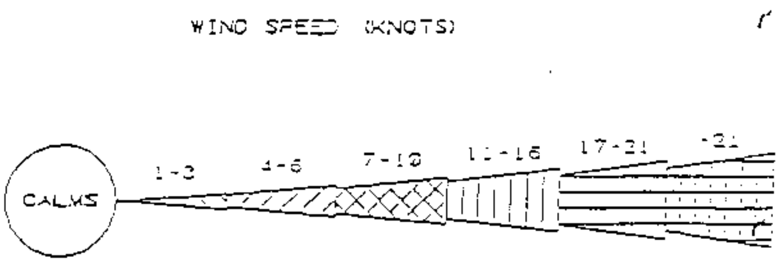
PORT HURON Monitor

January 1-December 31: Midnight-11 PM



CALM WINDS 1.99%

NOTE: Frequencies indicate direction from which the wind is blowing.



1993

DRAFT

APPENDIX E

BORING LOGS

DRAFT

BORING LOGS COMPLETED BY GZA IN OCTOBER AND NOVEMBER, 1990

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150

GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT

City Environmental, Inc.
Frederick Steet Facility

REPORT OF BORING No. SB-18
SHEET 1 OF 2
FILE No. 60669
CHKD. BY GAB

BORING Co. Great Lakes Drilling
FOREMAN Mike Warden
GZA ENGINEER Louis Johnston

BORING LOCATION See Site Plan
GROUND SURFACE ELEVATION 633.6' DATUM 635.30 BM#6
DATE START 11-9-90 DATE END 11-9-90

R: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

METHOD: 4-1/4" I.D./8.5" O.D. HOLLOW STEM AUGER

RIG TYPE: CME-55 TRUCK-MOUNTED

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME

DEPTH	SAMPLE NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMARKS
									Pocket Penetrometer	
5	1	SS	18/10	3.5 - 5	2-2-2	FILL: Very Loose SAND, Some Clay Lines, Trace Gravel, Black and Brown, Wet	FILL			
							8'			
10	2	SS	18/14	8.5 - 10	8-16-21	Hard, Silty CLAY with Sand and Gravel, Brown to Gray, Medium Plasticity, Moist (CL).			>4.5 TSF	
15	3	SSL	18/14	13.5 - 15	10-15-18	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Moist (CL).	CLAY		2.5 TSF	
20	4	SS	18/16	18.5 - 20	7-12-16	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Moist (CL).			4.0 TSF	
25	5	SS	18/14	23.5 - 25	10-12-13	Hard, Sandy CLAY, Trace Silt and Gravel, Gray, Medium Plasticity, Moist (CL).			>4.5 TSF	1
30	6	SSL	18/4	28.5 - 30	7-12-17	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Moist (CL).				
35	7	SSL	18/8	33.5 - 35	3-11-14	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Moist (CL).			2.3 TSF	
40										

REMARKS:

1. Pushed 3" Shelby tube, no sample recovered.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

FILE:60669SB.18

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
City Environmental, Inc.
Frederick Street Facility

DEPTH	NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMARKS
		SS	18/18	38.5 - 40	4-6-9	Stiff, Silty CLAY with Sand and Gravel, Gray, Medium Plasticity Moist (CL).			2.0 TSF	
45	9	SSL	18/14	43.5 - 45	8-8-11	Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity Moist (CL).			1.2 TSF	
50	10	SS	6/6	48.5 - 49	29/6"	Medium Stiff, Silty CLAY, Trace Gravel, Lines of Sand, Gray, Medium Plasticity, Wet (CL).	CLAY			
55	11	SSL	18/8	53.5 - 55	30-30-27	Medium Stiff, Silty CLAY with Sand, Trace Gravel, Gray, Medium Plasticity, Wet (CL).				
	12	SS	0	58.5	Refusal					2
60						~~End of Boring at 58.5 Feet~~	~~58.5~~			
						END OF BORING AT 60.5 FEET	60.5			3
70										
75										
80										
85										

REMARKS:

2. On boulder, hammer bouncing.
3. Monitoring well installed in boring.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
City Environmental, Inc.
Frederick Steet Facility

REPORT OF BORING No. SB-19
SHEET 1 OF 2
FILE No. 60669
CHKD. BY GAB

BORING Co. Great Lakes Drilling
FOREMAN Mike Warden
GZA ENGINEER Louis Johnston

BORING LOCATION See Site Plan
GROUND SURFACE ELEVATION 634.4' DATUM 635.30' BM#6
DATE START 10-26-90 DATE END 10-29-90

ER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 In.

METHOD: 4-1/4" I.D./8.0" O.D. HOLLOW STEM AUGER

RIG TYPE: CME-55 TRUCK-MOUNTED

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME
10-29-90	9:00	25'	Augers	Weekend

DEPTH	NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	FIELD TESTING (Pocket Penetrometer)	REMARKS
				0 - 0.4		CONCRETE	Fill		
5	1	SS	18/10	3.5 - 5	3-3-4	FILL: Loose, Medium SAND, Some Clay, Little Gravel, Black, Damp.			
							6'		
10	2	SSL	18/14	8.5 - 10	5-13-16	Hard, Silty CLAY with Sand, Brown, Medium Plasticity, Damp (CL).	CLAY	>4.5 TSF	
15	3	SS	18/18	13.5 - 15	10-16-17	Hard, Silty CLAY with Sand, Brown, Medium Plasticity, Damp (CL).		>4.5 TSF	
20	4	ST	18/14	18.5 - 20	Pushed	Hard, Silty CLAY, Trace of Sand and Gravel, Gray, Medium Plasticity, Damp (CL).			
25	5	SSL	18/12	23.5 - 25	4-6-8	Very Stiff, Silty CLAY, Trace of Sand and Gravel, Gray, Medium Plasticity, Damp (CL).			
30	6	SS	18/0	28.5 - 30	5-7-12	Stiff, Silty CLAY with Sand, Gray, Medium Plasticity, Moist (CL).			1
35	7	SSL	18/8	33.5 - 35	5-7-9	Stiff, Silty CLAY with Sand and Gravel, Gray, Medium Plasticity, Moist (CL).			
40									

EQUIPMENT INSTALLED

REMARKS:
1. No sample recovered, re-drove spoon for sample.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

FILE:60669SB.19

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
City Environmental, Inc.
Frederick Street Facility

REPORT OF BORING No. SB-19
SHEET 2 OF 2
FILE No. 60669
CHKD. BY

DEPTH	NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION / UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMARKS
		ST	24/24	38.5-40.5	Pushed	Stiff, Silty CLAY, Little Sand, Trace Gravel, Gray, Medium Plasticity, Wet (CL).				
45	9	SSL	18/10	43.5 - 45	4-6-8	Stiff, Silty CLAY, Little Sand, Trace Gravel, Gray, Medium Plasticity, Wet (CL).			1.2 TSF	
50	10	SS	18/14	48.5- 50	4-5-7	Stiff, Silty CLAY with Sand Seams, Gray, Medium Plasticity, Wet (CL).			1.5 TSF	
55	11	SSL	18/12	53.5 - 55	5-9-10	Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Wet (CL).	CLAY		1.0 TSF	
60	12	SS	18/8	58.5 - 60	8-10-12	Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Wet (CL).			1.3 TSF	
		SS	18/18	63.5 - 65	3-3-5	Medium Stiff, Silty CLAY, Little Sand, Trace Gravel, Gray, Medium Plasticity, Wet (CL).			0.5 TSF	
70	14	SS	18/10	68.5 - 70	2-4-5	Medium Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Wet (CL).			1.0 TSF	2 3
						Bottom of Boring at 70 Feet	70'			
75										
80										
85										

REMARKS:

2. Boring dry upon completion at 25' after weekend with no rain.
3. Monitoring well installed in boring SB-19.

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

File:60669SB.192

GOLDBERG-ZOINO & ASSOCIATES, INC. 38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT City Environmental, Inc. Frederick Steet Facility	REPORT OF BORING No. SB-20 SHEET 1 OF 2 FILE No. 60669 CHKD. BY

BORING Co. Great Lakes Drilling
FOREMAN Mike Warden
GZA ENGINEER Louis Johnston

BORING LOCATION See Site Plan
GROUND SURFACE ELEVATION 631.5 DATUM 635.30 BM#6
DATE START 10-24-90 DATE END 10-24-90

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

METHOD: 4-1/4" I.D./8.5" O.D. HOLLOW STEM AUGER

RIG TYPE: CME-55 TRUCK-MOUNTED

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME

DEPTH	SAMPLE NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
									Pocket Penetro-meter	
				0 - 3		Sandy TOPSOIL, Brown.	Fill			
5	1	SS	18/12	3.5 - 5	4-4-4	FILL: Sandy CLAY, Brown, Changing to Hard, Sandy CLAY, Gray and Brown, Damp (CL) at 4.5'.	CLAY 5'		4.5 TSF	
10	2	SS	18/18	8.5 - 10	9-17-22	Hard, Silty CLAY with Fine Sand, Brown, Low Plasticity, Damp (CL).			>4.5 TSF	
15	3	SS	18/18	13.5 - 15	5-8-11	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Damp (CL).			4.0 TSF	
20	4	ST	24/22	18.5-20.5	Pushed	Stiff, Clayey SILT, Trace Sand, Gray, Low Plasticity, Damp (ML).	SILT			
25	5	SS	18/18	23.5 - 25	4-7-11	Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Wet (CL).	CLAY		1.5 TSF	
30	6	SS	18/18	28.5 - 30	5-5-7	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Wet (CL).			2.5 TSF	
35	7	SS	18/0	33.5 - 35	4-6-9	Stiff, Silty CLAY, Trace Sand, Gray, Medium Plasticity, Wet (CL).			1.5 TSF	1
40		ST	18/0	38.5 - 40	Pushed					2

REMARKS:

1. Pushed spoon again to recover sample (8').
2. Tube crushed, no sample. Driving spoon to recover sample.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

FILE:60669SB.20

GOLDBERG-ZOINO & ASSOCIATES, INC. 38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT City Environmental, Inc. Frederick Street Facility	REPORT OF BORING No. SB-20 SHEET 2 OF 2 FILE No. 60669 CHKD. BY [signature]

DEPTH	SAMPLE No.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
		SS	18/18	38.5- 40	3-6-8	Stiff, Silty CLAY with Sand and Gravel, Medium Plasticity, Wet (CL).	CLAY		1.5 TSF	
45	9	ST	24/24	43.5-45.5	Pushed	Stiff, Silty CLAY, Trace Sand, Medium Plasticity, Wet (CL).			1.5 TSF	
							47' SAND			
50	10	SS	18/10	48.5- 50	1-1-4	Loose, Fine to Medium SAND with Some Clay, Gray, Non-Plastic, Wet (SC).				
							52' CLAY			
55	11	SS	18/12	53.5-55	6-7-16-	Very Stiff, Silty CLAY with Little Sand and Trace Gravel, Gray, Medium Plasticity, Wet (CL).				3
						End of Boring at 55 Feet	55'			
60										
65										
70										
75										
80										
85										

REMARKS:

3. Monitoring well SB-20 installed in boring SB-20.

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

File:60669SB.202

GOLDBERG-ZOINO & ASSOCIATES, INC. 38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT City Environmental, Inc. Frederick Steet Facility	REPORT OF BORING No. SB-21 SHEET 1 OF 2 FILE No. 60669 CHKD. BY

BORING Co. Great Lakes Drilling
FOREMAN Mike Warden
GZA ENGINEER Louis Johnston

BORING LOCATION See Site Plan
GROUND SURFACE ELEVATION 632.6 DATUM 635.30 BM#6
DATE START 10-29-90 DATE END 10-30-90

ER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

METHOD: 4-1/4" I.D./8.5" O.D. HOLLOW STEM AUGER

RIG TYPE: CME-55 TRUCK-MOUNTED

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME
10-30-90	7:30	35'	Augers	Overnight

DEPTH	SAMPLE NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION / UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMARKS
						FILL: Gravelly SAND and DEBRIS, Bricks.	FILL		Pocket Penetrometer	
5	1	SS	18/6	3.5 - 5	2-3-5	FILL: Sandy CLAY, Little Gravel and Debris, Gray, Dry.				
							6'			
10	2	SSL	18/10	8.5 - 10	10-17-21	Hard, Silty CLAY with Little Sand and Trace Gravel, Brown, Medium Plasticity, Dry (CL).	CLAY		>4.5 TSF	
15	3	SS	18/12	13.5 - 15	8-11-14	Hard, Silty CLAY with Sand, Trace Gravel, Gray, Medium Plasticity, Dry (CL).			4.5 TSF	
20	4	SSL	18/8	18.5 - 20	7-10-11	Hard, Silty CLAY with Trace Sand and Gravel, Brown, Medium Plasticity, Damp (CL).			4 TSF	
25	5	SS	18/12	23.5 - 25	3-7-9	Very Stiff, Silty CLAY with Sand and Gravel, Gray, Medium Plasticity, Moist (CL).			3 TSF	
30	6	ST	18/16	28.5 - 30	Pushed	Stiff, Silty CLAY with Sand and Gravel, Gray, Medium Plasticity, Moist (CL).			1.8 TSF	
35			18/0	33.5 - 35	3-5-10					
40										

REMARKS:

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

FILE:60669SB.21

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
City Environmental, Inc.
Frederick Street Facility

REPORT OF BORING No. SB-21
SHEET 2 OF 2
FILE No. 60669
CHKD. BY

DEPTH	SAMPLE NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION / UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
		SS	18/14	38.5- 40	4-7-10	Stiff, Sandy CLAY, Little Silt, Trace Gravel, Gray, Medium Plasticity, Wet (CL).	CLAY		2.0 TSF	
							41.5'			1
45	8	SSL	18/14	43.5-45	7-10-13	Medium Dense, Silty SAND, Little Gravel, Gray, Wet (SM).	Silty SAND			
50	9	SSL	18/14	48.5- 50	5-8-16	Very Stiff, Silty CLAY, Little Sand, Trace Gravel, Gray, Medium Plasticity, Wet (CL).	CLAY 49'		2.5 TSF	2
						End Boring at 50 Feet	50'			
55										
60										
70										
75										
80										
85										

REMARKS:

1. Groundwater encountered at 42' ±.
2. Monitoring well installed in boring.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

File:60669SB.212

DRAFT

BORING LOGS COMPLETED BY GZA IN MARCH & APRIL, 1987

(FORMERLY MARSHALL, HALPERT ASSOCIATES, INC.)

GENERAL NOTES - SOIL AND ROCK SYMBOLS

SOIL & ROCK SYMBOLS

- GRAVEL
- SAND
- SILT
- CLAY
- DEBRIS FILL
- ORGANIC MATTER
- LIMESTONE
- SANDSTONE
- SHALE
- IGNEOUS ROCK
- METAMORPHIC ROCK

SOIL CONSTITUENTS (percent by weight)

Trace	- 1 to 10%
Little	- 11 to 20%
Some	- 21 to 35%
And	- over 35%

Adjectives (silty, sandy, etc.) are used when the properties of a combination of two or more constituents dominate the engineering behavior of the soil. The principal constituent is that whose properties most affect the gross behavior of the soil.

PARTICLE SIZE RANGES

Boulders		- Greater than 12 inches (305mm)
Cobbles		- 3 to 12 inches (76.2 to 305mm)
Gravel	- Coarse	- 3/4 to 3 inches (19.05 to 76.2mm)
	Fine	- 3/16 to 3/4 inch (4.75 to 19.05mm)
Sand	- Coarse	- 2.0 to 4.75mm
	- Medium	- 0.425 to 2.0mm
	- Fine	- 0.074 to 0.425mm
Silt and Clay		- Less than 0.074mm

STANDARD PENETRATION TEST (ASTM D1586) - Driving a 2.0 inch outside diameter, 1-3/8 inch inside diameter split spoon sampler into undisturbed soil for three successive 6-inch increments of penetration by means of a 140 pound weight falling freely through a vertical distance of 30 inches. The cumulative number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N)

DENSITY OF COHESIONLESS SOILS

	Relative Density	Approximate Range of (N)
Very Loose	0 - 15%	0 - 4
Loose	16 - 35%	5 - 10
Medium Dense	36 - 65%	11 - 30
Dense	66 - 85%	31 - 50
Very Dense	86 - 100%	over 50

Relative Density of Cohesionless Soils is based upon an evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

SAMPLE DESIGNATION

- BL - Block Sample
- B - Bag Sample
- ST - Shelby Tube
- SS - Split Spoon
- SSL - Split Spoon with Liner

CONSISTENCY OF COHESIVE SOILS

Consistency	Unconfined Compressive Strength (PSF)
Very Soft	below - 500
Soft	500 - 1000
Medium Stiff	1000 - 2000
Stiff	2000 - 4000
Very Stiff	4000 - 8000
Hard	over 8000

Consistency is based on observed resistance to deformation under load.

MARSHALL, HALPERT ASSOCIATES
GROUND ENGINEERS

PROJECT NO. 60039
City Environmental, Inc.
Frederick Street, Detroit, Michigan

LOG NO. 1
SHEET 1
OF 3

TRACTOR: American Drilling & Testing Company
: J. Blank
R: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.2
DATE DRILLED: 3/27/87 to 3/30/87

METHOD: 4" SS Auger to 10'
3-3/4" Wash 10'-110'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD
	SS	1	18"	2"	1.0-2.5	8-8-6
5	SS	2	18"	3"	3.5-5.0	1-3-4
	SSL	1	18"	10"	6.0-7.5	2-4-4
10	SSL	2	18"	18"	8.5-10.0	10-15-24
	SSL	3	18"	18"	13.5-15.0	11-18-22
20	SSL	4	18"	18"	18.5-20.0	7-9-15
25	ST	--	24"	0"	23.0-25.0	PUSH
	SSL	5	24"	24"	23.0-25.0	PUSH
30	ST	1	24"	24"	28.0-30.0	PUSH
35	SSL	6	18"	18"	33.5-35.0	4-6-9
40	SSL	7	18"	18"	38.5-40.0	3-3-5

Depth	GROUND DESCRIPTION
0.0'-0.5'	SLAG
0.5'-1.9'	FILL: Medium Stiff CLAY, Silty, Dark Brown with Debris. (CL)
1.9'-3.9'	FILL: Medium Stiff CLAY, Silty, Brown and Gray. (CL)
3.9'-5.5'	Stiff CLAY, Fine Sandy, Brown. (CL-ML)
5.5'-8.0'	Very Stiff CLAY, Silty, Brown and Gray. (CL)
8.0'-16.0'	Hard CLAY, Silty, Brown, Trace Fine Sand. (CL)
16.0'-20.0'	Hard CLAY, Silty, Gray, Little Fine Sand. (CL)
20.0'-42.0'	Very Stiff CLAY, Silty, Gray, Little Fine Sand, Seams of Fine Sand and Silt To 30'. (CL)

KS Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 1.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

MARSHALL, HALPERT ASSOCIATES

GROUND ENGINEERS

PROJECT NO. 60039
City Environmental, Inc.
Frederick Street, Detroit, Michigan

LOG NO. 1
SHEET 2
OF 3

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
45	SSL	8	18"	18"	43.5-45.0	7-11-15	
50	SSL	9	18"	18"	48.5-50.0	9-12-12	42.0'-57.0' Medium Dense Fine SAND, Gray, Some Silt and Clay. (SM)
55	SSL	10	18"	1"	53.5-55.0	8-10-10	
60	SS	3	18"	7"	58.5-60.0	4-6-8	
65	SSL	11	18"	18"	63.5-65.0	2-4-5	57.0'-71.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)
70	SSL	12	18"	18"	68.5-70.0	3-6-8	
75	SSL	13	18"	18"	73.5-75.0	3-5-5	
80	SSL	14	18"	18"	78.5-80.0	5-7-9	71.0'-110.0' Medium CLAY, Silty, Gray, Trace Fine Sand. (CL)
85	SS	4	18"	1"	83.5-85.0	3-6-8	

CS

MARSHALL, HALPERT ASSOCIATES

GROUND ENGINEERS

City Environmental, Inc.

Frederick Street, Detroit, Michigan

SHEET 3 OF 3

	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D1586 BLOWS/6" OR ROD	GROUND DESCRIPTION	* R
90	SSL	15	18"	18"	88.5-90.0	2-4-5		
95	SSL	—	18"	0"	93.5-95.0	2-2-3	71.0'-110.0' Medium CLAY, Silty, Gray, Trace Fine Sand. (CL)	
	SS	5	18"	18"	93.5-95.0	PUSH		
100	SS	6	18"	6"	98.5-100.0	3-4-5		
105	SS	7	18"	18"	103.5-105.0	3-5-7		
	SS	8	18"	18"	108.5-110.0	3-4-6		

* REMARKS

GROUND ENGINEERS

Frederick Street, Detroit, Michigan

NTRACTOR: American Drilling & Testing Company

LOCATION: See Location Plan

REMAN: J. Blank

ELEVATION: 632.6

TER: R. Flickinger

DATE DRILLED: 4/9/87 & 4/10/87

4" Dia SS Auger to 15'
3-3/4" Dia Wash Method to 100'
6" Dia Wash to 70'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
						0.0'-3.0' FILL: Medium Stiff CLAY, Silty, Brownish Black with Debris. (CL)
SS	1	18"	15"	1.0-2.5	2-2-3	
						3.0'-6.0' Stiff CLAY, Silty, Brown and Gray. (CL)
SSL	1	18"	18"	3.5-5.0	2-2-7	
SSL	2	18"	18"	6.0-7.5	6-14-20	
SSL	3	18"	18"	8.5-10.0	11-20-31	6.0'-14.0' Hard CLAY, Silty, Brown, Trace Sand. (CL)
SS	2	18"	18"	13.5-15.0	6-8-11	
SS	3	18"	18"	18.5-20.0	5-6-10	14.0'-33.0' Very Stiff CLAY, Silty, Gray, Trace Sand. (CL)
SS	4	18"	1"	23.5-25.0	5-7-10	
SS	5	18"	15"	28.5-30.0	3-4-6	
						33.0'-64.0' Stiff CLAY, Silty, Gray, Little Fine Sand, Seams of Sand. (CL)
ST	1	24"	0"	38.0-40.0	PUSH	
SS	6	18"	18"	38.0-39.5	PUSH	

EMARKS Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information, see Installation Report for Monitoring Well Number 2.

S: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

MARSHALL HALPERT ASSOCIATES

GROUND ENGINEERS

City Environmental, Inc.

Frederick Street, Detroit, Michigan

SHEET 2 OF 3

Depth	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
45	SS	7	18"	15"	43.5-45.0	3-5-7	
							33.0'-64.0' Stiff CLAY, Silty, Gray, Little Fine Sand, Seams of Sand. (CL)
50	ST	2	24"	23"	48.0-50.0	PUSH	
55	SS	8	18"	15"	53.5-55.0	5-7-12	
60	SS	9	18"	15"	58.6-60.0	11-8-10	
							64.0'-66.0' Medium Dense SAND, Clayey, Gray. (SC)
70	SS	10	18"	18"	68.5-70.0	3-4-8	66.0'-80.0' Stiff CLAY, Silty, Gray, Little Sand. (CL)
75							
80	ST	3	24"	21"	78.0-80.0	PUSH	
							80.0'-100.0' Medium Stiff CLAY, Silty, Gray, Trace Sand. (CL)
85							

REMARKS

FT	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" ON ROD	GROUND DESCRIPTION
90	SS	11	18"	18"	88.5-90.0	2-3-4	80.0'-100.0' Medium Stiff CLAY, Silty, Gray, Trace Sand. (CL)
95							
100	SS	12	18"	18"	98.5-100.0	3-3-5	

REMARKS

MARSHALL, HALPERT ASSOCIATES

GROUND ENGINEERS

Project No.: City Environmental, Inc.

Frederick Street, Detroit, Michigan

SHEET 1 OF 1

CONTRACTOR: American Drilling & Testing Company

MAN: Mark Morand

R: Kevin Cook

LOCATION: See Location Plan

ELEVATION: 632.33

DATE DRILLED: 12/07/87

METHOD: 4" Dia. Solid Stem Auger

TYPE OF SAMPLE

BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	See	Remarks	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
							0.0-7.0' CLAY, Silty, Brown.
5							
							7.0-30.0' Very Stiff CLAY, Silty, Gray, Trace Sand, Trace Gravel (CL).
10							
20	SS	1	24	24	19.0-21.0	7-11-15-15	
	SS	2	24	24	23.0-25.0	5-9-11-14	
25							
	SS	3	24	24	28.0-30.0	9-10-15-17	
30							

Revision 2, 8/1/88

REMARKS (1) Borehole dry upon completion.
(2) Monitoring well installed in borehole upon completion.
(3) For groundwater and other pertinent information, see Installation Report for Monitoring Well Number 2A.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

MARSHALL GALLERY ASSOCIATES
GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 3

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
ER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 631.3
DATE DRILLED: 3/31/87 to 4/2/87

METHOD: 4" Solid Stem Auger to 10'
3-3/4" Dia Wash to 105'
6" Dia Wash to 72'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

Depth	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
							1.0'-3.0' FILL: Medium Stiff CLAY, Silty, Dark Brown with Debris.
5	SS	1	18"	18"	3.5-5.0	3-4-5	3.0'-7.0' Very Stiff CLAY, Silty, Brown and Gray. (CL)
10	SS	2	18"	18"	8.5-10.0	6-14-17	7.0'-12.0' Hard CLAY, Silty, Brown, Little Fine Sand. (CL)
15	SS	3	18"	10"	13.5-15.0	4-7-10	
20	ST	--	24"	0"	18.0-20.0	PUSH	12.0'-37.0' Very Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)
	SS	4	18"	18"	18.0-19.5	PUSH	
25	ST	1	24"	24"	23.0-25.0	PUSH	
30	SS	5	18"	0"	28.5-30.0	3-4-5	
	SS	5	18"	18"	28.5-30.0	PUSH	
35							
	ST	--	24"	0"	38.0-40.0	PUSH	
40	SS	6	18"	18"	38.0-39.5	PUSH	

REMARKS Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 3.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

Depth	Sample	Sample Number	Sampler Advance	Sample Recovered	Sample Interval	ASTM D1586 Blows/6" or ROD	Ground Description	*R
45	ST	2	24"	24"	43.0-45.0	PUSH	37.0'-48.0' Medium Dense Fine SAND, Gray, Little Silt and Clay, Trace Medium Sand. (SM)	
	SS	7	18"	0"	46.0-47.5	8-7-6		
50	SS	8	18"	18"	48.5-50.0	3-4-6		
55	ST	3	24"	24"	53.5-55.0	PUSH	48.0'-61.0' Very Stiff to Stiff CLAY, Silty, Gray, Some Fine Sand and Seams of Fine Sand. (CL-ML)	
60	SS	9	18"	18"	58.5-60.0	4-4-8		
	SS	10	18"	18"	63.5-65.0	6-14-8		
70	SSL	--	18"	0"	68.5-70.0	6-7-8	61.0'-78.0' Stiff SILT, Clayey, Gray, Little Fine Sand, Occasional Seams of Fine Sand. (ML)	
	SS	11	18"	18"	68.5-70.0	PUSH		
75	ST	4	24"	24"	73.0-75.0	PUSH		
80								
85	ST	5	24"	24"	83.0-85.0	PUSH	78.0'-105.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL-ML)	

REMARKS

FT	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
90							78.0'-105.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL-ML)
95	SSL	1	18"	18"	93.5-95.0	2-4-5	
100							
105	SS	--	18"	1"	103.5-105.0	3-4-6	

REMARKS

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 2

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
[…]EER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.4
DATE DRILLED: 4/2/87 & 4/3/87

[…]T.
4" SS Auger to 10'
3-3/4" Wash to 60'
6" Dia Wash to 55'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
							0.0'-0.7' CONCRETE
	SS	1	18"	12"	1.0-2.5	8-10-9	0.7'-3.7' FILL: Medium Stiff CLAY, Silty, Black with Debris.
5	SS	2	18"	18"	3.5-5.0	3-3-3	3.7'-8.0' Very Stiff CLAY, Silty, Brown and Gray. (CL)
	SSL	1	18"	6"	6.0-7.5	3-3-5	
10	SSL	2	18"	15"	8.5-10.0	9-17-27	8.0'-16.0' Hard CLAY, Silty, Brown, Little Fine SAND. (CL)
15	SSL	3	18"	12"	13.5-15.0	13-18-27	
20	ST	1	24"	24"	18.9-20.0	PUSH	
25	ST	2	24"	21"	23.0-25.0	PUSH	
30	SSL	4	18"	18"	28.5-30.0	3-5-8	16.0'-42.0' Very Stiff to Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Fine Sand to 30'. (CL)
35							
40	ST	3	24"	8"	38.0-40.0	PUSH	

REMARKS 1. Encountered concrete obstruction at 2.5' below surface.
2. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 4.

[…]ES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET ~ OF 2

Depth	Sample	Sample Number	Sampler Advance	Sample Recovered	Sample Interval	ASTM D 1586 Blows/6" or RQD	Ground Description
							42.0'-47.0' Medium Dense Fine SAND, Gray, Little Silt and Clay. (SM)
45	ST	4	24"	10"	43.0-45.0	PUSH	
50	SSL	5	18"	18"	48.5-50.0	3-4-6	47.0'-60.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL-ML)
55							
60	ST	5	24"	24"	58.0-60.0	PUSH	

REMARKS

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
ENGINEER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.3
DATE DRILLED: 4/6/87 & 4/7/87

METHOD: 4" Solid Stem Auger to 25'
3-3/4" Dia Wash to 70'
6" Dia Wash to 50'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" ON ROD
	SSL	1	18"	18"	1.0-2.5	3-5-7
5	SSL	2	18"	18"	3.5-5.0	3-4-6
	SSL	3	18"	14"	6.0-7.5	4-7-12
10	SSL	4	18"	12"	8.5-10.0	6-16-24
15	SSL	5	18"	18"	13.5-15.0	3-8-10
20	ST	1	24"	24"	18.0-20.0	PUSH
25	SSL	6	18"	18"	23.5-25.0	4-7-10
30	SSL	7	18"	18"	28.5-30.0	5-6-9
35						
40	SSL	8	18"	18"	38.5-40.0	3-6-7

GROUND DESCRIPTION

Depth	Description
0.0'-0.7'	CONCRETE
0.7'-1.8'	Loose SAND, Brown.
1.8'-2.2'	FILL: Medium Stiff CLAY, Dark Brown with Debris.
2.2'-7.2'	Very Stiff CLAY, Silty, Brown and Gray, Trace Fine Sand. (CL)
7.2'-12.0'	Hard CLAY, Silty, Brown, Trace Fine Sand. (CL)
12.0'-41.0'	Very Stiff to Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Fine Sand. (CL)

REMARKS: Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 5.

NOTES:
1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

DRAFT

APPENDIX G

TABULATION OF LABORATORY TEST DATA

PROJECT NO. 60039 | MARSHALL, HALPERT ASSOCIATES, INC. | SHEET 1 OF 3

TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample Tip (Feet)	Elevation of Sample Tip (Feet)	Cohesion – One-Half of Unconfined Compressive Strength (PSF)	Permeability x 10^{-8} cm/sec /Confining Pressure (PSF)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Volumetric Analysis: Solids (Percent)	Volumetric Analysis: Liquids (Percent)	Volumetric Analysis: Air (Percent)	Particle Size Distribution: Colloids (Percent)	Particle Size Distribution: Clay (Percent)	Particle Size Distribution: Silt (Percent)	Particle Size Distribution: Fine Sand (Percent)	Particle Size Distribution: Medium Sand (Percent)	Particle Size Distribution: Coarse Sand (Percent)	Particle Size Distribution: Gravel (Percent)	Atterberg Limits: Liquid Limit (Percent)	Atterberg Limits: Plastic Limit (Percent)	Atterberg Limits: Plasticity Index (Percent)	Apparent Specific Gravity	
1	SSL-1	7.5	625.7			17.0	108.6															
	SSL-2	10.0	623.2			12.9	126.5											25	14	11		
	SSL-4	20.0	613.2			13.1	124.0															
	ST-1	30.0	603.2		1.2/2160	14.6	120.4				25	32	17	20	4	1	1	23	14	9		
	SSL-8	45.0	588.2			11.6	131.1				9	13	22	48	4	2	2	NL	NP			
	SSL-9	50.0	583.2			10.7	133.2				3	21	26	50	0	0	0	NL	NP			
	SSL-11	65.0	568.2			16.4	119.4				24	32	15	20	6	2	1					
	SSL-13	75.0	558.2			19.7	111.5															
	SSL-14	80.0	553.2			18.0	115.3															
2	SSL-1	5.0	627.6	1970		17.3	113.9															
	SSL-2	7.5	625.1	9395		12.6	125.9															
	SSL-3	10.0	622.6	10710		12.3	126.0															
	SS-2	15.0	617.6			13.7	121.5															
	SS-3	20.0	612.6	2350		13.6	125.9															
	SS-5	30.0	602.6			16.5	112.4											24	15	9		
	SS-6	40.0	592.6			---	---															
	SS-7	45.0	587.6			---	---															
	ST-2	50.0	582.6		2.8/3600	15.8	117.9				21	31	20	21	5	1	1	22	14	8		
	ST-3	80.0	552.6		1.1/5760	19.8	111.5				29	34	14	17	4	1	1	28	16	12		
	SS-12	100.0	532.6			26.9	---											34	17	17		

PROJECT NO. 60039	MARSHALL, HALPERT ASSOCIATES, INC.	SHEET 2 OF 3

TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample Tip (Feet)	Elevation of Sample Tip (Feet)	Cohesion - One-Half of Unconfined Compressive Strength (PSF)	Permeability X 10^{-8} cm/sec /Confining Pressure (PSF)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Volumetric Analysis: Solids (Percent)	Volumetric Analysis: Liquids (Percent)	Volumetric Analysis: Air (Percent)	Particle Size Distribution: Colloids (Percent)	Particle Size Distribution: Clay (Percent)	Particle Size Distribution: Silt (Percent)	Particle Size Distribution: Fine Sand (Percent)	Particle Size Distribution: Medium Sand (Percent)	Particle Size Distribution: Coarse Sand (Percent)	Particle Size Distribution: Gravel (Percent)	Atterberg Limits: Liquid Limit (Percent)	Atterberg Limits: Plastic Limit (Percent)	Atterberg Limits: Plasticity Index (Percent)	Apparent Specific Gravity	
3	S-1	5.0	626.3			19.1	104.6				←	75	→	18	3	1	3					
	S-2	10.0	621.3			12.9	123.3				←	77	→	17	4	2	0					
	ST-1	25.0	606.3		0.95/2160	14.4	119.2				21	31	23	19	5	1	0	22	14	8		
	ST-2	45.0	586.3		540/3312	12.4	117.3				6	14	16	52	11	1		NP	NL			
	ST-3	55.0	576.3		7.71/3888	14.2	119.0				17	31	19	24	7	1	1	21	14	7		
	ST-4	75.0	556.3		10.0/1440	16.1	119.2				10	28	40	17	2	3	--	16	13	3		
	ST-5	85.0	546.3		1.1/6048	20.3	105.9				35	24	21	14	4	1	1	24	17	7		
4	ST-1	20.0	613.4		1.3/2160	12.8	120.2				19	40	19	18	2	1	1	25	15	10		
	ST-2	25.0	608.4		1.1/2160	13.7	120.1				16	40	24	16	2	1	1					
	LS-4	30.0	603.4			14.8	122.4											22	14	8		
	ST-3	40.0	593.4		1.0/3600	15.0	120.2															
	ST-4	45.0	588.4		4500/3312	13.6																
	ST-5	60.0	573.4		2.2/4320	15.1	118.4				18	32	21	20	5	3	1	20	13	7		
5	LS-3	7.5	625.8			15.6	120.3											29	17	12		
	ST-1	20.5	612.3		2.2/2160	13.1	123.9				19	30	23	21	5	2	0	19	11	17		
	LS-8	40.0	593.3			15.0	121.1											21	13	8		
	LS-10	60.0	573.3			15.3	98.7											19	13	7		

PROJECT NO. 60039	MARSHALL, HALPERT ASSOCIATES, INC.	SHEET 3 OF 3

TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample Tip (Feet)	Elevation of Sample Tip (Feet)	Cohesion - One-Half of Unconfined Compressive Strength (PSF)	Permeability x 10^{-8} cm/sec /Confining Pressure (PSF)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Volumetric Analysis: Solids (Percent)	Volumetric Analysis: Liquids (Percent)	Volumetric Analysis: Air (Percent)	Particle Size Distribution: Colloids (Percent)	Particle Size Distribution: Clay (Percent)	Particle Size Distribution: Silt (Percent)	Particle Size Distribution: Fine Sand (Percent)	Particle Size Distribution: Medium Sand (Percent)	Particle Size Distribution: Coarse Sand (Percent)	Particle Size Distribution: Gravel (Percent)	Atterberg Limits: Liquid Limit (Percent)	Atterberg Limits: Plastic Limit (Percent)	Atterberg Limits: Plasticity Index (Percent)	Apparent Specific Gravity
6	LS-1	10.0	623.3			12.1	126.7														
	S-3	40.0	593.3			15.5	122.2											21	14	7	
	S-4	45.0	588.3			13.7	---														
	S-5	50.0	583.3			14.7	---				16	34	22	21	5	2	0	22	14	8	
8	LS-4	10.0	623.6			15.2	123.5				21	32	24	17	3	3	0				
	ST-1	45.0	588.6		1.2/3168	14.6	119.0				18	28	20	21	4	6	3				
	SS-7	50.0	583.6			15.1	---				22	29	20	20	3	2	4				
	SS-9	70.0	563.6			17.4	---														
9	S-2	49.5	584.1			13.8	---														
10	LS-4	10.0	623.2			14.6	115.7				21	30	25	18	4	1	1				
	SS-5	40.0	593.2			16.4	---				22	30	20	19	4	2	3				
	ST-1	70.0	563.2		1.3/5040	16.1	117.1														
14	SSL-1	5.0	628.1	1035		25.3	91.6														
	SS-2	7.5	625.6	1160		22.4	105.1														
	SSL-2	10.0	623.1	4680		13.1	125.2														
	SSL-3	15.0	618.1	5022		13.2	123.2														

LABORATOI :ESTING DATA SUMMARY

Project Name C..y Environmental, Inc.
Frederick Street Facility

Project No. 60669 Project Engr. LAJ Assigned By JAB Date Assigned ______ Reviewed by ______ Date Required ______

Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	IDENTIFICATION TESTS								DENSITY		STRENGTH TESTS					CONSOL.	Laboratory Log and Soil Description
				Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	MAX (pcf) / W_{opt} (%)	Permeability cm/sec	Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	$\frac{C_c}{1 + e_0}$	
18	SS-2	10.0		12.8	25	13	78	29												Silty CLAY with Sand & Gravel, Brown-Gray, Med. Plast., Moist (CL)
	SSL-3	15.0		18.5							114.4									Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-4	20.0		14.3																Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-5	25.0		11.3	18	12	55	15												Sandy CLAY, Tr. Silt & Gravel, Gray, Med. Plast., Moist (CL).
	SS-6	30.0		15.9																Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-7	35.0		15.5							128.3									Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-8	40.0		15.5	23	14	74	23												Silty CLAY with Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SSL-9	45.0		15.2																Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-10	49.0		17.3																Silty CLAY, Lines of Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL)
	SS-11	55.0		14.6																Silty CLAY with Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL).

Project No. 60669 Project Engr. LAJ Assigned By JAB Date Assigned ______ Reviewed by ______ Date Required ______

Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	IDENTIFICATION TESTS: Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	DENSITY: MAX (pcf) / W_{opt} (%)	Permeability cm/sec	STRENGTH TESTS: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	CONSOL.: $\frac{C_c}{1+e_0}$	Laboratory Log and Soil Description
19	SL-2	10.0		13.4							123.7			UC	0		14,300			Hard, Silty CLAY with Sand, Brown, Med. Plast., Damp (CL).
	SS-3	15.0		12.6	27	16	73	26												Hard, Silty CLAY with Sand, Brown, Med. Plast., Damp (CL).
	ST-4	20.0		13.5							119.6		9.4×10^{-8}	K	2,000					Hard, Silty CLAY, Tr. of Sand, Gray, Med. Plast., Damp (CL).
	SL-5	25.0		15.3							119.8			UC	0		5,250			V. Stiff, Silty CLAY, Tr. of Sand, Gray, Med. Plast., Damp (CL).
	SS-6	30.0			24	14	73	26												Stiff, Silty CLAY with Sand, Gray, Med. Plast., Moist (CL).
	SL-7	35.0		15.0							123.6			UC	0		3,440			Stiff, Silty CLAY with Sand, Gray, Med. Plast., Moist (CL).
	SL-9	45.0		15.2																Stiff, Silty CLAY, Tr. Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL)
	SS-10	50.0		14.1	24	14	73	22												Stiff, Silty CLAY with Sand, Tr. Gravel, Med. Plast., Wet (CL).
	SL-11	55.0		15.6							119.6									Stiff, Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Wet (CL)
	SS-12	60.0		14.4																Stiff, Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Wet (CL)
	SS-13	65.0			25	15	77	28												Med. Stiff, Silty CLAY, L. Sand, Gray, Med. Plast., Wet (CL).
	SS-14	70.0		10.5																Med. Stiff, Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Wet (CL)

Project N   "ity Environmental, Inc.
lerick Street Facility

LABORATO TESTING DATA SUMMARY

Project No. 60669   Project Engr. LAJ   Assigned By JAB   Date Assigned ______   Reviewed by ______ Date Required ______

				IDENTIFICATION TESTS								DENSITY		STRENGTH TESTS					CONSOL.	
Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	MAX (pcf) / W_{opt} (%)	Permeability cm/sec	Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	$\frac{C_c}{1 + e_0}$	Laboratory Log and Soil Description
20	SS-1	5.0		22.7																FILL: Hard, Sandy CLAY, Gray & Brown, Damp (CL).
	SS-2	10.0		12.8	26	16	76													Hard, Silty CLAY with Sand, Brown, Low Plast., Damp (CL).
	SS-5	25.0		12.2	17	13														Stiff, Silty CLAY, Tr. Sand & Gravel, Med. Plast., Wet (CL).
	SS-6	30.0		13.3																V. Stiff, Silty CLAY, Tr. Sand & Gravel, Med. Plast., Wet (CL).
	SS-7	35.0		15.4																Stiff, Silty CLAY, Sand & Gravel, Med. Plast., Wet (CL).
	SS-8	40.0		15.0	25	14	74	25												Stiff, Silty CLAY with Tr. Sand, Gray, Med. Plast., Wet (CL).
	ST-9	45.5		14.2							120.5		7.2×10^{-9}	K	2,000					Stiff, Silty CLAY, Tr. Sand, Med. Plast., Wet (CL).
	SS-10	50.0																		Loose, Fine to Med. SNAD with Some Clay, Gray, Non-Plast., Wet (CL).
	SS-11	55.0		13.3																V. Stiff, Silty CLAY, Little Sand & Gravel, Gray, Med. Plast., Wet (CL)

GZA GeoEnvironmental, Inc.
Engineers and Scientists

LABORATO: 'ESTING DATA SUMMARY

Project Name ___ Environmental, Inc. Frederick Street Facility

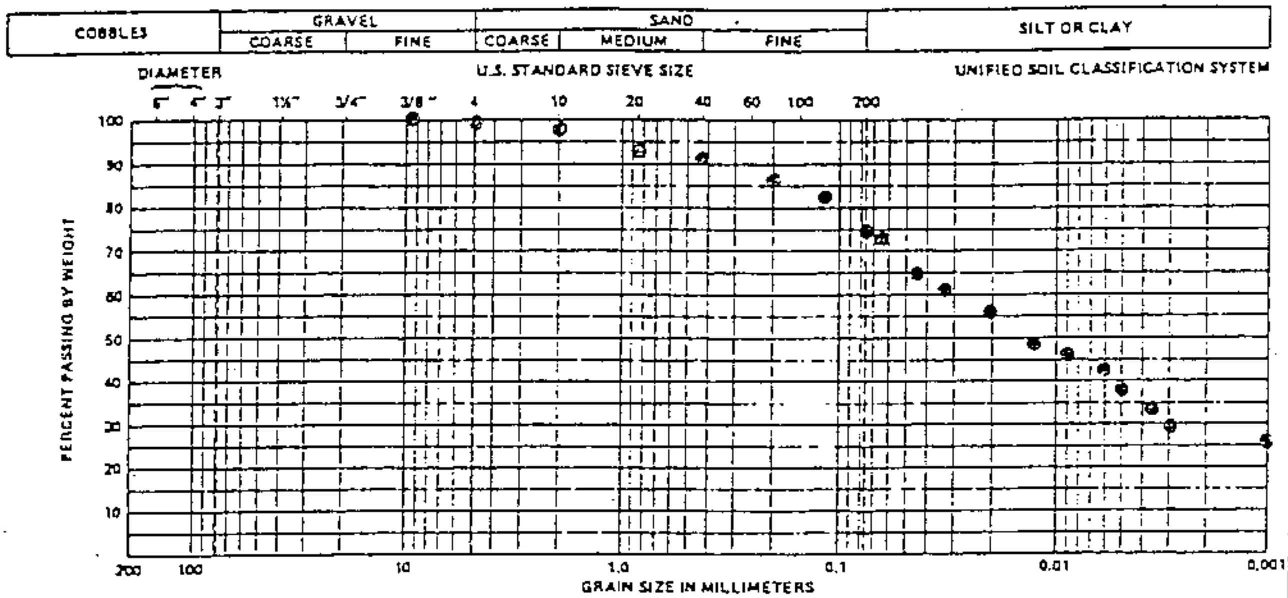
Project No. 60669 Project Engr. LAJ Assigned By JAB Date Assigned ______ Reviewed by ______ Date Required ______

Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	IDENTIFICATION TESTS Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	DENSITY MAX (pcf) / W_{opt} (%)	Permeability cm/sec	STRENGTH TESTS Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	CONSOL. $\frac{C_c}{1+e_0}$	Laboratory Log and Soil Description
21	SL-2	10.0		20.2							109.3									Hard, Silty CLAY, L. Sand, Brown, Med. Plast., Dry (CL).
	SS-3	15.0		13.9	27	16	75	26												Hard, Silty CLAY with Sand, Tr. Gravel, Gray, Med. Plast., Dry (CL)
	SL-4	20.0		14.5							110.2									Hard, Silty CLAY, Tr. Sand & Gravel Brown, Med. Plast., Damp (CL).
	SS-5	25.0		14.1	25	15	76	23												V. Stiff, Silty CLAY w/Sand & Gvl., Gray, Med. Plast., Moist (CL).
	ST-6	30.0		14.2							120.2		1.8×10^{-8}	K	2,000					Stiff, Silty CLAY with Sand & Gvl., Gray, Med. Plast., Moist (CL).
	SS-7	40.0		12.6	21	14	66	22												Stiff, Sandy CLAY, Little Silt, Tr. Gravel, Gray, Med. Plast., Wet (CL)
	SL-8	45.0		12.3							127.7									Med. Dense, Silty SAND, Little Gravel, Gray, Wet (SM).
	SL-9	50.0		14.7							120.2									V. Stiff, Silty CLAY, L. Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL)

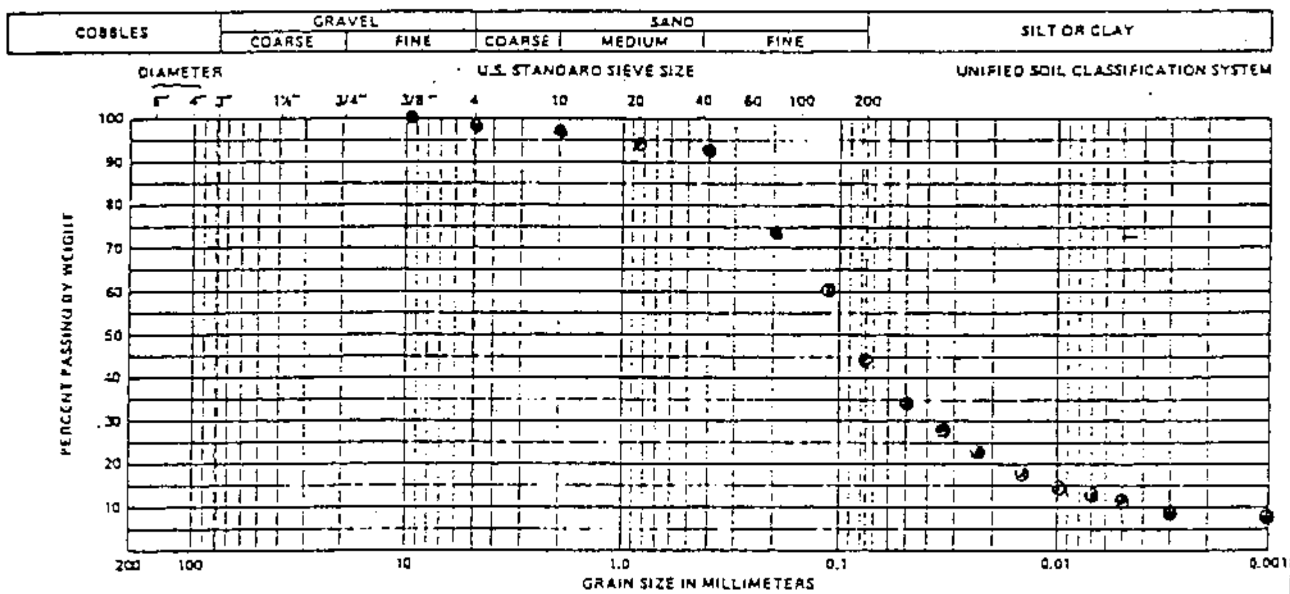
GZA GeoEnvironmental, Inc.
Engineers and Scientists

60669.7

GRAIN-SIZE DISTRIBUTION

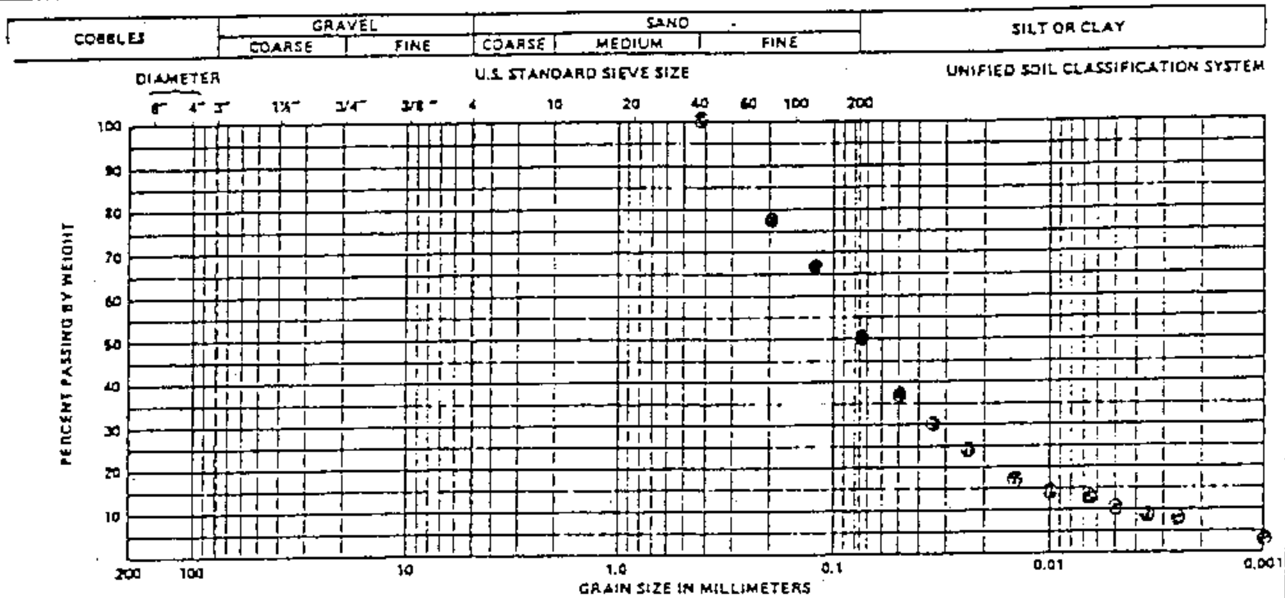


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
1	ST-1	30.0	CL	CLAY, Silty, Gray, Little Fine Sand.	14.6	23	14

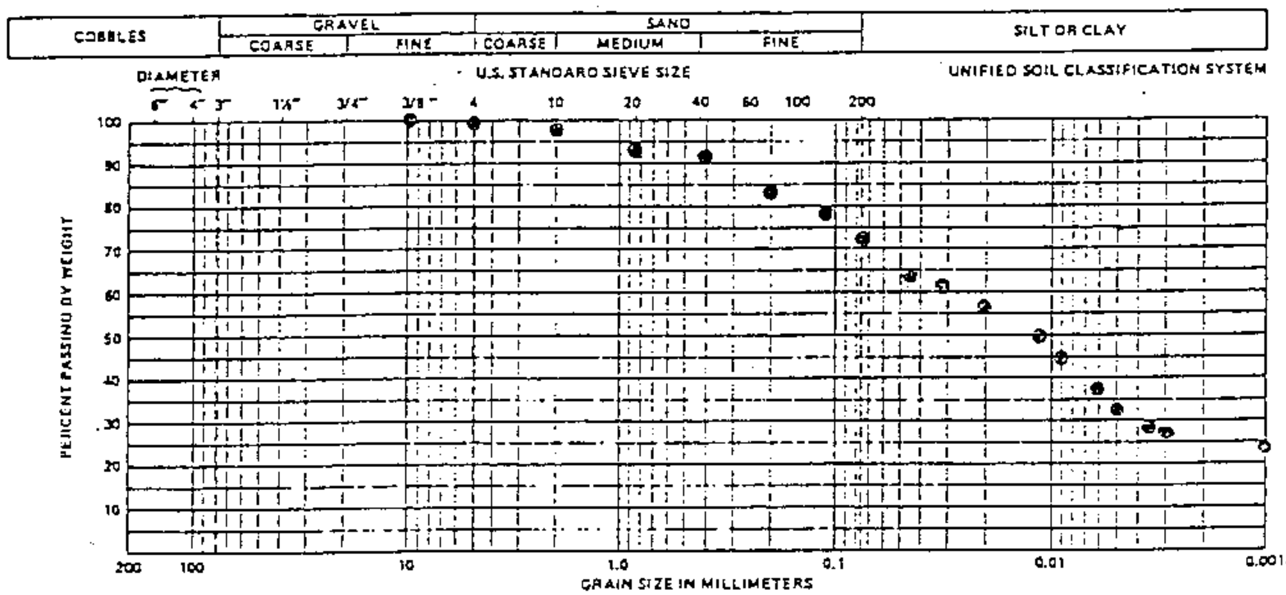


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
1	SSL-1	45.0	SC	Fine SAND, Gray, Some Silt and Clay.	11.6	NP	NL

GRAIN-SIZE DISTRIBUTION

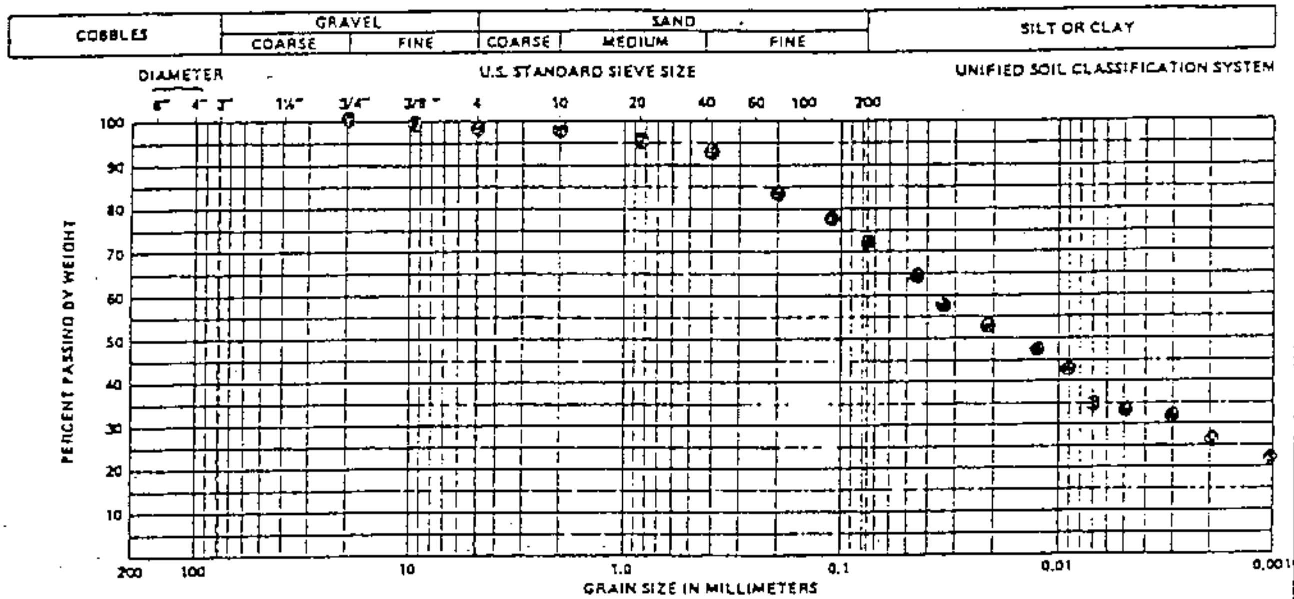


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
1	SSL-9	50.0	SC	Fine SAND, Gray, Some Silt and Clay.	10.7	NL	NP

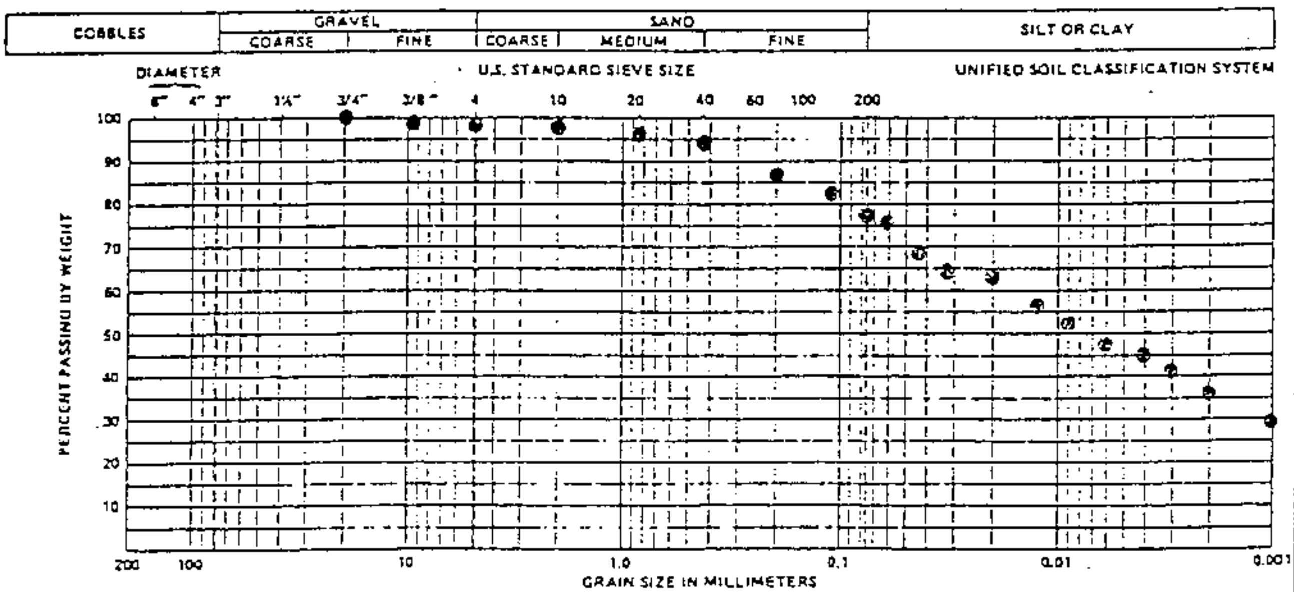


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
1	SSL-11	65.0	CL	CLAY, Silty, Gray, Little Fine Sand.	16.4	--	--

