US EPA RECORDS CENTER REGION 5
1004845

HAZARDOUS WASTE FACILITY PART B PERMIT APPLICATION

DETREX CORPORATION
12886 EATON AVE.
DETROIT, MI
MID 091 605 972

BOOK 1 OF 2

DNRE
AUG 1 0 2010
ENVIRONMENTAL RESOURCE MANAGEMENT DIVISION

xc: Dan

Detrex CORPORATION

24901 NORTHWESTERN HWY • SOUTHFIELD, MI 48075 • (248) 358-5800 • FAX (248) 799-7192

January 20, 2012

Mr. Dan Dailey
MDEQ, Waste Management Division
Constitution Hall, Atrium Level
525 W. Allegan
PO Box 30241
Lansing, MI 48909
VIA: Email and USPS

RE: Permit Application
Detrex Corporation
12886 Eaton Ave.
Detroit, MI 48227
EPA ID #: MID 091 605 972

Dear Mr. Dailey:

Enclosed please find one original and five copies of the engineering certification for our facility. I apologize for the delay but the document was misfiled with other paperwork and it was just recently discovered.

If you have any questions or need any other information please feel free to give me a call at 248.358.5800 ext. 131.

Best regards,

David Craig
Manager of Environmental and Safety Compliance

Enclosure: PE Certification

CC: file
C. McCausland - PCT

DEQ
FEB 16 2012
RESOURCE MANAGEMENT DIVISION

Dan

Detrex CORPORATION

24901 NORTHWESTERN HWY • SOUTHFIELD MI 48075 • (248) 358-5800 • FAX (248) 799-7192

August 9, 2010

Mr. Dan Dailey
MDEQ, Waste Management Division
Constitution Hall, Atrium Level
525 W. Allegan
PO Box 30241
Lansing, MI 48909
VIA: UPS

RE: Permit Application
Detrex Corporation
12886 Eaton Ave.
Detroit, MI 48227
EPA ID #: MID 091 605 972

Dear Mr. Dailey:

Enclosed please find one original and five copies of the Part B Permit Application for our facility located at 12886 Eaton Ave., Detroit MI, along with a check in the amount of $ 500.00 to cover the fees associated with the renewal application.

To assist you in the review process I have also enclosed one CD containing the following files:

- The entire permit application as PDF extension files.
- A folder containing the changes to the main sections of the permit from our 2000 submission in ~~strikeout~~ and underline format. Note that in the right or left margin will be a vertical line to highlight those sections where the text has changed; and
- A folder containing the template application forms; as noted although the permit is not in the template format, the templates reference the section(s) of our permit which answer the related questions.

Detrex would like to thank you in advance for your help and consideration in allowing us to obtain a five year permit renewal. If you have any questions please feel free to give me a call at 248.358.5800 ext. 131.

Best regards,

David Craig, CHMM
Manager of Environmental and Safety Compliance

CC: file
Facility

0810L permit application.doc

DNRE
AUG 10 2010
ENVIRONMENTAL RESOURCE MANAGEMENT DIVISION

DETREX CORPORATION P.O. BOX 5111 SOUTHFIELD, MICHIGAN 48086-5111 REMITTANCE ADVICE

INVOICE NO.	DISCOUNT	NET AMOUNT	INVOICE NO.	DISCOUNT	NET A
Renew Part B		500 00			

CHECK NO.	VENDOR NO		TOTAL ⇨	GROSS AMOUNT	DISCOUNT	CHECK AMOUNT
752522		152125				500.00

DETACH BEFORE DEPOSITING

9-32
720

Detrex CORPORATION

P.O. BOX 5111 SOUTHFIELD, MICHIGAN 48086-5111

CHECK NUMBER
752522

PAY TO THE ORDER OF.
State of Michigan
P.O. Box 30241
Lansing, MI 48909-7741
USA

DATE
8/6/2010

AMOUNT OF CHECK
$ *********500.00

DETREX CORPORATION

AUTHORIZED SIGNATURE

JPMorgan Chase, N.A.
Detroit, MI

⑈752522⑈ ⑆072000326⑆ 754297422⑈

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

DAN WYANT
DIRECTOR

March 8, 2012

Mr. James Blough
RCRA/TSCA Programs Section
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard, LR-8J
Chicago, Illinois 60604-3507

Dear Mr. Blough:

SUBJECT: Receipt of a Hazardous Waste Storage Facility Operating License Renewal Application (Application); Detrex Corporation (Detrex); MID 091 605 972

The Michigan Department of Environmental Quality (MDEQ), Resource Management Division, has received an Application from Detrex for their facility located at 12886 Eaton Avenue in Detroit, Michigan. The facility was originally issued a license on January 31, 2001. Enclosed are copies of the Application and the public notice. The public notice was mailed to the mailing list on March 8, 2012.

Mr. Daniel Dailey, the permit engineer responsible for the review of this Application, is coordinating the reviews for the appropriate agencies. Since Michigan is a fully delegated authority to issue an operating license for the storage proposed at the facility, we do not anticipate the need for issuance of a federal Hazardous and Solid Waste Amendments Permit for the facility. Nevertheless, if you would like to review and send completeness comments on the Application, please do so by April 9, 2012. If you or your staff members have technical comments, please provide them to Mr. Dailey by May 9, 2012.

Thank you for your cooperation in this matter. If you have any questions or comments, please contact Mr. Dailey at 517-335-6610, daileyd@michigan.gov, or MDEQ, RMD, P.O. Box 30241, Lansing, Michigan 48909-7741.

Sincerely,

DeLores Montgomery, Chief
Hazardous Waste Section
Resource Management Division
517-373-7973

Enclosures
cc: Mr. Daniel Dailey, MDEQ
Operating License File

PUBLIC NOTICE
RECEIPT OF AN OPERATING LICENSE RENEWAL APPLICATION FOR A HAZARDOUS WASTE STORAGE FACILITY

The Michigan Department of Environmental Quality (MDEQ), Resource Management Division (RMD), hereby gives notice that Detrex Corporation (Detrex) submitted an operating license renewal application on August 9, 2010. On January 31, 2001, Detrex was issued a hazardous waste storage facility operating license pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Detrex operates its hazardous waste storage facility at 12886 Eaton Avenue in Detroit, Michigan. Hazardous wastes are stored in containers at the facility, including wastes that exhibit a characteristic of corrosivity and/or toxicity, and listed hazardous wastes that remain a hazardous waste, unless excluded by rule, including spent solvents, wastewater treatment sludges from electroplating operations and the chemical conversion coating of aluminum, discarded commercial chemical products, off-specification species, container residues, and spill residues.
Mr. David Craig is the Environmental and Safety Compliance Manager for Detrex and can be contacted at 248-358-5800, Extension 131, or at Detrex Corporation, 24901 Northwestern Highway, Southfield, Michigan 48075.

RMD staff members are reviewing the renewal application to determine if it is complete and technically satisfies all state hazardous waste facility licensing requirements. If the application is found to be incomplete, the missing information will be requested from the applicant. As soon as the missing information is provided, the RMD will proceed with the technical review of the application. Based upon this review, the RMD will propose to reissue or deny the operating license. Prior to a final determination, a public hearing may be held regarding the tentative decision.

A notice will appear in the local newspaper and be announced on the local radio station approximately 30 days prior to any public hearing date. At this time, the MDEQ is soliciting public comments on the adequacy of the application and any issues associated with the facility's past operation. Comments should be sent to the address printed below by May 9, 2012.

Detrex's renewal application is available for inspection at the MDEQ, Resource Management Division, located on the North Atrium Level of Constitution Hall in Lansing, Michigan (contact Mr. Daniel Dailey at 517-335-6610); at the MDEQ Southeast Michigan District Office, 27700 Donald Court, Warren, Michigan (contact Ms. Noelle Grain at 586-753-3842); and at the MDEQ Detroit Field Office, Cadillac Place, 3058 West Grand Boulevard, Suite 2-300, Detroit, Michigan (contact Ms. Ann Vogen at 313-456-4663).

To receive future departmental notifications concerning this facility, please submit a written request for placement on the Detrex mailing list to the address below. Questions regarding the facility should be addressed to:

Mr. Daniel Dailey
Resource Management Division
Michigan Department of Environmental Quality
P.O. Box 30241
Lansing, Michigan 48909

Section A
Section B
3 Section C
4 Section D
Section E
6 Section F
7 Section G
8 Section H
9 Section I
10 Section J
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29 DNRE
30 AUG 1 0 2010
31 ENVIRONMENTAL RESOURCE MANAGEMENT DIVISION

SECTION A

PART A APPLICATION

DNRE
AUG 1 0 2010
ENVIRONMENTAL RESOURCE
MANAGEMENT DIVISION

LIST OF ATTACHMENTS

ATTACHMENT A-1 PART A APPLICATION

ATTACHMENT A-2 FACILITY PLAN

ATTACHMENT A-3 FACILITY PHOTOGRAPHS

ATTACHMENT A-4 OPERATING PERMITS

ATTACHMENT A-5 TOPOGRAPHIC MAP

SECTION A

PART A APPLICATION
[329 IAC 3.1-13-3, 40 CFR 270.11 (A) AND (D), 270.13]

This Licnese Application is submitted for the Detrex Corporation facility located at 12886 Eaton Ave., Detroit, MI. Detrex Corporation is the legal name of the Owner/Operator. The information in this section is supplied in accordance with 40 CFR 270.10(d), 270.11(a) and (d), 270.13 as adopted in Michigan Act 451, **Rule 299.9508(1).**

The following attachments provide the information as required in the Part A Permit Application.

Attachment A-1 provides the information as required under MDEQ's Operating License, Forms 1 and 3.

Attachment A-2 provides a scale drawing of the facility showing the location of all proposed hazardous waste management units. Reclamation operations were closed in June of 1996. As the still bottom tank (unit #3 in attachment A2) has been properlty closed, the Facilityh may use the tank for the storage of Non-Hazardous Wastes. Beyond the closure of the reclamation operations and the Hazardous Waste storage tank, there are no additional historic hazardous waste operations that have been discontinued.

Attachment A-3 provides photographs of the facility.

Attachment A-4 provides a copy of a letter from the City of Detroit Water amd Sewarage Department denoting that Detrex is no longer required to operate under a license. Documentation regarding the discontinuation of air monitoring is also included in this attachment.

Attachment A-5 provides a topographic map which extends at least one mile beyond the property boundary. Additional topographic mapping requirements are addressed in Section B of this license renewal application.

ATTACHMENT A-1
PART A APPLICATION

DEQ 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 P.A. 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 091 605 972

II. FACILITY'S LEGAL OWNER

A. NAME	DETREX CORPORATION
B. STREET OR P.O. BOX	24901 NORTHWESTERN HIGHWAY, SUITE 410
C. CITY OR TOWN, STATE, ZIP CODE	SOUTHFIELD, MI 48075
D. PHONE NUMBER (Area Code and Number)	(248) 358-5800
E. OWNER TYPE	P
F. OWNER CHANGE? YES	☐
NO	☒
DATE	

III. FACILITY OPERATOR

A. NAME	DETREX CORPORATION
B. STREET OR P.O. BOX	12886 EATON AVENUE
C. CITY OR TOWN, STATE, ZIP CODE	DETROIT, MI 48226
D. PHONE NUMBER (Area Code and Number)	(313) 491-4550
E. OPERATOR TYPE	P
F. OPERATOR CHANGE? YES	☐
NO	☒
DATE	

IV. TITLEHOLDER OF LAND

A. NAME	DETREX CORPORATION
B. STREET OR P.O. BOX	24901 NORTHWESTERN HIGHWAY, SUITE 410
C. CITY OR TOWN, STATE, ZIP CODE	SOUTHFIELD, MI 48075
D. PHONE NUMBER	(248) 358-5800

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		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)	N/A
B. UIC (Underground Injection of Fluids)	N/A
C. RCRA (Hazardous Wastes)	MID 091 605 972
D. PSD (Air Emissions From Proposed Sources)	N/A
E. OTHER (Specify)	

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

FACILITY RECEIVES HAZARDOUS WASTES IN DOT APPROVED CONTAINERS THAT ARE HELD ON SITE PRIOR TO TRANSFERRING TO ANOTHER PERMITTED FACILITY.

X. MAP

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

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

XII. PHOTOGRAPHS

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).

XII. 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	S01	13750	GAR		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.

XIV. DESCRIPTION OF HAZARDOUS WASTES								
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)
	F001	2000	T	S01				INCLUDED WITH ABOVE
	D002							" "
	D004 - D012							" "
	D018							" "
	D035							" "
	F002	1000	T	S01				
	D002							INCLUDED WITH ABOVE
	D004 - D012							" "
	D018							" "
	D035							" "
	F006	500	T	S01				
	F019	500	T	S01				
	U037	500	T	S01				
	U044	500	T	S01				
	U072	500	T	S01				
	U075	500	T	S01				
	U076	500	T	S01				
	U077	500	T	S01				
	U078	500	T	S01				
	U080	500	T	S01				
	U121	500	T	S01				
	U127	500	T	S01				
	U131	500	T	S01				
	U208	500	T	S01				
	U209	500	T	S01				
	U210	500	T	S01				
	U211	500	T	S01				
	U226	500	T	S01				
	U228	1450	T	S01				
	U161	1450	T	S01				
	F003	5000	T	S01				
	F005	5000	T	S01				

XV. OTHER 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)	SIGNATURE	DATE SIGNED
DETREX CORPORATION	Robert M. Currie ROBERT M. CURRIE VICE PRESIDENT, GEN. CSL. & SEC.	07.29.10
OPERATOR NAME (type or print)	SIGNATURE	DATE SIGNED
DETREX CORPORATION	Robert M. Currie ROBERT M. CURRIE VICE PRESIDENT, GEN. CSL. & SEC.	07.29.10
NAME OF TITLEHOLDER OF LAND (type or print)	SIGNATURE	DATE SIGNED
DETREX CORPORATION	Robert M. Currie ROBERT M. CURRIE VICE PRESIDENT, GEN. CSL. & SEC.	07.29.10

[redacted]

ATTACHMENT A-2
FACILITY PLAN

ATTACHMENT A-2
FACILITY LAYOUT

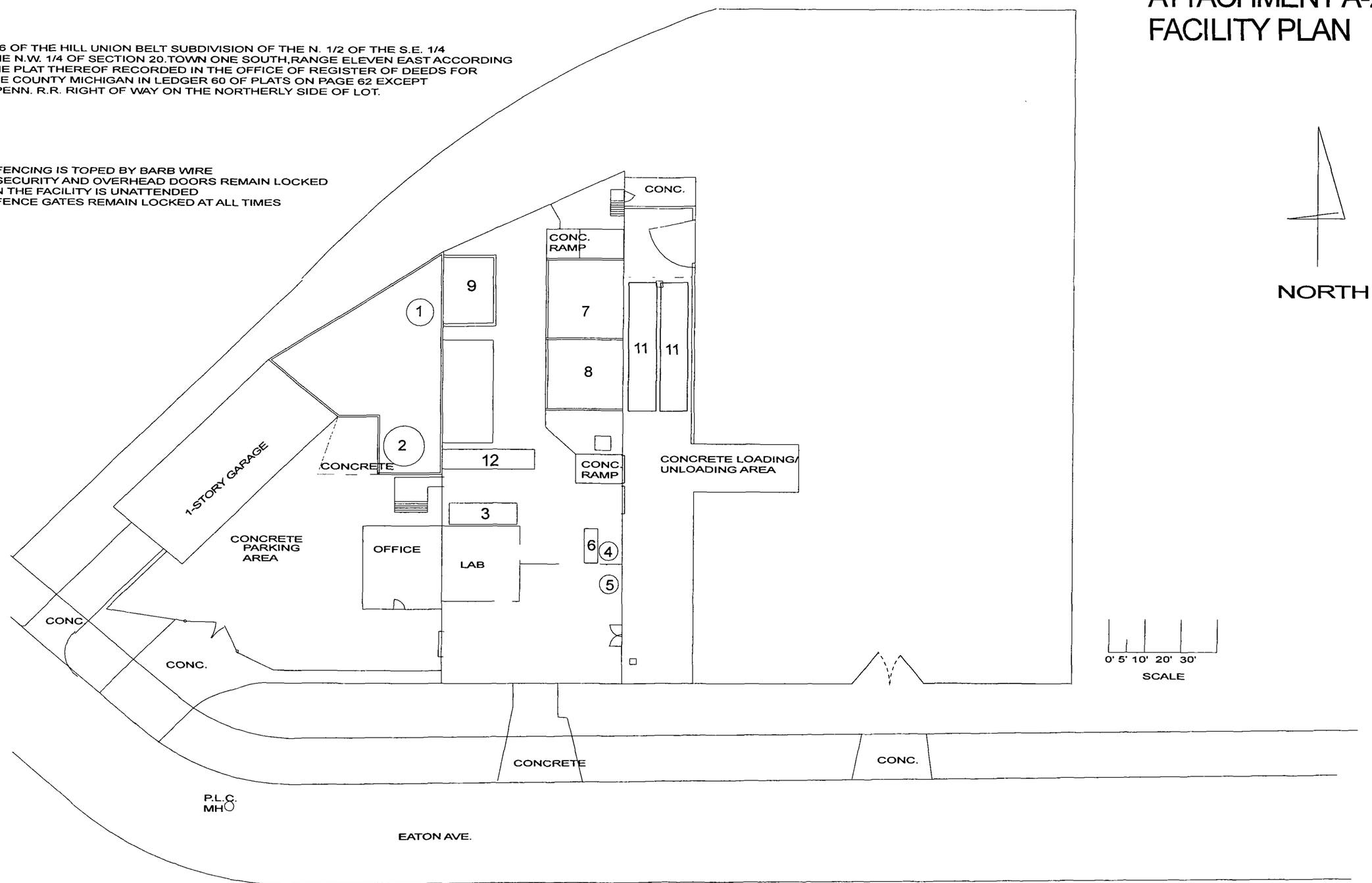
ID #	Equipment Name	Description
1	20,000 gal. Carbon steel Tank	Storage tank for Trichloroethylene
2	4,500 gal. Carbon Steel Tank	Storage tank for Trichloroethylene
3	5,000 gal. Carbon Steel Tank	Storage of Non-Hazardous Wastes.
4	3,000 gal. 316 stainless steel Tank	Storage of Non-Hazardous Wastes.
5	2,500 gal. 316 Stainless Steel Tank	Storage of Non-Hazardous Wastes
6	Staging area	Sampling (containers weighed as needed)
7-9	Interior Hazardous Waste Storage	Active
11	Exterior Hazardous Waste Storage	Storage of Flammables
12.	Drum Filling Station	Product Drumming Station.

ATTACHMENT A-2
FACILITY PLAN

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

NOTES:

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV NO.	CHANGE RECORD	BY	DATE	REV NO.	CHANGE RECORD	BY
				08.21.10	1	current site layout.07_2010	DDC

DR.	E.L.R.
CHK	~
APR	
SCALE	DATE
1/16"=12"	12/96

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

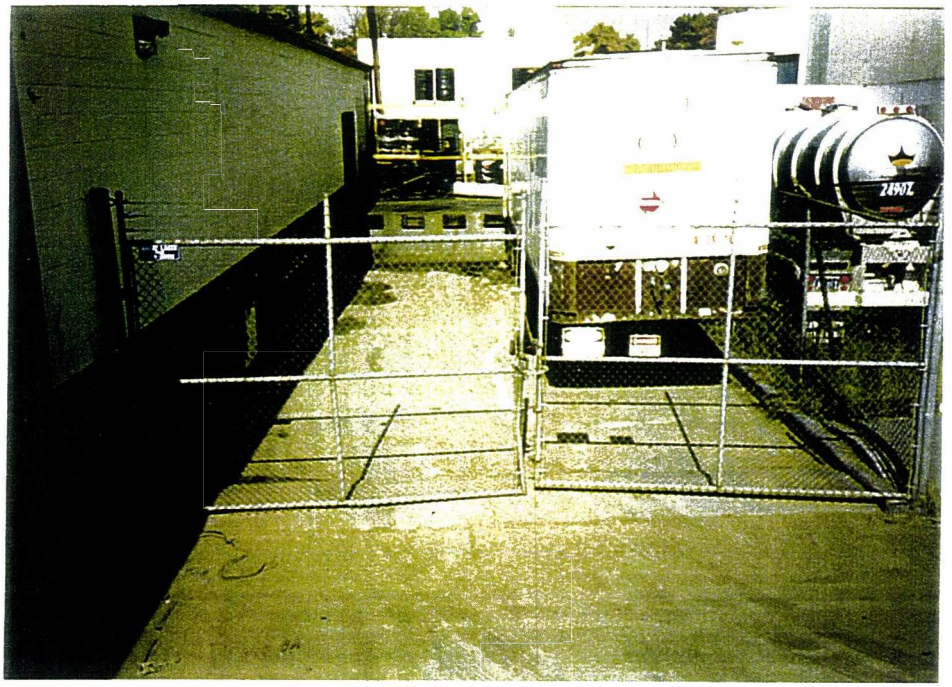
PROJECT No 9601

DWG No

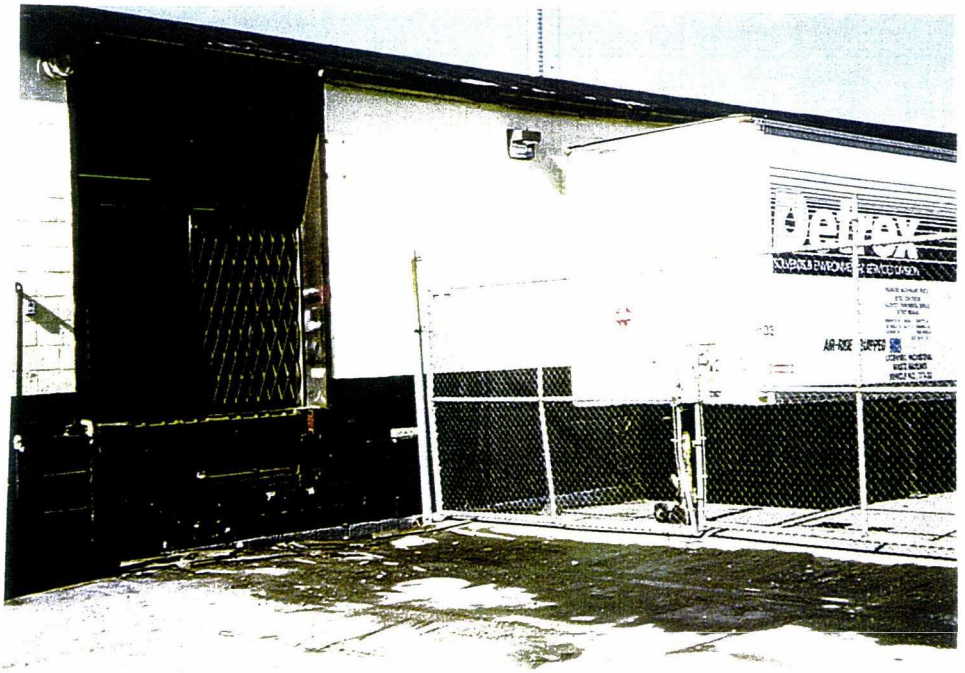
EATON AVE.

View of facility from Eaton Avenue - South East corner

View of Facility from Eaton Avenue - South West corner



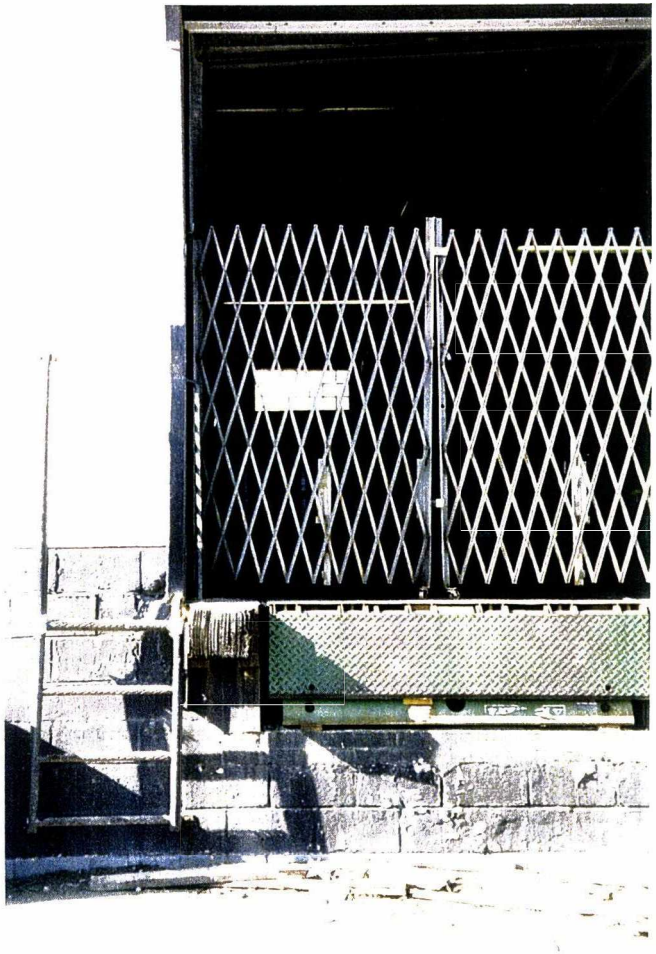
Flammable Waste Storage Area



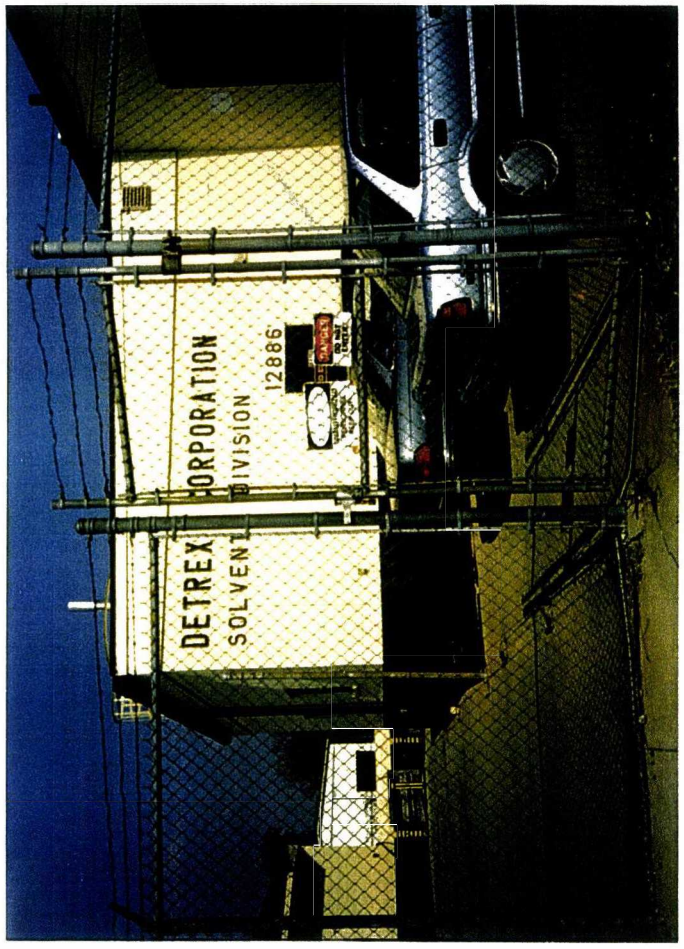
Loading / Unloading Area

Hazardous Waste Container Storage
Area showing aisle

Hazardous Waste Containers with
markings facing aisle



Security Precautions for the
Loading / Unloading Dock



Entrance to office area of Facility with
signs noting no entrance

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
INDUSTRIAL WASTE CONTROL DIVISION

303 S. LIVERNOIS AVENUE
DETROIT, MICHIGAN 48209
PHONE 313•297•5850
FAX 313•297•5860
WWW.CI.DETROIT.MI.US

Mr. Ronald Hritzkowin
Detrex Corp. Solvents Division
12886 Eaton
Detroit, MI 48227

Date: February 24, 2000
Seq. No.: 009474

Dear Mr. Hritzkowin:

Regarding: **CLASSIFICATION AS A MINOR USER**

The Detroit Water and Sewerage Department (DWSD) has classified your facility as a Minor User of the Detroit sewer system. This classification has been based upon one or more of the following criteria:

- Discharges less than 25,000 gallons per day of process (non-sanitary) wastewater,
- Discharge is not subject to a National Categorical Pretreatment Standard,
- Discharge is not expected to contain toxic pollutants in quantities which would subject you to regulation.

As a Minor User, you are not required to maintain a wastewater discharge permit from this agency. However, your facility may be subjected to regulation under the Surcharge Program and/or may be required to submit a Slug Control/Spill Prevention Plan (SC/SPP). We will refer, accordingly, your facility to the appropriate DWSD group, who will notify you separately of these requirements. Should the nature of your discharge, business, or address change, you are required to notify this office.

The DWSD accepts the wastewater discharge in accordance with the preceding basis, provided that you maintain compliance with the appropriate discharge requirements as defined by the local ordinance. Please retain this letter in the event of future inspections by a state or local agency.

Should you have any questions, please contact us at (313) 297-5842. Thank you for your efforts in pursuit of a cleaner environment.

Sincerely,

Jerry Spencer

Jerry Spencer
Survey Group
Industrial Waste Control

FAXED
MAR - 1 2000

JES/sl

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
LIVERNOIS CENTER

303 S. LIVERNOIS AVENUE
DETROIT, MICHIGAN 48209

CERTIFIED MAIL

Mr. Ronald Hritzkowin
Detrex Corporation
Solvent Division
12886 Eaton Avenue
Detroit, Michigan 48227

DATE: June 7, 1995

PERMIT NO.: 905-001

PERMIT CANCELLATION NOTICE

Effective immediately, Wastewater Discharge Permit No. 905-001, issued to Detrex Corporation, located at 12886 Eaton Avenue in Detroit, shall be cancelled; and said facility shall be classified as a Minor Discharger.

This action is based on findings that said facility is not discharging process wastewater into the Publicly Owned Treatment Works, and confirmed by a Comprehensive Inspection conducted April 12, 1995.

There shall be no further process discharge from this facility into the Detroit Sewerage System. Failure to comply with this notice can result in Enforcement action.

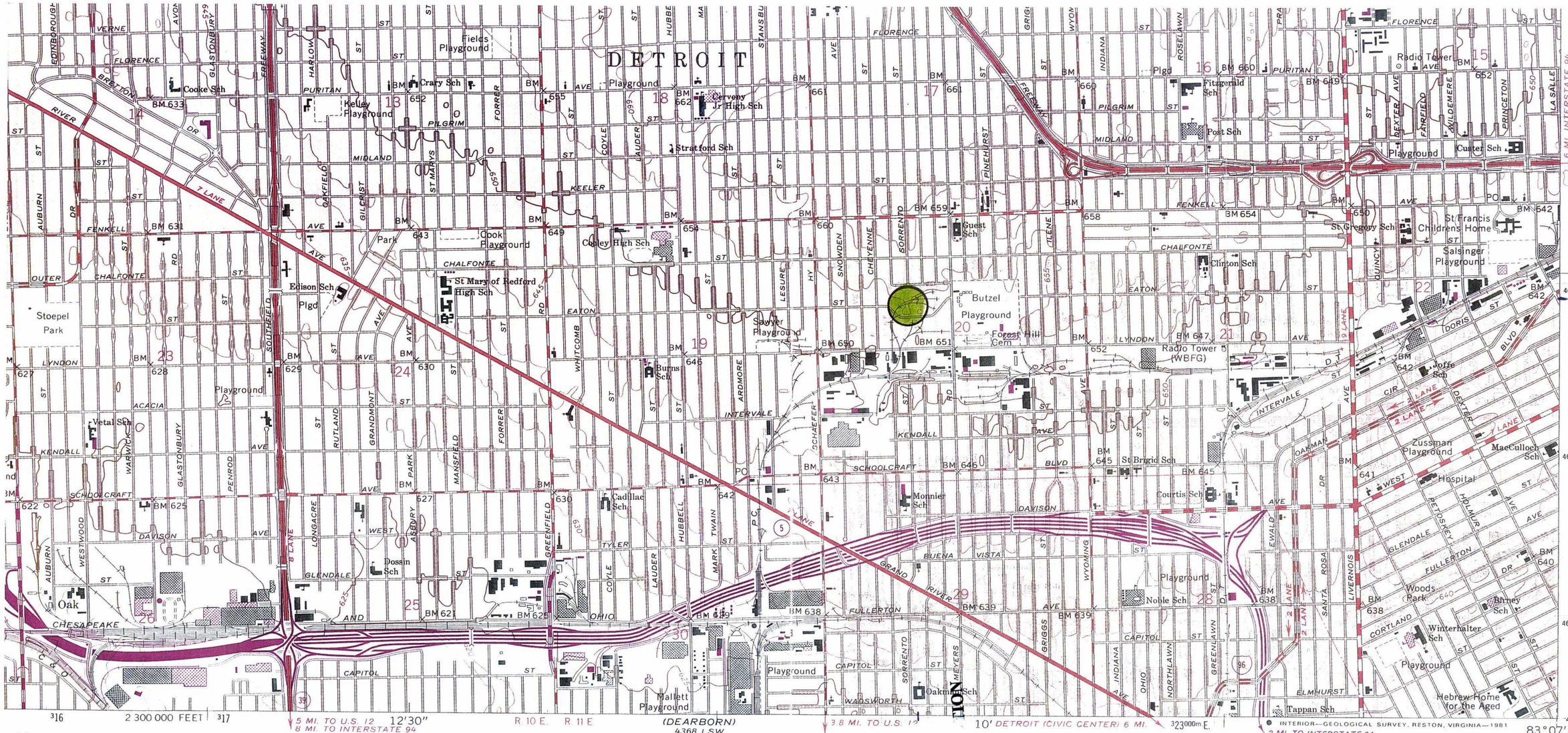
Should you decide to discharge process wastewater, you must notify IWC.

Stephen J. Kupijcki
Manager, IWC

SJK/WPS/vb

DENNIS W. ARCHER, MAYOR

ATTACHMENT A-5



ied by the Geological Survey
Michigan agencies
d City of Detroit
methods from aerial photographs
ys 1939. Revised from aerial
d checked 1968

MN GN
5° 89 MILS
1°29' 26 MILS

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface — Light-duty road, all weather, improved surface

Secondary highway, all weather, hard surface — Unimproved road, fair or dry weather

Interstate Route — U. S. Route — State Route

SECTION B

FACILITY DESCRIPTION

TABLE OF CONTENTS Page

FACILITY DESCRIPTION 3
B-1 GENERAL DESCRIPTION [40 CFR 270.14(b)(1)] 4
B-2 TOPOGRAPHIC MAP 5
B-2a GENERAL REQUIREMENTS 5
1) Topographic Map 5
2) Land Use 5
3) Wind Rose 5
4) Legal Boundaries 6
5) Access Control 6
6) Injection and Withdrawal Wells 6
7) Sewers 6
8) Loading and Unloading Areas 6
9) Fire Control 6
10) Flood Control 7
11) Hazardous Waste Management Units 7
12) Runoff Control 7
B-2b ADDITIONAL REQUIREMENTS FOR LAND DISPOSAL FACILITIES 7
B-3 LOCATION INFORMATION [40 CFR 270.14(b)(11)] 9
B-3a SEISMIC CONSIDERATIONS 9
B-3b FLOODPLAIN STANDARD [40 CFR 270.14(b)(11)(iii), 264.18(b)] 9
B-4 TRAFFIC INFORMATION 9

TABLES

TABLE B-1 LOCATION IN APPLICATION OF TOPOGRAPHIC MAP REQUIREMENTS B-9

LIST OF ATTACHMENTS

ATTACHMENT B-1 TOPOGRAPHICAL MAP & SITE LOCATION
ATTACHMENT B-2 SITE TOPOGRAPHIC MAP
ATTACHMENT B-3 ZONING & LAND USE MAP
ATTACHMENT B-4 WIND ROSE
ATTACHMENT B-5 LEGAL SURVEY
ATTACHMENT B-6 FACILITY PLAN
ATTACHMENT B-7 FLOOD HAZARD BOUNDARY MAP
ATTACHMENT B-8 TRAFFIC PATTERNS

SECTION B

FACILITY DESCRIPTION

This section of the license application provides a general description of the Detrex Corporation facility in Detroit, Michigan as required by Michigan Act 451 Rule 299.9504(1)(c) which incorporates 40 CFR 270.14(b) and (c) by reference. The applicable section(s) of the federal regulations (40 CFR) is referenced where appropriate

B-1 GENERAL DESCRIPTION [40 CFR 270.14(B)(1)]

Detrex Corporation is submitting this License Application for the storage of hazardous waste containers, at 12886 Eaton Avenue in Detroit, Michigan (Facility). The Facility is currently listed as a treatment, storage, and disposal facility (TSDF), by definition.

The Facility contact is:

Mr. Casey McCausland
12886 Eaton Avenue
Detroit, Michigan 48227
Phone Number: 313-491-4550
EPA ID#: MID 091 605 972

The technical contact for the license application is:

Mr. David Craig, CHMM
Detrex Corporation
PO Box 5111
Southfield, Michigan 48086-5111
Telephone: (248) 358-5800

The Facility specializes in the sale of various products, including cleaning fluids and related equipment, and the sale of recovered (recycled) of spent solvents. Spent solvent wastes are collected from operations including: metal working operations that clean machined and stamped parts, the electronic industry where circuit boards and other components are cleaned and defluxed, industries that spray paint and other similar type industries. The Facility operates under EPA Identification Number MID 091 605 972. The Standard Industrial Classification Code (SIC) for the Facility is 2869 & 5161.

Hazardous wastes entering the Facility will be stored in one of the four (4) hazardous waste container storage areas prior to shipment off site for processing/disposal. The entire Facility operates within a single enclosed building, or within a secured dock where access is controlled by a fence and gate, that is closed except when vehicles are being moved. The Facility may also handle Non-RCRA and Non-Hazardous Wastes. These non RCRA wastes may be combined/commingled in storage tanks prior to transportation to another permitted disposal facility.

The operations at the Facility will allow for a total of 13,750 gallons of Hazardous Waste to be stored in the stagingand container storage areas. Hazardous waste operations at the Facility will consist of:

- Three separate internal waste container storage areas and one exterior container storage area with total container storage capacity of 13,750 gallons (e.g. 250 x 55-gallon drums);

- a primary loading/unloading area
- a secondary loading/unloading area (dock area where flammables are stored); and
- Staging area (capable of holding up to 10 containers of waste plus rejected containers of waste).

B-2 TOPOGRAPHIC MAP

A single topographic map meeting the requirements of this section has not been prepared. The topographic mapping and other location information requirements are listed in Table B-1 depicting the location in this license application where the appropriate map/information is located. The mapping requirements are further discussed below.

B-2A GENERAL REQUIREMENTS

[40 CFR 270.14(B)(19)]

1) Topographic Map

A combination of several maps are provided to satisfy this requirement. Attachment B-1 is a copy of a portion of the United States Geological Survey (USGS) quadrangle map showing the Site location. The scale of this map is 1" = 2,000 feet.

Attachment B-2 provides a map surrounding the Facility with at least a 1,000-foot radius. The scale of this map is 1 inch = 200 feet.

2) Land Use

Attachments B-3 provide maps of the zoning and existing land-use, respectively, in the vicinity of the Facility. The zoning code for the industrial area in which the property is located is M4 while the surrounding area is R1. The M4 zoning code indicates an intensive industrial district while R1 indicates a single-family residential district. The closest residential property is over 300 feet west of the Facility.

The figures were reproduced from figures supplied by the Planning Department of the City of Detroit.

3) Wind Rose

A wind rose for the Detroit City Airport is presented in Attachment B-4. The airport is located approximately 25 miles east of the Facility.

4) Legal Boundaries

A copy of a legal survey indicating the legal boundaries and a legal description of the lands is provided as Attachment B-5.

5) Access Control

Fencing surrounding active potions of the Facility and the building itself provide the necessary access control to prevent both animals and people from entering the active portions of the operations. The fences are 8-foot high chain linked fence that is topped by razor wire.

Attachment A-3 provides photos illustrating some of the access control devices at the Facility. Security doors and overhead doors to the office and active portions of the Facility remain locked when the Building is unattended. Access to warehouse areas is controlled via gates and passage doors, which can only be opened from the inside.

All flammable wastes stored at the Facility occurs on trailers located in an area surrounded by an 8-foot high chain link fence and gate. The gate will remain locked at all times except when moving vehicles into or out of this area. In addition, the trailers will be closed during hours when the facility is not attended. These measures will eliminate any access to this area except through the warehouse and then only during operating hours.

6) Injection and Withdrawal Wells

There are no available records of any groundwater injection or withdrawal wells within a one-mile radius of the Eaton Avenue Facility.

7) Sewers

The location of sewers and other utilities is provided on the legal survey plan located in Attachment B-5. All drains in the Facility discharge to the Detroit Water and Sewerage Industrial Wastewater Department.

8) Loading and Unloading Areas

The loading and unloading area associated with the hazardous waste areas at the Facility is shown in Attachment B-6. The internal access roads are also shown.

9) Fire Control

There are two fire hydrants, serviced by an 8-inch diameter watermain, located near the Facility along Eaton Avenue. The nearest is only about 25 feet south of the south end of the Facility. These fire hydrants are shown on the legal plan located in Attachment B-5.

10) Flood Control

As indicated in Section B-3b of this operating license application, the Facility is not located in an area designated as a 100-year floodplain. As such, flood control structure/devices are not required. A Flood map of the area is provided in Attachment B-7

The outdoor loading / unloading area secondary containment system (i.e., the perimeter curbing and drive-over access ramp has been designed to accommodate a 24-hour 100-year rainfall event.

11) Hazardous Waste Management Units

Attachment B-6 is a Facility plan, which locates all existing and proposed hazardous waste management units.

12) Runoff Control

Most of the hazardous waste management units are located within a single enclosed building, which eliminates runoff. The only area not enclosed by the building is the facility's flammable storage area, which are located in the northeast corner of the Facility. Surface water runoff is directed away from the building structure in all areas except along the eastern wall.

A 12-inch square, 6-inch deep sump is located within the concrete loading/unloading area and the flammable storage area to provide runoff control. The accumulated runoff collected is visually inspected for the presence of a sheen, color, odor, and clarity. If it passes these parameters it is discharged into the municipal combined sanitary/storm water sewer system . If the water fails the parameters, it will be collected and tested. Waters failing discharge criteria will be sent for off-Site disposal in accordance with Federal, State and Local regulations.

B-2B ADDITIONAL REQUIREMENTS FOR LAND DISPOSAL FACILITIES

[40 CFR 270.14(C)(3) AND (4)(I), 264.95, 264.97]

The Facility located at 12886 Eaton Ave., Detroit, Michigan has not and will never be operated as a land idisposal facility.

TABLE B-1

LOCATION IN APPLICATION OF TOPOGRAPHIC MAP REQUIREMENTS

Items Required In Application For Topographic Maps	Location (Attachment Nos.)
1. Topographic map extending 2,000 feet beyond facility	B-1
2. Contour intervals	B-1, B-2
3. Map scale and date	B-1, B-2, B-5, B-6, B-7, B-8
4. 100-year floodplain area	B-7
5. Surface water including intermittent streams	B-1, B-2, B-7
6. Surrounding land uses	B-2, B-3
7. Wind rose	B-4
8. Orientation of the map	B-1, B-2, B-3, B-5, B-6, B-7, B-8
9. Legal boundaries of the facility	B-2
10. Access control and internal roads	B-2, B-5
11. Injection and withdrawal wells	N/A
12. Buildings	B-2, B-5, B-8
13. Sewers	B-2
14. Loading and Unloading Areas	B-2, B-5, B-8
15. Fire Control Facilities	B-5
16. Barriers for drainage and flood control	N/A
17. Location of container and tank storage areas	D-2
18. Location of process equipment	D-2

B-3 LOCATION INFORMATION [40 CFR 270.14(B)(11)]

B-3A SEISMIC CONSIDERATIONS

[40 CFR 270.14(b)(11)(i) and (ii), 264.18(a), Part 264 Appendix VI]

This section applies to new facilities only. Therefore, since this is an existing Facility, this section is not applicable.

B-3B FLOODPLAIN STANDARD [40 CFR 270.14(B)(11)(III), 264.18(B)]

The FIA map, found in Attachment B-7, indicates that the Facility is in neither the 100-year nor the 500-year floodplain. This area is entirely within Zone C indicating it is not subject to flooding.

The Facility is located approximately 7.5 miles northwest of the Detroit River and 5 miles east of the River Rouge. The 100-year flood elevation of the Detroit River is approximately 578 feet above National Geodetic Vertical Datum (NGVD). The Facility property elevation is approximately 655 feet above NGVD.

B-4 TRAFFIC INFORMATION

[40 CFR 270.14(B)(10)]

Attachment B-8 illustrates the traffic patterns at the Eaton Avenue Facility. Vehicular access to the Facility is direct via Eaton Avenue from Schaefer Avenue to the west or Meyers Road to the east. Primarily Highway 10 and Interstate 96, both major freeways in the area, service the Facility. There are no traffic control devices on site. Visitors and employees park directly in front of the building or inside the fenced enclosure to the west of the building.

All traffic associated with the movement of hazardous waste occurs to the east of the building. All incoming hazardous wastes arrive by truck. Transport of the waste is made using hazardous waste transporter vehicles , as required and according to Federal and State laws.

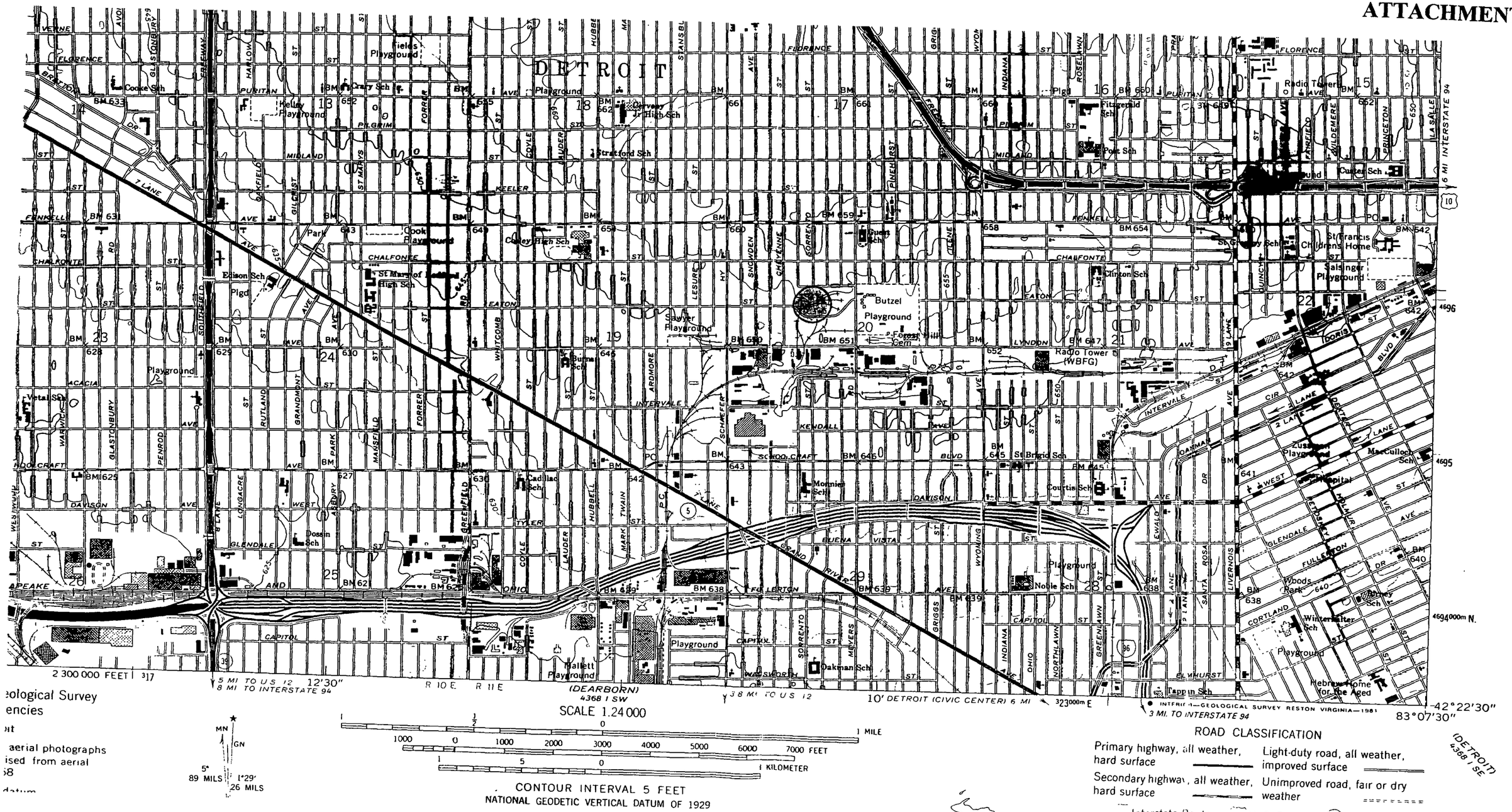
A forklift truck usually equipped with a special drum handling attachment is used to transfer drummed waste into and within the building. Wastes are received at the Facility on a daily basis and at the time of this application are expected to be transported off site at a frequency of at least two trucks per week.

All paved roads at the Facility are constructed of a minimum of six inches of concrete. Historical traffic flow at the Facility has not created any structural problems in the existing roads on site, indicating the bearing capacity of the roads is adequate.

ATTACHMENT B-1

TOPOGRAPHICAL MAP
&
SITE LOCATION

ATTACHMENT B--



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aerial photographs
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58

datum

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1°29'
26 MILS

SCALE 1:24 000

1 MILE
7000 FEET
1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION

Primary highway, all weather, hard surface

Light-duty road, all weather, improved surface

Secondary highway, all weather, hard surface

Unimproved road, fair or dry weather

Interstate Route

U. S. Route

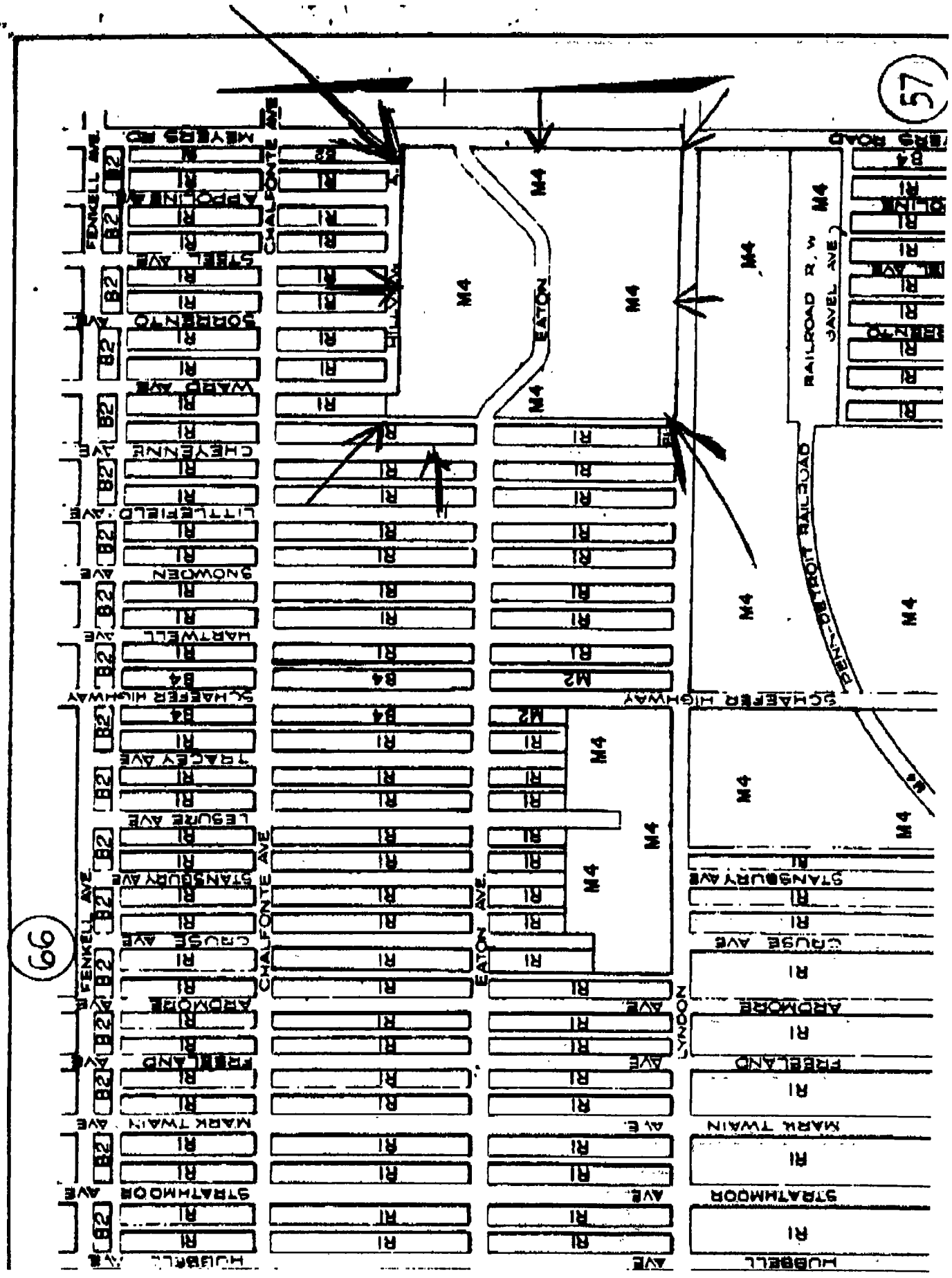
State Route

ATTACHMENT B-2

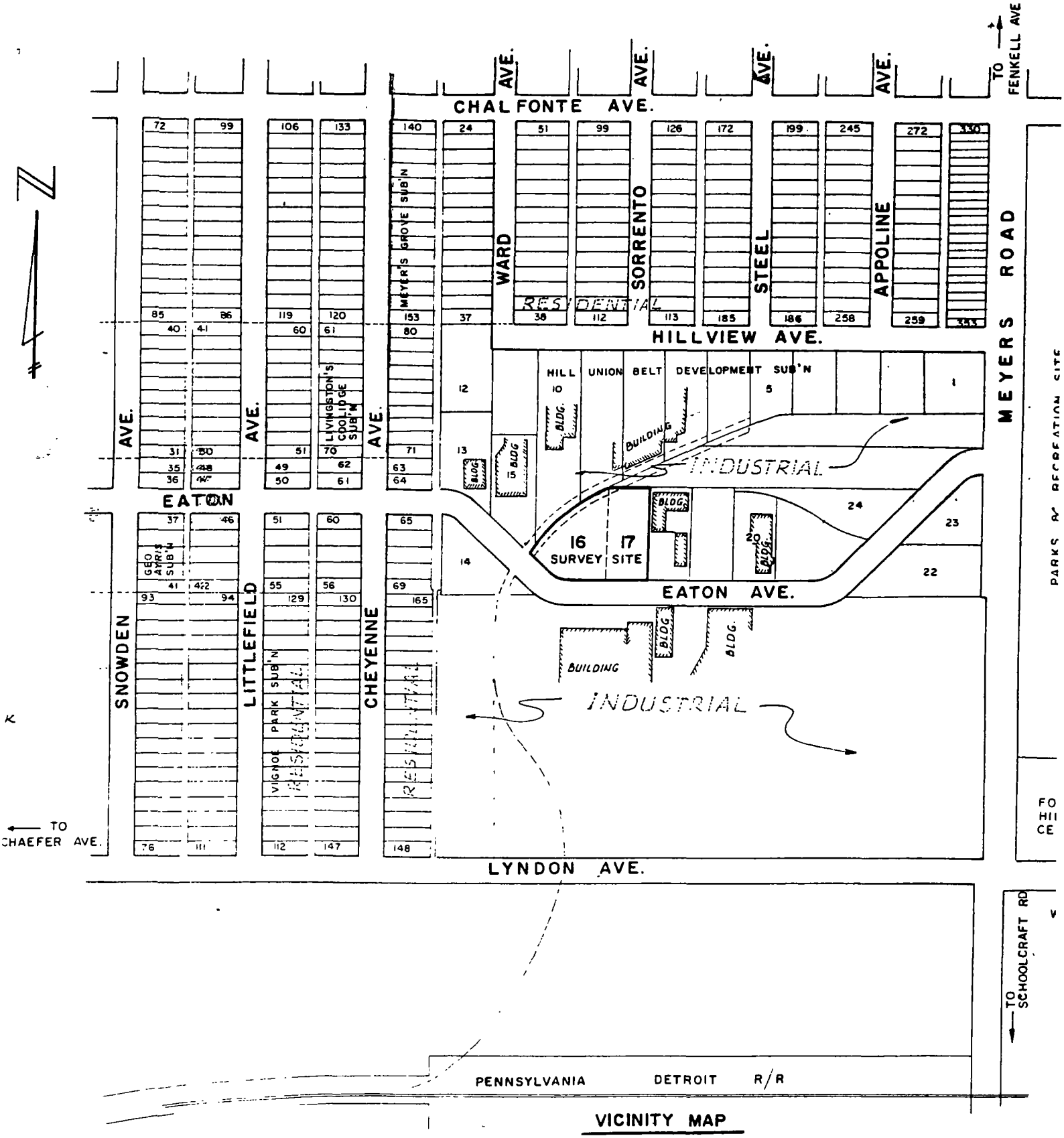
SITE TOPOGRAPHIC MAP

ATTACHMENT B-3

ZONING & LAND USE MAPS


57
66
MEYERS RD.
APPOLINE AVE
STEEL AVE
SORRENTO AVE
WARD AVE
CHEYENNE AVE
LITTLEFIELD AVE
SNOWDEN AVE
HARTWELL AVE
SCHAEFER HIGHWAY
TRACEY AVE
LESURE AVE
STANSBURY AVE
CRUSE AVE
ARDMORE AVE
FREELAND AVE
MARK TWAIN AVE
STRATHMOOR AVE
HUBBELL AVE
FENKELL AVE
CHALFONTE AVE
EATON AVE
LYNDON
RAILROAD R.W.
GAVEL AVE
PENN-DETROIT RAILROAD
M4
M2
B2
B4
R1

ATTACHMENT B-3
EXISTING LAND USE MAP



ATTACHMENT B-4

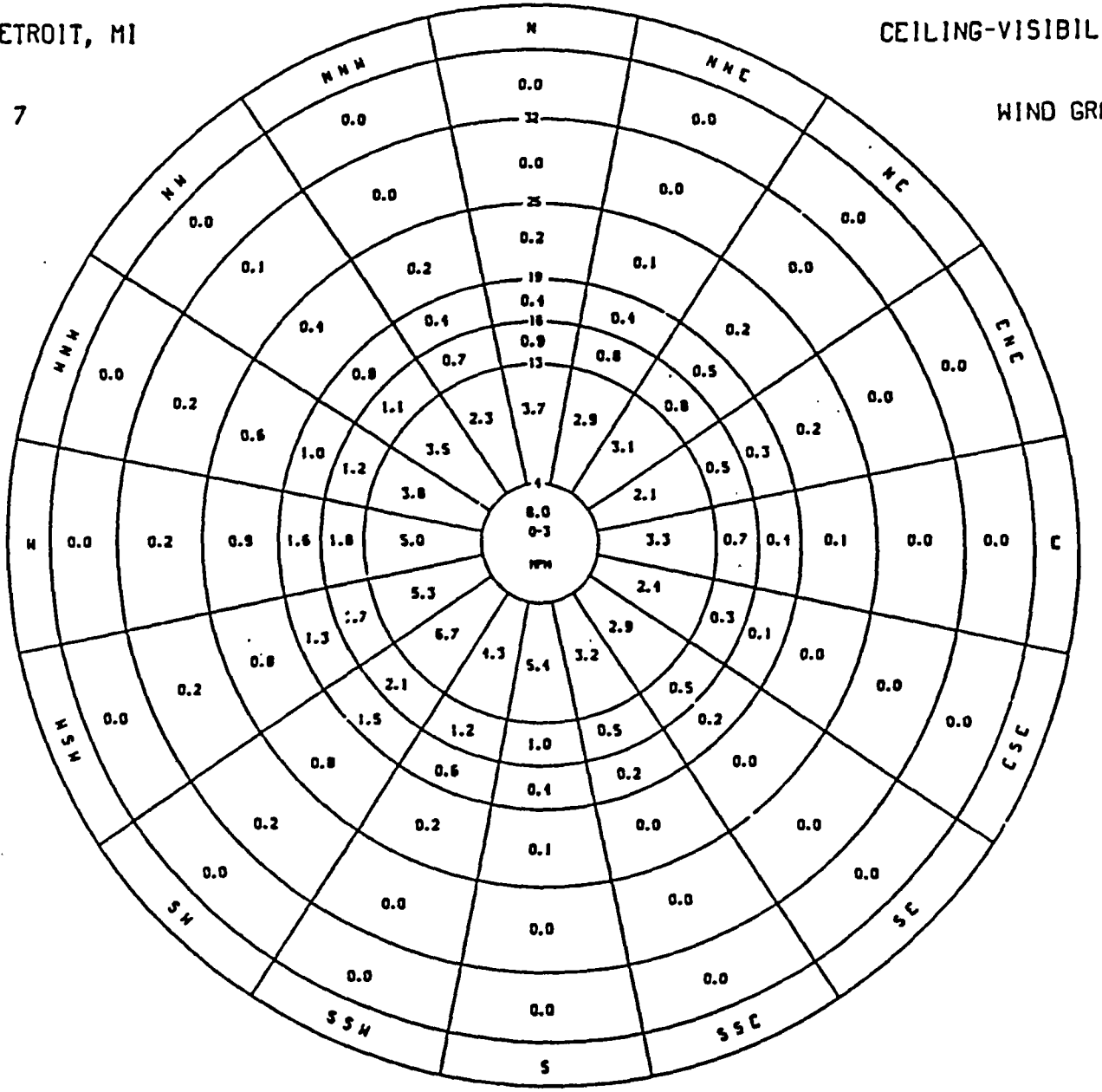
WIND ROSE

DTW DETROIT, MI

CLASS 7

CEILING-VISIBILITY

WIND GRAPH



ATTACHMENT B—

ATTACHMENT B-5

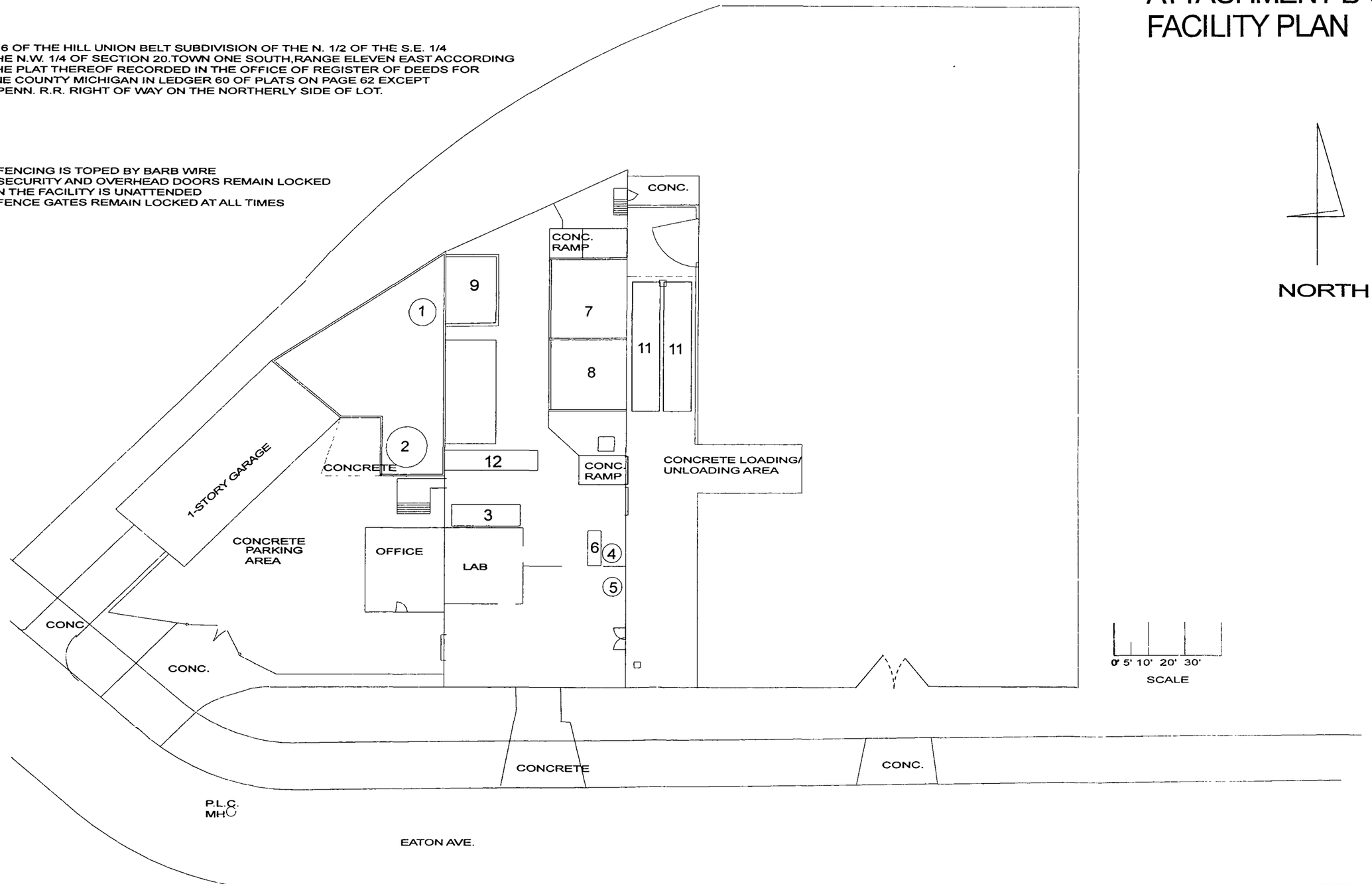
LEGAL SURVEY

ATTACHMENT B-6
FACILITY PLAN

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

NOTES:

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV NO	CHANGE RECORD	BY

DATE	REV NO	CHANGE RECORD	BY
08 21 10	1	current site layout 07_2010	DDC

DR.	E.L.R.
CHK.	~
APR.	
SCALE	DATE
1/16 = 1'-0"	12/96

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No 9601

DWG. No

EATON AVE.

ATTACHMENT B-7

FLOOD HAZARD BOUNDRY MAP

ATTACHMENT B-8

TRAFFIC PATTERNS

ATTACHMENT B-8
TRAFFIC PATTERNS

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

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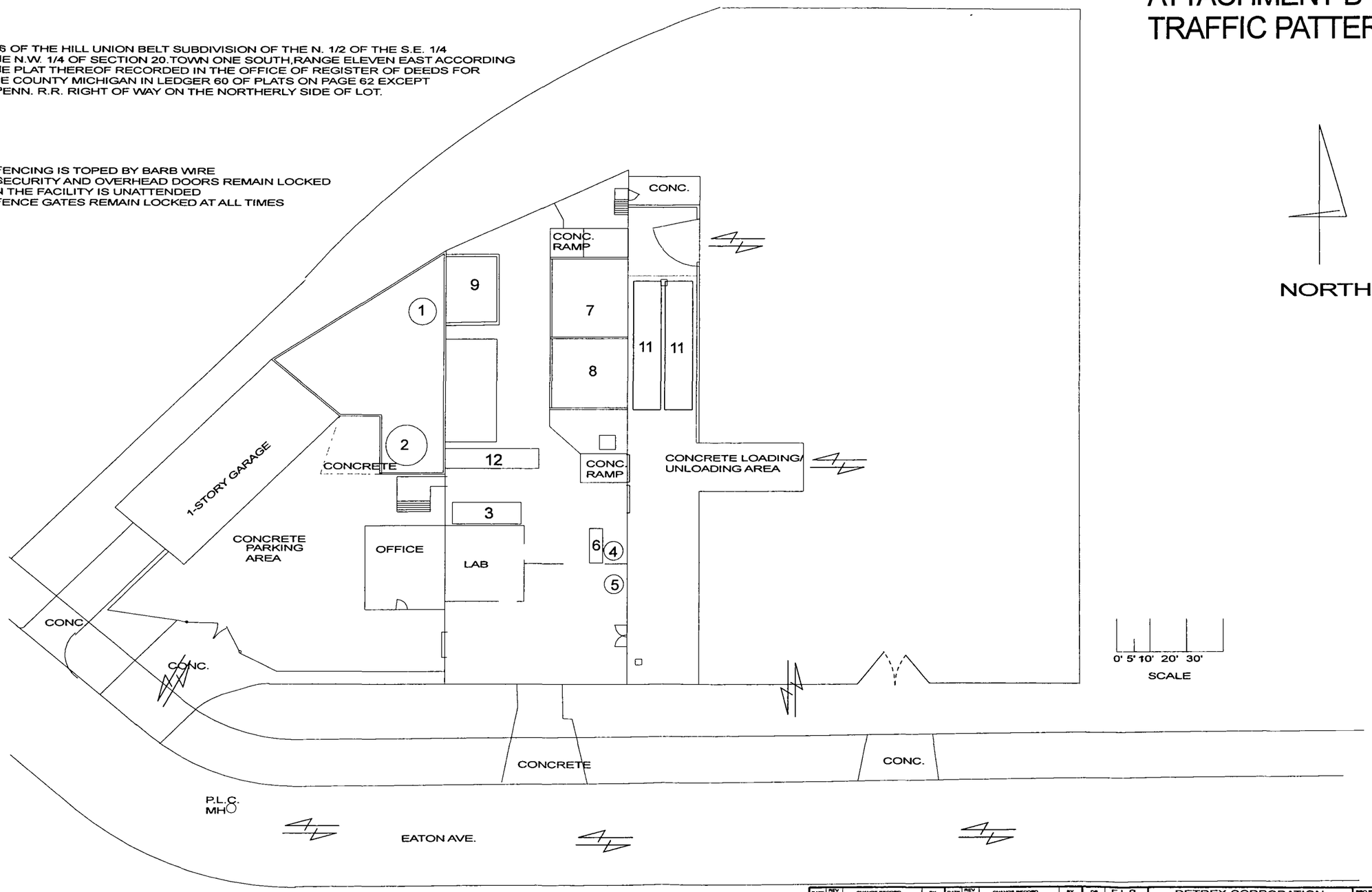


DATE	REV. NO.	CHANGE RECORD	BY	DATE	REV. NO.	CHANGE RECORD	BY
				09 21 10	1	current site layout.07_2010	DDC

DR.	E.L.R.	DETREX CORPORATION PROJECT ENGINEERING DEPARTMENT SOUTHFIELD, MICHIGAN 48086	PROJECT No. 9601
CHK	~		
APR		EATON AVE. FACILITIES GENERAL LAYOUT	DWG. No.
SCALE 1/16"=1'-0"	DATE 12/99		EATON AVE.

SECTION C
WASTE CHARACTERISTICS

TABLE OF CONTENTS **Page**

WASTE CHARACTERISTICS 1
C-1 OVERVIEW OF WASTE ANALYSIS PLAN 5
C-1a CONTAINERIZED WASTE 6
C-2 WASTE ANALYSIS PLAN 7
C-2A PARAMETERS AND RATIONALE 8
C-2b TEST METHODS 9
C-2b(1) Flammability 9
C-2b(2) Water Reactivity and pH Testing 10
C-2b(3) Compatibility Procedure 11
C-2b(4) Visual 11
C-2b(5) Cyanide Spot Test 12
C-2b(6) Lab Packs, PPE, Debris 12
C-2c SAMPLING METHODS 12
C-2d FREQUENCY OF ANALYSIS 14
C-2d(1) Waste Characterization 14
C-2d(2) Waste Screening 14
C-2d(3) Waste Compatibility 16
C-2d(4) Additional Testing 17
C-2d(5) Discrepencies & Waste Rejection Procedure 17
LOAD ACCEPTANCE 17
REJECTED LOADS 18
C-2e ADDITIONAL REQUIREMENTS FOR WASTES GENERATED OFF-SITE 18
C-2f ADDITIONAL REQUIREMENTS FOR IGNITABLE REACTIVE/OR INCOMPATIBLE WASTES 19
C-2f(1) Ignitable Wastes 19
C-2f(2) Reactive Wastes 19
C-2f(3) Incompatible Wastes 19
C-3 WASTE ANALYSIS REQUIREMENTS PERTAINING TO LAND DISPOSAL RESTRICTIONS 20
C-3a WASTE ANALYSIS 20
C-3a(1) Spent Solvent And Dioxin Wastes 21
C-3a(2) Listed Wastes 22
C-3a(3) Characteristic Wastes 22
C-3a(4) Waste Mixtures and Wastes with Overlapping Requirements 23
C-3b NOTIFICATION, CERTIFICATION, AND RECORDKEEPING REQUIREMENTS 23
C-3b(1) Retention of Generator Notices and Certifications 23
C-3b(2) Notification and Certification Requirements for Treatment Facilities 23
C-3b(3) Notification and Certification Requirements for Land Disposal Facilities 23

C-3b(4) Waste Shipped to Subtitle C Facilities 24
C-3b(5) Recordkeeping.....24
C-3b(6) Required Notice 24
C-3c REQUIREMENTS PERTAINING TO THE STORAGE OF RESTRICTED WASTES.....25
C-3c(1) Restricted Wastes Stored in Containers.....25

ATTACHMENTS

ATTACHMENT C-1 LIST OF HAZARDOUS WASTES
ATTACHMENT C-2 CHEMICAL PROPERTIES AND TOXIOCOGIAL DATA
ATTACHMENT C-3 REACTIVITYGROUP NUMBERS AND COMPATABILITY CHART
ATTACHMENT C-4 GENERATORS WASTE MATERIAL PROFILE SHEET & GENERATOR ANNUAL WASTE STREAM VERIFICATION LETTER
ATTACHMENT C-5 ANALYTICAL TESTING PARAMETERS
ATTACHMENT C-6 QUALITY ASSURANCE PROJECT PLAN
ATTACHMENT C-7 STANDARD OPERATING PROCEDURE FOR WASTE SAMPLING
ATTACHMENT C-8 LAB ANALYSIS FORMS

SECTION C

WASTE CHARACTERISTICS

This Waste Analysis Plan (WAP) outlines the procedures utilized at the Detrex Corporation Facility (Facility) to ensure that the following objectives are met:

1) Only waste types/waste codes allowed in the Operating License are approved and accepted at the Facility.
2) Wastes that are potentially incompatible with each other are not stored in the same area.
3) Arriving waste shipments meet the description and characteristics as represented by the generator. Any discrepancies must be resolved to ensure that the waste is from the pre-approved waste stream prior to waste acceptance.

The following sections outline the WAP, and the specific chemical and physical waste analysis procedures that comprise it. The WAP is divided into two major sections: waste characterization, and waste screening. Waste characterization is a waste evaluation procedure that takes place before giving permission to a generator to ship waste to the Facility. Waste screening is conducted on the waste at the Facility to ensure that the waste actually received is representative of the information and samples presented for pre-approval.

The information is provided pursuant to Michigan ACT 451, Part 111 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended and the administrative rules pursuant thereto.

C-1 OVERVIEW OF WASTE ANALYSIS PLAN

The Facility developed a Waste Analysis Plan (WAP) to ensure the Facility accepts only wastes for which the Facility is permitted to receive. The WAP has been prepared recognizing the nature of the wastes accepted by the Facility and based on extensive experience in the handling of hazardous wastes. A copy of the WAP is maintained at the Facility at all times. The WAP consists of two major sections, Waste Characterization and Waste Screening.

Provided in Attachment C-1 is a list of all hazardous wastes which may be stored at the facility. Attachment C-1 also provides for each waste constituent, its EPA hazardous wastes identification number(s) and hazard code(s).

The wastes to be accepted for storage at the facility may include solid, liquid and sludge material containing the constituents in Attachment C-1. Wastes accepted at the facility are stored prior to transportation to an off site permitted facility for treatment or disposal. The types of wastes, which may be received at the facility, consist of the following general waste groups:

1. amines, aliphatic and aromatic;
2. aromatic hydrocarbons;
3. halogenated organics;
4. ketones;
5. metals;
6. hydrocarbons, aliphatic-saturated and unsaturated; and
7. corrosive materials (i.e. acids, caustics).

The facility also handles Non-hazardous (i.e., non-RCRA) wastes that may be stored in bulk tanks, stored in DOT-approved containers within one of the hazardous waste storage areas, or stored elsewhere in the facility.

Material Safety Data Sheets (MSDSs) and/or general reference materials for the primary constituents of waste streams are maintained at the Facility to describe the physical and chemical properties, and to assist personnel in proper handling. Attachment C-2 provides a tabular summary of typical chemical properties for the various wastes as well as a tabular summary of toxicological data for the various wastes.

Section F-5 provides a discussion of waste compatibility for the different waste streams permitted under this license. A copy of the reactivity group number and the compatibility chart for the wastes to be accepted at the Facility can be found in Attachment C-3. In addition, chemistry reference texts, including items listed below, may also be on file at the Facility or at the Corporate Office to provide additional information.

1) *Handbook of Chemistry*, 9th Edition, N.A. Lange, 1956;

2) *Concise Chemical and Technical Dictionary*, 2nd Edition, H. Bennett, 1962;

3) *A Method for Determining the Compatibility of Hazardous Waste*, EPA-600/2-80-076, 1980;

4) *Merck Index*, 10th Edition, 1985;

5) *Handbook of Chemistry and Physics* (CRC), 73rd Edition, D.R. Lide, 1992-1993; and

6) *Lange's Handbook of Chemistry*, 13th Edition, J.A. Dean, 1985;

7) SW846 - Volumes IA, IB, IC, II, 1986 Edition (Updated volumes have been ordered for Corporate Offices); and

8) NIOSH Pocket Guide

Hazardous Wastes will be stored in one of the approved inside storage areas or in either trailer within the dock area. Depending on the circumstances, the hazardous wastes may be either shipped in the original DOT containers or transferred from the containers to another approved DOT container, for shipment off-site. The issue of incompatibility with the different waste streams, hazardous and non-hazardous, acceptable under this license is addressed within the WAP.

C-1a CONTAINERIZED WASTE
[40 CFR 264.172, 270.15(b)(1), 264.1086(c)(4)]

Once approved, hazardous wastes will be shipped to the Facility in DOT-approved containers that meet with the standards outlined in 49 CFR Parts 172, 173, 174 and 178, and all applicable regulations. A copy of 49 CFR Parts 170 through 178 is either maintained at the Facility's office or at the Corporate Office.

Although it is the Generator's responsibility to ensure that a DOT-approved container is compatible with the hazardous waste contents, Facility personnel will, when conditions indicate a need, verify that the container is compatible with the contents by utilizing DOT's regulations as set forth in 49 CFR Parts 172, 173 and 178.

Facility personnel inspect each container upon its arrival at the Facility to insure its structural integrity. In the event that the waste is accepted and the container is found to be in a condition that could allow hazardous wastes to be released from the container, personnel will either transfer the contents to another compatible container or overpack the container. In addition, if it is determined that the waste and container are incompatible, then the material will either be repackaged in a DOT-approved container that is compatible or the container will not be accepted. Since the facility does not hold containers longer than one year there is no need for subsequent reverification.

Wastes containing free liquids will be stored in areas that have adequate secondary containment.

C-2 WASTE ANALYSIS PLAN
[40 CFR 270.14(b)(3), 264.13(b) and (c), 266.102(a)(2)(ii), 266.104(a)(2), 268.7]

This Waste Analysis Plan (WAP) was developed to ensure the Eaton Ave. Facility accepts only wastes for which it is permitted to accept. The WAP is comprised of two components. The first component is a Waste Characterization to evaluate if a waste is permitted to be managed at the Facility. The second component is Waste Screening that is conducted on every shipment of waste received to ensure it meets the waste profile for the generator and to ensure it is properly managed within the Facility (i.e., compatibility with wastes already stored).

Prior to accepting wastes from a potentially new client, generators who want to ship waste to the Facility are required to complete a Waste Characterization process which includes the completion of a "Generator's Waste Material Profile Sheet" (Profile Sheet). A copy of a "typical" Profile Sheet can be seen in Attachment C-4. This procedure is designed to ensure that all hazardous wastes accepted by the Facility are acceptable within the scope of the Operating License and the Facility's hazardous waste storage capabilities. The Profile Sheet forms the basis of information that the Facility uses in determining if the waste can be accepted at the Facility. The process description, physical characteristics, and a representative sample of the waste may also be obtained to provide Facility personnel with adequate information to determine if the waste can be accepted or if additional data is required before a decision can be reached.

Typically, the Facility deals with hazardous wastes that contain greater than 500 parts per million by weight (ppmbw) Volatile Organic Concentration (VOC), which is documented in the Profile Sheet completed by the generator. In the event that the generator denotes that a hazardous waste contains less than 500 ppm VOC (at the point of origin), or the generator states that they have treated the waste to below the 500 ppmbw level, the generator will be required to provide information that they have properly treated the waste as required under 40 CFR 264.1083(b) Waste Determination Procedures For Treated Hazardous Waste.

A sample of the waste stream may either be obtained by Facility personnel or the generator. All samples, whether supplied by the generator or obtained by Facility personnel, will be handled in the same manner with regard to analysis. In the event that the generator provides the sample, personnel will review the profile provided by the generator to ascertain how the sample was obtained in order to ensure that a representative sample has been provided. If the generator does not provide sufficient information, the generator is contacted and requested to provide additional written information and possibly supporting laboratory analyses as necessary to determine the acceptability of the waste.

Facility personnel may also conduct an analytical confirmation as a secondary check on the accuracy of the Profile Sheet. In such cases an employee would review the Profile Sheet, confirmation analysis report, and any additional information provided by the generator to

perform a completeness review. This process review pays particular attention to the type of waste and the process that generates the waste.

As a final step in the approval process, personnel review the waste stream for potential incompatibilities by determining its appropriate waste group and reactivity number in accordance with Attachment C-3. A similar review is performed on all non-hazardous wastes using the same methodology to determine what reactivity group number the material falls under. This information is then added to the Profile Sheet maintained on file at the Facility, or is subsequently recorded for the non-hazardous material for future reference.

When a sample is provided and during the review process the information provided by the generator does not match the sample, the generator will be requested to revise the profile to accurately represent the waste stream.

When it is determined that a waste stream can be safely handled at the Facility in accordance with the license requirements, the generator is notified that the waste may be shipped to and accepted by the Facility as long as the waste conforms to the original waste characteristics in the pre-shipment sample and profile sheet.

In addition to the above, the Facility requires as part of their acceptance program that the generator complete a new Profile Sheet, or a Recertification Sheet, on an annual basis. At any time, if the Facility is informed or has reason to believe that a waste stream has been altered, the generator is required to complete a new Profile Sheet reflecting these changes. Each new Profile Sheet is reviewed as previously described. If, upon evaluation of the information contained in the profile, it is determined that additional analytical data is required to properly characterize the waste stream, the necessary analytical testing will be performed, or the waste will be rejected.

Wastes will be screened (fingerprinted) for parameters as specified in Section C-2 and Attachment C-5 for the appropriate waste codes. Section C-2 and Attachment C-5 define the parameters, flammability, pH, water reactivity, reactive cyanide, free liquids, and compatibility, under which testing must be performed for each type of waste to ensure that wastes received meet the generator's waste profile. During this process, Facility personnel will also record information on the color, appearance and any other parameter that may help with the screening process. In lieu of screening the facility will reject the waste for good reason.

C-2A PARAMETERS AND RATIONALE [40 CFR 264.13(b)(1)]

The waste screening (i.e., fingerprinting) parameters for each waste type is presented in Attachment C-5. The parameters have been selected to fulfill the requirements of 40 CFR Part 261 with respect to the storage of the waste at this Facility. The table found in Attachment C-5, provides a flow chart of the waste screening decision-making process. The rationale for each test is described in the following:

1. Flammability - provides verification that wastes which are not anticipated to be flammable, based on manifest information, are in fact non-flammable;
2. pH Testing - provides verification of corrosivity of wastes for storage purposes;
3. Water Reactivity - verifies that the waste stream in question does not react with water. This is necessary in order to provide information for the emergency coordinator in the event of a fire;
4. Compatibility Test - provides compatibility verification for similar waste streams;
5. Paint Filter Test - determine if a waste stream that is received and identified as a solid waste contains free liquid. The necessity of this test will be decided during the screening process to determine the method of storage as well as the final method of disposal; and
6. Visual– characteristics of color, appearance, and any other characteristic that Facility personnel help identify the waste.
7. Cyanide Spot Test - provides an indication if waste contains reactive cyanide.

C-2b TEST METHODS
[40 CFR 264.13(b)(2), 264.13(c)(1)]

Testing will be performed as detailed in the Quality Assurance Project Plan (QAPP) provided in Attachment C-6 as briefly described in the subsections below. The QAPP provides the policies, objectives, and specific quality assurance (QA) and quality control (QC) procedures to achieve the data quality objectives of the testing. All analyses are conducted on a grab samples collected in accordance with the procedures outlined in Section C-2c. The results of these tests are recorded and evaluated with respect to the pre-approved information.

C-2b(1) Flammability

A flammability potential screening analysis will be performed, on a discrete sample. At least 10% of the each hazardous waste stream received from each generator will be tested in accordance with the requirements of the QAPP and Attachment C-5. For shipments of less than 10 containers, the Facility will sample at least one container. If the test concludes the sample is non-flammable, then the waste stream represented by this discrete sample will have passed the flammability

criteria. If the test concludes that the sample failed the flammability potential screening analysis, the sample may be retested to determine its flash point using the Pensky-Martens test (ASTM D93-90 found in Attachment C-6), or rejected. If the material has a flash point above 140°F, the material will be accepted as non-flammable. If it is 140°F or less it will be classified as a flammable.

Any container received from the same line item on a manifest as the failed container will be tested using the flammability potential screening analysis. Any additional container, which fails this test, may be either rejected or retested using the Pensky-Martens test as stated above. Material failing this test will be subject to the procedure specified in Section C-2d(5), Discrepancies & Waste Rejection Procedures

Since the Facility is also permitted to accept flammable wastes, the generator may be contacted to reprofile the material. In such cases, a new profile sheet will be generated along with the appropriate land ban form. A discrepancy notation will be made on the manifest and the material will be transferred to the appropriate area for storage. In the event that the Facility is unable to accept the waste, it will be rejected according to the rejection procedures in Section C-2d(5).

C-2b(2) Water Reactivity and pH Testing

A Water Reactivity and pH test will be performed, on a discrete sample. At least 10% of each waste stream received from each generator will be tested in accordance with the requirements of the QAPP and Attachment C-5. For shipments of less than 10 containers, which require these tests, the Facility will sample at least one container. To determine if a waste is reactive with water, or exhibits an unexpected pH, Facility personnel will measure and record the pH on a sample when required as noted in Appendix C-5 using the method described in the QAPP, and at our discretion, as allowed under Section C-2d(4), Additional Testing. The pH of the resultant mixture and observations on the formation of gases, vapors, or fumes are recorded.

Water Reactivity tests are conducted under a fume hood, using appropriate safety equipment, to protect the employee.

Water reactive wastes will be rejected. Wastes exhibiting an unexpected pH may be rejected unless the generator can explain why a higher or lower pH than expected exists. If the characterization of the material is proper and the unexpected pH will not impact the processing/disposal of the waste at another licensed TSDF, the waste will be accepted. Waste rejection procedures are described in Section C-2d(5) .

C-2b(3) Compatibility Procedure

Waste compatibility is an important aspect of the Facility's waste management operation. Further details are presented in Section F-5, however a general discussion follows.

The initial step in evaluating waste compatibility is to determine the appropriate hazardous waste group (i.e. reactivity group number) for each waste stream in accordance with the USEPA guidance document *A Method for Determining the Compatibility of Hazardous Waste*, EPA-600/2-80-076, April 1980. The reactivity group number of a waste is used with the compatibility chart provided in Attachment C-3 to place potentially incompatible waste in separate container storage areas.

It should also be noted that all transportation of hazardous wastes to the Facility is conducted in accordance with all appropriate DOT requirements including 49 CFR §177.848, which applies to segregation of hazardous materials during shipping. Section C-2d(3) and Section F-5b specifically outlines the actions taken by Facility personnel to address the issue of incompatibility. If hazardous waste containers are in the staging area when a shipment of new waste arrives at the Facility, Facility personnel will determine the reactivity group number of each waste stream in the staging area. Reactivity Group numbers and compatibility charts, as found in Attachment C-3, would be used to evaluate if the transported wastes can be transferred into the staging area. If a compatibility problem exists then some, or all, of the hazardous wastes present in the staging area must be transferred to an appropriate container storage area prior to receiving the new waste based on potential incompatibilities.

In the event that no container storage area is available that can manage the new wastes due to potential incompatibilities, despite the wastes being acceptable based on the operating license, the wastes will be rejected. The rejection procedures described in Section C-2d(5) will be followed; however, it is anticipated that the wastes would be returned to the generator until an appropriate container storage area is available.

C-2b(4) Visual

Descrete samples for visual screening are obtained from each container received at the Facility. These parameters are used to determine if the waste stream may contain materials other than what are listed in the profile. Visual examination for liquid hazardous wastes will consist of wet-ability, presence of solids, uniformity, pumpability, color, or any other parameter that may characterize a liquid waste stream. Visual examination for solid hazardous wastes will consist of presence of free liquids, layering, color, or any other parameter that may characterize a solid waste stream. Facility Visual verification, in addition to

physical testing, can also be used to help indicate the potential presence of another material that may require additional investigation.

The characteristics of color and physical state alone may not trigger the issue of rejection. For example, in the case of chlorinated compounds, color alone may not indicate the presence of other materials. Depending on the amount of oil in the solvent the color may range from light yellow to a dark brown to black. As such, good judgment and the other parameters listed above must be used to actually determine if other materials exist.

C-2b(5) Cyanide Spot Test

A discrete sample will be used to determine if a waste contains reactive cyanide. The method a "Cyanide Spot Test for Sample Screening" will be conducted, as specified in Attachment C-5, according to: Standard Methods 17th Edition, Method 4500-CN. A copy of this method is included in Attachment C-6.

C-2b(6) Lab Packs, PPE, Debris

All containers associated with lab packs, PPE equipment and Debris will be 100% visually inspected unless the container was packaged by Facility personnel at the generators site and the container was sealed in such a way as to ensure tampering did not occur from the time the container was originally packaged unitl its receipt at the Facility.Hazardous debris accepted at the facility that exhibits the characteristics of ignitability, corrosivity, or reactivity will be treated using one of the extraction, destruction, or immobilization technologies identified in Table 1 of 40 CFR §268.45.

C-2c SAMPLING METHODS
[40 CFR 264.13(b)(3), Part 261 Appendix I, Part 266 Appendix IX]

The collection of representative waste samples for Screening is conducted by Facility personnel according to the sample collection procedures described in the QAPP and in Attachment C-7. The sampling procedures are provided for both liquid and solid samples.

The screening process for waste consists of visual observation on every container received at the Facility. Up to 10 containers (550 gallons) are unloaded into the staging area (see section D-1c for more details), opened and visually checked. At least one container is then sampled and tested as required under Attachment C-5 for the required parameters (flammability, water reactivity, pH, cyanide, compatibility, and paint filter test). When containers need to be weighed in to determine the weight of material in the

container, the scale at the drumming station may be used in addition to the scale in the staging area for obtaining weight; no sampling will occur here.

In the event that containers are not representatively sampled or cannot be representatively sampled, the waste will not be accepted by the Facility.

All containers of Hazardous Waste shipped to the Facility will be given a container number for tracking purposes. Other markings will be used to indicate the need for rejecting containers or for those containers failing screening. The marking will be placed next to the Hazardous Waste Marking. Containers passing the screening will only be marked with a container number. Rejected containers can remain in the container staging area (area 6) if no compatibility problems exist. These rejected containers do not count toward the 10-container allowance for this area.

The required screening on the 10 containers must be completed before additional drums may be brought into the screening area. Unloading in this fashion is done to speed up release of the transporter and reduce container handling by allowing any additional testing of the containers prior to placing them into their storage area(s).

In the event that a container to be unloaded is found to be incompatible with materials already unloaded, the containers presenting the incompatibility problem will be moved to an appropriate storage area, as detailed in Section F. The movement of waste from one storage area to another is only for previously accepted wastes . In no way will this be construed as to allow personnel the ability to directly offload material without completion of screening and meeting the compatibility requirements, while formally accepting the hazardous wastes.

All screening will be complete prior to signing the manifest and releasing the transport vehicle .

The screening process for wastes consists of sampling, visual observation and testing. Specifically, every container of waste received at the Facility is opened. Visual observations of unexpected sample characteristics such as color, consistency, and physical state are recorded.

Several problems can occur during container sampling that may compromise the integrity of the sample collected. Among these are: obstructions in the containers that inhibit the full depth of the container from being sampled; layering of liquids with different viscosities which makes sampling difficult (more viscous liquids will tend to adhere to the outside of the sampling device); and extremely hard solids that are difficult to sample. Possible solutions to these problems include: angling the sampling device to avoid the obstruction; allowing the viscous liquid to drip off the sampling device back into the container prior to transferring the sample to a container; or using alternate sampling equipment such as a non-sparking chisel and mallet.

To minimize drippage during sampling of liquids, a funnel system or absorbent pad may be placed on the container prior to sampling. The exterior of the sampling device will be allowed to thoroughly drain back into the container prior to transferring the sample into the sample container. Absorbent pads will be managed in the same manner as the waste, should the waste drip on the pad.

Sampling equipment will be disposable, dedicated to wastes of a specific reactivity group number or decontaminated after use. Sampling equipment will not be decontaminated between screening samples of the same reactivity group because the nature of the wastes and the testing procedures are such that minor cross-contamination between wastes will not affect the analyses. Utilizing dedicated equipment for various reactivity groups will prevent undesired reactions due to potential incompatibilities. On occasion, disposable-sampling equipment may also be used, which when disposed, will be managed in the same manner as the waste it was used to sample.

Decontamination will be accomplished by using a solvent (such as IPA) that will solubalize the contaminants followed by a detergent wash. The sampling device will then be triple rinsed with water to remove any residual detergent.

C-2d FREQUENCY OF ANALYSIS
[40 CFR 264.13 (a)(3), 264.13(b)(4)]

C-2d(1) Waste Characterization

Waste characterization/profiling is completed for every waste stream that may be received at the Facility. The waste characterization will be completed using one of the methods noted in Section C-3a(2). Waste characterization may, or may not, require additional laboratory testing depending on the generator's knowledge of the waste and the waste generation process. A Profile Sheet or a re-certification letter/sheet must be renewed at least annually.

C-2d(2) Waste Screening

Screening, using parameters described in Section C-2a, are conducted on each shipment of waste received at the Facility.

It should be noted that this Facility may also accept wastes from other Detrex facilities without the necessary prescreening IF those facilities screen waste coming in according to parameters similar to the Analytical Testing Parameters found in Appendix C-5. Since performing a second screening at this point will not provide any additional information, the Facility may meet the testing requirement by obtaining a copy of the test results from the other facility prior to acceptance of the particular waste shipment.

If the parameters and methodology for both facilities are the same, then the analysis will be accepted. If the analysis lacks any parameter or the methodology differs, the Facility will analyze for that parameter prior to accepting the waste. The analysis for wastes accepted in this manner will include both the initial analysis, performed by the other facility, and any additional analysis performed by personnel at this Facility. These results will be filed at this Facility and will become part of this Facility's operating record.

Containers of waste are removed from the transport vehicle, until a volumetric capacity of 550 gallons is reached in the Staging Area. Each container at this time is marked with a container number for the purposes of tracking. Shipping documents (manifest and land ban forms when required) are reviewed. The transporter will remain on-site until the analysis is complete, or until analysis from another facility is verified, and a signed copy of the manifest is provided to the transporter.

Discrete samples are obtained to perform the required analytical tests. The type of sample utilized for each test is specified in the testing procedure.

Attachment C-5 provides the parameters for screening each type of waste. Results of the analysis are recorded on forms similar to those found in Attachment C-8. Waste Screening is performed in two stages. The first stage of screening will consist of: visual observation (C-2b(4)) and ignitability. The second stage will include any required testing for compatibility (C-2b(3)), paint filter, water reactivity, pH, or reactive cyanide, as outlined in attachment C-5. Additional testing, as noted in C-2d(4), will be performed if deemed necessary by personnel. Since any additional testing performed is non-mandatory, such testing will not preclude the Facility's ability to accept the waste and place it into the storage area.

The Profile sheet is compared to information obtained from: lab results, sample observations, Manifest, and the Land Ban Forms. A complete record of all-sampling, unusual observations, and analytical work is placed in the operating files at the Facility.

Analytical testing may be done in the on-site laboratory or at another laboratory. The testing procedures described in the following sections are followed by either laboratory. A laboratory Quality Assurance Project Plan (QAPP) has also been developed to ensure the reliability and accuracy of analytical results.

Containers that fail analysis will have a rejection marking placed on the container near the hazardous waste marking. Rejected drums will be segregated from other containers and grouped in areas within the staging areas shown in Attachment D-1. These containers will either be rejected, returned to the

generator, sent to another TSDF under the consent of the generator, or reprofiled to allow acceptance.

In the event a waste stream is unacceptable, the manifest is not signed and the original waste generator is contacted to determine appropriate handling of the rejected waste. The waste would be handled as outlined in Waste Rejection Procedure under Section C-2d(5). In the event that an entire waste stream indicates the wastes are unacceptable, as profiled and manifested, but the waste can be accepted by the Facility, the generator would be contacted and the procedure under C-2a(5) followed. Rejection of partial loads of waste also follows the procedures under C-2a(5).

C-2d(3) Waste Compatibility

Another important aspect in the management of hazardous wastes is waste compatibility.

To prevent the possible mixing of incompatible wastes in the event of release personnel will follow the following procedure:

1. Upon acceptance, mark the reactivity group number(s) (RGNs) of the material on each DOT container near the hazardous waste marking;
2. Post the chart contained in Attachment F-2 as a reference guide to determine compatibility of different waste streams. Use the chart prior to placing any new RGN into the storage area.
3. Record all RGNs present within a given storage area or use a tracking system (such as a computer) to record and generate a list of RGNs in each containment area. .
4. If this system indicates a potential incompatibility problem between the wastes already in a given storage area and newly accepted wastes to be placed into the storage area, then an alternate storage area will be sought or incompatible waste(s) within a given storage area will be moved to another area.

If the materials already in the containment areas, or staging area are incompatible with the incoming waste, then the waste will not be off-loaded. In this case the waste in the storage area will be shipped out to make room for the incoming waste, or the incoming waste will either be shipped back to the generator or to another facility licensed to accept the waste.

C-2d(4) Additional Testing

There may be cases when personnel feel additional testing may need. All results of additional testing will be recorded on the lab sheet and become part of the facility records for that load of waste.

Examples of when additional testing is needed are: a multi-layered waste where the profile indicates a homogeneous material, or if the material is listed as solid but contains free liquids.

The presence of unusual visual indicators may not in and of themselves be enough to require additional testing of a material. While this would not necessitate the need to reject the material, it may create the need for better characterization. Under such conditions the Facility may perform additional testing, which could include the use of a GC. The testing will be performed on individual samples. When a number of containers have the same physical characteristics, an individual sample will be taken and tested from at least 10% of the containers. The generator will be contacted to complete the necessary paperwork which may include the generation of a new profile sheet

C-2d(5) Discrepencies & Waste Rejection Procedure

The Facility will compare all screening results to the parameters and information provided from the generator in the profile sheet. In the event the screening indicates that the waste does not match the profile/characterization, the waste may be rejected. The following procedure will be followed to determine if the Facility can accept the waste. Facility personnel will follow the rejection procedures for containers of hazardous waste based on Michhigan Department of Environment and Natural Resources's (MDENR's) requirements, or more stringent procedures, if they exist. The following outlines the basic steps taken in determining whether or not a load is rejected. In all cases the transporter remains on site until the load is accepted, by signing the manifest, or rejected.

In the event that screening indicates that a particular waste stream is potentially unacceptable, the Facility may reload this material after initial screening onto the truck to allow for additional material to be brought into the staging area. Facility personnel will temporary isolate these containers in the staging area as long as there are no compatibility issues and total facility capacity of 13,750 gallons is not exceeded.

LOAD ACCEPTANCE

1) The generator/broker is contacted to discuss the discrepancies identified during the screening and/or testing process.

2) If it is determined that the discrepancies can be resolved, and the Facility has previously approved the waste stream, they are noted on the manifest and the waste is transferred to an appropriate storage area.

3) If a new Profile Sheet is required to accept the waste, for a new waste stream or for an existing waste stream, the generator will be requested to fax a copy of the Profile Sheet to expedite the process of waste acceptance. Discrepancies would be noted on the manifest.

4) If it is determined that the discrepancies cannot be resolved, and the waste stream differs from the pre-approved waste, but is acceptable under the Facility's license, approval will be obtained from the generator to modify the manifest to accurately describe the waste shipped to the Facility. A discrepancy will be noted in the discrepancy box of the manifest. The generator will also be required to complete a Profile Sheet for the new waste stream.

   To expedite this process, the generator will be required to provide written authorization, to modify the manifest to correctly reflect the waste stream(s). While waiting for this authorization the waste will either be held in the staging area or be placed back onto the truck until the required approval is received. The transporter will remain on site until the manifest is signed.

REJECTED LOADS

In the event that all or part of the waste is determined not to be acceptable through the screening process, or other conditions as noted by the Facility, the generator will be contacted. The requirements for rejecting a partial or total shipment of Hazardous Waste will be followed.

In the event of a partial or total load rejection, the generator would be contacted to allow the waste to be transferred to another TSDF, as requested by the generator, or returned to the generator. In either case, the Facility would retain the TSDF portion of the manifest, or a Xerox copy of the manifest, for their records.

C-2e ADDITIONAL REQUIREMENTS FOR WASTES GENERATED OFF-SITE [40 CFR 264.13(b)(5) and (c), 264.73(b)]

As noted in Section C-2, the following requirements are in place for off-site waste generators.

The Facility requires, as part of their acceptance program, that the generator complete a Profile Sheet. If the Facility is informed, or has reason to believe that a waste

stream has been altered, the generator is requested to complete a new Profile Sheet reflecting these changes. Each new Profile Sheet is reviewed to characterize the waste stream and to determine if the waste stream can continue to be accepted. If, upon evaluation of the Profile Sheet, it is determined that analytical testing data is required to determine acceptability, the necessary analytical tests are performed by the generator, a Detrex Laboratory, or an outside laboratory.

Additionally, as an on-going acceptance assessment, the generator is required to submit a new Profile Sheet, or sign a waste recertification statement/letter on an annual basis.

C-2f ADDITIONAL REQUIREMENTS FOR IGNITABLE REACTIVE/OR INCOMPATIBLE WASTES [40 CFR 264.13(b)(6), 264.17]

C-2f(1) Ignitable Wastes

Precautions taken by the Facility to prevent ignition of ignitable wastes include separation and protection of ignitable waste from ignition sources and the use of non-sparking tools when handling or sampling. Warning signs with the legend 'No Smoking' are also posted conspicuously in the area designated for handling and storage of ignitable waste.

C-2f(2) Reactive Wastes

The Facility does not handle reactive wastes. As detailed in Section C-2b, tests are performed as necessary on incoming wastes to ensure that reactive wastes are not inadvertently accepted.

C-2f(3) Incompatible Wastes

The Facility handles all permitted waste types such that incompatible waste types are segregated from the moment they are received at the Facility. Incompatible wastes are subsequently handled and stored separately. Incompatible waste types have been determined for all proposed and current waste codes handled at the Facility in accordance with the USEPA guidance document *A Method for Determining the Compatibility of Hazardous Waste*, EPA-600/2-80-076, April 1980. An explanation of compatibility determinations is included in Section F-5.

Secondary containment areas will separate potentially incompatible wastes and prevent contact should one or more containers fail. Prior to acceptance of a waste stream, the compatibility of that waste with other currently stored waste

types will be evaluated as noted above. Special attention will be given to those waste types that have been determined to be incompatible with a substantial number of other waste types. Waste groups will not be accepted until a secondary containment area, containing only wastes that are compatible with the subject waste group, is available.

In addition to the systems noted above, the Facility will institute the following to help insure that potentially incompatible wastes are not inadvertently stored in the same storage area:

1. Follow the requirements listed in Section F-5b and F-5e;
2. Upon acceptance, mark the reactivity group number of the material on each DOT container;
3. Post the chart contained in Attachment C-3 to serve as a reference guide;
4. Determine that only compatible materials are placed in the same hazardous waste storage area; and
5. Verify prior to placing any waste in the storage area that there is no potential for incompatibility.

C-3 WASTE ANALYSIS REQUIREMENTS PERTAINING TO LAND DISPOSAL RESTRICTIONS [40 CFR 262.10, 262.11, 264.13, 264.73, 266.102(a)(2)(ii), Part 268, 270.14(b)(3)]

C-3a WASTE ANALYSIS [40 CFR 261.21 through 261.24, 264.13(a)(1), 268.1, 268.7, 268.9, 268.32 through 268.37, 268.41 through 268.43]

As many of the waste streams to be managed at the Facility are prohibited from land disposal, personnel are familiar with the Land Disposal Restrictions (LDRs). LDR forms (LDRFs) will be required to be filled out by the generator during the profile process. The LDRF is considered current if the generator has signed it within 365 days. To insure that forms are current, Facility personnel will notify the generator each year of the need to complete and return a LDR form for each waste stream. This will generally occur at the same time the profiles are renewed.

All shipments of wastes subject to LDR received at the Facility will be accompanied by appropriate generator notification and LDR notification in accordance

with R 299.9627 and 40 CFR §268.7. The LDR notification accompanying generator wastes will be reviewed, and any discrepancies in the LDR notification and the associated manifest, analytical records, or Waste Profile Form will require shipment rejection unless additional, satisfactory, clarifying information is provided by the generator. All information obtained to document LDR compliance will be maintained in the Facility operating record.

In the event that the Facility receives a load of waste without the LDRFs, or with obvious incorrect/incomplete information, the following actions will be taken:

1. Contact the generator to discuss the discrepancies or errors found on the LDRF. Obtain the generators approval to physically alter the LDRF to correct the discrepancies or errors found. ;
2. Correct the LDRF with the generators consent, for example by adding waste streams to the LDRF based on information listed in the profile sheet. Facility personnel will denote the individual providing permission to change the LDRF. A copy will be sent to the generator; or
3. Have the generator send a copy of the form to the Facility electronically with the complete and correct information on the form. The electronic copy will be held as would an original in the files.

A copy of each LDRF is retained at the Facility for the retention period required under 40 CFR 268.

When LDR wastes are shipped from the Facility, the necessary notification and certifications (i.e. LDRFs) to accompany the waste shipment off site will be completed. In many cases, these LDRFs will be generated based on the original generator's knowledge of the waste, and the testing and profiling information used in the initial characterization of the waste. In the cases where there may be a question regarding the level of a constituent, or if one is present, analytical testing may be conducted. The appropriate analytical records to support the certification will be provided to the reeiving TSDF as required.

C-3a(1) Spent Solvent And Dioxin Wastes
[40 CFR 264.13(a)(1), 268.2(f)(1), 268.7, 268.30, 268.31]

Analytical, generator process knowledge, or categorical streams will be used to determine the proper waste codes (e.g. D001, D002, F001, F002, F003, & F005). Generator process knowledge will be documented on the Waste Material Profile Report and LDRF. The LDRF will provide additional information regarding

the appropriate treatment standards for the waste and whether it has already been treated to the appropriate standards.

Dioxin wastes (F020-F023; F026-F028) are not accepted at the Facility.

C-3a(2) Listed Wastes
[40 CFR 264.13(a)(1), 268.7, 268.33, 268.34, 268.35, 268.36, 268.41, 268.42, 268.43]

There are two methods that a generator can use to provide documentation regarding the constituents present in the waste stream.

1. Perform a one-time analysis of the waste stream, including total metals or TCLP testing for underlying constituents, if the generator has not already performed these tests; or
2. Use defensible generator knowledge of the waste stream providing raw materials used and information on the process generating the waste.

Generator process knowledge will be used to determine whether a listed waste meets the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In accordance with R 299.9627 and 40 CFR §268.41, where treatment standards are based on concentrations in the waste extract, and the generator has stated they have met the treatment standards, the generator will provide the necessary analysis to show compliance with the wastes meet treatment standards. *Generator process knowledge* will be documented on the waste material profile report and LDR notification.

C-3a(3) Characteristic Wastes
[40 CFR 261.3(d)(1), 264.13(a)(1), 268.7, 268.9, 268.37, Part 268 Appendix I, Part 268 Appendix IX]

One of the methods noted in Section C-3a(2), will be used to determine whether characteristic wastes meet the applicable treatment standards, or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In addition, the generator's process knowledge or analytical data, if available, will be used to identify the underlying hazardous constituents that are expected to be present in wastes. The generator's process knowledge and analytical data will be documented on the Profile Sheet and LDRF.