GRAIN-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
2	ST-2	50.0	CL	CLAY, Silty, Gray, Little Fine Sand,	15.8	22	14
				Seams of Sand.			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
2	ST-3	80.0	CL	CLAY, Silty, Gray, Little Fine Sand.	19.8	28	16

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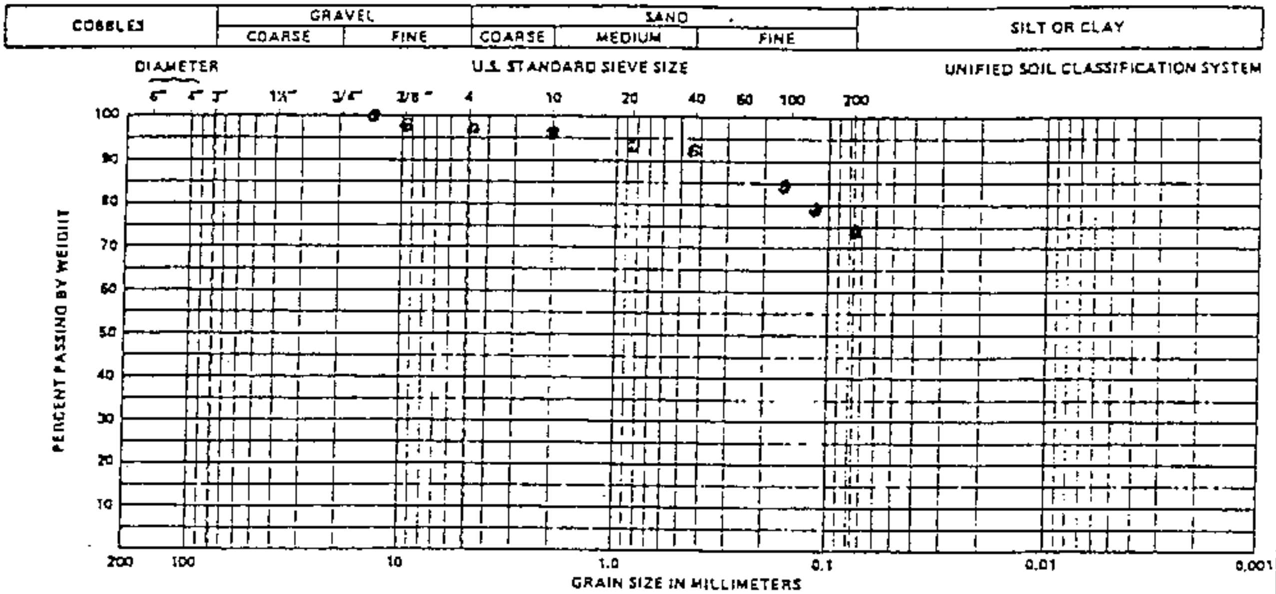
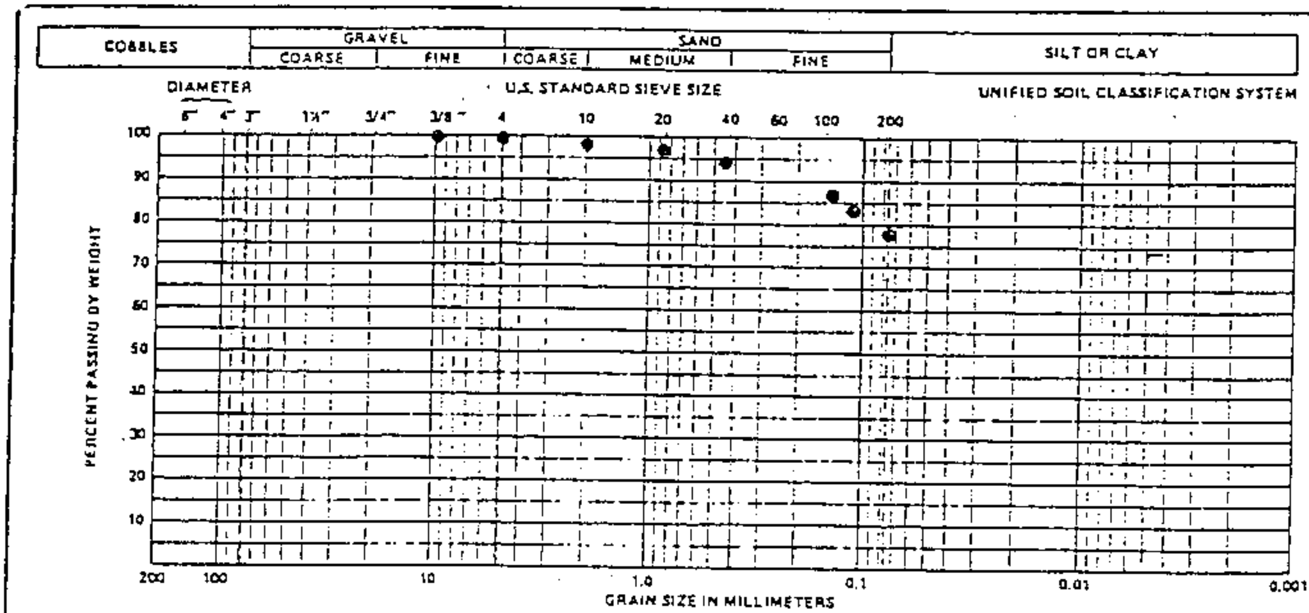
GRAIN-SIZE DISTRIBUTION

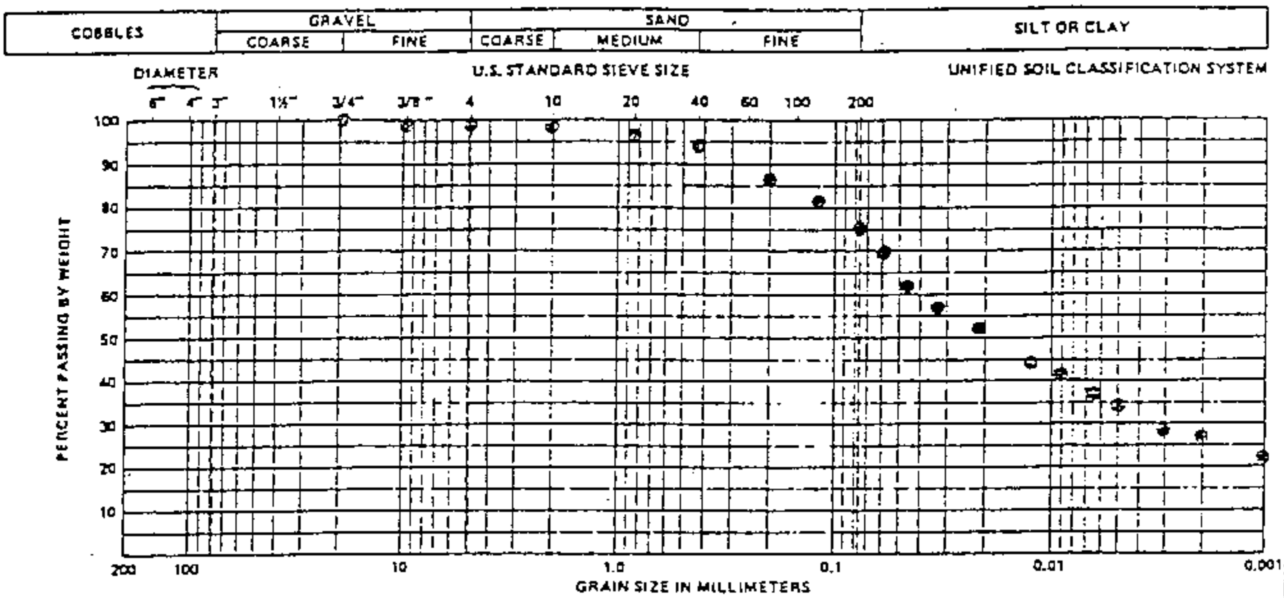


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
3	S-1	5.0	CL	CLAY, Silty, Brown and Gray, Little Fine Sand.	19.1	--	--

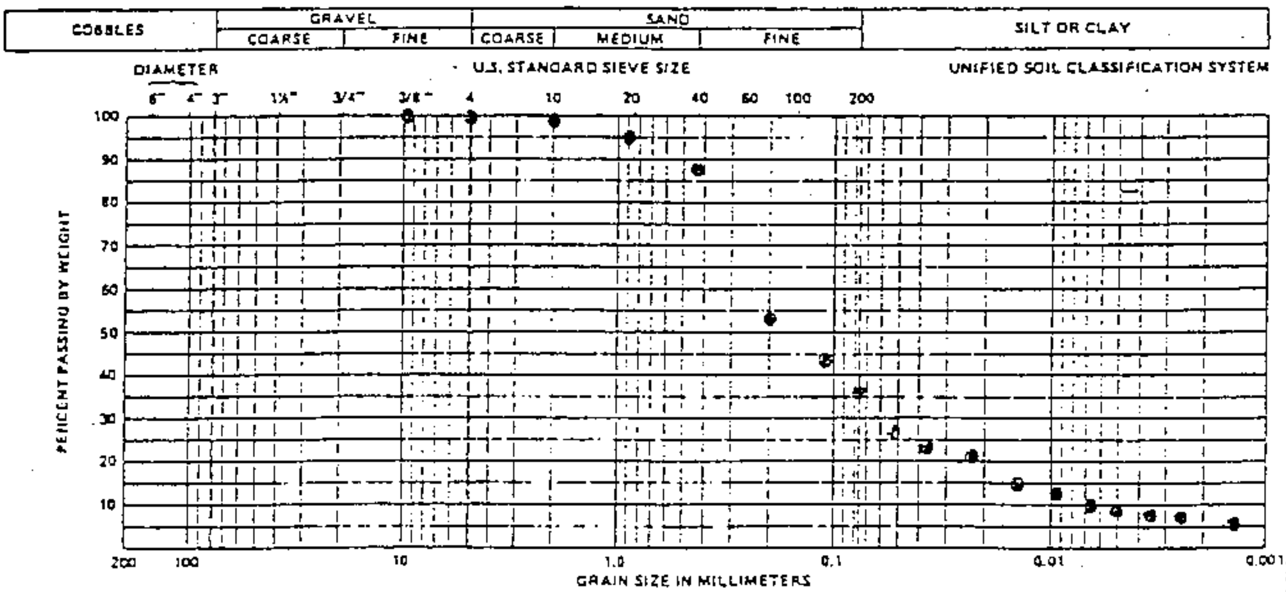


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
3	S-2	10.0	CL	CLAY, Silty, Brown, Little Fine Sand.	12.9		

GRAIN-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
3	ST-1	25.0	CL	CLAY, Silty, Gray, Little Fine Sand.	14.4	22	14



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
3	ST-2	45	SC	Fine SAND, Gray, Little Silt and Clay,	12.4	NP	NL
				Trace Medium Sand.			

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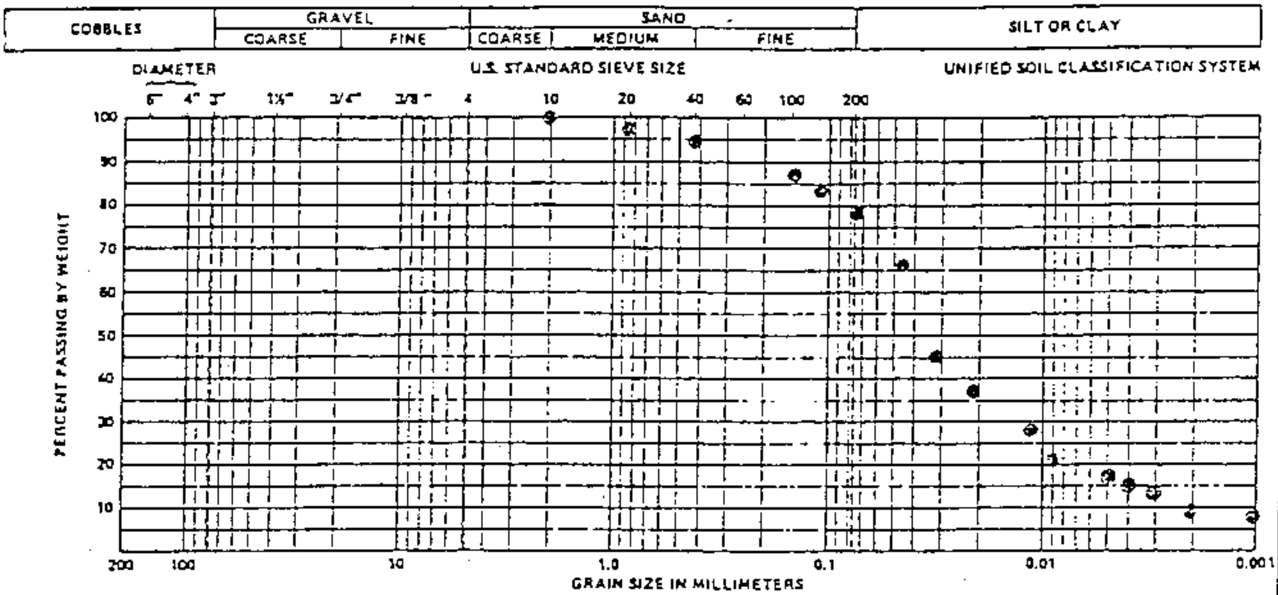
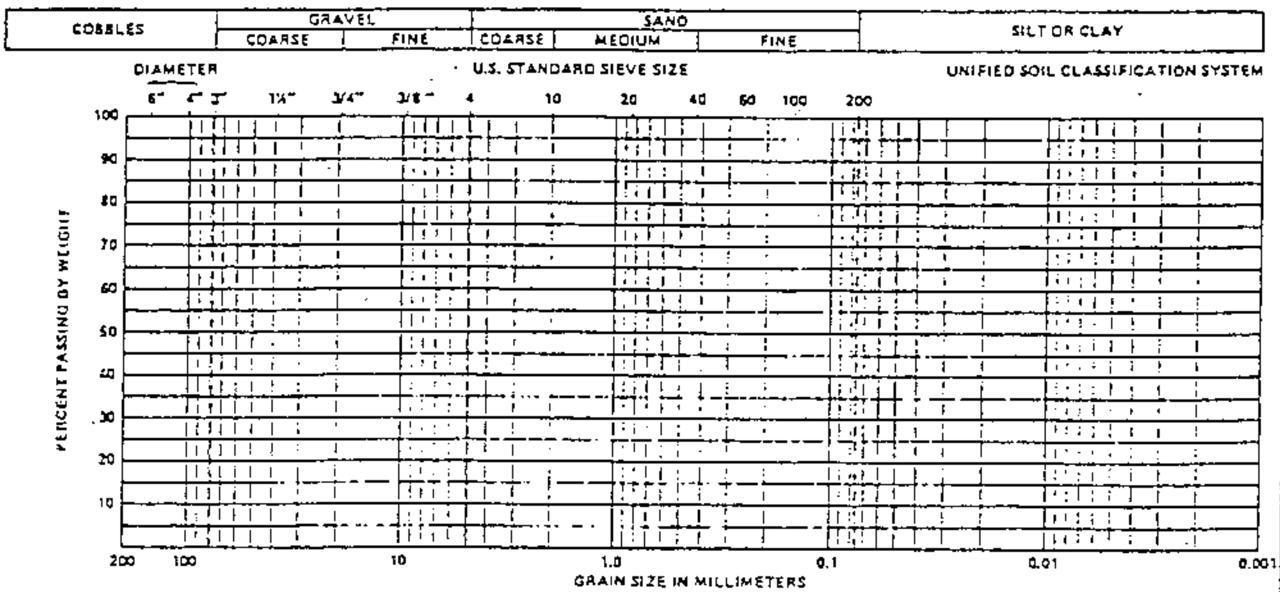
GRAIN-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
3	ST-4	75.0	ML	SILT, Gray, Some Fine Sand and Clay.	16.1	16	13



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)

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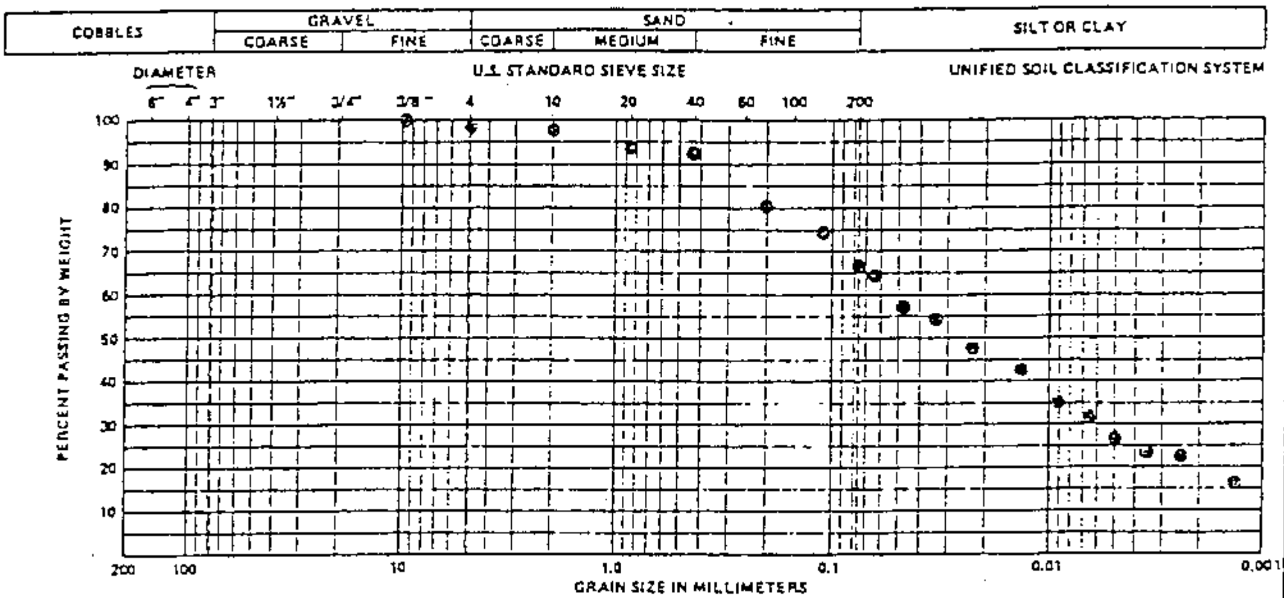
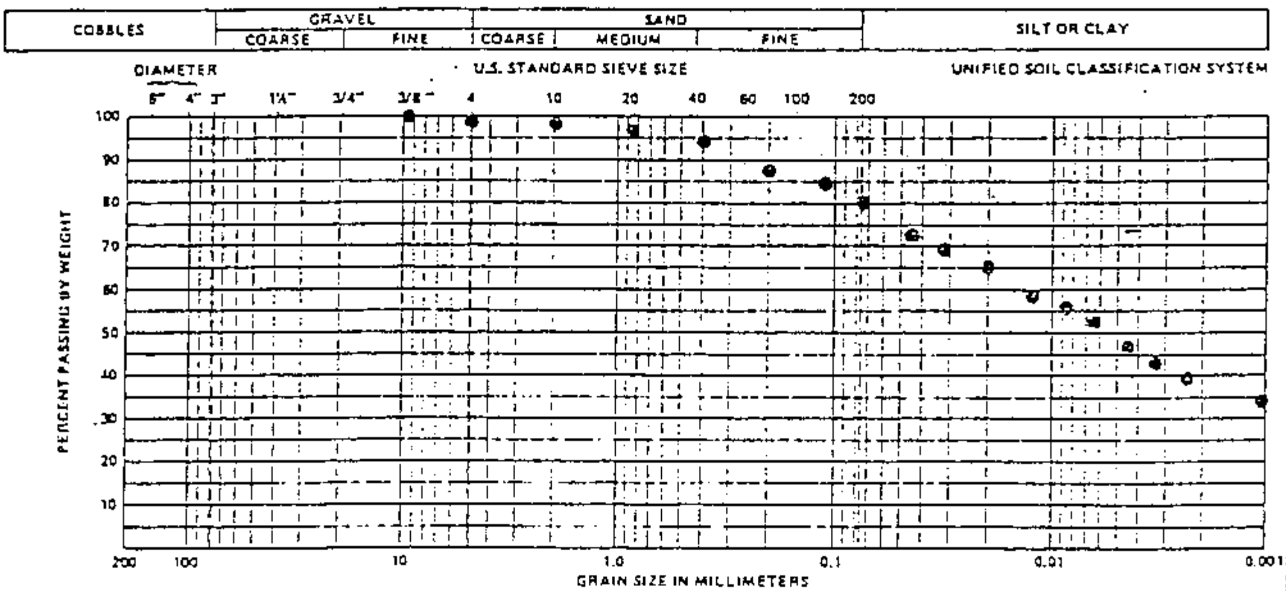


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
3	ST-3	55.0	CL	CLAY, Silty, Gray, Little Fine Sand,	14.2	21	14
				Seams of Fine Sand.			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
3	ST-5	85.0	CL	CLAY, Silty, Gray, Little Fine Sand.	20.3	24	17

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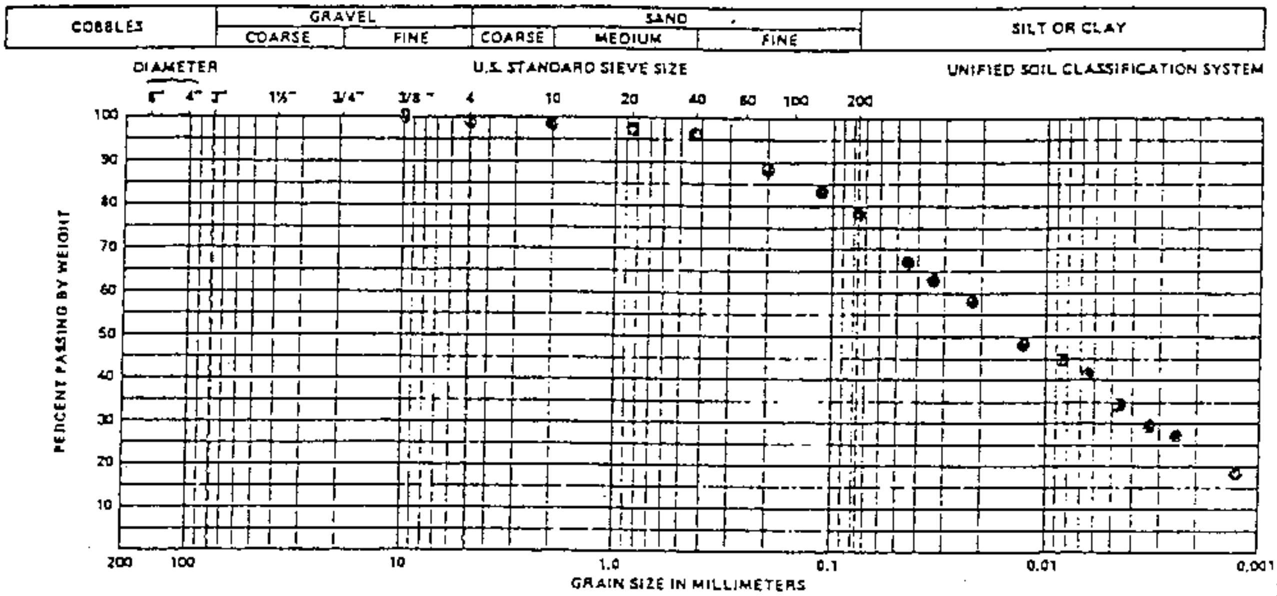
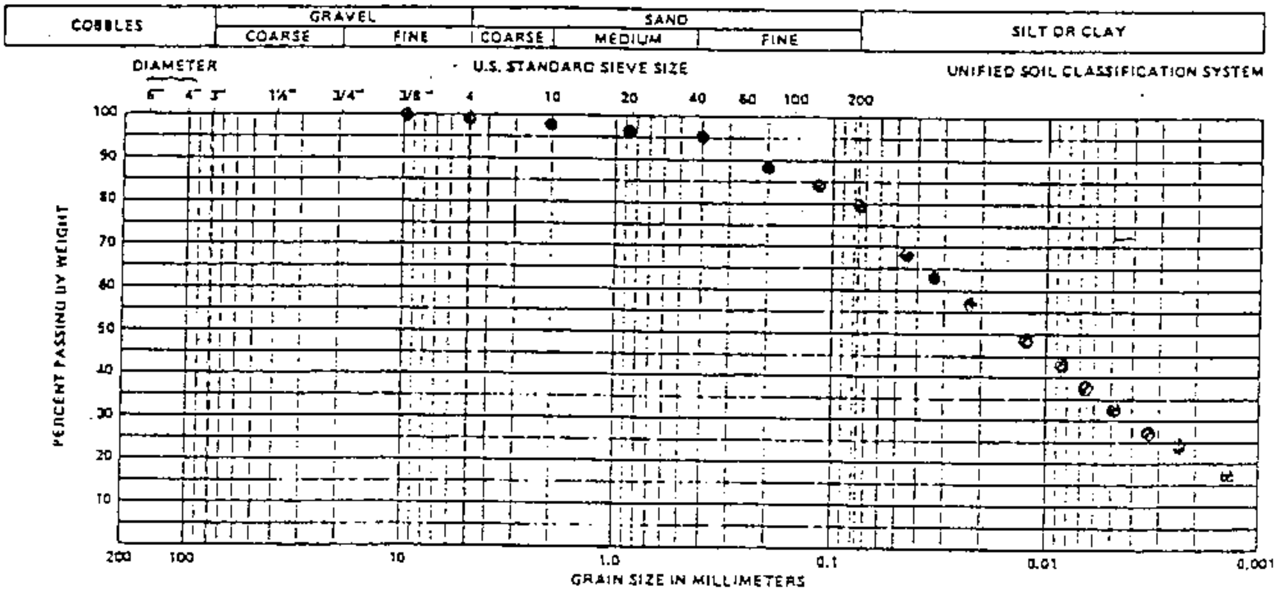
GRAIN-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
4	ST-1	20.0	CL	CLAY, Silty, Gray, Little Fine Sand,	12.8	25	15
				Seams of Fine Sand.			



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
4	ST-2	25	CL	CLAY, Silty, Gray, Little Fine Sand,	13.7	--	--
				Seams of Fine Sand.			

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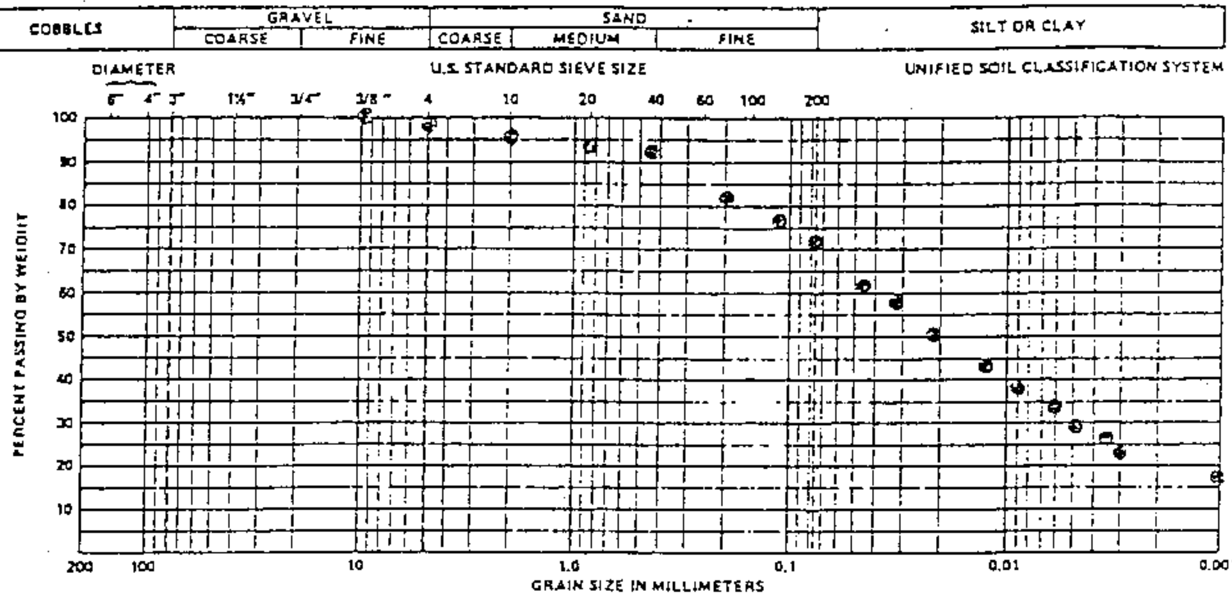
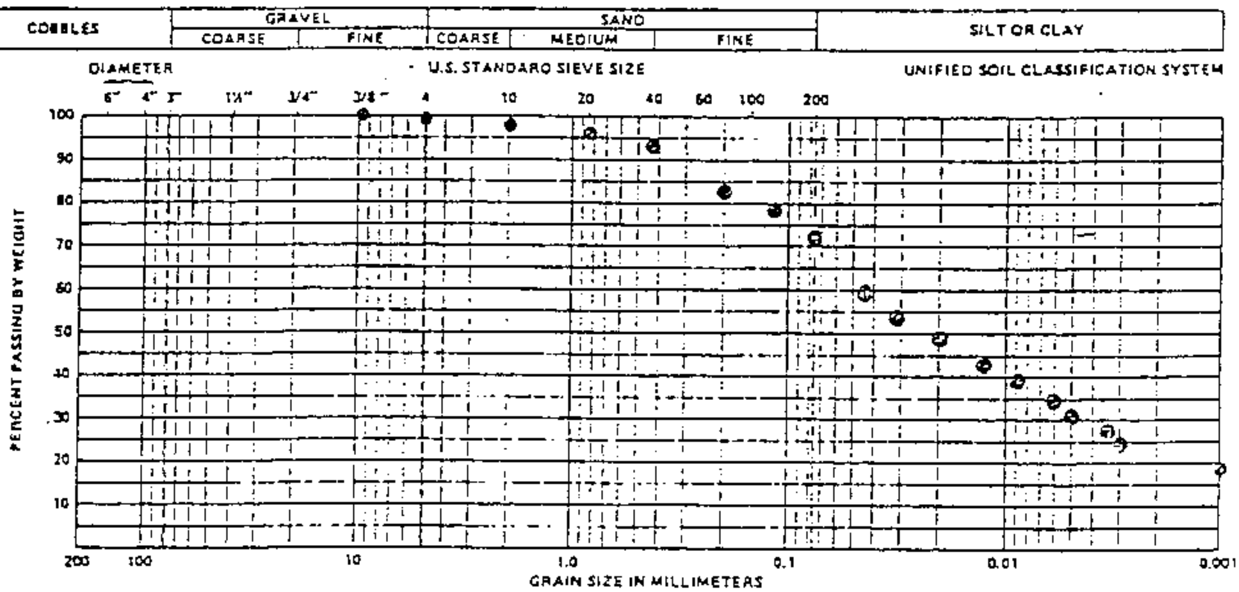
GRAIN-SIZE DISTRIBUTION

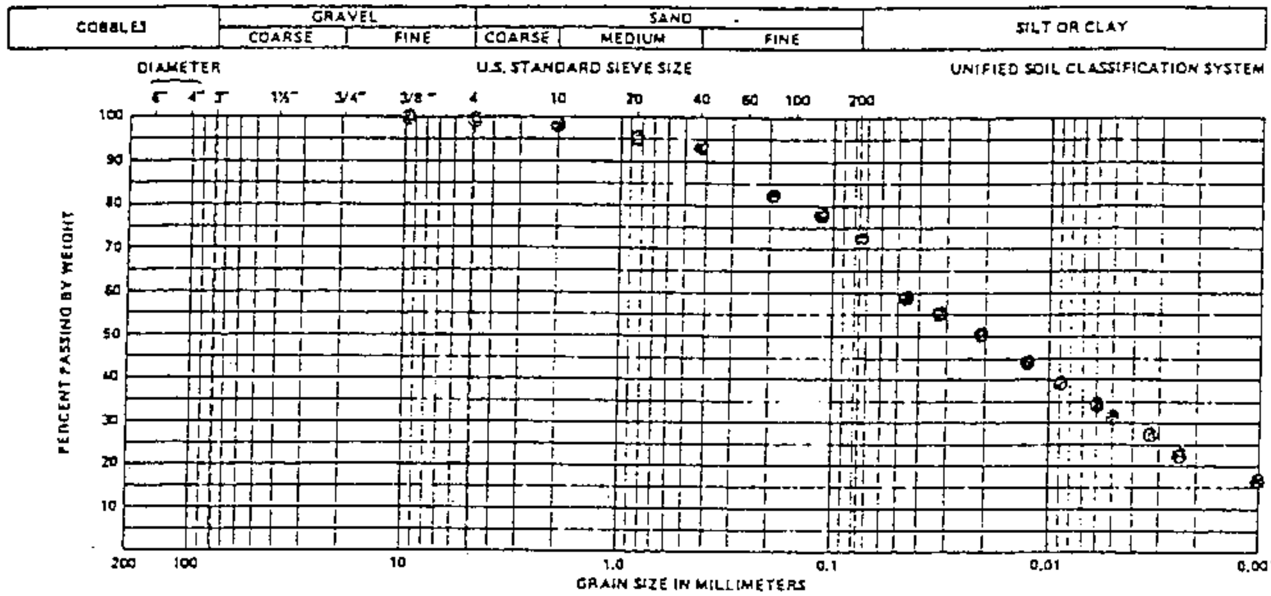


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
4	ST-5	60.0	CL	CLAY, Silty, Gray, Little Fine Sand.	15.1	20	13

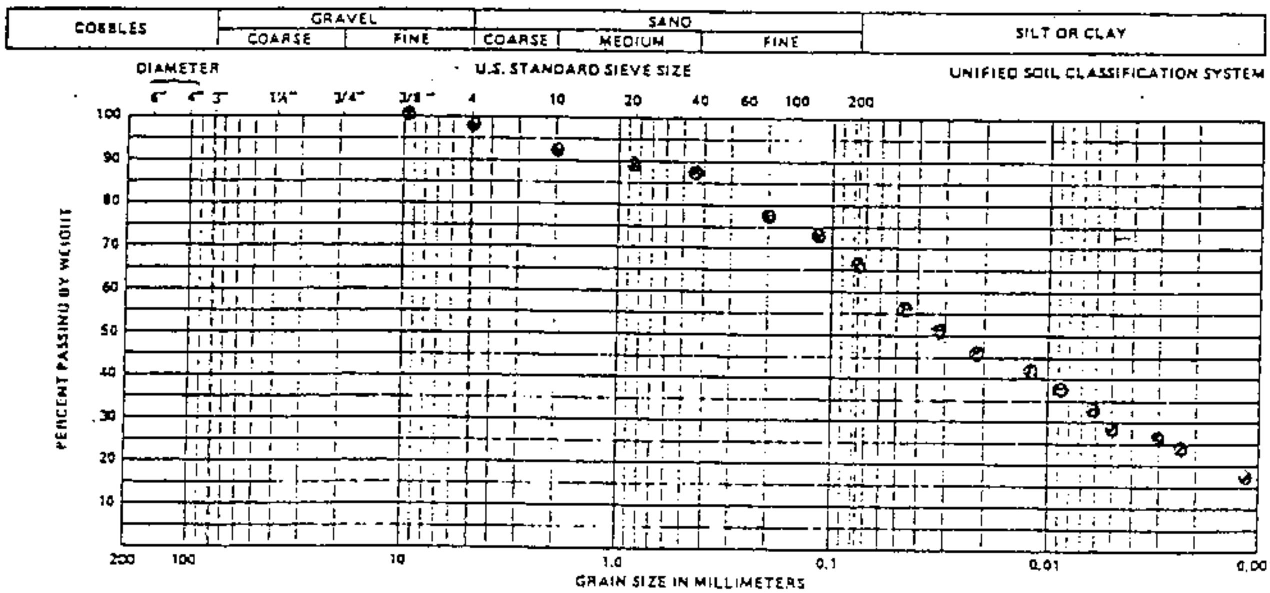


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
5	ST-1	20.5	CL	CLAY, Silty, Gray, Little Fine Sand,	13.1	19	11
				Seams of Fine Sand.			

GRAIN-SIZE DISTRIBUTION

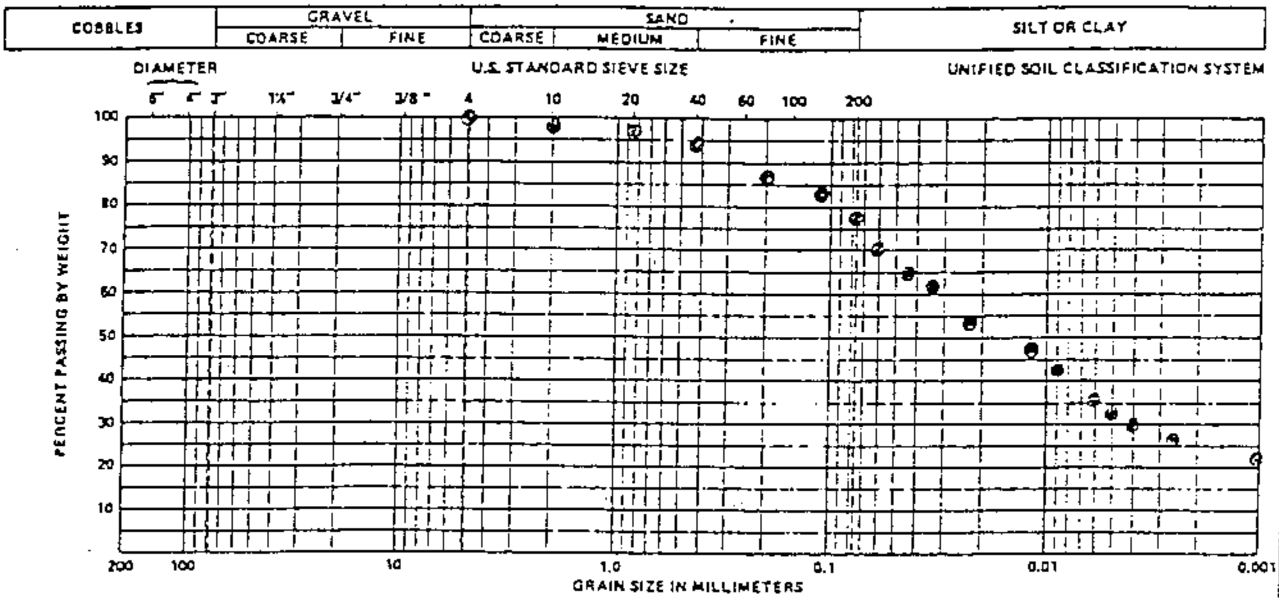


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
6	SS-5	50.0	CL	CLAY, Silty, Gray, Little Fine Sand	14.7	22	14
				and Seams of Sand.			

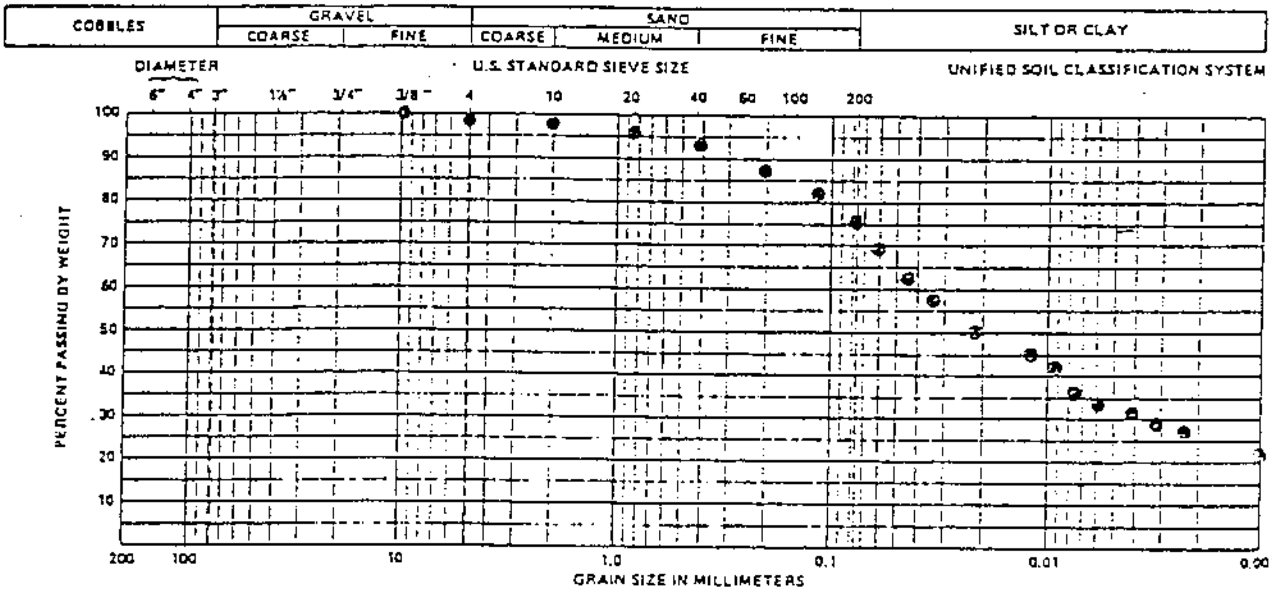


BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
8	ST-1	45.0	CL	CLAY, Silty, Gray, Little Fine Sand,	14.6	--	--
				Seams of Fine Sand.			

GRAIN-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
8	SSL-4	10.0	CL	CLAY, Silty, Brown, Little Fine Sand.	15.2	--	--



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_P (%)
10	SSL-4	10.0	CL	CLAY, Silty, Brown, Little Fine Sand.	14.6	--	--

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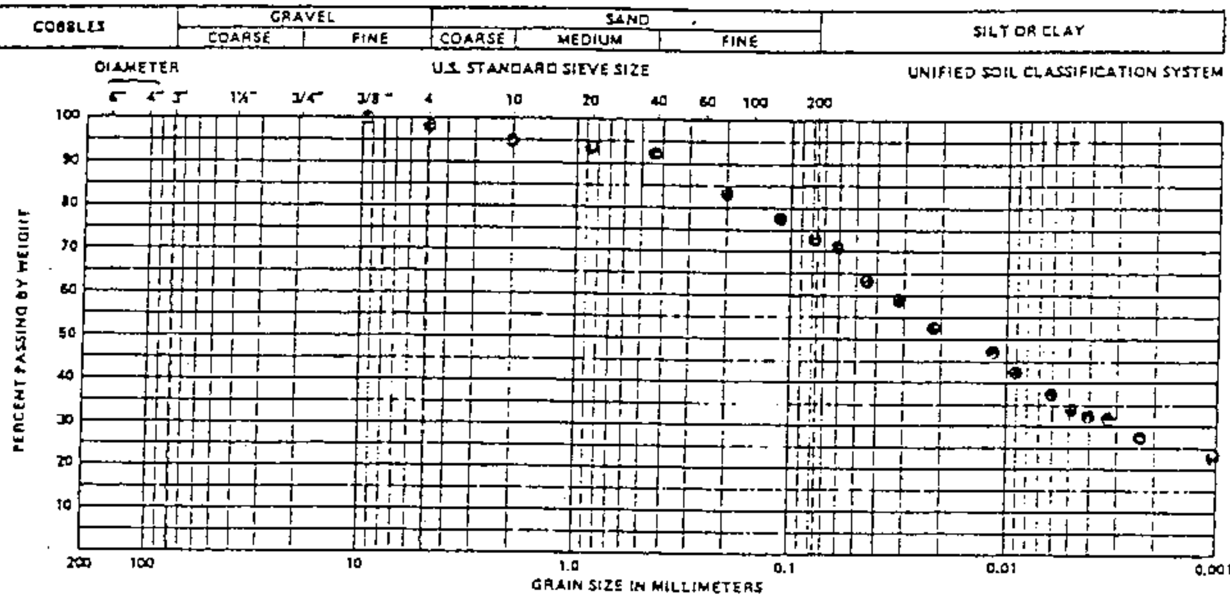
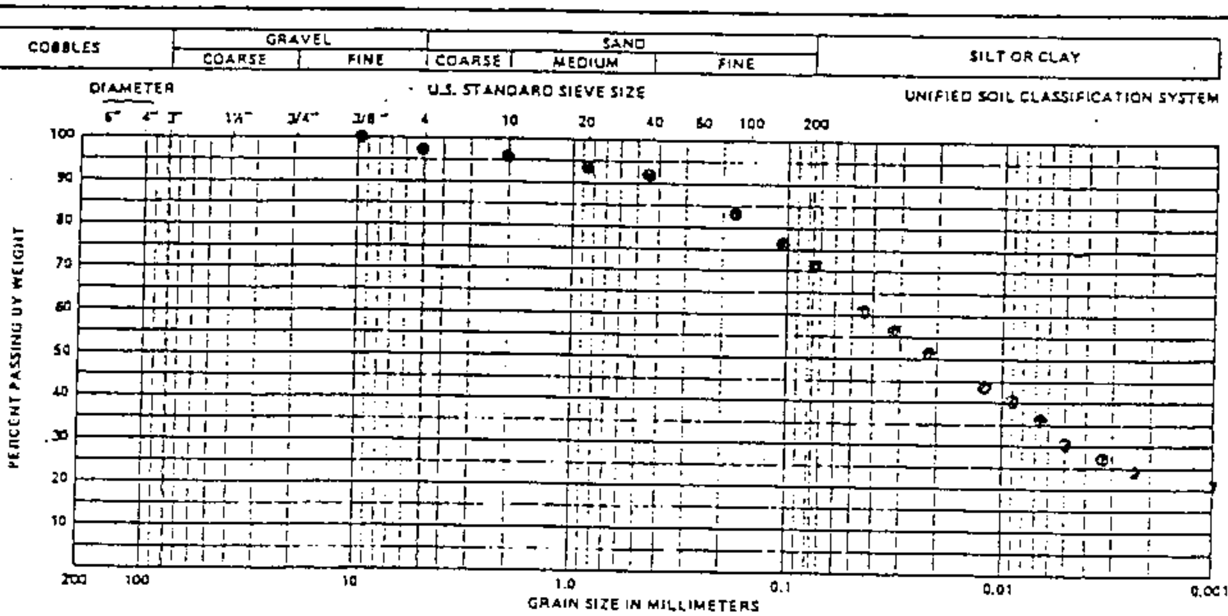
GRAIN-SIZE DISTRIBUTION



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_p (%)
10	SS-5	40.0	CL	CLAY, Silty, Gray, Little Sand.	16.4	--	--



BORING	SAMPLE	DEPTH (ft)	SYMBOL	CLASSIFICATION	w (%)	w_L (%)	w_p (%)
8	SS-7	50.0	CL	CLAY, Silty, Grav, Little Fine Sand.	15.1		

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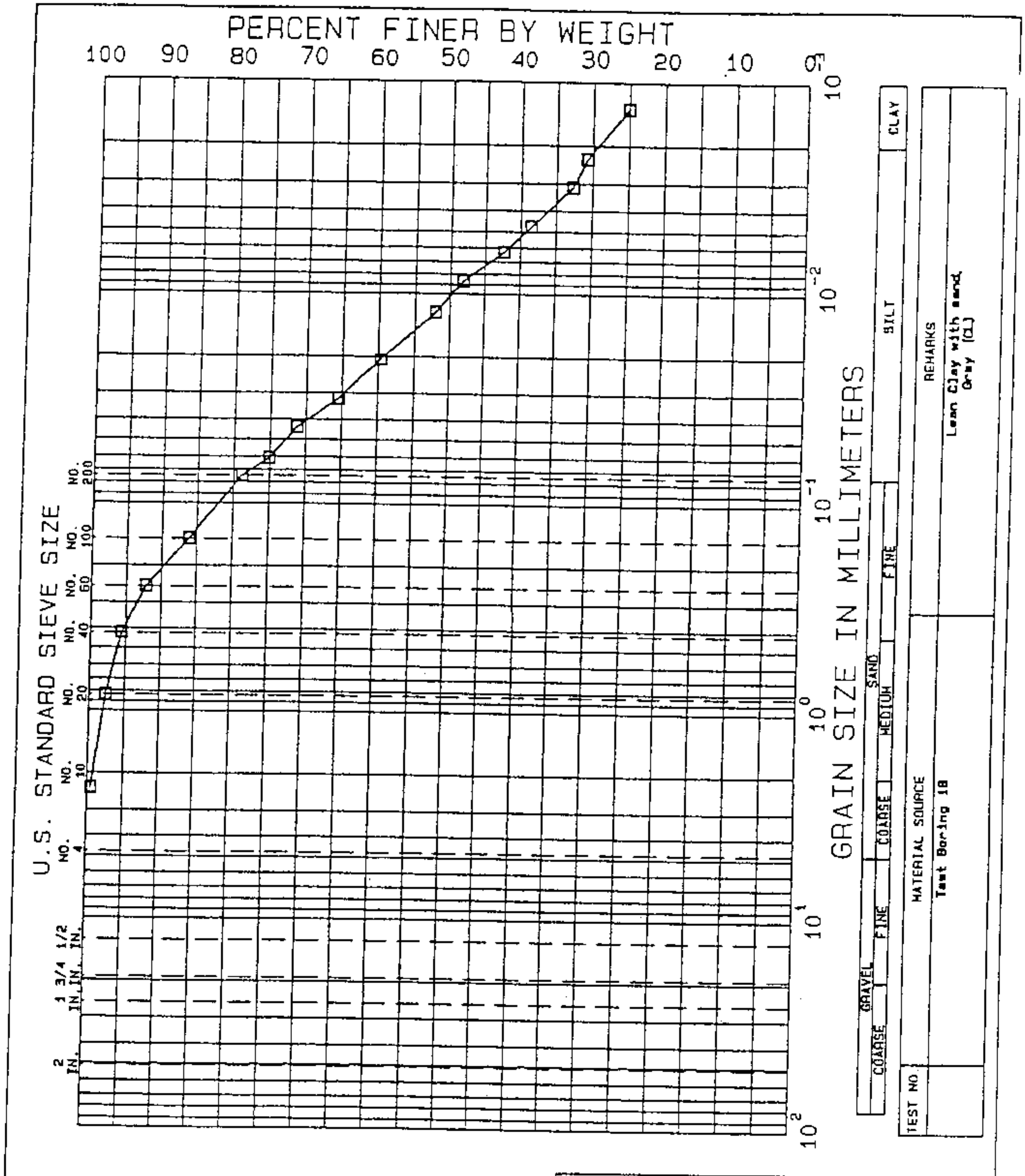
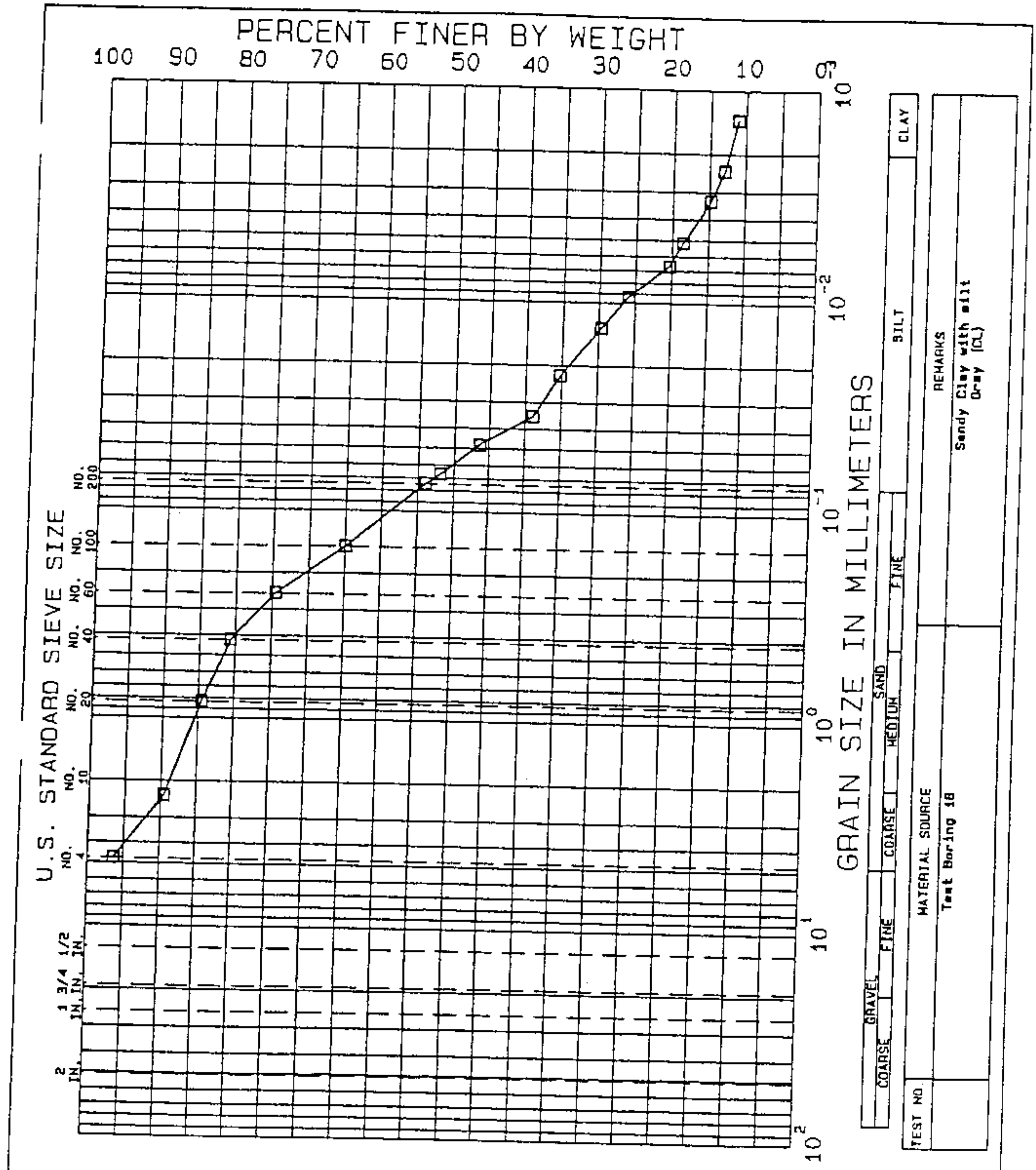


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. SB-18
SAMPLE SS-2
DEPTH 10.0'
TECH. R.R. Jr
REVIEWER L.A.J.

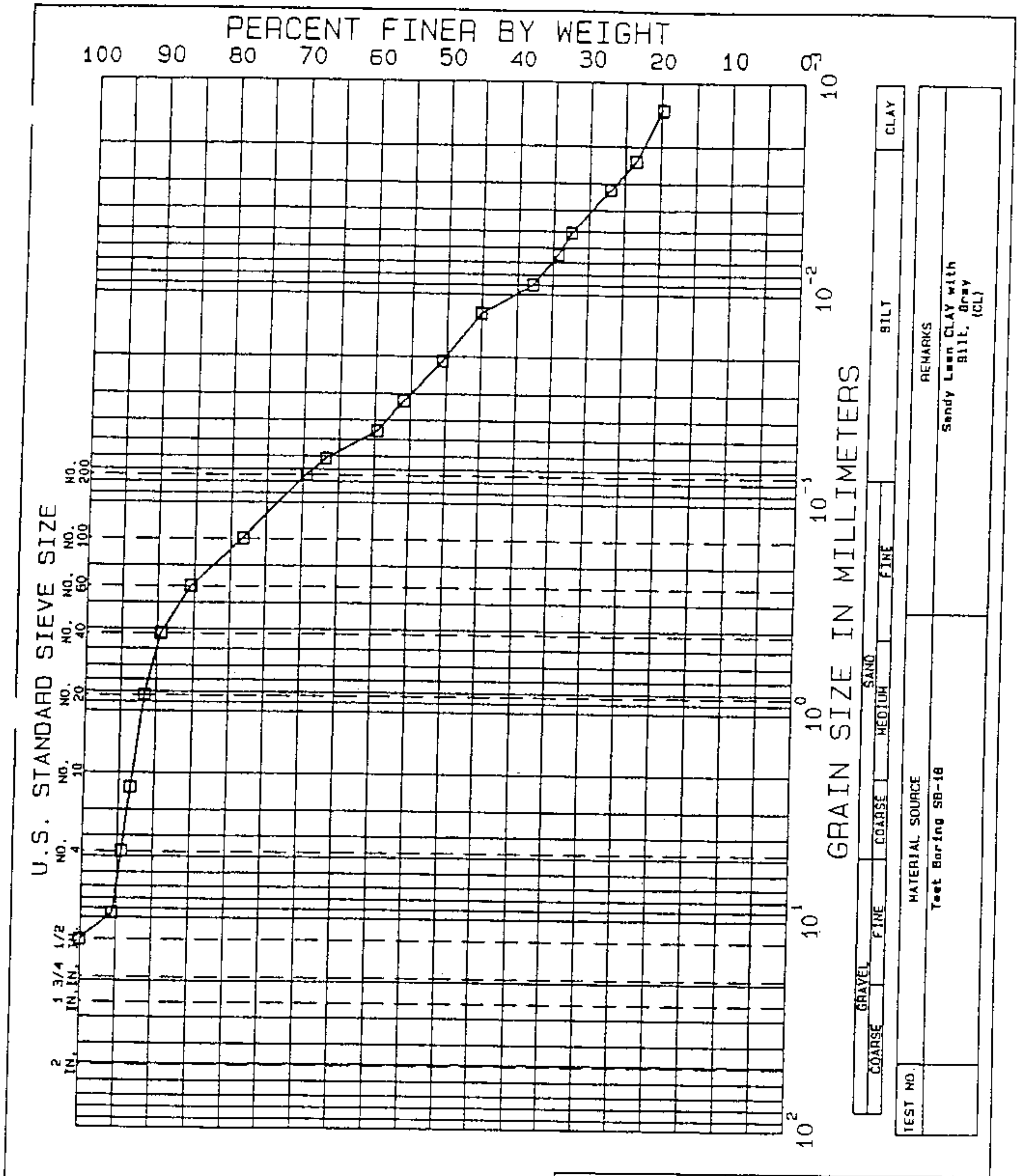
TEST SERIES NO.
DATE 1-17-91
FILE 80669.00



CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.

GRADATION TESTS

BORING NO. SB-18	TEST SERIES
SAMPLE SS-5	NO.
DEPTH 25.0'	DATE 1-17-91
TECH. R.R. Jr	
REVIEWER L.A.J.	FILE 80569.00

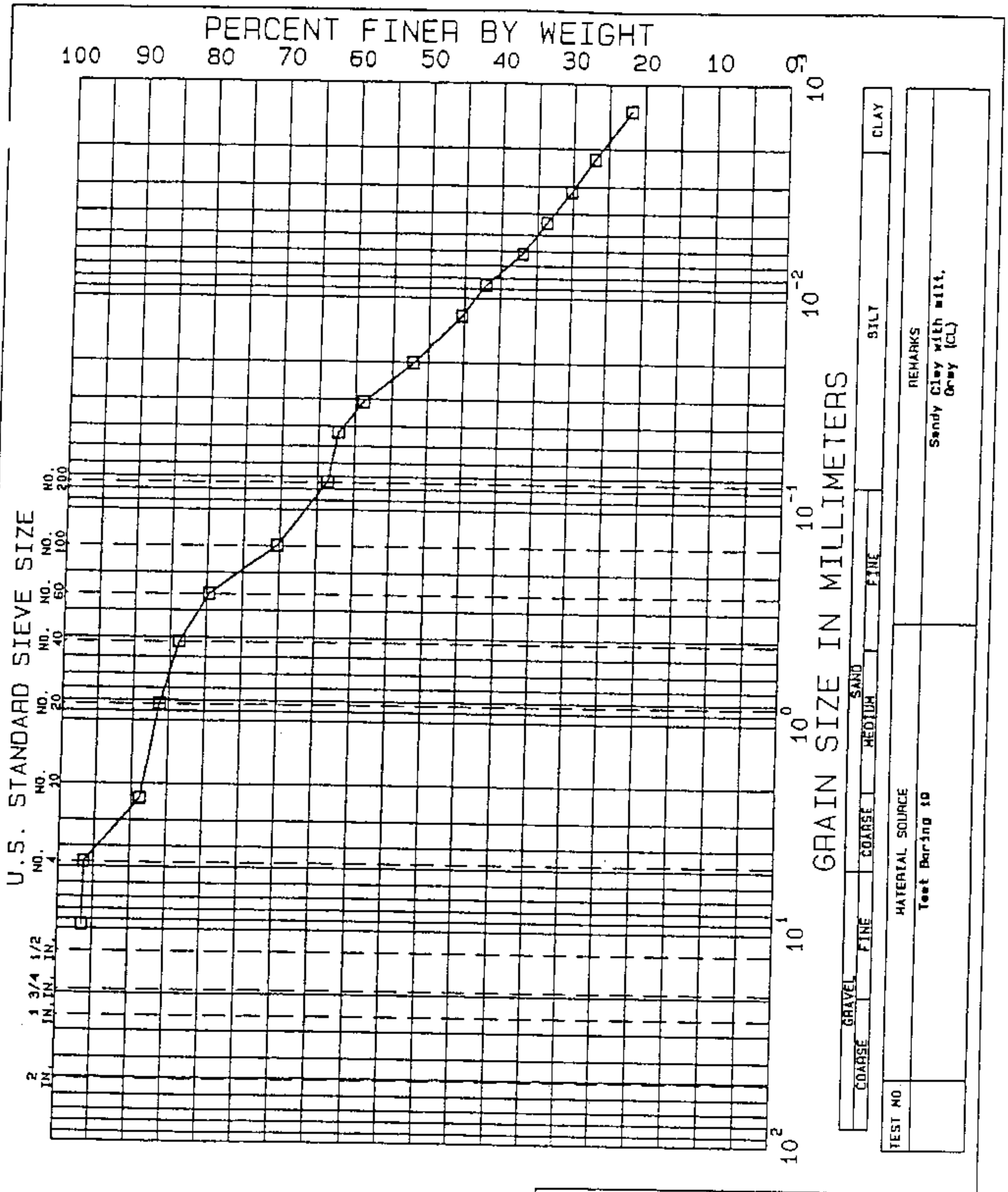


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MICH
GRADATION TESTS

BORING NO. SB-18
SAMPLE SS-8
DEPTH 40.0
TECH. R.R.
REVIEWER P.M.P.

TEST SERIES
NO. 1
DATE 1-17-91

FILE X60669.0

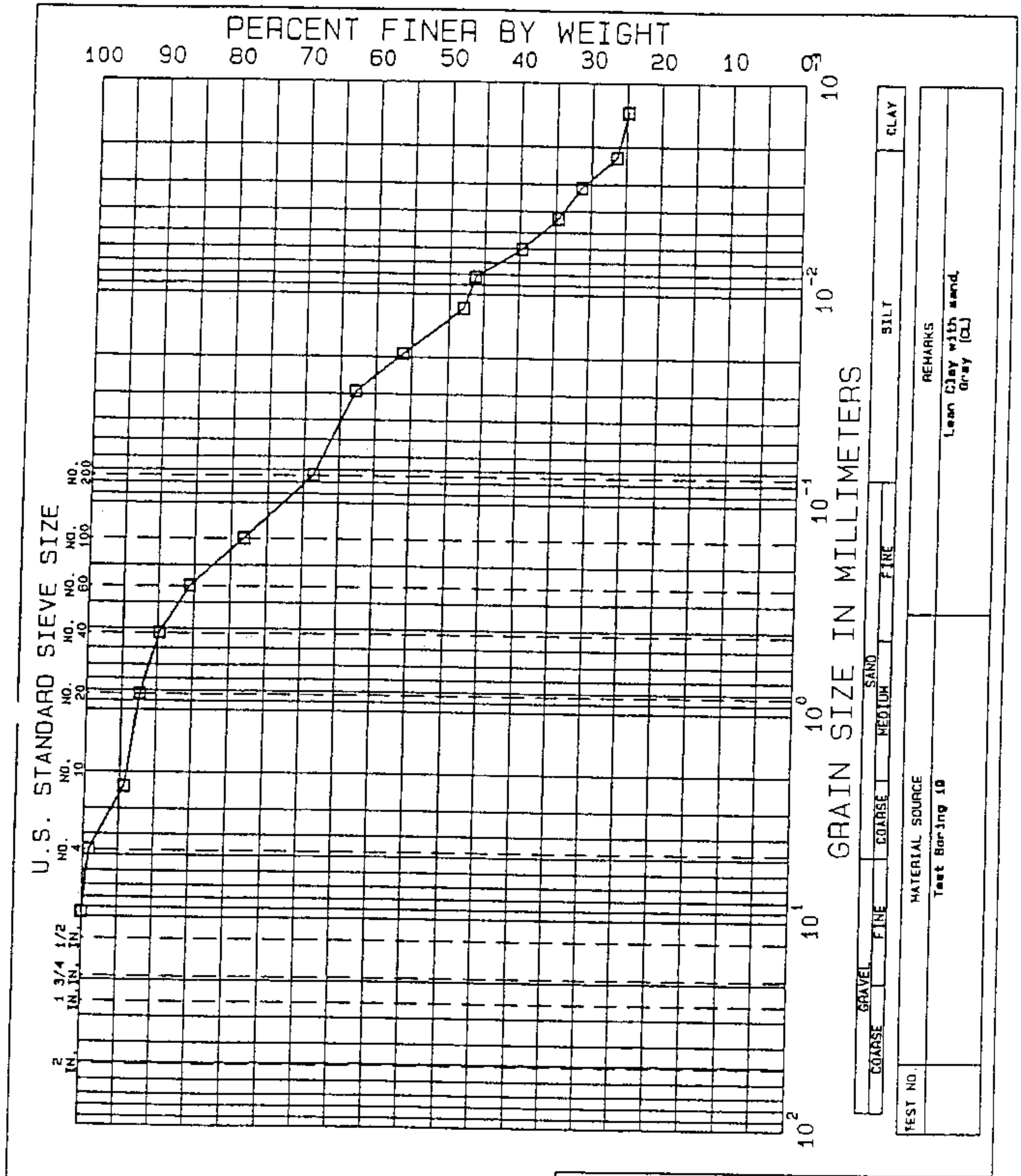


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. SB-19
SAMPLE SS-3
DEPTH 15.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES
NO
DATE 1-17-91

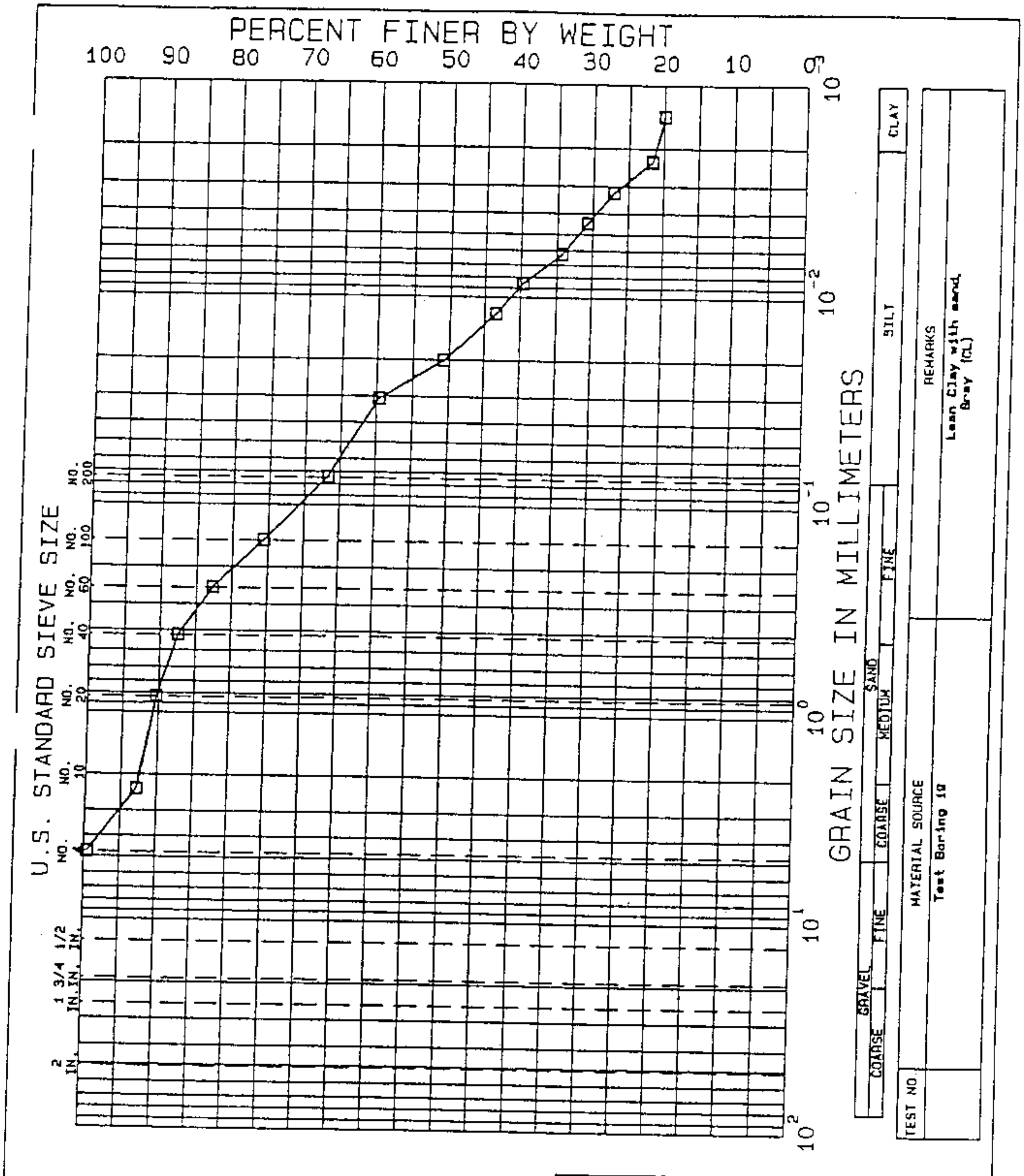
FILE 80059.00



CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. 98-19
SAMPLE SS-8
DEPTH 30.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES NO.
DATE 1-17-91
FILE 80559.00

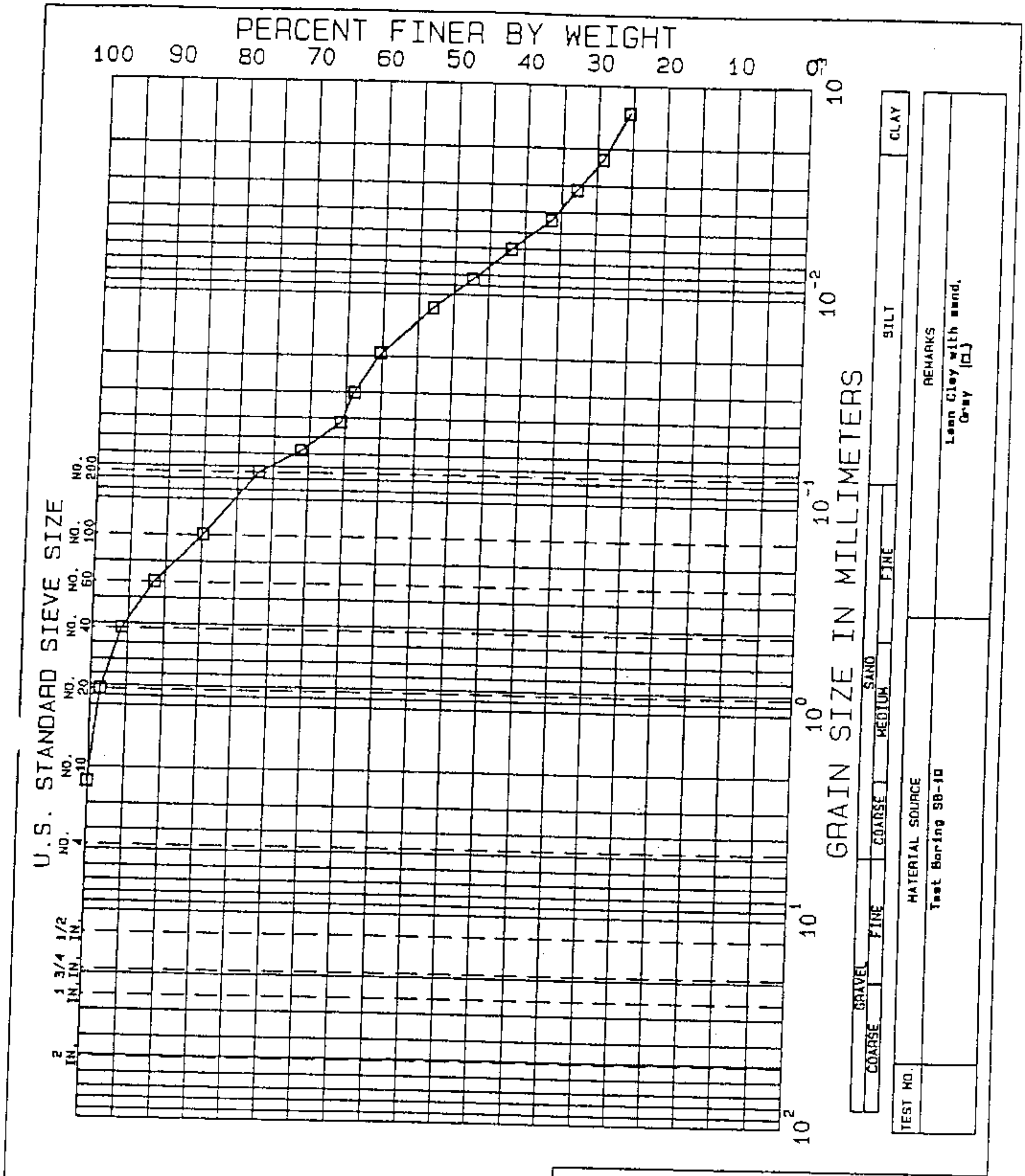


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. BB-19
SAMPLE SS-10
DEPTH 50.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES
NO.
DATE 1-17-91

FILE 80669.00



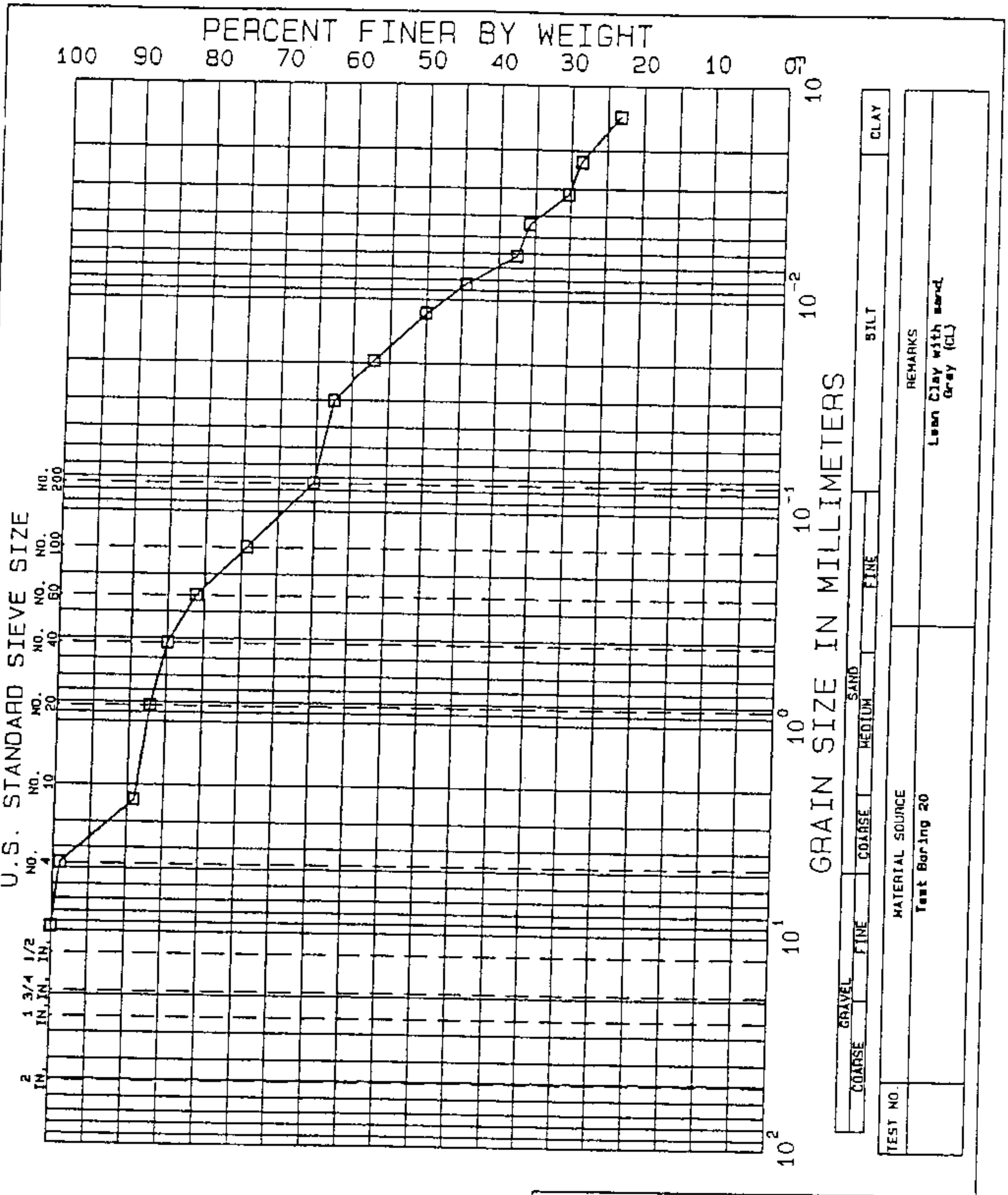
CITY ENVIRONMENTAL
FREDRICK ST. DETROIT, MICHIGAN
GRADATION TESTS

BORING NO. SB-19
SAMPLE SS-13
DEPTH 65.0
TECH. R.R. Jr.
REVIEWER P.K.P.

TEST SERIES
NO. 1
DATE 1-18-91

FILE X60599.0

GZA GEOENVIRONMENTAL, INC.
ENGINEERS AND SCIENTISTS

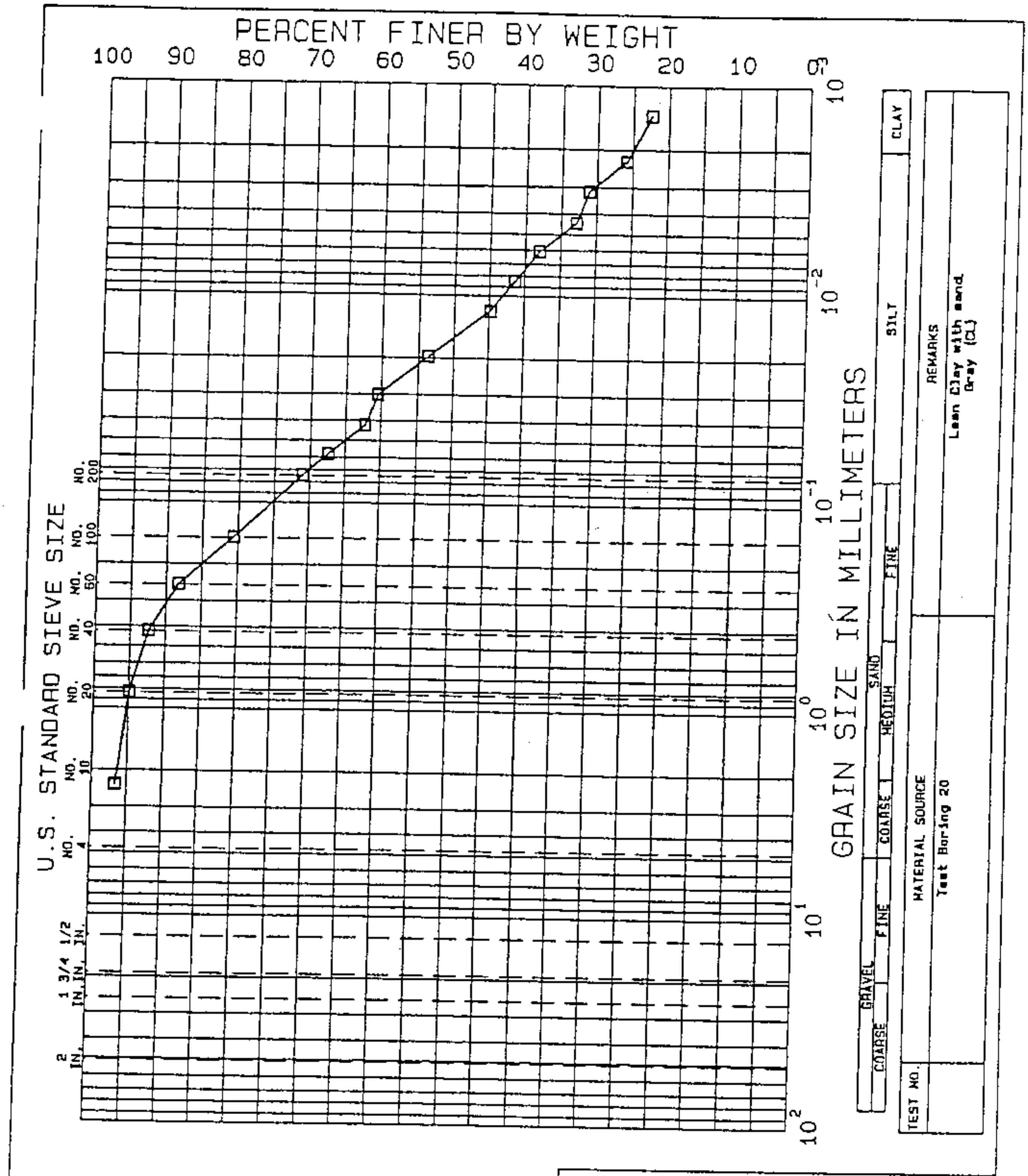


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. SB-20
SAMPLE SS-2
DEPTH 10.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES NO.
DATE 1-17-91

FILE 60669.00

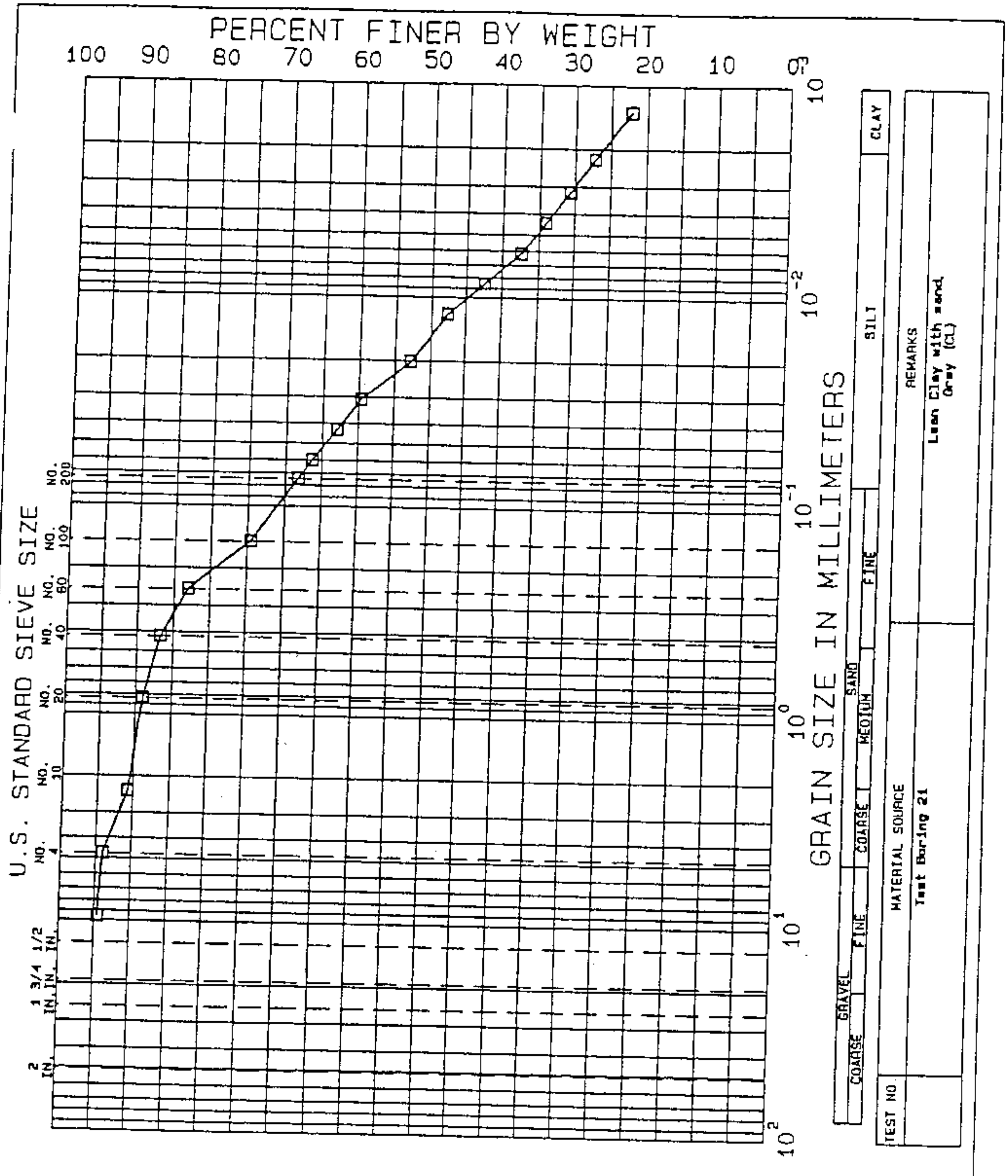


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. SB-20
SAMPLE SS-8
DEPTH 40.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES
NO.
DATE 1-17-91

FILE 80659.00

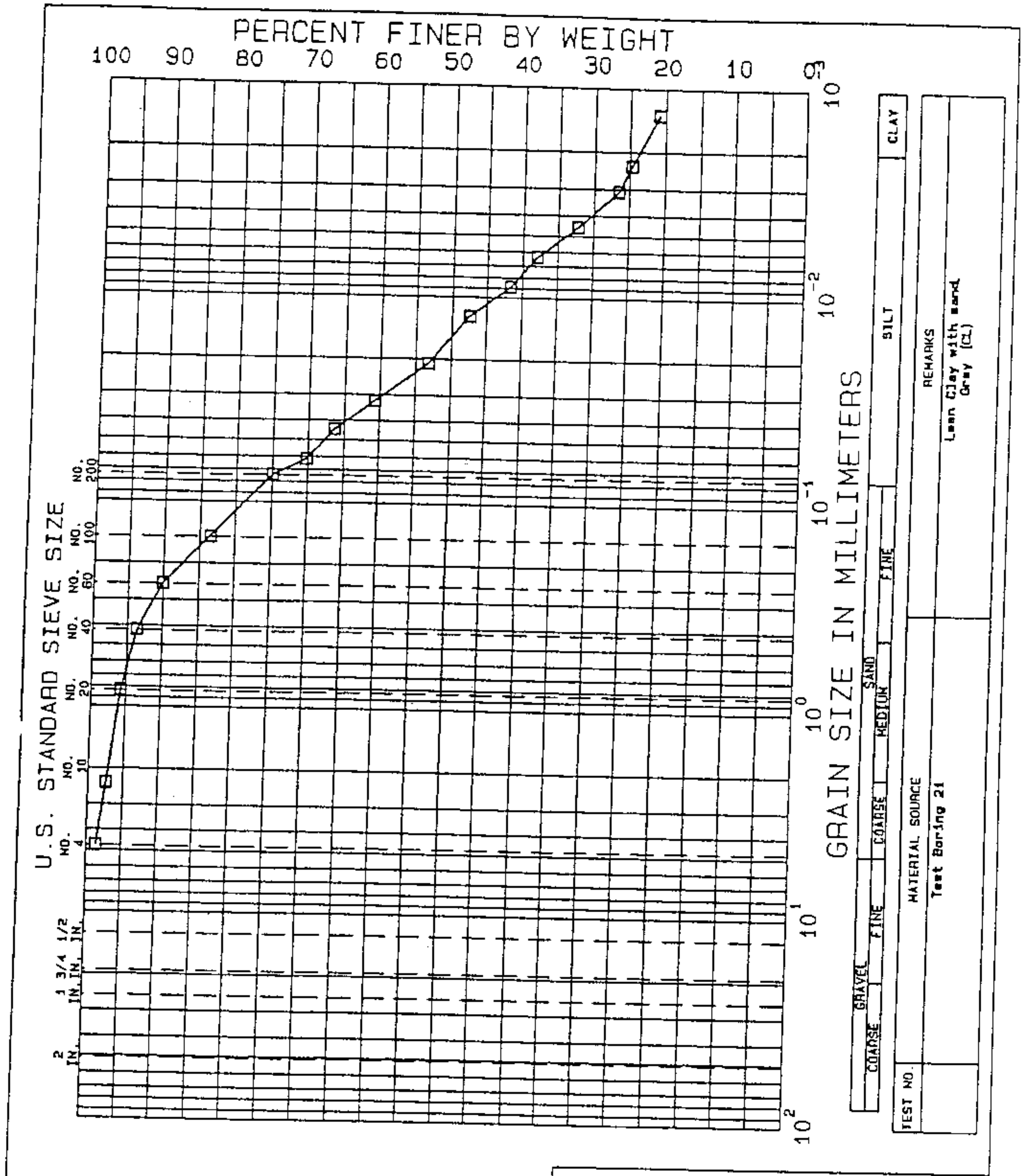


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. SB-21
SAMPLE SS-3
DEPTH 15.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES
NO.
DATE 1-17-91

FILE 80659.00

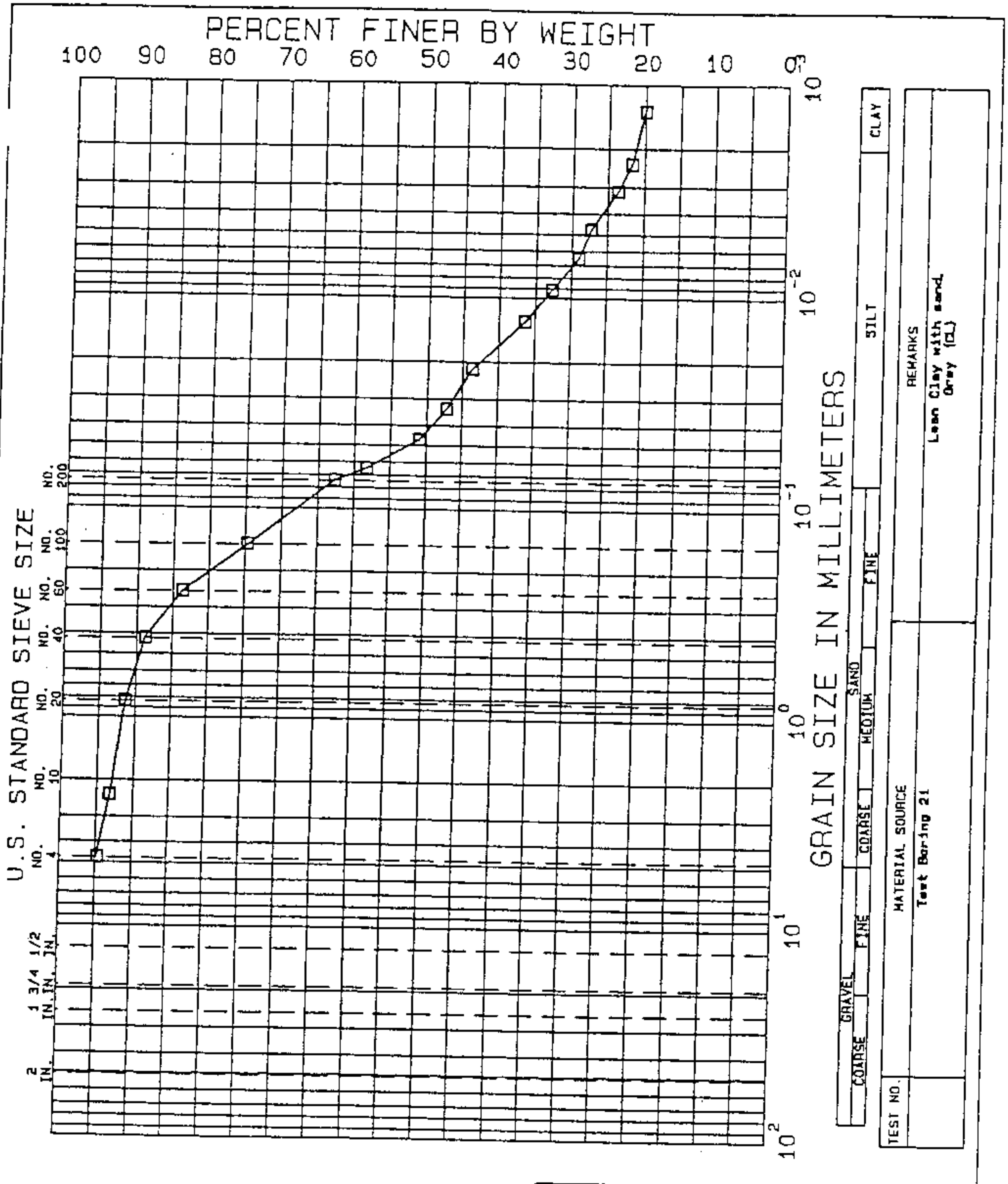


CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.
GRADATION TESTS

BORING NO. SB-21
SAMPLE SS-5
DEPTH 23.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES NO.
DATE 1-17-91

FILE 80659.00



CITY ENVIRONMENTAL INC.
FREDERICK ST., DETROIT, MI.

GRADATION TESTS

BORING NO. 98-21
SAMPLE SS-7
DEPTH 40.0'
TECH. R.R. Jr
REVIEWER L.A.J.

TEST SERIES NO.
DATE 1-17-91

FILE 60869.00

SAMPLING DATA SHEET

WELL NO: MW-3 PROJECT NO: 60669 DATE: 11/21/90

JOB DESCRIPTION: City Environmental, Hydrogeological Study

LOCATION: City Environmental, Detroit, Michigan

CONTACT: Tom Turnbull TELEPHONE: 923-0800

PERSONNEL PRESENT: Jim Riley, Mark Krumanacher (GZA

PARAMETERS TO BE ANALYZED: 40 CFR Part 265.52

WELL DATA

Total Depth: 71.5'

Secured (Lock and Cap): _

How can this be 71.5' MW Install report says 632.5-564: 67.6 4' deep

Static Head Measurement: Purge / Sample 8.5' / 35'

Well Casing Diam and Type: ______

Time: 1200

Volume of Static Water: 10

Method: Electronic Waterlevel Indicator

PURGING DATA

Date of Purging: 11/21/90

Purging Method: Disposable Bailer

Volume Purged: 12.5 gal. (Dry)

Purging Rate: ______

Specific Conductance: ______ umhos/cm @ 25 C

Temperature: ______ C

pH: ______

SAMPLING DATA

Date of Sampling: 11/21/90

Time of Sampling: 6:15

Sampling Method: Disposable Bailer

Chain-of-Custody: YES

Specific Conductance: 990 umhos/cm @ 25 C

Temperature: 13.5 C

pH: 8.80

REMARKS: (Color, Clarity, Odor, Other Measurements)

Sample waters slightly silty.

/60669.GMW

GROUNDWATER MONITORING WELL

GROUNDWATER MONITORING WELL
SAMPLING DATA SHEET

WELL NO: MW-4 PROJECT NO: 60669 DATE: 11/21/90

JOB DESCRIPTION: City Environmental, Hydrogeological Study

LOCATION: City Environmental, Detroit, Michigan

CONTACT: Tom Turnbull TELEPHONE: 923-0800

PERSONNEL PRESENT: Jim Riley, Mark Krumanacher (GZA)

PARAMETERS TO BE ANALYZED: 40 CFR Part 265.52

Saml, 49.5 633.0 Log smp 5

WELL DATA

Total Depth: 49.5'

Secured (Lock and Cap): ______

Static Head Measurement: Purge / Sample 3.5' / 20.1'

Well Casing Diameter and Type: ______

Time: 10:45

Volume of Static Water: Purge / Sample 7.54 gal. / 4.80 gal.

Method: Electronic Waterlevel Indicator

PURGING DATA

Date of Purging: 11/21/90

Purging Method: Disposable Bailer

Volume Purged: 9.5 gal. (Dry)

Purging Rate: ______

Specific Conductance: ______ umhos/cm @ 25 C

Temperature: ______ C

pH: ______

SAMPLING DATA

Date of Sampling: 11/21/90

Time of Sampling: 5:00

Sampling Method: Disposable Bailer

Chain-of-Custody: YES

Specific Conductance: 1400 umhos/cm @ 25 C

Temperature: 14 C

pH: 8.45

REMARKS: (Color, Clarity, Odor, Other Measurements)

Slightly silty to very silty at time of sampling.

\/60669.GMW

GROUNDWATER MONITORING WELL
SAMPLING DATA SHEET

WELL NO: MW-18 PROJECT NO: 60669 DATE: 11/21/90

JOB DESCRIPTION: City Environmental, Hydrogeological Study

LOCATION: City Environmental, Detroit, Michigan

CONTACT: Tom Turnbull TELEPHONE: 923-0800

PERSONNEL PRESENT: Jim Riley, Mark Krumanacher (GZA)

PARAMETERS TO BE ANALYZED: 40 CFR Part 265.52

WELL DATA

Total Depth: 60.1'

Secured (Lock and Cap): yes

Static Head Measurement: Purge / Sample 8.20' / 11.01'

Well Casing Diameter and Type: 2"

Time: 9:00

Volume of Static Water: Purge / Sample 8.53 gal. / 8.09 gal.

Method: Electronic Waterlevel Indicator

PURGING DATA

Date of Purging: 11/21/90

Purging Method: ~~Manual Bailing~~ Disposable Bailer

Volume Purged: 23 gal.

Purging Rate:

Specific Conductance: umhos/cm @ 25 C

Temperature: C

pH:

SAMPLING DATA

Date of Sampling: 11/27/90

Time of Sampling: 8:20

Sampling Method: Disposable Bailer

Chain-of-Custody: YES

Specific Conductance: 880 umhos/cm @ 25 C

Temperature: NA C

pH: 7.65

REMARKS: (Color, Clarity, Odor, Other Measurements)

Sampling water slightly silty.

pn/60669.GMW

GROUNDWATER MONITORING WELL
SAMPLING DATA SHEET

WELL NO: MW-19 PROJECT NO: 60669 DATE: 11/21/90

JOB DESCRIPTION: City Environmental, Hydrogeological Study

LOCATION: City Environmental, Detroit, Michigan

CONTACT: Tom Turnbull TELEPHONE: 923-0800

PERSONNEL PRESENT: Jim Riley, Mark Krumanacher (GZA)

PARAMETERS TO BE ANALYZED: 40 CFR Part 265.52

WELL DATA

Total Depth: 51.9'

Secured (Lock and Cap): ______

51.9'
Log says 54.'
3' of silt bot

Static Head Measurement: Purge / Sample 1.40' / 20.6'

Well Casing Diameter and Type: ______

Time: 12:15

Volume of Static Water: 8.33 gal. Pur

Method: Electronic Water Indicator

PURGING DATA

Date of Purging: 11/19/90

Purging Method: Peristaltic Pump

Volume Purged: 8.50 Gal.

Purging Rate: ______

Specific Conductance: ______ umhos/cm @ 25 C

Temperature: ______ C

pH: ______

SAMPLING DATA

Date of Sampling: 11/21/90

Time of Sampling: 3:35

Sampling Method: Disposable Bailer

Chain-of-Custody: YES

Conductance: 900 umhos/cm @ 25 C

Temperature: 13.5 C

pH: 7.70

REMARKS: (Color, Clarity, Odor, Other Measurements)

Sampling water slightly silty.

pn/60669.GMW

SAMPLING DATA SHEET

WELL NO: MW-20 PROJECT NO: 60669 DATE: 11/21/90

JOB DESCRIPTION: City Environmental, Hydrogeological Stud

LOCATION: City Environmental, Detroit, Michigan

CONTACT: Tom Turnbull TELEPHONE: 923-0800

PERSONNEL PRESENT: Jim Riley, Mark Krumanacher (GZA)

PARAMETERS TO BE ANALYZED: 40 CFR Part 265.52

53.5 53.5
Log says OK

WELL DATA

Total Depth: 53.5'

Secured (Lock and Cap): ____

Static Head Measurement: Purge / Sample 21.98' / 25.7'

Well Casing Diameter and Type: ____

Time: 11:30

Volume of Static Water: Purge / ___ 5.15 gal. / 4.62 gal.

Method: Electronic Waterlevel Indicator

PURGING DATA

Date of Purging: 11/19/90

Purging Method: Peristaltic Pump

Volume Purged: 5.1 gal.

Purging Rate: ____

Specific Conductance: ____ umhos/cm @ 25 C

Temperature: ____ C

pH: ____

SAMPLING DATA

Date of Sampling: 11/21/90

Time of Sampling: 2:45 Hrs. ?

Sampling Method: Disposable Bailer

Chain-of-Custody: YES

Specific Conductance: 1300 umhos/cm @ 25 C

Temperature: 13 C

pH: 7.72

REMARKS: (Color, Clarity, Odor, Other Measurements)

Sample water slightly silty at time of sampling.

/60669.GMW

SAMPLING DATA SHEET

WELL NO: MW-21 PROJECT NO: 60669 DATE: 11/21/90

JOB DESCRIPTION: City Environmental, Hydrogeological Study

LOCATION: City Environmental, Detroit, Michigan

CONTACT: Tom Turnbull TELEPHONE: 923-0800

PERSONNEL PRESENT: Jim Riley, Mark Krumanacher (GZA)

PARAMETERS TO BE ANALYZED: 40 CFR Part 265.52

WELL DATA

Total Depth: 48'

Secured (Lock and Cap): ____

Static Head Measurement: Purge / Sample 14.64' / 16.6'

Well Casing Diameter and Type: ____

48'

Log says 47.7' somewhat be[l] but still slight[l]

Time: 9:45

Volume of Static Water: Pur[ge] 5.4 g[al]

Method: Electronic Waterlevel Indicator

PURGING DATA

Date of Purging: 11/19/90

Purging Method: Peristaltic Pump

Volume Purged: 5.8 gal.

Purging Rate: ____

Specific Conductance: ____ umhos/cm @ 25 C

Temperature: ____ C

pH: ____

SAMPLING DATA

Date of Sampling: 11/21/90

Time of Sampling: 2:00

Sampling Method: Disposable Bailer

Chain-of-Custody: YES

Specific Conductance: 800 umhos/cm @ 25 C

Temperature: 14 C

pH: 7.95

REMARKS: (Color, Clarity, Odor, Other Measurements)

Sample water slightly silty to silty at end of sampling.

..n/60669.GMW

GROUNDWATER MONITORING WELL

DRAFT

APPENDIX I

GROUNDWATER ANALYTICAL TEST RESULTS

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RMINGTON HILLS, MICHIGAN 48335

'3) 477-6666
X (313) 477-4604

Need Chain of

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48990

SAMPLE DESCRIPTION: MW-3 TIME 1815

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGE
FREDERICK ST., DETROIT MI

Why is trichloroethe listed fu Should one be 1,1,1 tri

1,1-Dichlorethene		
	<1	p[illegible]
Arsenic		
	<0.053	p[illegible]
Barium		
	0.025	p[illegible]
Cadmium, Diss.		
	<0.003	p[illegible]
Chromium, Diss.		
	<0.007	p[illegible]
Iron, Diss.		
	0.533	ppm
Lead, Diss.		
	<0.042	ppm
Manganese, Diss.		
	0.038	ppm
Mercury		
	<0.025	ppm
Selenium		
	<0.075	ppm
Silver, Diss.		
	<0.050	ppm
Chloride		
	21.69	ppm
Coliforms, Total		
	None	/100 ml
Conductivity		
	10,200	umhos/cm

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48990

SAMPLE DESCRIPTION: MW-3 TIME 1815 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Fluoride
1.68
Nitrogen, Nitrate — ppm
<0.1
pH — ppm
7.91
Phenols — units
0.024
Sodium, Diss. — ppm
116
Sulfate — ppm
371.7
Turbidity — ppm
<1.0
Total Organic Carbon — N.T.U.
1.37
1,2-Dichlorbenzene — ppm
<1
Benzene — ppb
<1
Carbon Tetrachloride — ppb
<1
1,2-Dichloroethane — ppb
<1
Trichloroethene — ppb
<1
ppb

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48990

SAMPLE DESCRIPTION: MW-3 TIME 1815 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Vinyl Chloride	<1	ppb
Endrin	<0.01	ppm
Lindane	<0.01	ppm
Methoxychlor	<0.01	ppm
Toxaphene	<0.01	ppm
2,4,D	<0.01	ppm
2,4,5-TP(Silvex)	<0.01	ppm
Trichloroethene	<1	ppb
Gross Alpha	<5	pCi/L
Gross Beta	11	pCi/L
Radium	<3	PCi/L

TOTAL HALOGEN SCAN

Organic Chlorine	<0.01	mg/L
Organic Bromine	<0.01	mg/L
Organic Iodine	<0.01	mg/L

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48991

SAMPLE DESCRIPTION: MW-4 TIME 1700 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

1,1-Dichlorethene	
<1	
Arsenic	ppb
<0.053	
Barium	ppm
0.054	
Cadmium, Diss.	ppm
<0.003	
Chromium, Diss.	ppm
<0.007	
Iron, Diss.	ppm
0.066	
Lead, Diss.	ppm
<0.042	
Manganese, Diss.	ppm
0.225	
Mercury	ppm
<0.025	
Selenium	ppm
<0.075	
Silver, Diss.	ppm
<0.050	
Chloride	ppm
66.18	
Coliforms, Total	ppm
None	
Conductivity	/100 ml
14,500	
	umhos/cm

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FAX (313) 477-4604

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48991

SAMPLE DESCRIPTION: MW-4 TIME 1700 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Fluoride	1.25	ppm
Nitrogen, Nitrate	0.85	ppm
pH	7.86	units
Phenols	<0.01	ppm
Sodium, Diss.	143	ppm
Sulfate	518.7	ppm
Turbidity	<1.0	N.T.U.
Total Organic Carbon	<1.0	ppm
1,2-Dichlorbenzene	<1	ppb
Benzene	<1	ppb
Carbon Tetrachloride	<1	ppb
1,2-Dichloroethane	<1	ppb
Trichloroethene	<1	ppb

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48991

SAMPLE DESCRIPTION: MW-4 TIME 1700 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Vinyl Chloride	<1	ppb
Endrin	<0.01	ppm
Lindane	<0.01	ppm
Methoxychlor	<0.01	ppm
Toxaphene	<0.01	ppm
2,4,D	<0.01	ppm
2,4,5-TP(Silvex)	<0.01	ppm
Trichloroethene	<1	ppb
Gross Alpha	<5	pCi/L
Gross Beta	14	pCi/L
Radium	<3	PCi/l

TOTAL HALOGEN SCAN

Organic Chlorine	0.05	mg/L
Organic Bromine	<0.01	mg/L
Organic Iodine	<0.01	mg/L

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48993

SAMPLE DESCRIPTION: MW-4AB TIME 1735 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

1,1-Dichlorethene	<1	ppb
Arsenic	<0.053	ppm
Barium	0.052	ppm
Cadmium, Diss.	<0.003	ppm
Chromium, Diss.	<0.007	ppm
Iron, Diss.	0.078	ppm
Lead, Diss.	<0.042	ppm
Manganese, Diss.	0.297	ppm
Mercury	<0.025	ppm
Selenium	<0.075	ppm
Silver, Diss.	<0.050	ppm
Chloride	58.18	ppm
Coliforms, Total	None	/100 ml
Conductivity	14,400	umhos/cm

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RMINGTON HILLS, MICHIGAN 48335

(3) 477-6666
X (313) 477-4604

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48993

SAMPLE DESCRIPTION: MW-4AB TIME 1735 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Fluoride	1.2	ppm
Nitrogen, Nitrate	1.22	ppm
pH	7.83	units
Phenols	0.02	ppm
Sodium, Diss.	131	ppm
Sulfate	630.9	ppm
Turbidity	<1.0	N.T.U.
Total Organic Carbon	2.91	ppm
1,2-Dichlorbenzene	<1	ppb
Benzene	<1	ppb
Carbon Tetrachloride	<1	ppb
1,2-Dichloroethane	<1	ppb
Trichloroethene	<1	ppb

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48993

SAMPLE DESCRIPTION: MW-4AB TIME 1735 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Vinyl Chloride	<1	ppb
Endrin	<0.01	ppm
Lindane	<0.01	ppm
Methoxychlor	<0.01	ppm
Toxaphene	<0.01	ppm
2,4,D	<0.01	ppm
2,4,5-TP(Silvex)	<0.01	ppm
Trichloroethene	<1	ppb
Gross Alpha	5	pCi/L
Gross Beta	<4	pCi/L
Radium	<3	PCi/L
TOTAL HALOGEN SCAN		
Organic Chlorine	0.02	mg/L
Organic Bromine	<0.01	mg/L
Organic Iodine	<0.01	mg/L

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 49090

SAMPLE DESCRIPTION: MW-18 WATER

RECEIVED: 11-27-90

RELEASED: 01-17-91

GZA FILE NO: X6066.9
PROJECT HYDROGEO STUDY
FREDERICK STREET DETROIT, MI
* = CONFLUENT GROWTH OF BACTERIA, INCLUDING COLIFORMS

1,1-Dichlorethene	<1	ppb
Arsenic	<0.053	ppm
Barium	0.049	ppm
Cadmium, Diss.	<0.003	ppm
Chromium, Diss.	<0.007	ppm
Iron, Diss.	0.310	ppm
Lead, Diss.	<0.042	ppm
Manganese, Diss.	0.070	ppm
Mercury	<0.025	ppm
Selenium	<0.075	ppm
Silver, Diss.	<0.050	ppm
Chloride	154	ppm

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 49090

SAMPLE DESCRIPTION: MW-18 WATER

RECEIVED: 11-27-90

RELEASED: 01-17-91

GZA FILE NO: X6066.9
PROJECT HYDROGEO STUDY
FREDERICK STREET DETROIT, MI
* = CONFLUENT GROWTH OF BACTERIA, INCLUDING COLIFORMS

Coliforms, Total	*	/100 ml
Conductivity	840	umhos/cm
Fluoride	1.70	ppm
Nitrogen, Nitrate	0.16	ppm
pH	7.55	units
Phenols	<0.01	ppm
Sodium, Diss.	99.5	ppm
Sulfate	87.64	ppm
Turbidity	8.0	N.T.U.
Total Organic Carbon	1.30	ppm
1,2-Dichlorbenzene	<1	ppb

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 49090

SAMPLE DESCRIPTION: MW-18 WATER

RECEIVED: 11-27-90

RELEASED: 01-17-91

GZA FILE NO: X6066.9
PROJECT HYDROGEO STUDY
FREDERICK STREET DETROIT, MI
* = CONFLUENT GROWTH OF BACTERIA, INCLUDING COLIFORMS

Benzene		
	<1	ppb
Carbon Tetrachloride		
	<1	ppb
1,2-Dichloroethane		
	<1	ppb
Trichloroethene		
	<1	ppb
Vinyl Chloride		
	<1	ppb
Endrin		
	<0.01	ppm
Lindane		
	<0.01	ppm
Methoxychlor		
	<0.01	ppm
Toxaphene		
	<0.01	ppm
2,4,D		
	<0.01	ppm
2,4,5-TP(Silvex)		
	<0.01	ppm
Trichloroethene		
	<1	ppb

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 49090

SAMPLE DESCRIPTION: MW-18 WATER

RECEIVED: 11-27-90

RELEASED: 01-17-91

GZA FILE NO: X6066.9
PROJECT HYDROGEO STUDY
FREDERICK STREET DETROIT, MI
* = CONFLUENT GROWTH OF BACTERIA, INCLUDING COLIFORMS

Gross Alpha	
<5	pCi/L
Gross Beta	
<4	pCi/L
Radium	
4	pCi/L
TOTAL HALOGEN SCAN	
Organic Chlorine	
<0.01	mg/L
Organic Bromine	
<0.01	mg/L
Organic Iodine	
<0.01	mg/L

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48992

SAMPLE DESCRIPTION: MW-19 TIME 1535 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI
* = CONFLUENT GROWTH OF BACTERIA, INCLUDING COLIFORM

1,1-Dichlorethene	<1	ppb
Arsenic	<0.053	ppm
Barium	0.044	ppm
Cadmium, Diss.	<0.003	ppm
Chromium, Diss.	<0.007	ppr
Iron, Diss.	0.070	pp
Lead, Diss.	<0.042	pp
Manganese, Diss.	0.107	pI
Mercury	<0.053	PI
Selenium	<0.075	P
Silver, Diss.	<0.050	p
Chloride	70.18	ppm
Coliforms, Total	*	/100 ml
Conductivity	900	umhos/cm

Hg detection li

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48992

SAMPLE DESCRIPTION: MW-19 TIME 1535 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI
* = CONFLUENT GROWTH OF BACTERIA, INCLUDING COLIFORM

Fluoride	1.28	ppm
Nitrogen, Nitrate	0.31	ppm
pH	7.87	units
Phenols	0.012	ppm
Sodium, Diss.	67.7	ppm
Sulfate	127.7	ppm
Turbidity	2	N.T.U.
Total Organic Carbon	<1.0	ppm
1,2-Dichlorbenzene	<1	ppb
Benzene	<1	ppb
Carbon Tetrachloride	<1	ppb
1,2-Dichloroethane	<1	ppb
Trichloroethene	<1	ppb

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'50 INDOPLEX CIRCLE
RMINGTON HILLS, MICHIGAN 48335

3) 477-6666
X (313) 477-4604

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48992

SAMPLE DESCRIPTION: MW-19 TIME 1535 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI
* = CONFLUENT GROWTH OF BACTERIA, INCLUDING COLIFORM

Vinyl Chloride	<1	ppb
Endrin	<0.01	ppm
Lindane	<0.01	ppm
Methoxychlor	<0.01	ppm
Toxaphene	<0.01	ppm
2,4,D	<0.01	ppm
2,4,5-TP(Silvex)	<0.01	ppm
Trichloroethene	<1	ppm
Gross Alpha	8	pCi/L
Gross Beta	11	pCi/L
Radium	3	PCi/L

TOTAL HALOGEN SCAN

Organic Chlorine	0.01	mg/L
Organic Bromine	<0.01	mg/L
Organic Iodine	<0.01	mg/L

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) 477-6666
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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48994

SAMPLE DESCRIPTION: MW-20 TIME 1445 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI
* = CONFLUENT GROWTH OF UNIDENTIFIED ORGANISMS TNTC

1,1-Dichlorethene	<1	ppb
Arsenic	<0.053	ppm
Barium	0.020	ppm
Cadmium, Diss.	<0.003	ppm
Chromium, Diss.	<0.007	ppm
Iron, Diss.	0.448	ppm
Lead, Diss.	<0.042	ppm
Manganese, Diss.	0.098	ppm
Mercury	<0.025	ppm
Selenium	<0.075	ppm
Silver, Diss.	<0.050	ppm
Chloride	69.18	ppm
Coliforms, Total	*	/100 ml
Conductivity	1,300	umhos/cm

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350 INDOPLEX CIRCLE
ıRMINGTON HILLS, MICHIGAN 48335

13) 477-6666
-X (313) 477-4604

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48994

SAMPLE DESCRIPTION: MW-20 TIME 1445 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI
* = CONFLUENT GROWTH OF UNIDENTIFIED ORGANISMS TNTC

Fluoride	1.14	ppm
Nitrogen, Nitrate	0.65	ppm
pH	7.54	units
Phenols	<0.01	ppm
Sodium, Diss.	120	ppm
Sulfate	497.5	ppm
Turbidity	<1.0	N.T.U.
Total Organic Carbon	<1.0	ppm
1,2-Dichlorbenzene	<1	ppb
Benzene	<1	ppb
Carbon Tetrachloride	<1	ppb
1,2-Dichloroethane	<1	ppb
Trichloroethene	<1	ppb

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'350 INDOPLEX CIRCLE
ARMINGTON HILLS, MICHIGAN 48335

13) 477-6666
AX (313) 477-4604

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48994

SAMPLE DESCRIPTION: MW-20 TIME 1445 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI
* = CONFLUENT GROWTH OF UNIDENTIFIED ORGANISMS TNTC

Vinyl Chloride	<1	ppb
Endrin	<0.01	ppm
Lindane	<0.01	ppm
Methoxychlor	<0.01	ppm
Toxaphene	<0.01	ppm
2,4,D	<0.01	ppm
2,4,5-TP(Silvex)	<0.01	ppm
Trichloroethene	<1	ppb
Gross Alpha	8	pCi/L
Gross Beta	<4	pCi/L
Radium	7	PCi/L
TOTAL HALOGEN SCAN	.	
Organic Chlorine	0.03	mg/L
Organic Bromine	<0.01	mg/L
Organic Iodine	<0.01	mg/L

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48995

SAMPLE DESCRIPTION: MW-21 TIME 1400 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

1,1-Dichlorethene	
<1	ppb
Arsenic	
<0.053	ppm
Barium	
0.028	ppm
Cadmium, Diss.	
<0.003	ppm
Chromium, Diss.	
<0.007	ppm
Iron, Diss.	
0.067	ppm
Lead, Diss.	
<0.042	ppm
Manganese, Diss.	
0.050	ppm
Mercury	
<0.025	ppm
Selenium	
<0.075	ppm
Silver, Diss.	
<0.050	ppm
Chloride	
75.18	ppm
Coliforms, Total	
4	/100 ml
Fluoride	
1.42	ppm

![logo]

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350 INDOPLEX CIRCLE
RMINGTON HILLS, MICHIGAN 48335

'3) 477-6666
X (313) 477-4604

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48995

SAMPLE DESCRIPTION: MW-21 TIME 1400 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Nitrogen, Nitrate	0.37	ppm
Phenols	0.02	ppm
Sodium, Diss.	74.5	ppm
Sulfate	313.5	ppm
Turbidity	10	N.T.U.
Total Organic Carbon	<1.0	ppm
1,2-Dichlorbenzene	<1	ppb
Benzene	<1	ppb
Carbon Tetrachloride	<1	ppb
1,2-Dichloroethane	<1	ppb
Trichloroethene	<1	ppb
Vinyl Chloride	<1	ppb
Endrin	<0.01	ppm

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48995

SAMPLE DESCRIPTION: MW-21 TIME 1400 WATER

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Lindane	
<0.01	ppm
Methoxychlor	
<0.01	ppm
Toxaphene	
<0.01	ppm
2,4,D	
<0.01	ppm
2,4,5-TP(Silvex)	
<0.01	ppm
Trichloroethene	
<1	ppb
Gross Alpha	
<5	pCi/L
Gross Beta	
14	pCi/L
Radium	
7	PCi/L
TOTAL HALOGEN SCAN	
Organic Chlorine	
0.01	mg/L
Organic Bromine	
<0.01	mg/L
Organic Iodine	
<0.01	mg/L

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'50 INDOPLEX CIRCLE
RMINGTON HILLS, MICHIGAN 48335

3) 477-6666
: (313) 477-4604

CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48996

SAMPLE DESCRIPTION: TRIP BLANK

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

1,1-Dichlorethene	<1	ppb
Arsenic	<0.053	ppm
Barium	<0.002	ppm
Cadmium, Diss.	<0.003	ppm
Chromium, Diss.	<0.007	ppm
Iron, Diss.	0.145	ppm
Lead, Diss.	<0.042	ppm
Manganese, Diss.	0.004	ppm
Mercury	<0.025	ppm
Selenium	<0.075	ppm
Silver, Diss.	<0.050	ppm
Chloride	<1.0	ppm
Coliforms, Total	None	/100 ml
Conductivity	5.0	umhos/cm

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INDOPLEX CIRCLE
INGTON HILLS, MICHIGAN 48335