Generator process knowledge will be used to determine whether characteristic waste meets the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In accordance with R 299.9627 and 40 CFR §268.41, where treatment standards are based on concentrations in the waste extract, and the generator has stated they have met the

treatment standards, the generator will provide the necessary analysis to show compliance with the wastes meet treatment standards.

C-3a(4) Waste Mixtures and Wastes with Overlapping Requirements
[40 CFR 264.13(a), 268.7, 268.41(b), 268.43(b), 268.45(a)]

Generator process knowledge and analytical data, whenever deemed necessary, will be used to demonstrate that waste mixtures and wastes carrying multiple waste codes are properly characterized. Waste that carry more than one characteristic or listed Reactivity Group Numbers (RGNs) will be identified with a number for each characteristic.

C-3b NOTIFICATION, CERTIFICATION, AND RECORDKEEPING REQUIREMENTS
[40 CFR 264.73, 268.7,268.9(d)]

C-3b(1) Retention of Generator Notices and Certifications
[40 CFR 268.7(a)]

The following notices and certifications submitted by the initial generator of the waste will be reviewed and maintained:

- Notices of restricted wastes not meeting treatment standards or exceeding levels specified in RCRA §3004(d), including the information listed in R 299.9627 and 40 CFR §268.7(a)(1).
- Notices of restricted wastes meeting applicable treatment standards and prohibition levels, including the information in R 299.9627 and 40 CFR §268.7(a)(2).

C-3b(2) Notification and Certification Requirements for Treatment Facilities
[40 CFR 268.7(b)]

No chemical or physical treatment of wastes is conducted at this site. All wastes are eventually transported off site to a properly permitted facility. LDRFs are prepared as appropriate.

C-3b(3) Notification and Certification Requirements for Land Disposal Facilities
[40 CFR 268.7(c)(1)]

Not applicable to this Facility.

C-3b(4) Waste Shipped to Subtitle C Facilities
[40 CFR 268.7(a), 268.7(b)(6)]

All waste shipments from the Facility to a permitted TSDF have the appropriate notifications and certifications. As described in Section C-3b(2), the notifications/certifications will be prepared from the information provided by the original generator.

C-3b(5) Recordkeeping
[40 CFR 264.73, 268.7(a)(5), 268.7(a)(6), 268.7(a)(7), 268.7(d); ACT 64-299.9608(4) & 299.9610(3)]

The Facility maintains an Operating Log in accordance with 40 CFR 264.73. The operating log primarily consists of a waste tracking system (e.g. computerized) which is updated daily to accurately reflect the inventory of wastes received, processed and/or transported off-site.

Copies of all necessary notifications and certifications, as well as relevant inspection forms and monitoring data, are also maintained on file at the Facility. Files will be maintained for the required time as specified in the operating permit and the regulations.

In the event that a significant manifest discrepancy is discovered (i.e., variation in one piece count or misrepresentation of the type of waste - corrosive rather than flammable), which cannot be resolved with the generator or transporter within 15 days of receipt, Facility personnel will submit to the director and regional administrator a letter describing the discrepancy and all attempts to reconcile the discrepancy. The letter will include a copy of the manifest or shipping document.

C-3b(6) Required Notice
[R 299.9605(1) and 40 CFR 264.12(a) & (b)]

If the Facility expects to receive hazardous waste from a foreign source it will notify the Division Chief in writing at least four weeks before receiving the waste. Notice of subsequent shipments of the same waste from the same foreign source is not required. When receiving such hazardous waste, the Facility will comply with applicable treaties or other agreements entered into between the country in which the foreign source is located and the United States.

When the Facility is to receive hazardous waste from an off-site source, the facility will inform the generator in writing that the facility has the appropriate license for and will accept the waste the generator is shipping. The Facility will keep a copy of this written notice in the operating record.

C-3c REQUIREMENTS PERTAINING TO THE STORAGE OF RESTRICTED WASTES [40 CFR 268.50]

C-3c(1) Restricted Wastes Stored in Containers [40 CFR 268.5(a)(2)(i)]

Section D-1 of this license application describes the procedures followed to manage containerized hazardous wastes at the Facility. Many of the wastes managed at the Facility are restricted wastes. In particular, all containers are clearly marked to identify their contents and date of receipt at the Facility.

ATTACHMENT C-1

LIST OF HAZARDOUS WASTES

ATTACHMENT C-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Ignitable Wastes	D001 (I)
Corrosive Waste	D002 (C)
Arsenic	D004 (T)
Barium	D005 (T)
Cadmium*	D006 (T)
Chromium	D007 (T)
Lead	D008 (T)
Mercury	D009 (T)
Selenium*	D010 (T)
Silver	D011 (T)
Endrin	D012 (T)
Benzene	D018 (T, I)
Carbon Tetrachloride	D019 (T), U211(T)
Chlorobenzene	F002 (T, I), D021(T, I), U037(T, I)
Chloroform	D022 (T), U044(T)
1,4-Dichlorobenzene	D027 (T), U072(T)
1,2-Dichloroethane	D028 (T, I), U077(T, I)
1,1-Dichloroethylene	D029 (T, I), U078(T, I)
2,4-Dinitrotoluene	D030 (T)
Heptachlor*	D031 (T)
Hexachlorobenzene	D032 (T), U127(T)
Hexachloroethane	D034 (T), U131(T)
Methyl Ethyl Ketone	D035 (T, I), F003 (I)
Nitrobenzene	D036 (T)
Tetrachloroethylene	F001 (T), F002(T), D039 (T), U210(T)
Trichloroethylene	F001(T), F002(T), D040 (T), U228(T)
Vinyl Chloride	D043 (T, I)
Ortho-Dichlorobenzene	F002 (T)
1,1,2,2-Tetrachloroethane	U209(T)
1,1,1,2-Tetrachloroethane	U208(T)
Dichlorodifluoromethane	U075(T)
1,1-Dichloroethane	U076(T, I)
1,1,1-Trichloroethane	F001(T), F002(T), U226(T)
Dichloromethane (Methylene Chloride)	F001 (T), F002 (T), U080(T)
Monofluoromethane	F001 (T), F002 (T)

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT C-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Trichlorofluoromethane	F001(T), F002(T), U121(T)
Trichloromonofluoromethane	F001 (T), F002 (T)
1,1,2-trichloro-1,2,2-trifluoroethane	F002 (T)
Xylene	F003 (I)
Acetone	F003 (I)
Ethyl Acetate	F003 (I)
Ethyl Benzene	F003 (I)
Ethyl Ether	F003 (I)
n-Butyl Alcohol	F003 (I)
Cyclohexanone	F003 (I)
Methyl Isobutyl Ketone	F003 (I), U161 (I)
Methanol	F005 (I)
Toluene	F005 (T, I)
Methyl Ethyl Ketone	F005 (I,T)
Carbon Disulfide	F005 (H, I)
Isobutanol	F005 (I,T)
Pyridine	F005 (T, I)

Wastewater treatment sludges from electroplating operations except from the following processes: F006

1. sulfuric acid anodizing of aluminum;
2. tin plating on carbon steel;
3. zinc plating (segragated basis) on carbon steel;
4. aluminum or zinc-aluminum plating on carbon steel;
5. cleaning/stripping associated with tin, zinc and
6. aluminum plating on carbon steel; and
7. chemical etching and milling of aluminum.

Waste water treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process F019

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT C-2

CHEMICAL PROPERTIES
&
TOXICOLOGICAL DATA

ATTACHMENT C-2A

CHEMICAL PROPERTIES OF SITE-RELATED CHEMICALS DETREX CORPORATION DETROIT MICHIGAN

Chemical	*Molecular Weight (g/mol)*	*Aqueous Solubility At 20°C – 25°C (mg/l)*	*Vapor Pressure At 20°C – 25°C Mm Hg*	*Henry's Law Constant at 20°C – 25°C (atm-m³/mol)*	*Octanol-Carbon Partition Coefficient Koc (mg/g)*	*Flashpoint °C*	*Ignitable Chemicals*
1,1,1,2-Tetrachloroethane	167.84						
1,1,1-Trichloroethane	133.4	3.47E+02	124	8.0E-03	1.05E+02	none	
1,1,2,2-Tetrachloroethane	167.84						
1,1,2-Trichloro-1,2,2-trifluoroethane	187.38	1.70E+02	362.5	5.26E-01	3.89E+02	--	
1,1-Dichloroethane	98.97	5.06E+03	22.7	5.87E-03	3.00E+01	-6	
1,1-Dichloroethylene	96.95	2.73E+02	591	1.90E-01	6.46E+01	-15	
1,2-Dichloroethane	98.96	8.52E+03	78.7	9.77E-04	1.9E+01	13	
1,4-Dichlorobenzene	147.01	8.7E+01	1.76	1.50E-03	1.58E+02	65.6	
2,4-Dinitrotoluene	182.15					225.5	
Acetone	58.08	Soluble	400 mm @ 39.5°C			- 17.8	*
Arsenic	74.92	Insol. in Water	1 mm @ 372° C	--	--	--	
Barium	137.34	Insol. in Water	10 mm @ 1049° C	--	--	--	* Solid
Benzene	78.11	1.79E+03	95.2	5.43E-03	7.08E+01	-11	*
Cadmium	112.4	--	1 mm (@ 394a°C)	NA	NA	--	
Carbon Disulfide	76.13		400 mm @ 28°C			- 30	
Carbon tetrachloride	153.8	8.05E+02	113.8	3.04E-02	2.24E+02	nonflammable	
Chlorobenzene	112.56	4.72E+02	11.9	3.45E-03	3.31E+02	28	
Chloroform	119.39	7.95E+03	246	4.35E-03	4.37E+01	none	
Chromium	51.996	insoluble	1 mm (@ 1616°C)	NA	NA	--	
Cyclohexanone	96.12		4			33.89	
Dichlorodifluoromethane	134.94	--	--	--	--	--	

ATTACHMENT C-2A

CHEMICAL PROPERTIES OF SITE-RELATED CHEMICALS DETREX CORPORATION DETROIT MICHIGAN

Chemical	*Molecular Weight (g/mol)*	*Aqueous Solubility At 20°C – 25°C (mg/l)*	*Vapor Pressure At 20°C – 25°C Mm Hg*	*Henry's Law Constant at 20°C – 25°C (atm-m³/mol)*	*Octanol-Carbon Partition Coefficient Koc (mg/g)*	*Flashpoint °C*	*Ignitable Chemicals*
Dichloromethane	84.93	1.30E+04	434.9	2.68E-03	8.71	--	
o-Dichlorobenzene	147.01	insoluable				66	
Endrin	380.9	2.40E-02	2.00E-07	5.00E-07	8.32E+03	27	
Ethyl Acetate	88.12		100			- 4.4	*
Ethyl Benzene	106.18		10			15	*
Ethyl Ether	74.14		442			- 45	*
Heptachlor	373.35	5.6E-02	3.00E-04	2.3E-03	2.19E+04	--	
Hexachlorobenzene	284.79	6.20E-03	1.90E-05	1.3E-03	3.9E+03	242	
Hexachloroethane	236.76	5.00E+01	0.21	2.80E-03	2.19E+03	--	
Isobutanol	74.14		10			27.78	*
Lead	207.2	insoluble	10 mm (@ 1162°C)	NA	NA	--	
Mercury	200.59	5.60E-02	2.00E-03	--	--	not flammable	
Methanol	32.05		100				*
Methyl ethyl ketone	72.11	2.39E+05	90.6	1.05E-05	1.23E-00	-9	*
Methyl Isobutyl Ketone	100.16	2 gm / 100 ml	16 mm			17	*
Monofluoromethane	34.04	very	760 mm @ -78.2°C				*
n-Butyl Alcohol	74.14		5.5			35	*
Nitrobenzene	123.12		1 mm @ 44.4°C			87.78	
Pyridine	79.11		10 mm @ 13.2			20	*
Selenium	78.96	insoluble	1 mm (@ 356°C)	NA	NA	--	
Silver	107.868	soluble	100 mm (@ 1865°C - liquid)	NA	NA	--	

ATTACHMENT C-2A

CHEMICAL PROPERTIES OF SITE-RELATED CHEMICALS DETREX CORPORATION DETROIT MICHIGAN

Chemical	*Molecular Weight (g/mol)*	*Aqueous Solubility At $20^{O}C - 25^{O}C$ (mg/l)*	*Vapor Pressure At $20^{O}C - 25^{O}C$ Mm Hg*	*Henry's Law Constant at $20^{O}C - 25^{O}C$ (atm-m^3/mol)*	*Octanol-Carbon Partition Coefficient Koc (mg/g)*	*Flashpoint ^{O}C*	*Ignitable Chemicals*
Tetrachloroethylene	165.82	1.50E+03	18.47	1.49E-02	2.09E+02	none	
Toluene	92.15						*
Trichloroethylene	131.4	1.10E+03	69	1.03E-02	1.26E+02		
Trichloromonofluoromethane	137.36						
Vinyl Chloride	62.5		2,600			- 8	
Xylene	106.18		6.72			25	*

ATTACHMENT C-2b

TOXICOLOGICAL DATA FOR SITE-RELATED CHEMICALS
DETREX CORPORATION
DETROIT, MICHIGAN

Chemical	*Toxicological Classification*	*RfD Oral-Chronic (mg/kg-day)*	*RfD Inhalation-Chronic (mg/kg-day)*	*CSF Oral- Chronic [1/(mg/kg-day)]*	*CSF Inhalation-Chronic [1(mg/kg-day)]*
Arsenic	--	--	--	--	--
Acetone	A4				
Barium	C	1.00E-01	1.40E-01	--	--
Benzene	B2	--	--	9.10E-02	9.10E-02
Cadmium	C	9.00E-03	--	6.00E-01	1.75E-01
Carbon Disulfide	--				
Carbon tetrachloride	B2	6.00E-02	8.75E-01	7.50E-03	1.65E-03
Chlorobenzene					
Chloroform	D	3.00E-04	--	--	--
Chromium III	B2	5.00E-04	--	4.50E-00	4.50E-00
Chromium VI	B2	8.00E-04	--	1.60E-00	1.60E-00
Cyclohexanone	A4				
1,1-Dichloroethane	D	2.00E-02	5.70E-03	--	--
1,1-Dichloroethylene	B2	1.00E-02	--	6.10E-03	8.10E-02
1,2-Dichloroethane	--	1.00E-00	--	--	--
1,4-Dichlorobenzene	A	5.00E-03	--	--	4.20E+01
2,4 Dinitrotoluene	B2	--	2.29E-01	2.40E-02	--
o-Dichlorobenzene	A4				

EPA Weight of Evidence Ranking & TLV Values:
A / A1 - Known human carcinogen
B1 / A2- Probable human carcinogen (limited evidence in humans)
B2 - Probable human carcinogen (sufficient evidence in animal studies)
A3 – confirmed animal carcinogen with unknown relevance to humans
C - Probable human carcinogen (limited evidence in animal studies)
D / A4 - Not classified (inadequate evidence of carcinogenicity in animal studies)
A5 – Not Suspected as a Human Carcinogen

Date: 07.01.10

ATTACHMENT C-2b
TOXICOLOGICAL DATA FOR SITE-RELATED CHEMICALS
DETREX CORPORATION
DETROIT, MICHIGAN

Chemical	*Toxicological Classification*	*RfD Oral-Chronic (mg/kg-day)*	*RfD Inhalation-Chronic (mg/kg-day)*	*CSF Oral- Chronic [1/(mg/kg-day)]*	*CSF Inhalation-Chronic [1(mg/kg-day)]*
Dichlorodifluoromethane	C	1.00E-03	--	1.40E-02	1.40E-02
Dichloromethane	B2	--	--	--	--
Endrin	D	under review	under review	--	--
Ethyl Acetate	--				
Ethyl Benzene	--				
Ethyl Ether					
Heptachlor	D	6.00E-01	2.86E-01	--	--
Hexachlorobenzene	--	--	--	--	--
Hexachloroethane	--	--	--	--	--
Isobutanol	--				
Lead	D	5.00E-03	--	--	--
Mercury	D	5.00E-03	--	--	--
Methanol	--				
Methyl ethyl ketone	B2	1.00E-02	--	--	--
Monofluoromethane	--	--	--	--	--
n-Butyl Alcohol	D				
Nitrobenzene	D	9.00E-02	3.00E-01	--	--
4-Methyl-2-pentanone (MIBK)	--	--	--	--	--

EPA Weight of Evidence Ranking & TLV Values:
A / A1 - Known human carcinogen
B1 / A2- Probable human carcinogen (limited evidence in humans)
B2 - Probable human carcinogen (sufficient evidence in animal studies)
A3 – confirmed animal carcinogen with unknown relevance to humans
C - Probable human carcinogen (limited evidence in animal studies)
D / A4 - Not classified (inadequate evidence of carcinogenicity in animal studies)
A5 – Not Suspected as a Human Carcinogen

ATTACHMENT C-2b
TOXICOLOGICAL DATA FOR SITE-RELATED CHEMICALS
DETREX CORPORATION
DETROIT, MICHIGAN

Chemical	*Toxicological Classification*	*RfD Oral-Chronic (mg/kg-day)*	*RfD Inhalation-Chronic (mg/kg-day)*	*CSF Oral- Chronic [1/(mg/kg-day)]*	*CSF Inhalation-Chronic [1(mg/kg-day)]*
Pyridine	--				
Selenium	B2	under review	under review	--	under review
Silver	--	3.00E-00	8.60E-00	--	--
1,1,1,2-Tetrachloroethane	--	--	--	--	--
1,1,1-Trichloroethane	A	under review	under review	2.90E-02	2.90E-02
1,1,2,2-Tetrachloroethane	B1	5.00E-04 (water)	--	--	6.30E-00
1,1,2-Trichloro-1,2,2-trifluoroethane	B2	7.00E-04	--	1.30E-01	5.25E-02
Tetrachloroethylene	A3				
Toluene	D / A4				
Trichloroethylene	A5				
Trichloromonofluoromethane	A4				
Vinyl Chloride	A1				
Xylene	A4				

EPA Weight of Evidence Ranking & TLV Values:
A / A1 - Known human carcinogen
B1 / A2- Probable human carcinogen (limited evidence in humans)
B2 - Probable human carcinogen (sufficient evidence in animal studies)
A3 – confirmed animal carcinogen with unknown relevance to humans
C - Probable human carcinogen (limited evidence in animal studies)
D / A4 - Not classified (inadequate evidence of carcinogenicity in animal studies)
A5 – Not Suspected as a Human Carcinogen

Attachment C-2C
WASTE CHARACTERISTICS AND SPECIFIC GRAVITIES

Waste Code	Parameter	Characteristic	SpG
F001	Tetrachloroethylene (PCE)	T	1.64
	Trichloroethylene (TCE)	T	1.465[1]
	Methylene Chloride (MC)	T	1.32[1]
	1,1,1 Trichloroethane (TCA)	T	1.338[1]
	Carbon Tetrachloride	T	1.594[2]
	Trichlorotrifluoroethane (FC113)	T	1.570[1]
	Trichloromonofluoromethane (MF)	T	1.6[E]
	Chlorinated Fluorocarbons +10% F001, F004, F005	T	1.6[E]
F002	PCE	T	1.64
	MC	T	1.32
	TCE	T	1.465
	TCA	T	1.338
	Chlorobenzene	T	1.1058[2]
	FC 113	T	1.570
	Ortho-Dichlorobenzene	T	1.3048[2]
	Monofluoromethane	T	
	1,1,2 Trichloroethane	T	1.5635[2]
	+ >10% F001, F004, F005	T	1.64
F003	Xylene	I	
	Acetone	I	
	Ethyl Acetate	I	
	Ethyl Benzene	I	
	Ethyl Ether	I	
	n-Butyl Alcohol	I	
	Cyclohexanone	I	
	Methyl Isobutyl Ketone	I	
	Methanol	I	

Notes:
[1]Material Safety Data Sheet (from Section C, Part B)
[2]CRC Handbook, 55th Edition
[3]Perry's Chemical Engineer's Handbook, 5th Edition
[4]Akzo Nobel Product Information Package
5 Sax's Dangerous Properties of Industrial Materials (8th Edition)
[E]Estimated Maximum Specific Gravity

Attachment C-2C
WASTE CHARACTERISTICS AND SPECIFIC GRAVITIES

Waste Code	Parameter	Characteristic	SpG
F005			
	Toluene	T,I	
	Methyl Ethyl Ketone	I,T	
	Carbon Disulfide	H, I	
	Isobutanol	I,T	
	Pyridine	T, I	
F006	Wastewater treatment sludges from electorplate operations		
F019	Waste water treat\ment sludges from the chemical conversion coating of aluminum except fromzirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process		
U037	Chlorobenzene	I	1.1058[2]
U044	Chloroform	T	1.4832
U072	1,4-Dichlorobenzene	T	1.5459[2]
U075	Dichlorodifluoromethane	T	1.75[2]
U076	1,1 dichloroethane	T, I	1.1757[2]
U077	1,2 dichloroethane	T, I	1.2351[2]
U078	1,1 dichloroethylene	T, I	1.218[2]
U080	Methylene Chloride	T	1.3266[2]
U121	Trichloromonofluoromethane	T	
U127	Hexachlorobenzene	T	1.5691[2]
U131	Hexachloroethane	T	2.091[2]
U208	1,1,2,2-Tetrachloroethane	T	
U209	1,1,1,2-Tetrachloroethane	T	
U210	Tetrachloroethylene	T	1.64[1]
U211	Carbon Tetrachloride	T	1.594
U226	1,1,1 Trichloroethane	T	1.338
U228	Trichloroethylene	T	1.465[1]

Notes:

[1]Material Safety Data Sheet (from Section C, Part B)

[2]CRC Handbook, 55th Edition

[3]Perry's Chemical Engineer's Handbook, 5th Edition

[4]Akzo Nobel Product Information Package

5 Sax's Dangerous Properties of Industrial Materials (8th Edition)

[E]Estimated Maximum Specific Gravity

Attachment C-2C
WASTE CHARACTERISTICS AND SPECIFIC GRAVITIES

Waste Code	Parameter	Characteristic	SpG
D001	Ignitable Wastes	I	
D002	Liquids with 2 ≤pH ≥ 12.5	C	1.8337
D004	Arsenic	T	5.724[5]
D005	Barium	T	3.5[5]
D006	Cadmium	T	8.642[5]
D007	Chromium	T	
D008	Lead	T	1.3972[2]
D009	Mercury	T	13.534[5]
D010	Selenium	T	4.8[5]
D011	Silver	T	1.4769[2]
D012	Endrin	T	
D018	Benzene	I, T	.87865
D019	Carbon Tetrachloride	T	1.597[5]
D021	Chlorobenzene	T, I	1.1058
D022	Chloroform	T	1.4832
D027	1,4 Dichlorobenzene	T	1.5459
D028	1,2 Dichloroethane	T, I	1.3048
D029	1,1 Dichloroethylene	T, I	1.218
D030	2,4-Dinitrotoluene	T	
D031	Heptachlor	T	
D032	Hexachlorobenzene	T	1.5691
D034	Hexachloroethane	T	2.091
D035	Methyl Ethyl Ketone	I, T	0.81
D036	Nitrobenzene	T	1.205[5]
D039	Tetrachloroethylene	T	1.64
D040	Trichloroethylene	T	1.465
D043	Vinyl Chloride	T, I	

Notes:
[1]Material Safety Data Sheet (from Section C, Part B)
[2]CRC Handbook, 55th Edition
[3]Perry's Chemical Engineer's Handbook, 5th Edition
[4]Akzo Nobel Product Information Package
5 Sax's Dangerous Properties of Industrial Materials (8th Edition)
[E]Estimated Maximum Specific Gravity

ATTACHMENT C-3

REACTIVITY GROUP NUMBERS
&
WASTE COMPATABILITY CHART

Date: 07.01 10
Revision 10-1

Attachment: C-3
DETREX HAZARDOUS WASTE COMPATABILITY CHART

REACTIVITY CODE	CONSEQUENCES
H	HEAT
F	FIRE
G	INNOCUOUS AND NON-FLAMMABLE GAS GENERATION
GT	TOXIC GAS GENERATION
GF	FLAMMABLE GAS GENERATION
S	SOLUBILIZATION OF TOXIC SUBSTANCES
E	EXPLOSTION

REACTIVITY GROUP NUMBER	1	2	3	4	7	10	13	14	16	17	19	20	21	22	23	24	27	28	29	31	101
1																					
2																					
3		H,G																			
4	H	H, F	H, P																		
7	H	H, GT	H																		
10	H	H	H																		
13	H	H, F																			
14	H	H, F																			
16		H,F																			
17	H,GT	H,F,GT			H, GT	H,GF															
19	H	H,F				H															
20	GT, GF	H, F, GT								H	H										
21	GF, H, F	GF, H, F	GF, H, F	GF, H, F	GF, H	GF, H	GF, H			GF, H	GF, H	GF, H									
22	GF, H, F	GF, H, F	GF							H, E	GF, H	GF, H, F									
23	GF, H, F	GF, H, F				GF, H				H, E		GF, H, F									
24	S	S	S		S	S															
27		H, F, GT				H, E															
28	H	H, F												H, E							
29		H, F																			
31	H	H, F																			
101	H, G	H, F, GT																			

ATTACHMENT C-3

HAZARDOUS WASTES GROUPS

Reactivity Group Number	*Group Name and Constituents*
	Corrosive Materials
1, 2, 3	**Acids**
10	**Caustics**
4	**Alcohols and Glycols**
	1-Butanol
	iso-Butyl alcohol
	Methanol
	n-Butyl Alcohol
7	**Amines, Aliphatic and Aromatic**
	Pyridine
13	**Esters**
	Ethyl Acetate
14	**Ethers (All Isomers)**
	Ethyl Ether
16	**Aromatic Hydrocarbons**
	Benzene
	Toluene
	Xylene
	Ethyl Benzene
17	**Halogenated Organics**
	Freons
	Hexachloroethane
	Endrin
	Carbon tetrachloride
	Chlorobenzene (distillation or fractionation column bottoms)
	Chloroform
	1,4-Dichlorobenzene
	1,2-Dichloroethene
	1,1-Dichloroethylene
	Hexachlorobenzene
	Heptachlor
	Tetrachloroethylene
	Trichloroethylene
	1,1,1-Trichloroethane
	Dichloromethane
	Trichlorofluoromethane
	Chlorinated Fluorocarbons
	Vinyl Chloride
	1,1,2,2-Tetrachloroethane
	1,1,1,2-Tetrachloroethane
17	**Halogenated Organics**
	Dichlorodifluoromethane
	1,1-Dichloroethane

ATTACHMENT C-3

HAZARDOUS WASTES GROUPS

Reactivity Group Number	*Group Name and Constituents*
19	<u>Ketones</u> Methyl Ethyl Ketone Acetone Cyclohexanone 4-Methyl-2-pentanone
20	<u>Mercaptans and Other Organic Sulfides (All Isomers)</u> Carbon Disulfide
21-24	<u>Metals</u> Arsenic (24) Barium (21, 24) Cadmium (23, 24) Chromium (23, 24) Lead (23, 24) Mercury (24) Selenium (22, 24)
27	<u>Nitro Compounds</u> 2,4-Dinitrotoluene Nitrobenzene
28	<u>Hydrocarbons, Aliphatic, Unsaturated (All Isomers)</u> Xylene
29	<u>Hydrocarbons, Aliphatic, Saturated</u>
31	<u>Phenols</u> Phenol
101	<u>Combustible and Flammable Materials</u> Ignitable Waste

ATTACHMENT C-4

SAMPLE GENERATOR'S WASTE MATERIAL APROFILE SHEET

&

ANNUAL RECERTIFICATION LETTER

Detrex Corporation

MID091605972

12886 EATON AVE
DETROIT,MI 48227

Phone: (313) 491-4550
Fax: (313) 491-8044

Generator's Material Profile Data Sheet

DETREX USE ONLY

Approval No.		Sales Rep.	
Date Rec'd		Date App/Rej	

I. GENERATOR INFORMATION

Generator Name _____
Facility Address _____
_____
_____
Technical Contact _____
Title _____
Telephone No. _____
Fax No. _____
EPA I.D. Number _____
Generator Status: ☐ Lg. Qty. ☐ Small Qty. ☐ Cond. Exempt
SIC Code(s) _____

II. BILLING INFORMATION

☐ Same as above

Company Name _____
Contact _____
ing Address _____
_____
Telephone No. _____
Fax No. _____

III. GENERAL WASTE INFORMATION

Common Name _____
Generating Process _____
Rate of Generation _____
Volume in Storage _____

Radioactive Material	☐ Yes	☐ No
Biomedical/Etiological Waste	☐ Yes	☐ No
Polychlorinated Biphenyls	☐ Yes	☐ No
Cyanide/Sulfide Waste	☐ Yes	☐ No
Solvent Regulated Waste	☐ Yes	☐ No
California List Regulated Waste	☐ Yes	☐ No
Pesticide/Herbicide Waste	☐ Yes	☐ No

EPA Hazardous Waste No(s) _____
State Waste No(s) _____

IV. SHIPPING INFORMATION

DOT Hazardous? ☐ Yes ☐ No
DOT Ship Name _____
_____
_____
DOT I.D. No. _____
DOT ERG No. _____
Emergency Response Tel. No. _____
Type of Container _____
Transportation Method _____

V. PHYSICAL PROPERTIES

Physical State ☐ Liquid ☐ Sludge ☐ Solid ☐ Mixed ☐ Lab Pack
Layers ☐ 1 ☐ 2 ☐ 3 ☐ >3
Total Solids _____ Suspended _____
BTU / lb. ☐ <5000 ☐ 5000-10000 ☐ >10000
Specific Gravity ☐ 0.7-1.0 ☐ 1.0-1.2 ☐ >1.2
Water (%) _____
Flashpoint (°F) ☐ <73 ☐ 73-100 ☐ 100-140 ☐ 141-200 ☐ >200 ☐ None
pH ☐ <2.0 ☐ 2.1-7.0 ☐ 7.0-12.4 ☐ >12.5 ☐ N/A
Ash (%) _____ Sulfur(%) _____
Chlorine (%) _____ PCB's (ppm) _____
Vapor (%) _____ Bromine (%) _____

Odor _____
Appearance _____
Pourable? ☐ Yes ☐ No Pumpable? ☐ Yes ☐ No
MSDS Attached? ☐ Yes ☐ No
Sample Provided? ☐ Yes ☐ No
Additional Analysis? _____
Method of Disposal _____

FOR INFORMATION ONLY

VI. TOXICITY CHARACTERISTICS (mg/kg)

a. Metals

D004 Arsenic	☐ <5.0	☐ >5.0	
D005 Barium	☐ <100.0	☐ >100.0	
D006 Cadmium	☐ <1.0	☐ >1.0	
D007 Chromium	☐ <5.0	☐ >5.0	
D008 Lead	☐ <5.0	☐ >5.0	
D009 Mercury	☐ <0.2	☐ 0.2-259	☐ >260
D010 Selenium	☐ <1.0	☐ >1.0	
D011 Silver	☐ <5.0	☐ >5.0	

b. Organics

D012 Endrin	☐ <0.02	☐ >0.02
D013 Lindane	☐ <0.4	☐ >0.4
D014 Methoxychlor	☐ <10.0	☐ >10.0
D015 Toxaphene	☐ <0.5	☐ >0.5
D016 2,4-D	☐ <10.0	☐ >10.0
D017 2,4,5-TP (Silvex)	☐ <1.0	☐ >1.0
D018 Benzene	☐ <0.5	☐ >0.5
D019 Carbon Tetrachloride	☐ <0.5	☐ >0.5
D020 Chlordane	☐ <0.03	☐ >0.03
D021 Chlorobenzene	☐ <100.0	☐ >100.0
D022 Chloroform	☐ <6.0	☐ >6.0
D023 o-Cresol	☐ <200.0	☐ >200.0
D024 m-Cresol	☐ <200.0	☐ >200.0
D025 p-Cresol	☐ <200.0	☐ >200.0
D026 Creosol	☐ <200.0	☐ >200.0
D027 1,4-Dichlorobenzene	☐ <7.5	☐ >7.5
D028 1,2-Dichloroethane	☐ <0.5	☐ >0.5
D029 1,1-Dichloroethylene	☐ <0.7	☐ >0.7
D030 2,4-Dinitrotoluene	☐ <0.13	☐ >0.13
D031 Heptachlor	☐ <0.008	☐ >0.008
D032 Hexachlorobenzene	☐ <0.13	☐ >0.13
D033 Hexachlorobutadiene	☐ <0.5	☐ >0.5
D034 Hexachloroethane	☐ <3.0	☐ >3.0
D035 Methyl Ethyl Ketone	☐ <200.0	☐ >200.0
D036 Nitrobenzene	☐ <2.0	☐ >2.0
D037 Pentachlorophenol	☐ <100.0	☐ >100.0
D038 Pyridine	☐ <5.0	☐ >5.0
D039 Tetrachloroethylene	☐ <0.7	☐ >0.7
D040 Trichloroethylene	☐ <0.5	☐ >0.5
D041 2,4,5-Trichlorophenol	☐ <400.0	☐ >400.0
D042 2,4,6-Trichlorophenol	☐ <2.0	☐ >2.0
D043 Vinyl Chloride	☐ <0.2	☐ >0.2

VII. CHEMICAL COMPOSITION (Organic / Inorganic)

(No Trade Name)

Constituents	Range (%)

VIII. ADDITIONAL INFORMATION

Provide any additional information to help transport and manage this waste.

IX. CERTIFICATION: I hereby certify that the above information, including that which is attached hereto, is complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission or misrepresentation of composition or properties exists, and that all known or suspected hazards have been disclosed. I further certify that the material tested is representative of the material to be managed as waste.

Generator's Signature Date

I authorize Detrex Corporation to make corrections to this profile form, such corrections being consistent with the results of sample characterization and/or regulatory requirements. I understand that I will be notified in the event of such changes.

_____ Initials

If approved for management, Detrex Corporation has all the necessary permits and licenses for the waste that has been characterized and identified by this profile

FOR INFORMATION ONLY

LAND DISPOSAL RESTRICTION & BENZENE NESHAP CERTIFICATION FORM

Generator Name:_____ **EPA ID #:** _____

Waste Stream Approval #:_____ **Manifest # of first shipment:** _____

LISTED HAZARDOUS WASTES
ALL K, F, D, U, & P Codes
Define as either a waste water (WW) or non-waste water (NWW)

WW NWW	List all EPA Hazardous Waste Code(s) and Constituents for the waste stream

If F001-F005 Constituents exist specify exact chemical(s):

___ 1,1,1 Trichloroethane
___ 1,1,2 Trichloro 1,2,2 Trifluoroethane
___ 1,1,2 Trichloroethane
___ 2-Ethoxyethanol
___ 2-Nitropropane
___ Acetone
___ Benzene
___ Carbon Disulfide
___ Carbon Tetrachloride
___ Chlorinated Fluorocarbons
___ Chlorobenzene
___ Cresols
___ Cresylic Acid
___ Cyclohexanone
___ Ethyl Acetate
___ Ethyl Benzene
___ Ethyl Ether
___ Isobutanol
___ Methanol
___ Methyl Ethyl Ketone
___ Methyl Isobutyl Ketone
___ Methylene Chloride
___ N-Butyl Alcohol
___ Nitrobenzene
___ Ortho-Dichlorobenzene
___ Pyridine
___ Tetrachloroethylene
___ Toluene
___ Trichloroethylene
___ Trichlorofluoromethane
___ Trifluoroethane
___ Xylene

(NOTE: Generator MUST specify all underlying constituents and constituents of concern for the wastes listed above and include waste code F039. Characteristic Waste Codes & F039/UTS codes can be found on supplemental pages.)

GENERATOR CERTIFICATION
(CHOOSE APPLICABLE CERTIFICATION-SIGN WHERE REQUIRED)

_____ **UNTREATED CONTAMINATED WASTES (EXCEPT SOILS)**
The above waste is restricted an must be disposed of in the approved manner

_____ **UNTREATED CONTAMINATED SOILS**
I certify under penalty of law I personally have examined this contaminated soil and it [DOES/DOES NOT] contain listed hazardous waste and [DOES/DOES NOT] exhibit a characteristic of hazardous waste and requires treatment to meet the soil standards provided by 40 CFR Part 268.49 (c).

_____ **WASTE TREATED TO BELOW TREATMENT STANDARDS**
I certify under penalty of law I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

_____ **LAB PACK HANDLED ALTERNATIVE TREATMENT 268.42 (c).**
I certify under penalty of law I personally have examined and am familiar with the waste and the Lab Pack contains only waste that have not been excluded under appendix IV to 40 CFR Part 268 and that this lab pack will be sent to a combustion facility in in compliance with the alternate treatment standards for lab packs at 40 CFR 268.42 (c). I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

Generators Representative:

_____
(Signature/Date)

BENZENE WASTE OPERATIONS
NESHAP CERTIFICATION
(Must check one box)

_____ **YES** _____ **NO This waste stream came from a facility that operates under one or more of the following Standard Industrial Classifications (SIC) Codes series 2800 (Chemical and Allied Products) Code 2911 or Code 3312**

If YES, check the box below which indicates the status of your waste stream with regards to the reporting requirements as outlined in the Benzene NESHAP Standard per 40 CFR Part 61, Subpart FF.

_____ **This waste stream does not contain Benzene which is required controlled and treated in accordance with the provisions of 40 CFR 61.342 (f) (2).**

_____ **This waste stream contains Benzene which is required to be controlled and treated in accordance with the provision of 40 CFR 61.342. (f) (2).**

Generators Representative:

_____
(Signature/Date)

FOR INFORMATION ONLY

Detrex CORPORATION

Date

COMPANY NAME
ADDRESS
STATE, ZIP

FOR INFORMATION ONLY

Attention: XXXXX

Re: Waste Stream Re-Evaluation

Dear XXXX:

In order for Detrex Corporation to continue accepting your waste, we must ask your assistance in assuring the constituents in the following waste stream has not changed since our original approval.

Generator Name:
Generator EPA ID#:
Profile / Approval Number: XXX-XXXXX-XX
Waste Common Name:
EPA Waste Codes:
Current Expiration Date:
Process Waste:

In order for Detrex to continue accepting your waste stream without interruption, as specified in our permit, we are requesting that you review the waste stream and respond to us before the expiration date. If the waste stream has not changed since its initial acceptance, simply sign the certification statement below and return the documents to Detrex Corporation. In the event that the waste stream has changed please contact customer service to obtain a new 'Generator Waste Material Profile Sheet'.

I certify that the information contained above is an accurate representation of the waste stream on file with Detrex Corporation and that the process generating the waste has not changed since completion and submission of the original 'Generator Waste Material Profile Sheet'.

X_____ X_____
Generator's Signature Print Name

X_____ X_____
Title Date

Detrex Corporation operates in compliance with all Federal, State, and Local Regulations and has the necessary permits to properly accept and transport the proposed waste. Our environmental integrity, support staff, and our desire to do things in a safe and efficient manner are combined to offer you the best waste management service available today and into the future.

ATTACHMENT C-5

ANALYTICAL TESTING PARAMETERS

ATTAC NT C-5
ANALYTICAL PARAMETERS FOR WASTE SCREENING

Type of Waste	*Color*	*Appearance*	*Physical State*	*Flammability*	*pH Testing*	*Water Reactivity*	*Cyanide*	*Paint Filter Test*	*Compatibility Test*
F001 & F002	•	•	•	•				as necessary	as necessary
F003	•	•	•					as necessary	as necessary
F005	•	•	•					as necessary	as necessary
F006	•	•	•	•			•	as necessary	as necessary
F019	•	•	•	•				as necessary	as necessary
U037	•	•	•	•				as necessary	as necessary
U044	•	•	•	•				as necessary	as necessary
U072	•	•	•	•				as necessary	as necessary
U075	•	•	•	•				as necessary	as necessary
U076-U078	•	•	•	•				as necessary	as necessary
U080	•	•	•	•				as necessary	as necessary
U121	•	•	•	•				as necessary	as necessary
U127, U131	•	•	•	•				as necessary	as necessary
U161	•	•	•	•				as necessary	as necessary
U208, U209	•	•	•	•				as necessary	as necessary
U210, U211	•	•	•	•				as necessary	as necessary
U226	•	•	•	•				as necessary	as necessary
U228	•	•	•	•				as necessary	as necessary
D001	•	•	•					as necessary	as necessary
D002	•	•	•	•	•	•		as necessary	as necessary
D004 through D011	•	•	•	•	•	•		as necessary	as necessary
D012	•	•	•	•				as necessary	as necessary
D018	•	•	•					as necessary	as necessary

ATTACHMENT C-5
ANALYTICAL PARAMETERS FOR WASTE SCREENING

Type of Waste	*Color*	*Appearance*	*Physical State*	*Flammability*	*pH Testing*	*Water Reactivity*	*Cyanide*	*Paint Filter Test*	*Compatibility Test*
D019	•	•	•	•				as necessary	as necessary
D021	•	•	•					as necessary	as necessary
D022	•	•	•	•				as necessary	as necessary
D027	•	•	•	•				as necessary	as necessary
D028	•	•	•					as necessary	as necessary
D029	•	•	•					as necessary	as necessary
D030	•	•	•	•				as necessary	as necessary
D031, D032, D034	•	•	•	•				as necessary	as necessary
D035	•	•	•					as necessary	as necessary
D036	•	•	•	•				as necessary	as necessary
D039	•	•	•	•				as necessary	as necessary
D040		•	•	•				as necessary	as necessary
D043	•	•	•					as necessary	as necessary

ATTACHMENT C-6

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

Detrex Corporation
Waste Analysis Plan
Detroit, Michigan

LIST OF ACRONYMS AND SHORT FORMS

ASTM	-"Annual Book of ASTM Standards", American Society for Testing Materials, 1994
DQO	-Data Quality Objective
Facility	- Corporation - Detroit MI
MDEQ	-Michigan Department of Environmental Quality
PE	-Performance Evaluation
QA	-Quality Assurance
QA/QC	-Quality Assurance/Quality Control
QAO	-Quality Assurance Officer
QAPP	-Quality Assurance Project Plan
QC	-Quality Control
SM	-"Standard Methods for the Examination of Water and Wastewater", 19th Edition, 1995
SOPs	-Standard Operating Procedures
SW-846	-"Test Methods for Evaluating Solid Waste Physical/Chemical Methods", EPA SW-846, 3rd Edition, November 1986 with promulgated updates
USEPA	-United States Environmental Protection Agency

TABLE OF CONTENTS

Section Page

Contents

1.0 INTRODUCTION 5
2.0 PROJECT DESCRIPTION 5
2.1 DATA QUALITY OBJECTIVES 5
2.2 PROJECT OBJECTIVES 6
3.0 PROJECT ORGANIZATION AND RESPONSIBILITY 6
4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA 6
4.1 LEVEL OF QC EFFORT 7
4.2 ACCURACY, PRECISION AND SENSITIVITY OF ANALYSES 7
4.3 COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY 7
5.0 SAMPLING PROCEDURES 8
5.1 WASTE SAMPLING 8
5.1.1 Sample Labeling 8
5.1.2 Sample Containers and Handling 8
5.2 SAMPLING PROTOCOLS 9
5.2.1 Safety Considerations 9
5.2.2 Sampling Equipment 9
5.2.3 Container Sampling 9
5.2.3.1 Discrete Liquid Concentrated Waste Samples 9
5.2.3.2 Discrete Solid Waste Samples 9
5.2.4 Limitations 10
6.0 SAMPLE CUSTODY AND DOCUMENT CONTROL 10
6.1 FACILITY CHAIN-OF-CUSTODY PROCEDURES 10
6.1.1 ff-site Transfer of Custody and Shipment Procedures 10
6.2 LABORATORY CHAIN-OF-CUSTODY PROCEDURES 11
6.3 STORAGE OF SAMPLES 11
6.4 FINAL EVIDENCE FILES CUSTODY PROCEDURES 11
7.0 CALIBRATION PROCEDURES AND FREQUENCY 12
7.1 LABORATORY INSTRUMENTS 12
8.0 ANALYTICAL PROCEDURES 13
9.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY 13
10.0 DATA REDUCTION, VALIDATION AND REPORTING 13
11.0 PERFORMANCE AND SYSTEM AUDITS 13
11.1 SAMPLING PROCEDURE AUDITS 14

11.2 LABORATORY AUDITS 14
12.0 PREVENTIVE MAINTENANCE 14
13.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ...15
ACCURACY AND COMPLETENESS 15
13.1 LABORATORY DATA 15
13.1.1 Precision 15
13.1.2 Accuracy 15
13.1.3 Completeness 15
14.0 CORRECTIVE ACTION 15
15.0 QUALITY ASSURANCE REPORT TO MANAGEMENT 16

LIST OF APPENDICES

APPENDIX QAPP-I SUMMARY OF ANALYTICAL METHODS
APPENDIX QAPP-II TEST METHODS

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) activities associated with waste sampling and screening at the Detrex Corporation Facility (Facility), Detroit Michigan. This QAPP also describes the specific protocols which will be followed for sampling, sample handling and storage, chain-of-custody, and screening analyses.

All critical QA/QC procedures will be in accordance with applicable professional technical standards, USEPA requirements, government regulations and guidelines, and specific project goals and requirements.

2.0 PROJECT DESCRIPTION

This QAPP has been developed for the evaluation of hazardous wastes (wastes) received at the Facility in Detroit, Michigan. The QAPP has been prepared to establish the QA/QC procedures necessary for the screening wastes for storage at the Facility.

2.1 DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) are qualitative and quantitative statements which specify the quality of the data required to support decisions made during Site activities and are based on the end uses of the data to be collected.

The screening process is summarized in the Waste Analysis Plan (WAP) and consists of screening waste, as required under the WAP, for the following parameters:

i) specific gravity;
ii) flammability;
iii) pH, water reactivity;
iv) cyanide;
v) compatability; and
vi) free liquids.

In addition, compatibility testing will be performed on wastes in accordance with the requirements of the Waste Analysis Plan. It should be noted that specific gravity is done strictly for in house purposes to determine the recoverabiltiy of certain waste streams and will not impact the sites ability to accept the waste.

Since the screening analyses are intended to confirm waste characteristics or determine the acceptability of the waste relative to the Facility's permits, and are supplemental to information provided by the generator, the QA/QC procedures performed are minimal. The laboratory QA/QC procedures include verifying the tests will elicit a positive result using standard materials, where applicable, to ensure that false negative results do not occur and verifying that false positive results do not occur by testing blank materials for the same/similar parameters.

2.2 PROJECT OBJECTIVES

The objectives of the waste sampling and screening are to determine whether the wastes received at the facility are:

i) consistent with the generator's information and/or generator's waste material profile sheet (Profile Sheet);

ii) acceptable within the scope of the Facility's RCRA Part B Permit; and

iii) acceptable within the scope of the Facility's waste storage capabilities regarding the issue of compatability; and

3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

The Facility Manager has overall responsibility for the wastes accepted at the Facility. All waste sampling and any testing performed at the Facility will be under the direction of the Facility Manager. The President will provide corporate QA oversight of the Facility's operations.

The Facility laboratory, another laboratory, or -approved subcontract laboratory may perform the screening tests. The organization and responsibility of the laboratories will be consistent with each laboratory's QA Plan.

4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall QA objective is to develop and implement procedures for waste sampling, chain-of-custody, screening analyses and reporting that will provide data of sufficient quality to

determine if wastes are acceptable within the scope of the Facility's permits. Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, audits, preventive maintenance of laboratory equipment and corrective action are described in other sections of this QAPP. The purpose of this section is to address the specific objectives for accuracy, precision, completeness, representativeness and comparability.

4.1 LEVEL OF QC EFFORT

The level of QC effort will consist of testing blank and standard materials, where appropriate, to determine the presence of false positive and false negative results, respectively.

4.2 ACCURACY, PRECISION AND SENSITIVITY OF ANALYSES

The fundamental QA objective with respect to accuracy and precision of the screening data is to achieve the QC acceptance criteria of the analytical protocols referenced in Section 8.0.

4.3 COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is expected that the laboratory will provide data meeting QC acceptance criteria for 80 percent or more for all samples tested using the referenced methods.

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Representativeness is a qualitative parameter which is dependent upon the proper design of the sampling program and proper laboratory protocol. Representativeness will be satisfied by insuring that proper sampling techniques are used and proper testing procedures are followed.

Comparability expresses the confidence with which one data set can be compared with another. The extent to which existing and planned testing data will be comparable depends on the similarity of sampling and analytical methods. The procedures used to obtain the planned analytical data, as documented in the QAPP, are expected to provide

comparable data. These new analytical data, however, may not be directly comparable to existing data because of difference in procedures and QA objectives.

5.0 SAMPLING PROCEDURES

The following subsections presents the procedures for sampling wastes received by the facility.

5.1 WASTE SAMPLING

5.1.1 Sample Labeling

Each sample will be labeled with a unique sample number that will facilitate tracking and cross-referencing of sample information. The sample numbering system used will allow Facility personnel to identify the generator and assign a sequential number for each container.

5.1.2 Sample Containers and Handling

Samples that are to be stored at the Facility or shipped off-site will be placed in properly labeled and sealed sample containers. The sample labels will include the information specified in Section 5.1.1. Samples sent off site for testing will be cushioned within shipping containers as required under applicable DOT regulations for the shipment of hazardous materails.

Upon receipt of the shipping container at the laboratory, the shipping container will be inspected by the laboratory technician. The condition of the shipping container will be noted by the sample custodian in the event it is damaged. The laboratory's technician will check the contents of the shipping container with those samples listed on the packing list. Any damage to the samples or discrepancies in the accompanying documentation will be recorded by the laboratory. Any damage or discrepancies will be reported to The Facility Manager.

5.2 SAMPLING PROTOCOLS

5.2.1 Safety Considerations

1. Proper ventilation is provided for the sampling operation.
2. Personnel must wear appropriate protective gear.
3. Any built-up pressure within a container is slowly released by gently cracking the bung.

5.2.2 Sampling Equipment

Materials and equipment required for sampling are as follows:

1. A suitable sized container/bottle appropriate for the waste.
2. Sample label.
3. Four-foot by 3/8-inch ID sampling thief.
4. Bung wrench (non-sparking if required)
5. Packing slip (for off-site analyses).
6. Four-foot sampling auger (trier).

5.2.3 Container Sampling

5.2.3.1 Discrete Liquid Concentrated Waste Samples

The following procedure shall be adhered to during the sampling of individual containers.

1. Remove bung using bung wrench (non-sparking if necessary).
2. Slowly insert thief to the bottom of the container or until a solid layer is encountered.
3. Allow the waste in the container to reach its natural level in the thief.
4. Cap the thief.
5. Carefully remove the thief from the container and insert the uncapped end in a beaker or other suitable collection container.
6. Gently pour appropriate sample volume into sample jar.
7. Label sample.

5.2.3.2 Discrete Solid Waste Samples

The following procedures shall be adhered to during the sampling of individual containers.

1. Remove bung or container lid, as applicable
2. Advance sample auger through entire container.
3. Carefully remove sampler.
4. Place composite solid waste sample into sample jar.
5. Label sample.

5.2.4 Limitations

1. Extremely hard solid wastes may require alternate sampling method.
2. Viscous liquids may adhere to exterior of sample thief.

6.0 SAMPLE CUSTODY AND DOCUMENT CONTROL

6.1 FACILITY CHAIN-OF-CUSTODY PROCEDURES

The sample packaging and shipment procedures summarized below will insure that samples shipped off site will arrive at the laboratory with the chain-of-custody intact. The protocol for specific sample numbering and other sample designations are included in Section 5.0.

The following chain-of-custody procedures will be used by the facility:

1. The sampler is personally responsible for the care and custody of the samples until they are transferred. As few people as possible should handle the samples.

2. All bottles will be labeled with unique sample numbers.

3. Sample labels will be completed for each sample.

6.1.1 Off-site Transfer of Custody and Shipment Procedures

The following custody and shipping procedures will be followed:

1. Samples are accompanied by a properly completed packing list or chain-of-custody form. The sample numbers will be listed on the packing list or chain-of-custody form.

2. Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate signed packing list or custody form enclosed in each sample box or cooler.

3. Whenever samples are split with another party or government agency, a separate packing list or chain-of-custody record is prepared for those samples and marked to indicate with whom the samples are being split. The person relinquishing the samples to the other party should request the representative's signature acknowledging sample receipt.

4. All shipments will be accompanied by the packing list or chain-of-custody record identifying the contents. The original will accompany the shipment and copies will be retained by the Facility.

5. If the samples are sent by common carrier, a bill of lading will be used.

6.2 LABORATORY CHAIN-OF-CUSTODY PROCEDURES

The laboratory technician will use a unique number for each incoming sample to use in the laboratory. The unique number will allow Facility Personnel to retrieve the analysis in the future. The analysis will note the date of sample receipt and what facility submitted the sample if analized at the Facility laboratory.

Laboratory custody procedures and document control for those samples analyzed by the laboratory will be consistent with their standard laboratory protocols.

6.3 STORAGE OF SAMPLES

After the technician has prepared the sample log, the samples will be stored in the appropriate locations. All samples will be maintained under the proper preservation requirements until completion of all analytical work. When a duplicate/split sample has been retained for samples sent off-site for analysis, the duplicate/split sample will be maintained until after receipt of the analytical report from the outside lab.

6.4 FINAL EVIDENCE FILES CUSTODY PROCEDURES

THE LABORATORY WILL BE RESPONSIBLE FOR MAINTAINING AND STORING ANALYTICAL LOG BOOKS AND LABORATORY DATA. WHEN

OUTSIDE LABORATORIES ARE USED, RAW DATA FILES WILL BE INVENTORIED AND MAINTAINED BY THE LABORATORY FOR A PERIOD OF FIVE YEARS UNLESS THE NEED FOR LONGER STORAGE IS REQUIRED BY DETREX.

7.0 CALIBRATION PROCEDURES AND FREQUENCY

This section describes procedures for maintaining the accuracy for all the instruments and measuring equipment which are used for conducting testing. These instruments and equipment should be calibrated prior to each use or on a scheduled periodic basis.

7.1 LABORATORY INSTRUMENTS

Calibration of laboratory equipment will be based on the approved laboratory's standard operating procedures (SOPs). Records of calibration, repairs, or replacement will be filed and maintained by the designated laboratory personnel performing QA/QC activities. These records will be filed at the location where the work is performed and will be subject to QA audit. For all instruments, the laboratory will maintain a properly trained staff. Major repairs will be performed by someone who is trained to repair a particular piece of equipment.

The records of calibration will be kept as follows:

1. The facility will keep a record of calibration on each instrument will have.

2. A log will be kept for each instrument showing description, manufacturer, model numbers, date of last calibration and by whom calibrated (signature), due date of next calibration and compensation or correction figures, as appropriate.