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48995

SAMPLE DESCRIPTION: TRIP BLANK

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Fluoride		
	<0.1	ppm
Nitrogen, Nitrate		
	<0.1	ppm
pH		
	7.92	units
Phenols		
	<0.01	ppm
Sodium, Disc.		
	<0.050	ppm
Sulfate		
	<1.0	ppm
Turbidity		
	<1.0	N.T.U.
Total Organic Carbon		
	<1.0	ppm
1,2-Dichlorbenzene		
	<1	ppb
Benzene		
	<1	ppb
Carbon Tetrachloride		
	<1	ppb
1,2-Dichloroethane		
	<1	ppb
Trichloroethene		
	<1	ppb

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CITY ENVIRONMENTAL
ATTN: TOM TURNBULL
3400 E. LAFAYETTE
DETROIT, MI 48207

SAMPLE NO: 48996

SAMPLE DESCRIPTION: TRIP BLANK

RECEIVED: 11-23-90

RELEASED: 01-17-91

GZA FILE NO: X60669
PROJECT CITY ENVIRONMENTAL OF HYDROGEO STUDY
FREDERICK ST., DETROIT MI

Vinyl Chloride	<1	ppb
Endrin	<0.01	ppm
Lindane	<0.01	ppm
Methoxychlor	<0.01	ppm
Toxaphene	<0.01	ppm
2,4,D	<0.01	ppm
2,4,5-TP(Silvex)	<0.01	ppm
Trichloroethene	<1	ppb
Gross Alpha	<5	pCi/L
Gross Beta	<4	pCi/L
Radium	<3	PCi/L
TOTAL HALOGEN SCAN		
Organic Chlorine	0.03	mg/L
Organic Bromine	<0.01	mg/L
Organic Iodine	<0.01	mg/L

QUANT REPORT

Operator ID: SARMA
Output File: ^B6835::D4
Data File: >B6835::D2
Name: 48990CITY ENV
Misc: 5.0ML,ISSS 50PPB,VOLATILES

Quant Rev: 0
Quant Time: 901202 08:41
Injected at: 901128 15:09
Dilution Factor: 1.00000

ID File: VO50ID::D5
Title: VOLS IDFILE 50PPB
Last Calibration: 901129 17:58

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	1.21	28	10016	50.00	PPB	83
2)	Chloromethane	.67	14	1302	7.83	PPB	58
6)	Trichlorofluoromethane	.74	16	11117	81.35	PPB	93
8)	2-Propanone (Acetone)	.74	16	60203	393.02	PPB	98
10)	Carbon disulfide	.82	18	3025	6.09	PPB	90
11)	Dichloromethane	.82	18	82938	154.18	PPB	85
12)	2-Propenenitrile	1.44	34	2497	44.15	PPB	100
15)	Vinyl acetate	1.05	24	24432	113.05	PPB	85
17)	Chloroform	1.17	27	910	1.55	PPB	100
18)	d4 1,2-Dichloroethane (SS)	1.40	33	2504	52.28	PPB	100
19)	1,2-Dichloroethane	1.64	39	1192	4.11	PPB — B	100
20)	*1,4-Difluorobenzene	1.64	39	30152	50.00	PPB	100
23)	Benzene	1.44	34	1689	3.44	PPB — B	100
	1,2-Dichloropropane	1.64	39	8267	29.52	PPB	51
	d8-Toluene (SS)	2.84	70	27694	52.78	PPB	98
29)	t 1,3 Dichloropropene	3.19	79	181	.41	PPB	100
30)	1,1,2-trichloroethane	3.93	98	414	2.46	PPB	100
33)	*d5 Chlorobenzene	5.05	127	23498	50.00	PPB	100
34)	4-Methyl-2-pentanone	2.53	62	726	3.50	PPB	100
35)	2-Chloroethyl vinyl ether	1.64	39	8267	20.24	PPB	100
36)	Toluene	2.92	72	2156	4.59	PPB	100
38)	2-Hexanone	3.73	93	1406	10.17	PPB	100
40)	Ethyl benzene	5.44	137	1897	2.87	PPB	100
41)	1,3 & 1,4-Dimethylbenzene	5.44	137	1897	3.47	PPB	100
42)	1,2-Dimethylbenzene	6.18	156	1336	2.46	PPB	100
44)	4-Bromofluorobenzene (SS)	7.19	182	23400	56.26	PPB	100

* Compound is ISTD

QUANT REPORT

Operator ID: SARMA
Output File: ^B6636::04
Data File: >B6636::02
Name: 4899ICITY ENV
Misc: 5.0ML,ISSS 50PPB,VOLATILES

Quant Rev: 6
Quant Time: 901202 09:54
Injected at: 901129 15:44
Dilution Factor: 1.00000

ID File: VO50ID::05
Title: VOLS IDFILE 50PPB
Last Calibration: 901129 17:58

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	1.21	28	10895	50.00	PPB	86
2)	Chloromethane	.82	18	9410	49.75	PPB	65
6)	Trichlorofluoromethane	.74	16	13447	90.55	PPB	99
11)	Dichloromethane	.82	18	85150	145.65	PPB	84
12)	2-Propenenitrile	1.40	33	2382	38.76	PPB	100
17)	Chloroform	1.17	27	407	.64	PPB	100
18)	d4 1,2-Dichloroethane (SS)	1.40	33	2541	46.82	PPB	100
19)	1,2-Dichloroethane	1.64	39	1514	4.80	PPB	100
20)	*1,4-Difluorobenzene	1.64	39	32048	50.00	PPB	100
23)	Benzene	1.44	34	635	1.22	PPB	100
27)	d8-Toluene (SS)	2.84	70	29708	53.27	PPB	99
33)	*d5 Chlorobenzene	5.05	127	35900	50.00	PPB	100
34)	4-Methyl-2-pentanone	2.84	70	1509	4.77	PPB	100
35)	2-Chloroethyl vinyl ether	1.64	39	8937	14.32	PPB	100
36)	Toluene	2.92	72	1763	2.46	PPB	100
38)	2-Hexanone	3.50	87	585	2.77	PPB	100
40)	Ethyl benzene	5.32	134	547	.54	PPB	100
41)	1,3 & 1,4-Dimethylbenzene	5.59	141	114	.14	PPB	100
42)	1,2-Dimethylbenzene	5.94	150	982	1.19	PPB	100
44)	4-Bromofluorobenzene (SS)	7.19	182	25855	40.63	PPB	100

* Compound is ISTD

QUANT REPORT

erator ID: SARMA	Quant Rev: 6	Quant Time:	901202 08:55
ut File: ^B0637::D4		Injected at:	901128 16:20
Data File: >B0637::D1		Dilution Factor:	1.00000

Name: 48992CITY ENV
Misc: 5.0ML,ISSS 50PPB,VOLATILES

ID File: VO50ID::D5
Title: VOLS IDFILE 50PPB
Last Calibration: 901129 17:58

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	1.21	28	10953	50.00	PPB	85
2)	Chloromethane	.82	18	4101	21.55	PPB	64
6)	Trichlorofluoromethane	.74	16	4810	32.19	PPB	84
7)	2-Propenal(Acrolein)	1.05	24	596	27.19	PPB	62
11)	Dichloromethane	.82	18	23717	40.32	PPB	85
12)	2-Propenenitrile	1.40	33	2452	39.65	PPB	100
17)	Chloroform	1.17	27	270	.42	PPB	100
18)	d4 1,2-Dichloroethane (SS)	1.40	33	2625	50.12	PPB	100
19)	1,2-Dichloroethane	1.44	34	267	.84	PPB	100
20)	*1,4-Difluorobenzene	1.64	39	34186	50.00	PPB	100
23)	Benzene	1.48	35	484	.87	PPB	100
27)	d8-Toluene (SS)	2.84	70	32063	53.90	PPB	95
33)	*d5 Chlorobenzene	5.05	127	38112	50.00	PPB	100
34)	4-Methyl-2-pentanone	2.84	70	1900	5.66	PPB	100
.	2-Chloroethyl vinyl ether	1.91	46	903	1.36	PPB	100
)	Toluene	2.92	72	1726	2.27	PPB	100
38)	2-Hexanone	3.54	88	772	3.44	PPB	100
40)	Ethyl benzene	5.48	138	2784	2.59	PPB	100
41)	1,3 & 1,4-Dimethylbenzene	5.48	138	2784	3.14	PPB	100
42)	1,2-Dimethylbenzene	6.14	155	831	.94	PPB	100
44)	4-Bromofluorobenzene (SS)	7.18	182	25585	37.87	PPB	100

* Compound is ISTD

Output File: ^B6638::D4
Data File: >B0038::D2
Name: 4899SCITY ENV
  : 5.0ML,ISSS 50PPB,VOLATILES

Injected at: 901128 16:36
Dilution Factor: 1.00000

ID File: VOSOID::D5
Title: VOLS IDFILE 50PPB
Last Calibration: 901129 17:58

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	1.21	28	13066	50.00	PPB	85
2)	Chloromethane	.82	18	5005	21.23	PPB	75
6)	Trichlorofluoromethane	.74	16	5278	28.52	PPB	98
10)	Carbon disulfide	.82	18	72	.11	PPB	81
11)	Dichloromethane	.82	18	36289	49.81	PPB	84
12)	2-Propenenitrile	1.40	33	2715	35.44	PPB	100
16)	2-Butanone (MEK)	1.05	24	236	9.71	PPB	56
17)	Chloroform	1.17	27	337	.42	PPB	100
18)	d4 1,2-Dichloroethane (SS)	1.40	33	3162	48.74	PPB	100
19)	1,2-Dichloroethane	1.44	34	60	.15	PPB	100
20)	*1,4-Difluorobenzene	1.64	39	39942	50.00	PPB	100
23)	Benzene	1.44	34	684	1.05	PPB	100
27)	d8-Toluene (SS)	2.84	70	37336	53.72	PPB	99
33)	*d5 Chlorobenzene	5.05	127	45857	50.00	PPB	100
34)	4-Methyl-2-pentanone	2.41	59	1031	2.55	PPB	100
35)	2-Chloroethyl vinyl ether	1.95	47	74	.09	PPB	100
36)	Toluene	2.92	72	1634	1.78	PPB	100
38)	2-Hexanone	3.69	92	739	2.92	PPB	100
	Ethyl benzene	5.32	134	540	.42	PPB	100
	1,3 & 1,4-Dimethylbenzene	5.48	138	1101	1.03	PPB	100
42)	1,2-Dimethylbenzene	6.18	156	472	.45	PPB	100
44)	4-Bromofluorobenzene (SS)	7.19	182	31122	38.29	PPB	100

* Compound is ISTD

MGR-000 on file: >B6649

QUANT REPORT

O   ator ID: JIM
Output File: ^B6649::D4
Data File: >B6649::D6
Name: 48994
Misc: 5ML ISSS 50PPB

Quant Rev: 6   Quant Time: 901130 14:07
Injected at: 901129 01:43
Dilution Factor: 1.00000

ID File: VO50ID::DS
Title: VOLS IDFILE 50PPB
Last Calibration: 901129 17:58

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	1.21	28	13504	50.00	PPB	83
2)	Chloromethane	.82	18	35450	151.07	PPB	60
6)	Trichlorofluoromethane	.74	16	4549	25.23	PPB	89
8)	2-Propanone (Acetone)	.74	16	21051	220.60	PPB	95
10)	Carbon disulfide	.82	18	722	1.08	PPB	44
11)	Dichloromethane	.82	18	412680	569.01	PPB	89
12)	2-Propenenitrile	1.40	33	2858	37.48	PPB	100
17)	Chloroform	1.17	27	7859	9.91	PPB	100
18)	d4 1,2-Dichloroethane (SS)	1.40	33	3131	48.49	PPB	100
19)	1,2-Dichloroethane	1.64	39	1642	4.20	PPB	100
20)	*1,4-Difluorobenzene	1.60	38	39389	50.00	PPB	100
23)	Benzene	1.44	34	694	1.03	PPB	100
26)	Bromodichloromethane	2.06	50	1621	4.08	PPB	100
	d8-Toluene (SS)	2.84	70	36990	53.57	PPB	98
	Dibromochloromethane	4.08	102	253	.47	PPB	100
33)	*d5 Chlorobenzene	5.01	126	31514	50.00	PPB	100
34)	4-Methyl-2-pentanone	2.49	61	507	1.83	PPB	100
35)	2-Chloroethyl vinyl ether	1.64	39	10499	19.17	PPB	100
36)	Toluene	2.92	72	2205	3.50	PPB	100
38)	2-Hexanone	3.69	92	512	2.70	PPB	100
40)	Ethyl benzene	5.44	137	3199	3.60	PPB	100
41)	1,3 & 1,4-Dimethylbenzene	5.44	137	3199	4.36	PPB	100
42)	1,2-Dimethylbenzene	6.10	154	4537	6.24	PPB	100
43)	Styrene	6.14	155	76	.20	PPB	100
44)	4-Bromofluorobenzene (SS)	7.19	182	33484	59.94	PPB	100
45)	1,1,2,2-Tetrachloroethene	7.69	195	83	.37	PPB	100

* Compound is ISTD

QUANT REPORT

Quant Rev: 6 Quant Time: 901202 08:57

Injected at: 901129 17:32

Dilution Factor: 1.00000

or ID: SARMA

File: ^B6639::D4

ile: >B6639::D2

48995CITY ENV

5.0ML,ISSS 50PPB,VOLATILES

le: VO50ID::D5

: VOLS IDFILE 50PPB

Calibration: 901129 17:58

	Compound	R.T.	Scan#	Area	Conc	Units	q
	*Bromochloromethane	1.21	28	4864	50.00	PPB	84
	Chloromethane	.82	18	1890	23.43	PPB	62
	Trichlorofluoromethane	.74	15	2186	32.94	PPB	98
	2-Propenal(Acrolein)	1.05	24	139	14.28	PPB	84
	Dichloromethane	.82	18	12530	47.95	PPB	79
)	2-Propenenitrile	1.40	33	740	26.94	PPB	100
)	Chloroform	1.17	27	265	.93	PPB	100
)	d4 1,2-Dichloroethane (SS)	1.40	33	1089	46.82	PPB	100
)	1,2-Dichloroethane	1.64	39	558	3.96	PPB	100
	1,4-Difluorobenzene	1.60	38	12494	50.00	PPB	100
	S-Toluene (SS)	2.84	70	14067	64.70	PPB	98
3)	*d5 Chlorobenzene	5.05	127	16058	50.00	PPB	100
4)	4-Methyl-2-pentanone	2.49	61	1359	9.60	PPB	100
5)	2-Chloroethyl vinyl ether	1.83	44	67	.24	PPB	100
6)	Toluene	2.96	73	561	1.75	PPB	100
9)	2-Hexanone	3.73	93	619	6.55	PPB	100
10)	Ethyl benzene	5.44	137	588	1.30	PPB	100
41)	1,3 & 1,4-Dimethylbenzene	5.44	137	588	1.57	PPB	100
42)	1,2-Dimethylbenzene	6.14	155	100	.43	PPB	100
44)	4-Bromofluorobenzene (SS)	7.19	182	12252	43.05	PPB	100
45)	1,1,2,2-Tetrachloroethene	7.69	195	79	.70	PPB	100

* Compound is ISTD

QUANT REPORT

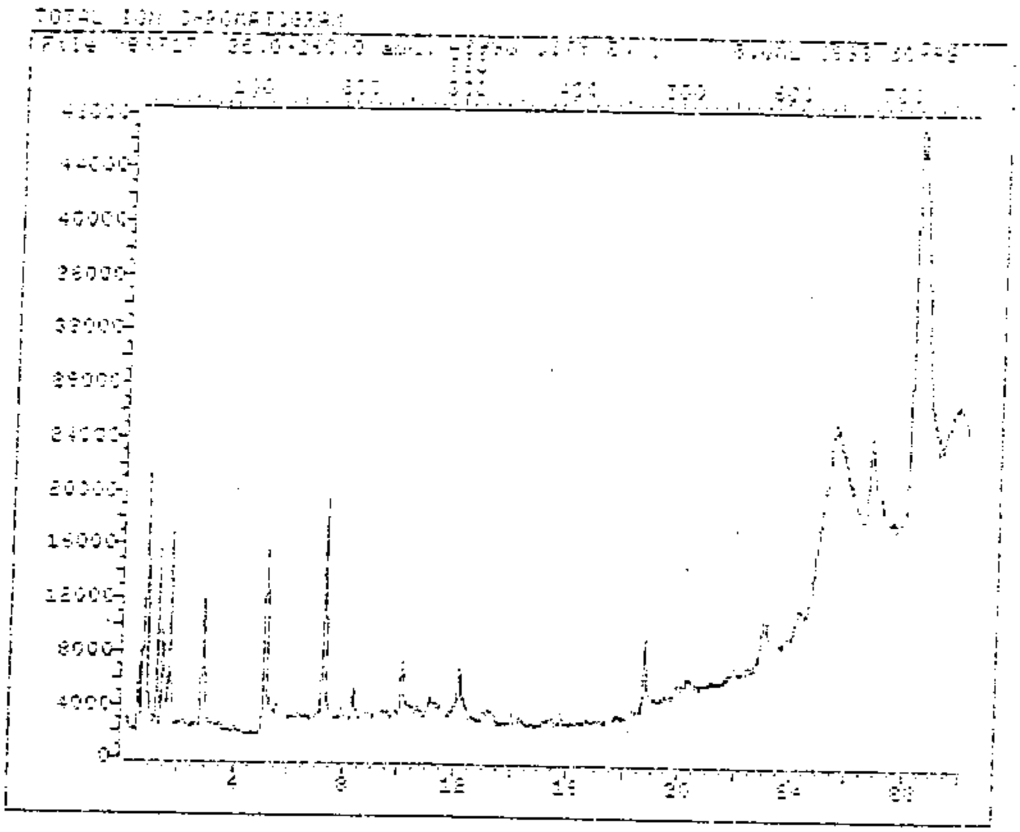
Operator ID: JIM
Output File: ^B6717::D4
Data File: >B6717::D2
Name: 48996 CITY ENV.
Misc: 5.0ML ISSS 50PPB

Quant Rev: 6 Quant Time: 901204 01:34
Injected at: 901204 01:23
Dilution Factor: 1.00000

ID File: VOSOID::DS
Title: VOLS IDFILE 50PPB
Last Calibration: 901203 22:58

	Compound	R.T.	Scan#	Area	Conc	Units	q
1)	*Bromochloromethane	1.25	29	10085	50.00	PPB	89
2)	Chloromethane	.86	19	3064	18.90	PPB	87
6)	Trichlorofluoromethane	.78	17	15185	21.57	PPB	94
7)	2-Propenal(Acrolein)	1.09	25	244	9.69	PPB	95
8)	2-Propanone (Acetone)	.74	16	9202	50.10	PPB	92
11)	Dichloromethane	.86	19	10774	24.84	PPB	81
12)	2-Propenenitrile	1.44	34	2016	45.45	PPB	100
17)	Chloroform	1.21	28	1401	2.14	PPB	100
18)	d4 1,2-Dichloroethane (SS)	1.44	34	2202	45.88	PPB	100
19)	1,2-Dichloroethane	1.67	40	1229	4.00	PPB	100
20)	*1,4-Difluorobenzene	1.63	39	33896	50.00	PPB	100
23)	Benzene	1.48	35	719	1.12	PPB	100
27)	d8-Toluene (SS)	2.88	71	28760	51.21	PPB	95
	*d5 Chlorobenzene	5.09	128	36214	50.00	PPB	100
	4-Methyl-2-pentanone	2.57	63	200	.39	PPB	100
~~35)~~	2-Chloroethyl vinyl ether	1.67	40	8149	19.14	PPB	100
36)	Toluene	2.99	74	1373	1.70	PPB	100
38)	2-Hexanone	3.81	95	253	.71	PPB	100
40)	Ethyl benzene	5.51	139	10187	11.62	PPB	100
41)	1,3 & 1,4-Dimethylbenzene	5.51	139	10187	12.62	PPB	100
42)	1,2-Dimethylbenzene	6.21	157	1189	1.52	PPB	100
44)	4-Bromofluorobenzene (SS)	7.26	184	25133	27.13	PPB	100

* Compound is ISTD



Data File: >B6717::D2
Name: 48996 CITY ENV.
Misc: 5.0ML ISSS 50PPB

Quant Output File: ^B6717::D4

Id File: VO50ID::D5
Title: VOLS IDFILE 50PPB
Last Calibration: 901203 22:58

Operator ID: JIM
Quant Time: 901204 01:54
Injected at: 901204 01:23

nalytic & Biological
aboratories, Inc.

350 INDOPLEX CIRCLE
RMINGTON HILLS, MICHIGAN 48335

31 477-6666
X (313) 477-4604

ME-TAL	DUP. 1	DUP. 2	RANGE	AVG.	STD. RUN	STD. VALUE	% RECOVERY
Si	563	555	8	559	10.2	10	102
Al	1,910	1,730	180	1.820	100	100	100
Ni	2.53	2.45	0.08	2.49	19.2	20.0	96.0
Se	<0.075	<0.075	0.00	<0.075	19.1	20.0	95.5
Ag	<0.050	<0.050	0.00	<0.050	20.5	20.0	103
Na	155	159	4.00	157	103	100	103
Hg	<0.025	<0.025	0.00	<0.025	20.3	20.4	99.5
Co	46.1	48.8	2.7	47.4	21.5	20.0	108
Tl	<12.0	<12.0	0.00	<12.0	20.7	19.6	106
Fe	87.2	91.0	3.80	89.1	21.4	20.4	105

APPENDIX E- 3: GROUNDWATER NOT IN AN AQUIFER DETERMINATION

CONESTOGA-ROVERS
& ASSOCIATES

261 Martindale Road, Unit #3
St. Catharines, Ontario L2W 1A2
Telephone: (905) 682-0510 Fax: (905) 682-8818
www.CRAworld.com

MEMORANDUM

TO: Jim Kreger

REF. NO.: 15988

FROM: Greg Carli/Shannon Richardson/sr/STC-1

DATE: July 28, 2002

RE: **Groundwater Not In An Aquifer Determination**
RCRA Part B Permit Application
US Liquids of Detroit, Detroit, Michigan

Under the Hazardous Waste Management Program Administrative Rules, promulgated pursuant to Part 111 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Rule 611 states that "an owner or operator of a hazardous waste treatment, storage, or disposal facility shall develop an environmental monitoring program that is capable of detecting a release of hazardous waste or hazardous waste constituents from the facility". Rule 611(3) allows the director to waive the groundwater monitoring requirements of Rule 612 given that the facility is not a land disposal facility and that the owner or operator can demonstrate that the monitoring is not required.

In reference to Rule 611 (3), Conestoga-Rovers & Associates (CRA) contacted Mr. Ron Stone the week of July 8, 2002 of the Michigan Department of Environmental Quality (MDEQ) Waste Management Division (WMD) to discuss what was required in order for the owner/operator of a facility to demonstrate that groundwater monitoring is not required. Mr. Stone indicated that demonstrating the groundwater at the facility meets the requirements of groundwater not in an aquifer (GWNIAA) would be the best way to demonstrate that groundwater monitoring is not required. This memorandum has been prepared to document that the groundwater at the US Liquids of Detroit (USL Detroit) facility meets the requirements of GWNIAA and to therefore recommend that groundwater monitoring is not required.

The MDEQ-WMD Staff Guidance for Determining Groundwater Not in an Aquifer, dated May 1, 2000, lists two criteria that must be met to satisfy the GWNIAA determination. The criteria are:

1. The formation yields an insignificant amount of water below the site (considering local and regional hydrogeology). This criteria can be met by any one or a combination of the following:

   a. All site monitoring wells installed in the formation bail or pump dry (at a minimum pumping rate of 0.1 gpm) and do not recharge to within 80 percent of the original well volumes within twenty-four (24) hours.
   b. The in situ hydraulic conductivity, based on a minimum of five (5) site-specific tests (all with results less than 1.0×10^{-6} centimeters per second (cm/s)) is less than 1.0×10^{-6} cm/s.

2. The groundwater in question is not in hydraulic communication with groundwater in an aquifer. This criterion can be met by:

   a. Demonstrating sufficient knowledge concerning the regional geology supplemented with adequate site-specific information (boring/monitoring well logs, geophysical information, etc.) and is approved by the MDEQ-WMD.

GEOLOGY

Although neither the surficial nor the bedrock geology of the USL Detroit facility have been mapped in detail, the site has been included on a general surficial geology map made by Ferrand[1] and on the bedrock maps prepared by Mozola[2] and Western Michigan University[3]. GZA GeoEnvironmental, Inc (GZA) conducted a Hydrogeologic Evaluation of the USL Detroit facility in 1991[4]. This report is included as Appendix E-2 to the Operating License Application. The conclusions drawn from GZA's 1991 hydrogeologic evaluation of the facility are in agreement with the conditions reported by Ferrand, Mazola and Western Michigan University.

Geologic Setting

Present subsurface features at USL Detroit and surrounding areas were formed during the Wisconsin stage of pleistocene glacial advances depositing sediments over the Dundee Limestone and Traverse Group formations. The position and succession of deposit features found are related to the advance and withdrawal of the Eric-Huron ice lobe. The site and surrounding areas are covered, in general, by lacustrine clays; however, early alluvium deposits of limited extent are interspersed glacial features of Wayne County, Michigan.

Surficial Geology

Near Surface Fills

The near-surface soils at the site consist mainly of disturbed sand fills with intermittent clay layers and urban rubble, including demolition debris. These fill soils range in thickness from 2 to 13 feet. Perched groundwater is found below the surface fills but is considered to be localized and limited in extent.

Clays

Silty clay material is found below the near surface soils. The silty clay material contains varying degrees of sand and gravel and is continuous to depths of over 100 feet below ground surface (bgs). The silty clay strata ranges in consistency from medium stiff to hard and is often referred to as

---

[1] Farrand, W.R., "Quanternary Geology of Michigan". State of Michigan Department of Natural Resources, Geological Survey, 1982.
[2] Mozola, Andrew J. "Geology for Land and Groundwater Development in Wayne County, Michigan". State of Michigan Department of Natural Resources, Geological Survey Report No. 3, 1969.
[3] Western Michigan University, "Hydrogeology for Underground Injection Control in Michigan". Department of Geology, 1981.
[4] GZA Environmental, Inc., "Hydrogeologic Evaluation Frederic Street Liquid Waste Treatment Facility, Detroit, Michigan". GZA Environmental, Inc. February 22, 1991.

lacustrine clay. Based on literature review, it is anticipated that the silty clay material or similar clayey soils continue to depths of between 150 to 200 feet bgs.

Bedrock Geology

The site lies above two formations which form the bedrock surface, those being the Dundee Limestone and Traverse Group formations. Geologic maps indicate the bedrock surface boundary between these formations runs at or near the site.

The Travers Group is a thick, 100 to 800 feet, sequence of alternating shales, limestone and dolomite. The shales in this group are not considered water-bearing aquifers; however, the limestone units may supply a larger volume of water locally. Shales in the Traverse Group serve as excellent confining layers due to their low effective porosity.

The limestone units are relatively impermeable but have local porous zones, particularly at the surface of the formation. The Dundee Limestone formation is a fossiliferous limestone that is locally dolomitized. It ranges from about 50 to more than 350 feet thick in the eastern portion of Michigan's lower peninsula. Although the Dundee has a relatively low effective porosity, selective porous and permeable zones associated with fractures and bedding planes are considered water bearing aquifers. Because of the presence of these fractures, the Dundee is limited as a confining layer.

HYDROGEOLOGIC CHARACTERISTICS

GZA's analysis of the hydrogeologic conditions at the site include those soil layers within 30 feet of ground surface, labeled the "upper aquifer" and a second subsurface pervious zone between 40-60 feet bgs labeled the "lower aquifer". The more permeable sand seams in these layers will largely control groundwater movement at the site. These zones are separated by what appears to be a continuous layer of clay soil that will act to retard groundwater movement between the two aquifers.

Hydraulic Conductivity

As part of GZA's 1991 Hydrogeologic Evaluation, in-situ permeability tests (slug tests) were performed on four new monitoring wells (MW-18, MW-19, MW-20, and MW-21) to determine the horizontal hydraulic conductivity of the of the soil layer being monitored. Standard methods such as those described by Hvorslev (1951) or Bouwer and Rice (1976) were used to interpreted the data collected. Geographic presentations of well recovery during "slug testing" are included in Attachment 1, when available. Results of these tests and those previously performed are summarized in Table 1 and indicate a horizontal permeability ranging from 10^{-5} to 10^{-6} cm/s for silty clay and clayey sand soils and $10^{-6}$to 10^{-7} for cm/s for the silty clay strata with fine sane seams. In addition, GZA performed permeability tests on "undisturbed", thin walled tube samples (shelby tube) in accordance with United States Environmental Protection Agency (USEPA) SW 846 Method 9100, Triaxial Permeability with Back Pressure. This testing was performed on samples collected from representative depths and locations to evaluate the hydraulic characteristics of the soils. The laboratory summaries are included in Attachment A. Permeability of the natural clays is approximately 10^{-8} cm/s. The results of these tests can be summarized as follows:

Unit	*Hydraulic Conductivity*

Upper Aquifer	10^{-7} cm/s
Intermediate Clay Layer	10^{-8} cm/s
Lower Aquifer	10^{-5} to 10^{-6} cm/s
Underlying Clay Layer	10^{-8} cm/s

As indicated, the permeabilities measured are considered relatively low. Additionally, no distinction between the horizontal and vertical permeability is shown because variations, even one degree of magnitude, will not significantly affect groundwater transport velocities.

Hydraulic Gradient and Flow Direction

Based on past and recent evaluations, groundwater flow direction interpreted for both the upper and lower aquifers appear to be consistent with the published area data. A general easterly flow direction appears to coincide with the axis of the deep bedrock valley and thick glacial deposits reported in the immediate site vicinity. Furthermore, static water level measurements at monitoring well MW-7 (screened in the upper aquifer) and MW-8 (screened in the lower aquifer), considered a well nest for the purpose of this memorandum, show nearly a two-foot difference in the groundwater elevation between the upper and lower aquifers. The vertical potential gradient calculated between MW-7 and MW-8 is approximately 0.08 ft/ft. Using the most conservative hydraulic conductivity (10^{-5} cm/s) from GZA's permeability test results, the groundwater travels between the upper and lower aquifer's clay confining layer at an approximate rate of 8×10^{-7} cm/s. In other words, it would take more than 36 years for groundwater from the upper aquifer to reach the lower aquifer 30 feet below. Using the intermediate clay layer hydraulic conductivity of 10^{-8} cm/s, it would take nearly 30,000 years for groundwater to travel between the upper and lower aquifers at the site. These calculations are provided in Attachment 2.

COMPETENCY OF THE CONFINING LAYER

Based on the March 5, 1999 Groundwater Evaluation, conducted for USL Detroit by 21st Century Resources, there are 14 existing monitoring wells at the USL Detroit facility. The list of current monitoring wells and their construction details are presented in Table 2. Borehole logs and monitoring well installation reports are provided in Attachment 3, where available. The near surface soils at the facility consist of disturbed sand fill with intermittent clay layers and demolition debris. The thickness of fill ranges from approximately 2 feet at MW-7 to 13 feet at MW-15. At other locations, MW-2A, no fill is encountered. Perched groundwater was only encountered in the fill soils occasionally and is considered to be localized and limited in extent.

Below the near surface fills, a thick silty clay layer is present. The clay strata ranges from medium stiff to hard. Based on the borehole logs included in Attachment 3, the clay layer continues to a depth of at least 110 feet below ground surface (bgs). Figure 1 presents the location of the monitoring wells (past and present) from which borehole logs were used to create a cross section parallel to the direction of groundwater flow, presented as Figure 2, and a cross section perpendicular to the direction of groundwater flow, presented as Figure 3. As seen on Figure 2 and Figure 3, the inorganic clay (CL) layer is continuous across the site and extends to a depth of no less than 523 bgs with a thickness of 102 feet at monitoring well MW-1. In addition to illustrating the soil conditions beneath the facility, the cross sections show information relevant to site topography, groundwater elevation and other pertinent features, when available.

GROUNDWATER EVALUATION

On December 29, 1998, 21st Century Resources conducted an evaluation of the groundwater at USL Detroit. The groundwater evaluation included static water level measurements and groundwater sampling and analysis of all existing wells. Static water level elevations were determined by measuring the depth to water in each monitoring well with an electronic interface probe. Static water level measurements are presented in Table 3.

Prior to sampling, monitoring wells were to be purged by removing three to five well volumes to insure the groundwater samples collected were representative of the water moving through the aquifer in the vicinity of each well. Each monitoring well was purged using a Keck Model SP-84 sampling pump operated at approximately one gallon per minute (gpm). All wells were pumped dry prior to removing three well volumes of water. Table 4 summarizes the quantity of water purged from each well.

After purging each well, the groundwater was allowed to recharge to allow collection of representative groundwater samples. Groundwater samples were collected December 29, 1998 using bottom filling, single use, disposable bailers. Samples were placed into laboratory supplied, individually labeled, glass sample containers and submitted to the USL Detroit laboratory for analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals.

No VOC parameters were detected in any of the groundwater samples. Some SVOCs were detected at MW-2A (chrysene, phenanthrene, pyrene, benzo(a)anthracene, benzo(a)pyrene, and fluoranthene) and MW-15 (2A (chrysene, phenanthrene, pyrene, benzo(a)anthracene, benzo(a)pyrene, fluoranthene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(ghi)perylene). Inorganic parameters were detected at various locations, as described below:

- Zinc was detected in all of the groundwater samples below the Residential Drinking Water Criteria (RDWC) of 2,400 μg/L;
- Barium was detected at MW-2A, MW-8, and MW-15 below its RDWC of 2,000 μg/L;
- Iron was detected at MW-15 below its RDWC of 300 μg/L;
- Sodium was detected in all of the groundwater samples below its RDWC of 160,000 μg/L;
- Manganese was detected at MW-1, MW-2A, MW-7, MW-10, MW-15, and MW-20 above its RDWC of 50 μg/L. It should be noted that levels above the RDWC for this parameter only affect taste, odor and/or appearance of the water;
- Chloride was detected in all of the groundwater samples below its RDWC of 250 μg/L; and
- Nitrate waste detected in all of the groundwater samples, except for those collected from MW-8 and MW-20, below its maximum contaminant level (MCL) of 10 μg/L.

Due to the close proximity of monitoring wells MW-2A and MW-15 to heavy truck traffic, monitoring wells MW-2A and MW-15 were re-sampled on February 2, and February 4, respectively. The SVOCs detected in the December 1998 sampling round were not detected in either well during the February 1999 sampling round. Therefore, based on the sampling and analysis of the groundwater at USL Detroit, it appears that the site groundwater has not been impacted by plant activities.

All groundwater analytical results are included in Attachment 4.

CORRESPONDENCE

The Detroit Health Department was contacted by CRA personnel on July 16, 2002. During the telephone conversation with Mr. Donald R. Hamel, CRA was notified that no crock or driven wells for any private water usage exist in the vicinity of the USL Detroit facility. Furthermore, CRA was told that no private wells of any kind are allowed in the City of Detroit due to elevated levels of hydrogen sulfide. A written response from the Detroit Health Department is included as Attachment 5.

The MDEQ Drinking and Radiological Protection Division (DWRPD) was contacted by CRA personnel on July 17, 2002. During a telephone conversation with Mr. Wayne W. Kukuk, CRA was notified that the USL Detroit facility is not located in an approved Local Wellhead Protection Area (LWPA). Written response from the MDEQ-DWRPD is included as Attachment 6.

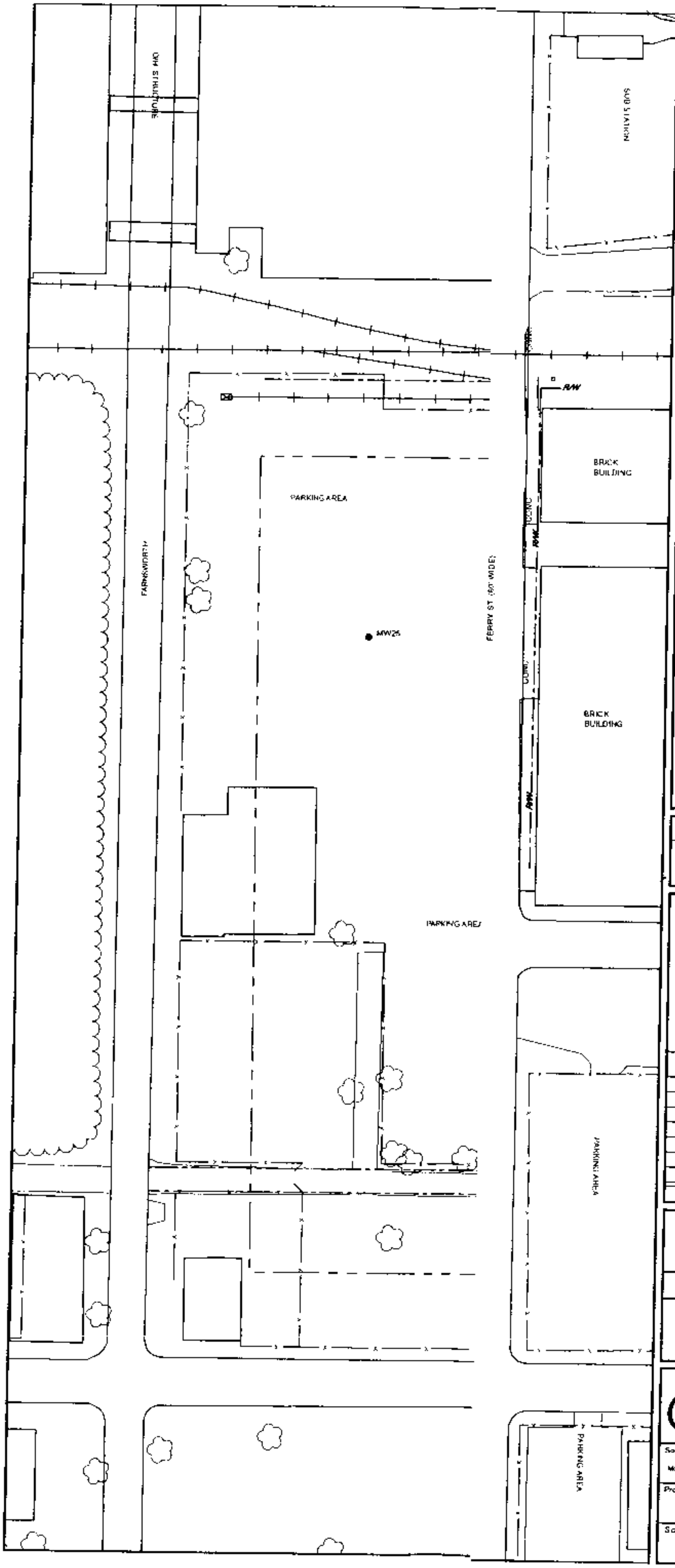
ADDITIONAL INFORMATION

The vast majority of the USL Detroit facility property is paved at present. Areas that are not currently paved will be paved as part of their proposed upgrades to the facility, included in the July 31, 2002 Operating License Application. As a result, all ground surfaces will be covered by asphalt or concrete in the near future greatly reducing or eliminating the pathway for contaminant, if any, to reach subsurface soils and groundwater.

Furthermore, as shown on Drawing C-3 (Existing Underground Site Plan), the few underground utilities dedicated to transporting hazardous waste between the tank farm and the Biological Building are secondarily contained underground (i.e., double walled piping). It should be noted that to date these utilities have not been utilized. No other underground utilities are used for hazardous waste.

CONCUSSIONS

The information presented herein is sufficient to support a determination that the groundwater beneath the Site is GWNIAA as outlined in the MDEQ-WMD Staff Guidance for Determining GWNIAA. The information provide supports determination that the formation beneath the site yields an insignificant amount of water and that the groundwater beneath the site is not in hydraulic communication with groundwater in an aquifer.



Nº	Revision	Date	Initial

0 20 50ft

LEGEND

RAILROAD LINE
FENCE LINE
RIGHT OF WAY
50FT BUFFER LINE
A — A' CROSS-SECTION LOCATION
MW25 ● MONITORING WELL LOCATION
S1 ■ SOIL MONITORING LOCATION

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY

Approved

DRAWING STATUS

Status	Date	Initial

US LIQUIDS OF DETROIT
DETROIT, MICHIGAN

OPERATING LICENCE APPLICATION

MONITORING WELL AND
CROSS-SECTION LOCATION MAP

CRA CONESTOGA-ROVERS & ASSOCIATES

Source Reference:
McNAMEE INDUSTRIAL SERVICES INC. FEB. 7/2002, JOB No. 0546058, DWG NAME: SITE-MON-WELLS.DWG

Project Manager	Reviewed By	Date	
G. CARLI	S. RICHARDSON	JULY 2002	
Scale	Project Nº	Report Nº	Drawing Nº
1" = 50'	15988-00	001	figure 1

15988-00(001)GN-WA003 JUL 25/2002

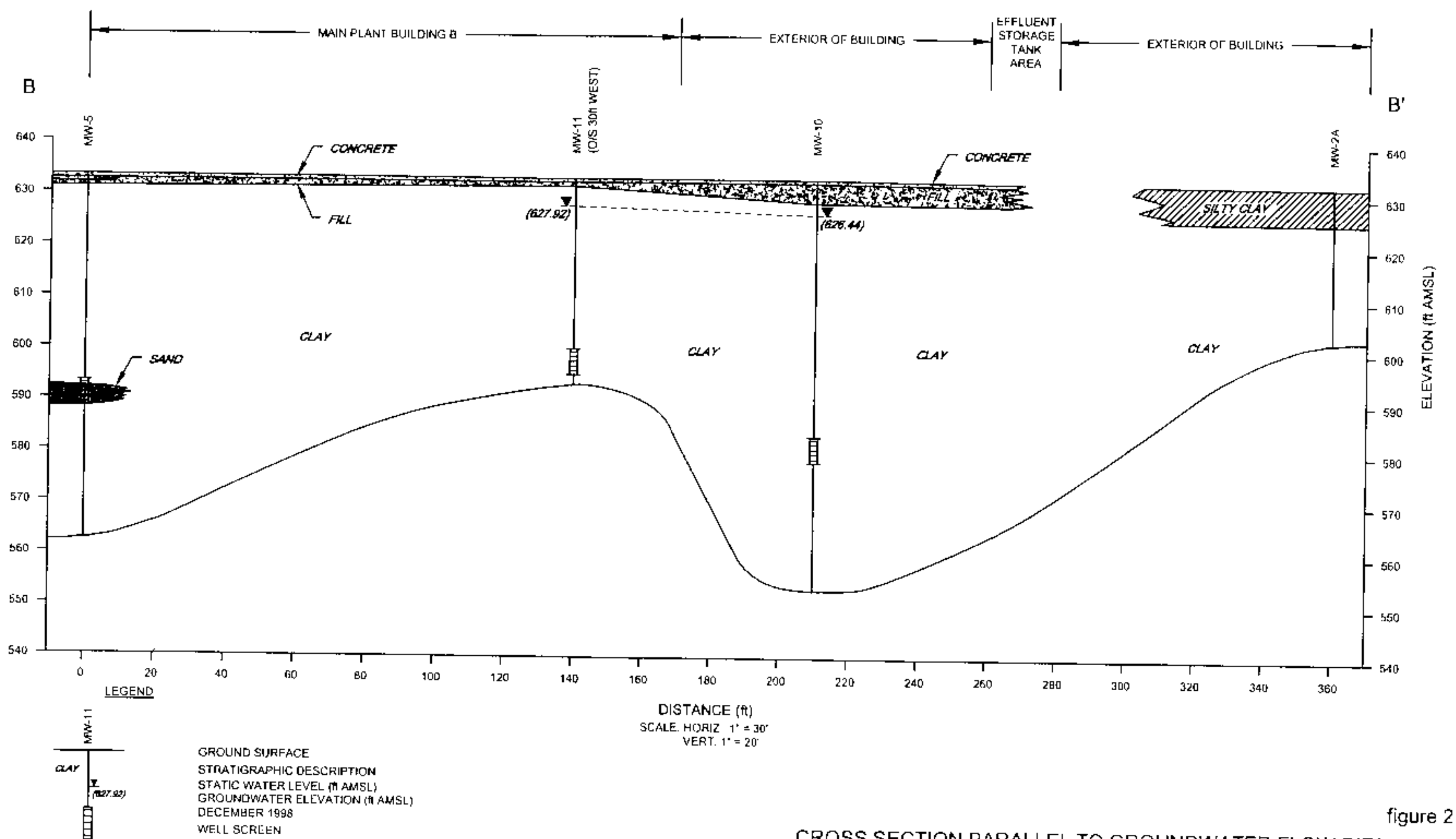


figure 2

CROSS SECTION PARALLEL TO GROUNDWATER FLOW DIRECTION
US LIQUIDS QF DETROIT
OPPERATING LICENSE APPLICATION
Detroit, Michigan

15988-00(001)GN-WA002 JUL 25/2002

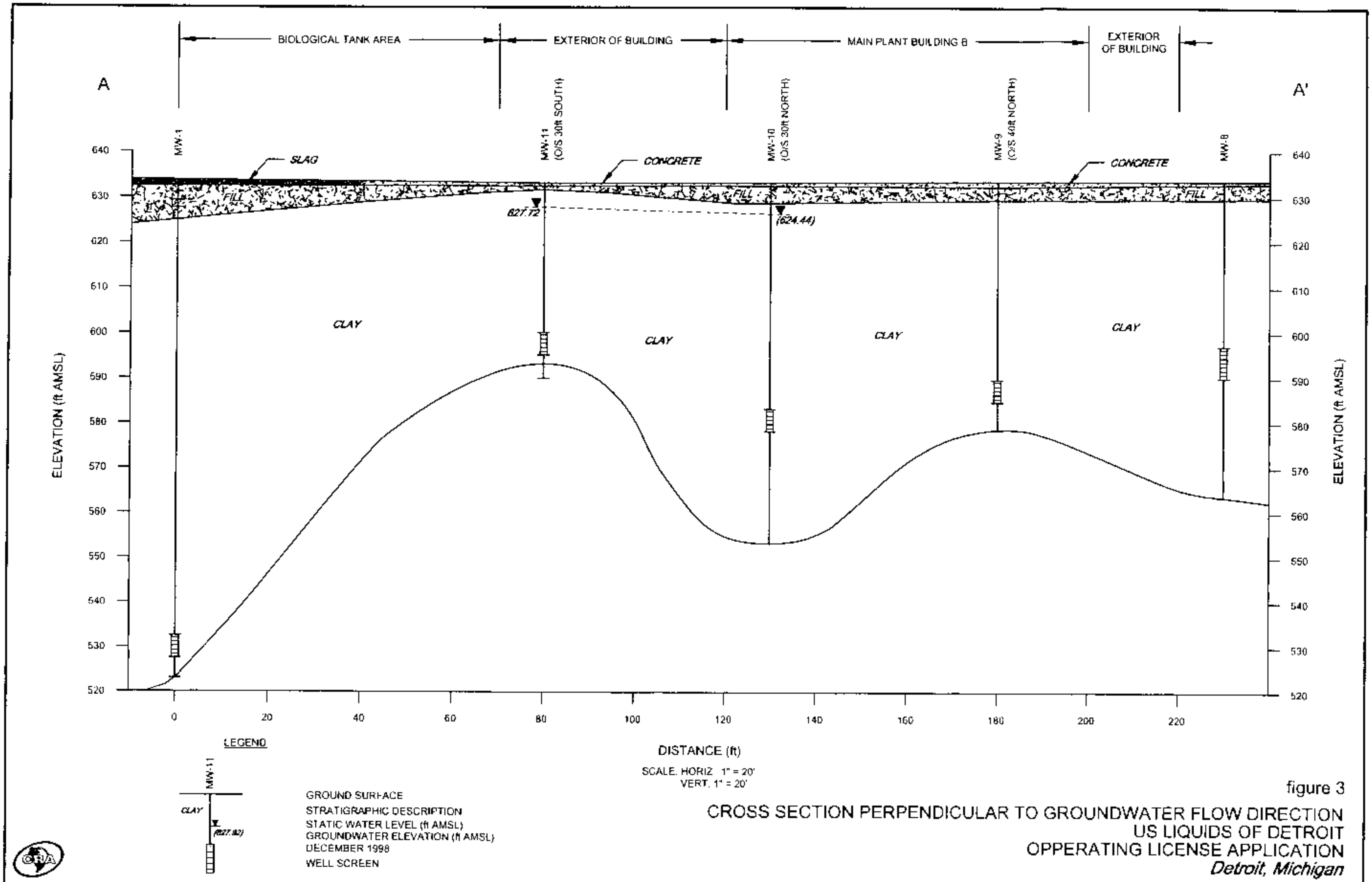


figure 3

CROSS SECTION PERPENDICULAR TO GROUNDWATER FLOW DIRECTION
US LIQUIDS OF DETROIT
OPPERATING LICENSE APPLICATION
Detroit, Michigan

15988-00(001)GN-WA001 JUL 25/2002

TABLE 1

MONITORING WELL CONSTRUCTION DETAILS
US LIQUIDS OF DETROIT
DETROIT, MICHIGAN

Well ID	*Ground Surface Elevation (ft AMSL)*	*Top of Casing Elevation (ft AMSL)*	*Well Depth (feet)*	*Well Material*	*Casing Diameter (inches)*	*Screen Material*	*Screen Length (feet)*	*Slot Size (inches)*
MW-1	633.80	633.64	106.1	PVC	2	PVC	5	0.010
MW-2A	na	na	na	PVC	2	PVC	na	0.010
MW-3	632.80	632.50	67.9	PVC	2	PVC	5	0.010
MW-4	633.40	633.06	49.2	PVC	2	PVC	5	0.010
MW-6	633.30	632.85	49.8	PVC	2	PVC	5	0.010
MW-7	633.30	632.90	19.1	PVC	2	PVC	5	0.010
MW-8	633.60	633.17	43.1	PVC	2	PVC	7	0.010
MW-9	633.60	633.23	48.4	PVC	2	PVC	5	0.010
MW-10	633.20	632.89	54.7	PVC	2	PVC	5	0.010
MW-11	633.20	632.99	37.8	PVC	2	PVC	5	0.010
MW-15	632.60	632.15	12.2	PVC	2	PVC	10	0.010
MW-20	631.50	632.93	54.9	PVC	2	PVC	10	0.010
MW-22	na	na	na	PVC	2	PVC	na	0.010
MW-24	na	na	na	PVC	2	PVC	na	0.010

<u>Notes:</u>

AMSL - Above Mean Sea Level
PVC - Polyvinyl Chloride
na - not available

TABLE 2

FIELD PERMEABILITY TEST RESULTS
US LIQUIDS OF DETROIT
DETROIT, MICHIGAN

Well ID	*Monitored Zone Elevation (ft AMSL)*	*Material Monitored*	*In-Situ Permeability*
MW-1	523 - 564	Silty CLAY with fine sand seams	2.9E-07
MW-2	563 - 595	Clayey SAND	7.2E-07
MW-3	559 - 587	Clayey SAND	4.8E-06
MW-4	578 - 593	Fine SAND, little silt and clay	3.1E-07
MW-5	583 - 596	Fine SAND, little silt and clay	2.2E-06
MW-6	578 - 593	Fine SAND, little silt and clay	1.6E-06
MW-7	610 - 620	Silty, fine SAND	6.0E-06
MW-8	589 - 612	Silty CLAY with fine sand seams	6.5E-06
MW-9	579 - 592	Fine, sandy SILT	7.0E-07
MW-10	573 - 594	Fine, sandy CLAY with fine sand seams	6.0E-06
MW-11	595 - 606	Silty CLAY with fine sand seams	2.5E-06
MW-18	578 - 594	Silty CLAY with sand seams, trace grav	1.7E-06
MW-19	579 - 603	Silty CLAY with sand seams, trace grav	1.2E-06
MW-21	585 - 593	Silty SAND, little gravel	1.1E-05

Notes:

AMSL - Above Mean Sea Level

TABLE 3

STATIC WATER LEVEL MEASUREMENTS
DECEMBER 29, 2002
US LIQUIDS OF DETROIT
DETROIT MICHIGAN

Well ID	*Ground Surface Elevation (ft AMSL)*	*Top of Casing Elevation (ft AMSL)*	*Depth to Water (feet)*	*Groundwater Elevation (ft AMSL)*
MW-1	633.80	633.64	10.56	623.08
MW-2a	na	na	1.89	na
MW-3	632.80	632.50	9.27	623.23
MW-4	633.40	633.06	na	na
MW-6	633.30	632.85	4.72	628.13
MW-7	633.30	632.90	4.36	628.54
MW-8	633.60	633.17	6.52	626.65
MW-9	633.60	633.23	6.56	626.67
MW-10	633.20	632.89	5.73	627.16
MW-11	633.20	632.99	4.28	628.71
MW-15	632.60	632.15	4.62	627.53
MW-20	631.50	632.93	8.42	624.51
MW-22	na	na	6.62	na
MW-24	na	na	8.94	na

Notes:

AMSL - Above Mean Sea Level
na - not available
MW-4 was found damaged.

TABLE 4

PURGED GROUNDWATER SUMMARY
DECEMBER 29, 2002
US LIQUIDS OF DETROIT
DETROIT MICHIGAN

Well ID	*Well Volume (gallons)*	*Quantity Purged (gallons)*	*Comments*
MW-1	15	15	Well pumped dry
MW-2A	4	8	Well pumped dry
MW-3	9	7	Well pumped dry
MW-4	na	na	na
MW-6	8	9.5	Well pumped dry
MW-7	3	4.5	Well pumped dry
MW-8	6	8.5	Well pumped dry
MW-9	8	7	Well pumped dry
MW-10	9	10	Well pumped dry
MW-11	6	8	Well pumped dry
MW-15	1	3	Well pumped dry
MW-20	7	14	Well pumped dry
MW-22	na	6.5	Well pumped dry
MW-24	na	7	Well pumped dry

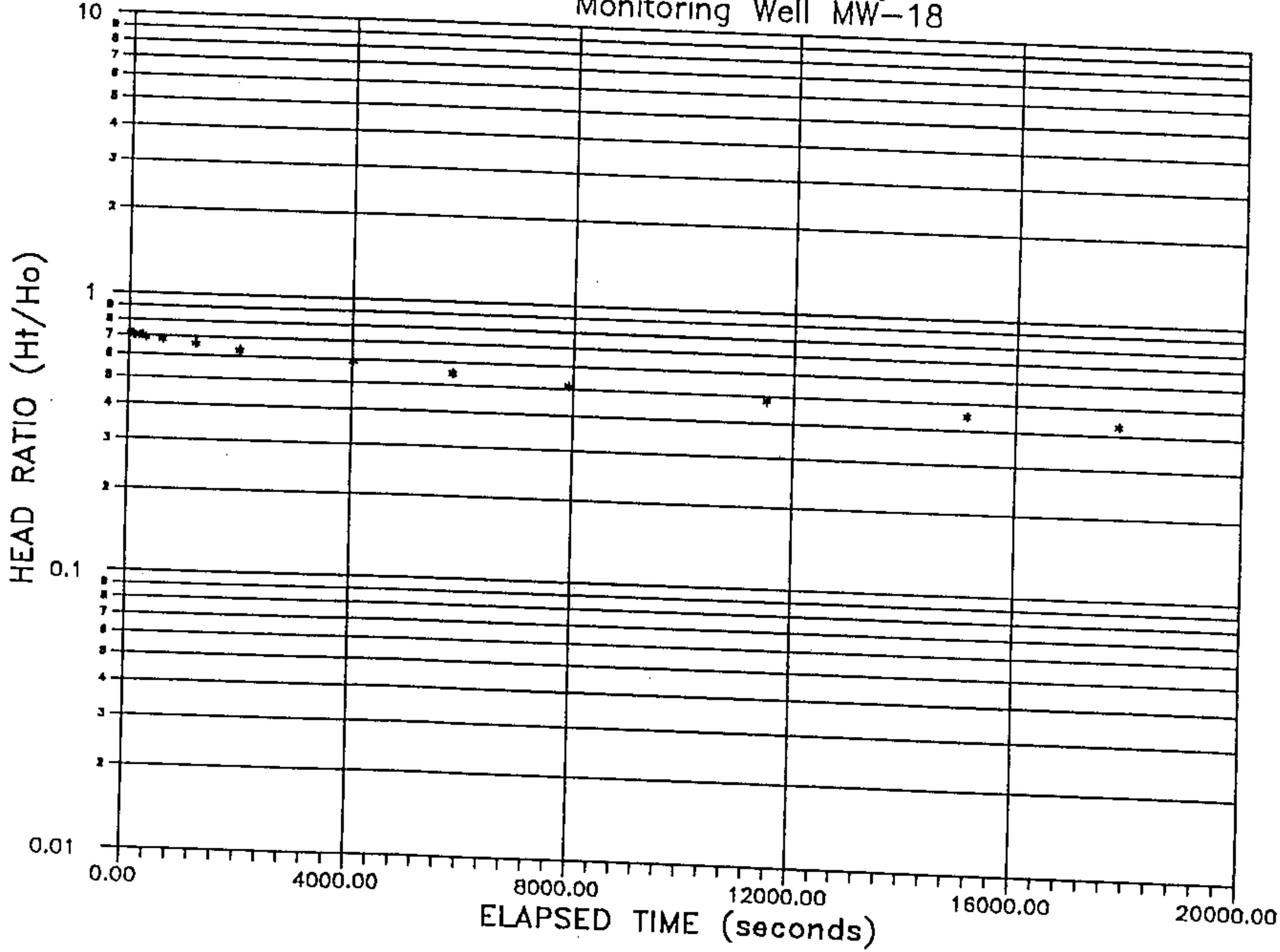
__Notes:__

na - not available
MW-4 was found damaged.