3. A written stepwise calibration procedure will be available for each piece of test and measurement equipment.

4. Any instrument that is not calibrated to within the manufacturer's original specification will display an appropriate warning tag.

Specific calibration procedures are detailed in the respective methods.

8.0 ANALYTICAL PROCEDURES

The samples collected for laboratory testing will be analyzed using the methods detailed in Appendix QAPP-I and reproduced in Appendix QAPP-II.

9.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

The internal QC checks for the methods of analyses will be consistent with the procedures specified in the methods in Appendix QAPP-II.

10.0 DATA REDUCTION, VALIDATION AND REPORTING

The laboratory will perform analytical data reduction as required (i.e. calculations, interpretation) and review in-house under the direction of the laboratory QA Officer. Specific data reduction procedures will be consistent with the laboratory's standard procedures. Data reduction, review and reporting by the laboratory will be conducted following the laboratory's QA Plan.

Laboratory data packages (i.e. analytical reports) will consist of the following deliverables:

i) a case narrative that includes a summary of analytical methods used, or a reference to the test method number;
ii) dates of sample receipt and analysis;
iii) laboratory and Facility sample identification numbers;
iv) samples results of all analyses; and
v) copies of packing lists or executed chain-of-custody forms for samples received from off-site.

11.0 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits of both Facility and laboratory activities may be conducted to verify that sampling and analysis are performed in accordance with the procedures established in the QAPP. The audits of Facility and laboratory activities include two separate independent parts; internal and external audits.

11.1 SAMPLING PROCEDURE AUDITS

Internal audits of sampling activities will be conducted by the Detrex Facility Manager. The audits will include examination of sampling records, sample collection, handling and packaging in compliance with the established procedures. These audits will be conducted to correct deficiencies, and to verify that QA procedures are maintained. The audits will involve review of sample documentation procedures.

Any external audits will be conducted by MDEQ or USEPA.

11.2 LABORATORY AUDITS

The internal performance and system audits of the laboratory will be conducted by the laboratory's QA Officer. The system audits will include examination of laboratory sample receiving documentation, sample log-in, sample storage, chain-of-custody procedure, sample preparation and analysis, instrument operating records, etc. Performance audits may be conducted on a quarterly basis through the auspices of USEPA's water pollution and water supply performance evaluation studies. The QA officer will evaluate the analytical results of these performance evaluation samples to ensure the laboratory maintains acceptable performance.

Any external audits of the laboratories will be conducted by MDEQ or USEPA.

12.0 PREVENTIVE MAINTENANCE

All analytical instruments to be used in this project for the screening of waste will be checked by the laboratory personnel at least quarterly. Instruments may also be serviced at other times due to failure. Requisite servicing beyond the abilities of the laboratory personnel will be performed by the equipment manufacturer or a qualified representative.

Each instrument will be checked on the days they are operated by the analyst who has been assigned responsibility for that instrument. Manufacturer's recommended procedures will be followed in every case.

13.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY AND COMPLETENESS

The following sections include the procedures utilized to assess the levels of precision, accuracy and completeness achieved during the associated sample analyses.

13.1 LABORATORY DATA

Laboratory results will be assessed for compliance with required precision, accuracy and completeness as follows:

13.1.1 Precision

Precision of laboratory analysis will be assessed for compliance with the established QC criteria that are described in the referenced methods.

13.1.2 Accuracy

Accuracy of laboratory results will be assessed for compliance with the established QC criteria that are described in the referenced methods.

13.1.3 Completeness

Completeness will be assessed by comparing the number of valid results to the total possible number of results. The required level of completeness for laboratory analyses will be 80 percent.

14.0 CORRECTIVE ACTION

The need for corrective action may be identified by system or performance audits or by standard QC procedures. The essential steps in the corrective action system will be:

i) checking the predetermined limits for data acceptability beyond which corrective action is required;

ii) identifying and defining problems;
iii) assigning responsibility for investigating the problem;
iv) investigating and determining the cause of the problem;
v) determination of a corrective action to eliminate the problem (this may include reanalyses or resampling and analyses);
vi) assigning and accepting responsibility for implementing the corrective action;
vii) implementing the corrective action and evaluating the effectiveness;
viii) verifying that the corrective action has eliminated the problem; and
ix) documenting the corrective action taken.

For each measurement system, the Laboratory's QA Officer or the analyst will be responsible for initiating the corrective action and the laboratory supervisor will be responsible for implementing the corrective action. The corrective action taken will be consistent with the laboratory's standard procedures.

15.0 QUALITY ASSURANCE REPORT TO MANAGEMENT

Management will receive reports on data quality with each analytical report in the form of QC summaries appended to the laboratory reports. The laboratory's QA Officer will be responsible within the organizational structure for preparing these reports and the Facility Manager will be responsible for maintaining the analytical reports

APPENDIX QAPP-I

SUMMARY OF TEST METHODS

SUMMARY OF TEST METHHODS
DETREX CORPORATION
DETROIT, MICHIGAN

MATRIX	PARAMETER	METHODS OF ANALYSIS
WASTE LIQUIDS AND SOLIDS	SPECIFIC GRAVITY	DETREX TEST METHOD
WASTE LIQUIDS AND SOLIDS	FLAMMABILITY	ASTM D4982-89
WASTE LIQUIDS AND SOLIDS	WATER REACTIVITY	Physical Test / Sample Inspection
WASTE LIQUIDS AND SOLIDS	pH	ASTM D4980-89
WASTE LIQUIDS AND SOLIDS	PAINT FILTER TEST	SW-846 9095
WASTE LIQUIDS AND SOLIDS	IGNITABILITY	ASTM D3278

NOTES:

ASTM	Annual Book Of ASTM Standards", American Society For Testing And Materials, 1994
SW-846	Test Methods For Evaluating Solid Wastes, Physical/Chemical Methods", SW-846
EPA	"A Method For Determining The Compatibility Of Hazardous Wastes", EPA 600/2-80-076

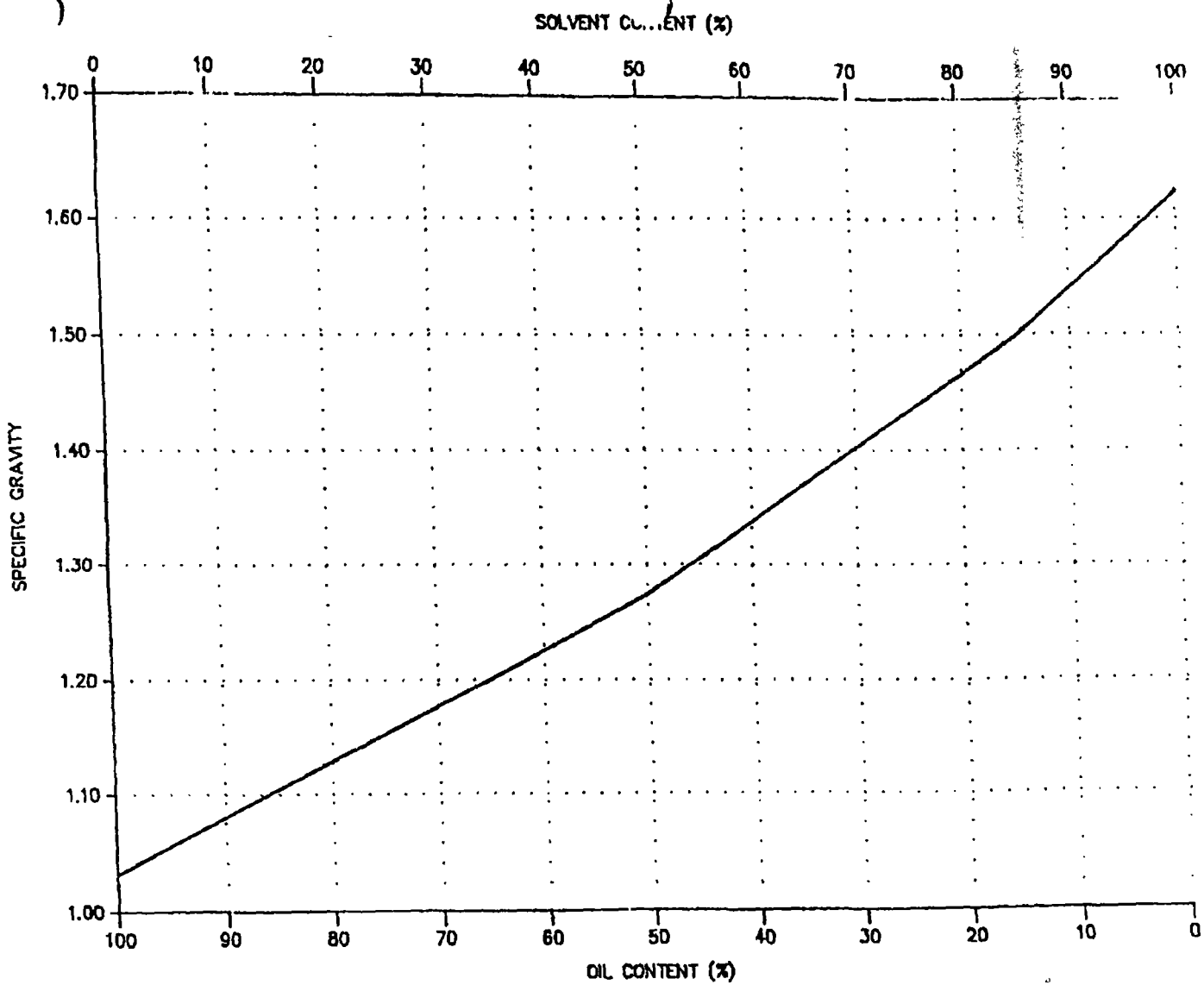
APPENDIX QAPP-II

TEST METHODS

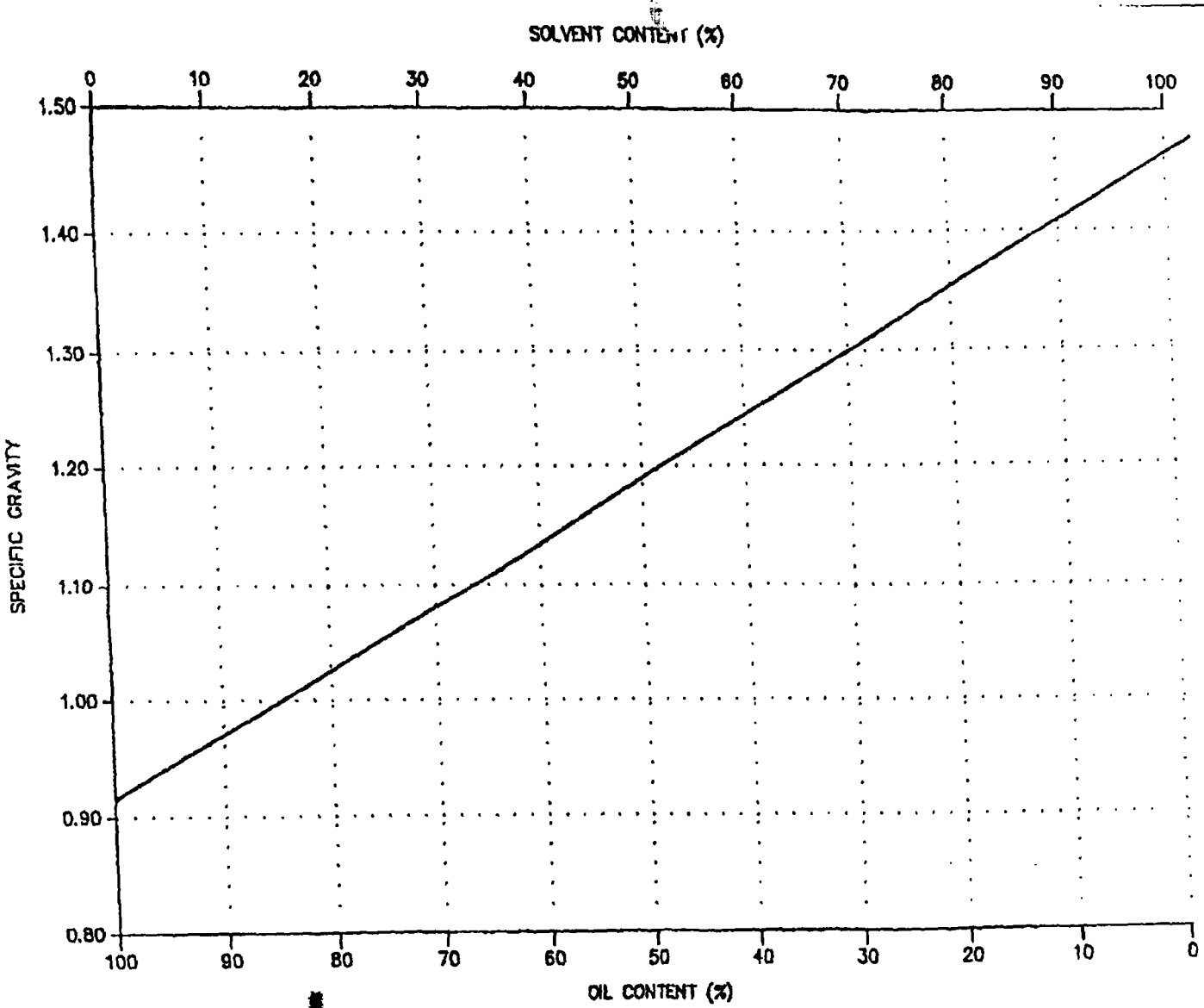
DETERMINATION OF SOLVENT CONTENT IN SPENT SOLVENTS FROM DEGREASING OPERATIONS USING SPECIFIC GRAVITY METHOD

PROCEDURE

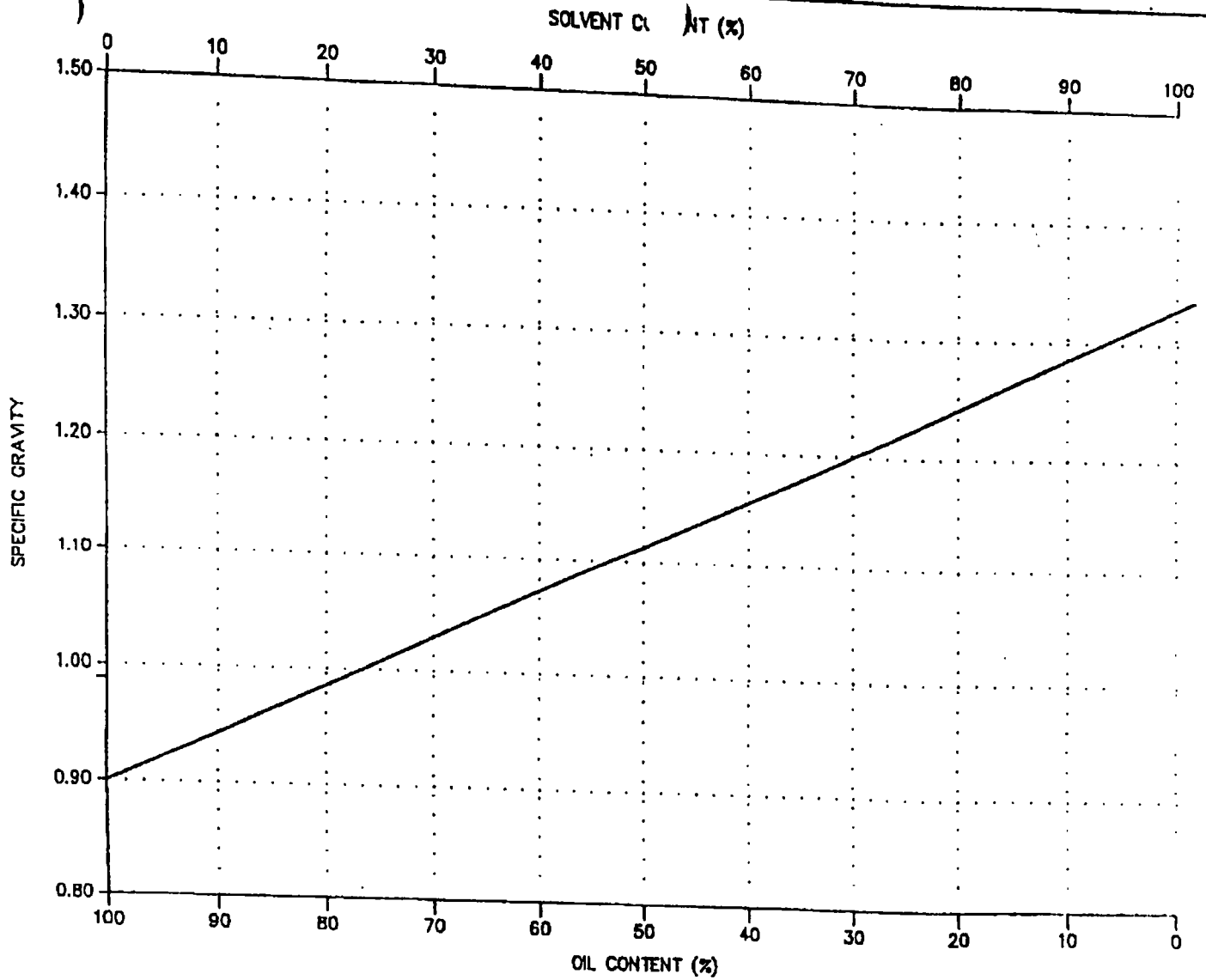
1. Collect sample using procedure for obtaining a sample
2. Transfer sample to a container of sufficient size to allow for mixing
3. Shake container for at least 30 seconds
4. Place thermometer and a hydrometer in the hydrometer jar
5. Fill the hydrometer jar to within one inch of the top with the mixture to be tested
6. If the hydrometer reads off-scale, replace it wit ha higher or lower range hydrometer as required
7. Read the hydrometer to the nearest 0.01 SpG. unit
8. Using the attached solvent-oil mixture vs. Specific Gravity Chart, for the appropriate type solvent, determine the weight percent oil
9. The solvent concentration is read directly from the chart.



PERCHLORETHYLENE (PERK)
SOLVENT–OIL VERSUS SPECIFIC GRAVITY CHART



TRICHLOROETHYLENE
SOLVENT–OIL VERSUS SPECIFIC GRAVITY CHART



1,1,1-TRICHLOROETHYLENE OR METHYLENE CHLORIDE
SOLVENT-OIL VERSUS SPECIFIC GRAVITY CHART

Designation: D 4982 – 89

Standard Test Methods for Flammability Potential Screening Analysis of Waste[1]

This standard is issued under the fixed designation D 4982; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods are used to indicate the fire-producing potential of wastes. The following test methods can be applied to waste liquids, sludges, semisolids, or solids:

	Sections
Test Method A—Test Sample Exposed to Heat and Flame	11 to 13
Test Method B—Test Sample Exposed to Spark Source	14 to 15

1.2 These test methods should be used to measure and describe the properties of materials, in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials under actual fire conditions. However, results of these tests may be used as elements of a fire risk assessment that takes into account all of the factors that are pertinent to an assessment of the fire hazard of a particular end use.

1.3 These test methods are designed and intended as preliminary tests to complement the more sophisticated quantitative analytical techniques that may be used to determine flammability. These test methods offer, to the user, the option and the ability to screen waste for potentially hazardous flammability potential when the more sophisticated techniques are not available and the total waste composition is unknown.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazard information is given in Section 6 and 13.4.3.1.

2. Referenced Documents

2.1 *ASTM Standard:*

D93 Test Methods for Flash Point by Pensky-Martens Closed Tester[2]

2.2 *Other Standard:*

Prudent Practices for Handling Hazardous Chemicals in Laboratories[3]

3. Terminology

3.1 *Description of Term Specific to This Standard:*

3.1.1 *screening analysis*—a *preliminary* qualitative or semiquantitative test developed from classical qualit and quantitative techniques that is designed to effici give the user specific information about a waste that wi in determining waste identification, process compatil and safety in handling.

4. Summary of Test Methods

4.1 *Method A*—A test sample is exposed to heat flame. The sample is reported as having a positiv negative flammability potential as described in the procedure.

4.2 *Method B*—Sparks from a flint lighter are introd to the vapor space immediately above a represen sample of a waste, and observation is made for a flash i vapor space or ignition of the sample. A flash in the space or ignition and burning of the waste indica positive flammability potential at ambient temperature

5. Significance and Use

5.1 These test methods are intended for use by the the waste management industries to aid in identi flammability potential or waste materials.

6. Hazards

6.1 Avoid inhalation and skin or eye contact, or bo any hazardous materials.

6.2 Standard laboratory hygiene practices should b lowed when conducting these tests.

6.3 All tests must be performed in a laboratory equipped with an exhaust intake along the front edge work area to collect any heavier-than-air vapors genera

6.4 The analyst must wear flame resistant oven glov

6.5 Waste containing or suspected of containing volatile organics or peroxides should be tested using a smaller sample than that used in 13.2.

7. Sampling

7.1 Sample containers must be kept tightly sealed tested.

7.2 Samples should be analyzed as soon as possible collection.

7.3 If necessary, allow the sample to come to temperature in a tightly sealed container. For exa frozen material should be allowed to thaw completely.

8. Report

8.1 Report the following information:

8.1.1 Sample identification,

8.1.2 Date of test,

8.1.3 Sample classification: positive or negative, an

8.1.4 Reference to the procedure applied.

[1] These test methods are under the jurisdiction of ASTM Committee D-34 on Waste Disposal and is the direct responsibility of Subcommittee D34.02 on Physical and Chemical Characterization.

Current edition approved Nov. 10, 1989. Published December 1989.

[2] *Annual Book of ASTM Standards*, Vol 05.01.

[3] National Research Council, National Academy Press, Washington, DC, 1981.

9. Quality Control

Quality control check samples and duplications should be performed at an action level specified by the laboratory and at an appropriate frequency.

9.2 Flammability standards should be maintained for analyst training and as reference guides. Examples are given in the following table.

Flammability Potential Screening Analysis

Methyl alcohol (methanol)	Difficult-to-see flame: flammable at or below room temperature.
Glacial acetic acid	Flammable at temperatures above normal room temperature.
Hendecane (n-undecane)	Flammable at temperatures higher than glacial acetic acid.
Kerosene (Fuel Oil No. 1)	Flammable over a range of temperatures higher than normal room temperature.
p-Xylene	Flammable at or above room temperature: freezes at 13°C. A spiked soil sample frozen at 0°C demonstrates interference.
Chlorofluorocarbon 113 (1,1,2-trichloro-1,2,2-trifluoroethane)	Warning: phosgene formation likely: see 13.4.3.1.

10. Precision and Bias

10.1 No statement is made about either the precision or bias of these test methods since the result merely states whether there is conformance to the criteria for success specified in the procedure.

METHOD A—EXPOSURE TO HEAT AND FLAME

Interferences

11.1 Drafts in the laboratory fume hood where the test is performed could cause excessive cooling and false negative results. A properly operating fume hood with a face velocity of 150 ft/min should provide consistent, usable results.

11.2 Ignition sources that provide excessive heating rates alone or combined with a very small test portion may obscure results. That is, the sample may be decomposed, sintered, fused, evaporated, or otherwise consumed before positive or negative evidence of flammability is observed. The use of sufficiently large test portions and of heating rates typical of a bunsen burner should resolve this problem.

11.3 An inadequate source of heating could limit the volatilization of flammable components and provide false negative results.

11.4 Difficult-to-observe flames resulting from the burning of certain compounds (for example, methanol) could provide false negative results. If the presence of these compounds is suspected, the presence of flammability might be confirmed by the insertion of a watchglass just above the test material. The watchglass is then examined for products of combustion (for example, moisture and soot).

NOTE 1—The watchglass method cannot distinguish between vaporized water or water produced by combustion.

11.[illegible] An improperly adjusted gas burner (for example, with an insufficiently aerated flame) could introduce raw gas into or immediately above the sample. This raw gas could [illegible]y support a flame after the source of ignition is [illegible]ved, providing the appearance of a flammable sample and a false positive result.

12. Apparatus

12.1 *Gas Burner*, (for example, a bunsen burner) with adjustable air shutter and an adjustable gas orifice is needed. The gas burner and fuel supply line must be appropriate to the gas supplied: natural gas, artificial gas (including propane and butane), or liquified petroleum gas (LP gas or LPG). Where a gas supply line cannot be provided, a propane torch may be substituted.

12.2 *Lighter*, (for example, piezo lighter) for burner is required.

12.3 *Aluminum Weighing Boats* or other non-flammable containers are needed.

12.3.1 Caution—Weighing boats of material other than aluminum should be used if the testing materials react with aluminum, for example, caustics.

12.4 *Watchglass*.

12.5 *Large Beaker, Tongs, Asbestos-Free High-Temperature Gloves or Mittens*, or other apparatus as needed to extinguish burning materials.

13. Procedure

13.1 Light a gas burner and adjust to a typically blue flame that is not readily blown out. A yellow flame easily affected by drafts indicates insufficient air (the air:fuel ratio is too low). A sharp, blue flame is good. (If the flame rises above the burner head, is very difficult to light, or tends to extinguish itself, indicates that too much air or too much air and fuel are being supplied to the burner.)

13.2 Place a sufficient amount (approximately 5 g) of test sample in an aluminum weighing boat or other nonflammable container.

13.3 Using a gas burner, hold the flame immediately above the test sample for 2 to 3 s without touching the visible flame to the sample.

13.3.1 If ignition (a flash or burning) is observed before or after the source of ignition (the flame of the burner) is removed, the sample is said to have a positive flammability potential. A positive result may require further investigation (see 13.4.1).

13.3.2 The confirmation of flammability may require the use of a watchglass (see 11.4).

13.3.3 If there is no ignition, proceed to 13.4.

13.4 Using a gas burner, briefly (for at least 15 s) apply the flame to the sample in an attempt to ignite the sample.

13.4.1 If the sample ignites, the sample is said to have a positive flammability potential.

13.4.1.1 When more accurate waste characterization is necessary, liquid samples may be quantified using a closed-cup flash point tester.

13.4.1.2 Solids with a positive flammability potential should be further investigated.

13.4.2 If the sample decomposes, boils (if a liquid), or otherwise fails to ignite after at least 15 s of continuous sample heating by the burner flame, the flammability potential is reported as negative.

13.4.3 Halogenated solvents typically give off visible vapors that may result in a false positive flammability potential.

NOTE 2: Warning—Phosgene, an extremely toxic gas, is a combustion product of halogenated compounds burned in air.

13.5 Shut off the gas burner when not in use. Extinguish a

burning sample by setting an aluminum weighing boat or watchglass atop the one containing the burning sample, (or invert a spoutless beaker over the sample container and all). Use of tongs or high temperature gloves or mittens may be necessary to handle the equipment.

TEST METHOD B—EXPOSURE TO SPARK SOURCE

14. Apparatus

14.1 *Oven Gloves.*

14.2 *Flint Lighter*, the type typically used to light an air/acetylene torch is required.

14.3 *Disposable 250-mL Beaker*, of plastic is required.

14.4 *Watchglass*, 100 mm.

14.5 *Metal Vessel* (with lid), of adequate depth and diameter to contain beaker and watchglass is needed.

14.6 *Thermometer.*

15. Procedure

15.1 Place approximately 100 mL of the representa... sample of the material to be tested into the plastic beaker (se 7.3).

15.2 Place the plastic beaker in the steel vessel, cover th beaker with the watchglass, and allow to stand at ambier conditions for 5 min.

15.3 Record the ambient temperature.

15.4 Remove the watchglass, place the igniter immed ately above the waste and strike it several times to produc sparks.

15.5 If the material does catch fire and burn, extinguis the flames by immediately placing the lid on the steel vesse thus smothering the fire and report as positive flammabilit potential.

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 1916 Race St., Philadelphia, PA 19103.

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Designation: D 93 – 90

Designation: 34/85

An American National
British Standard
American Association
Highway Transportation S
AASHTO No. T

Standard Test Methods for Flash Point by Pensky-Martens Closed Tester[1]

This standard is issued under the fixed designation D 93; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

These test methods were adopted as a joint ASTM-IP Standard in 1967.

These test methods have been adopted for use by government agencies to replace Method 1102 of Federal Test Method Standard No. 791b, and Method 4293 of Federal Test Method Standard No. 141A.

INTRODUCTION

This flash point test method depends on definite rates of temperature increases to control the precision of the method. It is considered to be a non-equilibrium method. The rate of heating will not give the precision expected in all cases because of the low thermal conductivity of some materials. To reduce this effect, Test Method D 3941 was issued in which the heating rate is considered to be an equilibrium method. Due to the slower heating rate, the time required to make a determination is considerably longer. If your specification requires Test Method D 93, do not substitute Test Method D 3941 or any other method without obtaining comparative data and agreement from the specifier.

1. Scope

1.1 These test methods cover the determination of the flash point by Pensky-Martens closed-cup tester of fuel oils, lube oils, suspensions of solids, liquids that tend to form a surface film under test conditions, and other liquids of similar viscosities.

NOTE 1—This test method can be employed for the detection of contamination of lubricating oils by minor amounts of volatile materials.

NOTE 2—The U.S. Department of Transportation (DOT)[2] and U.S. Department of Labor (OSHA) have established that liquids with a flash point under 100°F (37.8°C) are flammable as determined by methods for those liquids which have a viscosity of 5.8 cSt or more at 100°F (37.8°C) or 9.5 cSt or more at 77°F (25°C), or that contain suspended solids, or have a tendency to form a surface film while under test. Other classification flash points have been established by these departments for liquids using this test. These regulations are in degrees Fahrenheit.

1.2 Liquids having viscosities less than 5.5 cSt at 40°C (104°F) do not contain suspended solids or do not have a tendency to form a surface film while under test conditions can be tested in accordance with Test Method D 56.

1.3 The values stated in SI units shall be regarded as the standard. The values given in parentheses are for info tion only.

1.4 *This standard should be used to measure and des the properties of materials, products, or assemblies sponse to heat and flame under controlled laboratory c tions and should not be used to describe or appraise the hazard or fire risk of materials, products, or assemblies u actual fire conditions. However, results of this test ma used as elements of a fire risk assessment which takes account all of the factors which are pertinent to an assess of the fire hazard of a particular end use.*

1.5 *This standard does not purport to address all o safety problems associated with its use. It is the responsib of the user of this standard to establish appropriate safety health practices and determine the applicability of regula limitations prior to use.* For specific hazards statements, Section 7 and Note 5.

2. Referenced Documents

2.1 *ASTM Standards:*

D 56 Test Method for Flash Point by Tag Closed Test

D 850 Test Method for Distillation of Industrial Arom Hydrocarbons and Related Materials[4]

D 1015 Test Method for Freezing Point of High-Pu Hydrocarbons[3]

D 1016 Test Method for Purity of Hydrocarbons f Freezing Points[3]

D 1078 Test Method for Distillation Range of Vola Organic Liquids[4]

[1] These test methods are under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and are the direct responsibility of Subcommittee D02.08 on Volatility.

In the IP, these methods are under the jurisdiction of the Standardization Committee.

Current edition approved Oct. 26, 1990. Published December 1990. Originally published as D 93 – 21 T. Last previous edition D 93 – 85.

[2] For information concerning regulations of U.S. Department of Transportation, see Codes of U.S. Regulations 49 CFR, Chapter I, and of U.S. Department of Labor, see 29 CFR, Chapter XVII. Each of these items is revised annually and may be procured from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

[3] *Annual Book of ASTM Standards*, Vols 05.01 and 06.03.

[4] *Annual Book of ASTM Standards*, Vol 06.03.

41 Test Method for Flash Point by the Equilibrium Method With a Closed Cup Apparatus[4]
D 4057 Practice for Manual Sampling of Petroluem and Petroleum Products[5]
E 1 Specification for ASTM Thermometers[6]
E 300 Practice for Sampling Industrial Chemicals[7]

3. Terminology

3.1 *Description of a Term Specific to This Standard:*

3.1.1 *flash point*—the lowest temperature corrected to a barometric pressure of 101.3 kPa (760 mm Hg), at which application of a test flame causes the vapor of a specimen to ignite under specified conditions of test.

3.1.1.1 *Discussion*—The sample is deemed to have flashed when a large flame appears and instantaneously propagates itself over the surface of the sample.

3.1.1.2 *Discussion*—Occasionally, the application of the test flame will cause a blue halo or an enlarged flame. This generally occurs near the actual flash point but in some cases, especially with halogenated hydrocarbons and admixtures, can occur at any temperature. These phenomena are not to be considered true flash points.

4. Summary of Test Methods

4.1 The sample is heated at a slow, constant rate with continual stirring. A small flame is directed into the cup at regular intervals with simultaneous interruption of stirring. [illegible]ash point is the lowest temperature at which applica- [illegible] the test flame causes the vapor above the sample to [illegible]

5. Significance and Use

5.1 Flash point measures tendency of the sample to form a flammable mixture with air under controlled laboratory conditions. It is only one of a number of properties which must be considered in assessing the overall flammability hazard of a material.

5.2 Flash point is used in shipping and safety regulations to define flammable and combustible materials. One should consult the particular regulation involved for precise definitions of these classes.

5.3 Flash point can indicate the possible presence of highly volatile and flammable materials in a relatively nonvolatile or nonflammable material. For example, an abnormally low flash point on a sample of kerosine can indicate gasoline contamination.

5.4 This test method provides the only closed cup flash point test procedures for temperatures to 370°C (698°F).

6. Apparatus

6.1 *Pensky-Martens Closed Flash Tester*, as described in Annex A1.

6.2 *Thermometers*—Three standard thermometers shall be used with the ASTM Pensky-Martens tester as follows:

[illegible] For tests in which the indicated reading falls within [illegible] of 10 to 60°C (50 to 140°F), inclusive, an ASTM [illegible] Pensky-Martens low range Thermometer having a range from −5 to +110°C (20 to 230°F) and conforming to the requirements of Specification E 1 shall be used. Equally acceptable is IP thermometer 15C (15F), with specifications as shown in Annexes A2 and A3.

6.2.2 For tests in which the indicated reading falls within the limits 60 to 140°C (140 to 284°F), inclusive, an ASTM 88C (88F) Vegetable Oil Flash Thermometer having a range of 10 to 200°C (50 to 392°F) and conforming to the requirements of Specification E 1 shall be used. Equally acceptable is IP thermometer IP 101C.

6.2.3 For the range 60 to 110°C (140 to 230°F) either low or medium range thermometer may be used.

6.2.4 For tests in which the indicated reading falls within 130 to 370°C (265 to 700°F) an ASTM 10C (10F) Pensky-Martens high-range Thermometer having a range from 90 to 370°C (200 to 700°F) and conforming to the requirements of Specification E 1 shall be used. Equally acceptable is IP thermometer 16C (16F), with specifications as shown in Annex A3.

6.2.5 For the range 130 to 140°C (265 to 285°F) either the medium or high-range thermometer may be used.

NOTE 3—There are automatic flash point testers available and in use that may be advantageous in that they save testing time and exhibit other factors which may merit their use. In any cases of dispute the flash point as determined manually is considered the referee test.

7. Hazards

7.1 The operator must exercise and take appropriate safety precautions during the initial application of the test flame, since samples containing low-flash material can give an abnormally strong flash when the test flame is first applied.

8. Sampling

8.1 Erroneously high flash points may be obtained if precautions are not taken to avoid the loss of volatile material. Do not open containers unnecessarily and make a transfer unless the sample temperature is at least the equivalent of 8°C (18°F) below the expected flash point. Do not use samples from leaky containers for these test methods.

8.2 Do not store samples in plastic (polyethylene, polypropylene, etc.) containers, since volatile material may diffuse through the walls of the enclosure.

8.3 Obtain a sample in accordance with instructions given in Practice D 4057 or E 300.

8.4 Samples of very viscous materials may be warmed until they are reasonably fluid before they are tested. However, no sample should be heated more than is absolutely necessary. It shall never be heated above a temperature of 17°C (30°F) below its expected flash point.

8.5 Samples containing dissolved or free water may be dehydrated with calcium chloride or by filtering through a qualitative filter paper or a loose plug of dry absorbent cotton. Warming the sample is permitted, but it should not be heated for prolonged periods or above a temperature of 17°C (30°F) below its expected flash point.

NOTE 4—If the sample is suspected of containing volatile contaminants, the treatment described in 8.4 and 8.5 should be omitted.

9. Preparation of Apparatus

9.1 Support the tester on a level, steady table. Unless tests

[illegible]nual Book of ASTM Standards, Vol 05.03.
[illegible] Annual Book of ASTM Standards, Vols 05.03 and 14.03.
[illegible] Annual Book of ASTM Standards, Vols 06.03 and 15.05.

are made in a draft-free room or compartment, it is good practice, but not required, to surround the tester on three sides with a shield, each section of which is about 450 mm (18 in.) wide and 600 mm (24 in.) high.

NOTE 5—Caution—Meticulous attention to all details relating to the flame exposure device, size of test flame, rate of temperature increase, and rate of dipping the flame exposure device into the vapor of the specimen is desirable for good results.

10. Calibration

10.1 Determine the flash point of p-xylene[2] (Warning—See Note 6.), following the directions in Sections 9 through 11. When the tester is operating properly, a value of 27.2 ± 1.1°C (81 ± 2°F) will be obtained.

NOTE 6: Warning—P-xylene is extremely flammable. Harmful if inhaled. Keep away from heat, sparks and open flame. Keep container closed. Use with adequate ventilation. Avoid buildup of vapors and eliminate all sources of ignition, especially non-explosion proof electrical apparatus and heaters. Avoid breathing vapor or spray mist. Avoid prolonged or repeated contact with skin.

10.2 If the flash point obtained on p-xylene is not within the limits stated in 14.1.2, check the condition and operation of the apparatus to ensure conformity with the details listed in Annex A1, especially with regard to the tightness of the lid (A1.1.2.1), the action of the shutter, and position of the test flame (A1.1.2.2). After adjustment, if necessary, repeat the test. P-xylene having a flash point of 27.2 ± 1.1°C (81 ± 2°F) is not a suitable reference in the high temperature range of the Pensky-Martens Closed Tester which can be as high as 370°C (700°F).

10.3 P-xylene shall conform to the following requirements:

Specific Gravity	15.56/15.56°C 0.860 min., 0.866 max.
Boiling Range	2°C from start to dry, point when tested in accordance with Test Method D 850 or D 1078. The range shall include the boiling point of pure p-xylene which is 138.35°C (281.03°F).
Purity	99 % min., (freezing point of 11.23°C), min calculated in accordance with Test Method D 1016, from the experimentally determined freezing point, measured by Test Method D 1015.

PROCEDURE A—DETERMINATION OF FLASH POINT OF ORDINARY LIQUIDS

11. Procedure

11.1 Thoroughly clean and dry all parts of the cup and its accessories before starting the test, being sure to remove any solvent which had been used to clean the apparatus. Fill the cup with the sample to be tested to the level indicated by the filling mark. Place the lid on the cup and set the latter in the stove. Be sure to have the locating or locking device properly engaged. Insert the thermometer. Bring the material to be tested and the tester to a temperature of 15 ± 5°C (60 ± 10°F) or 11°C (20°F) lower than the estimated flash point, whichever is lower. Light the test flame and adjust it to 4 mm (5/32 in.) in diameter. Supply the heat at such a rate that the temperature as indicated by the thermometer increases 5 to 6°C (9 to 11°F)/min. Turn the stirrer 90 to 120 rpm, s in a downward direction.

11.2 If the sample is known to have a flash poin (230°F) or below, apply the test flame when the te of the sample is from 17°C (30°F) to 28°C (50°F) expected flash point and thereafter at a temperature that is a multiple of 1°C (2°F). Apply the test flar operating the mechanism on the cover which contrc shutter and test flame burner so that the flame is lc into the vapor space of the cup in 0.5 s, left in its lc position for 1 s, and quickly raised to its high positic not stir the sample while applying the test flame.

11.3 If the sample is known to have a flash point 110°C (230°F) apply the test flame in the manne described at each temperature that is a multiple of 2°C beginning at a temperature of 17°C (30°F) to 28°C below the expected flash point.

NOTE 7—When testing materials to determine if volatile co nents are present, it is not necessary to adhere to the temperatur for initial flame application as stated in 11.2 and 11.3.

11.4 Record as the observed flash point the tempe read on the thermometer at the time the test flame ar tion causes a distinct flash in the interior of the cup. D confuse the true flash point with the bluish halc sometimes surrounds the test flame at applications pre the one that causes the actual flash.

PROCEDURE B—DETERMINATION OF FLASH POIN SUSPENSIONS OF SOLIDS AND HIGHLY VISCO MATERIALS

12. Procedure

12.1 Bring the material to be tested and the t temperature of 15 ± 5°C (60 ± 10°F) or 11°C (20°F) than the estimated flash point, whichever is lower. Tu stirrer 250 ± 10 rpm, stirring in a downward direction. the temperature throughout the duration of the test ar of not less than 1 nor more than 1.5°C (2 to 3°F)/min. the exception of these requirements for rates of stirrir heating, proceed as prescribed in Section 11.

13. Calculation and Report

13.1 Observe and record the ambient barometric pr (Note 7) at the time of the test. When the pressure from 101.3 kPa (760 mm Hg), correct the flash pc follows:

$$\text{Corrected flash point} = C + 0.25\,(101.3 - p)$$
$$\text{Corrected flash point} = F + 0.06\,(760 - P)$$
$$\text{Corrected flash point} = C + 0.033\,(760 - P)$$

where:

C = observed flash point,
F = observed flash points, °F
P = ambient barometric pre[illegible] mm Hg, and
p = ambient barometric pres[illegible] kPa.

13.2 Record the corrected fla... point to the nearest (or 1°F).

13.3 Report the recorded flash point as the P Martens Closed Cup Flash Point ASTM D 93 – IP 34 sample tested.

NOTE 8—The barometric pressure used in this calculatio ambient pressure for the laboratory at the time of test. Ma

[2] Satisfactory p-xylene may be obtained as Flash Point Check Fluid from the Special Products Div., Chemical Dept., Phillips Petroleum Co., Drawer O, Borger, TX 79007.

s, such as those used at weather stations and airports, are d to give sea level readings and would not give the correct eading for this test.

14. Precision and Bias

14.1 *Precision*—The precision of Test Procedure A as determined by the statistical examination of the interlaboratory test results is as follows:

14.1.1 *Repeatability*—The difference between successive results obtained by the same operator with the same apparatus under constant operating conditions on identical test materials would, in the long run, in the normal and correct operation of the test method, exceed the following values in 1 case in 20.

Material	Flash Point Range °C (°F)	Repeatability °C (°F)
Suspensions of solids	35 to 43 (95 to 110)	2 (4)
All others	104 (220) and under	2 (4)
	Above 104 (220)	5.5 (10)

14.1.2 *Reproducibility*—The difference between two single and independent results obtained by different operators working in different laboratories on identical material would, in the long run, exceed the following values only in 1 case in 20.

Material	Flash Point Range °C (°F)	Reproducibility °C (°F)
Suspensions of solids	35 to 43 (95 to 110)	3.5 (6)
others	104 (220) and under	3.5 (6)
	Above 104 (220)	8.5 (15)

14.1.3 *Bias*—The procedure of this test method has no bias because flash point can be defined only in terms of a test method.

14.1.4 The precision data is not known to have been developed in accordance with Research Report D-2-1007.

14.2 *Precision*—The precision of Test Procedure B as determined by the statistical examination of the interlaboratory test results is as follows:

14.2.1 *Repeatability*—The difference between successive results obtained by the same operator with the same apparatus under constant operating conditions on identical test materials would, in the long run, in the normal and correct operation of the test method, exceed the following value in 1 case in 20:

Repeatability	5°C (9°F)

14.2.2 *Reproducibility*—The difference between 2 single and independent results obtained by different operators working in different laboratories on identical material would, in the long run, exceed the following value only in 1 case in 20.

Reproducibility	10°C (18°F)

14.2.3 The procedure of this test method has no bias because flash point can be defined only in terms of a test method.

14.2.4 The precision data is not known to have been developed in accordance with Research Report D-2-1007.

14.3 The definition of repeatability and reproducibility given here represents different components of the variance of the test methods: those given in 14.1 are derived from standards of ASTM Committee D-2 and the Institute of Petroleum, while those of 14.2 are from ASTM Committee D-2.

15. Keywords

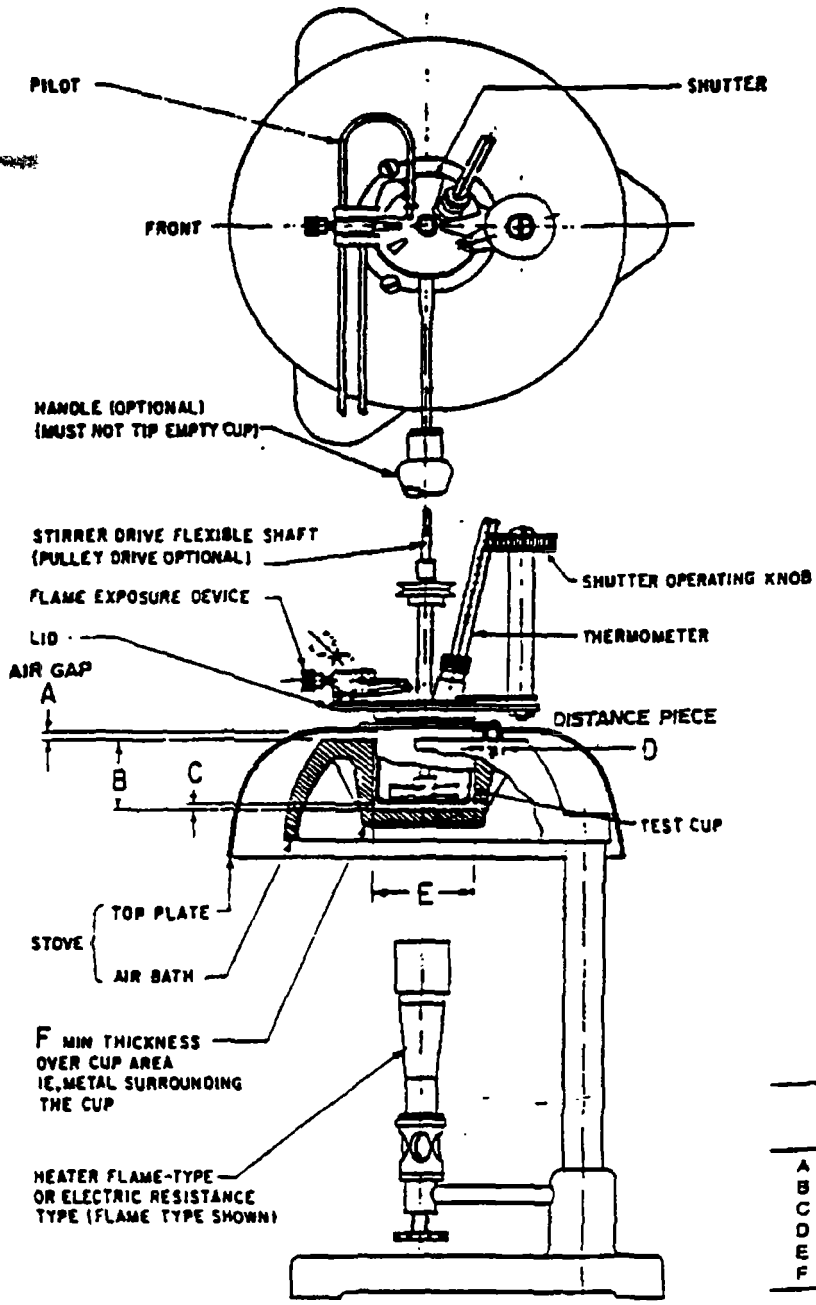
15.1 flash point; Pensky-Martens closed cup; flash point; flammability

ANNEXES

(Mandatory Information)

A1. APPARATUS SPECIFICATIONS

A1.1 A typical assembly of the apparatus, gas heated, is shown in Fig. A1.1. The apparatus shall consist of a test cup, cover, and stove conforming to the following requirem



	mm		(in.)	
	min	max	(min)	(ma
A	4.37	5.16	(0.172)	(0.2
B	41.94	42.06	(1.651)	(1.6
C	1.58	3.18	(0.062)	(0.1
D	...	9.52	(...)	(0.37
E	57.23	57.86	(2.253)	(2.27
F	6.35	...	(0.25)	(...

NOTE—Lid assembly may be positioned either right or left-handed.

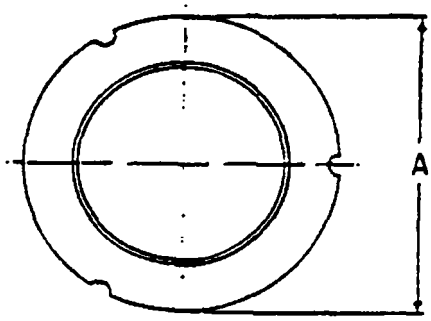
FIG. A1.1 Pensky-Martens Closed Flash Tester

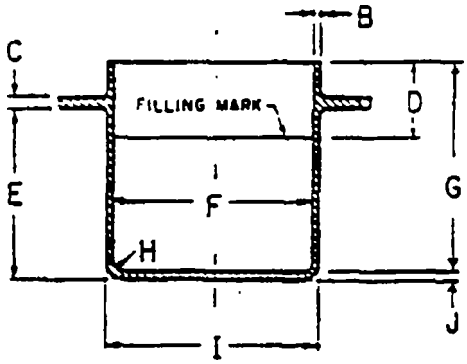
Cup—The cup shall be of brass, or other ...ng metal of equivalent heat conductivity, and shall :nform to the dimensional requirements in Fig. A1.2. The ...nge shall be equipped with devices for locating the ...sition of the cup in the stove. A handle attached to the ...nge of the cup is a desirable accessory. The handle shall ...t be so heavy as to tip over the empty cup.

A1.1.2 *Cover:*

A1.1.2.1 *Cover Proper*—The cover shown in Fig. A1.3 :all be of brass (A1.1.1) and shall have a rim projecting ...wnward almost to the flange of the cup. The rim shall fit ...e outside of the cup with a clearance not exceeding 0.36 ...m (0.014 in.) on the diameter. There shall be a locating or ...cking device, or both, engaging with a corresponding ...vice on the cup. The four openings in the cover, *A*, *B*, *C*, ...d *D*, are shown in Fig. A1.3. The upper edge of the cup ...all be in close contact with the inner face of the cover ...roughout its circumference.

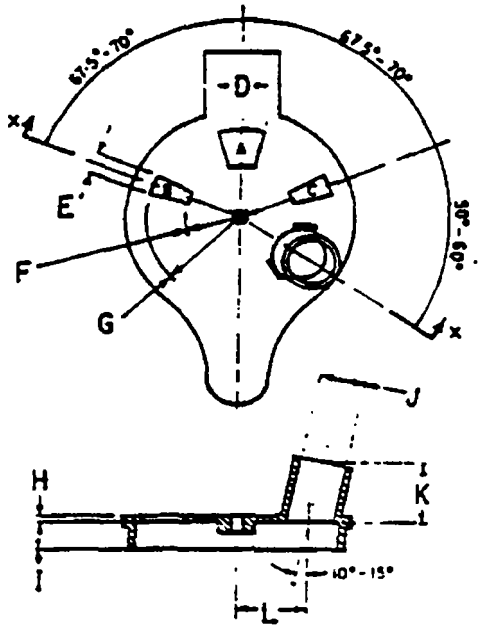
A1.1.2.2 *Shutter*—The cover shall be equipped with a ...ass (Section 3) shutter (Fig. A1.4), approximately 2.4 mm ...2 in.) thick, operating on the plane of the upper surface of ...e cover. The shutter shall be so shaped and mounted that it





	mm		(in.)	
	min	max	(min)	(max)
A	79.0	79.8	(3.11)	(3.14)
B	1.0	...	(0.04)	(...)
C	2.8	3.6	(0.11)	(0.14)
	21.72	21.84	(0.855)	(0.860)
	45.47	45.72	(1.790)	(1.800)
	50.72	50.85	(1.997)	(2.002)
G	55.75	56.00	(2.195)	(2.205)
	3.8	4.0	(0.15)	(0.16)
	53.90	54.02	(2.122)	(2.127)
	2.29	2.54	(0.090)	(0.100)

FIG. A1.2 Test Cup



	mm		(in.)	
	min	max	(min)	(max)
D	12.7	13.5	(0.50)	(0.53)
E	4.8	5.6	(0.19)	(0.22)
F	13.5	14.3	(0.53)	(0.56)
G	23.8	24.6	(0.94)	(0.97)
H	1.2	2.0	(0.05)	(0.08)
I	7.9	...	(0.31)	(...)
J	12.27	12.32	(0.483)	(0.485)
K	16.38	16.64	(0.645)	(0.655)
L	18.65	19.45	(0.734)	(0.766)

FIG. A1.3 Cover Proper

rotates on the axis of the horizontal center of the cover between two stops, so placed, that when in one extreme position, the openings *A*, *B*, and *C* in the cover are completely closed, and when in the other extreme position, these openings are completely opened. The mechanism operating the shutter should be of the spring type and constructed so that when at rest the shutter shall exactly close the three openings. When operated to the other extreme, the three cover openings shall be exactly open and the tip of the exposure tube shall be fully depressed.