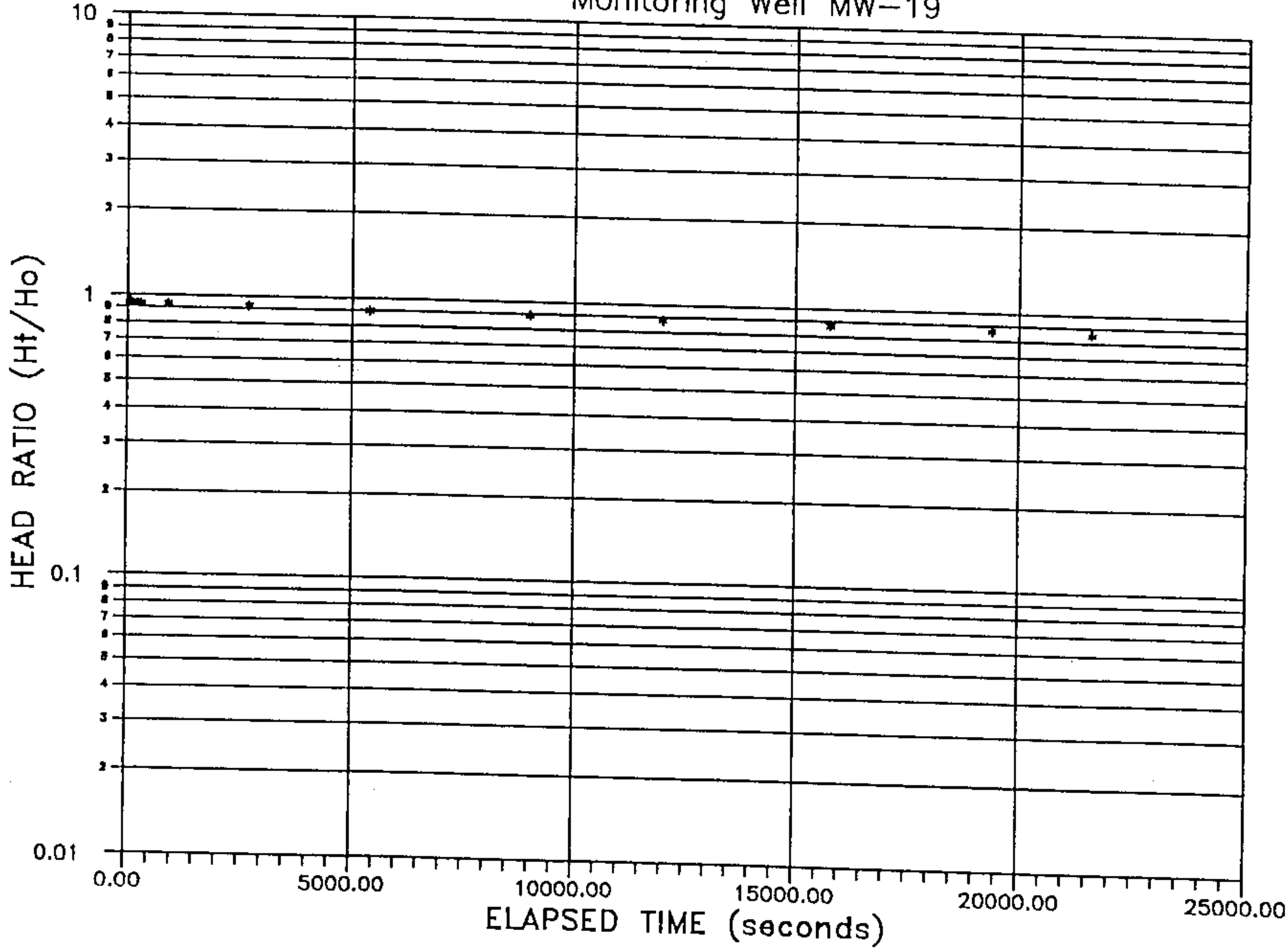
ATTACHMENT 1

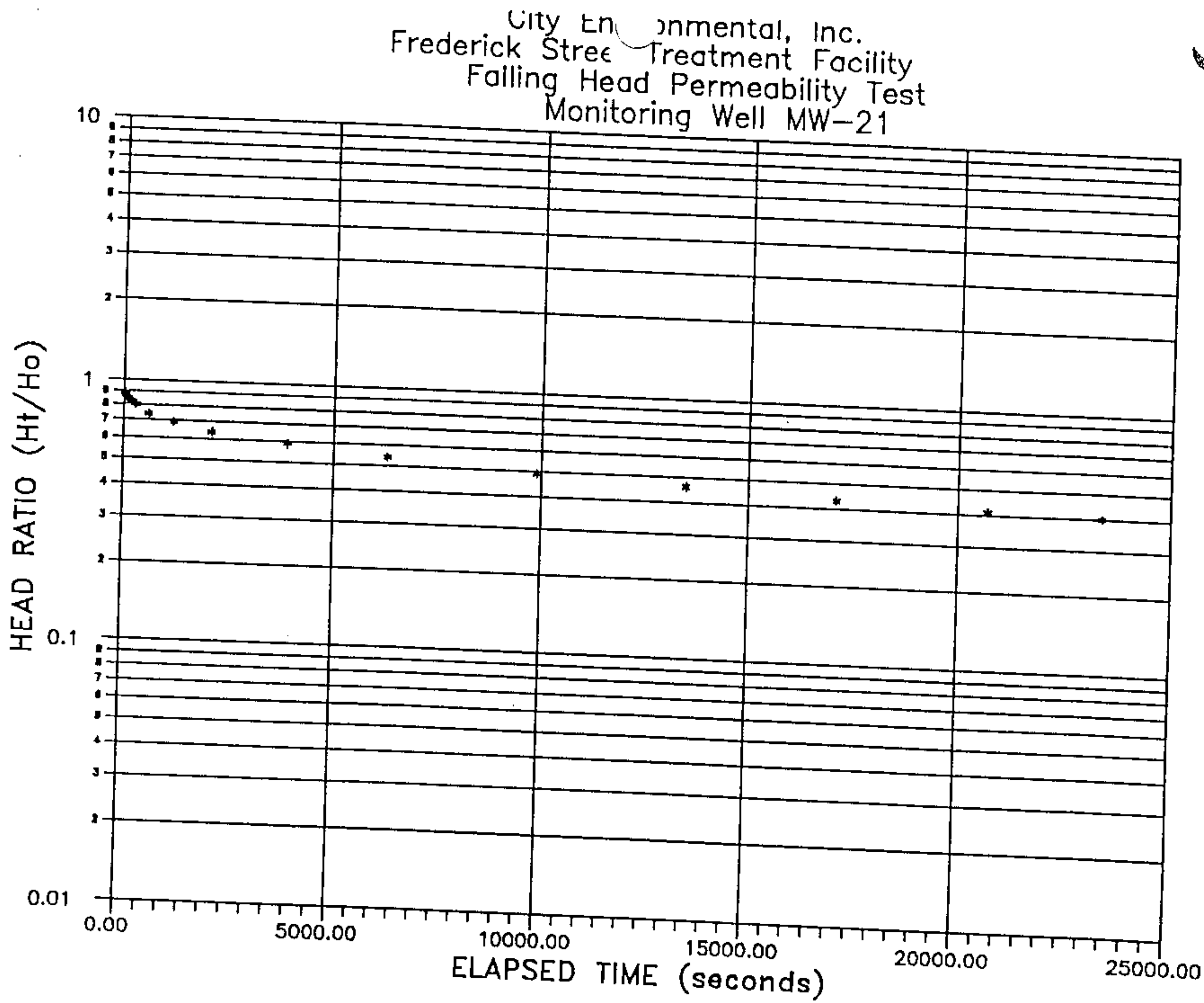
IN-SITU PERMEABILITY TEST RESULTS

Frederick Street Treatment Facility
Falling Head Permeability Test
Monitoring Well MW-18



Frederick Stree[illegible] Treatment Facility
Falling Head Permeability Test
Monitoring Well MW–19




City En onmental, Inc.
Frederick Stree Treatment Facility
Falling Head Permeability Test
Monitoring Well MW-21
10
1
0.1
0.01
HEAD RATIO (Ht/Ho)
0.00
5000.00
10000.00
15000.00
20000.00
25000.00
ELAPSED TIME (seconds)

PROJECT NO. 60039	MARSHALL, HALPERT ASSOCIATES, INC.	SHEET 1 OF 3

TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample Tip (Feet)	Elevation of Sample Tip (Feet)	Cohesion – One-Half of Unconfined Compressive Strength (PSF)	Permeability X 10^{-8} cm/sec /Confining Pressure (PSF)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Volumetric Analysis: Solids (Percent)	Volumetric Analysis: Liquids (Percent)	Volumetric Analysis: Air (Percent)	Particle Size Distribution: Colloids (Percent)	Particle Size Distribution: Clay (Percent)	Particle Size Distribution: Silt (Percent)	Particle Size Distribution: Fine Sand (Percent)	Particle Size Distribution: Medium Sand (Percent)	Particle Size Distribution: Coarse Sand (Percent)	Particle Size Distribution: Gravel (Percent)	Atterberg Limits: Liquid Limit (Percent)	Atterberg Limits: Plastic Limit (Percent)	Atterberg Limits: Plasticity Index (Percent)	Apparent Specific Gravity	
1	SSL-1	7.5	625.7			17.0	108.6															
	SSL-2	10.0	623.2			12.9	126.5															
	SSL-4	20.0	613.2			13.1	124.0											25	14	11		
	ST-1	30.0	603.2		1.2/2160	14.6	120.4															
	SSL-8	45.0	588.2			11.6	131.1				25	32	17	20	4	1	1	23	14	9		
	SSL-9	50.0	583.2			10.7	133.2				9	13	22	48	4	2	2	NL	NP			
	SSL-11	65.0	568.2			16.4	119.4				3	21	26	50	0	0	0	NL	NP			
	SSL-13	75.0	558.2			19.7	111.5				24	32	15	20	6	2	1					
	SSL-14	80.0	553.2			18.0	115.3															
2	SSL-1	5.0	627.6	1970		17.3	113.9															
	SSL-2	7.5	625.1	9395		12.6	125.9															
	SSL-3	10.0	622.6	10710		12.3	126.0															
	SS-2	15.0	617.6			13.7	121.5															
	SS-3	20.0	612.6	2350		13.6	125.9															
	SS-5	30.0	602.6			16.5	112.4															
	SS-6	40.0	592.6			---	---											24	15	9		
	SS-7	45.0	587.6			---	---															
	ST-2	50.0	582.6		2.8/3600	15.8	117.9				21	31	20	21	5	1	1	22	14	8		
	ST-3	80.0	552.6		1.1/5760	19.8	111.5				29	34	14	17	4	1	1	28	16	12		
	SS-12	100.0	532.6			26.9	---											34	17	17		

PROJECT NO. 60039

MARSHALL, HALPERT ASSOCIATES, INC.

SHEET 2 OF 3

TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample Tip (Feet)	Elevation of Sample Tip (Feet)	Cohesion – One-Half of Unconfined Compressive Strength (PSF)	Permeability x 10^{-8} cm/sec /Confining Pressure (PSF)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Volumetric Analysis: Solids (Percent)	Volumetric Analysis: Liquids (Percent)	Volumetric Analysis: Air (Percent)	Particle Size Distribution: Colloids (Percent)	Particle Size Distribution: Clay (Percent)	Particle Size Distribution: Silt (Percent)	Particle Size Distribution: Fine Sand (Percent)	Particle Size Distribution: Medium Sand (Percent)	Particle Size Distribution: Coarse Sand (Percent)	Particle Size Distribution: Gravel (Percent)	Atterberg Limits: Liquid Limit (Percent)	Atterberg Limits: Plastic Limit (Percent)	Atterberg Limits: Plasticity Index (Percent)	Apparent Specific Gravity	
3	S-1	5.0	626.3			19.1	104.6				←	75	→	18	3	1	3					
	S-2	10.0	621.3			12.9	123.3				←	77	→	17	4	2	0					
	ST-1	25.0	606.3		0.95/2160	14.4	119.2				21	31	23	19	5	1	0	22	14	8		
	ST-2	45.0	586.3		540/3312	12.4	117.3				6	14	16	52	11	1		NP	NL			
	ST-3	55.0	576.3		7.71/3888	14.2	119.0				17	31	19	24	7	1	1	21	14	7		
	ST-4	75.0	556.3		10.0/1440	16.1	119.2				10	28	40	17	2	3	--	16	13	3		
	ST-5	85.0	546.3		1.1/6048	20.3	105.9				35	24	21	14	4	1	1	24	17	7		
4	ST-1	20.0	613.4		1.3/2160	12.8	120.2				19	40	19	18	2	1	1	25	15	10		
	ST-2	25.0	608.4		1.1/2160	13.7	120.1				16	40	24	16	2	1	1					
	LS-4	30.0	603.4			14.8	122.4											22	14	8		
	ST-3	40.0	593.4		1.0/3600	15.0	120.2															
	ST-4	45.0	588.4		4500/3312	13.6																
	ST-5	60.0	573.4		2.2/4320	15.1	118.4				18	32	21	20	5	3	1	20	13	7		
5	LS-3	7.5	625.8			15.6	120.3											29	17	12		
	ST-1	20.5	612.3		2.2/2160	13.1	123.9				19	30	23	21	5	2	0	19	11	17		
	LS-8	40.0	593.3			15.0	121.1											21	13	8		
	LS-10	60.0	573.3			15.3	98.7											19	13	7		

PROJECT NO. 60039

MARSHALL, HALPERT ASSOCIATES, INC.

SHEET 3 OF 3

TABULATION OF TEST DATA

Test Boring or Test Pit Number	Sample Number	Depth of Sample Tip (Feet)	Elevation of Sample Tip (Feet)	Cohesion – One-Half of Unconfined Compressive Strength (PSF)	Permeability x 10^{-8} cm/sec /Confining Pressure (PSF)	Natural Water Content (Percent of Dry Weight)	In-Place Dry Density (Pounds per Cubic Foot)	Volumetric Analysis: Solids (Percent)	Volumetric Analysis: Liquids (Percent)	Volumetric Analysis: Air (Percent)	Particle Size Distribution: Colloids (Percent)	Particle Size Distribution: Clay (Percent)	Particle Size Distribution: Silt (Percent)	Particle Size Distribution: Fine Sand (Percent)	Particle Size Distribution: Medium Sand (Percent)	Particle Size Distribution: Coarse Sand (Percent)	Particle Size Distribution: Gravel (Percent)	Atterberg Limits: Liquid Limit (Percent)	Atterberg Limits: Plastic Limit (Percent)	Atterberg Limits: Plasticity Index (Percent)	Apparent Specific Gravity
6	LS-1	10.0	623.3			12.1	126.7														
	S-3	40.0	593.3			15.5	122.2											21	14	7	
	S-4	45.0	588.3			13.7	---														
	S-5	50.0	583.3			14.7	---				16	34	22	21	5	2	0	22	14	8	
8	LS-4	10.0	623.6			15.2	123.5				21	32	24	17	3	3	0				
	ST-1	45.0	588.6		1.2/3168	14.6	119.0				18	28	20	21	4	6	3				
	SS-7	50.0	583.6			15.1	---				22	29	20	20	3	2	4				
	SS-9	70.0	563.6			17.4	---														
9	S-2	49.5	584.1			13.8	---														
10	LS-4	10.0	623.2			14.6	115.7				21	30	25	18	4	1	1				
	SS-5	40.0	593.2			16.4	---				22	30	20	19	4	2	3				
	ST-1	70.0	563.2		1.3/5040	16.1	117.1														
14	SSL-1	5.0	628.1	1035		25.3	91.6														
	SS-2	7.5	625.6	1160		22.4	105.1														
	SSL-2	10.0	623.1	4680		13.1	125.2														
	SSL-3	15.0	618.1	5022		13.2	123.2														

Project Name Lily Environmental, Inc.
Frederick Street Facility

LABORATORY TESTING DATA SUMMARY

Project No. 60669 Project Engr. LAJ Assigned By JAB Date Assigned ______ Reviewed by ______ Date Required ______

Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	IDENTIFICATION TESTS: Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	DENSITY: MAX (pcf) / W_{opt} (%)	Permeability cm/sec	STRENGTH TESTS: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	CONSOL.: $\frac{C_c}{1+e_0}$	Laboratory Log and Soil Description
18	SS-2	10.0		12.8	25	13	78	29												Silty CLAY with Sand & Gravel, Brown-Gray, Med. Plast., Moist (CL)
	SSL-3	15.0		18.5							114.4									Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-4	20.0		14.3																Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-5	25.0		11.3	18	12	55	15												Sandy CLAY, Tr. Silt & Gravel, Gray, Med. Plast., Moist (CL).
	SS-6	30.0		15.9																Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-7	35.0		15.5							128.3									Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-8	40.0		15.5	23	14	74	23												Silty CLAY with Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SSL-9	45.0		15.2																Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Moist (CL).
	SS-10	49.0		17.3																Silty CLAY, Lines of Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL)
	SS-11	55.0		14.6																Silty CLAY with Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL).

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Project ... [illegible]
...ederick Street Facility

Project No. 60669 Project Engr. LAJ Assigned By JAB Date Assigned ______ Reviewed by ______ Date Required ______

Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	DENSITY: MAX (pcf) / W_{opt} (%)	Permeability cm/sec	STRENGTH TESTS: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	CONSOL.: $\frac{C_c}{1 + e_0}$	Laboratory Log and Soil Description
19	SL-2	10.0		13.4							123.7			UC	0		14,300			Hard, Silty CLAY with Sand, Brown, Med. Plast., Damp (CL).
	SS-3	15.0		12.6	27	16	73	26												Hard, Silty CLAY with Sand, Brown, Med. Plast., Damp (CL).
	ST-4	20.0		13.5							119.6		9.4×10^{-8}	K	2,000					Hard, Silty CLAY, Tr. of Sand, Grey, Med. Plast., Damp (CL).
	SL-5	25.0		15.3							119.8			UC	0		5,250			V. Stiff, Silty CLAY, Tr. of Sand, Grey, Med. Plast., Damp (CL).
	SS-6	30.0			24	14	73	26												Stiff, Silty CLAY with Sand, Gray, Med. Plast., Moist (CL).
	SL-7	35.0		15.0							123.6			UC	0		3,440			Stiff, Silty CLAY with Sand, Gray, Med. Plast., Moist (CL).
	SL-9	45.0		15.2																Stiff, Silty CLAY, Tr. Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL)
	SS-10	50.0		14.1	24	14	73	22												Stiff, Silty CLAY with Sand, Tr. Gravel, Med. Plast., Wet (CL).
	SL-11	55.0		15.6							119.6									Stiff, Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Wet (CL)
	SS-12	60.0		14.4																Stiff, Silty CLAY, Tr. Sand & Gravel, Gray, Med. Plast., Wet (CL)
	SS-13	65.0			25	15	77	28												Med. Stiff, Silty CLAY, L. Sand, Gray, Med. Plast., Wet (CL).
	SS-14	70.0		10.5																Med. Stiff, Silty CLAY, Tr. Sand & Gravel, Grey, Med. Plast., Wet (CL)

GZA GeoEnvironmental, Inc.
Engineers and Scientists

60669.7

Project N ity Environmental, Inc.
lerick Street Facility

LABORATO ESTING DATA SUMMARY

Project No. 60669 Project Engr. LAJ Assigned By JAB Date Assigned ______ Reviewed by ______ Date Required ______

Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	IDENTIFICATION TESTS: Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	DENSITY: MAX (pcf) / W_{opt} (%)	Permeability cm/sec	STRENGTH TESTS: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	CONSOL.: $\frac{C_c}{1 + e_0}$	Laboratory Log and Soil Description
20	SS-1	5.0		22.7																FILL: Hard, Sandy CLAY, Gray & Brown, Damp (CL).
	SS-2	10.0		12.8	26	16	76													Hard, Silty CLAY with Sand, Brown, Low Plast., Damp (CL).
	SS-5	25.0		12.2	17	13														Stiff, Silty CLAY, Tr. Sand & Gravel, Med. Plast., Wet (CL).
	SS-6	30.0		13.3																V. Stiff, Silty CLAY, Tr. Sand & Gravel, Med. Plast., Wet (CL).
	SS-7	35.0		15.4																Stiff, Silty CLAY, Sand & Gravel, Med. Plast., Wet (CL).
	SS-8	40.0		15.0	25	14	74	25												Stiff, Silty CLAY with Tr. Sand, Gray, Med. Plast., Wet (CL).
	ST-9	45.5		14.2							120.5		7.2×10^{-9}	K	2,000					Stiff, Silty CLAY, Tr. Sand, Med. Plast., Wet (CL).
	SS-10	50.0																		Loose, Fine to Med. SNAD with Some Clay, Gray, Non-Plast., Wet (CL).
	SS-11	55.0		13.3																V. Stiff, Silty CLAY, Little Sand & Gravel, Gray, Med. Plast., Wet (CL)

GZA GeoEnvironmental, Inc.
Engineers and Scientists

LABORATO[illegible] TESTING DATA SUMMARY

Project Name [illegible] Environmental, Inc.
Frederick Street Facility

Project No. 60669 Project Engr. LAJ Assigned By JAB Date Assigned ______ Reviewed by ______ Date Required ______

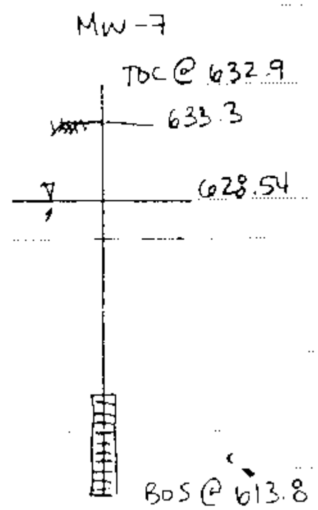
Boring or Test Pit No.	Sample No.	Depth ft.	Lab No.	IDENTIFICATION TESTS: Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	DENSITY: MAX (pcf) / W_{opt} (%)	Permeability cm/sec	STRENGTH TESTS: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	CONSOL.: $\frac{C_c}{1 + e_0}$	Laboratory Log and Soil Description
21	SL-2	10.0		20.2							109.3									Hard, Silty CLAY, L. Sand, Brown, Med. Plast., Dry (CL).
	SS-3	15.0		13.9	27	16	75	26												Hard, Silty CLAY with Sand, Tr. Gravel, Gray, Med. Plast., Dry (CL)
	SL-4	20.0		14.5							110.2									Hard, Silty CLAY, Tr. Sand & Gravel Brown, Med. Plast., Damp (CL).
	SS-5	25.0		14.1	25	15	76	23												V. Stiff, Silty CLAY w/Sand & Gvl., Gray, Med. Plast., Moist (CL).
	ST-6	30.0		14.2							120.2		1.8×10^{-8}	K	2,000					Stiff, Silty CLAY with Sand & Gvl., Gray, Med. Plast., Moist (CL).
	SS-7	40.0		12.6	21	14	66	22												Stiff, Sandy CLAY, Little Silt, Tr. Gravel, Gray, Med. Plast., Wet (CL)
	SL-8	45.0		12.3							127.7									Med. Dense, Silty SAND, Little Gravel, Gray, Wet (SM).
	SL-9	50.0		14.7							120.2									V. Stiff, Silty CLAY, L. Sand, Tr. Gravel, Gray, Med. Plast., Wet (CL)

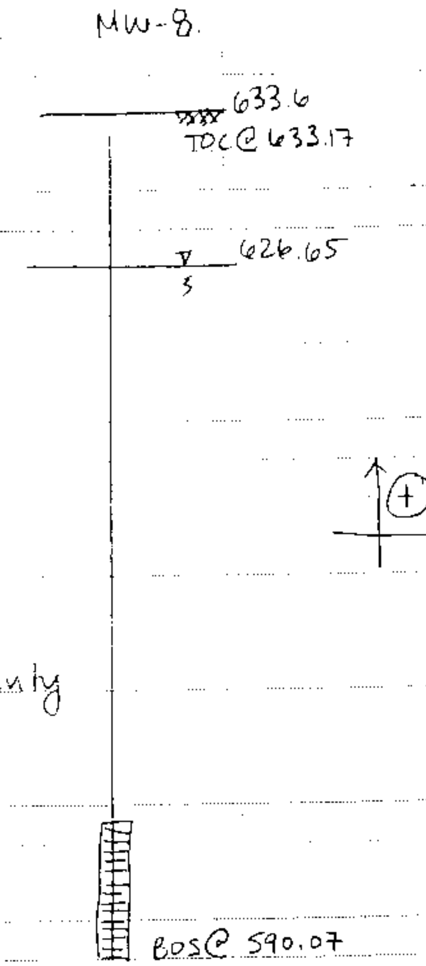
GZA GeoEnvironm[illegible]tal, Inc.
Engineers and S[illegible]ists

ATTACHMENT 2

VERTICAL HYDRAULIC GRADIENT CALCULATIONS

CRA CONESTOGA-ROVERS & ASSOCIATES	PROJECT No.: 15988 PROJECT NAME: USL Detroit GWNIAA Determination DATE: July 28, 2002	DESIGNED BY: SR CHECKED BY: GC PAGE 1 OF





$$\frac{dh}{dL} = \frac{\Delta \text{ water level elevation}}{\Delta \text{ BOS elevation}}$$

$$= \frac{628.54 - 626.65}{613.8 - 590.07}$$

$$= \frac{1.89 \text{ ft}}{23.73 \text{ ft}}$$

$$= 0.0796 \approx 0.08 \longleftarrow \frac{dh}{dL}$$

(+)

$$V = -K\frac{dh}{dL}$$

TOC - top of casing
BOS - bottom of screen
K - hydraulic conductivity (permeability)

when $K = 10^{-5}$ cm/s (most conservative)

$$V = -\left|\frac{10^{-5}\text{ cm}}{s}\right|\,0.08\,\Big| = -8\times10^{-7}\text{ cm/s or } 8.0\times10^{-7}\text{ cm/s downward}$$

$$t = \frac{d}{V} = \frac{30\text{ feet}}{8.0\times10^{-7}}\left|\frac{s}{\text{cm}}\right|\frac{\text{min}}{60\text{ s}}\left|\frac{\text{hour}}{60\text{ min}}\right|\frac{\text{day}}{24\text{ hour}}\left|\frac{\text{year}}{365\text{ day}}\right|\frac{30.48\text{ cm}}{\text{foot}}\Big| = 36.2$$

$= 36$ yr.

when $K = 10^{-8}$ cm/s

$V = 8\times10^{-10}$ cm/s

$t = 36{,}244$ years

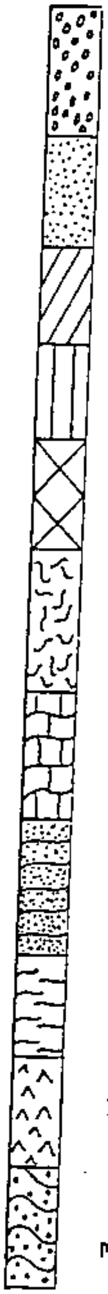
1001 (R) APR 25/94(W) REV.0 (C-47)

ATTACHMENT 3

BOREHOLE AND MONITORING WELL LOGS

GENERAL NOTES - SOIL AND ROCK SYMBOLS

SOIL & ROCK SYMBOLS



GRAVEL

SAND

SILT

CLAY

DEBRIS FILL

ORGANIC MATTER

LIMESTONE

SANDSTONE

SHALE

IGNEOUS ROCK

METAMORPHIC ROCK

SAMPLE DESIGNATION

BL	- Block Sample
B	- Bag Sample
ST	- Shelby Tube
SS	- Split Spoon
SSL	- Split Spoon with Liner

SOIL CONSTITUENTS (percent by weight)

Trace	- 1 to 10%
Little	- 11 to 20%
Some	- 21 to 35%
And	- over 35%

Adjectives (silty, sandy, etc.) are used when the properties of a combination of two or more constituents dominate the engineering behavior of the soil. The principal constituent is that whose properties most affect the gross behavior of the soil.

PARTICLE SIZE RANGES

Boulders		- Greater than 12 inches (305mm)
Cobbles		- 3 to 12 inches (76.2 to 305mm)
Gravel	- Coarse	- 3/4 to 3 inches (19.05 to 76.2mm)
	Fine	- 3/16 to 3/4 inch (4.75 to 19.05mm)
Sand	- Coarse	- 2.0 to 4.75mm
	- Medium	- 0.425 to 2.0mm
	- Fine	- 0.074 to 0.425mm
Silt and Clay		- Less than 0.074mm

STANDARD PENETRATION TEST (ASTM D1586) - Driving a 2.0 inch outside diameter, 1-3/8 inch inside diameter split spoon sampler into undisturbed soil for three successive 6-inch increments of penetration by means of a 140 pound weight falling freely through a vertical distance of 30 inches. The cumulative number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N)

DENSITY OF COHESIONLESS SOILS

	Relative Density	Approximate Range of (N)
Very Loose	0 - 15%	0 - 4
Loose	16 - 35%	5 - 10
Medium Dense	36 - 65%	11 - 30
Dense	66 - 85%	31 - 50
Very Dense	86 - 100%	over 50

Relative Density of Cohesionless Soils is based upon an evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

CONSISTENCY OF COHESIVE SOILS

Consistency	Unconfined Compressive Strength (PSF)
Very Soft - - - -	below - 500
Soft - - - -	500 - 1000
Medium Stiff - - -	1000 - 2000
Stiff - - - -	2000 - 4000
Very Stiff - - - -	4000 - 8000
Hard - - - -	over 8000

Consistency is based on observed resistance to deformation under load.

MARSHALL, HALPERT ASSOCIATES
GROUND ENGINEERS

PROJECT NO. 60039
City Environmental, Inc.
Frederick Street, Detroit, Michigan

LOG NO. 1
SHEET 1
OF 3

TRACTOR: American Drilling & Testing Company
N: J. Blank
R: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.2
DATE DRILLED: 3/27/87 to 3/30/87

METHOD: 4" SS Auger to 10'
3-3/4" Wash 10'-110'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD
	SS	1	18"	2"	1.0-2.5	8-8-6
5	SS	2	18"	3"	3.5-5.0	1-3-4
	SSL	1	18"	10"	6.0-7.5	2-4-4
10	SSL	2	18"	18"	8.5-10.0	10-15-24
	SSL	3	18"	18"	13.5-15.0	11-18-22
20	SSL	4	18"	18"	18.5-20.0	7-9-15
25	ST	--	24"	0"	23.0-25.0	PUSH
	SSL	5	24"	24"	23.0-25.0	PUSH
30	ST	1	24"	24"	28.0-30.0	PUSH
35	SSL	6	18"	18"	33.5-35.0	4-6-9
40	SSL	7	18"	18"	38.5-40.0	3-3-5

GROUND DESCRIPTION

Depth	Description
0.0'-0.5'	SLAG
0.5'-1.9'	FILL: Medium Stiff CLAY, Silty, Dark Brown with Debris. (CL)
1.9'-3.9'	FILL: Medium Stiff CLAY, Silty, Brown and Gray. (CL)
3.9'-5.5'	Stiff CLAY, Fine Sandy, Brown. (CL-ML)
5.5'-8.0'	Very Stiff CLAY, Silty, Brown and Gray. (CL)
8.0'-16.0'	Hard CLAY, Silty, Brown, Trace Fine Sand. (CL)
16.0'-20.0'	Hard CLAY, Silty, Gray, Little Fine Sand. (CL)
20.0'-42.0'	Very Stiff CLAY, Silty, Gray, Little Fine Sand, Seams of Fine Sand and Silt To 30'. (CL)

REMARKS: Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 1.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

MARSHALL, HALPERT ASSOCIATES

GROUND ENGINEERS

PROJECT NO. 60039
City Environmental, Inc.
Frederick Street, Detroit, Michigan

LOG NO. 1
SHEET 2
OF 3

DEP	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
45	SSL	8	18"	18"	43.5-45.0	7-11-15	
50	SSL	9	18"	18"	48.5-50.0	9-12-12	42.0'-57.0' Medium Dense Fine SAND, Gray, Some Silt and Clay. (SM)
55	SSL	10	18"	1"	53.5-55.0	8-10-10	
60	SS	3	18"	7"	58.5-60.0	4-6-8	
65	SSL	11	18"	18"	63.5-65.0	2-4-5	57.0'-71.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)
70	SSL	12	18"	18"	68.5-70.0	3-6-8	
75	SSL	13	18"	18"	73.5-75.0	3-5-5	
80	SSL	14	18"	18"	78.5-80.0	5-7-9	71.0'-110.0' Medium CLAY, Silty, Gray, Trace Fine Sand. (CL)
85	SS	4	18"	1"	83.5-85.0	3-6-8	

R CS

MARSHALL, HALPERT ASSOCIATES
GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

Depth	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION	* R
90	SSL	15	18"	18"	88.5-90.0	2-4-5		
95	SSL	—	18"	0"	93.5-95.0	2-2-3	71.0'-110.0' Medium CLAY, Silty, Gray, Trace Fine Sand. (CL)	
	SS	5	18"	18"	93.5-95.0	PUSH		
100	SS	6	18"	6"	98.5-100.0	3-4-5		
105	SS	7	18"	18"	103.5-105.0	3-5-7		
	SS	8	18"	18"	108.5-110.0	3-4-6		

* REMARKS

MONITORING WELL INSTALLATION REPORT

WELL # MW-1

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
[illegible]TECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT DESCRIPTION: City Enviornmental, Inc. Frederick Street Facility

LOCATION: Detroit, Michigan

FILE NO: 60669

DATE: 3-30-87

[illegible]ELD REP: John Balconi

SI[illegible] CONDITIONS:

WEATHER CONDITIONS:

DRILLING CONTRACTOR: American Drilling and Testing

DRILLER: John Blank

INSTALLATION METHOD: 4" SS Auger to 10'
3-3/4" Wash 10' 110'

ELEV DATUM: 635.30' BM#6

GROUND ELEV: 633.8'

TOP OF WELL ELEV: 633.64'

DATE SURVEYED: 1-8-91

SURVEYED BY: LAJ

MONITORING WELL DETAILS

WELLSCREEN DIA: 2" TYPE: PVC

SLOT SIZE: 0.010 LENGTH: 5'

WELL RISER DIA: 2" TYPE: PVC

PIPE CONNECTIONS: Threaded LENGTH:

FILTER SAND TYPE: 2NS OTHER:

PROTECTIVE CASING: Yes

LOCKED CAP: Yes LOCK NO:

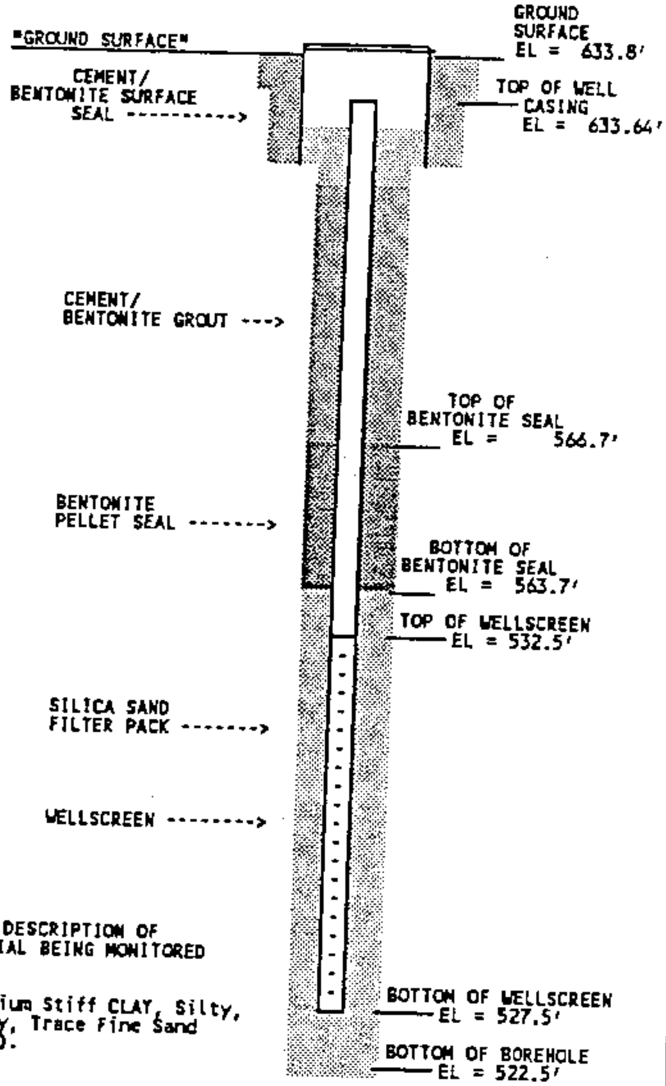
CASING DIA: 8" LENGTH: 12"

GROUNDWATER MEASUREMENT DATA

DATE	TIME	DEPTH	METHOD	ELEV.
3/30/87	3:55			560.62'
3/31/87	8:00			578.30'
[illegible] '87	9:00			527.33'
4/9/87	8:00			615.00'
4/10/87	10:00			616.97'
4/15/87	a.m.			621.70'
5/4/87	1:22			622.75
5/21/87	a.m.			624.62
5/29/87	a.m.			624.57

MONITORING WELL DRAWING

PROTECTIVE ROADBOX CASING AT GROUND SURFACE



DESCRIPTION OF MATERIAL BEING MONITORED

Medium Stiff CLAY, Silty, Gray, Trace Fine Sand (CL).

MONITORING WELL DRAWING NOT TO SCALE.

REMARKS:

Monitoring well originally completed with protective casing above grade. Roadbox was installed afterwards, as s[illegible] Elevations from 1987 reflect well casing in original condition.

FILE:60669MW.1

GZA
REPRESENTATIVE INITIAL__________ DATE__________

MARSHALL, HALPERT ASSOCIATES
GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 1

CONTRACTOR: American Drilling & Testing Company
FOREMAN: Mark Morand
R: Kevin Cook

LOCATION: See Location Plan
ELEVATION: 632.33
DATE DRILLED: 12/07/87

METHOD: 4" Dia. Solid Stem Auger

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	See	Remarks	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" ON ROD	GROUND DESCRIPTION
							0.0-7.0' CLAY, Silty, Brown.
5							
							7.0-30.0' Very Stiff CLAY, Silty, Gray, Trace Sand, Trace Gravel (CL).
10							
20	SS	1	24	24	19.0-21.0	7-11-15-15	
	SS	2	24	24	23.0-25.0	5-9-11-14	
25							
	SS	3	24	24	28.0-30.0	9-10-15-17	
30							

Revision 2, 8/1/88

REMARKS
(1) Borehole dry upon completion.
(2) Monitoring well installed in borehole upon completion.
(3) For groundwater and other pertinent information, see Installation Report for Monitoring Well Number 2A.

NOTES:
1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 3

NTRACTOR: American Drilling & Testing Company
REMAN: J. Blank
EER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 631.3
DATE DRILLED: 3/31/87 to 4/2/87

NG 4" Solid Stem Auger to 10'
3-3/4" Dia Wash to 105'
6" Dia Wash to 72'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

Depth	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD
5	SS	1	18"	18"	3.5-5.0	3-4-5
10	SS	2	18"	18"	8.5-10.0	6-14-17
15	SS	3	18"	10"	13.5-15.0	4-7-10
20	ST	--	24"	0"	18.0-20.0	PUSH
	SS	4	18"	18"	18.0-19.5	PUSH
25	ST	1	24"	24"	23.0-25.0	PUSH
30	SS	5	18"	0"	28.5-30.0	3-4-5
	SS	5	18"	18"	28.5-30.0	PUSH
35						
	ST	--	24"	0"	38.0-40.0	PUSH
40	SS	6	18"	18"	38.0-39.5	PUSH

GROUND DESCRIPTION

1.0'-3.0' FILL: Medium Stiff CLAY, Silty, Dark Brown with Debris.

3.0'-7.0' Very Stiff CLAY, Silty, Brown and Gray. (CL)

7.0'-12.0' Hard CLAY, Silty, Brown, Little Fine Sand. (CL)

12.0'-37.0' Very Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)

EMARKS Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 3.

S: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
45	ST	2	24"	24"	43.0-45.0	PUSH	37.0'-48.0' Medium Dense Fine SAND, Gray, Little Silt and Clay, Trace Medium Sand. (SM)
	SS	7	18"	0"	46.0-47.5	8-7-6	
50	SS	8	18"	18"	48.5-50.0	3-4-6	48.0'-61.0' Very Stiff to Stiff CLAY, Silty, Gray, Some Fine Sand and Seams of Fine Sand. (CL-ML)
55	ST	3	24"	24"	53.5-55.0	PUSH	
60	SS	9	18"	18"	58.5-60.0	4-4-8	
	SS	10	18"	18"	63.5-65.0	6-14-8	61.0'-78.0' Stiff SILT, Clayey, Gray, Little Fine Sand, Occasional Seams of Fine Sand. (ML)
70	SSL	--	18"	0"	68.5-70.0	6-7-8	
	SS	11	18"	18"	68.5-70.0	PUSH	
75	ST	4	24"	24"	73.0-75.0	PUSH	
80							
85	ST	5	24"	24"	83.0-85.0	PUSH	78.0'-105.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL-ML)

REMARKS

GROUND ENGINEERS

Frederick Street, Detroit, Michigan

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
90							78.0'-105.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL-ML)
95	SSL	1	18"	18"	93.5-95.0	2-4-5	
100							
105	SS	--	18"	1"	103.5-105.0	3-4-6	

REMARKS

MONITORING WELL INSTALLATION REPORT

WELL # MW-3

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
...OTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT DESCRIPTION: City Enviornmental, Inc. Frederick Street Facility
LOCATION: Detroit, Michigan

FILE NO: 60669
DATE: 4-2-87

...ELD REP: John Balconi
SI... CONDITIONS:
WEATHER CONDITIONS:

DRILLING CONTRACTOR: American Drilling and Testing
DRILLER: John Blank
INSTALLATION METHOD: 4" Solid Stem to 6" Dia. Wash to 72'

ELEV DATUM: 635.30' BH#6
GROUND ELEV: 632.8'
TOP OF WELL ELEV: 632.50'
DATE SURVEYED: 1-9-91
SURVEYED BY: JAB

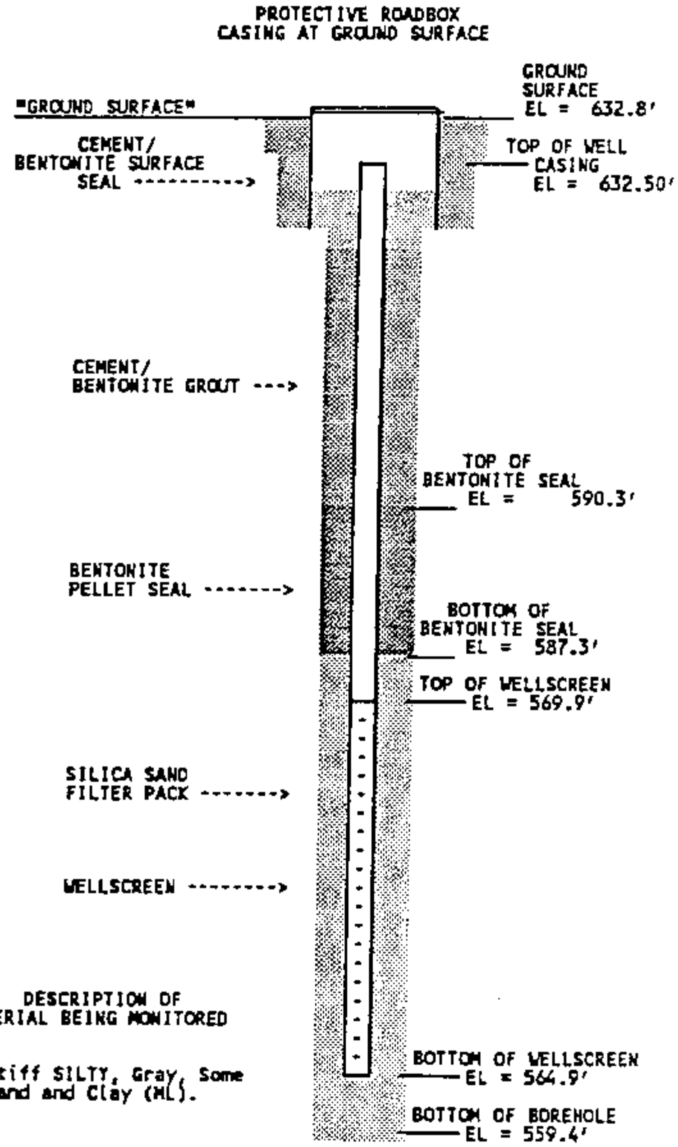
MONITORING WELL DETAILS

WELLSCREEN DIA:	2"	TYPE:	PVC
SLOT SIZE:	0.010	LENGTH:	5'
WELL RISER DIA:	2"	TYPE:	PVC
PIPE CONNECTIONS:	Threaded	LENGTH:	
FILTER SAND TYPE:	2NS	OTHER:	
PROTECTIVE CASING:	Yes		
LOCKED CAP:	Yes	LOCK NO:	
CASING DIA:	8"	LENGTH:	12"

GROUNDWATER MEASUREMENT DATA

DATE	TIME	DEPTH	METHOD	ELEV.
4/2/87	10:10			576.73'
4/2/87	10:47			580.80'
[illegible]7	11:04			583.75'
4/2/87	12:32			591.73'
4/9/87	7:56			624.88'
4/16/87	a.m.			623.88'
5/4/87	1:46			623.48
5/21/87	a.m.			623.36
5/29/87	a.m.			623.30
11/21/90	12:00	8.50'	Electric Indicator	624.00

MONITORING WELL DRAWING



DESCRIPTION OF MATERIAL BEING MONITORED

Stiff SILTY, Gray, Some Sand and Clay (ML).

MONITORING WELL DRAWING NOT TO SCALE.

REMARKS:

Monitoring well originally completed with protective casing above grade. Roadbox was installed afterwards, shown. Elevations from 1987 reflect well casing in original condition.

FILE:60667MW.3

GZA
REPRESENTATIVE INITIAL__________ DATE__________

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
ENGINEER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.4
DATE DRILLED: 4/2/87 & 4/3/87

4" SS Auger to 10'
3-3/4" Wash to 60'
6" Dia Wash to 55'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
							0.0'-0.7' CONCRETE
	SS	1	18"	12"	1.0-2.5	8-10-9	0.7'-3.7' FILL: Medium Stiff CLAY, Silty, Black with Debris.
5	SS	2	18"	18"	3.5-5.0	3-3-3	3.7'-8.0' Very Stiff CLAY, Silty, Brown and Gray. (CL)
	SSL	1	18"	6"	6.0-7.5	3-3-5	
10	SSL	2	18"	15"	8.5-10.0	9-17-27	8.0'-16.0' Hard CLAY, Silty, Brown, Little Fine SAND. (CL)
15	SSL	3	18"	12"	13.5-15.0	13-18-27	
20	ST	1	24"	24"	18.9-20.0	PUSH	
25	ST	2	24"	21"	23.0-25.0	PUSH	
30	SSL	4	18"	18"	28.5-30.0	3-5-8	16.0'-42.0' Very Stiff to Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Fine Sand to 30'. (CL)
35							
40	ST	3	24"	8"	38.0-40.0	PUSH	

REMARKS 1. Encountered concrete obstruction at 2.5' below surface.
2. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 4.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
							42.0'-47.0' Medium Dense Fine SAND, Gray, Little Silt and Clay. (SM)
45	ST	4	24"	10"	43.0-45.0	PUSH	
50	SSL	5	18"	18"	48.5-50.0	3-4-6	47.0'-60.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL-ML)
55							
60	ST	5	24"	24"	58.0-60.0	PUSH	

REMARKS

INSTALLATION REPORT FOR MONITORING WELL NO. 4

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 4/3/87 BY American Drilling & Testing

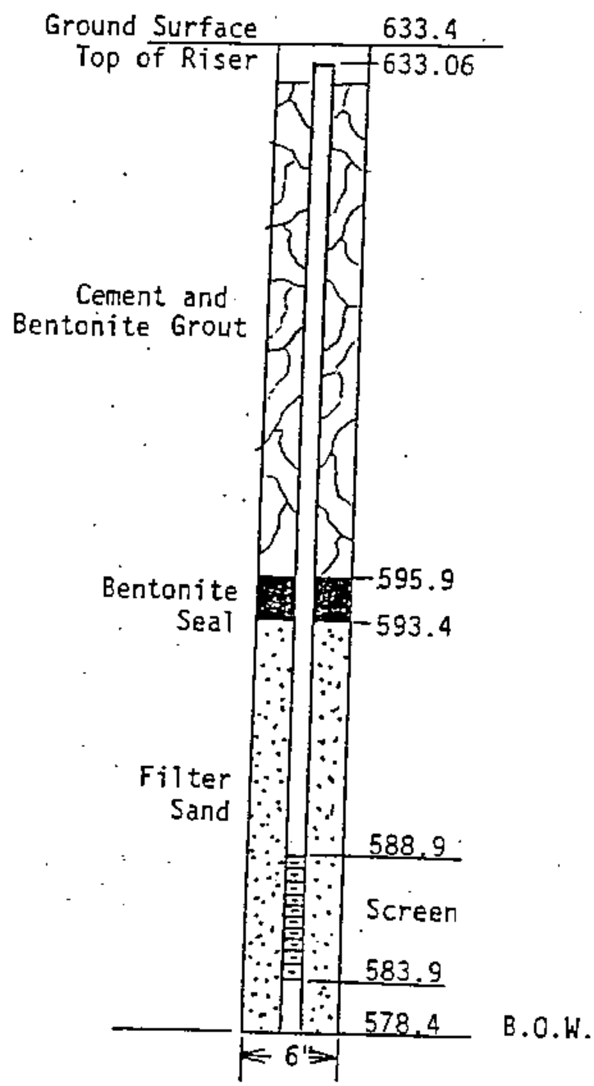
DRILLER J. Blank INSPECTOR J. Balconi

TOP OF CASING ELEVATION 633.06 GROUND SURFACE ELEVATION 633.4

DESCRIPTION OF SOIL BEING MONITORED Medium Dense Fine SAND, Gray, Little Silt and Clay. (SM)

FILTER 2NS Sand SCREEN 2"PVC .010 Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
4/3/87	1:12P	586.25
4/3/87	2:12P	601.63
4/6/87	8:00A	633.4
4/15/87	AM	615.31
5/4/87	12:15P	628.90
5/21/87	AM	628.84
5/29/87	AM	628.86
11/21/90	10:45	629.56



REMARKS

1. Bailed to Elev. 586.25 upon completion.
2. 4/6/87 Full of rain water.
3. 5/4/87 May have been affected by rain.
4. Purged and sampled 4/15/87.
5. Protected by 7-3/4" diameter road box.

MARSHALL, HALPERT ASSOCIATES, INC.

GROUND ENGINEERS A GZA COMPANY

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 2

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
ENGINEER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.3
DATE DRILLED: 4/6/87 & 4/7/87

METHOD:
4" Solid Stem Auger to 25'
3-3/4" Dia Wash to 70'
6" Dia Wash to 50'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" ON ROD
	SSL	1	18"	18"	1.0-2.5	3-5-7
5	SSL	2	18"	18"	3.5-5.0	3-4-6
	SSL	3	18"	14"	6.0-7.5	4-7-12
10	SSL	4	18"	12"	8.5-10.0	6-16-24
15	SSL	5	18"	18"	13.5-15.0	3-8-10
20	ST	1	24"	24"	18.0-20.0	PUSH
25	SSL	6	18"	18"	23.5-25.0	4-7-10
30	SSL	7	18"	18"	28.5-30.0	5-6-9
35						
40	SSL	8	18"	18"	38.5-40.0	3-6-7

GROUND DESCRIPTION		* R
0.0'-0.7'	CONCRETE	
0.7'-1.8'	Loose SAND, Brown.	
1.8'-2.2'	FILL: Medium Stiff CLAY, Dark Brown with Debris.	
2.2'-7.2'	Very Stiff CLAY, Silty, Brown and Gray, Trace Fine Sand. (CL)	
7.2'-12.0'	Hard CLAY, Silty, Brown, Trace Fine Sand. (CL)	
12.0'-41.0'	Very Stiff to Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Fine Sand. (CL)	

REMARKS Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 5.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
							41.0'-45.0' Medium Dense Fine SAND, Gray, Little Silt and Clay. (SM)
45							
							45.0'-55.0' Medium Stiff CLAY, Silty, Gray, Some Fine Sand, Seams of Fine Sand. (CL-ML)
50	SSL	9	18"	18"	48.5-50.0	3-4-5	
55							
60	SSL	10	18"	18"	58.5-60.0	4-6-8	55.0'-70.0' Medium Stiff CLAY, Silty, Gray, Trace Fine Sand. (CL-ML)
70	SS	1	18"	12"	68.5-70.0	5-6-9	

REMARKS

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 2

INTRACTOR: American Drilling & Testing Company
REMAN: J. Blank
SER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.3
DATE DRILLED: 4/7/87 & 4/8/87

ETH.
4" Solid Stem Auger to 15'
3-3/4" Dia Wash to 50'
6" Dia Wash to 55'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION
							0.0'-0.7' CONCRETE
5							0.7'-7.0' FILL: Loose SAND, Fine, Brown, Moist, Wet at 5'. (Next to scale pit wall.)
10	SSL	1	18"	18"	8.5-10.0	13-19-27	7.0'-13.0' Hard CLAY, Silty, Brown, Trace Fine Sand. (CL)
15	SS	1	18"	3"	13.5-15.0	8-10-14	
20	SS	--	18"	2"	18.5-20.0	8-11-12	
25							13.0'-44.4' Very Stiff to Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Fine Sand to 30'. (CL-ML)
30	SS	2	18"	18"	28.5-30.0	3-5-8	
35							
40	SS	3	18"	18"	38.5-40.0	3-5-7	

REMARKS 1. No samples obtained above 8.5' due to nearness of sanitary sewer.
2. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 6.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D1586 BLOWS/6" OR RQD	GROUND DESCRIPTION	R
45	SS	4	18"	18"	43.5-45.0	3-5-14	44.4'-49.0' Medium Dense Fine SAND, Gray, Little Clay and Silt. (SM)	
50	SS	5	18"	18"	48.5-50.0	3-5-6	49.0'-55.0' Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Fine Sand. (CL)	
55								

REMARKS

INSTALLATION REPORT FOR MONITORING WELL NO. 6

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 4/8/87 BY American Drilling & Testing

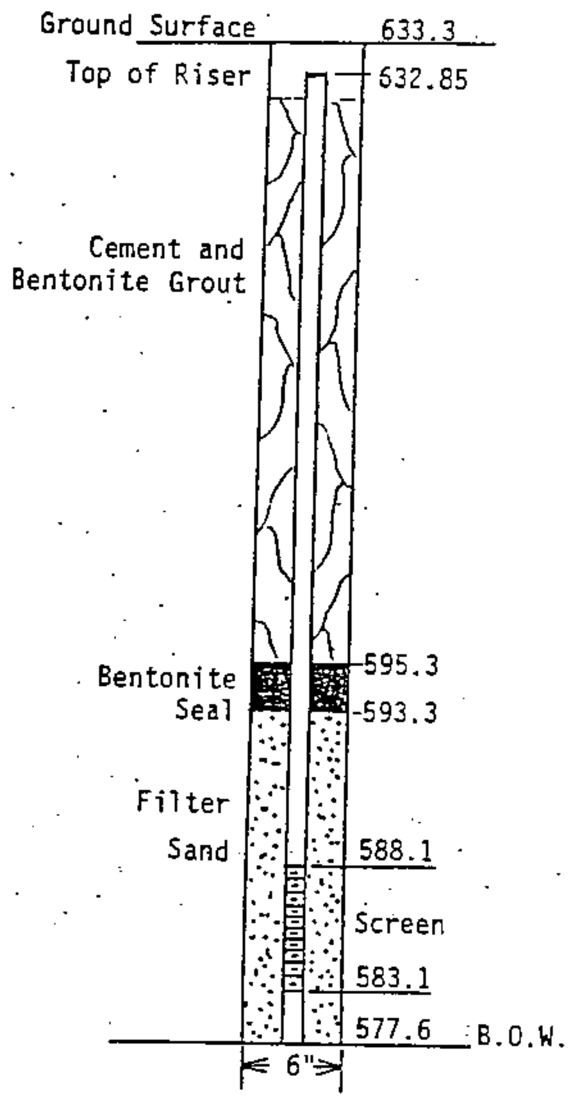
DRILLER J. Blank INSPECTOR J. Balconi

TOP OF CASING ELEVATION 632.85 GROUND SURFACE ELEVATION 633.3

DESCRIPTION OF SOIL BEING MONITORED Medium Dense Fine SAND, Gray, Little Clay and Silt. (SM)

FILTER 2NS Sand SCREEN 2"PVC .010 Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
4/8/87	10:30A	579.94
4/8/87	2:15P	592.49
4/9/87	8:14A	606.25
4/16/87	PM	624.56
5/4/87	12:12P	625.66
5/21/87	AM	625.95
5/29/87	AM	625.71



REMARKS

1. Bailed to Elev. 579.94 upon completion.
2. Purged and sampled 4/16/87.
3. Protected by 7-3/4" diameter road box.

MARSHALL, HALPERT ASSOCIATES, INC.

GROUND ENGINEERS A GZA COMPANY

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 1

CONTRACTOR: American Drilling & Testing Company
FOREMAN: W. Mills
...ER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.3
DATE DRILLED: 4/6/87

...THOD: 4" Solid Stem Auger

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD
	SSL	1	18"	18"	6.0-7.5	4-11-15
10	SSL	2	18"	18"	8.5-10.0	6-16-22
15	SSL	3	18"	18"	13.5-15.0	6-10-16
20	SSL	4	18"	18"	18.5-20.0	6-9-12
25	SSL	—	18"	0"	23.5-25.0	5-8-9
	SS	1	24"	24"	23.5-25.5	PUSH

GROUND DESCRIPTION

0.0'-0.7'	CONCRETE
0.7'-1.5'	FILL: Loose SAND, Fine, Brown.
1.5'-2.0'	FILL: Medium Stiff CLAY, Silty, Dark Brown with Debris.
2.0'-7.0'	Very Stiff CLAY, Silty, Brown and Gray. (CL)
7.0'-12.0'	Hard CLAY, Silty, Brown, Trace Fine Sand. (CL)
12.0'-15.0'	Very Stiff CLAY, Silty, Gray, Little Fine Sand and Seams of Fine Sand. (CL)
15.0'-18.0'	Medium Dense Fine SAND, Silty, Gray. (SM)
18.0'-25.5'	Very Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Fine Sand. (CL)

REMARKS
1. No samples obtained above 6' due to nearness of underground gas line, electric line and water line.
2. Borehole dry upon completion.
3. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 7.

NOTES:
1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

INSTALLATION REPORT FOR MONITORING WELL NO. 7

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 4/6/87 BY American Drilling & Testing

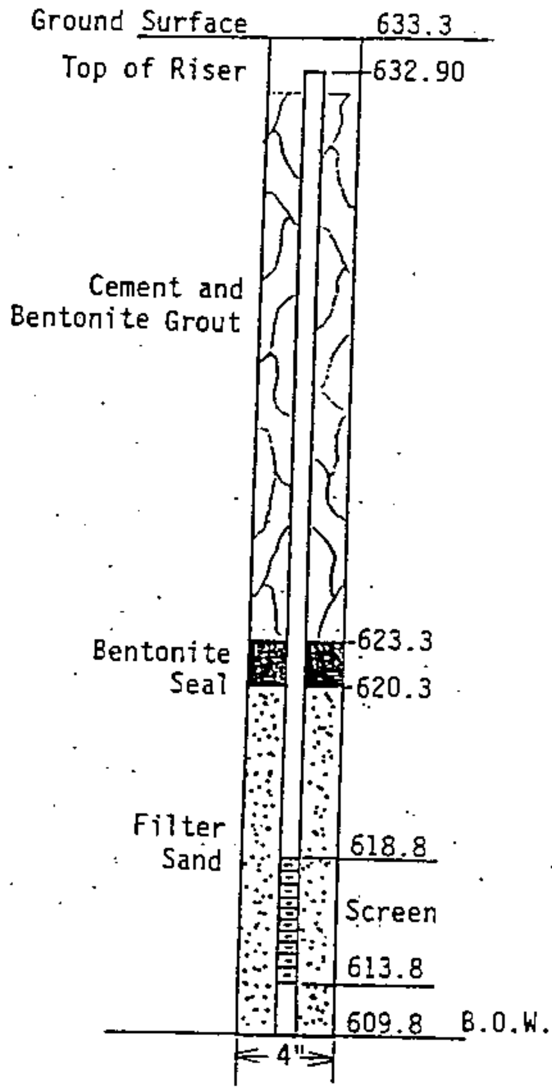
DRILLER W. Mills INSPECTOR J. Balconi

TOP OF CASING ELEVATION 632.90 GROUND SURFACE ELEVATION 633.3

DESCRIPTION OF SOIL BEING MONITORED Medium Dense Fine SAND, Silty, Gray. (SM)

FILTER 2NS Sand SCREEN 2"PVC .010 Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
4/6/87	2:40P	Dry
4/9/87	8:17A	628.29
4/10/87	12:53P	628.03
4/16/87	AM	628.15
5/4/87	1:42	628.25
5/21/87	AM	628.14
5/29/87	AM	628.02



REMARKS

1. Dry upon completion.
2. Purged and sampled 4/16/87.
3. Protected by 7-3/4" diameter road box.

MARSHALL, HALPERT ASSOCIATES, INC.

GROUND ENGINEERS A GZA COMPANY

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET ___ OF 2

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
ENGINEER: R. Flickinger

LOCATION: See Location Plan
ELEVATION: 633.6
DATE DRILLED: 4/8/87 & 4/9/87

4" Solid Stem Auger to 15'
3-3/4" Dia Wash to 70'
6" Dia Wash to 50'

TYPE OF SAMPLE
- BL - BLOCK SAMPLE
- B - BAG SAMPLE
- ST - SHELBY TUBE
- SS - SPLIT SPOON
- SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
							0.0'-0.7' CONCRETE
							0.7'-1.7' Loose SAND, Brown.
	SSL	1	18"	12"	1.0-2.5	4-5-6	1.7'-4.0' FILL: Medium Stiff CLAY, Silty, Dark Brown with Debris.
5	SSL	2	18"	12"	3.5-5.0	3-4-5	
	SSL	3	18"	1"	6.0-7.5	3-4-8	4.0'-8.0' Very Stiff CLAY, Silty, Brown and Gray, Trace Fine Sand. (CL)
10	SSL	4	18"	18"	8.5-10.0	7-14-20	8.0'-14.0' Hard CLAY, Silty, Brown, Little Fine Sand. (CL)
15	SS	1	18"	18"	13.5-15.0	6-8-12	
20	SS	2	18"	12"	18.5-20.0	3-6-8	14.0'-24.0' Very Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)
25	SS	3	18"	18"	23.5-25.0	3-5-9	24.0'-26.0' Medium Dense SAND, Fine to Medium, Gray, Some Clay and Silt. (SM)
							26.0'-30.0' Medium Stiff CLAY, Silty, Gray, Some Fine Sand, Trace Gravel. (CL-ML)
30	SS	4	18"	6"	28.5-30.0	3-5-6	
35							30.0'-41.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)
40	SS	5	18"	15"	38.5-40.0	3-5-9	

REMARKS: Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 8.

NOTES:
1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 2 OF 2

Depth	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION	* R
							41.0'-42.0' Medium Compact SAND, Gray, Some Silt and Gravel. (SM)	
45	ST	1	24"	18"	43.0-45.0	PUSH		
	SS	6	18"	18"	45.5-47.0	PUSH	42.0'-52.0' Stiff CLAY, Gray, Some Fine Sand and Silt. (CL-ML)	
50	SS	7	18"	18"	48.5-50.0	4-5-7		
55								
60	SS	8	18"	15"	58.5-60.0	3-4-5	52.0'-70.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)	
70	SS	9	18"	18"	68.5-70.0	3-3-8		

* REMARKS

INSTALLATION REPORT FOR MONITORING WELL NO. 8

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 4/9/87 BY American Drilling & Testing

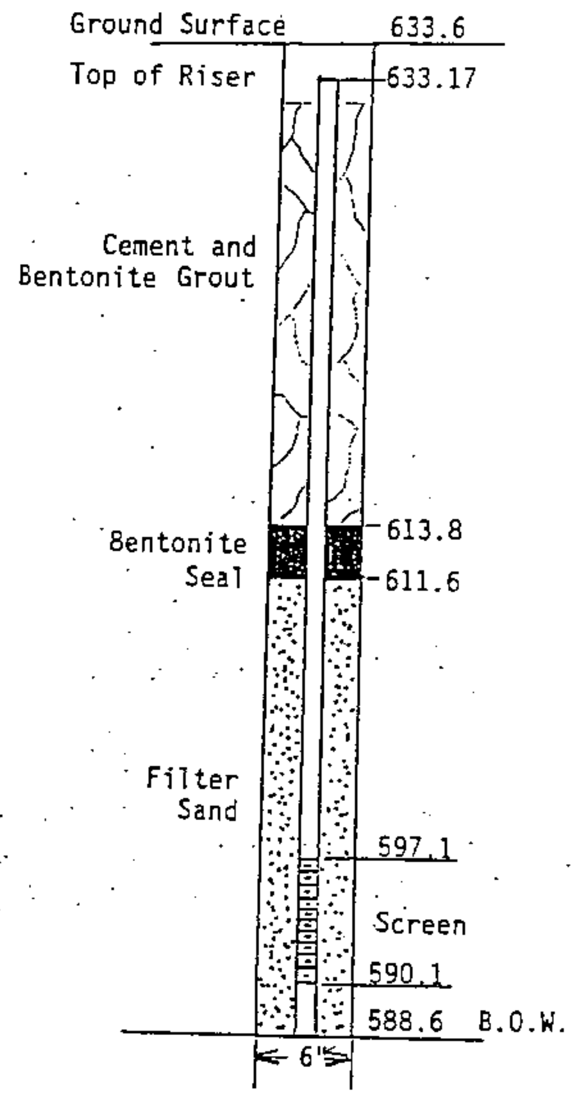
DRILLER J. Blank INSPECTOR R. Flickinger

TOP OF CASING ELEVATION 633.17 GROUND SURFACE ELEVATION 633.6

DESCRIPTION OF SOIL BEING MONITORED Medium Compact SAND, Gray, Some Silt and Gravel. (SM)

FILTER 2NS Sand SCREEN 2"PVC .010 Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
4/9/87	10:30A	588.51
4/9/87	1:50P	598.71
4/10/87	10:48A	611.36
4/16/87	AM	623.41
5/4/87	1:37P	624.84
5/21/87	AM	625.24
5/29/87	AM	625.21



REMARKS

1. Bailed to Elev. 588.51 upon completion.
2. Purged and sampled 4/16/87.
3. Protected by 7-3/4" diameter road box.

MARSHALL HALPERT ASSOCIATES

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 2

CONTRACTOR: American Drilling & Testing Company
FOREMAN: W. Mills
...ER: J. Balconi

LOCATION: See Location Plan
ELEVATION: 633.6
DATE DRILLED: 4/6/87 & 4/7/87

METHOD: 4" Solid Stem Auger

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
						0.0'-0.7' CONCRETE
SSL	1	18"	18"	1.0-2.5	5-7-8	0.7'-2.0' FILL: Medium Dense SAND, Brown.
						2.0'-4.1' FILL: Stiff CLAY, Silty, Dark Brown with Debris.
SSL	2	18"	10"	3.5-5.0	3-5-6	
SSL	3	18"	14"	6.0-7.5	2-4-6	4.1'-8.0' Very Stiff CLAY, Silty, Brown and Gray, Trace Fine Sand. (CL)
SSL	4	18"	18"	8.5-10.0	9-14-18	8.0'-14.7' Hard CLAY, Silty, Brown, Little Fine Sand. (CL)
SSL	5	18"	18"	13.5-15.0	10-19-23	14.7'-18.0' Hard CLAY, Silty, Gray, Trace Fine Sand and Gravel. (CL)
SSL	6	18"	18"	18.5-20.0	5-10-11	18.0'-44.8' Very Stiff to Stiff CLAY, Silty, Gray, Little Fine Sand, Occasional Seams of Sand. (CL)
SS	—	18"	0"	23.5-25.0	4-7-9	
SS	1	24"	24"	23.5-25.5	PUSH	
SSL	7	18"	18"	28.5-30.0	4-6-10	
SSL	8	18"	18"	38.5-40.0	5-8-11	

REMARKS 1. Encountered groundwater at 44.8'.
2. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 9.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D1586 BLOWS/6" OR RQD	GROUND DESCRIPTION	* R
45	SSL	9	18"	18"	43.5-45.0	4-7-8		
							44.8'-52.0' Medium Dense SILT, Fine Sandy, Gray. (ML)	
50	SS	2	18"	18"	48.5-50.0	3-6-10		
							52.0'-55.0' Stiff CLAY, Silty, Gray, Little Fine Sand. (CL)	
55	SS	3	18"	18"	53.5-55.0	3-6-8		

* REMARKS

INSTALLATION REPORT FOR MONITORING WELL NO. 9

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 4/7/87 BY American Drilling & Testing

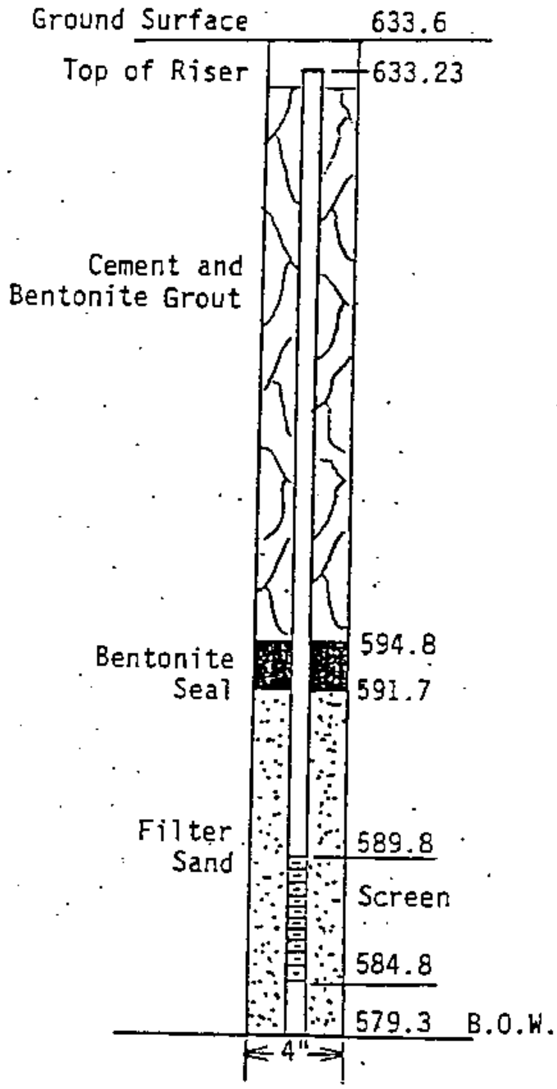
DRILLER W. Mills INSPECTOR J. Balconi

TOP OF CASING ELEVATION 633.23 GROUND SURFACE ELEVATION 633.6

DESCRIPTION OF SOIL BEING MONITORED Medium Dense SILT, Fine Sandy, Gray. (ML)

FILTER 2NS Sand SCREEN 2"PVC .010 Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
4/7/87	11:55A	Dry
4/9/87	8:21A	616.34
4/10/87	12:50P	619.33
4/15/87	PM	623.66
5/4/87	1:33P	624.20
5/21/87	AM	624.53
5/29/87	AM	624.29



REMARKS

1. Dry upon completion.
2. Purged and sampled 4/15/87
3. Protected by 7-3/4" diameter road box.

MARSHALL, HALPERT ASSOCIATES, INC.

GROUND ENGINEERS A GZA COMPANY

MARSHALL, HALPERT ASSOCIATES
GROUND ENGINEERS

PROJECT NO. 60035
City Environmental, Inc.
Frederick Street, Detroit, Michigan

LOG NO. 10
SHEET 1 OF 2

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
: R. Flickinger

LOCATION: See Location Plan
ELEVATION: 633.2
DATE DRILLED: 4/10/87 & 4/11/87

METHOD: 4" Dia SS Auger to 15'
3-3/4" Dia Wash to 80'
6" Dia Wash to 60'

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD	GROUND DESCRIPTION
							0.0'-0.7' CONCRETE
	SSL	1	18"	12"	1.0-2.5	3-3-3	0.7'-1.5' FILL: Medium Dense SAND, Brown.
							1.5'-4.5' FILL: Medium Stiff CLAY, Silty, Black with Debris.
5	SSL	2	18"	15"	3.5-5.0	3-4-6	
							4.5'-9.0' Very Stiff CLAY, Silty, Brown and Gray, Trace Sand. (CL)
	SSL	3	18"	15"	6.0-7.5	3-4-4	
10	SSL	4	18"	12"	8.5-10.0	8-10-16	
							9.0'-18.0' Hard CLAY, Silty, Brown, Little Sand. (CL)
15	SS	1	18"	18"	13.5-15.0	8-10-14	
20	SS	2	18"	12"	18.5-20.0	4-5-8	18.0'-23.0' Very Stiff CLAY, Silty, Gray, Trace Sand. (CL)
25	SS	3	18"	12"	23.5-25.0	4-6-8	
							23.0'-38.0' Very Stiff CLAY, Silty, Gray, Little Sand and Gravel. (CL)
30	SS	4	18"	12"	28.5-30.0	4-5-8	
35							
40	SS	5	18"	18"	38.5-40.0	3-3-5	

REMARKS 1. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 10.

NOTES: 1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

MARSHALL, HALPERT ASSOCIATES

GROUND ENGINEERS

City Environmental, Inc.

Frederick Street, Detroit, Michigan

Depth	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D1586 BLOWS/6" OR RQD	GROUND DESCRIPTION	* R
45							38.0'-50.0' Stiff CLAY, Silty, Gray, Little Sand. (CL)	
50	SS	6	18"	18"	48.5-50.0	4-6-10		
							50.0'-56.0' Stiff CLAY, Fine Sandy, Gray, Some Silt. (CL-ML)	
55	SS	7	18"	18"	53.5-55.0	4-3-6		
60	SS	8	18"	18"	58.5-60.0	3-4-6		
							56.0'-80.0' Stiff to Medium Stiff CLAY, Silty, Gray, Little Sand. (CL)	
70	ST	1	24"	21"	68.0-70.0	PUSH		
75								
80	SS	9	18"	18"	78.5-80.0	3-3-6		

* REMARKS

INSTALLATION REPORT FOR MONITORING WELL NO. 10

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 4/11/87 BY American Drilling & Testing

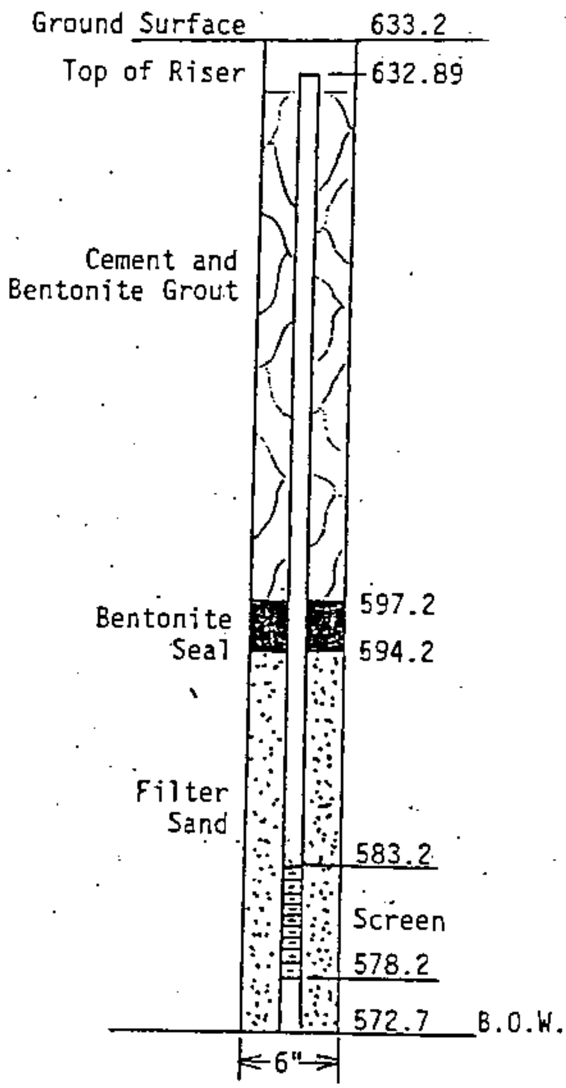
DRILLER J. Blank INSPECTOR R. Flickinger

TOP OF CASING ELEVATION 632.89 GROUND SURFACE ELEVATION 633.2

DESCRIPTION OF SOIL BEING MONITORED Stiff CLAY, Sandy, Gray, Some Silt. (CL-ML)

FILTER 2NS Sand SCREEN 2"PVC .010 Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
4/11/87	4:26P	587.00
4/11/87	5:26P	603.59
4/15/87	AM	624.41
5/4/87	1:15P	625.04
5/21/87	AM	625.31
5/29/87	AM	625.21



REMARKS

1. Bailed to Elev. 587.00 upon completion.
2. Purged and sampled on 4/15/87.
3. Protected by 7-3/4" diameter road box.

MARSHALL, HALPERT ASSOCIATES, INC.

GROUND ENGINEERS A GZA COMPANY

MARSHALL HALLER ASSOCIATES
GROUND ENGINEERS

City Environmental, Inc.
Frederick Street, Detroit, Michigan

SHEET 1 OF 1

CONTRACTOR: American Drilling & Testing Company
FOREMAN: J. Blank
ENGINEER: J. Balconi
METHOD: 4" Dia SS Auger

LOCATION: See Location Plan
ELEVATION: 633.2
DATE DRILLED: 4/8/87

TYPE OF SAMPLE
BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR RQD
	SS	1	18"	18"	1.0-2.5	2-2-3
5	SS	2	18"	18"	3.5-5.0	2-3-5
	SS	3	18"	18"	6.0-7.5	3-4-5
10	SS	4	18"	18"	8.5-10.0	7-10-16
15	SS	5	18"	18"	13.5-15.0	11-13-15
20	SS	6	18"	18"	18.5-20.0	5-11-14
25	SS	7	18"	18"	23.5-25.0	5-7-10
30	SS	8	18"	18"	28.5-30.0	4-6-8
35	SS	9	18"	18"	33.5-35.0	4-6-9
40	SS	10	18"	18"	38.5-40.0	4-6-9

GROUND DESCRIPTION

Depth	Description
0.0'-0.7'	CONCRETE
0.7'-1.5'	FILL: Loose SAND, Fine, Brown.
1.5'-1.7'	FILL: Medium Stiff CLAY, Silty, Dark Brown with Debris.
1.7'-7.1'	Very Stiff CLAY, Silty, Brown and Gray, Trace Sand. (CL)
7.1'-17.0'	Hard CLAY, Silty, Brown, Trace Sand. (CL)
17.0'-22.0'	Very Stiff CLAY, Silty, Gray, Trace Sand. (CL)
22.0'-40.0'	Stiff CLAY, Silty, Gray, Little Sand, Trace Gravel. (CL)

REMARKS
1. Borehole dry upon completion.
2. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 11.

NOTES:
1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

INSTALLATION REPORT FOR MONITORING WELL NO. 11

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 4/8/87 BY American Drilling & Testing

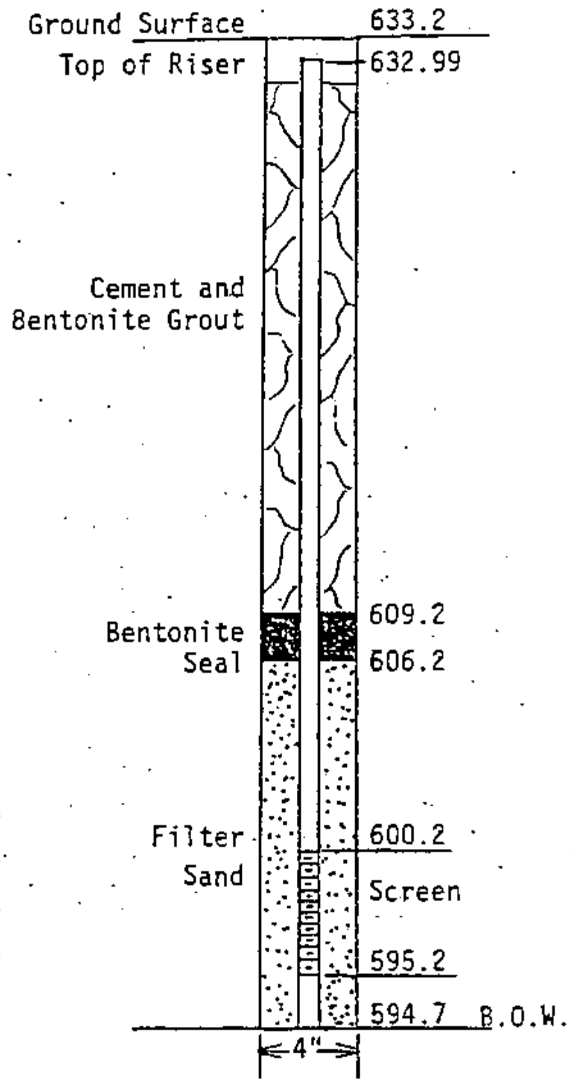
DRILLER J. Blank INSPECTOR J. Balconi

TOP OF CASING ELEVATION 632.99 GROUND SURFACE ELEVATION 633.2

DESCRIPTION OF SOIL BEING MONITORED Stiff CLAY, Silty, Gray, Little Sand, Trace Gravel. (CL)

FILTER 2NS Sand SCREEN 2"PVC .010 Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
4/8/87	2:30P	Dry
4/9/87	8:02A	596.61
4/10/87	10:21A	600.21
4/15/87	AM	621.27
5/4/87	1:19P	626.51
5/21/87	AM	628.71
5/29/87	AM	628.76
5/21/87	AM	628.71
5/29/87	AM	628.76



REMARKS

1. Dry upon completion.
2. Purged and sampled on 4/15/87.
3. Protected by 7-3/4" diameter road box.

MARSHALL, HALPERT ASSOCIATES, INC.

GROUND ENGINEERS A GZA COMPANY

GROUND ENGINEERS

[illegible] Frederick Street, Detroit, Michigan

SHEET ___ OF 1

CONTRACTOR: American Drilling & Testing Company

FOREMAN: J. Blank

ENGINEER: J. Balconi

LOCATION: See Location Plan

ELEVATION: 632.6

DATE DRILLED: 3/31/87

[illegible]: 4" Solid Stem Auger

TYPE OF SAMPLE

BL - BLOCK SAMPLE
B - BAG SAMPLE
ST - SHELBY TUBE
SS - SPLIT SPOON
SSL - SPLIT SPOON WITH LINER

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION TIME
	SEE	REMARKS	

DEPTH	SAMPLE	SAMPLE NUMBER	SAMPLER ADVANCE	SAMPLE RECOVERED	SAMPLE INTERVAL	ASTM D 1586 BLOWS/6" OR ROD	GROUND DESCRIPTION	* R
							0.0'-0.7' CONCRETE	
	SS	1	18"	18"	1.0-2.5	2-4-5		
5	SS	2	18"	18"	3.5-5.0	1-1-1	0.7'-7.5' FILL: Loose SAND, Brown with Trace Silt.	
	SS	3	18"	18"	6.0-7.5	1-2-3		
10	SS	4	18"	12"	8.5-10.0	2-1-3	7.5'-13.0' FILL: Medium Stiff CLAY, Silty, Brown and Gray, Streaks of Black with Sand Pockets Intermixed.	
15								

REMARKS
1. Boring advanced next to underground tank.
2. Encountered groundwater at 5.1'.
3. Encountered obstacle at 13.0'.
4. Monitoring Well installed in borehole upon completion. For groundwater and other pertinent information see Installation Report for Monitoring Well Number 15.

NOTES:
1. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

INSTALLATION REPORT FOR MONITORING WELL NO. 15

PROJECT City Environmental, Frederick Street PROJECT NO. 60039

DATE INSTALLED 3/31/87 BY American Drilling & Testing

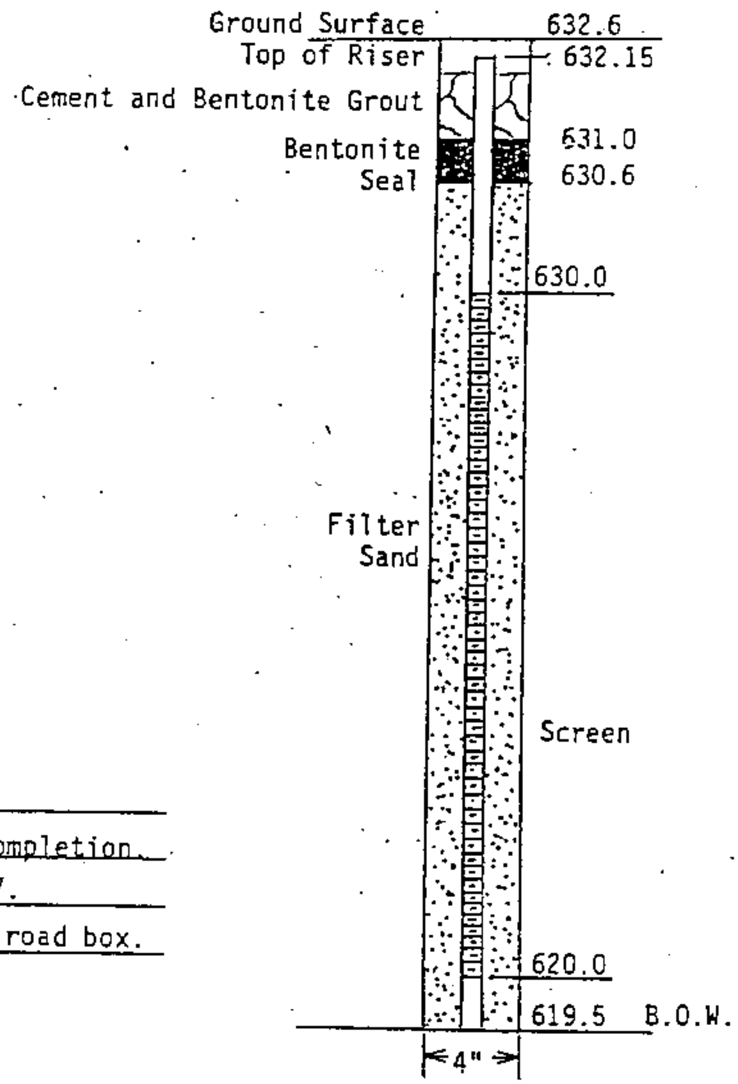
DRILLER J. Blank INSPECTOR J. Balconi

TOP OF CASING ELEVATION 632.15 GROUND SURFACE ELEVATION 632.6

DESCRIPTION OF SOIL BEING MONITORED FILL: Fine Sand, Brown, Layers of Clay

FILTER Fill Sand SCREEN 2"PVC .01D Slot RISER 2" PVC Threaded

GROUNDWATER DATA		
DATE	TIME	ELEV.
3/31/87	11:20A	626.21
4/15/87	PM	627.51
5/4/87	1:30P	624.79
5/21/87	AM	627.25
5/29/87	AM	627.14



REMARKS

1. Water at Elev. 626.21 upon completion.
2. Purged and sampled on 4/15/87.
3. Protected by 7-3/4" diameter road box.

MARSHALL, HALPERT ASSOCIATES, INC.

GROUND ENGINEERS A GZA COMPANY

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
City Environmental, Inc.
Frederick Steet Facility

REPORT OF BORING No. SB-20
SHEET 1 OF 2
FILE No. 60669
CHKD. BY [illegible]

BORING Co. Great Lakes Drilling
FOREMAN Mike Warden
GZA ENGINEER Louis Johnston

BORING LOCATION See Site Plan
GROUND SURFACE ELEVATION 631.5 DATUM 635.30 BM#6
DATE START 10-24-90 DATE END 10-24-90

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

METHOD: 4-1/4" I.D./8.5" O.D. HOLLOW STEM AUGER

RIG TYPE: CME-55 TRUCK-MOUNTED

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME

DEPTH	SAMPLE NO.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION / UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
									Pocket Penetrometer	
				0 - 3		Sandy TOPSOIL, Brown.	Fill			
5	1	SS	18/12	3.5 - 5	4-4-4	FILL: Sandy CLAY, Brown, Changing to Hard, Sandy CLAY, Gray and Brown, Damp (CL) at 4.5'.	CLAY 5'		4.5 TSF	
10	2	SS	18/18	8.5 - 10	9-17-22	Hard, Silty CLAY with Fine Sand, Brown, Low Plasticity, Damp (CL).			>4.5 TSF	
15	3	SS	18/18	13.5 - 15	5-8-11	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Damp (CL).			4.0 TSF	
20	4	ST	24/22	18.5-20.5	Pushed	Stiff, Clayey SILT, Trace Sand, Gray, Low Plasticity, Damp (ML).	SILT			
25	5	SS	18/18	23.5 - 25	4-7-11	Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Wet (CL).	CLAY		1.5 TSF	
30	6	SS	18/18	28.5 - 30	5-5-7	Very Stiff, Silty CLAY, Trace Sand and Gravel, Gray, Medium Plasticity, Wet (CL).			2.5 TSF	
35	7	SS	18/0	33.5 - 35	4-6-9	Stiff, Silty CLAY, Trace Sand, Gray, Medium Plasticity, Wet (CL).			1.5 TSF	1
40		ST	18/0	38.5 - 40	Pushed					2

REMARKS:
1. Pushed spoon again to recover sample (8').
2. Tube crushed, no sample. Driving spoon to recover sample.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

FILE:60669SB.20

GOLDBERG-ZOINO & ASSOCIATES, INC.
38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
City Environmental, Inc.
Frederick Street Facility

REPORT OF BORING No. SB-20
SHEET 2 OF 2
FILE No. 60669
CHKD. BY

DEPTH	SAMPLE No.	TYPE	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION / UNIFIED CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMARKS
		SS	18/18	38.5- 40	3-6-8	Stiff, Silty CLAY with Sand and Gravel, Medium Plasticity, Wet (CL).	CLAY		1.5 TSF	
45	9	ST	24/24	43.5-45.5	Pushed	Stiff, Silty CLAY, Trace Sand, Medium Plasticity, Wet (CL).			1.5 TSF	
							47'			
50	10	SS	18/10	48.5- 50	1-1-4	Loose, Fine to Medium SAND with Some Clay, Gray, Non-Plastic, Wet (SC).	SAND			
							52'			
55	11	SS	18/12	53.5-55	6-7-16	Very Stiff, Silty CLAY with Little Sand and Trace Gravel, Gray, Medium Plasticity, Wet (CL).	CLAY			3
						End of Boring at 55 Feet	55'			
60										
65										
70										
75										
80										
85										

REMARKS:

3. Monitoring well SB-20 installed in boring SB-20.

NOTES:
1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GZA

File:60669SB.202

MONITORING WELL INSTALLATION REPORT

WELL #MW-20

GOLDBERG-ZOINO & ASSOCIATES, INC. 38019 SCHOOLCRAFT ROAD, LIVONIA, MI 48150 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT DESCRIPTION: City Environmental, Inc. Frederick Street Facility LOCATION: Detroit, Michigan	FILE NO: 60669 DATE: 10-24-90
FIELD REP: Louis A. Johnston SITE CONDITIONS: Grassy Field WEATHER CONDITIONS: Sunny 60°	DRILLING CONTRACTOR: Great Lakes Drilling DRILLER: Mike Warden INSTALLATION METHOD: Hollow Stem Auger	ELEV DATUM: 635.30' BM#6 GROUND ELEV: 631.5' TOP OF WELL ELEV: 632.93' DATE SURVEYED: 1-9-91 SURVEYED BY: JAB

MONITORING WELL DETAILS

WELLSCREEN DIA: 2.5" TYPE: PVC

SLOT SIZE: 0.010" LENGTH: 10'

WELL RISER DIA: 2.5" TYPE: PVC

PIPE CONNECTIONS: Loc Joint LENGTH:

FILTER SAND TYPE: Silica OTHER: Natural

PROTECTIVE CASING: Yes

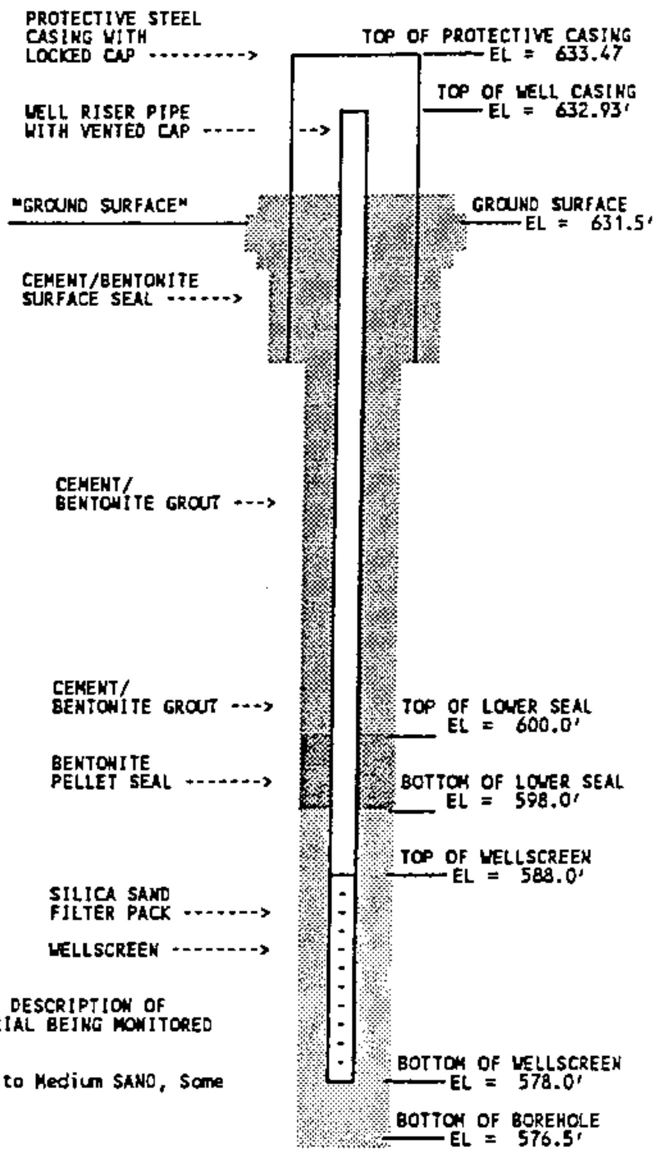
LOCKED CAP: Yes LOCK NO:

CASING DIA: LENGTH:

GROUNDWATER MEASUREMENT DATA

DATE	TIME	DEPTH	METHOD	ELEV.
11-21-90		21.98'	ELI	610.95'
12-10-90	2:45	14.40'	ELI	618.53'

MONITORING WELL DRAWING



DESCRIPTION OF MATERIAL BEING MONITORED

Fine to Medium SAND, Some Clay

MONITORING WELL DRAWING NOT TO SCALE.

REMARKS:

FILE:60669MW.20

GZA REPRESENTATIVE INITIAL L. L. DATE 1-3-91

ATTACHMENT 4

GROUNDWATER ANALYTICAL LABORATORY RESULTS

SUMMARY TABLES

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW1 890	MW2A 889	MW3 886	MW6 893	MW7 892	MW8 894	MDL
Metals (ppb)							
Copper	ND	ND	ND	ND	ND	ND	25
Zinc	570	577	205	294	224	208	20
Arsenic	ND	ND	ND	ND	ND	ND	5
Barium	ND	286	ND	ND	ND	203	200
Cadmium	ND	ND	ND	ND	ND	ND	0.5
Chromium	ND	ND	ND	ND	ND	ND	50
Lead	ND	ND	ND	ND	ND	ND	3
Mercury	ND	ND	ND	ND	ND	ND	0.2
Selenium	ND	ND	ND	ND	ND	ND	5
Silver	ND	ND	ND	ND	ND	ND	0.5
Iron	ND	ND	ND	ND	ND	ND	100
Sodium	155000	64700	144000	104000	110000	91700	0.5
Manganese	139	930	ND	ND	114	35	20
Chloride	<8%	<8%	<8%	<8%	<8%	<8%	10000
Nitrate	5110	ND	4120	3360	ND	ND	100
Volatiles (ppb)							
2-Hexanone	ND	ND	ND	ND	ND	ND	50
Benzene	ND	ND	ND	ND	ND	ND	5
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	ND	ND	ND	1
Chloroform	ND	ND	ND	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	1
Methyl Ethyl Ketone	ND	ND	ND	ND	ND	ND	50
Tetrachloroethene	ND	ND	ND	ND	ND	ND	1
Vinyl Chloride	ND	ND	ND	ND	ND	ND	1
Acetone	ND	ND	ND	ND	ND	ND	100
Bromodichloromethane	ND	ND	ND	ND	ND	ND	1
Bromoform	ND	ND	ND	ND	ND	ND	1
Bromomethane	ND	ND	ND	ND	ND	ND	1
Carbon Disulfide	ND	ND	ND	ND	ND	ND	50
Chloroethane	ND	ND	ND	ND	ND	ND	1
Chloromethane	ND	ND	ND	ND	ND	ND	1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	1
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	1
Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	1
cis-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
trans-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Ethylbenzene	ND	ND	ND	ND	ND	ND	1
Methylene Chloride	ND	ND	ND	ND	ND	ND	5
Methyl Isobutyl Ketone	ND	ND	ND	ND	ND	ND	50
Styrene	ND	ND	ND	ND	ND	ND	1
Trichloroethene	ND	ND	ND	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	1
Toluene	ND	ND	ND	ND	ND	ND	1
Vinyl Acetate	ND	ND	ND	ND	ND	ND	50
Xylenes	ND	ND	ND	ND	ND	ND	3

Continued,..........

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW1 890	MW2A 889	MW3 886	MW6 893	MW7 892	MW8 894	MDL
Semi-Volatiles (ppb)							
Acenaphtene	ND	ND	ND	ND	ND	ND	5
Acenaphthylene	ND	ND	ND	ND	ND	ND	5
Anthracene	ND	ND	ND	ND	ND	ND	5
Benzidine	ND	ND	ND	ND	ND	ND	50
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	5
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Chrysene	ND	15	ND	ND	ND	ND	5
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	5
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	5
Diethyl phthalate	ND	ND	ND	ND	ND	ND	5
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	5
Fluorene	ND	ND	ND	ND	ND	ND	5
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	5
Hexachloro-1,3-butadiene	ND	ND	ND	ND	ND	ND	5
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	5
Hexachloroethane	ND	ND	ND	ND	ND	ND	5
Isophorone	ND	ND	ND	ND	ND	ND	2
Naphthalene	ND	ND	ND	ND	ND	ND	5
Nitrobenzene	ND	ND	ND	ND	ND	ND	5
n_Nitroso-dimethylamine	ND	ND	ND	ND	ND	ND	40
n_Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	ND	5
n_Nitroso-diphenylamine	ND	ND	ND	ND	ND	ND	5
P-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	20
Pentachlorophenol	ND	ND	ND	ND	ND	ND	20
Phenanthrene	ND	9	ND	ND	ND	ND	5
Phenol	ND	ND	ND	ND	ND	ND	5
Pyrene	ND	13	ND	ND	ND	ND	5
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	5
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	5
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Benzo(a)anthracene	ND	6	ND	ND	ND	ND	5
Benzo (a) pyrene	ND	7	ND	ND	ND	ND	5
Benzo (b) fluoranthene	ND	ND	ND	ND	ND	ND	5
Benzo (k) fluoranthene	ND	ND	ND	ND	ND	ND	5
Benzo (ghi) perylene	ND	ND	ND	ND	ND	ND	5
Dibenzo (a,h) anthracene	ND	ND	ND	ND	ND	ND	5
Indeno (1,2,3-cd) pyrene	ND	ND	ND	ND	ND	ND	5
3,3-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	20
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	5
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
2-Nitrophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	50
4,6-Dinirto-o-cresol	ND	ND	ND	ND	ND	ND	50
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
Fluoranthene	ND	12	ND	ND	ND	ND	5
Hexachlorocyclopentadine	ND	ND	ND	ND	ND	ND	5
2-Nitroaniline	ND	ND	ND	ND	ND	ND	50
3-Nitroaniline	ND	ND	ND	ND	ND	ND	50
4-Nitroaniline	ND	ND	ND	ND	ND	ND	20
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Ethyl hexyl phthalate	ND	ND	ND	ND	ND	ND	5

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW9 895	MW10 896	MW11 897	MW15 888	MW20 887	MW22 898	MDL
Metals (ppb)							
Copper	ND	ND	ND	ND	ND	ND	25
Zinc	107	133	311	378	307	168	20
Arsenic	ND	ND	ND	ND	ND	ND	5
Barium	ND	ND	ND	325	ND	ND	200
Cadmium	ND	ND	ND	ND	ND	ND	0.5
Chromium	ND	ND	ND	ND	ND	ND	50
Lead	ND	ND	ND	ND	ND	ND	3
Mercury	ND	ND	ND	ND	ND	ND	0.2
Selenium	ND	ND	ND	ND	ND	ND	5
Silver	ND	ND	ND	ND	ND	ND	0.5
Iron	ND	ND	ND	117	ND	ND	100
Sodium	112000	124000	140000	93600	135000	84500	0.5
Manganese	45	75	ND	188	86	ND	20
Chloride	<8%	8%	<8%	<8%	<8%	<8%	10000
Nitrate	3880	3750	ND	2560	2820	ND	100
Volatiles (ppb)							
2-Hexanone	ND	ND	ND	ND	ND	ND	50
Benzene	ND	ND	ND	ND	ND	ND	5
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	1
Chlorobenzene	ND	ND	ND	ND	ND	ND	1
Chloroform	ND	ND	ND	ND	ND	ND	1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,1-Dichloroethylene	ND	ND	ND	ND	ND	ND	1
Methyl Ethyl Ketone	ND	ND	ND	ND	ND	ND	50
Tetrachloroethene	ND	ND	ND	ND	ND	ND	1
Vinyl Chloride	ND	ND	ND	ND	ND	ND	1
Acetone	ND	ND	ND	ND	ND	ND	100
Bromodichloromethane	ND	ND	ND	ND	ND	ND	1
Bromoform	ND	ND	ND	ND	ND	ND	1
Bromomethane	ND	ND	ND	ND	ND	ND	1
Carbon Disulfide	ND	ND	ND	ND	ND	ND	50
Chloroethane	ND	ND	ND	ND	ND	ND	1
Chloromethane	ND	ND	ND	ND	ND	ND	1
Dibromochloromethane	ND	ND	ND	ND	ND	ND	1
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	1
Dichloroethane	ND	ND	ND	ND	ND	ND	1
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	1
cis-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
trans-1,3-dichloropropene	ND	ND	ND	ND	ND	ND	1
Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Ethylbenzene	ND	ND	ND	ND	ND	ND	1
Methylene Chloride	ND	ND	ND	ND	ND	ND	5
Methyl Isobutyl Ketone	ND	ND	ND	ND	ND	ND	50
Styrene	ND	ND	ND	ND	ND	ND	1
Trichloroethene	ND	ND	ND	ND	ND	ND	1
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	1
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	1
Toluene	ND	ND	ND	ND	ND	ND	1
Vinyl Acetate	ND	ND	ND	ND	ND	ND	50
Xylenes	ND	ND	ND	ND	ND	ND	3

Continued,..........

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW9 895	MW10 896	MW11 897	MW15 888	MW20 887	MW22 898	MDL
<u>Semi-Volatiles (ppb)</u>							
Acenaphtene	ND	ND	ND	ND	ND	ND	5
Acenaphthylene	ND	ND	ND	ND	ND	ND	5
Anthracene	ND	ND	ND	ND	ND	ND	5
Benzidine	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	50
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	5
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	5
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Chrysene	ND	ND	ND	27	ND	ND	5
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	5
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	5
Diethyl phthalate	ND	ND	ND	ND	ND	ND	5
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	5
Fluorene	ND	ND	ND	ND	ND	ND	5
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	5
Hexachloro-1,3-butadiene	ND	ND	ND	ND	ND	ND	5
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	5
Hexachloroethane	ND	ND	ND	ND	ND	ND	5
Isophorone	ND	ND	ND	ND	ND	ND	2
Naphthalene	ND	ND	ND	ND	ND	ND	5
Nitrobenzene	ND	ND	ND	ND	ND	ND	5
n_Nitroso-dimethylamine	ND	ND	ND	ND	ND	ND	40
n_Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	ND	5
n_Nitroso-diphenylamine	ND	ND	ND	ND	ND	ND	5
P-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	20
Pentachlorophenol	ND	ND	ND	ND	ND	ND	20
Phenanthrene	ND	ND	ND	9	ND	ND	5
Phenol	ND	ND	ND	ND	ND	ND	5
Pyrene	ND	ND	ND	34	ND	ND	5
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	5
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	5
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	1
Benzo(a)anthracene	ND	ND	ND	12	ND	ND	5
Benzo (a) pyrene	ND	ND	ND	10	ND	ND	5
Benzo (b) fluoranthene	ND	ND	ND	17	ND	ND	5
Benzo (k) fluoranthene	ND	ND	ND	20	ND	ND	5
Benzo (ghi) perylene	ND	ND	ND	16	ND	ND	5
Dibenzo (a,h) anthracene	ND	ND	ND	ND	ND	ND	5
Indeno (1,2,3-cd) pyrene	ND	ND	ND	ND	ND	ND	5
3,3-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	20
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	5
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	5
2-Nitrophenol	ND	ND	ND	ND	ND	ND	5
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	50
4,6-Dinirto-o-cresol	ND	ND	ND	ND	ND	ND	50
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	5
Fluoranthene	ND	ND	ND	11	ND	ND	5
Hexachlorocyclopentadine	ND	ND	ND	ND	ND	ND	5
2-Nitroaniline	ND	ND	ND	ND	ND	ND	50
3-Nitroaniline	ND	ND	ND	ND	ND	ND	50
4-Nitroaniline	ND	ND	ND	ND	ND	ND	20
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	5
Ethyl hexyl phthalate	ND	ND	ND	ND	ND	ND	5

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW24 891	MDL
Metals (ppb)		
Copper	ND	25
Zinc	321	20
Arsenic	ND	5
Barium	ND	200
Cadmium	ND	0.5
Chromium	ND	50
Lead	ND	3
Mercury	ND	0.2
Selenium	ND	5
Silver	ND	0.5
Iron	ND	100
Sodium	90000	0.5
Manganese	ND	20
Chloride	<8%	10000
Nitrate	3950	100
Volatiles (ppb)		
2-Hexanone	ND	50
Benzene	ND	5
Carbon Tetrachloride	ND	1
Chlorobenzene	ND	1
Chloroform	ND	1
1,2-Dichloroethane	ND	1
1,1-Dichloroethylene	ND	1
Methyl Ethyl Ketone	ND	50
Tetrachloroethene	ND	1
Vinyl Chloride	ND	1
Acetone	ND	100
Bromodichloromethane	ND	1
Bromoform	ND	1
Bromomethane	ND	1
Carbon Disulfide	ND	50
Chloroethane	ND	1
Chloromethane	ND	1
Dibromochloromethane	ND	1
Dichlorodifluoromethane	ND	1
Dichloroethane	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-dichloropropene	ND	1
trans-1,3-dichloropropene	ND	1
Dichlorobenzene	ND	1
Ethylbenzene	ND	1
Methylene Chloride	ND	5
Methyl Isobutyl Ketone	ND	50
Styrene	ND	1
Trichloroethene	ND	1
1,1,1-Trichloroethane	ND	1
1,1,2,2-Trichloroethane	ND	1
1,1,2-Trichloroethane	ND	1
Trichlorofluoromethane	ND	1
Toluene	ND	1
Vinyl Acetate	ND	50
Xylenes	ND	3

Continued,..........

SUMMARY OF THE ANALYZED WATER SAMPLES (December 1998)
USL CEI-Frederick - Detroit, Michigan

USL CEI Sample # 19___	MW24 891	
Semi-Volatiles (ppb)		
Acenaphtene	ND	5
Acenaphthylene	ND	5
Anthracene	ND	5
Benzidine	ND	50
Bis(2-chloroethoxy)methane	ND	5
Bis(2-chloroethyl)ether	ND	5
Bis(2-chloroisopropyl)ether	ND	5
Bis(2-ethylhexyl)phthalate	ND	5
Butyl benzyl phthalate	ND	5
Chrysene	ND	5
Di-n-butyl phthalate	ND	5
Di-n-octyl phthalate	ND	5
Diethyl phthalate	ND	5
Dimethyl phthalate	ND	5
Fluorene	ND	5
Hexachlorobenzene	ND	5
Hexachloro-1,3-butadiene	ND	5
Hexachlorocyclopentadiene	ND	5
Hexachloroethane	ND	5
Isophorone	ND	2
Naphthalene	ND	5
Nitrobenzene	ND	5
n_Nitroso-dimethylamine	ND	5
n_Nitroso-di-n-propylamine	ND	40
n_Nitroso-diphenylamine	ND	5
p-Chloro-m-cresol	ND	5
Pentachlorophenol	ND	20
Phenanthrene	ND	20
Phenol	ND	5
Pyrene	ND	5
1,2,4-Trichlorobenzene	ND	5
2-Chloronaphthalene	ND	5
2,4,6-Trichlorophenol	ND	5
1,2-Dichlorobenzene	ND	5
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
Benzo(a)anthracene	ND	1
Benzo (a) pyrene	ND	5
Benzo (b) fluoranthene	ND	5
Benzo (k) fluoranthene	ND	5
Benzo (ghi) perylene	ND	5
Dibenzo (a,h) anthracene	ND	5
Indeno (1,2,3-cd) pyrene	ND	5
3,3-Dichlorobenzidine	ND	5
2,4-Dichlorophenol	ND	20
2,4-Dimetbylphenol	ND	5
4-Chlorophenyl phenyl ether	ND	5
4-Bromophenyl phenyl ether	ND	5
2-Nitrophenol	ND	5
2,4-Dinitrophenol	ND	5
4,6-Dinirto-o-cresol	ND	50
2,4-Dinitrotoluene	ND	50
2,6-Dinitrotoluene	ND	5
Fluoranthene	ND	5
Hexachlorocyclopentadine	ND	5
2-Nitroaniline	ND	5
3-Nitroaniline	ND	50
4-Nitroaniline	ND	50
Butyl benzyl phthalate	ND	20
Ethyl hexyl phthalate	ND	5
		5

SUMMARY OF THE ANALYZED WATER SAMPLES
USL CEI-Frederick - Detroit, Michigan

February 1999

USL CEI Sample # 20___	MW2A 235	MW15 205	MDL
Metals (ppb)			
Zinc	ND	193	20
Barium	ND	ND	200
Sodium	132000	93500	0.5
Manganese	ND	ND	20
Semi-Volatiles (ppb)			
Benzo(a)anthracene	ND	ND	5
Benzo (a) pyrene	ND	ND	5
Benzo (b) fluoranthene	NA	ND	5
Benzo (k) fluoranthene	NA	ND	5
Benzo (ghi) perylene	NA	ND	
Dibenzo (a,h) anthracene	NA	ND	5
Fluoranthene	ND	ND	5
Chrysene	ND	ND	5
Phenanthrene	ND	ND	5
Phenol	ND	ND	5
Pyrene	ND	ND	5

NA = Not Analyzed

ANALYTICAL LABORATORY REPORTS

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19890

Date Received: December :
Date Completed: January 05.

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-1 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST!

Test Description	Results	Units	W:
Iron	< 0.100	ppm	
Sodium	155	ppm	
Manganese	0.139	ppm	
% Chloride	< 0.008	%	
Nitrate	5.11	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	I
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19890

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.005	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.020	ppm
	< 0.005	ppm

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January 06, 1999

Sample Number: 19890

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	0
Zinc	0.570	ppm	0
Arsenic	< 0.005	ppm	D
Barium	< 0.200	ppm	D
Cadmium	< 0.0005	ppm	D
Chromium	< 0.005	ppm	D
Lead	< 0.003	ppm	D
Mercury	< 0.0002	ppm	D
Selenium	< 0.005	ppm	D
Silver	< 0.0005	ppm	D

Reviewed By: Daniel Kong

Manager:

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19889

Date Received: December :
Date Completed: January 05

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-2A - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTi

Test Description	Results	Units	W:
Iron	< 0.100	ppm	
Sodium	64.7	ppm	
Manganese	0.930	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	I
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.100	ppm	
Methyl ethyl ketone	< 0.100	ppm	

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January 06, 1999

Sample Number: 19889

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	0.006	ppm
Benzo(a)pyrene	0.007	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	0.015	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19889

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	0.012	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.005	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.050	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.005	ppm	
N-Nitrosodi-n-propylamine	< 0.050	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.005	ppm	
Phenanthrene	< 0.020	ppm	
Phenol	0.009	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	0.013	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.005	ppm	
Zinc	< 0.025	ppm	0
Arsenic	0.577	ppm	0
Barium	< 0.005	ppm	D
Cadmium	0.286	ppm	D
Chromium	< 0.0005	ppm	D
Lead	< 0.005	ppm	D
Mercury	< 0.003	ppm	D
Selenium	< 0.0002	ppm	D
Silver	< 0.005	ppm	D
	< 0.0005	ppm	D

Reviewed By: Daniel Kong

Manager:

CITY Environmental, Inc.

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 18, 1999

Sample Number: 19886

Date Received: December
Date Completed: January 05

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Customer # 108839

Sample Identification: MW-3 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST

Test Description	Results	Units	W
Iron	< 0.100	ppm	
Sodium	144	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	4.12	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.100	ppm	

USL CITY Environmental, Inc.

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
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January 06, 1999

Sample Number: 19886

Methylene chloride	< 0.001	ppm
Methyl Isobutyl Ketone	< 0.001	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
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January 06, 1999

Sample Number: 19886

Di-n-octyl phthalate	< 0.005	ppm
Fluoranthene	< 0.005	ppm
Fluorene	< 0.005	ppm
Hexachlorobenzene	< 0.005	ppm
Hexachloro-1,3-butadiene	< 0.005	ppm
Hexachlorocyclopentadiene	< 0.005	ppm
Hexachloroethane	< 0.005	ppm
Indeno(1,2,3-cd)pyrene	< 0.005	ppm
Isophorone	< 0.005	ppm
2-Methylnaphthalene	< 0.005	ppm
2-Methylphenol	< 0.005	ppm
4-Methylphenol	< 0.005	ppm
Naphthalene	< 0.005	ppm
N-Nitrosodimethylamine	< 0.005	ppm
m-Nitroaniline	< 0.005	ppm
o-Nitroaniline	< 0.050	ppm
p-Nitroaniline	< 0.050	ppm
N-Nitrosodiphenylamine	< 0.050	ppm
2-Nitrophenol	< 0.005	ppm
4-Nitrophenol	< 0.005	ppm
N-Nitrosodi-n-propylamine	< 0.050	ppm
Nitrobenzene	< 0.005	ppm
Pentachlorophenol	< 0.005	ppm
Phenanthrene	< 0.020	ppm
Phenol	< 0.005	ppm
2-Picoline	< 0.005	ppm
Pyrene	< 0.005	ppm
Pyridine	< 0.005	ppm
2,3,4,6-Tetrachlorophenol	< 0.005	ppm
1,2,4-Trichlorobenzene	< 0.005	ppm
2,4,5-Trichlorobphenol	< 0.005	ppm
2,4,6-Trichlorophenol	< 0.005	ppm
Copper	< 0.005	ppm
Zinc	< 0.025	ppm
Arsenic	0.205	ppm
Barium	< 0.005	ppm
Cadmium	< 0.200	ppm
Chromium	< 0.0005	ppm
Lead	< 0.005	ppm
Mercury	< 0.003	ppm
Selenium	< 0.0002	ppm
Silver	< 0.005	ppm
	< 0.0005	ppm

Reviewed By: Daniel Kong

Manager:

USL CITY Environmental, Inc.

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313) 9
FAX: (313) 9
SALES FAX: (313) 9

January 06, 1999

Sample Number: 19893

Date Received: December 2
Date Completed: January 05,

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-6 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Wa
Iron	< 0.100	ppm	
Sodium	104	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	3.36	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

JSL CITY Environmental, Inc.

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
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January 06, 1999

Sample Number: 19893

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313) 9
FAX: (313) 9
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January 06, 1999

Sample Number: 19893

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	0
Zinc	0.294	ppm	0
Arsenic	< 0.005	ppm	I
Barium	< 0.200	ppm	I
Cadmium	< 0.0005	ppm	I
Chromium	< 0.005	ppm	I
Lead	< 0.003	ppm	I
Mercury	< 0.0002	ppm	I
Selenium	< 0.005	ppm	I
Silver	< 0.0005	ppm	I

Reviewed By: David Kong

Manager:

JSL CITY Environmental, Inc.

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19892

Date Received: December :
Date Completed: January 05

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer# 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-7 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST

Test Description	Results	Units	W
Iron	< 0.100	ppm	
Sodium	110	ppm	
Manganese	0.114	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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FAX: (313)
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January 06, 1999

Sample Number: 19892

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Styrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.050	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.005	ppm
	< 0.005	ppm

USL CITY Environmental, Inc.

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
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January 06, 1999

Sample Number: 19892

Di-n-octyl phthalate		
Fluoranthene	< 0.005	ppm
Fluorene	< 0.005	ppm
Hexachlorobenzene	< 0.005	ppm
Hexachloro-1,3-butadiene	< 0.005	ppm
Hexachlorocyclopentadiene	< 0.005	ppm
Hexachloroethane	< 0.005	ppm
Indeno(1,2,3-cd)pyrene	< 0.005	ppm
Isophorone	< 0.005	ppm
2-Methylnaphthalene	< 0.005	ppm
2-Methylphenol	< 0.005	ppm
4-Methylphenol	< 0.005	ppm
Naphthalene	< 0.005	ppm
N-Nitrosodimethylamine	< 0.005	ppm
m-Nitroaniline	< 0.005	ppm
o-Nitroaniline	< 0.050	ppm
p-Nitroaniline	< 0.050	ppm
N-Nitrosodiphenylamine	< 0.050	ppm
2-Nitrophenol	< 0.005	ppm
4-Nitrophenol	< 0.005	ppm
N-Nitrosodi-n-propylamine	< 0.050	ppm
Nitrobenzene	< 0.005	ppm
Pentachlorophenol	< 0.005	ppm
Phenanthrene	< 0.020	ppm
Phenol	< 0.005	ppm
2-Picoline	< 0.005	ppm
Pyrene	< 0.005	ppm
Pyridine	< 0.005	ppm
2,3,4,6-Tetrachlorophenol	< 0.005	ppm
1,2,4-Trichlorobenzene	< 0.005	ppm
2,4,5-Trichlorophenol	< 0.005	ppm
2,4,6-Trichlorophenol	< 0.005	ppm
Copper	< 0.005	ppm
Zinc	< 0.025	ppm
Arsenic	0.224	ppm
Barium	< 0.005	ppm
Cadmium	< 0.200	ppm
Chromium	< 0.0005	ppm
Lead	< 0.005	ppm
Mercury	< 0.003	ppm
Selenium	< 0.0002	ppm
Silver	< 0.005	ppm
	< 0.0005	ppm

Reviewed By: Daniel Koncz

Manager:

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19894

Date Received: December
Date Completed: January 05

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer# 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-8 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST

Test Description	Results	Units	W
Iron	< 0.100	ppm	
Sodium	91.7	ppm	
Manganese	0.035	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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FAX: (313) 9
SALES FAX: (313) 9

January 06, 1999

Sample Number: 19894

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	0.006	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.005	ppm
	< 0.005	ppm

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January 06, 1999

Sample Number: 19894

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	0(
Zinc	0.208	ppm	0(
Arsenic	< 0.005	ppm	D
Barium	0.203	ppm	D
Cadmium	< 0.0005	ppm	D
Chromium	< 0.005	ppm	D
Lead	< 0.003	ppm	D
Mercury	< 0.0002	ppm	D
Selenium	< 0.005	ppm	D
Silver	< 0.0005	ppm	D

Reviewed By: Daniel Kon

Manager: Zn

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FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19895

Date Received: December 1
Date Completed: January 05,

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-9 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST

Test Description	Results	Units	W
Iron	< 0.100	ppm	
Sodium	112	ppm	
Manganese	0.045	ppm	
% Chloride	< 0.008	%	
Nitrate	3.88	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	1
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19895

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19895

Di-n-octyl phthalate	< 0.005	ppm
Fluoranthene	< 0.005	ppm
Fluorene	< 0.005	ppm
Hexachlorobenzene	< 0.005	ppm
Hexachloro-1,3-butadiene	< 0.005	ppm
Hexachlorocyclopentadiene	< 0.005	ppm
Hexachloroethane	< 0.005	ppm
Indeno(1,2,3-cd)pyrene	< 0.005	ppm
Isophorone	< 0.005	ppm
2-Methylnaphthalene	< 0.005	ppm
2-Methylphenol	< 0.005	ppm
4-Methylphenol	< 0.005	ppm
Naphthalene	< 0.005	ppm
N-Nitrosodimethylamine	< 0.005	ppm
m-Nitroaniline	< 0.050	ppm
o-Nitroaniline	< 0.050	ppm
p-Nitroaniline	< 0.050	ppm
N-Nitrosodiphenylamine	< 0.005	ppm
2-Nitrophenol	< 0.005	ppm
4-Nitrophenol	< 0.050	ppm
N-Nitrosodi-n-propylamine	< 0.005	ppm
Nitrobenzene	< 0.005	ppm
Pentachlorophenol	< 0.020	ppm
Phenanthrene	< 0.005	ppm
Phenol	< 0.005	ppm
2-Picoline	< 0.005	ppm
Pyrene	< 0.005	ppm
Pyridine	< 0.005	ppm
2,3,4,6-Tetrachlorophenol	< 0.005	ppm
1,2,4-Trichlorobenzene	< 0.005	ppm
2,4,5-Trichlorohphenol	< 0.005	ppm
2,4,6-Trichlorophenol	< 0.005	ppm
Copper	< 0.025	ppm
Zinc	0.107	ppm
Arsenic	< 0.005	ppm
Barium	< 0.200	ppm
Cadmium	< 0.0005	ppm
Chromium	< 0.005	ppm
Lead	< 0.003	ppm
Mercury	< 0.0002	ppm
Selenium	< 0.005	ppm
Silver	< 0.0005	ppm

Reviewed By: Daniel Koncz

Manager:

JSL CITY Environmental, Inc.