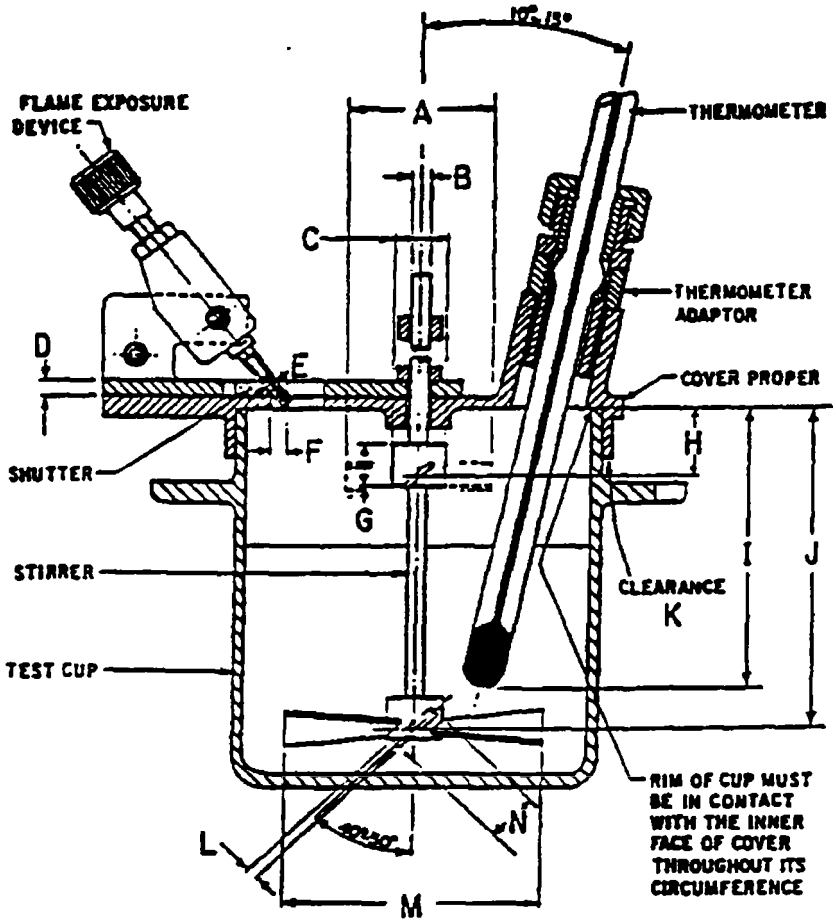
A1.1.2.3 *Flame-Exposure Device*—The flame-exposure device (Fig. A1.4) shall have a tip with an opening 0.69 to 0.79 mm (0.027 to 0.031 in.) in diameter. This tip shall be made preferably of stainless steel, although it may be fabricated of other suitable metals. The flame-exposure device shall be equipped with an operating mechanism which, when the shutter is in the open position, depresses the tip so that the center of the orifice is between the planes of the under and upper surfaces of the cover proper at a point on a radius passing through the center of the larger opening *A* (Fig. A1.3).

A1.1.2.4 *Pilot Flame*—A pilot flame shall be provided for automatic relighting of the exposure flame. A bead 4 mm (5/32 in.) in diameter can be mounted on the cover so that the size of the test flame can be regulated by comparison. The tip

of the pilot flame shall have an opening the same size as the tip of the flame exposure device (0.69 to 0.79 mm (0.027 to 0.031 in.) in diameter).

A1.1.2.5 *Stirring Device*—The cover shall be equipped with a stirring device (Fig. A1.4) mounted in the center of the cover and carrying two 2-bladed metal propellers. In Fig. A1.4 lower propeller is designated by the letters *L*, *M*, and *N*. This propeller shall measure approximately 38 mm from tip to tip, with each of its two blades 8 mm in width with a pitch of 45°. The upper propeller is designated by the letters *A*, *C*, and *G*. This propeller measures approximately 19 mm. tip, each of its two blades is also 8 mm in width wi of 45°. Both propellers are located on the stirrer sha a manner that, when viewed from the bottom of ti the blades of one propeller are at 0 and 180° while the of the other propeller are at 90 and 270°. A stirrer shaft be coupled to the motor by a flexible shaft or a su arrangement of pulleys.

A1.1.2.6 *Stove*—Heat shall be supplied to the cu means of a properly designed stove which is equivalent



	mm		(in.)	
	min	max	(min)	(max)
A	18.3	19.8	(0.72)	(0.78)
B	2.38	3.18	(0.094)	(0.125)
C	7.6	8.4	(0.30)	(0.33)
D	2.0	2.8	(0.08)	(0.11)
E	0.69	0.79	(0.027)	(0.031)
F	2.0	2.8	(0.08)	(0.11)
G	6.4	10.4	(0.25)	(0.41)
H	9.6	11.2	(0.38)	(0.44)
I[A]	43.0	46.0	(1.69)	(1.81)
J	50.0	51.6	(1.97)	(2.03)
K	...	0.36	(...)	(0.014)
L	1.22	2.06	(0.048)	(0.08)
M	31.8	44.4	(1.25)	(1.75)
N	7.6	8.4	(0.30)	(0.33)

[A] Includes tolerance for length of thermometer given in Specification E 1.

FIG. A1.4 Test Cup and Cover Assembly

he stove shall consist of an air bath and a top plate . the flange of the cup rests.

A1.1.2.7 *Air Bath*—The air bath shall have a cylindrical erior and shall conform to the dimensional requirements Fig. A1.1. The air bath may be either a flame or ctrically heated metal casting (A1.1.2.8), or an electric- istance element (A1.1.2.9). In either case, the air bath st be suitable for use at the temperatures to which it will subjected without deformation.

A1.1.2.8 *Heater, Flame or Electric*—If the heating ele- nt is a flame or an electric heater, it shall be so designed d used that the temperatures of the bottom and the walls approximately the same. In order that the air bath ernal surfaces should be at a uniform temperature, it uld not be less than 6.4 mm (¼ in.) in thickness unless the ting element is designed to give equal heat flux densities r all the wall and bottom surfaces.

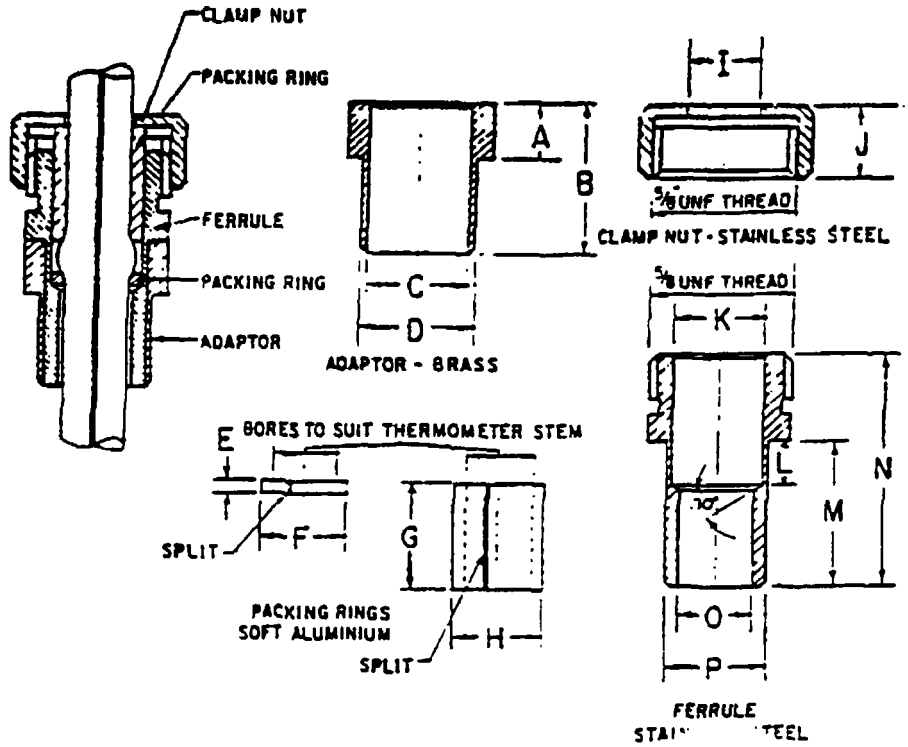
A1.1.2.9 *Heater, Electric Resistance*—If the heater is of the electric resistance type, it shall be constructed so that all parts of the interior surface are heated uniformly. The wall and bottom of the air bath shall not be less than 6.4 mm (¼ in.) in thickness unless the resistance heating elements are distributed over at least 80 % of the wall and all the bottom of the air bath. A heater having such a distribution of the heating elements positioned at least 4.0 mm (5/32 in.) away from the internal surface of the heating unit can be used in conjunction with a minimum thickness of 1.58 mm (1/16 in.) for the wall and bottom of the air bath.

A1.1.2.10 *Top Plate*—The top plate shall be of metal, and shall be mounted with an air gap between it and the air bath. It may be attached to the air bath by means of three screws and spacing bushings. The bushings should be of proper thickness to define an air gap of 4.8 mm (3/16 in.), and they shall be not more than 9.5 mm (⅜ in.) in diameter.

A2. MANUFACTURING STANDARDIZATION OF THERMOMETER AND FERRULE

A2.1 The low-range thermometer, which conforms also to the specification for the cup thermometer in the Tag closed tester (Test Method D 56) and which frequently is fitted with a metal ferrule intended to fit the collar on the cover of the Tag flash tester, can be supplemented by an adapter (Fig. A2.1) to be used in the larger diameter collar of the Pensky-Martens apparatus. Differences in dimen these collars, which do not affect test results, are a sc unnecessary trouble to manufacturers and suppliers c struments, as well as to users.

A2.2 Dimensional requirements are shown in Fig. . Conformity to these requirements is not mandatory, t desirable to users as well as suppliers of Pensky-Ma testers.



	mm			
	[illegible]	max	(min)	(max)
A	6.20	6.50	(0.244)	(0.256)
B	17.0	18.0	(0.67)	(0.71)
C	9.80	9.85	(0.386)	(0.388)
D	12.19	12.24	(0.480)	(0.482)
E	1.40	1.65	(0.055)	(0.065)
F	8.56	8.61	(0.337)	(0.339)
G	[illegible]	[illegible]	(0.49)	(0.57)
H	[illegible]	8.61	(0.337)	(0.339)
I	8.1	8.6	(0.32)	(0.34)
J	9.9	10.7	(0.39)	(0.42)
[illegible]	8.64	8.69	(0.340)	(0.342)
L	5.1	5.6	(0.20)	(0.22)
M	17.0	17.[illegible]	(0.67)	(0.69)
[illegible]	27.4	28	(1.08)	(1.11)
	[illegible]		(0.280)	(0.282)
P	9.73	[illegible]	(0.383)	(0.385)

FIG. A2.1 Dimensions for Thermometer Adapter, Ferrule, and Packing Ring

A3. THERMOMETER SPECIFICATIONS

TABLE A3.1 IP Thermometer Specifications

NOTE—The stem shall be made with an enlargement having a diameter of 1.5 to 2.0 mm greater than the stem and a length of 3 to 5 mm, the bottom of the enlargement being 64 to 66 mm from the bottom of the bulb. These dimensions shall be measured with the test gage shown in Fig. A3.1.

Name	IP 15C	IP 16C	IP 101C
	Pensky-Martens Low	Pensky-Martens High	Pensky-Martens Medium
Range	−5 to +110°C	90 to 370°C	20 to 150°C
Graduation	0.5°C	2°C	1°C
Immersion, mm	57	57	57
Overall length ± 5 mm	280	280 ± 10	280
Stem diameter, mm	6.0 to 7.0	6.0 to 7.0	6.0 to 7.0
Bulb shape	cylindrical	cylindrical	cylindrical
Bulb length, mm	9 to 13	7 to 10	9 to 13
Bulb diameter, mm	not less than 5.5 and not greater than stem	not less than 4.5 and not greater than stem	not less than 5.5 and not greater than stem
Length of graduated portion, mm	140 to 175	143 to 180	140 to 175
Distance bottom of bulb to,	0°C	90°C	20°C
mm	85 to 95	80 to 90	85 to 95
Longer lines at each	1 and 5°C	10 and 20°C	5°C
Figured at each	5°C	20°C	5°C
Expansion chamber	required	required	required
Top finish	ring	ring	ring
Scale error not to exceed ±	0.5°C	1 to 260°C 2°C above 260°C	1°C
See notes	1 and Table A3.3 for emergent stem temperatures	1 and Table A3.3 for emergent stem temperatures	1 and Table A3.3 for emergent stem temperatures

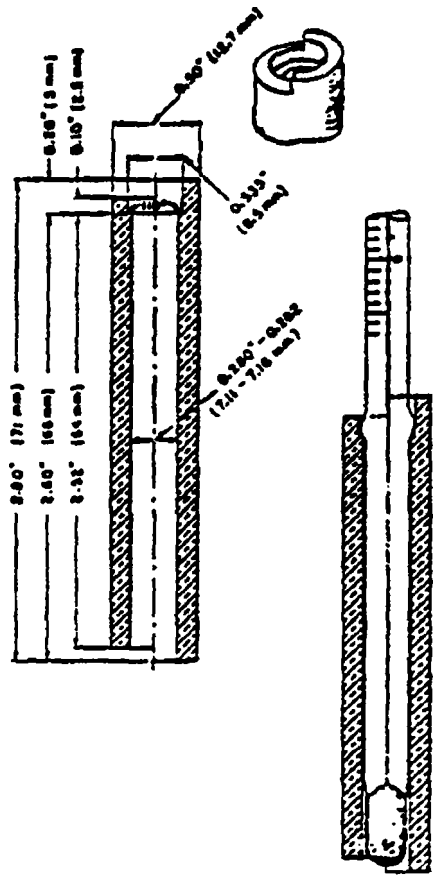
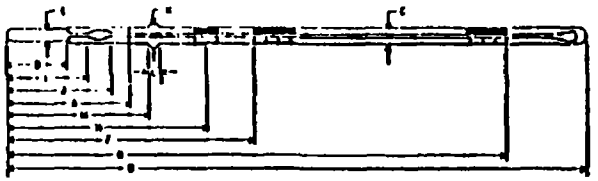


FIG. A3.1 Test Gage for Checking Enlargements on Thermometers

TABLE A3.2 Specifications for ASTM Thermometers
All dimensions are in millimetres.
See Table A3.3 for Standardization Temperature.



ASTM No. and Name	Range	For Test at	Immersion	Graduations: Subdivisions	Graduations: Long Lines at Each	Graduations: Number at Each	Scale Error max	Special Inscription	Expansion Chamber: Permit Heating to	Total Length, ±5 B	Stem OD C	Bulb: Length D	Bulb: OD E	Scale Location: Bottom of Bulb to Line at	Scale Location: Distance F	Scale Location: Bottom of Bulb to Line at	Scale Location: Distance G	Ice Point Scale: Range H	Ice Point Scale: Bottom of Bulb to Ice Point	Contraction Chamber: Distance to Bottom, min I	Contraction Chamber: Distance to Top, max J	Stem Enlargement: OD K	Stem Enlargement: Length L	Stem Enlargement: Distance to Bottom M
9C-62 Pensky-Martens, Low-Range Tag Closed Tester 9F-62	-5 to +110°C (20 to 230°F)		57	0.5°C 1°F	1°C 5°F	5°C 10°F	0.5°C 1°F	ASTM 9C or 9F 57 mm IMM	160°C 320°F	287	6.0 to 7.0	9.0 to 13	> stem	0°C 32°F	85 to 98	100°C 212°F	221 to 237					7.5 to 8.5	2.5 to 5.0[D]	64 to 66
10C-62 Pensky-Martens, High-Range 10F-62	90 to 370°C (200 to 700°F)		57	2°C 5°F	10°C 25°F	20°C 50°F	[A] [B]	ASTM 10C or 10F 57 mm IMM	[C]	287	6.0 to 7.0	8.0 to 10.0	4.5 to 6.0	110°C 230°F	86 to 99	360°C 680°F	227 to 245					7.5 to 8.5	2.5 to 5.0[D]	64 to 66

[A] Scale error: 1°C up to 260°C; 2°C over 260°C.
[B] Scale error: 2.5°F up to 500°F; 3.5°F over 500°F.
[C] An expansion chamber is provided for relief of gas pressure to avoid distortion of the bulb at higher temperatures. It is not for the purpose of joining mercury separations; and under no circumstances should the thermometer be heated above the highest temperature reading.
[D] The length of the enlargement, and the distance from the bottom of the enlargement to the bottom of the bulb shall be measured with the test gage shown in Fig. A3.1.

TABLE A3.3 Standardization Temperatures

NOTE—The emergent column temperatures are those attained when using the thermometers in the test equipment for which the thermometers were originally designed. In [illegible] cases these temperatures are markedly different from those realized during standardization.

Temperature	Average Temperature of Emergent Column	Temperature	Average Temperature of Emergent Column	Temperature	Average Temperature of Emergent Column	Temperature	Average Temperature of Emergent Column
Thermometer 9C (−5 to +100°C)		Thermometer 9F (20 to 230°F)		Thermometer 10C (90 to 370°C)		Thermometer 10F (200 to 700°F)	
0°C	19°C	32°F	66°F	100°C	61°C	212°F	141°F
35°C	28°C	100°F	86°F	200°C	71°C	390°F	159°F
70°C	40°C	160°F	106°F	300°C	87°C	570°F	189°F
105°C	50°C	220°F	123°F	370°C	104°C	700°F	220°F
IP 15C (−7 to 110°C)		IP 15F (20 to 230°F)		IP 16C (90 to 370°C)		IP 16F (20 to 700°F)	
0°C	19°C	32°F	66°F	100°C	61°C	200°F	140°F
20°C	20°C	70°F	70°F	150°C	66°C	300°F	149°F
40°C	31°C	100°F	88°F	200°C	71°C	400°F	160°F
70°C	[illegible]	150°F	104°F	250°C	78°C	500°F	175°F
100°C	48°C	212°F	118°F	300°C	87°C	600°F	199°F
				350°C	99°C	700°F	220°F

TABLE A3.4 Specifications for Medium-Range Pensky-Martens

	ASTM No. 88F (88C) Vegetable Oil Flash Thermometer		
Name		Medium Range Pensky-Martens	
Reference Fig. No.		5	
Range	10–200°C		50–392°F
For test at			
A Immersion, mm		57	
Graduations:			
Subdivisions	0.5°C		1°F
Long lines at each	1°C and 5°C		5°F
Numbers at each	5°C		10°F
Scale error, max	0.5°C		1°F
cal inscription		ASTM 88F(88C) 57 mm IMM	
Expansion chamber:			
Permit heating to	205°C		400°F
B Total length, mm		285 to 295	
C Stem OD, mm		6.0 to 7.0	
D Bulb length, mm		8.0 to 12.0	
E Bulb OD, mm		>4.5 and <stem[A]	
Scale location:			
Bottom of bulb to line at	20°C		68°F
F Distance, mm		80 to 90	
G Length of graduated portion, mm		145 to 160	
Ice-point scale:			
Range			
H Bottom of bulb to ice-point, mm			
Contraction chamber:			
I Distance to bottom, min, mm			
J Distance to top, max, mm			
Stem enlargement:			
K OD, mm		7.5 to 8.5	
L Length, mm		2.5 to 5.0[A]	
M Distance to bottom, mm		64 to 66	

[A] Bulb OD shall be greater than 4.5 mm and less than the outside diameter of the stem (C).

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This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 1916 Race St., Philadelphia, PA 19103.

Designation: D 3278 – 82[ε1]

Standard Test Methods for Flash Point of Liquids by Setaflash Closed-Cup Apparatus[1]

This standard is issued under the fixed designation D 3278; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

These test methods have been approved for use by agencies of the Department of Defense and for listing in the DoD Index of Specifications and Standards.

[ε1] NOTE—The title was changed, Note 3 was added, and Footnote 7 corrected editorially in July 1984.

1. Scope

1.1 These test methods cover the determination of the flash point by Setaflash® Closed-Cup Apparatus, of paints, enamels, lacquers, varnishes, and related products and their components having flash points between 32 and 230°F (0 to 110°C) and a viscosity lower than 150 st at 77°F (25°C).

NOTE 1—Tests at higher or lower temperatures are possible.

NOTE 2—More viscous materials may be tested in accordance with Annex A4.

NOTE 3—Organic peroxides may be tested in accordance with Annex A5.

1.2 The procedures may be used to determine whether a material will or will not flash at a specified temperature or to determine the finite temperature at which a material will flash.

1.3 The results from these test methods are comparable to those obtained by the Tag Closed Tester procedure described in Test Method D 56 and the Pensky-Martens Tester method described in Test Method D 93.[2]

1.4 *This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.*

1.5 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability or regulatory limitations prior to use.*

NOTE 4—These test methods are similar to International Standards ISO 3679, Paints, varnishes, petroleum and related products—Determination of flash point—Rapid equilibrium method and ISO 3680 varnishes, petroleum and related products—Flash/no flash test-Equilibrium method.[3]

2. Referenced Documents

2.1 *ASTM Standards:*

D 56 Test Method for Flash Point by Tag Closed T

D 93 Test Method for Flash Point by Pensky-M Closed Tester[4]

D 850 Test Method for Distillation of Industrial Arc Hydrocarbons and Related Materials[4]

D 1015 Test Method for Freezing Points of High- Hydrocarbons[4]

D 1078 Test Method for Distillation Range of V Organic Liquids[4]

3. Summary of Methods

3.1 By means of a syringe, 2 mL of sample is intro through a leakproof entry port into the tightly Setaflash Tester or directly into the cup that has brought to within 5°F (3°C) below the expected flash As a flash/no flash test, the *expected* flash point tempe may be a specification or other operating requirement temperature of the apparatus is raised to the precise te ature of the expected flash point by slight adjustment temperature dial. After 1 min, a test flame is applied the cup and note is taken as to whether the test spec flashes or not. If a repeat test is necessary, a fresh spec must be used.

3.2 For a finite flash measurement, the temperatu sequentially increased through the anticipated range, th flame being applied at 9°F (5°C) intervals until a fla observed. A true determination is then made using a specimen, starting the test at the temperature of the interval before the flash point of the material and m tests at increasing 1°F (0.5°C) intervals.

4. Apparatus

4.1 *Setaflash Tester*[5], shown in Fig. A1.1, and desc

[1] These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings and Materials and are the direct responsibility of Subcommittee D01.22 on Health and Safety.

Current edition approved Oct. 29, 1982. Published January 1983. Originally published as D 3278 – 73. Last previous edition D 3278 – 78.

[2] The U.S. Department of Transportation has accepted the use of this method as an alternative to either Test Methods D 56 or D 93 for determining the fire hazard classification of liquids.

[3] Available from American National Standards Institute, 1430 Broadway York, NY 10018.

[4] *Annual Book of ASTM Standards*, Vol 06.03.

[5] Unit shown in Fig. A1.1 is manufactured by Stanhope-Seta Ltd., Park Egham, Surrey, England. It is available in the United States from Engineering Corp., P.O. Box 1310, Evanston, IL 60204, or from Paul N. G Co., Station 9, P.O. Box 6633, Fort Lauderdale, FL 33316.

Ann— A1.

4.2 *rmometers*[6], low, medium, high, Setaflash. Test to :ermine that the scale error does not exceed 0.5°F (0.25°C). e use of a magnifying lens significantly assists in making nperature observations.

4.3 *Glass Syringe*, 2 ± 0.1-mL capacity at 77°F (25°C), to ovide a means of taking a uniform specimen. Check the oacity by discharging water into a weighing bottle and ighing. Adjust plunger if necessary. A disposable syringe of ıal precision may be used.

4.4 *Cooling Block*, aluminum (described in Annex A2) :t fits snugly within the test cup for rapid cooling of the nple cup.

4.5 *Barometer*.

Reagents and Materials

5.1 *p-Xylene*[7]—Reference standard for checking the :ıflash tester.

.2 *Cooling Mixture*[8] of ice water or dry ice (solid CO_2) i acetone.

.3 *Liquefied Petroleum Gas*.

.4 *Heat Transfer Paste*.[9]

Sampling

6.1 The specimen size for each test is 2 mL. Obtain at st a 25-mL sample from the bulk source and store in a :rly full tightly closed clean glass container or in other ıtainer suitable for the type of liquid being sampled.

.2 F neously high-flash points may be obtained if :caut are not taken to avoid loss of volatile material. not open sample containers unnecessarily and do not nsfer the specimen to the cup unless its temperature is at st 20°F (10°C) below the expected flash point. Discard nples in leaky containers.

Preparation of Apparatus

7.1 Prior to initial use or after removal of the thermom-:, insert the thermometer into its pocket, Fig. A1.2, with a od heat transfer paste.

7.2 To help in making the necessary settings during a test, ermine the relationship between the temperature control l and thermometer readings at intervals not over 10°F C) throughout the scale range of heater before the initial :.

7.3 Place the tester in a subdued light and in a position :re it is not exposed to disturbing drafts. Provide a ck-coated shield, if necessary.

7.4 Read the manufacturer's operating and maintenance tructions on the care and servicing of the tester. Observe specific suggestions regarding the operation of its various ıtrols.

7.5 Check the accuracy of the tester by determining the sh point of the *p*-xylene reference standard in duplicate ınex A3). The mean of the results should be 81 ± 1.5°F (27.2 ± 0.8°C). If not, remove the thermometer and observe whether sufficient heat transfer paste surrounds the thermometer to provide good heat transfer from the cup to the thermometer.

METHOD A—FLASH/NO FLASH

8. Procedure—Ambient to 230°F (110°C)

8.1 Inspect the inside of the test cup, lid, and shutter mechanism for cleanliness and freedom from contamination. Use an absorbent tissue to wipe clean, if necessary. Lock the cover lid tightly in place.

8.2 Switch the tester on, if not already at stand-by. To rapidly approach the specification flash temperature of the material under test turn the heater dial fully clockwise (Note 5) causing the heater signal (red) light to glow. When the thermometer indicates a temperature of about 5°F (3°C) below the specification or target flash point temperature, reduce the heat input to the test cup by slowly turning the heater control dial counter clockwise until the signal light goes out (Note 6).

NOTE 5—When the correct temperature is dialed on the temperature controller, the elapsed time to reach it may be greater than when turned Full On, but less attention will be required in the intervening period.

NOTE 6—The test cup temperature is stable when the signal light slowly cycles on and off.

8.3 Determine the barometric pressure to determine the corrected specification temperature at that barometric pressure (see 13.2).

8.4 After the test cup temperature has stabilized at the specification or target flash point, charge the syringe with the sample to be tested and transfer the syringe to the filling orifice (Fig. A1.2) taking care not to lose any sample. Discharge the specimen into the test cup by depressing the syringe plunger to its lowest position, then remove the syringe. If the material has a viscosity greater than 45 SUS at 100°F (38°C) or equivalent of 9.5 cSt at 77°F (25.0°C), discharge the contents of the syringe directly into the cup. Immediately close tightly the lid and shutter assembly.

8.5 Set the 1-min timing device by rotating its knob clockwise to the required setting. In the meantime, open the gas control valve and light the pilot and the test flames. Adjust the test flame size with the pinch valve so as to match the size of the 5/32 in. (4-mm) diameter flame gage.

8.6 After 1 min has elapsed, observe the temperature. If at the specification temperature (accounting for the differences of the barometer reading from 760 mm), watch for :: flash (Note 8), apply the test flame by slowly and unif mly opening the slide fully and closing completely over a p riod of approximately 2½ s.

NOTE 7—When inserted, the nozzle of the ignition device shall be 1 ± 1 mm above the underside of the cover.

NOTE 8—The material is considered to have flashed only if a comparatively large blue flame appears and propagates itself over the surface of the liquid. Occasionally, particularly near the actual flash point temperature application of the test flame may give rise to a halo; this should be ignored.

8.7 Turn off the test and the pilot flame. Clean the apparatus in preparation for the next test.

Therm s may be obtained from the suppliers of the Setaflash.

p-xylene available as "Flash Point Check Fluid" from Special Products Div., mical Department, Phillips Petroleum Co., Borger, TX 25303.

Cooling blocks may be obtained from Erdco Engineering Corp, P.O. Box). Evanston, IL 60204.

Heat transfer paste is available from the suppliers of the Setaflash Tester. Dow ning also can supply a similar paste as their No. 340 silicone.

9. Procedure—32°F (0°C) to Ambient

9.1 If the specification or target flash point is at or below ambient temperature, cool the sample to 10 to 20°F (5 to 10°C) below that point by some convenient means.

9.2 Cool the tester to approximately the temperature of the sample by inserting the cooling block (Annex A1.2) filled with a cooling mixture (9.2.1) into the sample well. Dry the cup with a paper tissue to remove any collected moisture prior to adding the specimen.

9.2.1 Caution—Be careful in handling the cooling mixture and cooling block; wear gloves and goggles. Mixtures such as dry ice and acetone can produce severe frost bite. Be careful in inserting the cooling block into the tester cup to prevent damage to the cup.

9.3 Introduce the specimen as in 8.4. Allow the temperature to rise under ambient conditions or increase the temperature of the cup by rotating the heater controller clockwise slowly until the specification temperature adjusted for barometric pressure is reached. Determine whether the material flashes as in 8.5 and 8.6.

9.4 Turn off the test and pilot flames. Clean up the apparatus.

METHOD B—FINITE FLASH POINT

10. Procedure—Ambient to 230°F (110°C)

10.1 *Preliminary or Trial Test*

10.1.1 Follow steps 8.1 to 8.5 omitting the barometric reading and using an estimated finite flash point instead of a specification flash point temperature.

10.1.2 After 1 min has elapsed, observe the temperature, apply the test flame by slowly and uniformly opening the slide fully and closing completely over a period of 2½ s, watching for a flash (Note 8) while the flame is inserted.

10.2 If a flash is observed proceed as in 10.3. If no flash is observed, proceed as in 10.4.

10.3 Using a temperature of 9°F (5°C) lower than the temperature observed in 10.1.2, repeat 10.1 (Note 9). If a flash is still observed, repeat at 9°F (5°C) lower intervals until no flash is observed.

NOTE 9—Never make a repeat test on the same specimen. Always take a fresh portion for each test.

10.3.1 After establishing the approximate flash point repeat 10.1 with a new specimen, but stabilizing the test cup temperature at the temperature at which no flash occurred previously. Observe if a flash occurs at this temperature, if not, increase the temperature at 1°F (0.5°C) intervals by making small incremental adjustment to the temperature controller, and allowing 1 min between each increment and the flash point test. Record the temperature at which the flash actually occurs. Record the barometric pressure. Turn off pilot and test flames and clean up tester.

10.4 Using a test temperature of 9°F (5°C) higher than the temperature observed in 10.2, repeat 10.1 (Note 9). If no flash is observed, repeat at 9°F (5°C) higher intervals until a flash is observed.

10.4.1 Repeat 10.3.1 with a new specimen.

11. Procedure—32°F (0°C) to Ambient Temperature

11.1 *Preliminary or Trial Test:*

11.1.1 Cool the sample to 5 to 10°F (3 to 5°C) bel expected flash point.

11.1.2 Cool the tester to approximately the tempera the sample by inserting the cooling block filled with a c medium, into the sample well (9.2.1).

11.1.3 Insert the specimen as in 8.4. Set the 1-min device. After 1 min, observe the temperature, apply t flame by slowly and uniformly opening the slide full closing completely over a period of 2½ s, watching for (Note 8) while the flame is inserted. Record the tempe

11.2 If a flash is observed, proceed as in 11.3. If no f observed, proceed as in 11.4.

11.3 Take a new specimen and recool the sample 9°F (5°C) below the previous temperature (11.1.3). A min, check for a flash as in 11.1.3. If the material repeat at 9°F (5°C) lower intervals until no flash is ob

11.4 After establishing the approximate flash point 11.1 with a new specimen but stabilizing the te temperature at which no flash occurred previously. O if a flash occurs at this temperature, if not, increa temperature at 1°F (0.5°C) intervals by making small mental adjustments to the temperature controller, allo min between each increment and the flash point test. R the temperature at which the flash actually occurs. R the barometric pressure.

11.5 Using a test temperature of 9°F (5°C) higher th temperature observed in 11.1.3, repeat 11.1.3 (Note 9). flash is observed, repeat at 9°F (5°C) higher intervals flash is observed.

11.5.1 Using a new specimen, follow 11.4 until a occurs.

12. Clean Up of Apparatus and Preparation for Next

12.1 To prepare for the next test, unlock the lid as of the tester and raise to the hinge stop. Soak up liqui an absorbent paper tissue and wipe dry. Clean the und of the lid and filling orifice. A pipe cleaner may assistance in cleaning the orifice.

12.2 If the material is a viscous liquid or contain persed solids, after soaking up most of the specimen small amount of a suitable solvent for the sample to th and then soak up the solvent and wipe clean the in surfaces of the cup with an absorbent tissue paper.

NOTE 10—If necessary to remove residual high boiling residues, moisten tissue with acetone and wipe clean.

NOTE 11—If any further cleaning is necessary, remove the shutter assembly. Disconnect the silicone rubber hose and slide assembly to the right to remove. If warm, handle carefully.

12.3 After the cup has been cleaned, its temperatur be rapidly increased to some stand-by value by turni temperature control dial to an appropriate point.

NOTE 12—It is convenient to hold the test cup at some st temperature (depending on planned usage) to conserve time in b the cup within the test temperature range. The cup temperature quickly lowered by inserting the aluminum cooling block filled appropriate cooling mixture into the cup.

12.4 The syringe is easily cleaned by filling it several with acetone or any compatible solvent, dischargin solvent each time, and allowing the syringe to air dry the plunger removed. Replace the plunger, and pump s times to replace any solvent vapor with air.

13. Correction for Barometric Pressure

13.1 Determine the corrected specification flash point by the following equation:

$$F = S - 0.06\,(760 - P)$$
$$C = S - 0.03\,(760 - P)$$

where:

F, C = flash point to be observed to obtain the specification flash point at standard pressure, and
S = specification flash point.

14. Report

14.1 When using the flash/no flash method, report whether the sample flashed at the required flash point and that Method A was used.

14.2 If an actual flash point was determined, report the mean of duplicate runs to the nearest 1°F (0.5°C) provided the difference between the two values does not exceed 2°F (1°C) and that Method B was used.

15. Precision[10]

15.1 On the basis of an interlaboratory study of this method in which one operator in each of five laboratories made two runs on two different days on four solvents, and three resins and two paints of different flash points the within-laboratory and between-laboratories standard deviations were found to be:

Materials	Standard Deviation	
	Within-Laboratory	Between-Laboratories
Solvents (viscosity below 45 SUS at 100°F)	0.98°F	1.55°F
Resins and paints (viscosity above 45 SUS at 100°F)	1.39	2.41

Based on these standard deviations the following criteria should be used for judging the acceptability of results at the 95 % confidence level:

15.2 Liquids at or below 45 SUS at 100°F or equivalent viscosity:

15.2.1 *Repeatability*—Two results, each the mean of duplicate results, obtained by the same operator on different days should be considered suspect if they differ by more than 3°F (1.7°C).

15.2.2 *Reproducibility*—Two results, each the mean of duplicate results, obtained by operators in different laboratories should be considered suspect if they differ by more than 6°F (3.3°C).

15.3 Viscous liquid above 45 SUS at 100°F or liquids with dispersed solids:

15.3.1 *Repeatability*—Two results, each the mean of duplicate results, obtained by the same operator on different days should be considered suspect if they differ by more than 6°F (3.3°C).

15.3.2 *Reproducibility*—Two results, each the mean of duplicate results, obtained by operators in different laboratories should be considered suspect if they differ by more than 9°F (5°C).

15.4 A study to determine the precision for materials with a viscosity greater than 150 St is underway.

15.5 The precision for liquid peroxides has not been determined; however, it should be similar to that of other liquids.

[10] Supporting data are available on loan from ASTM Headquarters, 1916 Race St., Philadelphia, PA 19103. Request RR: D01-1000. This data is also reported in *Journal of Paint Technology*, Vol 45, No. 581, p. 44.

ANNEXES

(Mandatory Information)

A1. APPARATUS SPECIFICATIONS

A1.1 A typical apparatus is shown in Fig. A1.1 and A1.2. Electrical heaters are fastened to the cup in a way as to provide for efficient transfer of heat. The tester includes a variable heater control device with a scaled dial and a visible signal to indicate when energy is or is not being applied. Energy may be supplied from a 115 or 230-V a-c main service (for stationary use) or by a 12-V d-c battery service (for field use). An adjustable test flame and a pilot flame to maintain the test flame, are provided. These flames may be fueled by piped gas service (fixed location) or by a self-contained tank of liquefied petroleum gas (5.3) (for po
A test flame measuring 5/32 in. (4 mm) in diameter
checked against a gage ring; on the surface of t
Never recharge the gas tank with the pilot or te
lighted, nor in the vicinity of other naked flames.
audible signal is a desirable accessory. The cover is fi
an opening slide device capable of inserting the
flame into the well when the slide is open. When ins
nozzle of the ignition device shall be 1 ± 0.1 mm a
underside of the cover.

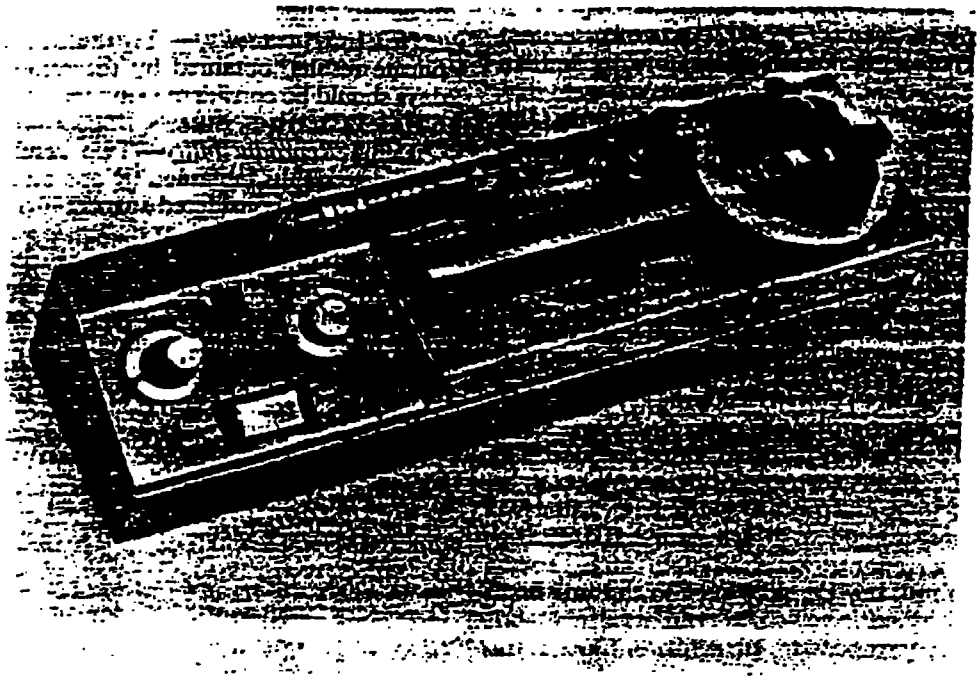
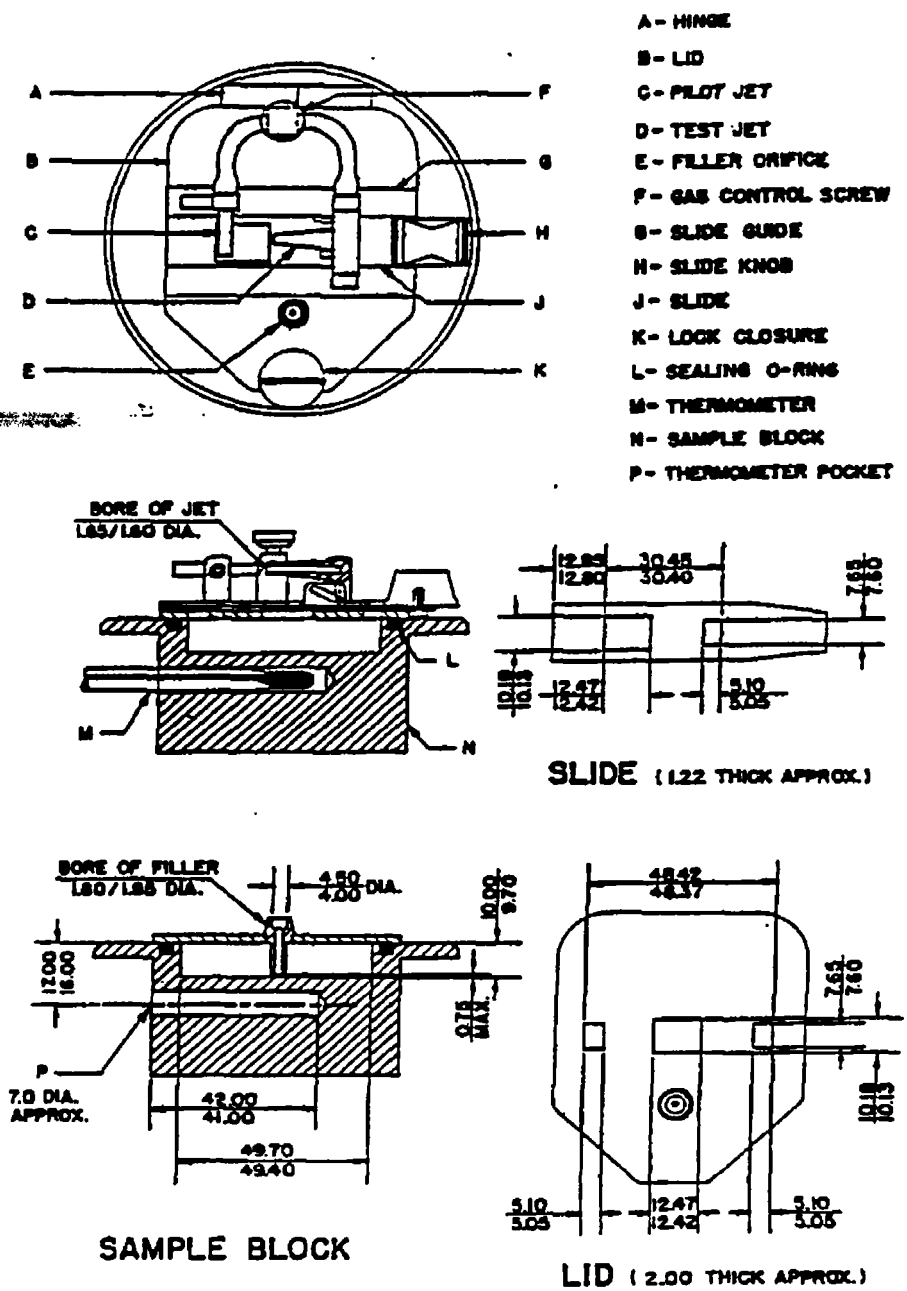


FIG. A1.1 Setaflash Tester



NOTE—All dimensions are in millimetres.

FIG. A1.2 Setaflash Unit

A2. COOLING BLOCK

A2.1 The cooling block with dimensions as shown in Fig. A2.1 is made of aluminum and covered with pipe insu

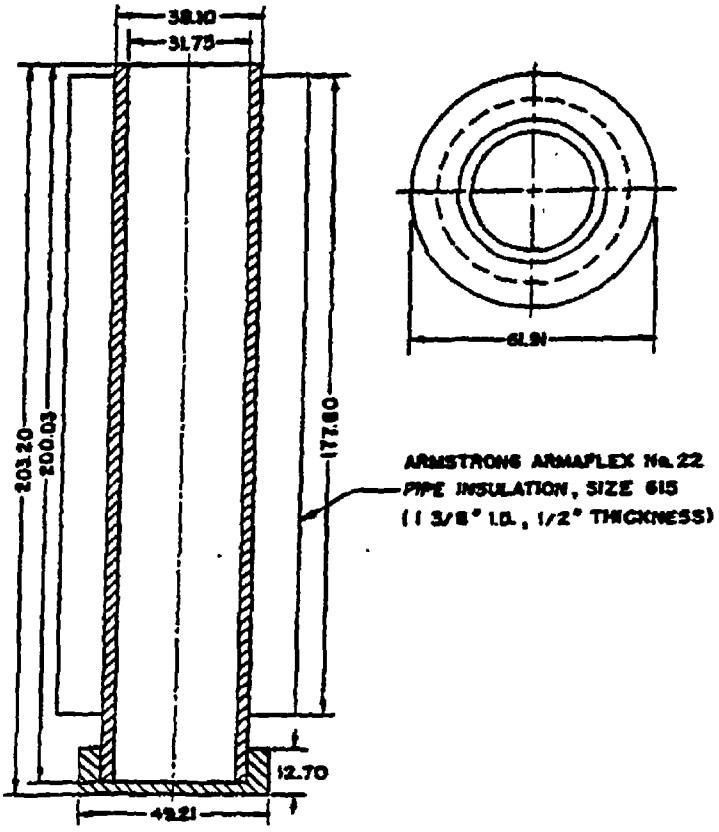


FIG. A2.1 Cooling Block

A3. SPECIFICATIONS FOR *p*-XYLENE REFERENCE STANDARD

A3.1 *Specific Gravity (60/60°F) (15.6/15.6°C)*—0.860 min, 0.866 max.

A3.2 *Boiling Range*—2°C max from start to dry point when tested by Test Method D 850 or Test Method D 1078. The range shall include the boiling point of pure *p*-xy which is 138.35°C (281.03°F).

A3.3 *Freezing Point*—11.23°C min (95 % molal puri determined by Test Method D 1015.

A4. TESTING HIGH-VISCOSITY LIQUIDS

A4.1 High-viscosity materials may be added to the cup by the following procedure:

A4.1.1 *Procedure*—Back load a 5- or 10-mL syringe with the sample to be tested and extrude 4 mL into the cup. Spread the specimen as evenly as possible over the bottom of the cup.

A4.1.2 If the sample cannot be loaded into a syringe and extruded, other means of adding the specimen to the cup may be used such as a spoon. Add approximately 4 mL of material to the spoon and then push the material from the spoon into the cup.

A4.1.3 If the test specimen does not close the sampling port in the cup, seal the cup externally by suitable means.

A4.2 Using Method A (Section 8 or 9) determine whether the material flashes or Method B (Section 10 or 11) determine the flash point of the specimen.

A5. TESTING ORGANIC PEROXIDES

A5.1 Organic peroxides may be tested by Method A or Method B with minor modifications that take into account the hazard potential of these compounds.

A5.1.1 The tester should be located behind a transparent safety shield and fire-resistant gloves should be worn.

A5.1.2 Paragraph 8.1 is followed with the exception that the cover lid is not locked in place. Rather, a spring-wire test tube holder is clamped to the hold-down lock on the lid to provide an extension arm about 5 in. long. A weight of approximately 100 g is hung from the end of the test tube holder. This arrangement adequately seals the tester while allowing venting for a rapidly decomposing peroxide.

A5.1.3 Follow the procedure described in Sections 8 through 11 inclusive. However, when applying the test flame, grasp the slide knob by means of a second test tube holder, pliers, or tongs.

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, 1916 Race St., Philadelphia, PA 19103.

4500-CN K. Spot Test for Sample Screening

1. General Discussion

The spot test procedure allows a quick screening of the sample to establish whether more than 50 µg/L of cyanide amenable to chlorination is present. The test also establishes the presence or absence of cyanogen chloride (CNCl). With practice and dilution, the test reveals the approximate concentration range of these compounds by the color development compared with that of similarly treated standards.

When chloramine-T is added to cyanides amenable to chlorination, CNCl is formed. CNCl forms a red-blue color with the mixed reagent pyridine-barbituric acid. When testing for CNCl omit the chloramine-T addition. (CAUTION: *CNCl is a toxic gas; avoid inhalation.*)

The presence of formaldehyde in excess of 0.5 mg/L interferes with the test. A spot test for the presence of aldehydes and a method for removal of this interference are given in Section 4500-CN.B.3.

Thiocyanate (SCN^-) reacts with chloramine-T, thereby creating a positive interference. The CN^- can be masked with formaldehyde and the sample retested. This makes the spot test specific for SCN^-. In this manner it is possible to determine whether the spot discoloration is due to the presence of CN^-, SCN^-, or both.

2. Apparatus

a. Porcelain spot plate with 6 to 12 cavities.

b. Dropping pipets.

c. Glass stirring rods.

3. Reagents

a. Chloramine-T solution: See Section 4500-CN.E.3*a*.

b. Stock cyanide solution: See Section 4500-CN.E.3*b*.

c. Pyridine-barbituric acid reagent: See Section 4500-CN.E.3*d*.

d. Hydrochloric acid, HCl, 1 + 9.

e. Phenolphthalein indicator aqueous solution.

f. Sodium carbonate, Na_2CO_3, anhydrous.

g. Formaldehyde, 37%, pharmaceutical grade.

4. Procedure

If the solution to be tested has a pH greater than 10, neutralize a 20- to 25-mL portion. Add about 250 mg Na_2CO_3 and swirl to dissolve. Add 1 drop phenolphthalein indicator. Add 1 + 9 HCl dropwise with constant swirling until the solution becomes colorless. Place 3 drops sample and 3 drops distilled water (for blanks) in separate cavities of the spot plate. To each cavity, add 1 drop chloramine-T solution and mix with a clean stirring rod. Add 1 drop pyridine-barbituric acid solution to each cavity and again mix. After 1 min, the sample spot will turn pink to red if 50 µg/L or more of CN^- are present. The blank spot will be faint yellow because of the color of the reagents. Until familiarity with the spot test is gained, use, in place of the water blank, a standard solution containing 50 µg CN^-/L for color comparison. This standard can be made by diluting the stock cyanide solution (¶ 3*b*).

If SCN^- is suspected, test a second sample pretreated as follows: Heat a 20- to 25-mL sample in a water bath at 50°C; add 0.1 mL formaldehyde and hold for 10 min. This treatment will mask up to 5 mg CN^-/L, if present. Repeat spot testing procedure. Color development indicates presence of SCN^-. Comparing color intensity in the two spot tests is useful in judging relative concentration of CN^- and SCN^-. If deep coloration is produced, serial dilution of sample and additional testing may allow closer approximation of the concentrations.

d. *Interference:* All known interferences are eliminated or reduced to a minimum by distillation.

2. Apparatus

Colorimetric equipment: One of the following is required:

a. Spectrophotometer, for use at 578 nm, providing a light path of 10 mm or longer.

b. Filter photometer, providing a light path of at least 10 mm and equipped with a red filter having maximum transmittance at 570 to 580 nm.

3. Reagents

a. Chloramine-T solution: Dissolve 1.0 g white, water-soluble powder in 100 mL water. Prepare weekly and store in refrigerator.

b. Stock cyanide solution: Dissolve approximately 1.6 g NaOH and 2.51 g KCN in 1 L distilled water. (CAUTION—*KCN is highly toxic; avoid contact or inhalation.*) Standardize against standard silver nitrate ($AgNO_3$) titrant as described in Section 4500-CN⁻ D.4, using 25 mL KCN solution. Check titer weekly because the solution gradually loses strength: 1 mL = 1 mg CN^-.

c. Standard cyanide solution: Based on the concentration determined for the KCN stock solution (¶ 3*b*) calculate volume required (approximately 10 mL) to prepare 1 L of a 10 µg CN^-/mL solution. Dilute with the NaOH dilution solution. Dilute 10 mL of the 10 µg CN^-/mL solution to 100 mL with the NaOH dilution solution: 1.0 mL = 1.0 µg CN^-. Prepare fresh daily and keep in a glass-stoppered bottle. (CAUTION—*Toxic: take care to avoid ingestion.*)

d. Pyridine-barbituric acid reagent: Place 15 g barbituric acid in a 250-mL volumetric flask and add just enough water to wash sides of flask and wet barbituric acid. Add 75 mL pyridine and mix. Add 15 mL conc hydrochloric acid (HCl), mix, and cool to room temperature. Dilute to volume and mix until barbituric acid is dissolved. The solution is stable for approximately 6 months if stored in an amber bottle under refrigeration; discard if precipitate develops.

e. Acetate buffer: Dissolve 410 g sodium acetate trihydrate, $NaC_2H_3O_2 \cdot 3H_2O$, in 500 mL of water. Add glacial acetic acid to adjust to pH 4.5, approximately 500 mL.

f. Sodium hydroxide dilution solution: Dissolve 1.6 g NaOH in 1 L distilled water.

4. Procedure

a. Preparation of standard curve: Pipet a series of standards containing 1 to 10 µg CN^- into 50-mL volumetric flasks (0.02 to 0.2 µg CN^-/mL). Dilute to 40 mL with NaOH dilution solution. Use 40 mL of NaOH dilution solution as blank. Develop and measure absorbance in 10-mm cells as described in ¶ *b* for both standards and blank. For concentrations lower than 0.02 µg CN^-/mL use 100-mm cells.

Recheck calibration curve periodically and each time a new reagent is prepared.

Color development: Pipet a portion of absorption solution into a 50-mL volumetric flask and dilute to 40 mL with NaOH dilution solution. Add 1 mL acetate buffer and 2 mL chloramine-T solution, stopper, and mix by inversion twice. Let stand exactly 2 min.

Add 5 mL pyridine-barbituric acid reagent, dilute to volume with distilled water, mix thoroughly, and let stand exactly 8 min. Measure absorbance against distilled water at 578 nm.

Measure absorbance of blank (0.0 mg CN^-/L) using 40 mL NaOH dilution solution and procedures for color development.

5. Calculation

Use the linear regression feature available on most scientific calculators, or compute slope and intercept of standard curve as follows:

$$m = \frac{n \Sigma ca - \Sigma c \Sigma a}{n \Sigma a^2 - (\Sigma a)^2}$$

$$b = \frac{\Sigma a^2 \Sigma c - \Sigma a \Sigma ac}{n \Sigma a^2 - (\Sigma a)^2}$$

where:

a = absorbance of standard solution,
c = concentration of CN^- in standard, mg/L,
n = number of standard solutions,
m = slope of standard curve, and
b = intercept on c axis.

Include the blank concentration, 0.0 mg CN^-/L and blank absorbance in the calculations above.

$$CN^-, \text{ mg/L} = (ma_1 + b) \times \frac{50}{X} \times \frac{250}{Y}$$

where:

X = absorption solution, mL,
Y = original sample, mL, and
a_1 = absorbance of sample solution.

6. Precision and Bias[2]

Based on the results of nine operators in nine laboratories, the overall and single-operator precision of this method within its designated ranges may be expressed as follows:

Reagent water: $S_r = 0.06x + 0.003$
$S_o = 0.11x + 0.010$

Selected water matrices: $S_r = 0.04x + 0.018$
$S_o = 0.04x + 0.008$

where:

S_r = overall precision, mg/L,
S_o = single-operator precision, mg/L, and
x = cyanide concentration, mg/L.

Recoveries of known amounts of cyanide from Type II reagent water and selected water matrices (coke plant and refinery wastes, sewage, and surface water) are:

Medium	Added mg/L	Recovered mg/L	n	S_r	Bias	% Bias
Reagent water	0.060	0.060	26	0.0101	0.000	0
	0.500	0.480	23	0.0258	−0.020	−4
	0.900	0.996	27	0.0669	0.096	
Selected water matrices	0.060	0.060	25	0.0145	0.000	0
	0.500	0.489	26	0.0501	−0.011	−3
	0.900	0.959	24	0.0509	0.059	7

ATTACHMENT C-7

STANDARD OPERATING PROCEDURES - WASTE SAMPLING

Attachment C-7
STANDARD OPERATING PROCEDURE WASTE SAMPLING

This section describes in detail the procedures that are to be followed for sampling.

1. SAFETY CONSIDERATIONS

1) Proper ventilation is provided for the sampling operation.
2) Personnel must wear appropriate personal protective equipment.
3) Any built-up pressure within a container is slowly released by gently cracking the bung.
4) For ignitable or potentially ignitable wastes, proper bonding and grounding is required.

2. SAMPLING EQUIPMENT

Materials and equipment required for sampling are as follows:

1) A suitable sized container/bottle appropriate for the waste.
2) Sample label.
3) Sampling thief (ensure proper dedicated sample thief for wastes reactivity group is selected or is properly decontaminated after each reactivity group).
4) Bung wrench (non-sparking for flammable wastes).
5) Packing slip and chain-of-custody form (for off-site analyses).
6) Four-foot sampling auger (trier) for non-flammables.

3. CONTAINER SAMPLING

3.1 Discrete Liquid Concentrated Waste Samples

The following procedure shall be adhered to during the sampling of individual containers. NOTE; CONTAINERS SHOULD NOT BE OPENED UNTIL THEY ARE READY TO BE SAMPLED TO REDUCE THE VOLITALIZATION OF THE CONTAINERS CONTENTS. IF BUNGS ARE LOOSENED, THEY SHOULD BE PLACED ON TOP OF THE OPENING UNTIL SAMPLING OCCURS AND CLOSED AS SOON AS POSSIBLE THEREAFTER.

Attachment C-7
STANDARD OPERATING PROCEDURE WASTE SAMPLING

1) Remove bung using a bung wrench (non-sparking for flammables). To minimize volitalization of the containers contents, place the bung on the opening of the container until the container is sampled. Once opened the container needs to be sampled and closed within 15 minutes.
2) Slowly insert open thief to the bottom of the container or until a solid layer is encountered.
3) Allow the waste in the container to reach its natural level in the thief.
4) Cap the thief.
5) Carefully remove the thief from the container.
6) If this is the initial sample using a dedicated thief or a decontainated theif, release the liquid back into drum 3 times prior to actual sample collection to reduce potential for minor cross-contamination.
7) Transfer liquid into an inert container. Repeat process for other containers in composite sample trying to obtain equal volumes from each container.
7) Gently pour appropriate sample volume into sample jar.
8) Label sample.

3.2 Discrete Solid Waste Samples

The following procedures shall be adhered to during the sampling of individual containers.

1) Remove bung or container lid, as applicable.
2) Advance sample auger through entire container.
3) Carefully remove sampler.
4) Place composite solid waste sample into sample jar.
5) Label sample.

4. LIMITATIONS

1) Extremely hard solid wastes may require alternate sampling method.
2) Viscous liquids may adhere to exterior of thief.

ATTACHMENT C-8

LAB ANALYSIS FORMS

Detroit Check-In Sheet

Waste Stream Fingerprint	Physical State:	
Layers:	Specific Gravity:	Color
Total Solids:	pH Range	Appearance:
Suspended Solids:	Odor:	

21-Jul-10

Date Approved:

Detrex Profile #: **Generator Approval #:**

Generator: **Manifest #:** **Sample #:** **Reactivity Code:**

Drum #	Drum Weight	SG	Flam	pH	H2O RXN	Cynide	Inches of Water	Inches of Solid	Color	Odor	Visual Insp	Phs. State
Type of Waste:												
02 -												

EXAMPLE

NA - NOTAPPLICABLE
X - NOT REQUIRED
P - PASS
F - FAIL

SECTION D

PROCESS INFORMATION

TABLE OF CONTENTS

Page

Contents

PROCESS INFORMATION 3
D-1 CONTAINERS 4
D-1a CONTAINERS WITH FREE LIQUIDS 5
D-1a(1) Description of Containers 5
D-1a(2) Container Management Practices [40 CFR 264.173] 5
D-1a(3) Secondary Containment System Design and Operation 8
D-1a(3)(a) Requirement for the Base or Liner to Contain Liquids 9
D-1a(3)(b) Containment System Drainage 9
D-1a(3)(c) Containment System Capacity 10
D-1a(3)(d) Control of Run-on 10
D-1a(3)(e) Removal of Liquids from Containment System 10
D-1b CONTAINERS WITHOUT FREE LIQUIDS 11
D-1b(1) Test for Free Liquids 11
D-1b(2) Description of Containers 11
D-1b(3) Container Management Practices 11
D-1b(4) Container Storage Area Drainage 12
D-1c SUBPART CC [40 CFR 264.1086] 12
D-2 TANK SYSTEMS 12
D-3 MANIFEST SYSTEM & REPORTING 13
D-4 RECORD KEEPING 13
D-5 REPORTING 14
D-5a Biennial Report 14
D-5b Unmanifested Waste Report 15
D-6 LOCATION STANDARDS 15
D-7 FACILITY DESIGN AND OPERATING STANDARDS 15

ATTACHMENTS

ATTACHMENT D-1 FACILITY PLAN
ATTACHMENT D-2 TYPICAL HAZARDOUS WASTE CONTAINER MARKING
ATTACHMENT D-3 DESIGN DRAWINGS OF STRUCTURAL RENOVATIONS
ATTACHMENT D-4 COATING SPECIFICATIONS AND MANUFACTURERS APPLICABILITY DETERMINATION
ATTACHMENT D-5 SECONDARY CONTAINMENT VOLUME CALCULATIONS
ATTACHMENT D-6 AIR EMISSION STANDARDS (SUBPART CC)

SECTION D

PROCESS INFORMATION

The hazardous waste management operations at this Detrex Corporation Facility (Facility) will involve container storage (process code S01).

The curbing which already exists at the Facility will provide separate secondary containment for each of the hazardous waste container storage areas and the primary staging/storage area. Attachment D-1 presents an existing Facility plan showing the locations of the container storage areas. .

Attachment D-3 presents a set of drawings, which detail the secondary containment structures existing at the Facility.

D-1 CONTAINERS
[40 CFR 270.15, 264.170 THROUGH 264.178]

Hazardous wastes (wastes) are received at the Facility in Department of Transportation (DOT) approved shipping containers ranging in size from one (1) to 550 gallons. Before scheduling any pickup of Wastes from generators, Facility Personnel will verify the amount of waste currently on hand to determine if the Facility has the necessary capacity to accept the wastes. This may be done via a visual inspection or by a container tracking system. In cases where the potential exists for total capacity to exceed the 13,750 gallons total allowable storage/staging of hazardous waste, arrangements will be made to ship waste off site to allow for acceptance of the new wastes.

Containers, upon their arrival at the Facility, will initially be placed in a staging area for sampling, screened in accordance with the Waste Analysis Plan (WAP - Section C), and then transferred to the appropriate hazardous waste container storage area once they have passed analysis. The transporter will remain on-site until the screening is complete and a signed copy of the manifest is provided to the transporter.

Prior to transferring containers from a transport truck to the staging area, the compatibility groups associated with each container of waste will be reviewed with any containerized waste already present in the area to ensure potentially incompatibilities do NOT exist. Facility personnel will use the compatibility chart found in Attachment F-2 to verify compatibility. Once screening is complete and the containers have been approved, they will be moved to a storage area with compatible wastes. The locations of the container storage areas and the staging area are shown on the Facility plan provided in Attachment D-1.

The procedure noted above, and detailed in Section F-5b & F-5d, is designed to preclude the need for having designated storage areas. This review will include all chemicals (including products and non-hazardous wastes) stored in the same secondary containment area.

To address concerns regarding a failed container squirting material into an adjacent storage area, the placement of waste within a given storage area (7, 8 & 9) has been adjusted to allow at least 3 feet between the edge of adjacent hazardous waste storage areas,

B Past experience has shown failed containers holding free liquids are not able to project liquids if there is minor damage to the container. This is because closed containers that fail below the liquid line rapidly develop a vacuum as liquids leave the container while, leaks that occur near the liquid / air interface of a container lack the necessary head pressure to project any distance. Therefore in a worst case scenario, only an initial projection would occur followed by weeping since the container needs to take in air. For larger holes, the liquid would flow (gurgle) out without projecting.

The Facility is complying with the requirements of Subpart CC regarding container closures and meeting the requirement for initial inspection of containers. The daily inspection form will be

used to denote any containers that fail the inspection required upon initially accepting the container.

D-1A CONTAINERS WITH FREE LIQUIDS

D-1a(1) Description of Containers [40 CFR 264.171, 264.172, 270.14 (b)(2)]

The Facility only accepts and utilizes DOT-approved containers (49 CFR 178 Subparts D and H) for shipment and storage of hazardous waste. For a DOT-approved container to be accepted by the Facility, it must meet the following conditions:

1. The container must not have any leaks;
2. The container must not have excessive corrosion or rust buildup which could, upon handling, result in leakage;
3. The container MUST NOT be excessively dented such that the usable volume is significantly less than its DOT description (e.g. 55 gallons for drums, up to 550 gallons for totes, etc.);
4. The container must be properly sealed with a suitable bung and gasket; and
5. The container must be properly marked, labeled and manifested (according to Rule 299.9609).

In the event that an unsuitable container is received at the Facility, based upon the above criteria, the container may be accepted if it is over-packed or other precautionary measures are implemented (e.g., contents transferred to a suitable DOT approved container). Over-packing involves the placing of the unsuitable container, with its contents, into a larger DOT-approved container that is suitable for that particular waste. For example, a 55-gallon drum may be over-packed into a 75 or 85-gallon over-pack drum by lifting the 55-gallon drum via a forklift equipped with a sling or grappler and placing the drum into the over-pack container.

Containers with no free liquids are handled in the same fashion as those that contain free liquids.

D-1a(2) Container Management Practices [40 CFR 264.173]

To ensure there is no spillage of hazardous waste during shipment from a generator's facility, each container must meet the requirements specified previously in Section D-1a(1).

The type of container the material will be shipped in will be as directed by the DOT (outlined in 49 CFR § 172, 173 and 178). Facility Personnel have access to the regulations,

which specify the type of container that may be used, via hard copies maintained at the site and through the internet at http://www.access.gpo.gov/nara/cfr/cfr-table-search.html.

All containers will remain tightly sealed while in the staging or storage areas and will only be opened when the waste material is to be sampled or transferred. For safety reasons sampling or transferring wastes in or out of a container will not occur while containers are stacked.

When containerized wastes are received at the Facility, they will be initially placed in the waste container staging area (Area 6 - see Attachment D-1). Containerized wastes will be sampled and analyzed according to the procedures discussed in Section C. Once the waste passes screening, the material will be moved to a suitable storage area. Containers holding wastes that may not be compatible with each other will not be stored in the same container storage area. For storage area number 11, the staging area will be the transport vehicle itself. Containers will be placed at the end of the trailer and sampled. All other aspects of the screening process discussed in section C are applicable.

The following procedures will be followed to ensure that only compatible wastes will be stored/staged in any area of the Facility:

1. All waste shipments to the Facility will be scheduled prior to receipt of the shipment;
2. Per DOT compatibility shipping requirements, only compatible wastes will be scheduled to be received at the same time; and
3. The wastes will be evaluated in the staging area (see Attachment D-1 segregated according to EPA compatibility (see Section F) with compatible wastes, and then transferred to the appropriate hazardous waste container storage area within the Facility.

Containers may be handled within the building using a forklift or a hand drum truck. Containers being moved will always have properly secured lids and bungs, and care will be taken during the handling operations to protect against accidental damage to a container that could result in leakage or spillage while stored at the Facility. Should a container incur a breach of integrity, its contents will be transferred to a DOT approved container or over-pack container.

Storage of non-bulk containers (capacity less than or equal to 119 gallons, as defined by the DOT), such as 55-gallon drums, will depend on the size and quantity of the containers. Small containers, such as a 5-gallon pail, may be stacked on top of each other (to a height less than or equal to that of a 55-gallon drum) and then placed on top of a pallet of drums or on another pallet of similar containers. Bulk DOT containers stored in the container storage area are typically designed with skid mounts to ease in their movement and stacking. As such, their handling will not create any problems.

All containers will be stored such that the markings and labels are visible from the aisle. A minimum aisle space of 24 inches will be maintained in Container Storage Areas. Non-Bulk containers in these areas may be stacked to a maximum of two layers high. It is noted

that larger portable tank containers (i.e., totes up to 550-gallons) will not be placed on pallets since the container is constructed with support legs, which allow direct inspection for potential leaks. Only similar sized containers will be placed on the same pallet to ensure the stability when there is an overlying pallet. The inspection of the bulk and non-bulk DOT containers for deterioration such as leaks is discussed in detail in Section F-2.

In area 11, the containment trailers, the containers will be placed such that there will be two rows. One row is approximately 48 inches and will allow for two drums or one tote, while the other row will be limited to a single row of drums. If pails are stored on the trailer, they may be stacked two high.

The following procedures are followed whenever the Facility is receiving and/or transporting hazardous wastes:

1. Only accept waste types identified in Section C for storage within the Facility;
2. Compare information on the manifest to the profile sheet and LDRF on file. If discrepancies exist, waste will not be accepted until all discrepancies are resolved;
3. Verify the amount of waste on the manifest coincides with the amount of waste received (based on volume or weight);
4. Shipments are recorded in the Facility Operating Log upon receipt at the Facility;
5. Containers are placed in the staging area;
6. the containers are sampled according to the procedures outlined in Section C-2d. Once the required screening analysis indicates the wastes are acceptable, the manifest is signed and a copy is given to the transporter in accordance with the regulations as found under 49 CFR § 172.205(d)(2) and (e)(1);

   In the event the screening process determines that the material is not acceptable, the manifest will not be signed and the generator will be contacted. Based on information obtained from the generator, the Facility may direct the waste back to the generator or ship the waste material to an alternate permitted facility. In either case, shipment of the waste will be handled in accordance with manifesting requirements as defined by MDENR, 49 CFR 172.205, and if more stringent, the rejection requirements of other states. A discrepancy will be noted in the discrepancy section of the manifest, indicating the reason for rejection.

   If the waste is determined to be acceptable under the screening process, the generator will be forwarded a copy of the manifest within 30 days and a copy will be retained at the Facility for a period of at least 3 years.
7. The accepted container will be moved into an area with compatible materials.
8. Once the manifest is signed, indicating the screening of the waste has been completed, the transporter is released.

Hazardous waste containers are distinguished from virgin product containers by proper marking and labeling. Attachment D-2 provides a typical hazardous waste drum marking. Hazardous waste containers will be marked to identify their contents and to ensure that compatible wastes are stored in the appropriate areas.

D-1a(3) Secondary Containment System Design and Operation
[40 CFR 270.15(a)(1), 264.175(a), 264.175(d)]

The secondary containment system consists of:

1. Three separate interior container storage areas;
2. Containment trailers for storing flammable wastes; and
3. the loading/unloading area.

The interior secondary containment system consists of a concrete slab and curbing. For hazardous waste storage areas 7, 8 & 9, movement of the containers within these areas will be accomplished in one of two ways; via portable ramps (as shown in Attachment D-3) to allow the lift truck to move containers over the secondary containment curbing, or lowering a pallet of containers into an empty pallet within the storage area and subsequently moving it with a pallet jack . . The curbing will be coated/sealed on the sides and top with a material compatible with the wastes that may be potentially stored there. Cross-sectional details of the interior secondary containment systems, concrete dikes, are provided in Attachment D-3.

The Facility's maximum waste capacity is 13,750 gallons for storage areas 6, 7, 8, 9 and 11. Listed below are the maximum amounts of waste that may be stored in any one-container storage area at any given time.:

Container Storage Area #7	3,520 gallons	(64 x 55-gallon drums)
Container Storage Area #8	3,520 gallons	(64 x 55-gallon drums)
Container Storage Area #9	5, 830 gallons	(106 x 55-gallon drums)
Container storage area 6	550 gallons	(10 drums)
Container Storage Area #11	7,040 gallons	(128 x 55-gallon drums)

The design capacities are based upon 55-gallon drums, although totes up to 550-gallons may also be stored. A four-drum pallet measures 4 feet by 4 feet, which has the approximate dimension of a tote. Other sized containers or totes may be stored within any of the container storage areas, however the maximum capacity may not be exceeded.

To allow for flexibility, a variable storage capacity is used. Under this scenario, the amount of material that may be stored in any storage area is limited to its maximum storage as stated above, or that amount necessary to prevent the Facility from exceeding its maximum

allowable storage of 13,750-gallons. As an example, if 64 drums were stored in area 7, the Facility's remaining storage capacity would be 10,320 gallons for storage areas 6, 8, 9 & 11.

There are no floor drains in any of the secondary containment areas. In the event of damage to the curbing, any cracks or gaps will be cleaned out and repaired with the selected compatible, chemically resistant sealant/coating.Engineering evaluations of the secondary containment for the Facility are presented in Attachment D-3. Included in Attachment D-3 is the engineering evaluation of the current containment system, specifiying that it is in good structural shape and does not have any cracks or gaps. The second evaluation is related to the 1992 consruction associated with the extension of the loading and unloading area.

D-1a(3)(a) Requirement for the Base or Liner to Contain Liquids
[40 CFR 264.175(b)(1)]

Secondary containment structures designed to hold liquids, are treated (the floor and curbing) with a coating, or a sealent designed to penetrate the concrete. The specifications for two such products ICO Super Guard and Xypex, ,are provided in Attachment D-4. Both products will provide containment for the constituents being stored for at least 24 hours.

Xypex is a unique product in that it is NOT a coating. Xypex works by penetrating the concrete to a depth of about 2 inches, forming a crystalline structure that prevents the migration of liquids. This product was chosen to replace the coating in container storage area 9, as its ability to provide protection continues even if the surface is damaged. The benefit of this material, unlike coatings when they delaminate, is that protection continues even if the surface is damaged.

Xypex does have one limitation, due to its chemical structure, it will not stand up to high or low pH conditions. As such, container storage area 9 will not be used for any wastes with pH values higher than 10 or lower than 4. Wastes with high or low pH values will be stored in container storage areas 7, 8 or 11 as appropriate.

D-1a(3)(b) Containment System Drainage
[40 CFR 270.15(a)(2), 264.175(b)(2)]

Since there is no secondary containment drainage system, spills will be removed as described in paragraph D-1a(3)(e) as soon as practical after discovery.

In order to prevent direct contact between containerized hazardous wastes and standing liquids, the lower level of containers are placed on pallets to elevate them off the floor.

D-1a(3)(c) Containment System Capacity
[40 CFR 270.15(a)(3), 264.175(b)(3)]

The calculations and volumes for each secondary containment area are provided in Attachment D-5. The largest DOT container to be stored in any one of the container storage areas is a 550-gallon steel tote.

The hazardous waste secondary containment systems as shown in Attachment D-1 provide the following secondary containment capacities:

Containment Storage Area #7:	17.3% of total volume (3,520 gallons) 110.6 % of largest container (550-gallon tote)
Containment Storage Area #8:	17.3 % of total volume (3,520gallons) 110.6 % of largest container (550-gallon-tote)
Containment Storage Area #9:	35.7 % of total volume (5,830 gallons) 372.4 % of largest container (550-gallon tote)
Containment area #6	25% (based on secondary containment pallet design)
Containment Storage Area # 11	11.2 % of total volume (3,520 gallons x 2) 97 % of largest container (550 gallon-tote)

Therefore, the minimum secondary containment capacity requirement (i.e., 100 percent of largest container or 10 percent of total volume) is satisfied for the waste storage capacity for each of the secondary containment areas.

D-1a(3)(d) Control of Run-on
[40 CFR 270.15(a)(4), 264.175(b)(4)]

Run-on into the interior secondary containment system is eliminated by the building structure and by secondary containment structures. The Facility is NOT located within the 100-year Flood Plain. Thus, run-on cannot enter the hazardous waste containment storage areas or the staging area as a result of normal precipitation or flooding.

Run-on protection is provided in container area number 11 by the trailer itself. The trailer is elevated approximately 4 feet off of the ground and as such there is no chance for flooding from precipitation.

D-1a(3)(e) Removal of Liquids from Containment System
[40 CFR 270.15(a)(5), 264.175(b)(5)]

The composition of a spilled material is easily determined since all containers are marked and labeled to indicate their contents. If an inspection of a spill area does not clearly define the source of the spilled material, the containers can be further examined to determine if

any container has less than its expected volume. If the visual examination does not identify the source of the release, a sample of the material will be obtained when sufficient volume exists. The containers may also be moved within the container storage areas to provide better visual inspection and room to facilitate the cleanup.

The containers within the secondary containment areas are separated by adequate aisle space to allow for routine inspection. Therefore, minor leaks or spills are easily detected and removed with absorbent material or other suitable methods, for subsequent disposal at a permitted facility. Section G-4e of the Contingency Plan provides further details of the procedures to be followed to clean spilled materials. In the unlikely event that the spill cannot be controlled in this manner, the procedures listed in the Contingency Plan would be implemented. It is considered very unlikely that spilled material will overtop a secondary containment area based on the secondary containment volumes provided (see Section D-1a(3)(c)). All spills will be cleaned up by Facility personnel within 24 hours of discovery, wherever possible. Outside independent agencies/contractors may be used as deemed necessary by the Emergency Coordinator.

D-1B CONTAINERS WITHOUT FREE LIQUIDS

Most of the wastes to be stored at the Facility are liquid wastes. Solid wastes may also be accepted for storage or solids may be present with liquids inside waste containers (i.e., sludge).

Screening procedures for solid wastes are described in Section C-2. In the event visual evidence during sampling indicates the potential presence of free liquids within a container designated as a solid waste, a paint filter test may be conducted.

D-1b(1) Test for Free Liquids
[40 CFR 270.15(b)(1)]

A paint filter test may be conducted on any wastes, which are to be accepted by the Facility and managed as "containers without free liquids".

D-1b(2) Description of Containers
[40 CFR 264.171, 264.172]

DOT-approved containers identified in Section D-1a(1) will be utilized for shipments of hazardous waste.

D-1b(3) Container Management Practices
[40 CFR 264.173]

The containers will be managed in the same manner as described in Section D-1a(2).

D-1b(4) Container Storage Area Drainage
[40 CFR 270.15(b)(2), 264.175(c)]

All container storage areas are enclosed within a single building or within the containment trailer. In addition, the procedures documented in Section D-1a(3)(b) are in place to insure containers are properly elevated except within the containment trailer.

D-1C SUBPART CC [40 CFR 264.1086]

The Facility only accepts wastes in DOT approved containers, and as such,meets the requirements for level 1 and level 2 controls. Facility personnel inspect each container upon its arrival at the Facility to insure its structural integrity. The containers are also inspected daily for signs of leaks or deterioration and to ensure the containers are properly marked and labeled. Since the Facility does not hold containers longer than one year there is no need for subsequent re-verification.

If during the daily inspection of the containers, one is found to be in a condition likely to allow hazardous wastes to be released from the container, Facility personnel will will make note of the finding in the inspectionlog, make the first attempt at repairing the container within 24 hours of its discovery, transfer the contents to another compatible container, or over-pack the container. All attempts at repair or transfer will be completed within 5 days of initial discovery.

Typically, the Facility deals with hazardous wastes containing Volatile Organic Compounds (VOC) greater than 500-ppmbw concentration (at the point of generation). This is documented in the Profile Sheet completed by the generator prior to accepting the waste. In the event that the generator denotes that a hazardous waste contains less than 500 ppm VOC (at the point of origin), or the generator states that they have treated the waste, the generator will be requested to provide information of meeting the 500 ppmbw level or that they have properly treated the waste as required under 40 CFR 264.1083(b) Waste Determination Procedures For Treated Hazardous Waste.

Attachment D-6 provides a detailed outline of the procedures followed by the facility to comply with subpart CC requirements.

D-2 TANK SYSTEMS
[40 CFR 270.16; 264.191 through 264.194]

This section is not applicable as the Facility does not operate hazardous waste storage tanks.

D-3 MANIFEST SYSTEM & REPORTING
[299.9608 & 299.9610]

The Facility accepts only properly manifested hazardous wastes for storage .

Upon receipt of a hazardous waste shipment at the Facility, the following procedures are followed:

1) The waste shipment paperwork (including manifest and land ban notification) are reviewed for completeness;
2) The wastes are sampled, in accordance with the WAP;
3) Waste screening is conducted to confirm the acceptability of the waste material;
4) Upon approval, the manifest is signed and dated;
5) the TSDF copy is retained, and the transporter is provided their copy of the manifest;
6) Within 30 days, a signed copy of the manifest is returned to the original generator; and
7) A copy of each manifest and LBDF is maintained at the Facility for a period of at least three years.

Any discrepancies found in the manifest are appropriately noted as are steps taken to reconcile the discrepancy with the original waste generator. In the event a discrepancy cannot be resolved within 15 days,a letter will submit to the director describing the discrepancy, attempts to reconcile it, and a copy of the manifest.

D-4 RECORD KEEPING
[299.9609]

The Facility maintains an operating record within the office. This operating record includes a copy of the Operating License and Application and related correspondence. The operating record, including the information described below, will be maintained until closure of the Facility.

The operating record includes at a minimum the following:

1) A description and quantity of all wastes received for container storage, including cross-reference to appropriate manifest document number and dates of receipt;
2) A copy of all manifests signed by the Facility, LBDFs, and results of all waste analyses conducted including preliminary characterization, waste screening and annual waste re-characterization for at least 3 years;

3) Copies of the Contingency Plan, acknowledgment agreements, and all required reports from the implementation of the Contingency Plan;
4) Inspection reports - maintained on file for at least 3 years;
5) A record of any waste shipments rejected by the Facility;
6) Personnel training records for all former employers for at least 3 years after employment ends and all past records for current employees until closure;
7) A copy of the most recent closure cost estimate and a copy of financial assurance for closure;
8) Any related correspondence or reports submitted to, or received from, the Director relating to the TSDF operation; and
9) All monitoring, testing, or analytical data required by the operating license and notices to generators referenced in 40 CFR §264.12(b) will be maintained until closure.

D-5 REPORTING

All required reports are prepared and submitted by Detrex Corporation. All reports will be signed and certified in accordance with the provisions of 40 CFR §270.11.

D-5A BIENNIAL REPORT

a biennial report is submitted by March 1 of each even numbered year to the Director of the Department. The report will be submitted on a form required and approved by the MDENR and provide all information required on the form.

This information may include:

1) The EPA identification number, name, and address of the Facility;
2) The calendar year covered by the report;
3) A listing of EPA identification numbers for each hazardous waste generator from which wastes were received and for imported shipments, if any, the name and address of the foreign generator;
4) A description and quantity of each hazardous waste received during the year including EPA identification number of the generator;
5) The method of storage (i.e. container) for each hazardous waste; and
6) The most recent closure cost estimate under R 299.9702.

D-5B UNMANIFESTED WASTE REPORT

Regulated wastes that are not properly manifested are not accepted at the Facility. Should unmanifested waste be sent to the Facility, the Facility will contact the generator to obtain a manifest when the material has already been profiled, or reject the material as noted in the WAP. Since unmanifested waste is not accepted, a report is not required. .

D-6 LOCATION STANDARDS [R299.9603]

Since the TSDF for which this Operating License Application is an existing facility, and there are no new regulated treatment, storage, or disposal facilities, expansions or enlargements, the location standards do not apply.

the Facility is not located in the vicinity of a fault, a floodway, a coastal area, nor over a sole-source aquifer, or near a public water supply. The waste management area is located approximately 75 feet from the nearest property line (to the north), however it is over 130 feet to the nearest building (to the east). Based on the operation at the Eaton Avenue Facility, this is considered an adequate separation distance.

D-7 FACILITY DESIGN AND OPERATING STANDARDS [R299.9604]

The Facility is an existing TSDF and should therefore be exempt from the requirements of this rule.

Hazardous waste container storage areas 7, 8, & 9 are located within an enclosed building provided with adequate secondary containment. Containment area 11 is enclosed within trailers that provide secondary containment. These vehicles are located in a fenced area that is locked except when moving vehicles in or out of the area. Thus, run-on and run-off management systems are not required for the regulated units. Additionally, the outdoor loading/unloading area secondary containment system has been designed for the 24-hour 100-year rainfall event.

The Facility has been designed and is operated to prevent hazardous waste and hazardous waste constituents from escaping into the soil, surface water, groundwater, drains or sewers.

ATTACHMENT D-1

FACILITY PLAN

"I, Vicki R. Garon, inspected container storage areas 6, 7, 8, and 9 at Detrex Corporation's (Detrex) facility located at 12886 Eaton Avenue, Detroit, Michigan on December 14, 2010. Based on my inspection, the referenced container storage areas appear constructed in accordance with the approved plans and specifications shown in attachment D-1, D-3 (figures D-3.1, D-3.2, and D3.3) and E-2 in Detrex's August 2010 Hazardous Waste Management Facility Operating License Application (Application); are free of any cracks or gaps in the concrete; have been sealed (area 9), coated (areas 7 and 8), or are provided with intact secondary containment devices (area 6) to prevent migrations of liquids. Proper aisle spacing has been provided by painting lines on the floor in storage areas 7, 8 and 9. I have also reviewed the outside loading and unloading areas associated with Attachment E-5 and have found them to be in structurally sound condition.

Based on my inspection of container storage areas 6, 7, 8, and 9, the loading and unloading areas, and associated documentation, I certify the Detrex facility is capable of storing hazardous waste containers in compliance with its operating license application and Part 111.

I certify under penalty of law that this document was 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.

Vicki R. Garon

Dated: August 19, 2011

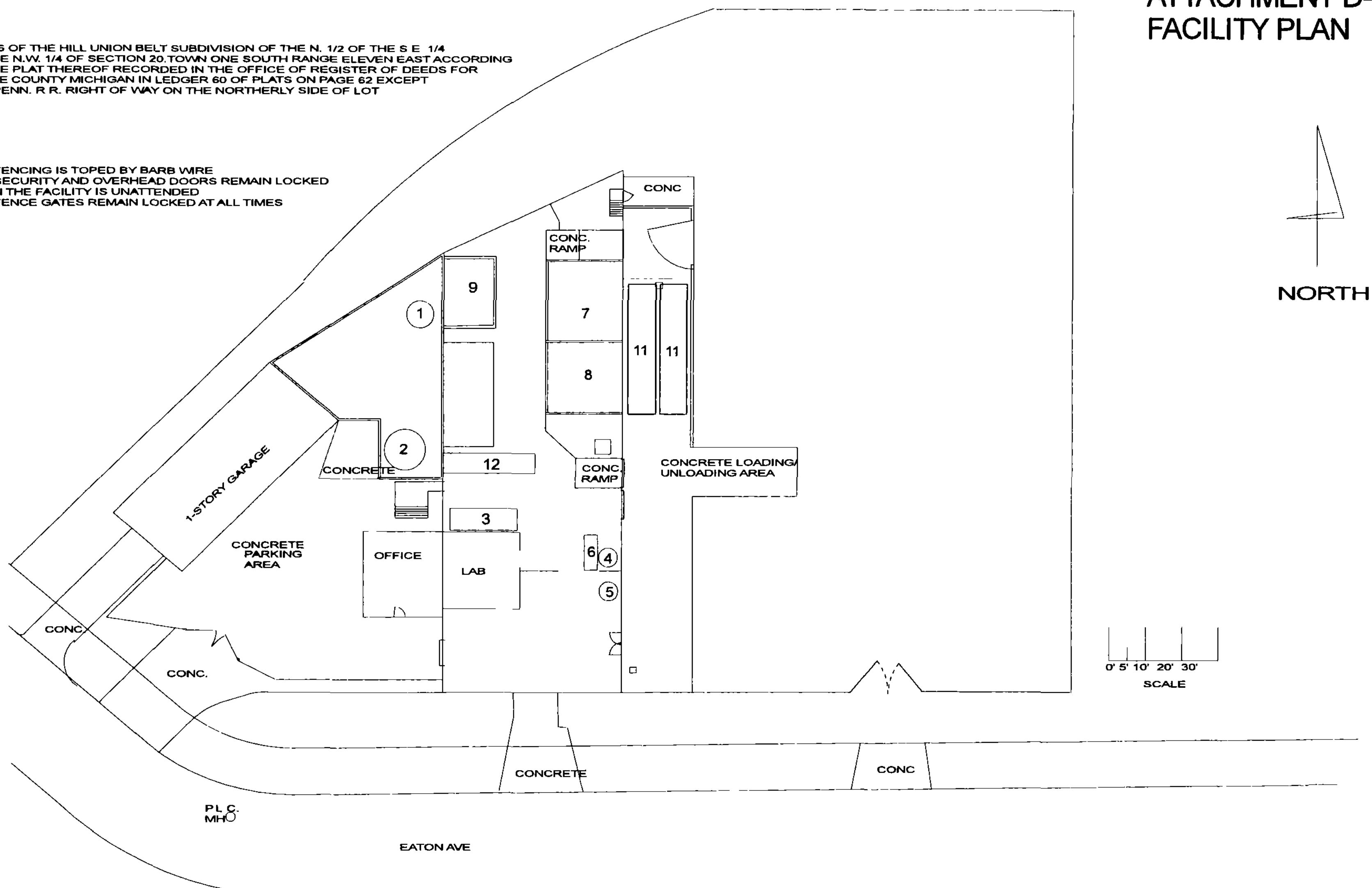
Seal:

ATTACHMENT D-1
FACILITY PLAN

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S E 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT

NOTES

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV NO.	CHANGE RECORD	BY	DATE	REV NO.	CHANGE RECORD	BY	DR.	E L.R.	DETREX CORPORATION	PROJECT NO. 9601
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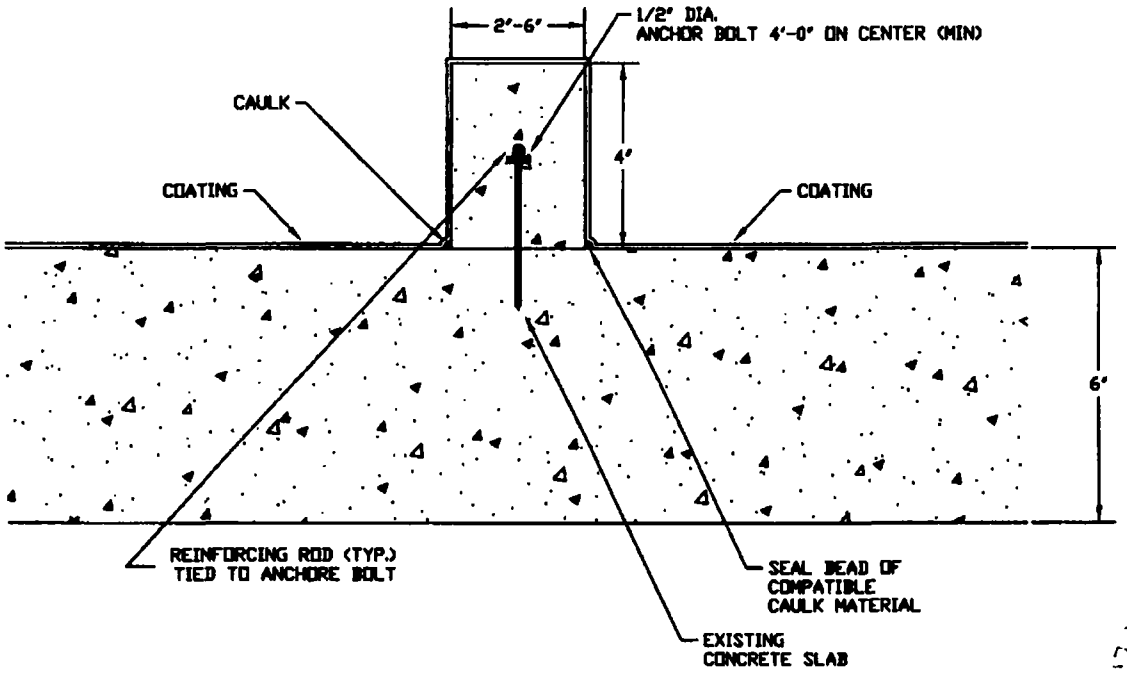
								APR			
								SCALE 1/16"=12"	DATE 12/96		EATON AVE.

ATTACHMENT D-1
FACILITY LAYOUT

ID #	Equipment Name	Description
1	20,000 gal. Carbon steel Tank	Storage tank for Trichloroethylene
2	4,500 gal. Carbon Steel Tank	Storage tank for Trichloroethylene
3	5,000 gal. Carbon Steel Tank	Storage of Non-Hazardous Wastes.
4	3,000 gal. 316 stainless steel Tank	Storage of Non-Hazardous Wastes.
5	2,500 gal. 316 Stainless Steel Tank	Storage of Non-Hazardous Wastes
6	Staging area	Sampling (containers weighed as needed)
7-9	Interior Hazardous Waste Storage	Active
11	Exterior Hazardous Waste Storage	Storage of Flammables
12.	Drum Filling Station	Product Drumming Station.

ATTACH D-3.1



N

SCALE IN FEET

1/8 0 1/8 1/4

Ronald E. Swan Jr. 10/5/00

STATE OF MICHIGAN
RONALD E. SWAN JR.
ENGINEER
NO.
LICENSED PROFESSIONAL ENGINEER

Northern Environmental
Hydrologists Engineers Geologists

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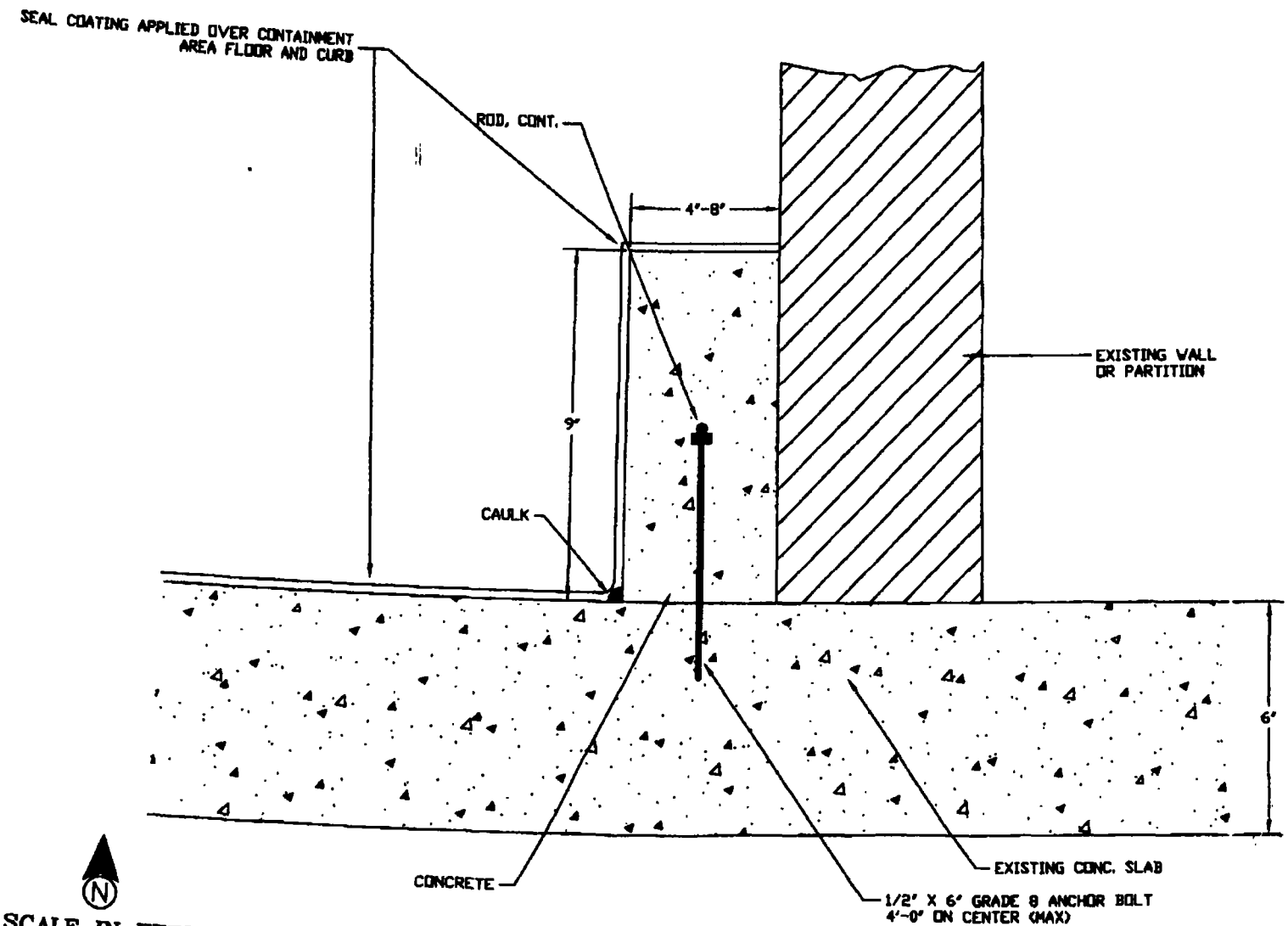
SECONDARY CONTAINMENT CURB
FOR STORAGE AREAS 7&8

DRAWN:	NAN	DATE: 10/3/00	CAD FILE:
CHECKED:	RES	DATE: 10/5/00	
APPROVED:	RES	DATE: 10/5/00	
REVISED:		DATE:	
REVISED:		DATE:	
REVISED:		DATE:	

PROJECT NO.:
DRAWN FOR:
FIGURE:
PAGE NO.
1 OF 1

ATTACH D-3.2



Ronald E. Swan Jr. 10/5/00

Northern Environmental
Hydrologists Engineers Geologists

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EXISTING SECONDARY CONTAINMENT CURB
AGAINST WALL

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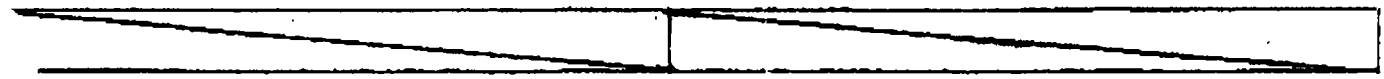
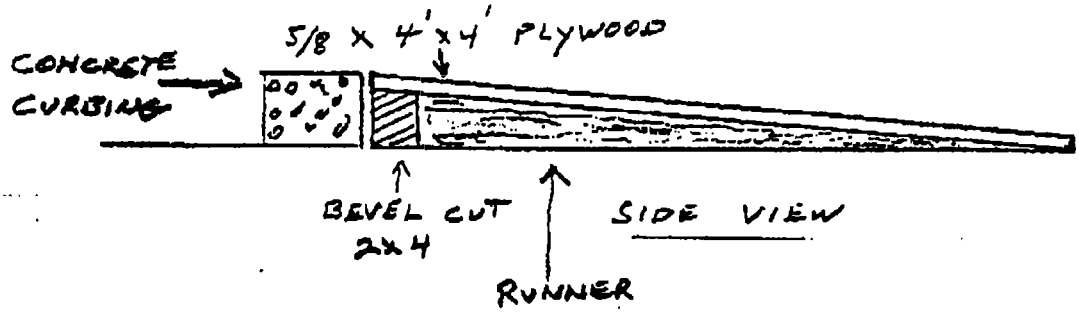
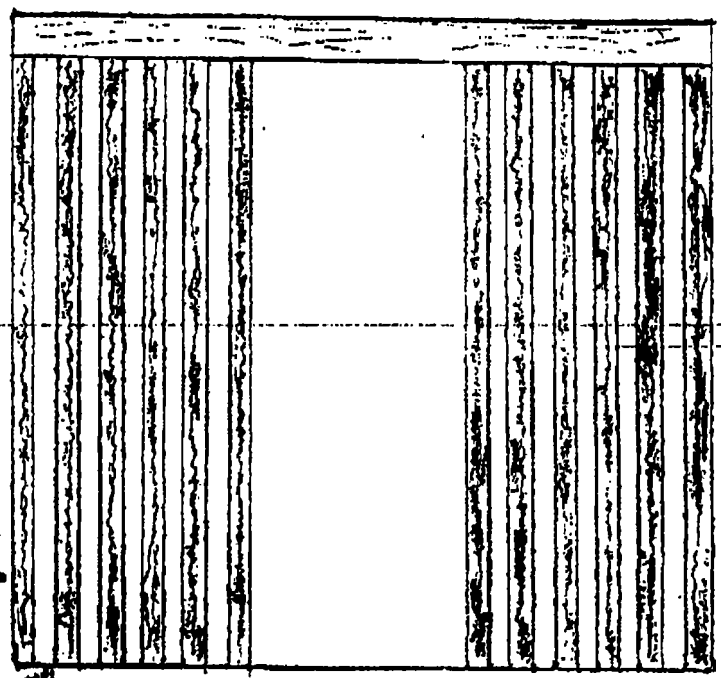


CUTTING EACH 8' 2x4 WILL GIVE YOU 4 PIECES



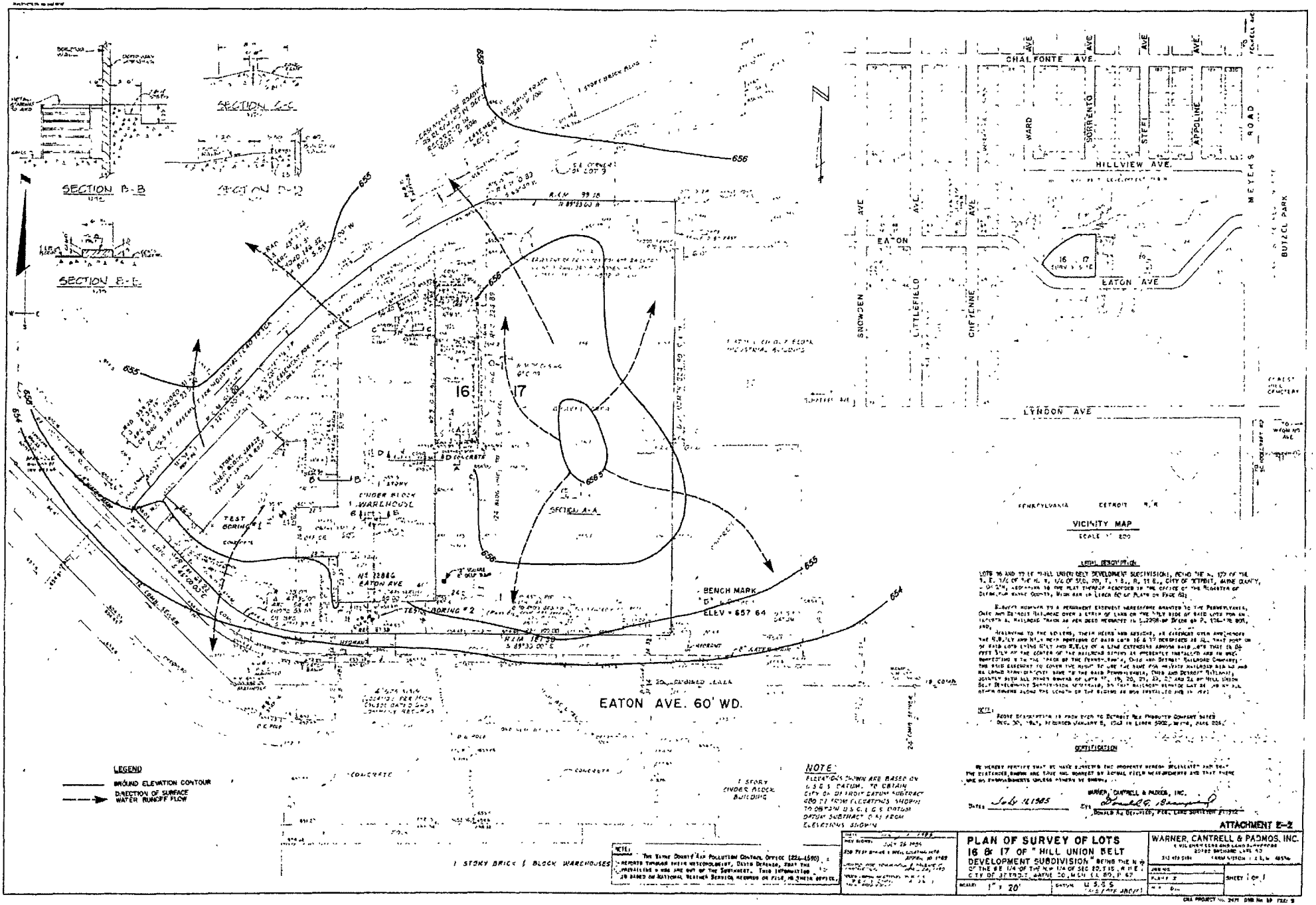
SIDE VIEW



UNDERSIDE VIEW

Ronald E. Swan Jr. 10/5/00

YOU'LL NEED 6 TO 8 RUNNERS PER SIDE DEPENDING ON FORKLIFT WIDTH


SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
CHALFONTE AVE.
HILLVIEW AVE.
LYNDON AVE
EATON AVE
EATON AVE. 60' WD.
WARD AVE
SORRENTO AVE
STEEL AVE
APPOLINE AVE
MEYERS ROAD
BUTZEL PARK
SNOWDEN AVE
LITTLEFIELD AVE
CHEYENNE AVE
16
17
SECTION A-A
CINDER BLOCK WAREHOUSE
TEST BORING #1
TEST BORING #2
BENCH MARK
ELEV = 657.64
1 STORY CINDER BLOCK BUILDING
1 STORY BRICK & BLOCK WAREHOUSES
VICINITY MAP
LEGEND
GROUND ELEVATION CONTOUR
DIRECTION OF SURFACE WATER RUNOFF FLOW
NOTE:
ELEVATIONS SHOWN ARE BASED ON U.S.G.S. DATUM. TO OBTAIN CITY OF DETROIT DATUM SUBTRACT 680.71 FROM ELEVATIONS SHOWN TO OBTAIN U.S.G.S. DATUM DATUM SUBTRACT 0.61 FROM ELEVATIONS SHOWN
ATTACHMENT E-2
PLAN OF SURVEY OF LOTS 16 & 17 OF "HILL UNION BELT DEVELOPMENT SUBDIVISION"
WARNER, CANTRELL & PADMOS, INC.
SCALE: 1" = 20'
SHEET 1 OF 1

ATTACHMENT D-1
FACILITY LAYOUT

ID #	Equipment Name	Description
1	20,000 gal. Carbon steel Tank	Storage tank for Trichloroethylene
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6	Staging area	Sampling (containers weighed as needed)
7-9	Interior Hazardous Waste Storage	Active
11	Exterior Hazardous Waste Storage	Storage of Flammables
12.	Drum Filling Station	Product Drumming Station.

ATTACHMENT D-1
FACILITY PLAN

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

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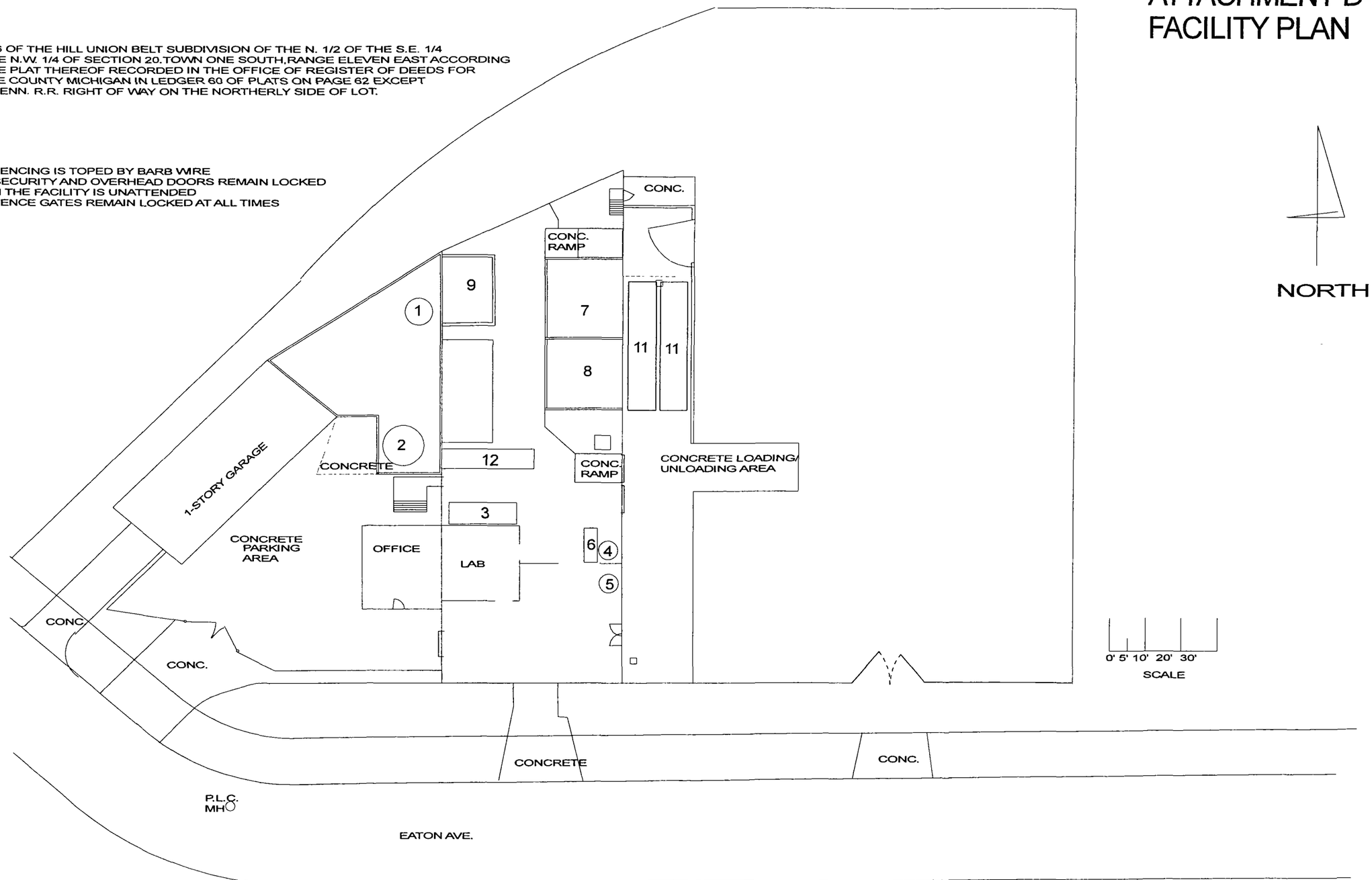


DATE	REV NO.	CHANGE RECORD	BY	DATE	REV NO.	CHANGE RECORD	BY				
				06.21.10	1	current site layout 07, 2010	DDC	DR.	E.L.R.	DETREX CORPORATION PROJECT ENGINEERING DEPARTMENT SOUTHFIELD MICHIGAN 48086	PROJECT No. 9601
								CHK.	~		
								APR.		EATON AVE. FACILITIES GENERAL LAYOUT	DWG No.
								SCALE	DATE		
								1/16"=12"	12/96		

EATON AVE.