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FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19896

Date Received: December
Date Completed: January 05

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-10 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST

Test Description	Results	Units	W
Iron	< 0.100	ppm	
Sodium	124	ppm	
Manganese	0.075	ppm	
% Chloride	< 0.008	%	
Nitrate	3.75	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.001	ppm	
Chlorobenzene	< 0.050	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.001	ppm	
Methyl ethyl ketone	< 0.050	ppm	
	< 0.050	ppm	

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January 06, 1999

Sample Number: 19896

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.005	ppm
	< 0.005	ppm

USL CITY Environmental, Inc.

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January 06, 1999

Sample Number: 19896

Di-n-octyl phthalate	< 0.005	ppm
Fluoranthene	< 0.005	ppm
Fluorene	< 0.005	ppm
Hexachlorobenzene	< 0.005	ppm
Hexachloro-1,3-butadiene	< 0.005	ppm
Hexachlorocyclopentadiene	< 0.005	ppm
Hexachloroethane	< 0.005	ppm
Indeno(1,2,3-cd)pyrene	< 0.005	ppm
Isophorone	< 0.005	ppm
2-Methylnaphthalene	< 0.005	ppm
2-Methylphenol	< 0.005	ppm
4-Methylphenol	< 0.005	ppm
Naphthalene	< 0.005	ppm
N-Nitrosodimethylamine	< 0.005	ppm
m-Nitroaniline	< 0.050	ppm
o-Nitroaniline	< 0.050	ppm
p-Nitroaniline	< 0.050	ppm
N-Nitrosodiphenylamine	< 0.005	ppm
2-Nitrophenol	< 0.005	ppm
4-Nitrophenol	< 0.050	ppm
N-Nitrosodi-n-propylamine	< 0.005	ppm
Nitrobenzene	< 0.005	ppm
Pentachlorophenol	< 0.020	ppm
Phenanthrene	< 0.005	ppm
Phenol	< 0.005	ppm
2-Picoline	< 0.005	ppm
Pyrene	< 0.005	ppm
Pyridine	< 0.005	ppm
2,3,4,6-Tetrachlorophenol	< 0.005	ppm
1,2,4-Trichlorobenzene	< 0.005	ppm
2,4,5-Trichlorohphenol	< 0.005	ppm
2,4,6-Trichlorophenol	< 0.005	ppm
Copper	< 0.025	ppm
Zinc	0.133	ppm
Arsenic	< 0.005	ppm
Barium	< 0.200	ppm
Cadmium	< 0.0005	ppm
Chromium	< 0.005	ppm
Lead	< 0.003	ppm
Mercury	< 0.0002	ppm
Selenium	< 0.005	ppm
Silver	< 0.0005	ppm

Reviewed By: Daniel Kon

Manager:

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FAX: (313) 9
SALES FAX: (313) 9

January 06, 1999

Sample Number: 19897

Date Received: December 2
Date Completed: January 05,

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-11 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTI

Test Description	Results	Units	W
Iron	< 0.100	ppm	
Sodium	140	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	< 1	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	I
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

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January 06, 1999

Sample Number: 19897

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.005	ppm
	< 0.005	ppm

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January 06, 1999

Sample Number: 19897

Di-n-octyl phthalate	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Fluorene	< 0.005	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.050	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.005	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.050	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.020	ppm	
Phenanthrene	< 0.005	ppm	
Phenol	< 0.005	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	< 0.005	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.025	ppm	0(
Zinc	0.311	ppm	0(
Arsenic	< 0.005	ppm	D
Barium	< 0.200	ppm	D
Cadmium	< 0.0005	ppm	D
Chromium	< 0.005	ppm	D
Lead	< 0.003	ppm	D
Mercury	< 0.0002	ppm	D
Selenium	< 0.005	ppm	D
Silver	< 0.0005	ppm	D

Reviewed By: Daniel Kong

Manager:

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 18, 1999

Sample Number: 19888

Date Received: December 2

Date Completed: January 05,

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US

Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-15 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTI

Test Description	Results	Units	W:
Iron	0.117	ppm	
Sodium	93.6	ppm	
Manganese	0.188	ppm	
% Chloride	< 0.008	%	
Nitrate	2.56	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	I
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.100	ppm	

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January 06, 1999

Sample Number: 19888

Methylene chloride	< 0.001	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.100	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	0.012	ppm
Benzo(a)pyrene	0.010	ppm
Benzo(b)fluoranthene	0.017	ppm
Benzo(g,h,i)perylene	0.016	ppm
Benzo(k)fluoranthene	0.020	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	0.027	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.005	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19888

Di-n-octyl phthalate			
Fluoranthene	< 0.005	ppm	
Fluorene	0.011	ppm	
Hexachlorobenzene	< 0.005	ppm	
Hexachloro-1,3-butadiene	< 0.005	ppm	
Hexachlorocyclopentadiene	< 0.005	ppm	
Hexachloroethane	< 0.005	ppm	
Indeno(1,2,3-cd)pyrene	< 0.005	ppm	
Isophorone	< 0.005	ppm	
2-Methylnaphthalene	< 0.005	ppm	
2-Methylphenol	< 0.005	ppm	
4-Methylphenol	< 0.005	ppm	
Naphthalene	< 0.005	ppm	
N-Nitrosodimethylamine	< 0.005	ppm	
m-Nitroaniline	< 0.005	ppm	
o-Nitroaniline	< 0.050	ppm	
p-Nitroaniline	< 0.050	ppm	
N-Nitrosodiphenylamine	< 0.050	ppm	
2-Nitrophenol	< 0.005	ppm	
4-Nitrophenol	< 0.005	ppm	
N-Nitrosodi-n-propylamine	< 0.005	ppm	
Nitrobenzene	< 0.005	ppm	
Pentachlorophenol	< 0.005	ppm	
Phenanthrene	< 0.020	ppm	
Phenol	0.009	ppm	
2-Picoline	< 0.005	ppm	
Pyrene	< 0.005	ppm	
Pyridine	0.034	ppm	
2,3,4,6-Tetrachlorophenol	< 0.005	ppm	
1,2,4-Trichlorobenzene	< 0.005	ppm	
2,4,5-Trichlorohphenol	< 0.005	ppm	
2,4,6-Trichlorophenol	< 0.005	ppm	
Copper	< 0.005	ppm	
Zinc	< 0.025	ppm	0(
Arsenic	0.378	ppm	0(
Barium	< 0.005	ppm	D
Cadmium	0.325	ppm	D
Chromium	< 0.0005	ppm	D
Lead	< 0.005	ppm	D
Mercury	< 0.003	ppm	D
Selenium	< 0.0002	ppm	D
Silver	< 0.005	ppm	D
	< 0.0005	ppm	D(

Reviewed By: Daniel Konsa

Manager:

USL CITY Environmental, Inc.

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 18, 1999

Sample Number: 19887

Date Received: December
Date Completed: January 05

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-20-Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST

Test Description	Results	Units	W
Iron	< 0.100	ppm	
Sodium	135	ppm	
Manganese	0.086	ppm	
% Chloride	< 0.008	%	
Nitrate	2.82	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.001	ppm	
Chlorobenzene	< 0.050	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.001	ppm	
Methyl ethyl ketone	< 0.100	ppm	
	< 0.050	ppm	

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January 06, 1999

Sample Number: 19887

Methylene chloride	< 0.001	ppm
Methyl Isobutyl Ketone	< 0.001	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.001	ppm
Vinyl chloride	< 0.050	ppm
Xylenes	< 0.001	ppm
1,2-Dichlorobenzene	< 0.003	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.005	ppm
Aniline	< 0.050	ppm
Anthracene	< 0.020	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.005	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.050	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.005	ppm
4-Chloro-3-methylphenol	< 0.050	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.005	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.020	ppm
2,6-Dinitrotoluene	< 0.005	ppm
	< 0.005	ppm

USL CITY Environmental, Inc.

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19887

Di-n-octyl phthalate	< 0.005	ppm
Fluoranthene	< 0.005	ppm
Fluorene	< 0.005	ppm
Hexachlorobenzene	< 0.005	ppm
Hexachloro-1,3-butadiene	< 0.005	ppm
Hexachlorocyclopentadiene	< 0.005	ppm
Hexachloroethane	< 0.005	ppm
Indeno(1,2,3-cd)pyrene	< 0.005	ppm
Isophorone	< 0.005	ppm
2-Methylnaphthalene	< 0.005	ppm
2-Methylphenol	< 0.005	ppm
4-Methylphenol	< 0.005	ppm
Naphthalene	< 0.005	ppm
N-Nitrosodimethylamine	< 0.005	ppm
m-Nitroaniline	< 0.050	ppm
o-Nitroaniline	< 0.050	ppm
p-Nitroaniline	< 0.050	ppm
N-Nitrosodiphenylamine	< 0.005	ppm
2-Nitrophenol	< 0.005	ppm
4-Nitrophenol	< 0.050	ppm
N-Nitrosodi-n-propylamine	< 0.005	ppm
Nitrobenzene	< 0.005	ppm
Pentachlorophenol	< 0.020	ppm
Phenanthrene	< 0.005	ppm
Phenol	< 0.005	ppm
2-Picoline	< 0.005	ppm
Pyrene	< 0.005	ppm
Pyridine	< 0.005	ppm
2,3,4,6-Tetrachlorophenol	< 0.005	ppm
1,2,4-Trichlorobenzene	< 0.005	ppm
2,4,5-Trichlorohphenol	< 0.005	ppm
2,4,6-Trichlorophenol	< 0.005	ppm
Copper	< 0.025	ppm
Zinc	0.307	ppm
Arsenic	< 0.005	ppm
Barium	< 0.200	ppm
Cadmium	< 0.0005	ppm
Chromium	< 0.005	ppm
Lead	< 0.003	ppm
Mercury	< 0.0002	ppm
Selenium	< 0.005	ppm
Silver	< 0.0005	ppm

Reviewed By: Daniel Kamers

Manager: [illegible]

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19898

Date Received: December
Date Completed: January 05,

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-22 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTM

Test Description	Results	Units	Wa
Iron			
Sodium	< 0.100	ppm	
Manganese	84.5	ppm	
% Chloride	< 0.020	ppm	
Nitrate	< 0.008	%	
Acetone	< 1	ppm	
Benzene	< 0.100	ppm	
Bromodichloromethane	< 0.005	ppm	D
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.001	ppm	
Chlorobenzene	< 0.050	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.001	ppm	
Methyl ethyl ketone	< 0.050	ppm	
	< 0.050	ppm	

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January 06, 1999

Sample Number: 19898

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Stryrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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January 06, 1999

Sample Number: 19898

Di-n-octyl phthalate	< 0.005	ppm
Fluoranthene	< 0.005	ppm
Fluorene	< 0.005	ppm
Hexachlorobenzene	< 0.005	ppm
Hexachloro-1,3-butadiene	< 0.005	ppm
Hexachlorocyclopentadiene	< 0.005	ppm
Hexachloroethane	< 0.005	ppm
Indeno(1,2,3-cd)pyrene	< 0.005	ppm
Isophorone	< 0.005	ppm
2-Methylnaphthalene	< 0.005	ppm
2-Methylphenol	< 0.005	ppm
4-Methylphenol	< 0.005	ppm
Naphthalene	< 0.005	ppm
N-Nitrosodimethylamine	< 0.005	ppm
m-Nitroaniline	< 0.005	ppm
o-Nitroaniline	< 0.050	ppm
p-Nitroaniline	< 0.050	ppm
N-Nitrosodiphenylamine	< 0.050	ppm
2-Nitrophenol	< 0.005	ppm
4-Nitrophenol	< 0.005	ppm
N-Nitrosodi-n-propylamine	< 0.050	ppm
Nitrobenzene	< 0.005	ppm
Pentachlorophenol	< 0.005	ppm
Phenanthrene	< 0.020	ppm
Phenol	< 0.005	ppm
2-Picoline	< 0.005	ppm
Pyrene	< 0.005	ppm
Pyridine	< 0.005	ppm
2,3,4,6-Tetrachlorophenol	< 0.005	ppm
1,2,4-Trichlorobenzene	< 0.005	ppm
2,4,5-Trichlorohphenol	< 0.005	ppm
2,4,6-Trichlorophenol	< 0.005	ppm
Copper	< 0.025	ppm
Zinc	0.168	ppm
Arsenic	< 0.005	ppm
Barium	< 0.200	ppm
Cadmium	< 0.0005	ppm
Chromium	< 0.005	ppm
Lead	< 0.003	ppm
Mercury	< 0.0002	ppm
Selenium	< 0.005	ppm
Silver	< 0.0005	ppm

Reviewed By:

Manager:

JSL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313)
FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19891

Date Received: December 2
Date Completed: January 05,

Customer: CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW-24 - Ground Water - Water Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, Chloride, Nitrate, 8260, 8270

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST

Test Description	Results	Units	Wa
Iron	< 0.100	ppm	
Sodium	90.0	ppm	
Manganese	< 0.020	ppm	
% Chloride	< 0.008	%	
Nitrate	3.95	ppm	
Acetone	< 0.100	ppm	
Benzene	< 0.005	ppm	D
Bromodichloromethane	< 0.001	ppm	
Bromomethane	< 0.001	ppm	
Bromoform	< 0.001	ppm	
Carbon tetrachloride	< 0.001	ppm	
Carbon disulfide	< 0.050	ppm	
Chlorobenzene	< 0.001	ppm	
Chloroethane	< 0.001	ppm	
Chloroform	< 0.001	ppm	
Chloromethane	< 0.001	ppm	
1,1-Dichloroethene	< 0.001	ppm	
trans-1,2-Dichloroethene	< 0.001	ppm	
Dibromochloromethane	< 0.001	ppm	
Dichlorodifluoromethane	< 0.001	ppm	
1,1-Dichloroethane	< 0.001	ppm	
1,2-Dichloroethane	< 0.001	ppm	
1,2-Dichloropropane	< 0.001	ppm	
cis-1,3-Dichloropropene	< 0.001	ppm	
trans-1,3-Dichloropropene	< 0.001	ppm	
Ethyl benzene	< 0.001	ppm	
2-Hexanone	< 0.050	ppm	
Methyl ethyl ketone	< 0.050	ppm	

ISL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313) 9
FAX: (313) 9
SALES FAX: (313) 9

January 06, 1999

Sample Number: 19891

Methylene chloride	< 0.005	ppm
Methyl Isobutyl Ketone	< 0.050	ppm
Styrene	< 0.001	ppm
Trichloroethylene	< 0.001	ppm
1,1,1-Trichloroethane	< 0.001	ppm
1,1,2-Trichloroethane	< 0.001	ppm
Tetrachloroethylene	< 0.001	ppm
Trichloromonofluoromethane	< 0.001	ppm
1,1,2-trichloro-1,2,2-trifluoroethane	< 0.001	ppm
1,1,2,2-Tetrachloroethane	< 0.001	ppm
Toluene	< 0.001	ppm
Vinyl acetate	< 0.050	ppm
Vinyl chloride	< 0.001	ppm
Xylenes	< 0.003	ppm
1,2-Dichlorobenzene	< 0.005	ppm
1,3-Dichlorobenzene	< 0.005	ppm
1,4-Dichlorobenzene	< 0.005	ppm
Acenaphthene	< 0.005	ppm
Acenaphthylene	< 0.005	ppm
4-Aminobiphenyl	< 0.050	ppm
Aniline	< 0.020	ppm
Anthracene	< 0.005	ppm
Azobenzene	< 0.005	ppm
Benzoic acid	< 0.050	ppm
Benzyl alcohol	< 0.050	ppm
Benzo(a)anthracene	< 0.005	ppm
Benzo(a)pyrene	< 0.005	ppm
Benzo(b)fluoranthene	< 0.005	ppm
Benzo(g,h,i)perylene	< 0.005	ppm
Benzo(k)fluoranthene	< 0.005	ppm
Bis(2-chloroethyl)ether	< 0.005	ppm
Bis(2-chloroethoxy)methane	< 0.005	ppm
Bis(2-chloroisopropyl)ether	< 0.005	ppm
Bis(2-ethylhexyl)phthalate	< 0.005	ppm
4-Bromophenyl phenyl ether	< 0.005	ppm
Butyl benzyl phthalate	< 0.005	ppm
2-Chlorophenol	< 0.005	ppm
Chrysene	< 0.005	ppm
4-Chloroaniline	< 0.050	ppm
4-Chloro-3-methylphenol	< 0.005	ppm
1-Chloronaphthalene	< 0.005	ppm
2-Chloronaphthalene	< 0.005	ppm
4-Chlorophenyl phenyl ether	< 0.005	ppm
Dibenz(a,j)acridine	< 0.005	ppm
Dibenzofuran	< 0.005	ppm
Dibenzo(a,h)anthracene	< 0.005	ppm
Di-n-butyl phthalate	< 0.005	ppm
2,4-Dichlorphenol	< 0.005	ppm
2,6-Dichlorophenol	< 0.005	ppm
Diethyl phthalate	< 0.005	ppm
p-Dimethylaminoazobenzene	< 0.005	ppm
7,12-Dimethylbenz(a)anthracene	< 0.005	ppm
2,4-Dimethylphenol	< 0.005	ppm
Dimethyl phthalate	< 0.005	ppm
4,6-Dinitro-2-methylphenol	< 0.020	ppm
2,4-Dinitrophenol	< 0.020	ppm
2,4-Dinitrotoluene	< 0.005	ppm
2,6-Dinitrotoluene	< 0.005	ppm

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FAX: (313)
SALES FAX: (313)

January 06, 1999

Sample Number: 19891

Di-n-octyl phthalate		
Fluoranthene	< 0.005	ppm
Fluorene	< 0.005	ppm
Hexachlorobenzene	< 0.005	ppm
Hexachloro-1,3-butadiene	< 0.005	ppm
Hexachlorocyclopentadiene	< 0.005	ppm
Hexachloroethane	< 0.005	ppm
Indeno(1,2,3-cd)pyrene	< 0.005	ppm
Isophorone	< 0.005	ppm
2-Methylnaphthalene	< 0.005	ppm
2-Methylphenol	< 0.005	ppm
4-Methylphenol	< 0.005	ppm
Naphthalene	< 0.005	ppm
N-Nitrosodimethylamine	< 0.005	ppm
m-Nitroaniline	< 0.005	ppm
o-Nitroaniline	< 0.050	ppm
p-Nitroaniline	< 0.050	ppm
N-Nitrosodiphenylamine	< 0.050	ppm
2-Nitrophenol	< 0.005	ppm
4-Nitrophenol	< 0.005	ppm
N-Nitrosodi-n-propylamine	< 0.050	ppm
Nitrobenzene	< 0.005	ppm
Pentachlorophenol	< 0.005	ppm
Phenanthrene	< 0.020	ppm
Phenol	< 0.005	ppm
2-Picoline	< 0.005	ppm
Pyrene	< 0.005	ppm
Pyridine	< 0.005	ppm
2,3,4,6-Tetrachlorophenol	< 0.005	ppm
1,2,4-Trichlorobenzene	< 0.005	ppm
2,4,5-Trichlorohphenol	< 0.005	ppm
2,4,6-Trichlorophenol	< 0.005	ppm
Copper	< 0.005	ppm
Zinc	< 0.025	ppm
Arsenic	0.321	ppm
Barium	< 0.005	ppm
Cadmium	< 0.200	ppm
Chromium	< 0.0005	ppm
Lead	< 0.005	ppm
Mercury	< 0.003	ppm
Selenium	< 0.0002	ppm
Silver	< 0.005	ppm
	< 0.0005	ppm

Reviewed By: Daniel Kong

Manager:

JSL CITY Environmental, Inc.

Metals Batch Quality Control

Digested Date: 12-30-98

Sample Numbers: 19886-91

Parameter	MDL (mg/L)	Method Blank (mg/L)	Method STD % Rec.	Method STD QC Lim.	Spike Conc. (mg/L)
As	0.005	0.031	100	90-110	2
Ba	0.200	ND	103	90-110	2
Cd	0.0005	ND	105	90-110	2
Cr	0.005	ND	103	90-110	2
Cu	0.025	ND	98.1	90-110	2
Fe	0.100	ND	99.1	90-110	2
Pb	0.003	ND	99.1	90-110	2
Se	0.005	0.039	105	90-110	2
Zn	0.020	ND	99.0	90-110	2

Parameter	Matrix Spike % Rec.	Matrix Spike Duplicate % Rec.	Precision % RPD	Precision Limit	Accuracy % Rec	Accuracy Limit
As	117	121	3.36	<20	119	75-125
Ba	94.4	103	8.71	<20	98.7	75-125
Cd	100	107	6.73	<20	104	75-125
Cr	104	110	5.61	<20	107	75-125
Cu				<20		75-125
Fe				<20		75-125
Pb	101	108	6.67	<20	105	75-125
Se	107	137	24.6*	<20	122	75-125
Zn				<20		75-125

Initials: RB

Sample Numbers: 19892-8

Parameter	MDL (mg/L)	Method Blank (mg/L)	Method STD % Rec.	Method STD QC Lim.	Spike Conc. (mg/L)
As	0.005	0.055	100	90-110	2
Ba	0.200	ND	103	90-110	2
Cd	0.0005	0.012	105	90-110	2
Cr	0.005	0.007	103	90-110	2
Cu	0.025	ND	98.1	90-110	2
Fe	0.100	ND	99.1	90-110	2
Pb	0.003	0.041	99.1	90-110	2
Se	0.005	ND	105	90-110	2
Zn	0.020	ND	99.0	90-110	2

Initials: RB

USL CITY ENVIRONMENTAL, INC. • 1923 FREDERICK STREET • DETROIT, MICHIGAN 48211 • (313) !
FAX: (313) !
SALES FAX: (313) !

February 19, 1999

Sample Number: 20235

Date Received: February 0-
Date Completed: February 0!

Customer: USL/CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW - 2A - Ground water - Grab

Description: Clear Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, PCB, 8270, 8260

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or AST!

Test Description	Results	Units	Wa
Zinc	< 0.020	ppm	0
Barium	< 0.200	ppm	D
Sodium	132	ppm	
Manganese	< 2.00	ppm	
Benzo(a)anthracene	< 0.005	ppm	
Benzo(a)pyrene	< 0.005	ppm	
Chrysene	< 0.010	ppm	
Fluoranthene	< 0.005	ppm	
Phenanthrene	< 0.005	ppm	
Pyrene	< 0.005	ppm	
PCB-Total	< 0.0002	ppm	

Reviewed By: Christina A Kr

Manager:

USL CITY Environmental, Inc.

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FAX: (313) 9
SALES FAX: (313) 9

February 19, 1999

Sample Number: 20205

Date Received: February 02
Date Completed: February 09

Customer: USL/CEI DIVISION 100
Address: 1923 FREDERICK STREET
Detroit, MI 48211 US
Customer # 108839

Contact: Dave Vauris/Mark Casteele
Phone: 313 923-0080
Fax: 313 923-0217

Sample Identification: MW - 15 - Ground - Water Grab

Description: Brown Liquid

ATRACS #:

Sample was Analyzed: As Received
Type of Analysis: Total Metals, PCB, 8270, 8260

Methods: Taken from EPA SW-846, Standard Methods for Water and Wastewater, and/or ASTN

Test Description	Results	Units	Wa:
Zinc	0.193	ppm	0(
Barium	< 0.200	ppm	D
Iron	17.6	ppm	
Sodium	93.5	ppm	
Manganese	< 2.00	ppm	
Benzo(a)anthracene	< 0.005	ppm	
Benzo(a)pyrene	< 0.005	ppm	
Benzo(b)fluoranthene	< 0.005	ppm	
Benzo(g,h,i)perylene	< 0.005	ppm	
Benzo(k)fluoranthene	< 0.005	ppm	
Chrysene	< 0.005	ppm	
Fluoranthene	< 0.005	ppm	
Phenanthrene	< 0.005	ppm	
Pyrene	< 0.005	ppm	
PCB-Total	< 0.0002	ppm	

Reviewed By:

Manager:

ATTACHMENT 5

DETROIT HEALTH DEPARTMENT CORRESPONDENCE

City of Detroit
Health Department
Environmental Health Services

1151 Taylor Bldg. 4
Detroit Michigan 48202
Phone 313-876-4549
www.ci.detroit.mi.us

July 24, 2002

Mr. Neil Levesque
Conestoga-Rovers & Associates
261 Martindale Road, Unit #3
St. Catherines, Ontario L2W 1A2

Dear Mr. Levesque:

RE: DRINKING WATER WELLS NEAR 1923 FREDRICK, DETROIT, MICHIGAN

Recently, you contacted our office by telephone inquiring as to whether crock wells or driven wells for any private water usage exist in the vicinity of 1923 Fredrick in the city of Detroit. As was indicated to you during this telephone conversation, no legal drinking water wells are located in the city of Detroit. According to our records, all known drinking water wells have been properly abandoned and are no longer in use by city of Detroit residents or Detroit based businesses. In addition, all Detroit residents and businesses are required to use the water service provided by the Detroit Water and Sewerage Department if they are located within 200 feet of a water main, which would include virtually all Detroit residents and businesses. Furthermore, our records do not indicate that a well of any type was ever in existence on the subject property. Since all residents and businesses are required to use the City's water service, which uses Lake Huron and the Detroit River as its sources of fresh water, the Detroit Health Department has no concerns regarding groundwater at the site.

We are aware that the site is and has been used as a hazardous liquid waste treatment facility whose activities are regulated by the Michigan Department of Environmental Quality and our office would investigate any citizen complaints that we received regarding activities at the site. As of this writing we have no complaints in our files regarding this site. If you have any further questions regarding this matter, please contact Mr. Paul Max at (313) 876-4549.

Sincerely,

Donald R. Hamel

Donald R. Hamel, M.S., R.S.
Administrator
Environmental Health Services

ATTACHMENT 6

MDEQ DRINKING AND RADIOLOGICAL
PROTECTION DIVISION CORRESPONDENCE

Drinking Water & Radiological Protection Division
P.O. Box 30630
Lansing, Michigan 48909-8130
Phone (517) 241-1300
FAX (517) 241-1256

Fax

To:	Neil Levesque, Conestoga-Rovers	From:	Wayne W. Kukuk
Fax:	905-682-8818	Pages:	3 (Includes cover sheet)
Phone:	905-682-0510	Date:	7/24/2002
Re:	WHP Areas	CC:	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:** Mr. Levesque,

In your facsimile request of July 17, 2002, you requested that I investigate whether your specified site was within a Local Wellhead Protection Area, prepare a written letter with my response to your inquiry, address it to your office in St. Catharines, Ontario, and deliver it by July 24, 2002.

I completed the letter (see attached) and sent it via the U.S. Postal Service on July 18, 2002. I did not discern a specific request for a copy of the letter to be transmitted to your office via facsimile.

Please contact me if you have further requests or questions.

Sincerely,

Wayne Kukuk

Wayne W. Kukuk, Geologist
Michigan Department of Environmental Quality
Drinking Water & Radiological Protection Division
Groundwater Supply Section
Wellhead Protection Unit
Voice (517) 241-1434
FAX (517) 241-1328
E-mail kukukw@michigan.gov

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

JOHN ENGLER
GOVERNOR

RUSSELL J. HARDING
DIRECTOR

July 18, 2002

Mr. Neil Levesque
Conestoga-Rovers & Associates
261 Martindale Road, Unit #3
St. Catharines, Ontario L2W 1A2

SUBJECT: Wellhead Protection Areas

Dear Mr. Levesque:

In response to your facsimile inquiry today, I have checked our database for the existence of delineated wellhead protection areas in the vicinity of the following site:

- US Liquids of Detroit, 1923 Fredrick Street, Detroit, Michigan

This site is not within a delineated wellhead protection area. At the present time, there are no wellhead protection area delineations within Wayne County, Michigan.

Please contact me if you have further questions.

Sincerely,

Wayne W Kukuk

Wayne W. Kukuk, Geologist
Wellhead Protection Unit
Ground Water Supply Section
Drinking Water and Radiological
Protection Division
517-241-1434
kukukw@michigan.gov

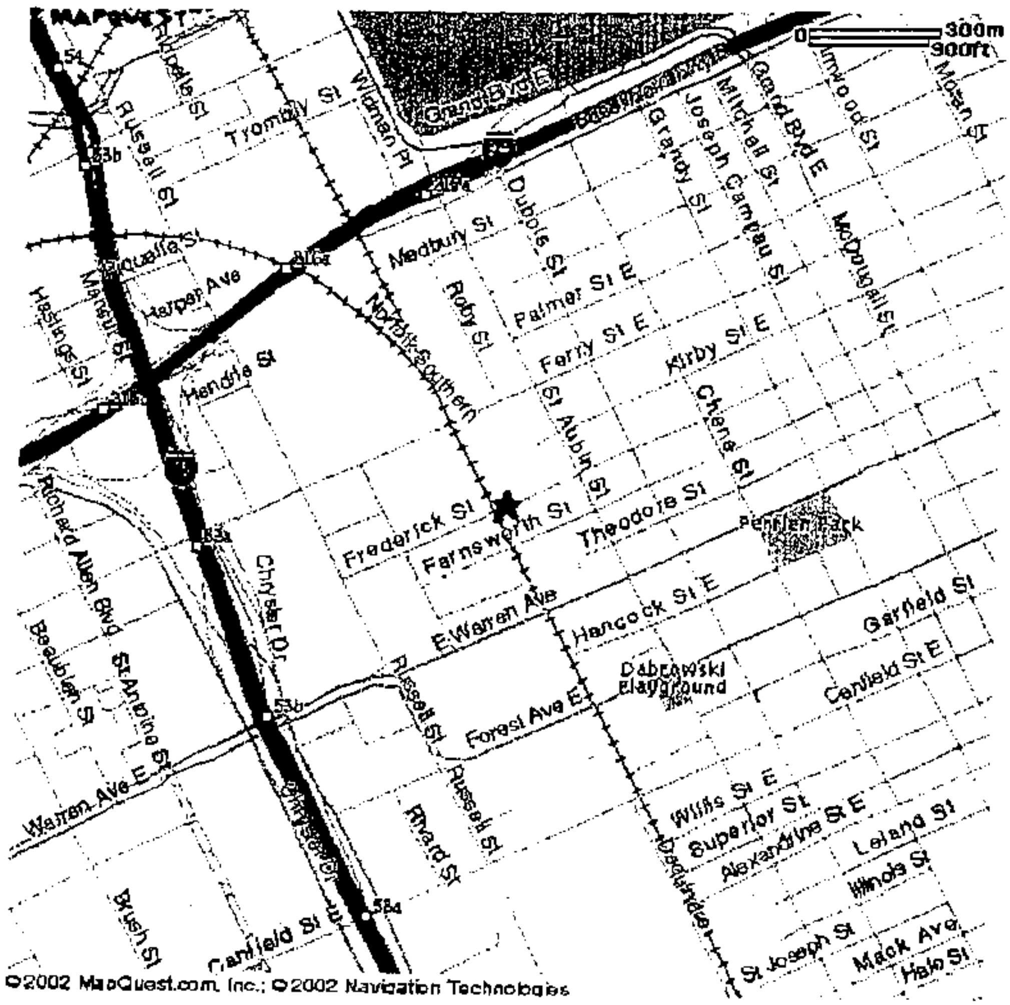
Enclosure

MAPQUEST

1923 Frederick St
Detroit, MI
48211-2603, US

SEND TO PRINTER

Back



Appendix E- 4: Waiver of Groundwater Requirements

DEQ

Notice of Final Decision

And

Response to Comments

Hazardous Waste Management Operating License

US Liquids of Detroit, Inc.
MID 980 991 566

December 12, 2003

Final Decision

The Michigan Department of Environmental Quality (MDEQ) issued a hazardous waste management operating license to US Liquids of Detroit, Inc. (USL), pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and its administrative rules, Michigan Administrative Code R 299.9101 *et seq.* The license was issued on December 12, 2003, and authorizes USL to continue to operate its commercial hazardous waste storage and treatment facility at 1923 Frederick Street, Detroit, Michigan. The license expires on December 12, 2008.

Background

The MDEQ announced its intent to issue the license on September 24, 2003. The draft license, Fact Sheet, and the entire administrative record were made available for public review, and interested persons were offered an opportunity to comment on the proposed decision during a public comment period from September 24, 2003, to November 14, 2003. The DEQ also conducted a public hearing regarding the proposed decision on October 30, 2003.

Public Comments

Public comments on the draft operating license were limited. The two significant comments received and the MDEQ's responses are provided below:

Comment 1: *Truck traffic associated with the facility is hard on the nearby houses and residential streets.*

Response 1: The USL facility is located in an industrial area and trucks traveling to and from the facility use major routes that impact the smallest number of residences possible. Truck traffic is excluded from residential side streets by posted signs.

Comment 2: *The City of Detroit Water and Sewerage Department (DWSD) will continue to require USL to meet the sewer discharge limits for each individual process at the point where the wastewater exits the process; not after the individual waste streams have been combined.*

Response 2: The MDEQ understands that USL is currently complying with the discharge limits for individual processes, and USL is required under Condition V.B. of the license to comply with the limits established by the DWSD.

Changes to Draft License

The MDEQ did not make any substantive changes to the draft license before issuing it to USL. The changes are summarized below:

Condition IV.C. of the license was revised for clarification to include a summary table of the tank treatment process capacities that are detailed in Attachment 10 of the license.

Condition IV.E.8. of the license was revised to clarify the prohibition on the direct discharge of untreated hazardous waste into the sewer system. All hazardous waste that is discharged to the sewer must be managed in tanks in accordance with the license.

Drawings P-4, P-4AA, P-4D, P-4E, and P-10 in Attachment 6 of the license were replaced with revised drawings. USL revised the drawings to reflect minor changes to the proposed North Drum Storage and Staging Area modifications that are authorized in the license. The configuration of containers and the secondary containment system layout were revised. The process capacities, design standards, and operating requirements remain the same as provided in the draft license.

Available Information

The license and supporting administrative record are available for review at the MDEQ's Waste and Hazardous Materials Division office located in Constitution Hall, Atrium North, 525 West Allegan Street, Lansing, Michigan. For additional information, contact Mr. Steve Sliver at 517-373-1976 or by e-mail at slivers@michigan.gov.

FACT SHEET

PROPOSED OPERATING LICENSE

US LIQUIDS OF DETROIT, INC.
Detroit, Michigan
MID 980 991 566

September 24, 2003

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WASTE AND HAZARDOUS MATERIALS DIVISION

Introduction

The Michigan Department of Environmental Quality (MDEQ) proposes to issue a hazardous waste management operating license for the continued operation of the US Liquids of Detroit, Inc. (USL) facility based on the following:

I. The application submitted by USL is sufficiently detailed for the MDEQ to evaluate the facility and its impact on human health and the environment.

II. The facility satisfies all of the applicable technical requirements under Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451).

III. The issuance of the operating license will minimize the potential for this facility to present a hazard to human health or the environment during operation.

IV. USL has obtained all other environmental permits necessary for operation of the facility.

Simultaneously, the United States Environmental Protection Agency (U.S. EPA) proposes to issue USL a federal permit pursuant to the federal Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA).

Prior to making the final decision, the MDEQ and the U.S. EPA are required to provide a fact sheet on the draft operating license and permit. The fact sheet must contain a brief description of the facility and activity subject to the operating license and permit, the types and quantities of hazardous wastes that will be managed, reasons why any requested variance or alternatives to minimum standards do or do not apply, and a description of the procedures for reaching a final decision, including: the beginning and end dates for public comment and the address where comments will be received; procedures for requesting a hearing and the nature of the hearing; other procedures by which the public may participate in the final decision; and the name and telephone number of the persons to contact for more information. This fact sheet contains all of the required information, plus additional information regarding the hazardous waste management program and the review of the USL project.

Table of Contents

Background

The management of hazardous waste in Michigan is regulated under Part 111, Hazardous Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), and its administrative rules, MAC R 299.9101 *et seq*. In addition, the management of hazardous waste in Michigan and nationwide is regulated under Subtitle C of the federal Solid Waste Disposal Act, as amended, 42 USC 6901 *et seq.*, which is commonly known as the Resource Conservation and Recovery Act of 1976 (RCRA). The RCRA was amended substantially by the Hazardous and Solid Waste Amendments of 1984 (HSWA).

Under the RCRA, a state may obtain authorization to administer its program in lieu of the federal program. Michigan amended its hazardous waste management administrative rules in 1985 to be equivalent to those under the RCRA. Michigan then became authorized in October 1986 to administer the portions of the federal program that were duplicated by the state program. Since that time, Michigan has continued to amend its administrative rules to stay as stringent as those rules under the RCRA.

Both the RCRA and Part 111 of Act 451 establish a permit system governing the treatment, storage, and disposal of hazardous wastes. Because Michigan is authorized, a state operating license is issued to existing facilities in lieu of a federal permit. In circumstances where Michigan does not yet have equivalent administrative rules or authorization to implement new federal requirements, a federal permit – narrow in scope - may also be required to enforce those portions of the federal program that are not covered by the state operating license.

Operating License Process

An owner or operator who is conducting an activity prior to the effective date of rules that subject it to the licensing requirements is allowed to continue that activity under "interim status" until the MDEQ makes a final determination on an operating license for the facility. Continued operation then becomes subject to the terms and conditions of an operating license. If the operating license is denied, the activity must cease.

The licensing process begins when the MDEQ calls in the operating license application. When the application is submitted, the MDEQ reviews the application to ensure that it is administratively complete. After the MDEQ determines that the application is complete, the MDEQ reviews the application for technical adequacy. The MDEQ notifies the applicant of any deficiencies and the applicant is required to submit revisions to the application to correct them. The application requirements and processing procedures are explained more fully in R 299.9508 and R 299.9510.

Before making a final decision on the operating license application, the MDEQ must prepare a fact sheet and a draft operating license or basis for denial. The MDEQ must also conduct a public hearing on the draft decision and allow an opportunity for persons to submit written comments as well. After the close of the comment period, the MDEQ must prepare a responsiveness summary to all relevant comments and render a final decision. These public participation requirements are explained more fully in R 299.9511.

US Liquids of Detroit, Inc. (USL) Facility

Description of Facility

USL operates a commercial hazardous waste storage and treatment facility. The facility accepts hazardous wastewaters, sludges, and solids from industry. The wastes are hazardous because they are corrosive (acidic or basic), ignitable (low flashpoint), reactive (limited cyanide or sulfide content), or because they contain toxic contaminants (heavy metals or chemicals). The wastewaters are treated in tanks to neutralize them and to reduce the concentrations of contaminants prior to discharge to the sewer system. Sludges, solids, and some wastewaters are solidified in tanks and then disposed offsite in landfills. The facility also manages certain nonhazardous wastes (liquid industrial wastewaters, used oils, and solid wastes).

Location

The facility is located at 1923 Frederick Street in Detroit, Michigan, Wayne County. The 12 acre site is near the intersection of Interstates 75 and 94; it is bordered on the north by Ferry Street, on the east by St. Aubin Avenue, on the south by Farnsworth Avenue, and on the west by the Grand Trunk & Western Railroad.

Regulatory Status

USL obtained interim status to continue to store and treat the toxicity characteristic wastes that became regulated under the RCRA in 1990. After Michigan adopted the toxicity characteristic wastes in 1994, USL obtained authorization under Part 111 of Act 451 to continue to store and treat those wastes and other hazardous wastes until a final determination is made on a hazardous waste management operating license for the facility.

Environmental Permits

In addition to the hazardous waste management operating license, the facility requires other environmental permits. All other required environmental permits have been obtained and include: a Solid Waste Processing Plant Operating License from the MDEQ; Air Use Installation Permits from Wayne County (now administered by the MDEQ); and a Type 3 Wastewater Discharge Permit from the City of Detroit.

Operating License Application

USL submitted its hazardous waste management operating license application on September 29, 1999. The application covers the container storage areas and tank systems for the storage and treatment of hazardous wastes; it covers all aspects of the facility location, design, and hazardous waste management operations.

MDEQ Review

The MDEQ reviewed the application and determined that it was incomplete on October 6, 1999. USL submitted revisions to the application on December 6, 1999. On December 22, 1999, the MDEQ determined that the application was administratively complete. USL revised the application further based on the MDEQ's preliminary technical comments of March 7, 2000, and the MDEQ's Technical Review Notice of Deficiency of May 29, 2002. Subsequent revisions to the application demonstrate that the facility satisfies the applicable technical requirements under Part 111 of Act 451. The MDEQ is therefore required to prepare a draft operating license for the facility.

Draft Operating License

The requirements for the content of operating licenses are contained in R 299.9516 and R 299.9521. The MDEQ has prepared a draft operating license to satisfy those requirements. The draft operating license is organized in seven parts:

I. Standard Conditions

II. General Operating Conditions

III. Container Storage Conditions

IV. Tank System Storage and Treatment Conditions

V. Environmental Monitoring Conditions

VI. Corrective Action Conditions

VII. Schedule of Compliance

In addition, the following components of the application are incorporated as attachments to the operating license:

1. Waste Analysis Plan
2. Inspection Schedule
3. Training Outline
4. Contingency Plan
5. Closure Plan
6. Engineering Plans and Specifications
7. List of Acceptable Hazardous Wastes
8. Procedures to Prevent Hazards

9. Tank Overfill Protection and Procedures
10. Treatment Methods
11. Ambient Air Monitoring Program

Authorized Capacities and Activities

The draft operating license authorizes the storage of up to 614,110 gallons of hazardous wastes in containers and 1,552,531 gallons of hazardous waste in tanks.

In addition, the draft operating license authorizes the treatment of up to 675,000 gallons per day of hazardous wastes by biological wastewater treatment processes, 300 tons per hour by chemical fixation processes, and 432,000 gallons per day by chemical wastewater treatment processes. The treatment methods include: activated sludge; stabilization and solidification; neutralization; oxidation, reduction, and precipitation; and activated carbon adsorption.

Treated wastewaters are discharged to the sewer, and stabilized and solidified wastes are disposed offsite at licensed solid waste and hazardous waste landfills.

The license also authorizes USL to bulk and consolidate hazardous wastes in tanks and containers for subsequent shipment offsite to other facilities.

Authorized Hazardous Wastes

The operating license authorizes the storage and treatment of a variety of solid and liquid wastes which are hazardous due to their corrosive, ignitable, reactive, or toxic characteristics. Wastes that are prohibited include those containing regulated concentrations of polychlorinated biphenyls, explosive wastes, and wastes that could generate toxic fumes during treatment.

Variances or Alternatives to Minimum Standards

Except for waivers of certain environmental monitoring requirements as explained in this Fact Sheet, USL did not request, and the draft operating license does not authorize, any variances or alternatives to the minimum design, construction, or operating standards under Part 111 of Act 451.

Environmental Monitoring

Under R 299.9611, an owner or operator must conduct an environmental monitoring program that is capable of detecting a release of hazardous wastes or hazardous waste constituents from the facility. These requirements can be waived based on the design and operation of the facility, its location, and the hydrogeological characteristics of the site.

In its application, USL requested a waiver of the soil monitoring requirements under R 299.9611(2)(d). As explained in the application, there are no exposed soils on the active portion of the facility, and USL is required to conduct regular inspections and repairs of cracks and gaps in the concrete pavement that could be a potential pathway for contaminants to reach underlying soils. In accordance with R 299.9611(4), the draft operating license does not contain a soil monitoring program based on this demonstration that soil monitoring is not required.

USL also requested a waiver of the groundwater monitoring requirements under R 299.9611(2)(b). As explained in the application, given the design of the facility and hydrogeology of the site, there is no potential for migration of liquid from the facility to the uppermost aquifer during the active life of the facility and any post-closure care period that may be required. In accordance with R 299.9611(3)(b), the draft operating license does not contain a groundwater monitoring program based on this demonstration that groundwater monitoring is not required.

The draft operating license requires USL to conduct an ambient air monitoring program to detect violations of Part 55, Air Pollution Control, of Act 451.

The draft operating license also requires USL to monitor the treated effluent wastewaters in accordance with the requirements of its City of Detroit Water and Sewerage Department Wastewater Discharge Permit.

Facility-Specific Conditions

In addition to the standard or "boilerplate" conditions typical of all operating licenses, the draft operating license contains several facility-specific conditions as follows:

1. Condition II.U requires USL to develop and maintain a program to prevent vehicles and equipment from tracking out hazardous waste from the facility and to keep the affected areas clean.

2. Condition IV.F.5 prohibits USL from managing hazardous wastes in the existing 600 Series tanks. These tanks for flammable and combustible liquids have been out of service because they have not yet been upgraded to current standards. USL intends to replace them with new tanks that comply with all current technical standards under Part 111 of Act 415 and Michigan's Flammable and Combustible Liquids Rules.

3. Condition IV.I requires USL to maintain the air emissions control system for the Chemical Fixation Building to ensure that all dusts and other airborne contaminants generated during the treatment process are not released to the atmosphere.

4. Part VII establishes a schedule of compliance which requires USL to complete several routine and minor repairs and upgrades to the container storage and tank system secondary containment structures. Part VII also authorizes substantial modifications to the facility as follows:

    a. Replacing and upgrading existing tank systems.

b. Shifting capacity from tanks that have been taken out of service to container storage areas.

c. Adding secondary and tertiary wastewater treatment tanks so the facility can meet the more-stringent sewer discharge limits scheduled to take effect next year.

These modifications do not represent an alteration of the authorized processes or an increase beyond the authorized capacities for the facility; they represent requirements that USL must satisfy if it wants to retain its current authorization for those processes and capacities.

Draft Federal Permit

Several hazardous waste codes have been added to the federal RCRA regulations within the past few years. USL has applied to manage these newly-listed wastes. The MDEQ has not yet adopted these newly-listed wastes and it has not been authorized to regulate them in lieu of the U.S. EPA. Therefore, USL needs a RCRA permit to continue to manage these newly-listed wastes. The U.S. EPA has drafted a permit for consideration and issuance concurrent with the state operating license.

Public Participation

The purpose of pubic participation is to ensure that the public has knowledge of the MDEQ's and the U.S. EPA's proposed action, and that the public has an opportunity to comment on that action. In addition, the process ensures that the MDEQ and the U.S. EPA have the opportunity to benefit from any information that the public might have relative to the proposed action.

Public Comment Procedures

Comments may be submitted in writing to the contact person identified below between now and November 14, 2003. Comments may also be presented at the public hearing. The public comment and public hearing procedures are in accordance with R 299.9514 and R 299.9515.

The public hearing on the draft operating license will be held on Thursday, October 30, 2003 in Room L-500 of Cadillac Place, 3058 West Grand Boulevard, Detroit, Michigan, starting at 7:00 p.m. and continuing until all persons have had an opportunity to present their comments for the record. All persons that intend to speak at the public hearing must register by 7:30 p.m. Persons with disabilities needing accommodations for effective participation in this hearing should contact Mr. Steve Sliver at the address below, or at 517-373-1976, at least a week in advance of the hearing to request mobility, visual, hearing, or other assistance.

After the close of the public comment period, the MDEQ will decide whether to issue the operating license. The Chief of the Waste and Hazardous Materials Division will consider the written comments submitted during the public comment period and the oral testimony presented at the public hearing. Responses to all relevant comments will be included in the administrative record supporting the final decision. The final decision will be communicated to the applicant, to each person who commented during the public comment period, and to each person on the facility mailing list.

Locations of Available Information

The draft operating license, RCRA permit, and the application may be reviewed in the Sociology and Economics Department of the Detroit Public Library located at 5201 Woodward Avenue, Detroit, Michigan; at the MDEQ Detroit Office located at Cadillac Place, 3058 West Grand Boulevard, Suite 2-300, Detroit, Michigan (contact Ms. Jeanette Noechel at 313-456-4664); at the MDEQ Waste and Hazardous Materials Division Office located at Constitution Hall, Atrium North, 525 West Allegan Street, Lansing, Michigan (contact Mr. Steve Sliver at 517-373-1976); and at the U.S. EPA Region 5 Office, Waste Management Branch, 77 West Jackson Boulevard, Chicago, Illinois (contact Mr. John Gaitskill at 312-886-6795). The U.S. EPA also has information available on the Internet at http://www.epa.gov/reg5rcra/wptdiv/permits/index.htm.

Contact Persons

Comments and requests regarding the Part 111 of Act 451 draft operating license must be addressed to:

Mr. Steve Sliver
Waste and Hazardous Materials Division
Department of Environmental Quality
P.O. Box 30241
Lansing, Michigan 48909-7741

Mr. Sliver can also be contacted by telephone at 517-373-1976, and by e-mail at slivers@michigan.gov.

Comments and requests regarding the RCRA permit must be addressed to:

Mr. John Gaitskill DW-8J
U.S. EPA Region 5
Waste Management Branch
77 West Jackson Boulevard
Chicago, Illinois 60604

Mr. Gaitskill can also be contacted by telephone at 312-886-6795, and by e-mail at gaitskill.john@epamail.epa.gov.

APPENDIX G-1

NOTIFICATION CORRESPONDENCE

Hazardous Waste Emergency Response Official
Michigan Department of Environmental Quality
Waste Management Division
Post Office Box 30028
Lansing, Michigan 48909

Subject: EQ Detroit, Inc. Facility

Dear Sir/Madame:

As you may be aware, EQ Detroit, Inc (EQD) operates a hazardous and non-hazardous waste facility at 1923 Frederick Street, Detroit, Michigan 48211. Hazardous and non-hazardous wastes are stored at the facility prior to processing in containers (i.e., drums) and above ground storage tanks. All hazardous wastes processed by EQD are shipped off-site and disposed of according to the U.S. EPA and Michigan Department of Environmental Quality (MDEQ) rules and regulations.

In accordance with these state and federal regulations, I am providing your department with a copy of our Contingency Plan, which describes the following:

1. The actions our personnel will take in response to emergencies (e.g., fires or spills of hazardous waste).
2. Arrangements we would like your department to agree to in the event of an emergency.
3. A layout of our plant (showing where personnel normally work, hazardous waste generation and storage areas, safety equipment, entrances to the plant and evacuation routes).
4. A description of the properties and associated hazards of the hazardous wastes handled at our plant.

We are requesting that your department approve the following services in the event of an emergency regarding waste storage at our facility:

- Technical support
- Communications support

Please review our Contingency Plan which is enclosed. If you agree to the arrangements, complete and return the enclosed form letter.

If you have any questions, please contact me at (313) 347-1300

Sincerely,
EQ Detroit, Inc

Mary Peterson
QEHS Engineer EQD

Police Chief
Detroit Police Department
1300 Beaubien Detroit, Michigan 48226

Subject: EQ Detroit, Inc. Facility

Dear Sir/Madame:

As you may be aware, EQ Detroit, Inc (EQD) operates a hazardous and non-hazardous waste facility at 1923 Frederick Street, Detroit, Michigan 48211. Hazardous and non-hazardous wastes are stored at the facility prior to processing in containers (i.e., drums) and above ground storage tanks. All hazardous wastes processed by EQD are shipped off-site and disposed of according to the U.S. EPA and Michigan Department of Environmental Quality (MDEQ) rules and regulations.

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If you have any questions, please contact me at (313) 347-1300

Sincerely,
EQ Detroit, Inc

Mary Peterson
QEHS Engineer EQD

Fire Chief
Detroit Fire Department
900 Merrill Plaisance
Detroit, Michigan 48203

Subject: EQ Detroit, Inc. Facility

Dear Sir/Madame:

As you may be aware, EQ Detroit, Inc (EQD) operates a hazardous and non-hazardous waste facility at 1923 Frederick Street, Detroit, Michigan 48211. Hazardous and non-hazardous wastes are stored at the facility prior to processing in containers (i.e., drums) and above ground storage tanks. All hazardous wastes processed by EQD are shipped off-site and disposed of according to the U.S. EPA and Michigan Department of Environmental Quality (MDEQ) rules and regulations.

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If you have any questions, please contact me at (313) 347-1300

Sincerely,
EQ Detroit, Inc

Mary Peterson
QEHS Engineer EQD

Civil Defense Coordinator
Detroit Emergency Medical Services
900 Merrill Plaisance
Detroit, Michigan 48203

Subject: EQ Detroit, Inc. Facility

Dear Sir/Madame:

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If you have any questions, please contact me at (313) 347-1300

Sincerely,
EQ Detroit, Inc

Mary Peterson
QEHS Engineer EQD

Detroit Receiving Hospital
4201 St. Antoine Blvd.
Detroit, Michigan 48201

Subject: EQ Detroit, Inc. Facility

Dear Sir/Madame:

As you may be aware, EQ Detroit, Inc (EQD) operates a hazardous and non-hazardous waste facility at 1923 Frederick Street, Detroit, Michigan 48211. Hazardous and non-hazardous wastes are stored at the facility prior to processing in containers (i.e., drums) and above ground storage tanks. All hazardous wastes processed by EQD are shipped off-site and disposed of according to the U.S. EPA and Michigan Department of Environmental Quality (MDEQ) rules and regulations.

In accordance with these state and federal regulations, I am providing your department with a copy of our Contingency Plan, which describes the following:

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- Communications support

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If you have any questions, please contact me at (313) 347-1300

Sincerely,
EQ Detroit, Inc

Mary Peterson
QEHS Engineer EQD

Hazardous Waste Emergency Response Official
Michigan Department of Environmental Quality
Waste Management Division
Lansing, Michigan 48909

Attention: Emergency Response Official

Subject: Formal Written Notification of
Incident/Emergency Response Plan Enactment

Dear Sir/Madame:

Pursuant to EQ Detroit Inc. (EQD) verbal notification of contingency plan enactment on ___________, 20_____, this formal notification is provided. In accordance with 40 CFR 265.56(j), EQD is documenting this incident via the following information.

Name/Address/Telephone Of Facility Owner:	EQ Detroit, Inc. 1923 Frederick Street Detroit, Michigan 48211 (313) 923-0080
Facility Address:	1923 Frederick Street Detroit, Michigan 48211 (313) 347-1300
Date/Time/Type of Incident:	_____________, 20____a.m./p.m.
(i.e., fire, explosion, release)	______________________________ ______________________________ ______________________________
Name & Quantity of Material Involved:	Name: _________________________ ______________________________ Quantity: ________________________ ________________________________

Injuries: Yes No

If yes, extent of injuries:
(i.e., number of people, any hospitalization, mortalities, etc.)

Health/Environmental Hazard Assessment (Actual and Potential): Yes No
(i.e., surficial, groundwater, adjacent homes, soils, etc.)

____

____

Estimated Quantity/Deposition Of Recovered Material: Quantities:

Deposition (i.e., treated on-site, transported off-site)

____

____

____

It is understood EQD is required to notify your office again prior to resuming operations. As our immediate notification stated, EQD was expecting to resume full operations with ______day(s) of incident resolution; however, the appropriate verification that: no incompatible released material was stored with existing waste and used emergency has been restored to operations order.

Should you have additional concerns, please contact the under signed.

Sincerely,
EQ Detroit, Inc.

Mary Peterson
QEHS Engineer

APPENDIX H-1

EQ NEW EMPLOYEE OR JOB TRANSFER / CONTRACTOR SAFETY ORIENTATION CHECKLIST

NFORMATION:

Name of Associate: ______________________________ Job Title:__________________________________

Supervisor: ____Dept./Location____________________________

Contractor? YES NO (Circle) or Company:

New Employee? YES NO (Circle) Date of Hire/Transfer_______________________

Job Transfer? YES NO (Circle) or Start on site:

Emergency Contacts:

Name:__________________________ Relationship:____________________ Phone:__________________________

Name:__________________________ Relationship: Phone:______________________________

TO BE COMPLETED BY THE HEALTH AND SAFETY REPRESENTATIVE ON THE FIRST DAY IN THE WORK AREA.

1. Conducted facility tour	( ) YES	( ) NO	( ) N/A
2. Reviewed Facility Emergency Response/Evacuation Plan	( ) YES	( ) NO	( ) N/A
3. Reviewed general plant hazards	( ) YES	( ) NO	( ) N/A
4. Reviewed accident/injury reporting protocol	( ) YES	( ) NO	( ) N/A
5. Reviewed PPE requirements, use, and acquisition	( ) YES	( ) NO	( ) N/A
6. Reviewed Hazard Communication Program	( ) YES	( ) NO	( ) N/A
7. Reviewed Hearing Conservation Program	( ) YES	( ) NO	( ) N/A
8. Reviewed General Lockout/Tagout Requirements	( ) YES	( ) NO	( ) N/A
9. Reviewed Confined Space Entry Requirements	( ) YES	( ) NO	( ) N/A
10.Reviewed Safe Lifting Techniques	( ) YES	( ) NO	( ) N/A
11. Reviewed Warning Signs/Tags	( ) YES	( ) NO	( ) N/A
12. Reviewed Smoking Policies	( ) YES	( ) NO	( ) N/A
13. Reviewed Special Training Requirements	( ) YES	( ) NO	( ) N/A
14. Reviewed OSHA Employees Rights	( ) YES	( ) NO	( ) N/A
15. Reviewed Bloodborne Pathogens	( ) YES	( ) NO	( ) N/A
16. Reviewed SPCC Plan	( ) YES	( ) NO	( ) N/A

Appendix H- 2: EQ Detroit Job Titles and Job Specific Training for Current Employees

Job Title: EQD-LTL COORDINATOR

Reports To:	Operations Manager—Lab Pack & LTL Services	Department:	Operations
Grade Level:	L14	Company:	EQD- T&P
Date:	5/12/03	Prepared By:	Eric Hall
Date:	5/19/03	Revised By:	K. Newcombe
Date:	10/16/03	Revised By:	K. Cote
Date:	8/8/05	Revised By:	C. Secoy
Date:	4/17/07	Revised By:	T. McGillis

Job Summary:

Describe the purpose of the position.

Facilitate LTL drum program at EQ Transfer and Processing Facility through utilization of internal/external resources and internal personnel.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Work closely with AEs and external customers to provide a cradle to grave approach to small quantity generators
- Establish routes, characterize waste, and generate proper paperwork including manifests, labels, LDRs, etc.
- Establish and maintain daily, weekly and monthly tracking documents
- Produce financial reports specifically designed to measure P&L of the operation
- Interaction with internal operations, external disposal facilities and transporters
- Proper Invoicing
- Ensure DOT compliance
- Maintain meticulous attention to detail, profitability and efficiency

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- General sales/cold calling
- Establish SOPs
- Streamline operational costs
- Other duties as assigned by supervisor/manager

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma or equivalent, degree in technical field preferred
- 2-3 years experience in the environmental industry
- Strong knowledge of DOT and RCRA regulations
- Excellent verbal and written communication skills
- Ability to multi-task and work well under pressure

Training Requirements :

Required training necessary to comply with company policy and regulatory requirements.

- New employee orientation/ 3 days on the job training
- 24 Hour Hazwopper
- 8 Hour Refresher Training
- DOT Security Training
- ISO Training 9000 and 14000
- HM 126 Manifesting Training
- Fire Extinguisher Awareness Training
- Contingency Plan Training
- DOT Drug and Alcohol Supervisor Training

Job Title: EQD-LTL DRIVER

Reports To:	**Operations Manager— Lab Pack & LTL Services**	**Department:**	**Operations**
Grade Level:		**Company:**	**EQD- LTL Services**
Date:	**4/17/07**	**Prepared By:**	**T. McGillis**

Job Summary:

Describe the purpose of the position.

Facilitate LTL drum program at EQD LTL by transporting wastes from customer sites to EQD or EQD T&P.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Provide transportation services for customers maintaining compliance with applicable RCRA and DOT regulations and with established EQ company SOP's
- Ensure personal DOT HM 126 compliance for yourself as well as CDL licensing.
- Provide polite, courteous, and professional customer service to customers on their sites.
- Interact with internal plant operations personnel in an efficient manner.
- Maintain meticulous attention to detail, profitability and efficiency.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Assist other plant profit centers in transportation needs if time permits.
- Other duties as assigned by supervisor/manager.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma or equivalent, degree in technical field preferred
- 2-3 years experience in the environmental industry
- CDL licensing, A level.
- Ability to maintain a professional presence.
- Strong knowledge of DOT and RCRA regulations
- Excellent verbal and written communication skills
- Ability to multi-task and work well under pressure

Training Requirements :

Required training necessary to comply with company policy and regulatory requirements.