ATTACHMENT D-2

TYPICAL HAZARDOUS WASTE CONTAINER MARKING

HAZARDOUS WASTE

STATE AND FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY OR THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES

GENERATOR INFORMATION:

NAME _____

ADDRESS _____ PHONE _____

CITY _____ STATE _____ ZIP _____

EPA ID NO / MANIFEST DOCUMENT NO _____ / _____

EPA WASTE NO _____ CA WASTE NO _____ ACCUMULATION START DATE _____

CONTENTS COMPOSITION. _____

PHYSICAL STATE ☐ SOLID ☐ LIQUID

HAZARDOUS PROPERTIES ☐ FLAMMABLE ☐ TOXIC ☐ CORROSIVE ☐ REACTIVITY ☐ OTHER _____

D O T PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

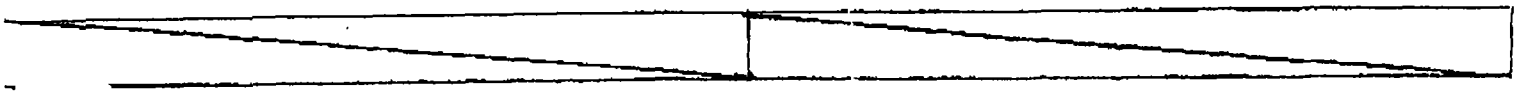
STYLE WMCA6

Printed by LABELMASTER, Div of AMERICAN LABELMARK CO CHICAGO, IL 60646

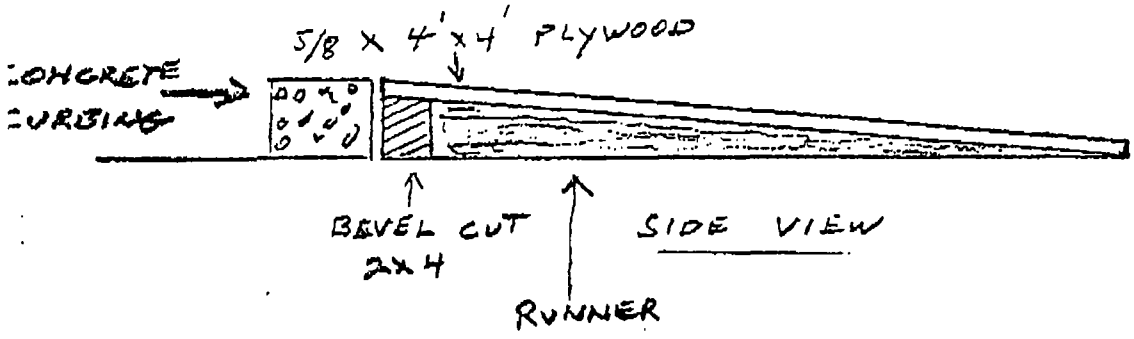
TYPICAL HAZARDOUS WASTE DRUM MARKING
PART B PERMIT APPLICATION

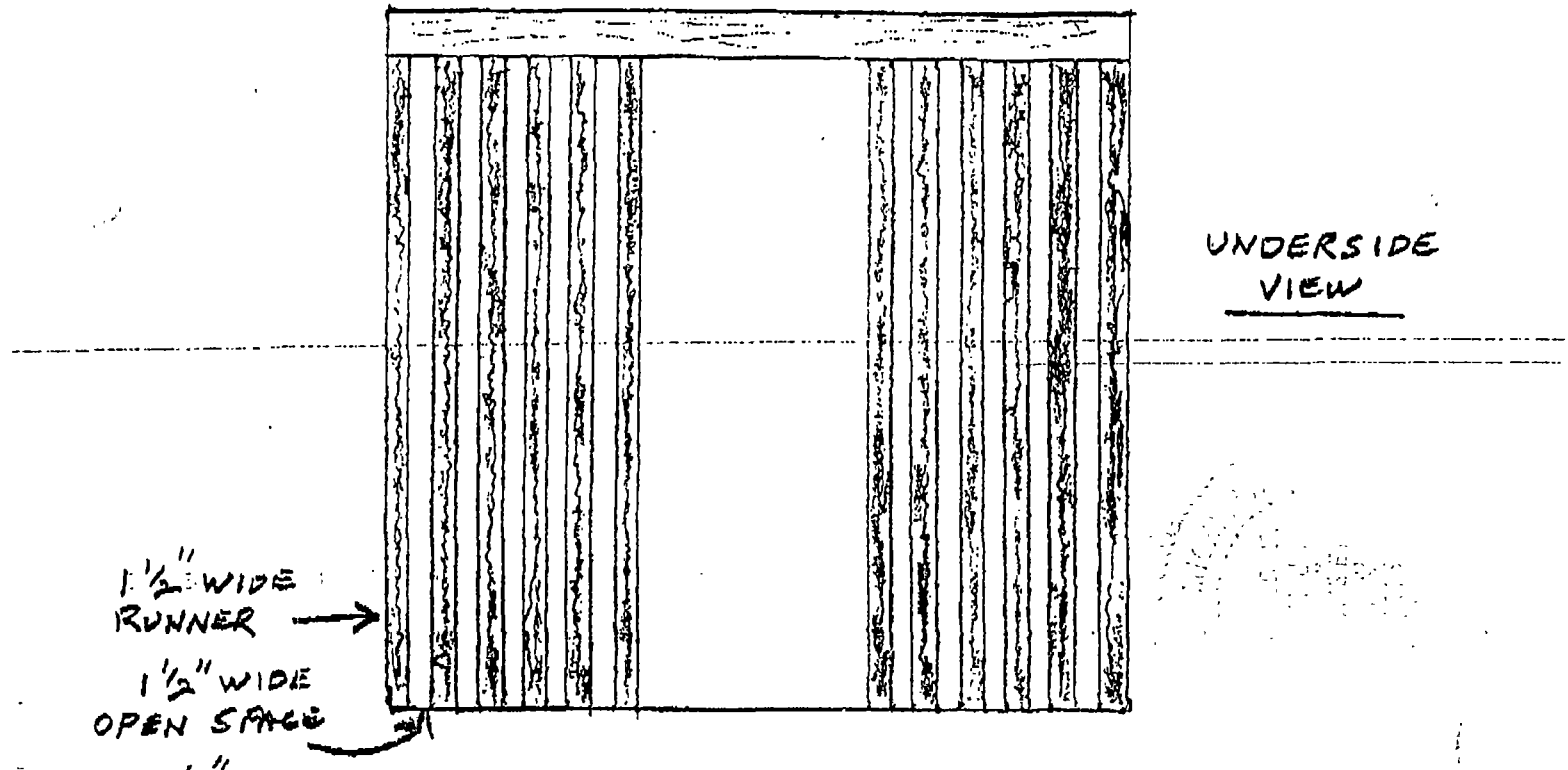
ATTACHMENT D-3

DRAWINGS OF SECONDARY CONTAINMENT STRUCTURES



CUTTING EACH 8' 2X4 WILL GIVE YOU 4 PIECES



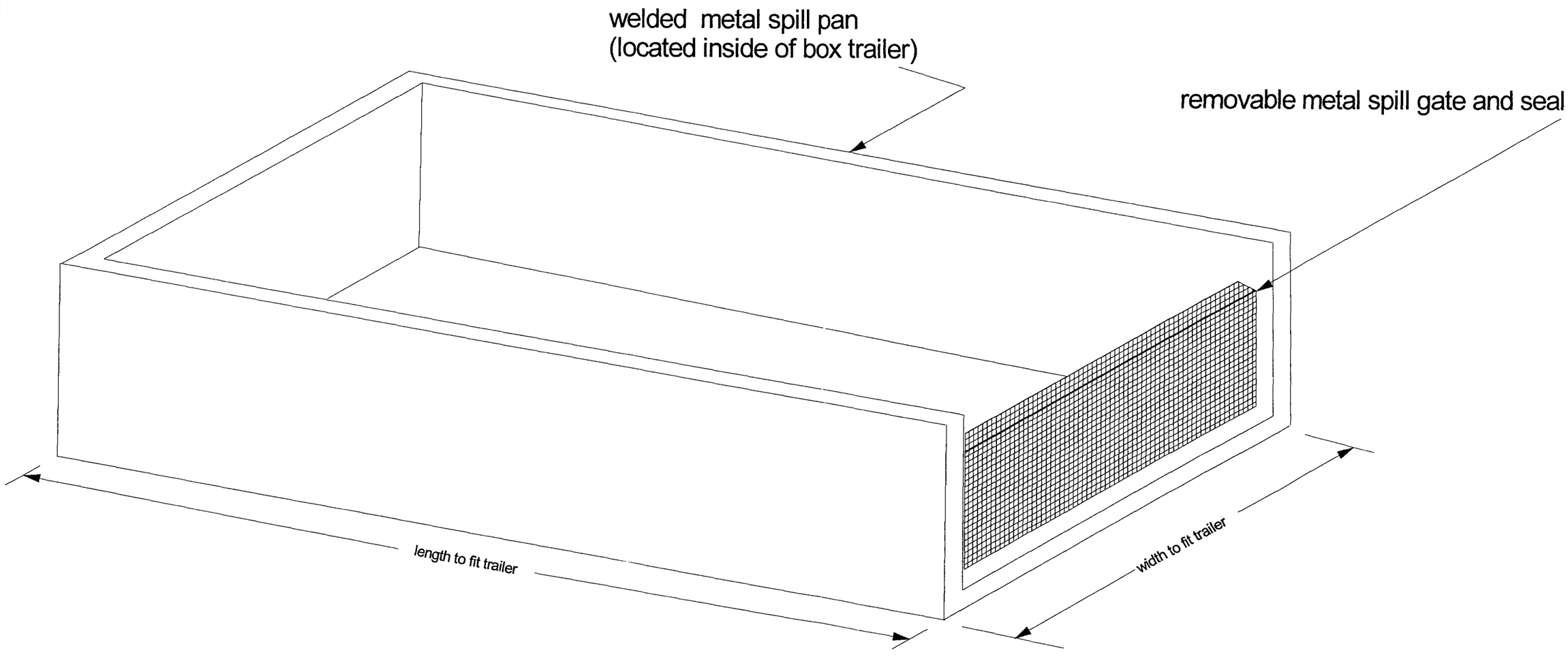


Donald E. Swan Jr. 10/5/00

YOU'LL NEED 6 TO 8 RUNNERS PER SIDE DEPENDING ON FORKLIFT WIDTH

ATTACHMENT D-3.2
FLAMMABLE SECONDARY CONTAINMENT

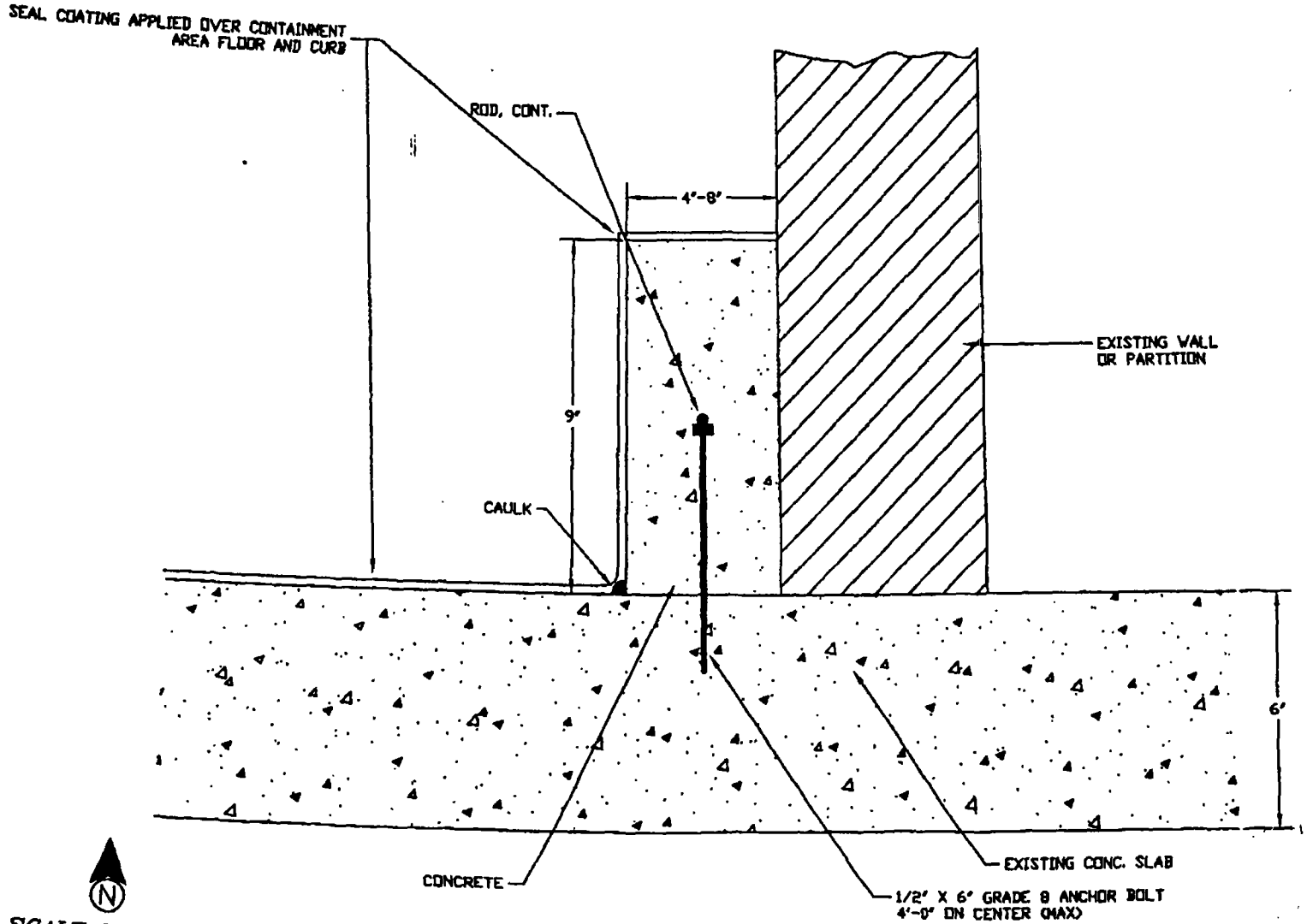
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



None	flam contanment.0710	SIZE	FSCM NO	DWG NO	REV
DDC		SCALE		SHEET 1	

trailer contanment system

ATTACH D-3



N

SCALE IN FEET

1/8 0 1/8 1/4

Ronald E. Swan Jr. 10/5/00

Northern Environmental
Hydrologists Engineers Geologists

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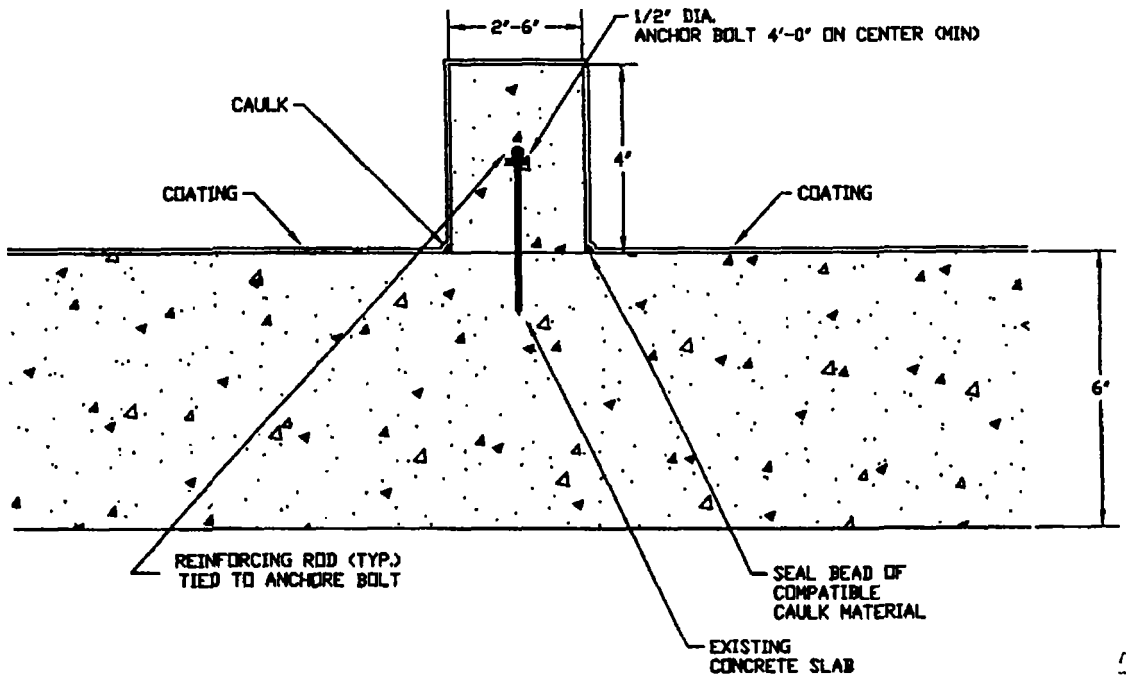
EXISTING SECONDARY CONTAINMENT CURB
AGAINST WALL

DRAWN: NAN	DATE: 10/3/00	CAD FILE:	PROJECT NO.:
CHECKED: RES	DATE: 10/5/00		DRAWN FOR:
APPROVED: RES	DATE: 10/5/00		FIGURE:
REVISED:	DATE:		
REVISED:	DATE:	PAGE NO.	DRAWING:

ATTACH D-3



N

SCALE IN FEET

1/8 0 1/8 1/4

10/5/00

STATE OF MICHIGAN
RONALD E. SWAN JR.
NO.
LICENSED PROFESSIONAL ENGINEER

Northern Environmental
Hydrologists Engineers Geologists
31555 SCHOOLCRAFT AVENUE, STE. 100, LIVONIA MI. 48150

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SECONDARY CONTAINMENT CURB
FOR STORAGE AREAS 7&8

DRAWN: NAN	DATE: 10/3/00	CAD FILE:	PROJECT NO.:
CHECKED: RES	DATE: 10/5/00		DRAWN FOR:
APPROVED: RES	DATE: 10/5/00		FIGURE:
REVISED:	DATE:		
REVISED:	DATE:	PAGE NO.	DRAWING:
REVISED:	DATE:	1 OF 1	CURB SECN.

ATTACHMENT D-4

SEALENT/COATING SPECIFICATIONS

Corro-Shield International, Inc.

7047 Barry Street
Rosemont, Illinois 60018
708-298-7770
847

Corro Ultra-Cote Chemical Resistance Chart

Chemical		Rating
Acetic Acid -	10%	FS
Acetic Acid -	20%	FS
Acetic Acid -	36%	NR
Acetic Anhydride		OS
Acetone		FS
Acrylonitrile		NR
Alum		FS
Ammonium Hydroxide		FS
Ammonium Nitrate		FS
Aniline		FS
Animal Fats		FS
Beer		FS
Benzene		FS
Black Liquor		FS
Boric Acid		FS
Brake Fluid		FS
Butyl Alcohol		FS
Butyl Cellosolv		FS
Calcium Chloride		FS
Calcium Nitrate		FS
Carbon Tetrachloride		FS
Carbonated Beverage		FS
Chlorine Water		FS
Chloroform		OS
Chromic Acid, 0 - 30%		FS
Citric Acid, conc.		FS
Copper Chloride		FS
Copper Sulfate		FS
Cumene Hydroperoxide		FS
Diesel Fuel		FS
Ethanol		FS
Ethyl Acetate		FS
Ethylene Dichloride		OS
Ethylene Glycol		FS
Ferric Chloride		FS
Ferrous Chloride		FS
Formaldehyde		FS
Formic Acid -	10%	FS
Formic Acid -	30%	NR
Formic Acid -	50%	NR
Freon TS		FS

Chemical		Rating
Gasoline		FS
Glacial Acetic		NR
Green Liquor		FS
n-Hexane		FS
Hydrobromic Acid - 50%		FS
Hydrochloric Acid - 37%		FS
Hydrofluoric Acid - 10%		FS
Hydrofluoric Acid - 30%		FS
Hydrofluoric Acid - 50%		FS
Hydrofluorosilicic Acid 30%		FS
Hydrogen Peroxide 50%		FS
Hydrogen Sulfide		FS
Isoprene		FS
Isopropyl Aclohol		FS
Jet Fuel		FS
Kerosene		FS
Klenzade		FS
Kodak Developer		FS
Lactic Acid -	20%	FS
Lactic Acid -	50%	FS
Lactic Acid -	88%	OS
Maleic Acid		FS
Malic Acid		FS
Methanol		FS
Methyl Acetate		FS
Methyl Esters		FS
Methyl Ethyl Ketone		FS
Methyl Isobutyl Ketone		FS
Methyl Methacrylate		FS
N-Methyl Pyrolidone		OS
Methyl Salicylate		FS
Methylene Chloride		FS
Mineral Oil		FS
Mineral Spirits		FS
Nitric Acid -	10%	FS
Nitric Acid -	30%	FS
Nitric Acid -	50%	NR
Nitric Acid -	conc.	NR
Nitropropane		FS
Oleic Acid		FS
Oxalic Acid		FS

Chemical		Rating
Palm Oil		FS
Perchloroethylene		FS
Peroxyacetic Acid		OS
Phenol		NR
Phosphoric Acid	30%	FS
Phosphoric Acid	50%	FS
Phosphoric Acid	85%	OS
Picric Acid, conc.		FS
Potassium Nitrate		FS
Pyridine		NR
Salt Brine		FS
Silver Nitrate		FS
Skydrol		FS
Sodium Chloride		FS
Sodium Hydroxide - 30%		FS
Sodium Hydroxide - 50%		FS
Sodium Hypochlorite, 5%		FS
Sodium Hypochlorite, 10%		FS
Sodium Hypochlorite, 15%		FS
Stearic Acid, conc.		FS
Styrene		FS
Sugars		
Sulfamic Acid, conc.		
Sulfuric Acid -	10%	FS
Sulfuric Acid -	50%	FS
Sulfuric Acid -	80%	FS
Sulfuric Acid -	98%	FS
Tannic Acid -	50%	FS
Tartaric Acid, conc.		FS
Tetrachloroethylene		FS
Tetrahydrofuran		FS
Toluene		FS
1.1.2 Trichloroethane		FS
Trichloroethylene		FS
Trichlorofluoroethane		FS
Tri Sodium Phosphate		FS
Uric Acid		FS
Vinegar		FS
Water, Deionized		FS
Water, Distilled		FS
White Liquor		FS
Xylene		FS

Key: NR - Not Recommended
OS - Occasional Spillage
FS - Frequent Spillage

Note: The above test data was obtained from total immersion tests. The table should be used as a guid as no warranty can be expressed or implied regardi accuracy of the information given as it would apply actual plant use. Certain chemicals will discolor the epoxy floor, however, this will in no way affect the integrity of the system.

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847
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PRODUCT DATA SHEET (Rev. Mar. 95)

CORRO ULTRA-COTE (Ref. No. 103)

Product Description
Corro Ultra-Cote is a 100% solids, solvent free, low odor, novolac epoxy coating system. It's specially formulated resin produces a surface impervious to the spillage of a wide variety of acids and solvents, including Methylene Chloride and up to 98% Sulfuric Acid. Specifically formulated to resist some of the harshest chemicals, it makes for the ideal protective system for secondary containment areas.

Special Features
Corro Ultra-Cote cures to provide a hard wearing highly abrasive resistant coating with excellent chemical resistance.

Due to the blending in of special adhesion promoters Corro Ultra-Cote will adhere tenaciously to almost any clean, sound surface including damp concrete, without priming. It's low odor and no solvent smell requires no special ventilating precautions, unlike many other coating systems, resulting in less shut down time. Corro Ultra-Cote is applied and finished complete with a textured surface all in one application. With these unique characteristics and easy application techniques it makes for the ideal system for in-plant maintenance programs where protection against corrosion is of primary importance.

Optional Features
Corro Ultra-Cote is also available as a self-leveling system. Corro Ultra-Flor SL, a flooring, Corro Ultra-Flor, or as a grout for tiles, Corro Ultra-Grout. Refer to Product Data Sheets on these products.

Precautions
When working with Corro Ultra-Cote, good hygienic habits must be observed. Avoid skin contact, regular washing with warm soapy water is recommended. Long exposures to resins and hardeners may cause skin irritation, and the wearing of protective clothing and gloves is a must. Before using any of the products, please read their respective safety data sheets.

Priming
Corro Ultra-Cote is self-priming, however, priming is recommended only as a precautionary measure to try and seal the concrete to help reduce outgassing and eliminate the formation of blisters and "dry spots". However, if Corro Ultra-Cote is going to be applied over "green" concrete, then Corro-Cure (a slow set primer) must be used first. Refer to Corro-Prime data sheets.

Set Times
Corro Ultra-Cote is only available in one setting time, which is fast. Corro Ultra-Cote should be applied at a temperature between 50°F and 90°F. For temperatures lower than 50°F, please consult the factory.

Colors
Corro Ultra-Cote is supplied in the following colors: Gray, Dark Gray, Brick Red, Beige, Green and Brown. Special colors are available upon request.

Packaging and Mixing
Corro Ultra-Cote can be purchased in pre-measured 1, 2, or 3 gallon paks or 50 gallon drums. For further convenience and identification the buckets of Corro Ultra-Cote Part A and Part B will be labeled with matching Blue labels which also is the color of this product data sheet as well as the material safety data sheets. All our products will be identified by their own color coding. Corro Ultra-Cote is supplied in a user friendly mix ratio of 3:1 by volume A:B.

Clean Up
Corro Ultra-Cote while still wet can be cleaned up with a solvent, but if allowed to set then mechanical cleaning will have to be used.

Technical Assistance
With a combined total of over 180 years experience, our management team can offer unequaled design details to concrete and epoxy floors as well as installation techniques and materials designed to meet your requirements. We are prepared to assist in training your own maintenance crew in the installation of our products.

5/4/01

Brown

1 MIL

Physical Characteristics

Density (lbs./gal.)

Part A	12.3
Part B	8
Parts A & B Mixed	11.2

Mix Ratios by Volume
A : B
3 : 1

Coverage (Theoretical)
One Gallon at 10 mils = 160 sq. ft.

Pot Life at 77°F	
A & B Mixed	25 minutes

Set time at 77°F	
For walking on	4 hours
Light traffic	6 hours
Maximum Chemical Resistance	7 days

Chemical Resistance (21 days immersion)

Chemical		Rating
Acetic Acid	20%	FS
	Glacial	NR
Acetone		FS
Ammonium Hydroxide		FS
Aniline		FS
Animal Fats		FS
Beer		FS
Chlorine Water	30%	FS
Chloroform		OS
Citric Acid	50%	FS
Ethyl Acetate		FS
HCL	24%	FS
	conc. (37%)	FS
Hydrogen Peroxide	10%	FS
	30%	FS
Hydrogen Sulfide		FS
Lactic Acid	20%	FS
	50%	FS
	88%	OS
Methanol		FS
Methylene Chloride		FS
MEK		FS

Chemical		Rating
Nitric Acid	10%	FS
	30%	FS
	50%	NR
Palm Kernel Oil		FS
Phosphoric Acid	30%	FS
	50%	FS
	85%	OS
Picric Acid		FS
Salt Brine Solution		FS
Sodium Hydroxide	30%	FS
	50%	FS
Sodium Hypochlorite	5%	FS
	10%	FS
	15%	FS
Sulfuric Acid	10%	FS
	50%	FS
	80%	FS
	98%	FS
Tannic Acid	50%	FS
Toluene		FS
Xylene		FS

Note: The table should be used as a guideline, as no warranty can be expressed or implied regarding the accuracy of the information given as it would apply to actual plant use. Certain chemicals will discolor the epoxy floor, however, this will in no way affect the integrity of the system.

Code: FS - Frequent Spillage
OS - Occasional Spillage
NR - Not Recommended

Warranty

The data, statements and recommendations set forth in this product information sheet are based on testing, research and other development work which has been carefully conducted by us, and we believe such data, statements and recommendations will serve as reliable guidelines. However, this product is subject to numerable uses under varying conditions over which we have no control, and accordingly, we do NOT warrant that this product is suitable for any particular use. Users are advised to test the product in advance to make certain it is suitable for their particular production conditions and particular use or uses.

WARRANTY - All products manufactured by us are warranted to be first class material and free from defects in material and workmanship.

Liability under this warranty is limited to the net purchase price of any such products proven defective or, at our option, to the repair or replacement of said products upon their return to us transportation prepaid. All claims hereunder on defective products must be made in writing within 30 days after the receipt of such products in your plant and prior to further processing or combining with other materials and products. WE MAKE NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE SUITABILITY OF ANY OF OUR PRODUCTS FOR ANY PARTICULAR USE, AND WE SHALL NOT BE SUBJECT TO LIABILITY FROM ANY DAMAGES RESULTING FROM THEIR USE IN OPERATIONS NOT UNDER OUR DIRECT CONTROL.

THIS WARRANTY IS EXCLUSIVE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND NO REPRESENTATIVE OF OURS OR ANY OTHER PERSON IS AUTHORIZED TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF OUR PRODUCTS.

847

CORRO-SHIELD INTERNATIONAL, INC.

7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784

Application Specifications for Corro Flexi-Prime and Corro-Cote

1. On uncoated concrete floors, clean by either acid etching with a 10% muriatic acid solution, followed by a neutralizing rinse, or if the concrete has a smooth power trowelled surface, then it must be abraded by lightly shot blasting or sanding. Oil saturated floors must be thoroughly cleaned with a heavy duty degreasing agent. Repeat if necessary.

2. All holes, eroded surfaces or badly pitted areas must be filled with Corro-Grout.

3. Control joints and cracks greater than 1/8" are to be filled with Corro-Grout.

4. Apply a coat of Corro Flexi-Prime to the concrete and while still wet, roll out the Corro-Mat over the primer, ensuring a complete wet out by immediately applying a second coat of Corro Flexi-Prime. Remove all trapped air bubbles by using a ribbed or porcupine roller. After wetting out the cloth, it will take on a transparent appearance. Areas showing the white of the cloth must be rolled over so as to ensure complete wet out. The Corro-mat after having been laid must be flat on the surface, and show no sign of any air bubbles. Any areas which have dried and show signs of a bubble must be cut out and reprimed and covered with the Corro-Mat.

5. After allowing the Corro Flexi-Prime to set, the area is then coated with two coats of Corro-Cote.

6. The Corro-Cote must be applied to the primer while it is still fresh or even slightly tacky. Do not allow the primer to set up hard, especially in direct sunlight. If for any reason the primer has allowed to set up hard, then it must be sanded to remove all gloss to provide a "key". The wearing of spike shoes will enable the applicator to walk on the floor if it is still tacky.

7. The first coat of Corro-Cote is applied at the rate of 160 square feet per gallon (10 mils) and is allowed to set or become tacky, thereafter, a second coat is applied at the same rate of coverage, and while it is still wet, chopped fiberglass pieces are blown or broadcast into the wet coating, to create a texture.

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Repair of Cracks and Expansion Joint

The object of this specification is to clean out and fill the cracks and then cover them with a 6" wide fiberglass cloth, impregnated with a flexible primer, and then to top coat with an epoxy coating.

SCOPE OF WORK

1. Chase open the cracks to form a V shape 3/4" wide by 1/4" deep, as well as mechanically cleaning the concrete 4" on either side of the crack.

2. Fill the crack with Corro-Grout as well as repairing any holes in the 4" strip of concrete on either side of the concrete.

3. After grouting the crack and holes, grind down any rough edges, especially those which may be left after grouting. The success of the fiberglass cloth is its ability to lay perfectly flat on the surface without any protrudances or rough edges to hinder this.

4. Allow the grout to set up to a semi-stiff or hard consistency, and then cover the crack with Corro-Mat which is 6" wide. The mat is impregnated with Corro Flexi-Prime. This is achieved by pouring the Flexi-Prime onto the mat and then spread with a trowel so as to wet out the mat un[illegible] it takes on a transparent appearance.

5. While the primer is still wet, the cloth is rolled over with a ribbed or porcupine roller until all whiteness of the mat disappears.

6. After the primer has set, the area is then coated with a coat of Corro-Cote. The Corro-Cote is applied with a roller at the rate of 160 square feet per gallon.

Depending on the temperature, the Corro-Grout, Corro Flexi-Prime and Corro-Cote can be supplied in various setting times.

EXPANSION JOINT

The expansion joint is treated in the same manner as the cracks, except that the joint need not be chased open.

After cleaning, filling and covering the expansion joint with the fiberglass cloth [illegible] is coated with Corro Ultra-Cote. The Ultra-Cote when mixed has a pot life of only twenty min[illegible] and is applied with a roller. For convenience, the Ultra-Cote is supplied in pre-measure[illegible] 4 gallon paks.

All Corro-Shield products are supplied in pre-measured, easy to use, convenient paks, however, if smaller amounts are required, they have easy, user friendly mix ratios of either 2:1 or 3:1 by volume. The mix ratios are printed on each bucket.

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PRODUCT DATA SHEET

Ref. No. 607 6/94

CORRO FLEXI-PRIME

Product Description

Corro Flexi-Prime is a 100% solids, solvent free, flexible epoxy primer designed to bridge cracks and seal porous surfaces. It is specially formulated with various setting times and with virtually no odor, making it ideal for bridging cracks in concrete floors, especially floors subject to temperature changes. With its unique formula, which includes special adhesion and wetting promoters, it penetrates and tenaciously adheres to both dry as well as damp concrete and metal.

Application

Corro Flexi-Prime when used in conjunction with our Corro-Mat, a 1.5 ounce non-binder chopped strand mat fiberglass cloth, creating a reinforced flexible membrane which bridges cracks as well as help to prevent cracks from propagating through to the protective layer. By using the Corro-Flexi-Prime with the Corro-Mat a reinforced flexible membrane is created that not only helps in bridging cracks, but also helps to seal old eroded concrete or floors that have been mechanically cleaned, leaving an "open" porous surface. Priming the "open" concrete will seal the surface helping to prevent any outgassing which could create blisters in the top protective layer. Priming is also recommended to help seal the "open" concrete to help reduce the absorption of the epoxy liquids eliminating "dry" spots. Corro Flexi-Prime can be applied to 24 hour old concrete but the concrete must first be primed with our Corro-Prime S.S. (Slow Set). Vertical walls can also be protected with the Corro Flexi-Prime and Corro-Mat.

Setting Times

Corro Flexi-Prime is supplied in two setting times, either as a slow set, 83 minutes pot life, for hot conditions, or normal set, 45 minutes pot life, for ambient conditions. For temperatures below 50°F a special fast set primer can be made, please consult the factory.

Coverage

When used to wet out the Corro-Mat coverage is reduced to approximately 35 square feet per gallon.

Packaging

Corro Flexi-Prime is supplied in one gallon paks, standard paks (4 gallon) or in drum paks. The gallon and standard paks are supplied as pre-measured paks. The drum paks, however, are to be measured out. Measuring is easy because Corro Flexi-Prime is supplied in a user friendly mix ratio of 2:1 by volume of Part A to Part B. This 2:1 ratio stays the same for slow set or regular set.

Precautions

As with any epoxy avoid contact with liquids as they may cause skin irritation after prolonged use. Wear protective gloves and clothing, and practicing good hygiene is necessary. Please read the Material Safety Data Sheets before using this product.

Special Features

Corro-Mat is a non-bindered chopped strand mat and is compatible with epoxy resins. Unlike other fiberglass cloths which have binders to hold them together, Corro-Mat is stitched together. This process of manufacture allows for a complete wet out of the cloth and complete compabability with epoxy resins.

Technical Assistance

With a combined total of over 180 years experience, our management team can offer unequalled design details to concrete and epoxy floors as well as installation techniques and materials designed to meet your requirements. We are prepared to assist in training your own maintenance crew in the installation of our products.

Cleanup

Corro Flexi-Prime while still wet can be cleaned with any solvent. When dry, the primer can only be removed by mechanical means or special paint stripper.

Physical Characteristics

Solids by Weight 100%

Elongation % at 75°F 100
Elongation % at 14°F 52

Viscosity, cps 2960

Density
Part A: 8.82 lbs./gal.
Part B: 8.56 lbs./gal.
Mixed: 8.73 lbs./gal.

Full Chemical Cure: 7 days
Shelf Life: 12 months

Application Methods: Brush, Roller or Spray

Mixing Ratio:
By Volume (A:B) 2:1
By Weight (A:B) 2.1:1

Pot Life @ 75°F: 45 minutes

Thin Film Set Time: 13 hours at 75°F
33 hours at 50°F

Foot Traffic Set Time: 24 hours at 75°F
40 hours at 50°F

The data, statements and recommendations set forth in this product information sheet are based on testing, research and other development work which has been carefully conducted by us, and we believe such data, statements and recommendations will serve as reliable guidelines. However, this product is subject to numerable uses under varying conditions over which we have no control, and accordingly, we do NOT warrant that this product is suitable for any particular use. Users are advised to test the product in advance to make certain it is suitable for their particular production conditions and particular use or uses.
WARRANTY - All products manufactured by us are warranted to be first class material and free from defects in material and workmanship.
Liability under this warranty is limited to the net purchase price of any such products proven defective, or, at our option, to the repair or replacement of said products upon their return to us transportation prepaid. All claims hereunder on defective products must be made in writing within 30 days after the receipt of such products in your plant and prior to further processing or combining with other materials and products. WE MAKE NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE SUITABILITY OF ANY OF OUR PRODUCTS FOR ANY PARTICULAR USE, AND WE SHALL NOT BE SUBJECT TO LIABILITY FROM ANY DAMAGES RESULTING FROM THEIR USE IN OPERATIONS NOT UNDER OUR DIRECT CONTROL.

THIS WARRANTY IS EXCLUSIVE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND NO REPRESENTATIVE OF OURS OR ANY OTHER PERSON IS AUTHORIZED TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF OUR PRODUCTS.

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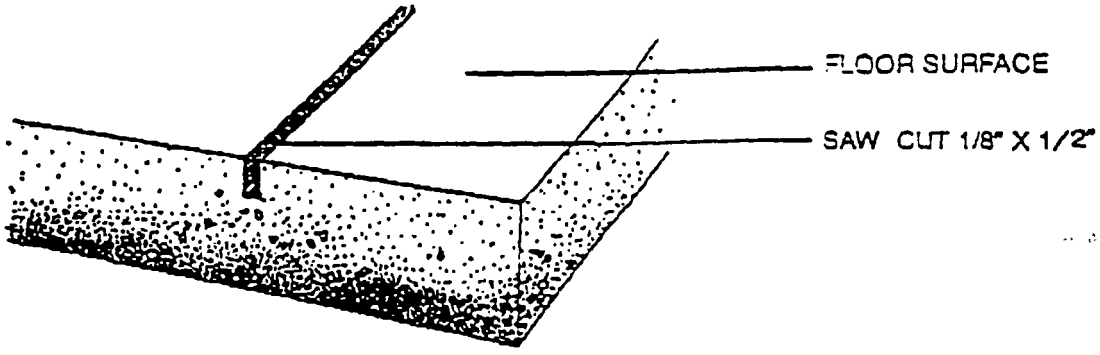
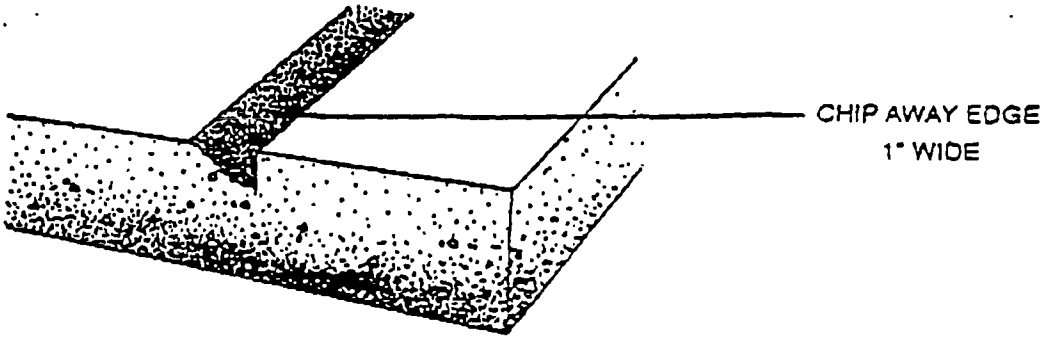
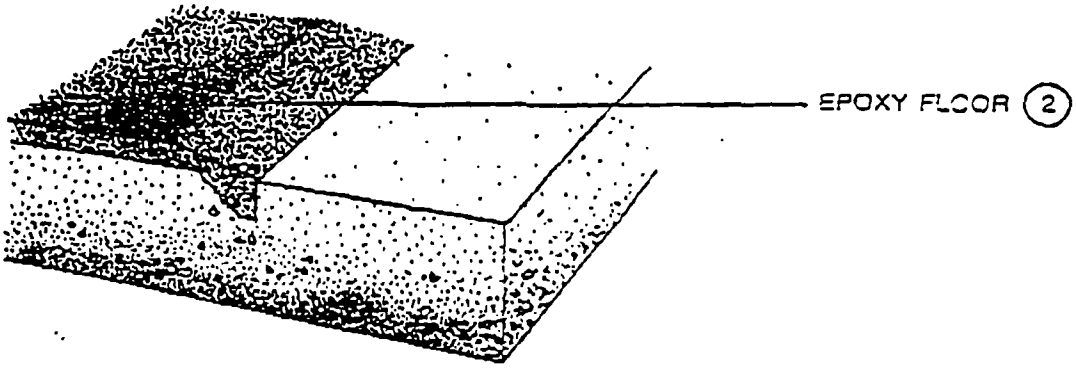
DRAWING DETAIL 1
PERIMETER KEY







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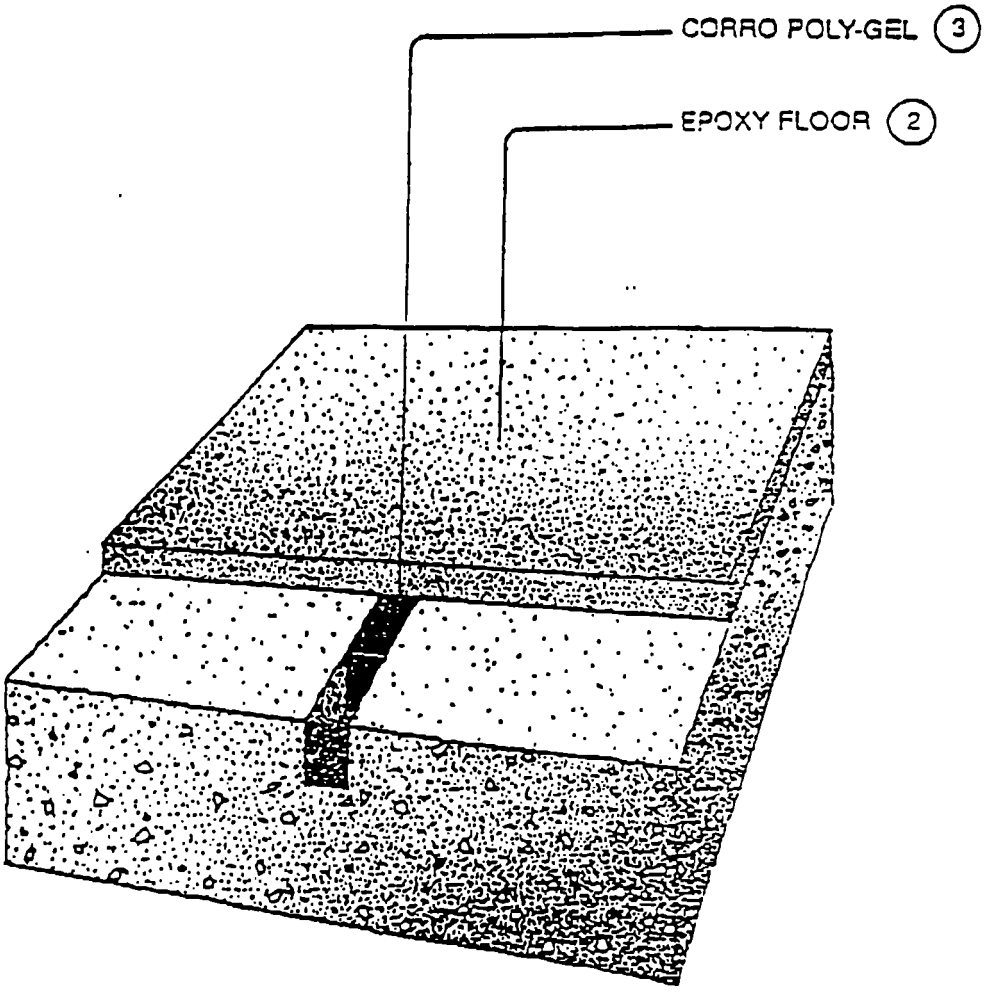

DRAWING DETAIL 2
CONTROL JOINT

CORRO-SHIELD INTERNATIONAL, INC.
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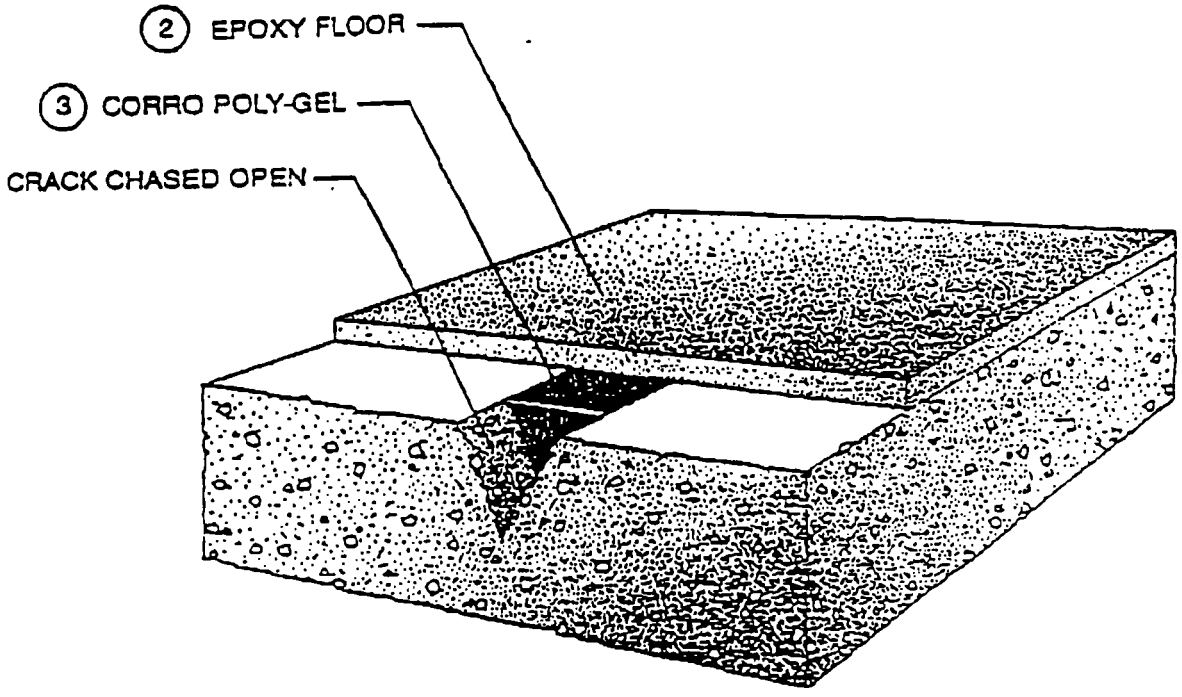
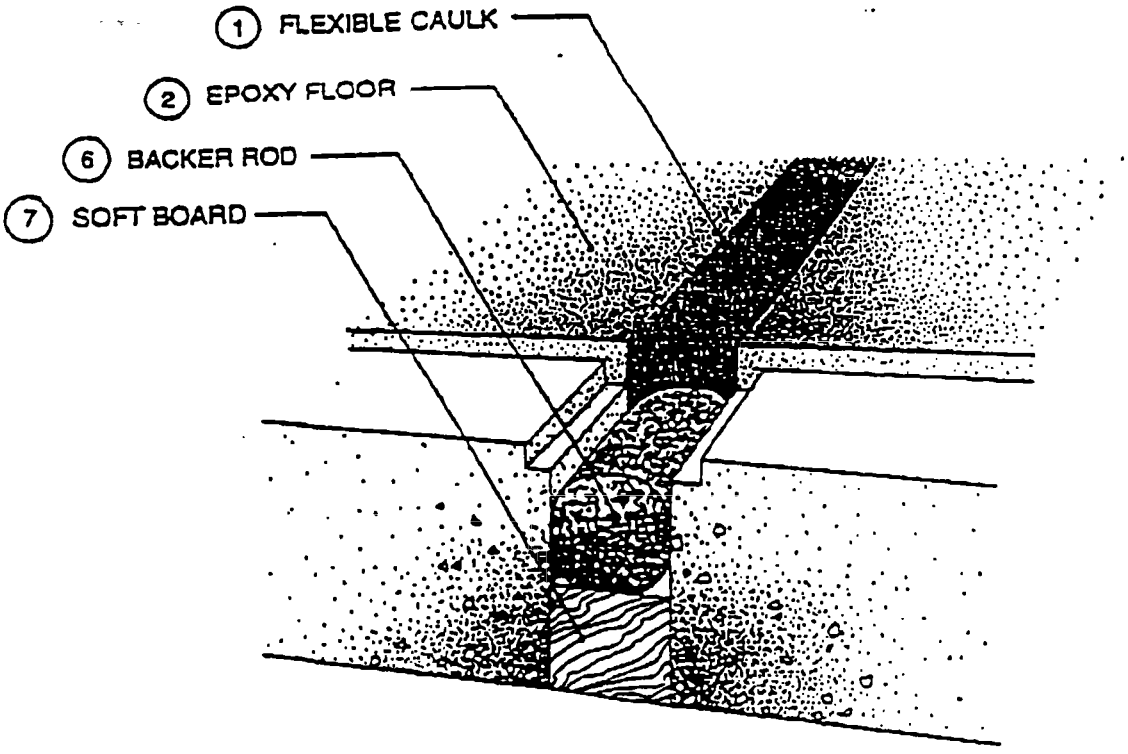


DRAWING DETAIL 3
CRACK REPAIR

CORRO-SHIELD INTERNATIONAL, INC.
7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784



Note: The depth of the flexible caulk must never be deeper than 50% of the width

DRAWING DETAIL 4
EXPANSION JOINT

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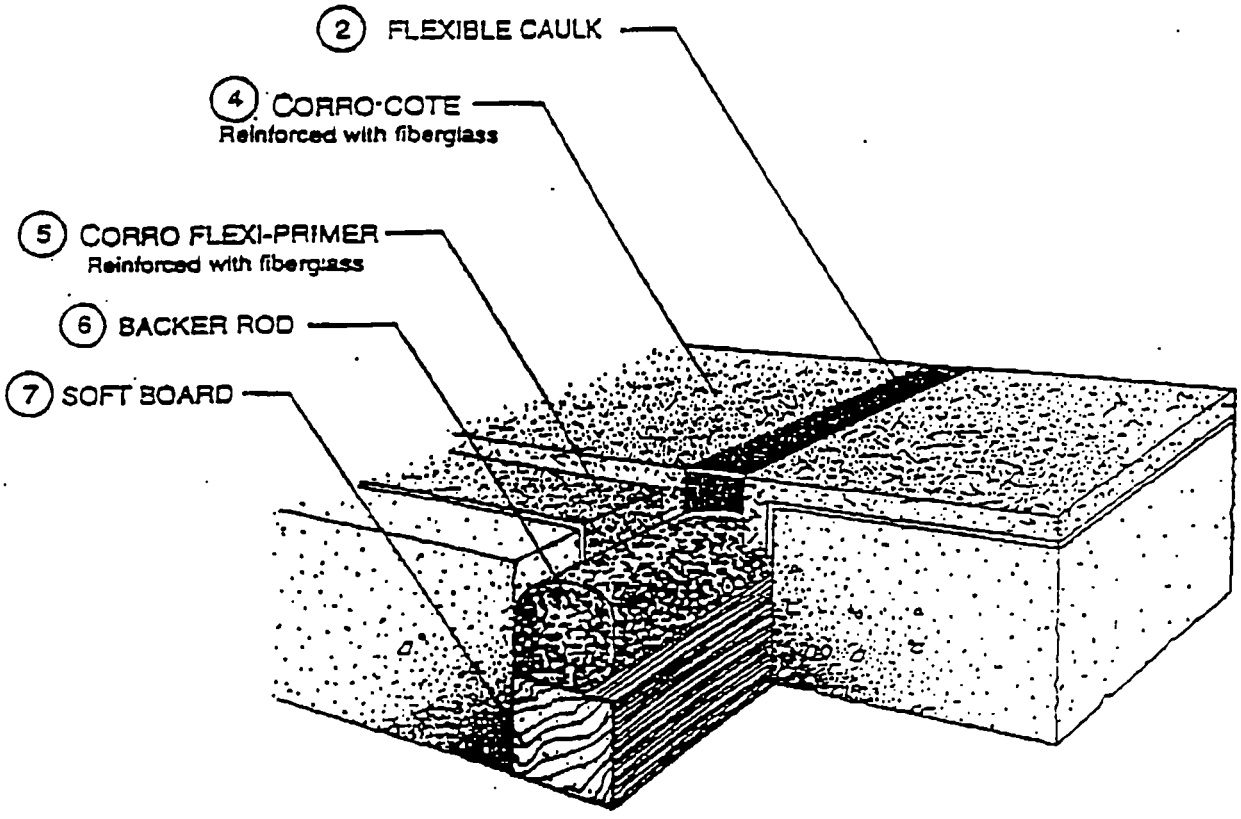
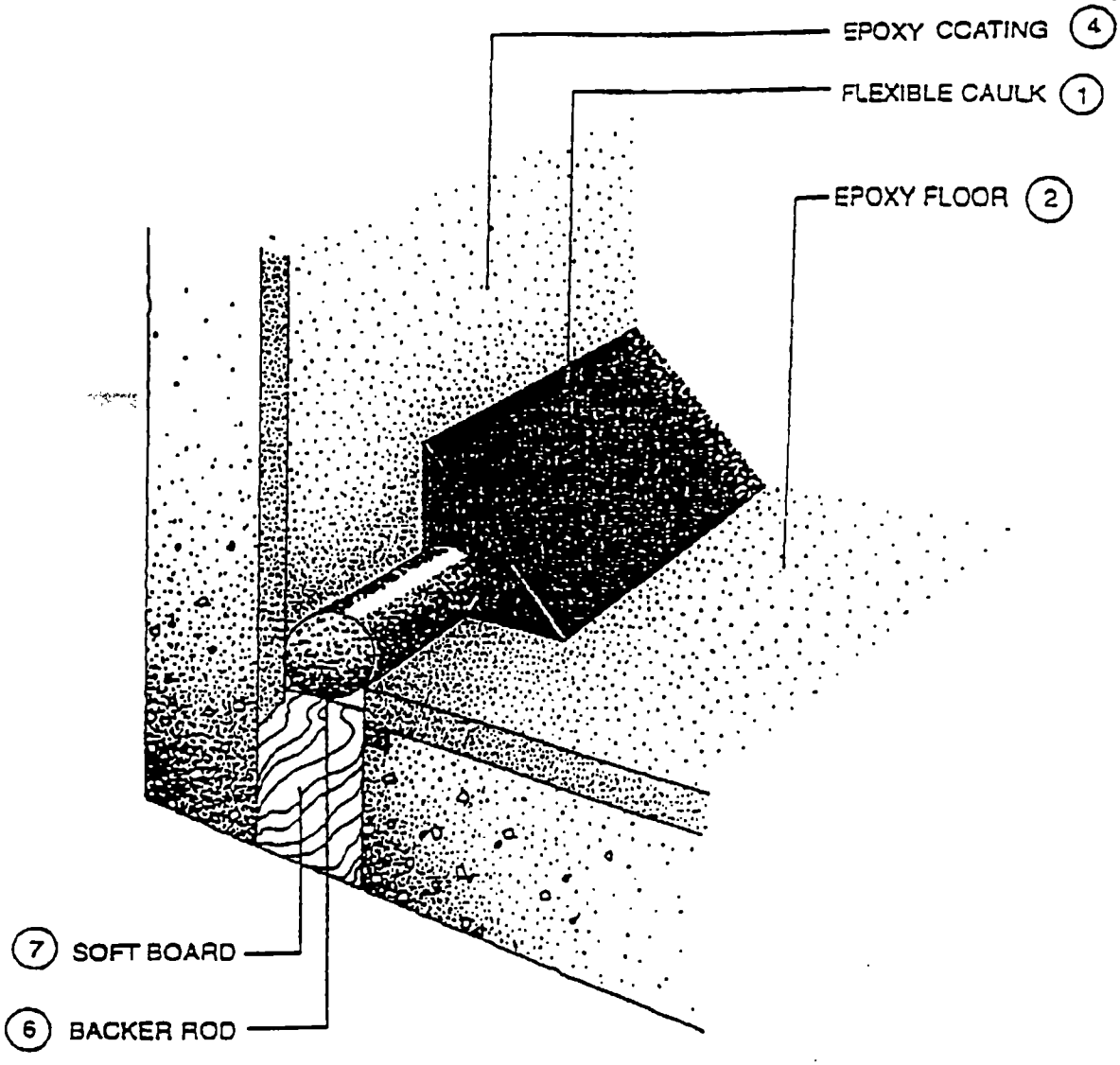