- New employee orientation/ 3 days on the job training
- 24 Hour Hazwopper
- 8 Hour Refresher Training
- DOT Security Training
- ISO Training 9000 and 14000
- HM 126 Manifesting Training
- Fire Extinguisher Awareness Training
- Contingency Plan Training

Job Title: EQD-LAB PACK/LTL RESOURCE COORDINATOR

Reports To:	**Operations Manager—Lab Pack & LTL Services**	**Department:**	**Operations**
Grade Level:	**L14**	**Company:**	**EQD- LTL**
Date:	**4/17/07**	**Prepared By:**	**T. McGillis**

Job Summary:

Describe the purpose of the position.

Facilitate Lab Pack and LTL drum program at EQ Detroit through utilization of internal/external resources and internal personnel.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Increase profit margins for all Lab Pack and LTL businesses by directing customer waste to the most cost efficient EQ facility.
- Assist Lab Pack and LTL managers with new business quotes, billing, and invoicing.
- Coordinate existing Lab Pack and LTL businesses, including technical support in servicing existing LTL and Lab Pack businesses.
- Backup the LTL manager in the event of an absence.
- Secure new businesses from existing customers and new customers using sales aging reports and internet geographic searches for businesses.
- Work closely with Account Executives to achieve the sales goals for their defined geographical area.
- Work closely with Lab Pack and LTL management to achieve revenue and profit goals.
- Maintain an in-depth knowledge of EQ's product lines and services.
- Develop a method for tracking new business revenue.
- Be familiar with competitor's products, sales & marketing techniques, and financial principles.
- Other duties as assigned by supervisor/manager.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- General sales/cold calling
- Establish SOPs
- Streamline operational costs

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- Bachelors degree in life science, marketing, business, or related field.
- Ability to maintain a professional presence.
- Ability to work with AE's for team sales.
- Excellent written, verbal, and oral communication skills.

Training Requirements :

Required training necessary to comply with company policy and regulatory requirements.

- New employee orientation/ 3 days on the job training
- 24 Hour Hazwopper
- 8 Hour Refresher Training
- ISO Training 9000 and 14000
- HM 126 Manifesting Training

Job Title: MAINTENANCE LEAD

Reports To:	**Operations Manager**	**Department:**	**Maintenance**
Grade Level:	**L-**	**Company:**	**EQ Detroit**
Date:	**4/05**	**Prepared By:**	**Pat Globke**

Job Code:
Job Abbr: Maint Coor

Job Summary:

Describe the purpose of the position.

General building maintenance of EQ Detroit buildings and grounds.
Trailer and tanker repairs.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Maintain regular building maintenance program.
Equipment repairs.
Pump repairs or replacements.
Plumbing of existing and new tanks and pumps.
Schedule and coordinate with contractors who perform activities out the normal realm.
Fabricator, welder – all new builds.
Identify and repair all safety issues on the facility.
Determines extent of repairs needed.
Uses a variety of hand and power tools.
Follows detailed verbal or written instructions.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

Locating and ordering parts for maintenance activities.
Boiler operations and maintenance.
Air system monitoring.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

Ability to read and follow detailed instructions.
Thorough knowledge of equipment and aptitude for understanding mechanical systems.
High school graduate with some formal education or training.
ASME & AWS certified welder.
Certified pipe fitter.
Ability to build from prints.

TRAINING REQUIREMENTS

Job Title: **Maintenance Coordinator**

Designation: **Hazardous Waste Worker**

Reports To: **Operations Manager**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
Powered Industrial Truck (triennial)
Aerial Work Platform (triennial)
Fall Protection (initial)
Respiratory Protection (initial)
DOT HM-232 Transportation Security Plan (initial and annual)
Basic Electrical Safety (initial)
New Employee Safety Orientation (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Hot Work
Overhead Crane
Confined Space Rescue
Drug and Alcohol Awareness

Environmental Aspects & Impacts

(Environmental Aspects – Element of an organization's activities, products or services that can interact with the environment. Environmental Impact – Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.)

Aspect:

Impact:

Job Title: MAINTENANCE

Reports To:	**Director of Operations**	**Department:**	**Maintenance**
Grade Level:	**N/A**	**Company:**	**EQD**

Job Summary:

Describe the purpose of the position.

To maintain and repair all equipment required to support hazardous and nonhazardous waste operations, including transfer operations, and all buildings.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Repair and maintenance of all equipment as directed.
Repair and maintenance of all building and infrastructure as directed.
Ordering of parts and completion of work orders and purchase orders as required.
Assisting in management of garage, supply inventory, part inventory, staffing or other duties as assigned.
Prioritization of repairs to keep critical machinery functional.
Assist in general housekeeping duties.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

Any other assigned task.
Provide feedback on equipment.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma
- 24-hour hazwoper training
- Excellent oral and written communication skills.
- Forklift, man-lift certifications.

Training Requirements

Job Title: **Maintenance**

Designation: **Hazardous Waste Worker**

Reports To: **Director of Operations**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
Powered Industrial Truck (triennial)
Aerial Work Platform (triennial)
Fall Protection (initial)
Respiratory Protection (initial)
DOT HM-232 Transportation Security Plan (initial and annual)
Basic Electrical Safety (initial)
New Employee Safety Orientation (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Hot Work
Overhead Crane
Confined Space Rescue

Job Title: MAINTENANCE LEAD

Reports To:	**Operations Manager**	**Department:**	**Maintenance**
Grade Level:	**L-**	**Company:**	**EQ Detroit**
Date:	**4/05**	**Prepared By:**	**Pat Globke**

Job Code:
Job Abbr: Maint Lead

Job Summary:

Describe the purpose of the position.

Supervise projects on vehicles and heavy maintenance.
Determine priority of repairs needed.
Maintain all buildings.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

General building maintenance.
Heavy and light equipment repairs.
Schedule regular maintenance equipment.
Assign jobs and follow up on job completions.
Locating and ordering parts.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

Able to run lathe, Bridgeport for repair of parts needed.
Handle special projects as needed.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

Thorough knowledge of equipment and aptitude for mechanical maintenance.
One year of previous experience in supervisory position.
High School diploma and mechanical training.
Knowledge of OSHA regulations.

TRAINING REQUIREMENTS

Job Title: **Maintenance Lead**

Designation: **Hazardous Waste Worker**

Reports To: **Operations Manager**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
Powered Industrial Truck (triennial)
Aerial Work Platform (triennial)
Fall Protection (initial)
Respiratory Protection (initial)
DOT HM-232 Transportation Security Plan (initial and annual)
Basic Electrical Safety (initial)
New Employee Safety Orientation (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Hot Work
Overhead Crane
Confined Space Rescue
Alcohol and Drug Awareness

Environmental Aspects & Impacts

(Environmental Aspects – Element of an organization's activities, products or services that can interact with the environment. Environmental Impact – Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.)

Aspect:

Impact:

Job Title: OPERATIONS MANAGER-CHEM FIX

Reports To:	**Director of Operations**	**Department:**	**Operations EQ-Detroit**
Grade Level:		**Company:**	**EQ**
Date:	**10/05**	**Prepared By:**	**S. Binder**

Job Summary:

Describe the purpose of the position.

Oversee and control the operations at EQ-Detroit Chem-fix Treatment Plant. To ensure that EQ-Detroit is compliant with all regulatory agencies while still remaining profitable. To oversee all receiving functions at EQ-Detroit stabilization operation..

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Oversee day-to-day operations at EQ-Detroit to ensure that operations occur safely, compliantly, and efficiently.
- Oversee material management program to ensure overall profitability of this stream.
- Interface between operations, regulatory, sales, laboratory, and heath and safety groups to ensure seamless interaction to optimize the operation.
- Develop new and analyze current procedures to help to maximize production at EQ-Detroit while maintaining safety and compliance.
- Required to track and maintain costs within budget to ensure profitability.
- Oversee all projects with respect to the operation and ensure they are completely in a timely manner within budget.
- Interact with internal and external customers on a daily basis to help solve problems or answer questions.
- Provide necessary guidance to staff to allow EQ-Detroit to run at it's highest capacity possible while still maintaining it's safety and compliance record.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Month reporting.
- Interaction with regulatory agencies during inspections.
- Hiring of new employees.
- Disciplinary action

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- College Degree required in Environmental Field or related.
- Minimum of 5 years in the hazardous waste field.
- Minimum of 3 years in the management field.
- Excellent written and oral communication skills.
- Ability to multi-task.

TRAINING REQUIREMENTS

Job Title: **Operations Manager – EQ-Detroit**

Designation: **Hazardous Waste Worker**

Reports To: **VP – Hazardous Waste Operations**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Supervisor (initial)
8 Hour HAZWOPER Refresher (annual)
DOT HM-126F Training (triennial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
Asbestos NESHAP & PCB's (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee/Safety Orientation

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Fall Protection (intial)
Aerial Work Platform (triennial)
Powered Industrial Truck (triennial)
Alcohol & Drug Awareness (initial)

Job Title: OPERATIONS MANAGER CHEM PRE

Reports To:	**Director of Operations**	**Department:**	**Operations EQ-Detroit**
Grade Level:		**Company:**	**EQ**
Date:	**10/05**	**Prepared By:**	**S. Binder**

Job Summary:

Describe the purpose of the position.

Oversee and control the operations at EQ-Detroit Wastewater Treatment Plant. To ensure that EQ-Detroit is compliant with all regulatory agencies while still remaining profitable.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Oversee day-to-day operations at EQ-Detroit to ensure that operations occur safely, compliantly, and efficiently.
- Oversee material management program to ensure overall profitability of this stream.
- Interface between operations, regulatory, sales, laboratory, and heath and safety groups to ensure seamless interaction to optimize the operation.
- Develop new and analyze current procedures to help to maximize production at EQ-Detroit while maintaining safety and compliance.
- Required to track and maintain costs within budget to ensure profitability.
- Oversee all projects with respect to the operation and ensure they are completely in a timely manner within budget.
- Interact with internal and external customers on a daily basis to help solve problems or answer questions.
- Provide necessary guidance to staff to allow EQ-Detroit to run at it's highest capacity possible while still maintaining it's safety and compliance record.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Month reporting.
- Interaction with regulatory agencies during inspections.
- Hiring of new employees.
- Disciplinary action

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- College Degree required in Environmental Field or related.
- Minimum of 5 years in the hazardous waste field.
- Minimum of 3 years in the management field.
- Excellent written and oral communication skills.
- Ability to multi-task.

TRAINING REQUIREMENTS

Job Title: **Operations Manager – EQ-Detroit**

Designation: **Hazardous Waste Worker**

Reports To: **Director of Operations**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Supervisor (initial)
8 Hour HAZWOPER Refresher (annual)
DOT HM-126F Training (triennial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
Asbestos NESHAP & PCB's (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee/Safety Orientation

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Fall Protection (intial)
Aerial Work Platform (triennial)
Powered Industrial Truck (triennial)
Alcohol & Drug Awareness (initial)

Job Title: OPERATIONS MANAGER

Reports To:	**Director of Operations**	**Department:**	**Operations EQ-Detroit**
Grade Level:		**Company:**	**EQ**
Date:	**4/05**	**Prepared By:**	**C. Counsil**

Job Summary:

Describe the purpose of the position.

Oversee and control the operations at EQ-Detroit Waste Treatment Plant. To ensure that EQ-Detroit is compliant with all regulatory agencies while still remaining profitable. To oversee all receiving functions at EQ-Detroit.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Oversee day-to-day operations at EQ-Detroit to ensure that operations occur safely, compliantly, and efficiently.
- Oversee material management program to ensure overall profitability of this stream.
- Interface between operations, regulatory, sales, laboratory, and heath and safety groups to ensure seamless interaction to optimize the operation.
- Develop new and analyze current procedures to help to maximize production at EQ-Detroit while maintaining safety and compliance.
- Required to track and maintain costs within budget to ensure profitability.
- Oversee all projects with respect to the operation and ensure they are completely in a timely manner within budget.
- Interact with internal and external customers on a daily basis to help solve problems or answer questions.
- Provide necessary guidance to staff to allow EQ-Detroit to run at it's highest capacity possible while still maintaining it's safety and compliance record.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Month reporting.
- Interaction with regulatory agencies during inspections.
- Hiring of new employees.
- Disciplinary action

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- College Degree required in Environmental Field or related.
- Minimum of 5 years in the hazardous waste field.
- Minimum of 3 years in the management field.
- Excellent written and oral communication skills.
- Ability to multi-task.

Job Title: LEAD PLANT OPERATOR-CHEM FIX

Reports To:	**Operations Manager**	**Department:**	**Operations-EQ-Detroit**
Grade Level:	**N/A**	**Company:**	**EQ**
Date:	**4/05**	**Prepared By:**	**C. Counsil**

Job Summary:

Describe the purpose of the position.

To operate all heavy equipment and fulfill all duties as described below.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Oversee Chem Fix Operators to ensure the following duties are performed efficiently, compliantly, and safely.
- Effective communicate all necessary operations information during shift transition.
- Treatment of all materials as directed by the Plant Supervisor.
- Sampling all post-treated materials for testing by the laboratory.
- Loading of all cleared post-treatment materials for landfill.
- Operating heavy equipment including excavators, loaders, and heavy trucks as directed.
- Crushing/shearing of all drums that require such utilizing excavators with shearing attachment.
- Assist in general housekeeping duties.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Any other assigned tasks.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma
- 24-hour hazwoper training
- Excellent oral and written communication skills.
- Previous experience running heavy equipment.

Training Requirements

Job Title: **Lead Plant Operator – Chem Fix**

Designation: **Hazardous Waste Worker**

Reports To: **Operations Manager**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
New Employee/Safety Orientation
Respiratory Protection (initial and annual)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Aerial Work Platform (triennial)
Powered Industrial Truck (triennial)
Basic Electrical Safety (initial)
Fall Protection (initial)
Alcohol & Drug Awareness (initial)

Job Title: PLANT OPERATOR-CHEM FIX

Reports To:	**Operations Manager**	**Department:**	**Operations-EQ-Detroit**
Grade Level:	**N/A**	**Company:**	**EQ**
Date:	**4/05**	**Prepared By:**	**C. Counsil**

Job Summary:

Describe the purpose of the position.

To operate all heavy equipment and fulfill all duties as described below.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Treatment of all materials as directed by the Operations Manager or Lead Plant Operator.
- Sampling all post-treated materials for testing by the laboratory.
- Loading of all cleared post-treatment materials for landfill.
- Operating heavy equipment including excavators, loaders, and heavy trucks as directed.
- Crushing/shearing of all drums that require such utilizing excavators with shearing attachment.
- Assist in general housekeeping duties.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Any other assigned tasks.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma
- 24-hour hazwoper training
- Excellent oral and written communication skills.
- Previous experience running heavy equipment.

Training Requirements

Job Title: **Plant Operator – Chem Fix**

Designation: **Hazardous Waste Worker**

Reports To: **Operations manager and Lead Plant Operator**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee Safety Orientation

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Aerial Work Platform (triennial)
Powered Industrial Truck (triennial)
Fall Protection (initial)
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Confined Space Rescue

Job Title: LEAD OPERATOR - CHEM PRE

Reports To:	**Operations Manager**	**Department:**	**Chem Pre**
Grade Level:	**N/A**	**Company:**	**EQ-Detroit**

Job Summary:

Describe the purpose of the position.

Perform the operational functions relating to Chem Pre at EQD in a safe, efficient manner in compliance with all applicable regulations.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Loading and unloading of bulk and containerized materials.
Jar test and execute chemical treatment required to meet discharge limitations.
Resolve operations issues between EQD departments as they occur.
Completion of necessary paperwork.
Operation of Filter presses and duties associated with managing press solids.
Interface with laboratory and Operations Manager to determine most efficient methods for processing materials.
Sampling process tanks for compliance testing.
General Housekeeping of Plant and grounds.
Assist in training of less-experienced operators.
Order chemicals for treatment of wastewater and oily waste.
Order laboratory, PPE, and other miscellaneous supplies needed to operate Chem Pre.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

General duties as needed.
Preventive maintenance as needed.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

High school diploma
24-hour hazwoper training
Excellent oral and written communication skills.
Hi-lo, man-lift certifications.

Training Requirements

Job Title: Plant Operator – Chem pre

Designation: Hazardous Waste Worker

Reports To: Operations Manager

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee Safety Orientation
Aerial Work Platform (triennial)
Fall Protection (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Powered Industrial Truck (triennial)
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Confined Space Rescue

Job Title: CHEMIST I

Reports To:	**Laboratory Supervisor**	**Department:**	**Laboratory**
Level:	**G11**	**Company:**	**EQ Detroit**
Date:	**05/05**	**Prepared By:**	**R. Landsberg**

Job Summary:

Describe the purpose of the position.

Responsible for the completion of laboratory procedures involved with the instrumentation analysis of environmental samples

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Guided by established protocols, perform necessary wet chemistry prep work and sample analysis.
Analyze inbound material to make determination of acceptance into facility.
Ensure proper instrument calibration, operation, and maintenance.
Ensure that all proper test methods and QA/QC procedures are adhered to.
Provide technical assistance to any other area of the operation as needed.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

Prepare analytical data into reports for final review.
Maintain good housekeeping and lab cleanliness.
Maintain complete records and logbooks.
Support training program.
Perform pre-approval/receiving/drum fingerprints.
General awareness to laboratory safety protocols.
Inventory and analytical supply management
Supervision of technicians.
Any other applicable duties, which may be assigned.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

Bachelor's Degree in chemistry or related field.
0-2 years experience in chemical analysis.
Strong communication and interpersonal skills.
Sound understanding of related regulatory and lab techniques.
Independent worker with sound judgment and multitasking skills.

Job Training:

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
New Employee/Safety Orientation
Respiratory Protection (initial and annual)
Chemical Hygiene Plan (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Lockout/Tagout Requirements (initial)

Job Title: CHEMIST II

Reports To:	**Laboratory Supervisor**	**Department:**	**Laboratory**
Level:	**G12**	**Company:**	**EQ Detroit**
Date:	**05/05**	**Prepared By:**	**R. Landsberg**

Job Summary:

Describe the purpose of the position.

Responsible for the completion of laboratory procedures involved with the instrumentation analysis of environmental samples

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Guided by established protocols, perform necessary wet chemistry prep work and sample analysis.
Analyze inbound material to make determination of acceptance into facility.
Ensure proper instrument calibration, operation, and maintenance.
Ensure that all proper test methods and QA/QC procedures are adhered to.
Provide technical assistance to any other area of the operation as needed.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

Prepare analytical data into reports for final review.
Maintain good housekeeping and lab cleanliness.
Maintain complete records and logbooks.
Support training program.
Perform pre-approval/receiving/drum fingerprints.
General awareness to laboratory safety protocols.
Inventory and analytical supply management
Supervision of technicians.
Any other applicable duties, which may be assigned.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

Bachelor's Degree in chemistry or related field.
1-4 years experience in chemical analysis.
Strong communication and interpersonal skills.
Sound understanding of related regulatory and lab techniques.
Independent worker with sound judgment and multitasking skills.

Job Training:

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
New Employee/Safety Orientation
Respiratory Protection (initial and annual)
Chemical Hygiene Plan (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Lockout/Tagout Requirements (initial)

Job Title: CHEMIST III

Reports To:	**Laboratory Supervisor**	**Department:**	**Laboratory**
Level:	**G13**	**Company:**	**EQ Detroit**
Date:	**05/05**	**Prepared By:**	**R. Landsberg**

Job Summary:

Describe the purpose of the position.

Responsible for the completion of laboratory procedures involved with the instrumentation analysis of environmental samples

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Guided by established protocols, perform necessary wet chemistry prep work and sample analysis.
Analyze inbound material to make determination of acceptance into facility.
Ensure proper instrument calibration, operation, and maintenance.
Ensure that all proper test methods and QA/QC procedures are adhered to.
Provide technical assistance to any other area of the operation as needed.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

Prepare analytical data into reports for final review.
Maintain good housekeeping and lab cleanliness.
Maintain complete records and logbooks.
Support training program.
Perform pre-approval/receiving/drum fingerprints.
General awareness to laboratory safety protocols.
Inventory and analytical supply management
Supervision of technicians.
Any other applicable duties, which may be assigned.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

Bachelor's Degree in chemistry or related field.
3-5 years experience in chemical analysis.
Strong communication and interpersonal skills.
Sound understanding of related regulatory and lab techniques.
Independent worker with sound judgment and multitasking skills.

Job Training:

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
New Employee/Safety Orientation
Respiratory Protection (initial and annual)
Chemical Hygiene Plan (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Lockout/Tagout Requirements (initial)

Job Title: EQD-LAB PACK FIELD CHEMIST

Reports To:	**Operations Manager— Lab Pack & LTL Services**	**Department:**	**Operations**
Grade Level:	**L14**	**Company:**	**EQD- Lab Pack**
Date:	**4/17/07**	**Prepared By:**	**T. McGillis**

Job Summary:

Describe the purpose of the position.

Facilitate the Lab Pack program by providing field services for customers on their site, including the characterization, packaging, handling, and transportation of customer wastes.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Provide Lab Packing services at customer sites maintaining compliance with applicable RCRA and DOT regulations and with established EQ company SOP's.
- Sample and characterize customer waste, when necessary.
- Transport wastes from customer sites to end user or transfer facility.
- Generate all required internal paperwork in order to provide accurate and timely customer service and invoicing.
- When necessary, provide customer with detailed inventory of waste on site.
- Generate quotations for customers for work to be performed.
- Generate waste profiles into end user facility.
- Help to off load waste at end user facility.
- Interact with internal operations, external disposal facilities, and transporters.
- Maintain meticulous attention to detail, profitability, and efficiency.
- Perform all duties following established company ISO procedures.
- Back up Lab Pack Depack Chemist in the event of an absence.
- Maintain personal DOT HM126 certification and CDL licensing.
- Other duties as assigned by supervisor/manager.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Generate and mail customer invoices
- Establish SOPs
- Streamline operational costs

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- Bachelors degree in life science, marketing, business, or related field.
- Ability to maintain a professional presence.
- Ability to work with AE's for team sales.
- Excellent written, verbal, and oral communication skills.

Training Requirements :

Required training necessary to comply with company policy and regulatory requirements.

- New employee orientation/ 3 days on the job training
- 24 Hour Hazwoper.
- 8 Hour Refresher Training
- ISO Training 9000 and 14000
- HM 126 Manifesting Training
- Contingency Plan Training.
- If driving a company truck, must have a current Commercial Drivers License (CDL)

Job Title: LABORATORY SUPERVISOR

Reports To:	**Manager, Lab Services**	**Department:**	**Laboratory**
Level:	**L14**	**Company:**	**EQ Detroit**
Date:	**05/05**	**Prepared By:**	**R. Landsberg**

Job Summary:

Describe the purpose of the position.

Responsible for the day to day operations of the on-site laboratory

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Directly oversee lab personnel, including work schedules and disciplinary functions.
Prioritize, organize, and delegate workload in a manner consistent with EQ business objectives and policies.
Maintain complete records to ensure technical proficiency of the lab.
Provide scientifically defensible results in accordance with USEPA SW-846, 40 CFR, ASTM, and other accepted protocols.
Identify and solve department problems.
Implement QA/QC Program, ISO certification, QAP, Chemical Hygiene Plan, MSDS and other standards as needed.
Ensure that laboratory equipment is properly maintained and kept in operable condition.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

Permit (WAP) support.
Promote good housekeeping and safety practices.
Responsible for all laboratory reports.
Ensure that all work is completed in a timely manner.
Budget planning.
Validation of Batch Certificate Package.
Validation & Distribution of Lab Analysis
Maintain Billing Flow
Order supplies

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

Bachelor's Degree in chemistry or related field.
At least 3 years of industrial or commercial lab experience.
Hazardous waste experience preferred.
Ability to supervise employees.
Ability to work without direct supervision.
Ability to establish short term plans and objectives for the lab.

Job Training:

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
8 Hour Supervisor HAZWOPER
Chemical Hygiene Plan (initial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
New Employee/Safety Orientation
Respiratory Protection (initial and annual)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Lockout/Tagout Requirements (initial)

Job Title: EQ DETROIT ADMINISTRATIVE ASSISTANT

Reports To:	**Customer relations Manager**	**Department:**	**EQ Detroit Resource Team**
Grade Level:	**G-11**	**Company:**	**EQ**
Date:	**4/05**	**Prepared By:**	**Liz Hillgren**

Job Summary:

Describe the purpose of the position.

Provide administrative support to the Customer relations Manager, Resource Coordinators, Approvals Coordinators, Compliance Coordinators and operations staff.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Manage approval and manifest file system.
- Manage office supplies.
- Operate switchboard and direct all incoming calls.
- Guide all vistors at the site.
- Manage all department office equipment.
- Provide support to EQ Detroit staff.
- Manage department calendar.
- Coordinate inbound/outbound mail and UPS.
- Manage manifest requests from customers and staff.
- Coordinate manifest mailings for customers and regulatory agencies.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Prepare reports as required by the Customer relations Manager and director of operations.
- Act as a liaison for the payroll department and maintain payroll records for the site.
- Assist Resource Coordinators with data entry.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma or GED equivalent, bachelor's degree preferred.
- Strong computer skills required.
- Excellent organizational and prioritizing skills.
- Excellent oral and written communication skills.
- Ability to work within a team environment and handle multiple tasks

Required Training:

Required Training necessary to carry on the purpose and critical functions of the position.

- 8 Hour Hazwoper
- DOT HM-126 Manifesting
- DOT HM-232 Transportation Security Plan
- SPCC
- Haz Com
- RCRA/Contingency Plan
- General Plant Hazards
- Accident/Injury Reporting
- PPE
- Safe Lifting Techniques
- Warning/Tags
- Smoking Policies
- OSHA Employee Rights
- Bloodborn Pathogens
- New Employee/Safety Orientation

Suggested Training.

- First Aid/CPR
- Portable Fire Extinguisher
- Drug and Alcohol awareness
- Customer service Training

Job Title: REGULATORY SPECIALIST

Reports To:	**VP – Regulatory Affairs**	**Department:**	**Regulatory Affairs**
Grade Level:		**Company:**	**EQ Detroit**
Date:	**8/05**	**Prepared By:**	**S. Maris**

Job Summary:

Describe the purpose of the position.
To identify compliance issues, develop and implement corrective measures, and to manage to completion regulatory and permit driven projects as assigned and directed by the Director – Regulatory Affairs.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Develop, negotiate and implement new permits or permit modifications.
- Manage to completion regulatory and permit driven special projects, such as reports, new regulations, research, data assembly, data synthesis and data analysis as driven by regulatory and legal contingencies.
- Maintain compliance histories.
- Inspect the EQ treatment and disposal operations for compliance with all permits, state and federal regulations.
- Report inspection findings to management and work closely with them to develop and implement corrective procedures.
- Provide training.
- Maintain and develop regulatory expertise.
- Measure and correct operational and laboratory compliance with EQ SOPs

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Develop expertise on EQ operating permits, licenses and operations. Assist in any way necessary to modify the permit, licenses and operations.
- Develop expertise on EQ operating records management system - in both paper and electronic media.
- Develop a positive working relationship with regulatory inspectors, permit writers and community contacts.
- Interact frequently with management and hourly associates to identify and solve problems.
- Serve as a regulatory and technical resource throughout the company.
- Train associates on regulatory and related technical matters

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- Bachelor's degree in a technical field, engineering degree preferred.
- At least three to five years in the hazardous waste industry. Demonstrated broad knowledge of environmental regulations.
- Knowledge of waste treatment and disposal practices requirements.
- Ability to work under pressure to meet deadlines.
- Ability to deal with unstructured problems that require defensible decisions on complex regulatory matters.
- Performance of other duties and responsibilities as required by management.

Training Requirements

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
Chemical Hygiene Plan (initial)
DOT HM-126F Training (triennial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
Respiratory Protection (initial)
DOT HM-232 Transportation Security Plan (initial and annual)
Fall Protection (initial)

Suggested:

8 Hour HAZWOPER Supervisor (initial)
First Aid/CPR
Portable Fire Extinguisher
Basic Electrical Safety
Alcohol & Drug Awareness
Confined Space Rescue

Environmental Aspects & Impacts

(Environmental Aspects – Element of an organization's activities, products or services that can interact with the environment. Environmental Impact – Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.)

Aspect:

Impact:

Job Title: REGULATORY COORDINATOR

Reports To:	**VP – Regulatory Affairs**	**Department:**	**Regulatory Affairs**
Grade Level:		**Company:**	**EQ Detroit**
Date:	**8/05**	**Prepared By:**	**S. Maris**

Job Summary:

Describe the purpose of the position.
Position designed to keep accurate profiles and manifest documentation for regulatory compliance. Have the knowledge to answer or route issues that occur through acceptance of materials. To create Standard Operating Procedures that are efficient and manageable within compliance.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Responsible for maintaining daily environmental compliance tracing of all waste received, processed, disposed and/or sent off-site.
- ISO Management Representative - ISO 9001/14001
- Review tracing information for compliance and resolve any issues that arise.
- TRI Reporting
- Bi-ennial reporting
- For vaults 701-708, discharge tanks and all other tanks before movement.
- 624, when results are in they go to Compliance.
- Track manually all material received from cradle to grave.
- Work with operations to create proper tracking documentation.
- Manage vault and discharge documentation.
- Implement information into EQAI for cradle to grave.
- Track Compliance Requirements.
- Conducting training for all departments regarding waste tracking, record keeping and standard operating procedures (SOPs)
- Assist operations waste acceptance, and customer service regarding compliance tracking

Additional Responsibilities:

Performance of additional duties not critical for job performance.

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Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High School diploma
- Education, knowledge or experience equivalent to graduation from a university with specialization in environmental engineering.
- Two to five years understanding the environmental business and in dealing with Hazardous Waste Compliance or equivalent experience.
- Knowledge in RCRA, MDEQ, DOT and other local authority regulations.
- Ability to work well under time deadlines.

Training Requirements

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
Chemical Hygiene Plan (initial)
DOT HM-126F Training (triennial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Bloodborne Pathogens (initial)
DOT HM-232 Transportation Security Plan (initial and annual)
New Employee/Safety Orientation (initial)
Internal Auditor Training –ISO 9000/14000

Suggested:

8 Hour HAZWOPER Supervisor (initial)
First Aid/CPR
Portable Fire Extinguisher
Basic Electrical Safety
Alcohol & Drug Awareness
Confined Space Rescue
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Compressed Gasses (initial)
Respiratory Protection (initial)
Fall Protection (initial)
Qualitative Fit Test

Environmental Aspects & Impacts

(Environmental Aspects – Element of an organization's activities, products or services that can interact with the environment. Environmental Impact – Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.)

Aspect:

Impact:

Job Title: EQ DETROIT APPROVALS COORDINATOR

Reports To:	**Customer Relations Manager**	**Department:**	**EQ Resource Team**
Grade Level:	**L14**	**Company:**	**EQ Detroit**
Date:	**4/05**	**Prepared By:**	**Liz Hillgren**

Job Summary:

Describe the purpose of the position.

To ensure that EQ Detroit maintains a high level of regulatory and customer service professionalism for materials managed.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Review paperwork and samples for completeness, safety with respect to treatment/disposal, and compliance with all applicable regulations/permits.
- Identify potential problematic wastestreams and direct such wastestreams to the proper department.
- Assist customers in the proper completion of waste profiles and work with customers to achieve proper completion in a timely manner.
- Provide technical support to the sales department.
- Maintain all inbound files with regards to re-approvals, to ensure continued compliance with applicable regulations/permits.
- Set up and maintain approvals at TSDF's for outbound shipments.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Maintain communication with the sales department to maintain customer satisfaction.
- Act as a liaison between the operations and sales departments.
- Assist in manifest discrepancies.
- Provide technical support in any special projects.
- Assist in paperwork completion for outbound shipments

Job Training:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- Bachelors degree in chemistry, biology, life science, or a related field.
- Strong background in EPA/MDEQ/DOT/TSCA(PCB) regulations.
- Strong verbal and written communication skills.
- Ability to work within a team environment.
- Ability to manage multiple projects and perform consistently under time constraints.

Required Training:

Required Training necessary to carry on the purpose and critical functions of the position.

- 24 Hour Hazwoper
- 8 Hour Refresher
- DOT HM-126 Manifesting
- DOT HM-232 Transportation Security Plan
- SPCC
- Haz Com
- RCRA/Contingency Plan
- General Plant Hazards
- Accident/Injury Reporting
- PPE
- Safe Lifting Techniques
- Warning/Tags
- Smoking Policies
- OSHA Employee Rights
- Bloodborn Pathogens
- Chemical Hygiene Plan
- New Employee/Safety Orientation

Suggested Training.

- First Aid/CPR
- Portable Fire Exit
- Drug and Alcohol awareness
- Customer service Training

Job Title: DIRECTOR - EQ-DETROIT OPERATIONS

Reports To:	**VP-Hazardous Waste**	**Department:**	**EQ Detroit**
Grade Level:	**L19**	**Company:**	**EQ**
Date:	**10/04**	**Prepared By:**	**S. Binder**

Job Code:
Job Abbr:

Job Summary:

Describe the purpose of the position.

To direct and coordinate the profitable management of EQ-Detroit in a manner which is consistent with all applicable environmental compliance and health and safety standards, and all EQ-Detroit customer and associate satisfaction goals.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Administer activities of site managers, to achieve annual profit plan goals.
Oversee implementation of environmental compliance/policies and health and safety programs.
Oversee construction projects and act as liaison with engineering, construction, and finance to ensure projects are completed within budget and schedule constraints.
Supervise to minimize operating costs, design and implement cost reduction programs.
Manage all personnel including supervision, training, discipline and recruiting.
Oversee research, development and implementation of innovative cost effective landfill management technologies.
Represent EQ landfill services to industry/trade/professional groups.
Report inspection findings to management and work closely with them to write and implement corrective procedures.
Provide training and corrective procedures.
Preparation of various budget, operations and regulatory reports.
Oversee the management contract work off-site.
Oversee the management of building maintenance at EQD.
Oversee the management of security.
Oversee the management of the maintenance department on site.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

B.S. in Environmental related discipline.
Minimum five years experience in operations/management.
Broad working knowledge of stabilization, wastewater treatment, local environmental markets.
General management capacity for budget/profit and plan/capital expenditure control.

TRAINING REQUIREMENTS

Job Title: **Operations Manager – EQ-Detroit**

Designation: **Hazardous Waste Worker**

Reports To: **VP – Hazardous Waste Operations**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Supervisor (initial)
8 Hour HAZWOPER Refresher (annual)
DOT HM-126F Training (triennial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
Asbestos NESHAP & PCB's (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee/Safety Orientation

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Fall Protection (intial)
Aerial Work Platform (triennial)
Powered Industrial Truck (triennial)
Alcohol & Drug Awareness (initial)

Job Title: RECEIVING COORDINATOR

Reports To:	**Receiving Supervisor**	**Department:**	**Receiving**
Grade Level:	**G10**	**Company:**	**DETROIT**
Date:	**4/05**	**Prepared By:**	**R. Lewandowski**

Job Summary:

Describe the purpose of the position.

Team member responsible for coordinating inbound materials and ensuring that all inbound materials are in accordance with facility, State and Federal regulations.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Ensure that all incoming loads are properly manifested, complete and within compliance.
- Ensure that all Land Disposal Restriction forms are properly completed and attached.
- Ensure that all quantities are properly reported.
- Ensure that waste is approved into the facility.
- Enter all manifest information into the computer and issue billing tickets.
- Verify that waste in trucks matches approval and is within 10% of manifested quantity.
- Review fingerprint for accuracy
- Manage truck traffic in accordance with treatment tank availability.
- Resolve truck problems and manifest discrepancies.
- Sample loads as scheduled.
- Prepare and complete outbound paperwork
- Prepare manifest for distribution
- Assign batch information to load.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Arrange for offloading assistance for drivers as necessary.
- Ensure that drivers have and wear appropriate PPE.
- Ensure that trucks remain closed/tarped until they arrive at the offloading area.
- Inspect the sampling area and truck staging area for spills or leaks.
- Fax and photocopy as required.
- Sample disposal
- Other duties as assigned.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma or GED equivalent.
- Completion of 24-hour OHSA/RCRA training.
- Knowledge of RCRA and DOT regulations preferred.
- Excellent communication and interpersonal skills.
- Ability to wear a respirator.
- Must be able to follow directions and complete required tasks in a timely manner.
- Previous customer service experience preferred.

TRAINING REQUIREMENTS

Job Title: Receiving Coordinator

Designation: Hazardous Waste Worker

Reports To: Receiving Supervisor -

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
DOT HM-126F Training (triennial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
DOT HM-232 Transportation Security Plan (initial and annual)
Qualitative Fit Test for Respirators (annual)
Fall Protection (initial)
Basic Electrical Safety (initial)
Bloodborne Pathogens (initial)
Respiratory Protection (annual)
Lock Out/Tag Out Requirements (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Drug & Alcohol Awareness

Job Title: RECEIVING SUPERVISOR

Reports To:	**Customer Relations Manager**	**Department:**	**RECEIVING**
Grade Level:	**L14**	**Company:**	**Detroit**
Date:	**4/05**	**Prepared By:**	**R. Lewandowski**

Job Summary:

Describe the purpose of the position.

To direct the receiving functions for Detroit. To ensure the accuracy of manifest entry and handling. To facilitate and manage the flow of materials into and out of the processing areas.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Supervise and train the receiving staff.
- Inspect and report daily transactions for accuracy and regulatory compliance.
- Maintain manifest tracking system and proper distribution of manifest copies.
- Ensure proper load sampling.
- Identify, maintain tracking, and release all "hold" items.
- Review and process rail paperwork.
- Act as point of contact for facility and customer information requests.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Liaise between Receiving and facility departments; manage compliance/problem issues to resolution
- Review all fingerprints.
- Perform Receiving Coordinator duties as needed
- Attend departmental meetings as necessary.
- Yearly employee reviews
- Maintain equipment

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- Through knowledge of RCRA regulations.
- Working knowledge of DOT regulations.
- Thorough knowledge of the production capabilities
- Ability to handle multiple tasks simultaneously.
- Ability to direct receivers and continuously monitor department functions.
- Must be able to understand the needs of various facility departments relative to their interaction with Receiving

TRAINING REQUIREMENTS

Job Title: **Receiving Supervisor**

Designation: **Hazardous Waste Worker**

Reports To:

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Supervisor (initial)
8 Hour HAZWOPER Refresher (annual)
DOT HM-126F Training (triennial)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Hearing Conservation (initial)
DOT HM-232 Transportation Security Plan (initial and annual)
Fall Protection (initial)
Basic Electrical Safety (initial)
Bloodborne Pathogens (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Lock Out/Tag Out
Respiratory Protection
Qualitative Fit Test for Respirators
Confined Space Entry
Confined Space Rescue
Drug and Alcohol Awareness

Job Title: TRUCK DRIVER

Reports To:	**Operations Manager/FSM**	**Department:**	**Operations**
Grade Level:	**Union Represented**	**Company:**	**EQ-Detroit**
Date:	**6/19/05**	**Prepared By:**	**Scott Binder**
Date:		**Revised By:**	
Date:		**Revised By:**	
Date:			

Job Summary:

Describe the purpose of the position.

The primary purpose of the position is to ensure that driving and operation of equipment is conducted in a safe and compliant manner while hauling hazardous and nonhazardous waste.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Performing duties in a safe and compliant manner
- Operate roll-off
- Operate tanker
- Maintain vehicle log
- On-call 24 hours per day 365 days per year

If over the road operator:

- All duties listed above
- Driving for a minimum of 8 hours per day with heavy loads being disposed of at designated TSDF facilities.
- May involve truck runs being out-of-town for 1-10 days.

Additional Responsibilities:

- MDOT Pre-trip and Post-trip inspections

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- CDL A or B with hazardous and tanker endorsements
- Clean driving record, no violations for the past 36 months
- 1-2 years previous experience (preferably with vacuum trucks and tankers)
- High School or GED
- Must be 18 years of age or older
- Able to read, write, and understand the English language, and able to follow verbal and written instructions
- Physically able to wear personal protective equipment (PPE) when necessary and lift > 80lbs routinely.
- Performance of other duties and responsibilities as required by management.

Job Title: TRUCK DRIVER

Training Requirements:

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee Safety Orientation
DOT Alcohol Awareness Training

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Powered Industrial Truck (triennial)
Fall Protection (initial)
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Confined Space Entry Requirements (initial)

Job Title: LEAD PLANT OPERATOR-WAREHOUSE

Reports To:	**Operations Manager**	**Department:**	**Operations-EQ-Detroit**
Grade Level:		**Company:**	**EQ Detroit**
Date:	**4/05**	**Prepared By:**	**C. Counsil**

Job Summary:

Describe the purpose of the position.

To operate all heavy equipment and fulfill all duties as described below.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Oversee day-to-day activities of warehouse plant operators
- Operation of forklift and other light equipment to off-load and re-load trucks as directed by the Operations Manager.
- Process drums into various vault locations as directed by the Operations Manager.
- Stage and organize containers inside the warehouse in a safe, efficient, and compliant manner.
- Assist in the drum fingerprint and sampling process as specified by the site Waste Analysis Plan.
- Assist in general housekeeping duties.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Any other assigned tasks.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma
- 24-hour hazwoper training
- Excellent oral and written communication skills.
- Previous experience running heavy equipment.

Training Requirements

Job Title: **Plant Operator – Chem Fix**

Designation: **Hazardous Waste Worker**

Reports To: **Operations Manager**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee/Safety Orientation

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Aerial Work Platform (triennial)
Powered Industrial Truck (triennial)
Fall Protection (initial)
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)

Job Title: PLANT OPERATOR-WAREHOUSE

Reports To:	**Operations Manager**	**Department:**	**Operations-EQ-Detroit**
Grade Level:	**N/A**	**Company:**	**EQ**
Date:	**4/05**	**Prepared By:**	**C. Counsil**

Job Summary:

Describe the purpose of the position.

To operate all heavy equipment and fulfill all duties as described below.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

- Operation of forklift and other light equipment to off-load and re-load trucks as directed by the Operations Manager or Lead Plant Operator-Warehouse.
- Process drums into various vault locations as directed by the Operations Manager or Lead Plant Operator-Warehouse.
- Stage and organize containers inside the warehouse in a safe, efficient, and compliant manner.
- Assist in the drum fingerprint and sampling process as specified by the site Waste Analysis Plan.
- Assist in general housekeeping duties.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

- Any other assigned tasks.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

- High school diploma
- 24-hour hazwoper training
- Excellent oral and written communication skills.
- Previous experience running heavy equipment.

Training Requirements

Job Title: **Plant Operator – Chem Fix**

Designation: **Hazardous Waste Worker**

Reports To: **Operations Manager and Lead Plant Operator**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee Safety Orientation

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Aerial Work Platform (triennial)
Powered Industrial Truck (triennial)
Fall Protection (initial)
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)

Job Title: PLANT OPERATOR - CHEM PRE

Reports To:	**Operations Manager**	**Department:**	**Chem Pre**
Grade Level:	**N/A**	**Company:**	**EQ-Detroit**

Job Summary:

Describe the purpose of the position.

Perform the operational functions relating to Chem pre at EQD in a safe, efficient manner in compliance with all applicable regulations.

Essential Functions:

Critical duties/tasks to fulfill the purpose of the position. A function is critical if you answer " yes" to this question, " Would the flow of work be interrupted by not performing this function?"

Loading and unloading of bulk and containerized materials.
Completion of necessary paperwork.
Operation of Filter presses and duties associated with managing press solids.
Interface with laboratory and Operations Manager to determine most efficient methods for processing materials.
Sampling process tanks for compliance testing.
General Housekeeping of Plant and grounds.
Assist in training of less-experienced operators.

Additional Responsibilities:

Performance of additional duties not critical for job performance.

General duties as needed.
Preventive maintenance as needed.

Job Qualifications:

Required qualifications necessary to carry on the purpose and critical functions of the position.

High school diploma
24-hour hazwoper training
Excellent oral and written communication skills.
Hi-lo, man-lift certifications.

Training Requirements

Job Title: **Plant Operator – Chem pre**

Designation: **Hazardous Waste Worker**

Reports To: **Operations Manager**

Mandatory:

24 Hour HAZWOPER (initial)
8 Hour HAZWOPER Refresher (annual)
SPCC Plan (initial)
Hazard Communication (initial)
RCRA/Contingency Plan (initial and annual)
General Plant Hazards (initial)
Accident/Injury Reporting Protocol (initial)
PPE Requirements, Use and Acquisition (initial and annual)
Hearing Conservation (initial)
Lockout/Tagout Requirements (initial)
Confined Space Entry Requirements (initial)
Safe Lifting Techniques (initial)
Warning Signs/Tags (initial)
Smoking Policies (initial)
OSHA Employee Rights (initial)
Compressed Gasses (initial)
Bloodborne Pathogens (initial)
DOT HM-126F Training (triennial)
DOT HM-232 Transportation Security Plan (initial & annual)
Respiratory Protection (initial & annual)
New Employee Safety Orientation
Aerial Work Platform (triennial)
Fall Protection (initial)

Suggested:

First Aid/CPR
Portable Fire Extinguisher
Powered Industrial Truck (triennial)
Basic Electrical Safety (initial)
Alcohol & Drug Awareness (initial)
Confined Space Rescue

Appendix J- 1: Evaluation of Releases

Tetra Tech EM Inc.

1099 18th Street, Suite 1960 ♦ Denver, CO 80202 ♦ (303) 295-1101 ♦ FAX (303) 295-2818

October 27, 1999

Mr. Dave Navarre
McNamee Industrial Services
3131 South State Street
Ann Arbor, MI 48108

Subject: **Evaluation of Worst Case Releases From Detroit Hazardous Waste Treatment Facility**

Dear Dave:

At your request, we have performed a preliminary screening analysis of the air quality impact of two, worst case, accidental releases from the Detroit hazardous waste processing facility. Based upon our discussions with you we created the following scenarios:

- Solid Waste Section - Chemical Fixation

  A 20 cu. yd. container with 5,000 ppm sulfide is assumed to react with the wrong chemical producing 5,000 ppm H_2S inside the building. Gaseous emissions are assumed to be collected by the ventilation system and discharged to atmosphere. The total potential quantity of H_2S is assumed to be discharged to the atmosphere over a one hour period. Total quantity of potential released H_2S is 250 lbs. assuming a soil density of 2,500 lbs. per cu yd.

- Liquid Waste Section - Chemical Precipitation

  A 5,000 gal tank of liquid containing 1000 ppm of HCN is assumed to rupture spilling the entire contents. HCN is totally volatilized as a gas and disperses over a one hour period. There is no ventilation system but the gas is assumed to seep out through building openings. The estimated emissions of HCN are 0.86 lbs in an hour based upon a mitigation factor of 0.55 (EPA Guidance on Accidental Releases - Appendix B).

To predict the potential impact of air emissions from the above two scenarios we used the EPA T-SCREEN model which simulates both point and area sources. We obtained building and stack parameters and used the shortest distance from the releases to the property boundary to estimate maximum 1-hr ambient concentrations of H_2S and HCN. Model input parameters are shown in Table-1.

We compared those modeled maximum concentrations with Emergency Release Planning Guidelines (ERPG-2) which are prepared by the American Industrial Hygiene Association and also used by EPA as guidance for accidental release evaluation. The ERPG's represent maximum 1-hr concentrations that individuals can be exposed to without serious harm. Model results compared to ERPG's for H_2S and HCN are shown in Table-2. These results show that the predicted maximum air quality impact from these two worst case scenarios are well below a harmful level for both H_2S and HCN.

TABLE 1

MODEL INPUT PARAMETERS

Model Inputs	H_2S Point Source Release	HCN Area Source Release
Emission rate, g/s	31.5	0.11
Stack height, m	21.0	0
Stack I.D., m	1.2	-
Stack exit velocity, m/s	27.1	-
Stack gas exit temp., °k	29.3	-
Building height, m	9.1	-
Min. hor. bldg. dim., m	59.7	-
Max. hor. bldg. dim., m	69.2	-
Length of larger side, m	-	46.95
Length of smaller side, m	-	46.95

TABLE 2

MAXIMUM PREDICTED IMPACT OF RELEASES

Release Scenario	Pollutant	Type of Release	Emission Rate	Max. Modeled Conc.	Acceptable Ambient Conc (ERPG-2)
Gaseous release from 20 cu. yds. of contaminated soil	H_2S	Point source ventilation system	2.15 lb/hr or 31.5 g/s	1 ppm	30 ppm
Spill/rupture of 5,000 gallon liquid tank	HCN	Area source from building	0.86 lb/hr or 0.11 g/s	0.5 ppm	10 ppm

Appendix M-1

Protocol for Evaluating the Uniform Hazardous Waste Manifest

Protocol for Evaluating the Uniform Hazardous Waste Manifest

Note: All Manifest discrepancies must be resolved with the assistance of the Customer Service Department (CSD).

ITEM 1: Generator's U.S. EPA ID No./Manifest Document No.

The generator's U.S. EPA (EPA) twelve digit identification number or State generator identification number if the generator site does not have an EPA Identification Number must be entered.

ITEM 2: Page 1 of _

Waste Acceptance Staff (WAS) should confirm that, if more than three transporters were used to transport the shipment, a "2" is entered here and a continuation sheet accompanies the Manifest. In all other cases "1 of 1" is the appropriate entry.

ITEM 3: Emergency Response Phone

The generator must enter a phone number for which emergency response information can be obtained during transportation. The emergency response number must:

- Be the number of the generator or the number of an agency or organization who is capable of and accepts responsibility for providing detailed information about the shipment;
- Reach a phone that is monitored 24 hours a day at all times the waste is in transportation (including transportation related storage); and
- Reach someone who is either knowledgeable of the hazardous waste being shipped and has comprehensive emergency response and spill cleanup/incident mitigation information for the material being shipped or has immediate access to a person who has that knowledge and information about the shipment.

ITEM 4: Manifest Tracking Number

This unique tracking number must be pre-printed on the manifest by the forms printer

ITEM 5 Generator's Mailing Address, Phone Number and Site Address

The Generator's name, mailing address to which the completed signed manifest will be sent by EQD to the generator, and the generator's telephone number must be entered in this space. The physical site address from which the shipment originated should be entered if this is different from the mailing address.

ITEM 6: Transporter 1 Company Name and U.S. EPA ID Number

The company name and U.S. EPA ID number for the first transporter who transported the waste must be entered in this space.

ITEM 7: Transporter Company Name and U.S. EPA ID Number

If applicable, the company name and U.S. EPA ID number for the second transporter who transported the waste must be entered in this space. If more than two transporters are needed, a Continuation Sheet (EPA Form 8700-22A) should be attached.

ITEM 8: Designated Facility Name, Site Address, and U.S. EPA ID Number

The Designated Facility company name and U.S. EPA ID number, and telephone number(EQD for wastes being received at EQD) of the facility designated to receive the waste listed on the manifest.

ITEM 9: U. S. DOT Description (including Proper Shipping Name, Hazard Class or Division, Identification Number, and Packing Group)

Item 9a: If the wastes identified in Item 9b consist of both hazardous and nonhazardous materials, then the the hazardous materials are identified by entering an “X” in this Item next to the corresponding hazardous material identified in Item 9b

Item 9b: The U. S. DOT Proper Shipping Name, Hazard Class or Division, Identification Number (UN/NA), and Packing Group) for each waste as identified in 49 CFR 172 must be entered; technical names and reportable quantity references must be included if applicable..

ITEM 10: Containers (Number and Type)

The number and type of container for each waste must be included in Item 10.

ITEM 11: Total Quantity

The total quantity of waste, rounded to the nearest whole unit is entered in Item 11. .

ITEM 12: Units of Measure

Appropriate abbreviations per 40 CFR 263.21 are used to denote the unit of measure.

ITEM 13: Waste Codes

Up to six Federal and State Waste Codes which describe each waste stream identified in Item 9b are entered in Item 13. State waste codes that are not redundant with federal codes must be entered here, in addition to the federal wate codes which are most representative of the properties of the waste.

ITEM 14: Special Handling Instructions and Additional Informaiton

1. Generators special handling or shipment-specific information for proper management or tracking of the materials may be entered in this space.
2. Limited types of federally required information for which no specific space was provided on the manifest, including alternate facility designations; the manifest tracking number of the original manifest for rejected wastes and residues that are re-shipped under a second manifest; and the specification of PCB waste

descriptions and PCB out of service dates required under 40 CFR 761.207 is enterd in this space.

ITEM 15: Generator's Offerers Certifications

This item must have the generator's certification signature.

ITEM 16: International Shipments

The export box must be checked by the primary exporter. The point of exit (city and state) from the United States must be entered. The transporter must sign and date the manifest to indicated the date the shipment left the United States. The import box is checked and the point of entry (city and state) into the United States must be entered in this block.

ITEM 17: Transporters' Acknowledgements of Receipt

The name, signature and date of acceptance of the person that accepted the waste (EQD Waste Acceptance Staff for waste being received at EQD) on behalf of the first transporter. If applicable, the name, signature and date of acceptance of the person accepting the waste on behalf of the second transporter.

ITEM 18: Discrepancy

Item 18a: Discrepancy Indication Space:

1. The authorized representative of the designated facility (EQD, if the waste was received at EQD) must note any discrepancies between the waste described on the Manifest and the waste actually received at the facility. Manifest discrepancies are significant differences as defined by 40 CFR 264.72(b) and 265.72(b).
2. The appropriate box is checked for rejected loads or a regulated residue that cannot be removed from a container. The reason for the rejection or inability to remove a residue should be entered in this block, as well as the Manifest tracking number for any additional manifests being used to track the rejected waste or residue shipment. Indicate the original manifest tracking number in item 14, the Special Handling Block and Addition Information Block of the addional manifests.
3. A letter must be submitted to the Regional Director where owners or operators of facilities are located in unauthorized States and where significant differences in quantity or type could not be resolved within 15 days.

Item 18b: Alternate Facility (or Generator) for Receipt of Full Load Rejections

The name, address, telephone number and EPA ID number of the Generator or Alternate Facility which the rejecting TSDF has designated, after consulting with the generator, to receive a fully rejected waste shipment.

Item 18c: Alternate Facility (or Generator) Signature:

This block must contain the signature and date of the authorized representative of the Alternate Facility or Generator, acknowledging the receipt of the fully rejected wastes.

ITEM 19: Hazardous Waste Report Management Method Codes

The most appropriate Hazardous Waste Report Management Method Code that best describes the way in which the waste is to be managed when received by the TSDF (EQD, if the waste is received at EQD) for each waste listed in Item 9. The Hazardous Waste Report Management Code is entered by the first TSDF that receives the waste.

ITEM 20: Designated Facility Owner or Operator Certification of Receipt

The name, signature of the person who received the waste (EQD Waste Acceptance Staff) on behalf of the owner or operator and the date of the waste receipt or rejection is entered in this block.

MANIFEST CONTINUATION SHEET

This form must be used as the continuation sheet to the Manifest if:

- More than two transporters are used to transport the wastes; or
- More space is required for the U.S. DOT descriptions and related information in Item 9 of the Manifest.

ITEM 21: Generator's U.S. EPA ID Number.

The generator's U.S. EPA (EPA) twelve digit identification number or State generator identification number if the generator site does not have an EPA Identification Number must be entered.

ITEM 22: Page 1 of _

Enter the page number of the Continuation Sheet

ITEM 23: Manifest Tracking Number

Enter the Manifest Tracking Number from Item 4 of the Manifest form.

ITEM 24: Generators Name-

The generator's name as it appears in Item 5 of the first page of the Manifest should be found in this block.

ITEM 25: Transporter—Company Name

Where more than two transporters are used to transport the waste described on the Manifest, the company name of each additional transporter, in the order in which they transported the waste along with the EQD ID number.

ITEM 26: Transporter Name

Where more than two transporters are used to transport the waste described on the Manifest, the company name of each additional transporter is found in this space.

ITEM 27: U.S. DOT Description Including Proper Shipping Name, Hazard Class and ID Number (UN?NA)

The number under Item 27b corresponds to the order of waste codes from one continuation sheet to the next, to reflect the total number of wastes being shipped.

ITEM 28: Containers (No. and Type)

Refer to the instructions for Item 10 of the Manifest for the information that corresponds to this block.

ITEM 29: Total Quantity

Refer to the instructions for Item 11 of the Manifest for the information that corresponds to this block

ITEM 30: Units of Measure

Refer to the instructions for Item 12 of the Manifest for the information that corresponds to this block.

ITEM 31: Waste Codes

Refer to the instructions for Item 13 of the Manifest for the information that corresponds to this block.

ITEM 32: Special Handling Instructions and Additional Information

Refer to the instructions for Item 14 of the Manifest for the information that corresponds to this block.

ITEM 33: Transporter—Acknowledgement of Receipt of Materials

The number for the transporter as found in Item 25, as well as the name and signature of the person accepting the waste on behalf of the Transporter (Company Name), and the date of receipt is found in this block.

ITEM 34: Transporter—Acknowledgement of Receipt of Materials

The number for the transporter as found in Item 26, as well as the name and signature of the person accepting the waste on behalf of the Transporter (Company Name), and the date of receipt is found in this block

ITEM 35: Discrepancy Indication Space

Refer to Item 18. This space may be used to more fully describe information on discrepancies identified in Item 18a of the manifest form.

ITEM 36: Hazardous Waste Report Management Method Codes

The sequential number that corresponds to the waste materials described in Item 27 and the appropriate process code that describes how the materials will be processed when received. If additional continuations sheets are attached, the waste materials and process codes will be entered sequentially.

APPENDIX M-2
LAND DISPOSAL RESTRICTION

APPENDIX M-2

LAND DISPOSAL RESTRICTIONS

The basic components of the land disposal restrictions are relatively straightforward. For each hazardous waste, EPA must establish treatment standards that are protective of human health and the environment when the wastes are land disposed. Land disposal includes placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome or salt bed formation, underground mine or cave, or concrete vault or bunker.

The treatment standards either require the use of one or more specified treatment technologies, or the require that wastes be treated to meet certain concentration limits on hazardous constituents. Where concentration limits are used, EPA assumes that a waste is treated with the best demonstrated available technology (BDAT). Although such wastes can be treated by any technology, the concentration of hazardous constituents In any treatment residues cannot be higher than those obtained using BDAT. For example, incineration is the BDAT for many organic hazardous wastes. Incinerators typically produce two treatment residues, ash and scrubber water. EPA analyzes the concentration of hazardous constituents in the ash and scrubber water when a particular waste is being burned, and then uses those concentrations as the treatment standards for the waste. In this case, one treatment standard for "non-wastewaters" is applied to the ash, and a different treatment standard for "wastewaters" is applied to the scrubber water. Although the use of incineration is not required, the treated wastes and/or treatment residues cannot be land disposed unless the concentration of hazardous constituents is equal or less than the concentration limits (treatment standards) based on the use of incineration.

Once the BDAT has been identified for a particular waste, EPA next establishes an effective date for the land disposal restrictions based on the availability of the BDAT capacity. The capacity determination is made on a nationwide basis. No allowance is made for the fact that waste from a specific facility might have to be shipped all the way across the country to utilize the available capacity. If inadequate capacity exists to handle additional wastes subject to the land disposal restrictions, EPA can delay the effective date of the treatment standards for up to two years.

If a treatment standard has been established, and if the effective date has passed for a specific waste, that waste may only be land disposed if it meets the treatment standard or if an exemption or variance has been obtained.

Point of Determination

Even though the land disposal restrictions apply to the disposal of hazardous wastes, EPA has decided that the point of generation must be used to determine if a waste is restricted. By evaluating a waste at the point of generation, subsequent dilution of waste to meet the concentration limits is prevented

Alternatively, 268.7(a) allows the generator to use knowledge of the waste to determine if it is subject to the land disposal restrictions; however, documentation substantiating this determination must be kept in the generator's files.

One of the important aspects of the land disposal restrictions is that the toxicity characteristic leaching procedure (TLCP) must be used to test many wastes. This procedure, which is codified as Appendix II of Part 261, was specifically desgined for complex wastes containing volatile organics.

Because RCRA does not impose retroactive waste management requirements, wastes that were disposed in the past need not be exhumed for additional treatment. However, if a a waste generated prior to the effective date of the land disposal restrictions is removed from a storage or disposal unit, it becomes subject to land disposal restrictions in effect at that time. Similarly, residues generated from such wastes, like leachate or contaminated groundwater, are viewed as newly generated wastes subject to regulation under RCRA and the land disposal restrictions.