DRAWING DETAIL 4a
EXPANSION JOINT DETAIL

CORRO-SHIELD INTERNATIONAL, INC.
7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784



DRAWING DETAIL 5
CORNER EXPANSION JOINT

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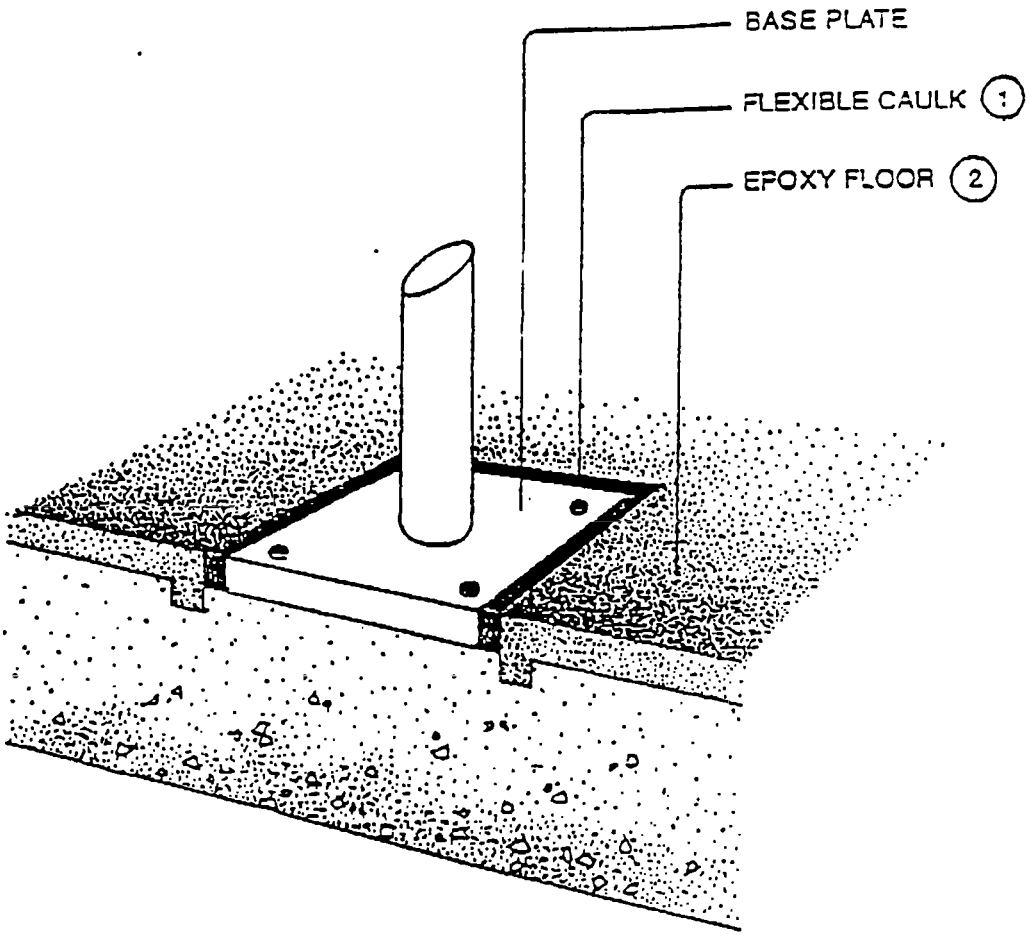
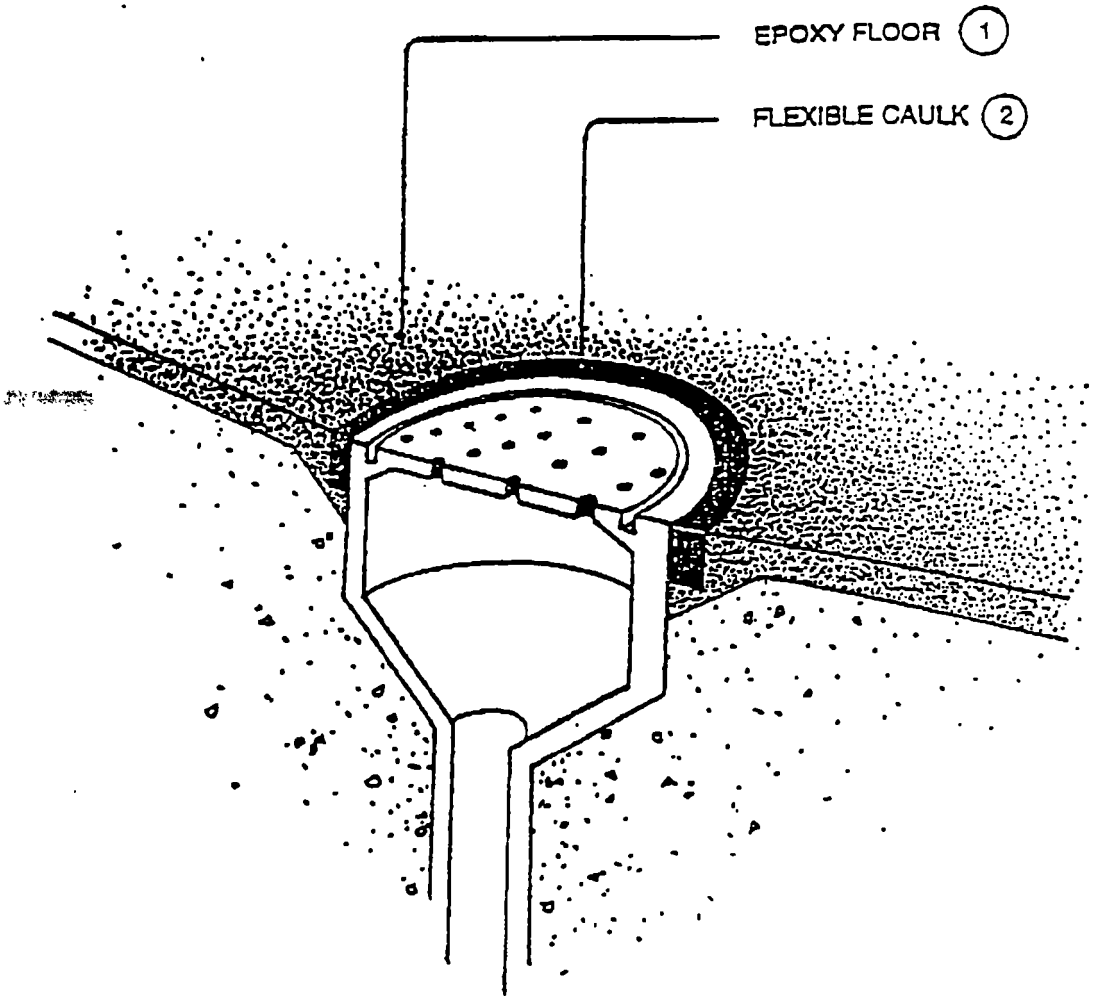
7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7784



DRAWING DETAIL 6
METAL BASE PLATES

CORRO-SHIELD INTERNATIONAL, INC.
7047 Barry Street • Rosemont, Illinois 60018 • ☎ 708-298-7770 • fax 708-298-7754



• DRAWING DETAIL 7
DRAIN

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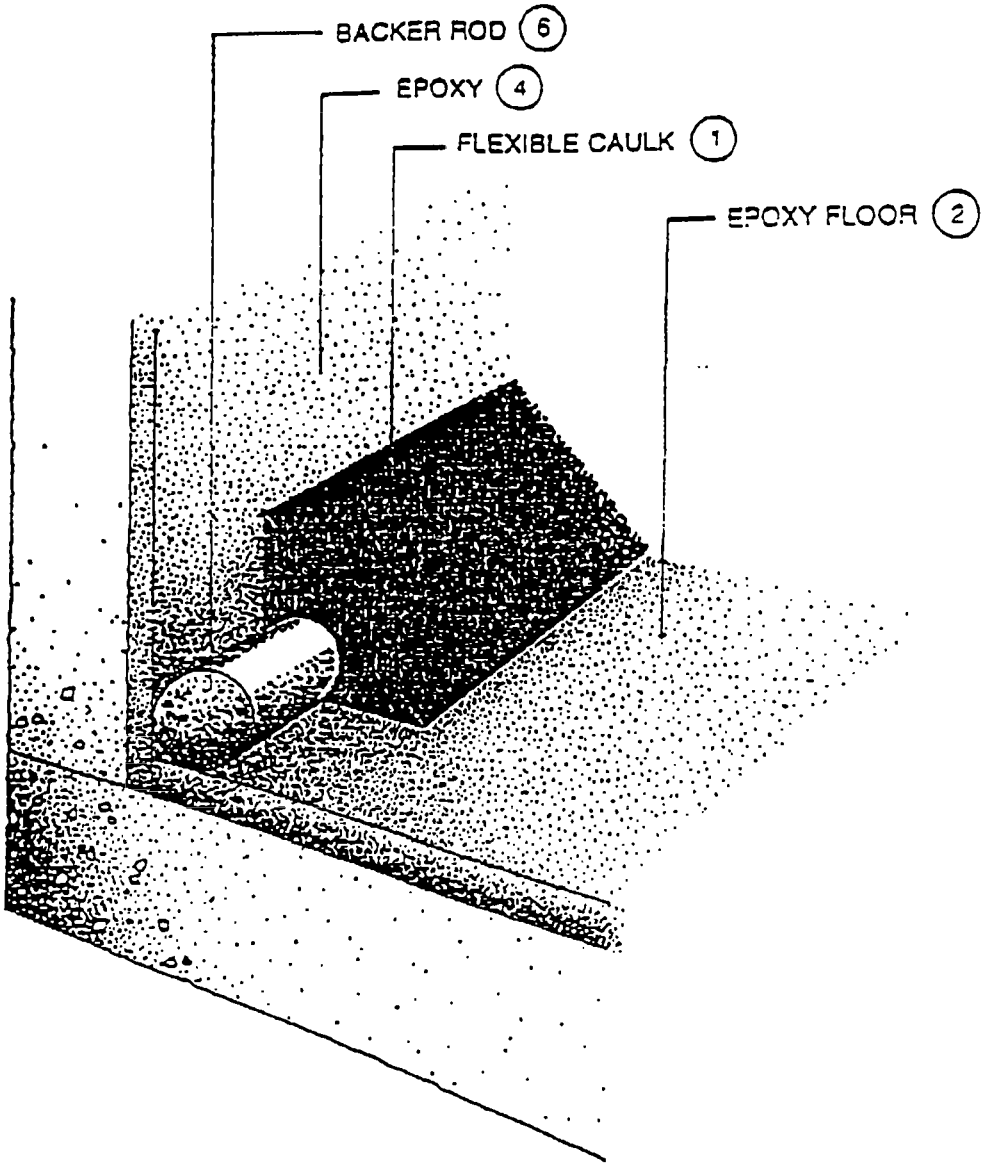

DRAWING DETAIL 8.

CORNER DETAIL – NO EXPANSION JOINT

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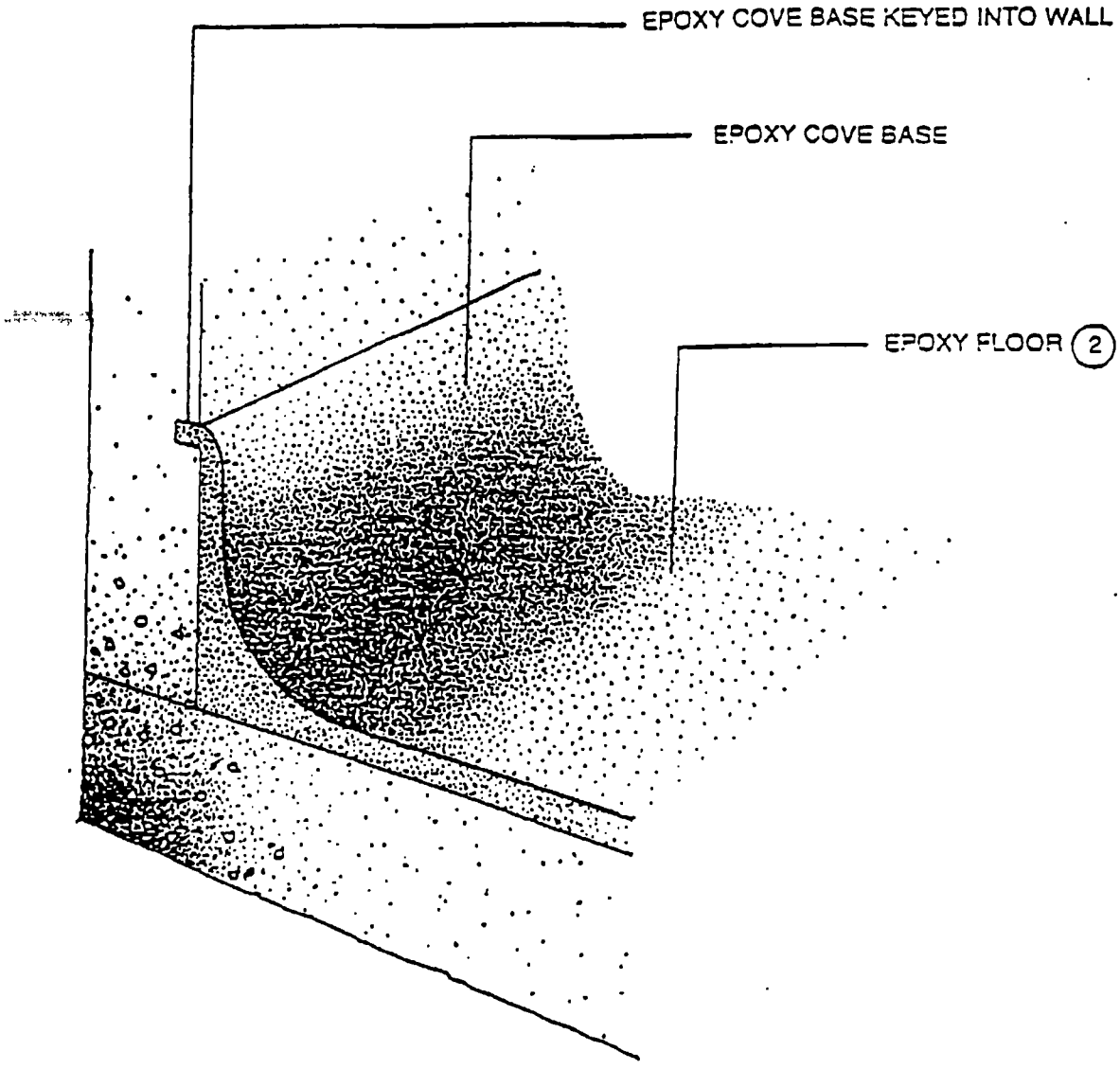

DRAWING DETAIL 9

COVE BASE

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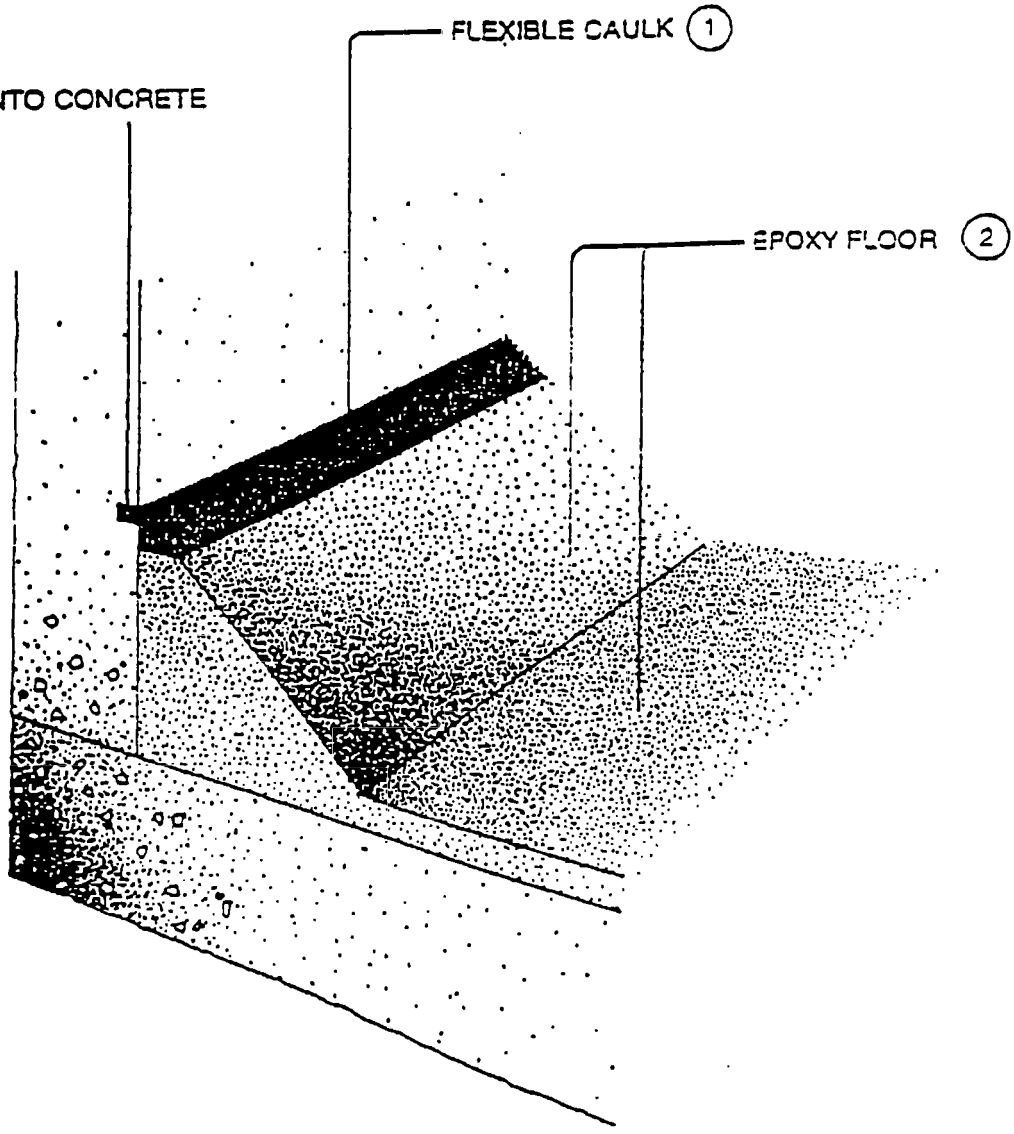

DRAWING DETAIL 10

CANT COVE BASE

XYPEX CONCENTRATE

DESCRIPTION

Xypex is a unique chemical treatment for the waterproofing, protection and repair of concrete. XYPEX CONCENTRATE is the most chemically active product within the Xypex Crystalline Waterproofing System. When mixed with water, this light grey powder is applied as a cementitious slurry coat to above-grade or below-grade concrete, either as a single coat or as the first of a two-coat application. It is also mixed in Dry-Pac form for sealing strips at construction joints, or for the repairing of cracks, faulty construction joints and honeycombs. Xypex prevents the penetration of water and other liquids from any direction by causing a catalytic reaction that produces a non-soluble crystalline formation within the pores and capillary tracts of concrete and cement-based materials.

RECOMMENDED FOR:

- Reservoirs
- Sewage and Water Treatment Plants
- Underground Vaults
- Secondary Containment Structures
- Foundations
- Tunnels and Subway Systems
- Swimming Pools
- Parking Structures

ADVANTAGES

- Resists extreme hydrostatic pressure
- Becomes an integral part of the substrate
- Can seal hairline cracks up to 0.4 mm
- Allows concrete to breathe
- Highly resistant to aggressive chemicals
- Non-toxic
- Does not require a dry surface
- Cannot puncture, tear or come apart at the seams
- No costly surface priming or leveling prior to application
- Does not require sealing, lapping and finishing of seams at corners, edges or between membranes
- Can be applied to the positive or the negative side of the concrete surface
- Does not require protection during backfilling or during placement of steel, wire mesh or other materials
- Less costly to apply than most other methods
- Not subject to deterioration
- Permanent

PACKAGING

Xypex Concentrate is available in 20 lb. (9.1 kg) pails, 60 lb. (27.2 kg) pails and 50 lb. (22.7 kg) bags.

STORAGE

Xypex products must be stored dry at a minimum temperature of 45°F (7°C). Shelf life is one year when stored under proper conditions.

COVERAGE

For normal surface conditions, the coverage rate for each Xypex coat is 6 to 7.2 sq. ft./lb. (1.25 - 1.5 lb./sq. yd. or 0.65 - 0.8 kg/m²).

TEST DATA

PERMEABILITY

U.S. Army Corps of Engineers (USACE) CRD C48-73 "Permeability of Concrete" Pacific Testing Labs, Seattle, USA

Two inch (51 mm) thick, 2000 psi (13.8 MPa) Xypex-treated concrete samples were pressure tested up to a 405 ft. (124 m) water head (175 psi/1.2 MPa), the limit of the testing apparatus. While untreated samples showed marked leakage, the Xypex-treated samples (as a result of the crystallization process) became totally sealed and exhibited no measurable leakage.

DIN 1048 "Water Impermeability of Concrete" Bautest – Corporation for Research & Testing of Building Materials, Augsburg, Germany

Twenty cm thick Xypex-treated concrete samples were pressure tested up to 7 bars (230 ft./70 m water head) for 24 hours to determine water impermeability. While the reference specimens measured water penetration up to a depth of 92 mm, Xypex-treated samples measured water penetration of zero to an average of 4 mm.

XYPEX Concrete Waterproofing Cementitious Crystalline

ÖNORM B 3303 "Water Impermeability of Concrete" Technologisches Gerwerbemuseum, Federal Higher Technical Education & Research Institute, Vienna, Austria

Xypex-treated concrete samples were pressure tested to a maximum 7 bars (230 ft./70 m water head) for 10 days. Test revealed that while 25 ml of water had penetrated the untreated concrete samples, zero ml had penetrated the Xypex-treated samples. Test specimens were then broken and showed water penetration to a depth of 15 mm on untreated samples but no measurable water penetration on the Xypex-treated samples.

CSN 1209/1321 "Impermeability and Resistance to Pressurized Water" Institute of Civil Engineering, Technology and Testing, Bratislava, Slovak Republic

Xypex-treated and untreated concrete samples were exposed to 1.2 MPa of pressure to determine water permeability. Results showed the Xypex-treated samples provided effective protection against hydrostatic water pressure. Treated and untreated samples were also subjected to contact with silage juices and various petroleum products (e.g. diesel oil, transformer oil, gasoline) at 14 kPa for 28 days. The Xypex-treated samples significantly reduced the penetration of these solutions.

CHEMICAL RESISTANCE

ASTM C 267-77 "Chemical Resistance to Mortars" Pacific Testing Labs, Seattle, USA

Xypex-treated cylinders and untreated cylinders were exposed to hydrochloric acid, caustic soda, toluene, mineral oil, ethelyne glycol, pool chlorine and brake fluid and other chemicals. Results indicated that chemical exposure did not have any detrimental effects on the Xypex coating. Tests following chemical exposure measured an average 17% higher compressive strength in the Xypex-treated specimens over the untreated control samples.

IWATE University Technical Report "Resistance to Acid Attack" Tokyo, Japan

Xypex-treated mortar and untreated mortar were measured for acid resistance after exposure to a 5% H_2SO_4 solution for 100 days. Xypex suppressed concrete erosion to 1/8 of the reference samples.

FREEZE/THAW DURABILITY

ASTM C 672 "Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to De-icing Chemicals" Twin City Testing Lab, St. Paul, USA

Xypex-treated samples restricted chloride ion concentration to below the level necessary to promote electrolytic corrosion of reinforcing steel. Visual examination of untreated panels after 50 freeze/thaw cycles showed a marked increase in surface deterioration compared to Xypex-treated samples.

JIS A 6204 "Concrete Freeze/Thaw" Japan Testing Center For Construction Materials, Tokyo, Japan

The resonating frequency of both untreated and Xypex-treated concrete samples were measured throughout 435 freeze/thaw cycles. At 204 cycles, the Xypex-treated samples showed 96% relative durability compared to 90% in the untreated samples. At 435 cycles, the Xypex-treated samples measured 91% relative durability compared to 78% in the untreated reference samples.

POTABLE WATER EXPOSURE

NSF 61 "Drinking Water System Component-Health Effects" NSF International, Ann Arbor, USA

Exposure testing of potable water in contact with Xypex-treated samples indicated no harmful effects.

RADIATION RESISTANCE

U.S.A. Standard No. N69 "Protective Coatings for the Nuclear Industry" Pacific Testing Labs, Seattle, USA

After exposure to 5.76×10^4 rads of gamma radiation, the Xypex treatment revealed no ill effects or damages.

APPLICATION PROCEDURES

1. SURFACE PREPARATION Concrete surfaces to be treated must be clean and free of laitance, dirt, film, paint, coating or other foreign matter. Surfaces must also have an open capillary system to provide "tooth and suction" for the Xypex treatment. If surface is too smooth (e.g. where steel forms are used) or covered with excess form oil or other foreign matter, the concrete should be lightly sandblasted, waterblasted, or etched with muriatic (HCL) acid.

2. STRUCTURAL REPAIR Rout out cracks, faulty construction joints and other structural defects to a depth of 1.5 inches (37 mm) and a width of one inch (25 mm). Apply a brush coat of Xypex Concentrate as described in steps 5 & 6 and allow to dry for 10 minutes. Fill cavity by tightly compressing Dry-Pac into the groove with pneumatic packing tool or with hammer and wood block. Dry-Pac is prepared by mixing six parts Xypex Concentrate powder with one part water to a dry, lumpy consistency.

Note:

1. Against a direct flow of water (leakage) or where there is excess moisture due to seepage, use Xypex Patch'n Plug then Xypex Dry-Pac followed by a brush coat of Xypex

Concentrate. (Refer to Xypex Specifications and Applications Manual for full details.)

2. For expansion joints or chronic moving cracks, flexible materials such as expansion joint sealants should be used.

3. WETTING CONCRETE Xypex requires a saturated substrate and a damp surface. Concrete surfaces must be thoroughly saturated with clean water prior to the application so as to aid the proper curing of the treatment and to ensure the growth of the crystalline formation deep within the pores of the concrete. Remove excess surface water before the application. If concrete surface dries out before application, it must be re-wetted.

4. MIXING FOR SLURRY COAT Mix Xypex powder with clean water to a creamy consistency in the following proportions:

For Brush Application

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m²)
5 parts powder to 2 parts water

2.0 lb./sq. yd. (1.0 kg/m²)
3 parts powder to 1 part water

For Spray Application

1.25 - 1.5 lb./sq. yd. (0.65 - 0.8 kg/m²)
5 parts powder to 3 parts water
(ratio may vary with equipment type)

Do not mix more Xypex material than can be applied in 20 minutes. Do not add water once mix starts to harden. Protect hands with rubber gloves.

5. APPLYING XYPEX Apply Xypex with a semi-stiff nylon bristle brush, push broom (for large horizontal surfaces) or specialized spray equipment. The coating must be uniformly applied and should be just under 1/16 in. (1.25 mm). When a second coat (Xypex Concentrate or Xypex Modified) is required, it should be applied after the first coat has reached an initial set but while it is still "green" (less than 48 hours). Light pre-watering between coats may be required due to drying. The Xypex treatment must not be applied under rainy conditions or when ambient temperature is below 40°F (4°C). For recommended equipment, contact Xypex Chemical Corporation or your nearest Xypex distributor.

6. CURING A misty fog spray of clean water must be used for curing the Xypex treatment. Curing should begin as soon as the Xypex has set to the point where it will not be damaged by a fine spray of water. Under normal conditions, it is sufficient to spray Xypex-treated surfaces three times per day for two to three days. In hot or arid climates, spraying may be required more frequently. During the curing period, the coating must be protected from rainfall, frost, wind, the puddling of water and temperatures below 36°F (2°C) for a period of not less than 48 hours after application. If plastic sheeting is used as protection, it must be raised off the Xypex to allow the coating to breathe. Xypex Gamma Cure may be used in lieu of water curing for certain applications (consult with Xypex Chemical Corporation or your nearest Xypex distributor).

Note: For concrete structures that hold liquids (e.g. reservoirs, swimming pools, tanks, etc.), Xypex should be cured for three days and allowed to set for 12 days before filling the structure with liquid.

TECHNICAL SERVICES

For more instructions, alternative application methods, or information concerning the compatibility of the Xypex treatment with other products or technologies, contact the Technical Department of Xypex Chemical Corporation or your local Xypex representative.

SAFE HANDLING INFORMATION

Xypex is alkaline. As a cementitious powder or mixture, Xypex may cause significant skin and eye irritation. Directions for treating these problems are clearly detailed on all Xypex pails and packaging. The Manufacturer also maintains comprehensive and up-to-date Material Safety Data Sheets on all its products. Each sheet contains health and safety information for the protection of your employees and customers. The Manufacturer recommends you contact Xypex Chemical Corporation or your local Xypex representative to obtain copies of Material Safety Data Sheets prior to product storage or use.

WARRANTY

The Manufacturer warrants that the products manufactured by it shall be free from material defects and will be consistent with its normal high quality. Should any of the products be proven defective, the liability to the Manufacturer shall be limited to replacement of the product ex factory. The Manufacturer makes no warranty as to merchantability or fitness for a particular purpose and this warranty is in lieu of all other warranties expressed or implied. The user shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith.

XYPEX PRODUCT DESCRIPTIONS

XYPEX RESTORA-TOP

Xypex Restora-Top products are designed specifically for the repair and rehabilitation of horizontal concrete surfaces such as warehouse floors, bridge decks, roads, curbs, and walkways where the repaired area must be returned to normal service within two hours of the completed repair. Restora-Top products consist of specially modified portland cement, aggregates, admixtures and bonding agents combined in controlled proportions to provide excellent adhesion properties, rapid setting and strength gain, as well as superior durability and reduced shrinkage.

XYPEX GAMMA CURE

Xypex Gamma Cure is a curing agent designed specifically for Xypex crystalline waterproofing products. The use of Gamma Cure may eliminate the need for water curing the Xypex coating in some cases. Consult manufacturer for specific recommendation.

XYCRYLIC-ADMIX

Xycrylic-Admix is a water-based polymer dispersion specifically designed for fortifying portland cement compositions. The liquid is milky-white in colour and has a high solids content. Xycrylic-Admix can be used with Xypex Patch'n Plug to increase bond strength.

WHAT IS THE SHELF LIFE OF XYPEX?

The shelf life of Xypex products is one year when stored under proper conditions. Xypex products must be stored dry at a minimum temperature of 45°F (7°C) and must not be allowed to freeze. Each Xypex package is stamped with a batch reference number. Batch numbers and destinations are maintained. If you wish to know the source or age of a specific package, please call 604 273·5265.

XYPEX

"CONCRETE WATERPROOFING BY CRYSTALLIZATION"

Telecopier Transmission

Date: 12-20 Time: 10^15

To: David Craig - Detrex (248) 799-7192

Company:

From: Doug Bailey

Number of Pages:

RE: Michigan Jobs w/ Xypex both in coating & admix form. If you need more let me know. Glad to help. Any Q's please call

Regards
Doug

* NOTE -
Just received your call from Friday call me and let me help
Doug

B.D. ASSOCIATES
767 E. Mt. Morris Street, Mt. Morris, Michigan 48458, (810) 687-3600, FAX (810) 687-0924

XYPEX

"CONCRETE WATERPROOFING BY CRYSTALLIZATION"

PARTIAL LIST OF XYPEX PROJECTS

GENERAL MOTORS:	New construction at BOC Grand Blanc, BOC Flint Automotive, Flint Engine, Buick City Complex, A.C. Rochester Flint, (flumes, sludge pits, hazardous containment pits, wet decks, oil proofing and general elimination of any penetration of liquids.
FORD MOTOR CO:	New construction, Louisville, KY., Hazelwood, MS., Chicago, IL., Maumee, OH.
CITY OF MIDLAND, MI:	Existing Water Reservoirs.
CITY OF FLINT, MI:	Existing Water Reservoirs.
CITY OF DETROIT, MI:	Existing 5 and 10 million gallon Water Reservoirs.
GENESEE COUNTY, MI:	Ragnone Wastewater Treatment Plant. New and old structures.
FAIRFIELD, IL:	Wastewater Treatment Plant. New structures.
COLINSVILLE, IL:	New Wastewater Treatment Plant, all structures.
FLORA, IL:	New Wastewater Treatment Plant, all structures.
CHICAGO, IL: (SHEDD AQUARIUM)	New construction-All Salt Water Holding Structures.
SATURN PROJECT, TN: (GENERAL MOTORS)	New construction-wet decks, floor slabs, containment pits.
B.P. OIL, TOLEDO, OH:	2 Largest Retention Basins in U.S.
PLYMOUTH TWP., MI: (TOYOTA)	Toyota-Proto-type, new construction.
BERMUDA/VIRGIN ISLAND:	Water Containment Tanks.
MARLBORO, MD:	Sewage Treatment Plant.

B.D. ASSOCIATES

767 E. Mt. Morris Street, Mt. Morris, Michigan 48458, (810) 687-3600, FAX (810) 687-0924

XYPEX

"CONCRETE WATERPROOFING BY CRYSTALLIZATION"

XYPEX WATERPROOFING ADMIX

PARTIAL LIST OF MICHIGAN PROJECTS

- Diesel Technologies - Containment Pits -
- Sturgis WWTP - Waste Water Structures
- Mueller Brass - Press Pit - S.S.O.E., Inc.
- St. Clair New County Building - Bill Vogan Arch. & T.R. Valentine Engineers
- Commerce Township WWTP - Waste Water Structures - Giffels/Webster Engineers
- Kurtz Gravel and Transit Mix - Various Residential, Commercial & Industrial Structures
- Wm. Snow Enterprises - Swimming Pool
- Genesee County - Meter Pits - County Engineering
- Woodbury Estates - Outlet Structures
- Grosse Isle - Sludge Storage Tank - Charles Raines Engineering
- Mio WWTP - Waste Water Structures -
- General Motors - Various pits, Wet decks & Hazardous containment structures for Secondary Containment.
- Beaumont Hospital - Tunnel
- Advanced Concrete Products - Various manholes & vaults
- Hamilton High School - Olympic Swimming Pool
- Ecorse School - Olympic Pool

B.D. ASSOCIATES

767 E. Mt. Morris Street, Mt. Morris, Michigan 48458, (810) 687-3600, FAX (810) 687-0924

XYPEX

"CONCRETE WATERPROOFING BY CRYSTALLIZATION"

XYPEX - USED 'WORLD WIDE'

REFERENCES

FIRMS THAT HAVE SPECIFIED XYPEX: PARTIAL LIST

Malcomb/Pernie
Coquillard/Dundon/Peterson & Argenta
Cummins & Barnard, Inc.
Giffels Associates, Inc.
Grainger Associates, Inc.
Harley Ellington Pierce Yee Associates, Inc.
Albert Kahn Associates, Inc.
McClurg & MacMillan, Inc.
S.S.O.E., Inc.
William Prine, Arch.
Spicer Engineering, Co.
Black & Veatch
Neyer, Tiseo & Hindo, Ltd.
Wade-Trim Associates, Inc.
Bechtel
Detroit Edison
URS Dalton
Spaulding DeDecker & Associates, Inc.
Smith, Hinchman & Grylls Associates, Inc.
City of Detroit Water and Sewer Dept.
City of Flint Watertreatment Plant
Ford Motor Co.
General Motors Corp.
Saturn Project
Tomblinson Harburn Associates, Inc.
Wigen/Tincknell & Associates, Inc.
Wolverine Engineering-Mason, Mi.
Flint Engine Plant
BOC Grand Blanc
Erickson Lindstrom Construction Co.
The Christman Co.
Edmonds Engineering-Ross Lake
Wong & Associates - Charles Wong
Prien-Newhoff
Bennett Engineering
Ellis/Naeyaert/Genheimer Associates, Inc.
Greely Hanson

B.D. ASSOCIATES

167 E. Mt, Morris Street. Mt. Morris Michigan 48458 (810) [illegible]

TECHNOLOGISCHES GEWERBEMUSEUM

INDUSTRIAL MUSEUM OF TECHNOLOGY
FEDERAL HIGHER TECHNICAL EDUCATION AND RESEARCH INSTITUTE OF VIENNA XX

STATE-LICENSED RESEARCH INSTITUTE FOR SILICATE TECHNOLOGY

EXPERT OPINION
RE

CONCRETE SEALING MATERIAL / 1ST PART

Application File Number:	VA/Sil 610/63
Application Received:	Jan. 25th, 1983
TGM (IMT) Number:	834/83

INDUSTRIAL MUSEUM OF TECHNOLOGY
Federal Higher Technical Education and Research Institute of Vienna XX
A-1200 Vienna, Wexstrasse 19-23
Director: Hofrat (Privy Councillor) Dipl.-Ing. Dr. Techn. F. PLÖCKINGER

STATE-LICENSED RESEARCH INSTITUTE FOR SILICATE TECHNOLOGY
Postal Address: A-1200 Vienna, Wexstrasse 19-23
Delivery Address: A-1200 Vienna, Jägerstrasse 71
Telephone: o222/35 11 07
Telex: 13-1924
Banking Connection: Postal Cheque Account No. 5030.855

Head of the Research Institute: Prof.Dr.rer.nat. Hugo Hubacek
The Research Institute has been licensed in accordance with RGBl. No. 185 of September 9th, 1910 (lex Exner).

Range of Authorization (Licence):
Examinations/Tests, Try-outs and Texting of Materials in the following fields: silicate technology and applied mineralogy including related mechanical-technical, chemical-physical examinations of silicate raw materials, semi-finished and finished products, testing of silicate-technical devices, processes and testing methods.

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1. The test results used in this Opinion refer exclusively to the described testing material(s).
2. Papers and Materials returned to the Applicant will be marked by the Research Institute insofar as this be necessary and possible.
3. Any information re content of this Expert Opinion can only be given to a third party after receipt of a written authorization from the Applicant.
4. The rendering of this Opinion in extracts shall require the previous permission in writing by the Research Institute.

1. **DESCRIPTION OF SAMPLES RECEIVED**

(a) Quantity: about 5 kg of material
Appearance: homogeneous, cementlike powder
Designation: XYPEX

(b) 3 concrete slabs measuring 20 x 20 x 12 cm

2. **SUBSTANCE OF APPLICANT'S ORDER**

"Testing of Sealing Effect re penetration of water"

3. **TESTING METHODS**

3.1. **Tests now completed:**

3.1.1. To test the waterproofing effect of XYPEX, the **"impermeability"** ("Wasserundurchlässigkeit") was tested according to ÖNORM B 3303 'Testing of Concrete, point 5.10.

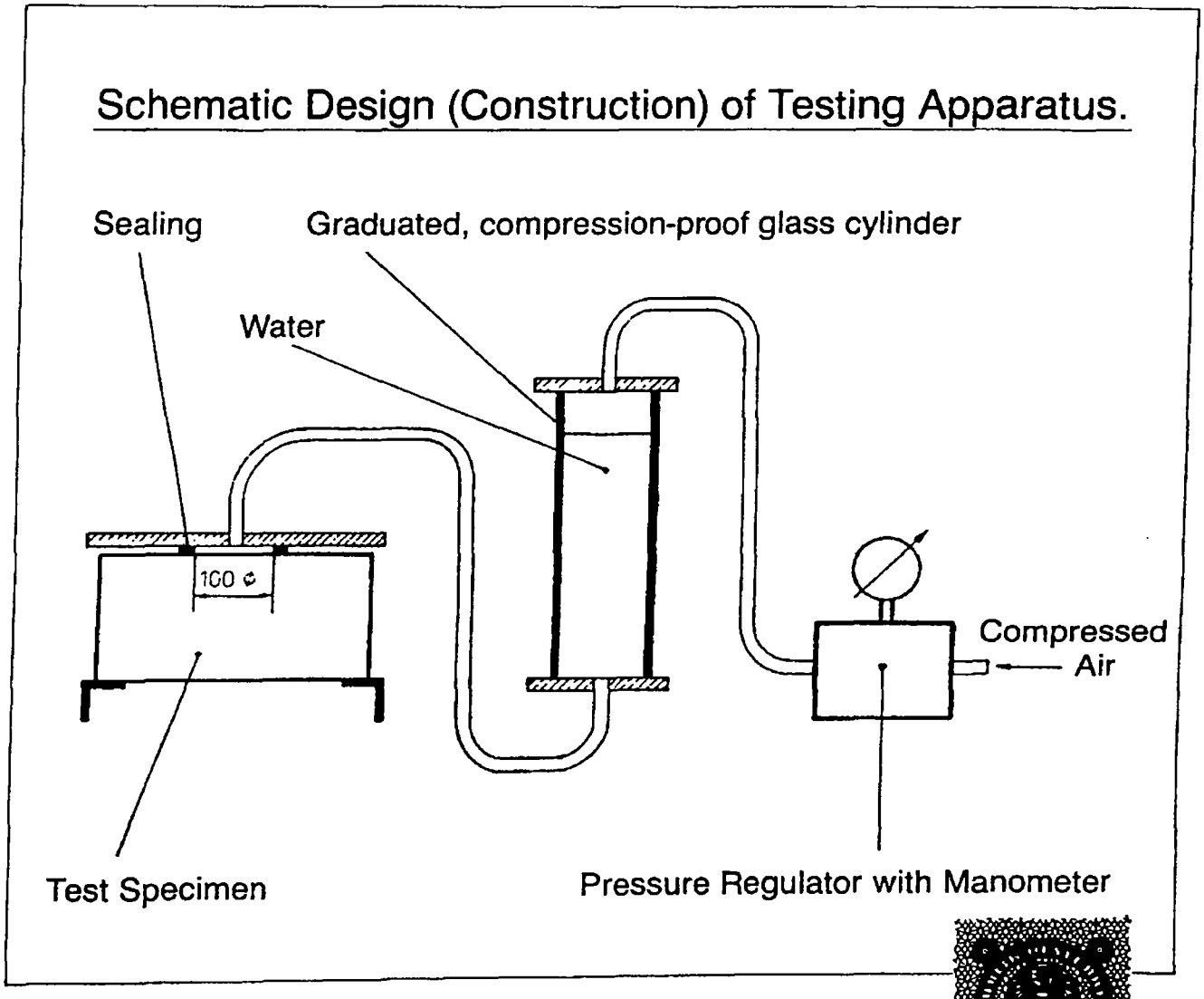
3.1.2. In order to be able to ascertain a possible influence of the sealing material on the ultimate strength of the concrete, **compressive strength tests** (Druckfestigkeitsprüfungen") were carried out on at various times after its production coated and uncoated concrete in accordance with ÖNORM B 3303, point 5.4. The concrete test samples had the same composition and the same testing age.

3.2. **Tests being carried out:**

Going beyond ÖNORM B 3303 as the suitability test for concrete, the "spontaneous absorption of water upon short-time storage" with which to determine the **capillary absorbency** will be examined. The tests will be carried out as described in the following literature: Concrete-technical Information, Research Institute of the Cement Industry; "On the effectiveness of sealing (leakproofing) material for concrete", G. Wischers & E. Drum, No. 8, 9 and 10/75. The **frost-melting salt test** on coated and uncoated concrete specimens is carried out according to ÖNORM B 3303 of March 1st, 1983.

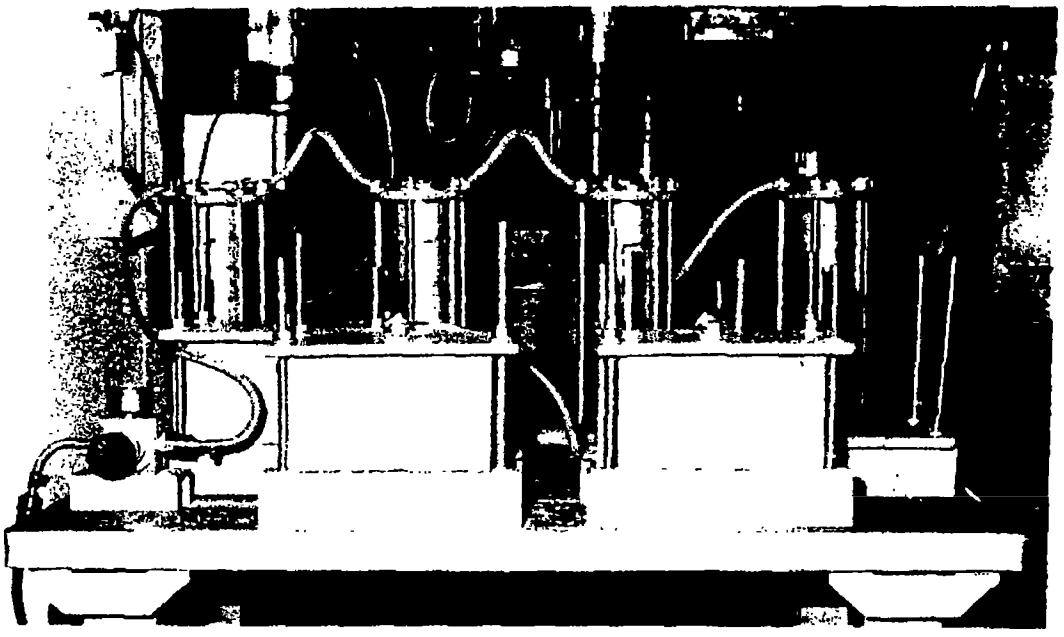
4. **DESCRIPTION OF EXPERIMENTAL PLANT FOR THE WATER LEAKAGE (IMPERMEABILITY) TEST**

The experimental plant built in the Research Center is shown schematically in Picture 1.



Wien XX.

Picture 2 is a photo of the original testing arrangement.

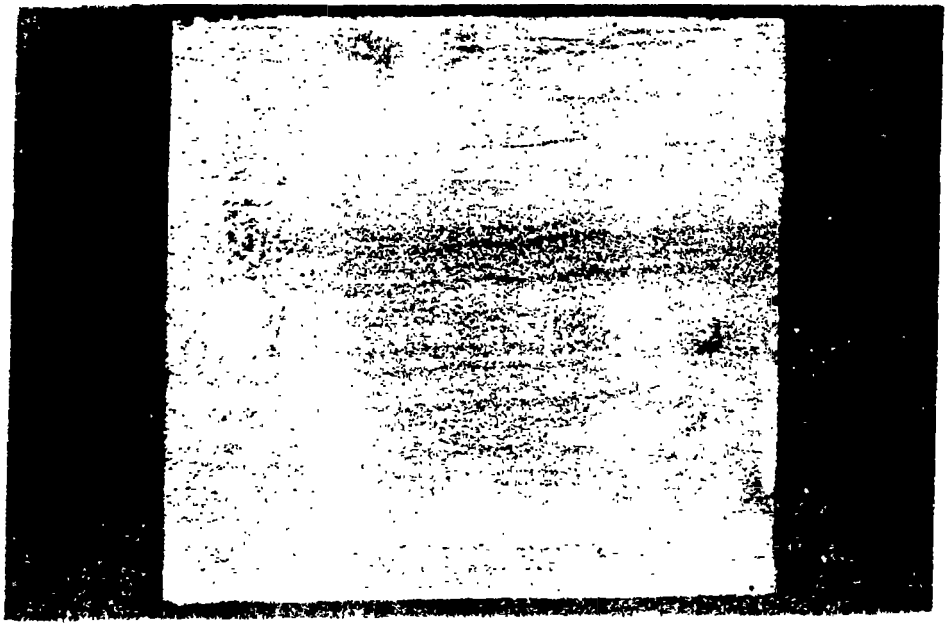


The concrete test areas of 100 mm in diameter — to be admitted with water — were picked (roughened) as prescribed (Picture 3).

The water pressure amounted to 1.4 bar on the 1st and 2nd day
2.8 bar on the 3rd day
4.2 bar on the 4th day
7.0 bar on the 5th to 15th day.

5. EXECUTION OF COATING OF CONCRETE AREA

The coating was carried out on moist concrete surfaces by persons not connected with the Research Center, i.e. by technicians of the Applicant in the Research Center while being under observation by personnel of the said Research Center (Picture 4).



For the impermeability (to water) test according to ÖNORM B 3303 a concrete test area of the test specimen (= one side) was coated; for the capillary absorbency all concrete test areas (= all sides) of a test piece will be coated.

The first test slab was coated 36 hours after its production, the second test slab after 28 days.

The actual tests were started only after an additional 12 days of storage since according to the Applicant only after this period of time the effectiveness of the sealing material is assured.

With regard to the coating, and contrary to the ÖNORM, all test specimens, i.e. also the uncoated ones, were kept not under water during the entire period of storage but in a steam-saturated atmosphere at room temperature.

6. TEST RESULTS

6.1. Impermeability to water

	Penetration in ml after			
	1 hour	2 days	3 days	15 days
Uncoated concrete test specimen (A)	10 ml	10 ml	18 ml	25ml
Concrete test specimen coated 36 hours after its production (B)	no longer measurable within accuracy of reading			
Concrete test specimen coated 28 days after its production (C)	no longer measurable within accuracy of reading			

All concrete test specimens were broken up in the middle and judged visually. The uncoated test specimens clearly showed a penetration of water to the depth of 15 mm; the coated test specimens showed no penetration of water.

6.2. **Compression Strength**

Cubes with a 100 mm long edge were cut from the broken-up test specimens and the compression areas polished 'plane-parallel' (or: 'with parallel faces').

	kN/cm²
Uncoated concrete test specimen (A)	6.6
Concrete test specimen coated 36 hours after its production (B)	7.7
Concrete test specimen coated 28 days after its production (C)	6.9

EXPERT OPINION

As requested by the Applicant, an Interim Report regarding the current tests is herewith given: The sofar executed tests demonstrate that the concrete test specimens coated with XYPEX have an impermeability to water quite superior to the uncoated ones.

* * * * * * * * * * * * * * *

Vienna, May 10th, 1983

Enclosures:

Seal: "State-licensed Research Institute for Silicate Technology in Vienna:

Prof.Dr.rer.nat. H. Hubacek
Head of the Research Institute

Prof.Dr.rer.nat. H. Hubacek
Appraiser

Hofrat Dipl.-Ing. Dr.techn.
Friedrich Plöckinger

XYPEX NEWS

ISSUE NO. 85 - 7 (TECHNICAL)

FEDERAL RESEARCH INSTITUTE OF VIENNA

PERMEABILITY STUDY OF XYPEX

XYPEX has now been tested by the prestigious Federal Higher Technical Education and Research Institute of Vienna, in Austria.

The subject of the test was "Testing of Sealing Effect re: Penetration of Water" and was performed according to Austrian Standard ONORM-B-3303 "Testing of Concrete", Point 5.10, and ONORM-B-3303, Point 5.4.

The results of the tests showed that **XYPEX-treated concrete specimens exhibited no measurable leakage whatsoever.**

In addition, "All test specimens were broken up in the middle and judged visually. The uncoated test specimens clearly showed a penetration of water to the depth of 15 mm.; **the coated specimens showed no penetration of water."**

The compressive strength of the **XYPEX**-treated specimens was an average of **11% higher** than the untreated specimen.

Expert Opinion by Prof. Dr. Hugo Hubacek, Head of the Institute:

".... The sofar executed tests demonstrate that the concrete test specimens coated with **XYPEX** have an impermeability to water quite superior to the uncoated ones. "

Concrete Waterproofing by Crystallization"

ComFile: vientest.nws

CLIENT

XYPEX CHEMICAL CORPORATION

12520 VICKERS WAY

RICHMOND, B.C., CANADA V6V1H9

PROJECT

XYPEX CHEMICAL WATERPROOFING TREATMENT CHEMICAL RESISTANCE STUDY

PREPARED BY:

PACIFIC TESTING LABORATORIES

3220 17TH AVE. WEST

SEATTLE, WA 98119

CERTIFICATE NO. 8103-1045

24 JUNE 1983

PROJECT COORDINATOR: Gregory D. Strand

GREGORY D. STRAND

CIVIL ENGINEER, E.I.T.

TECHNICALLY REVIEWED: James C. Freeling

JAMES C. FREELING, P.E.

VICE-PRESIDENT, ENGINEERING

APPROVED: George R. Knight

DR. GEORGE R. KNIGHT, P.E.

PRESIDENT

PACIFIC TESTING LABORATORIES STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

Xypex Chemical Company
Chemical Resistance Study: Data Sheet
Certificate No. 8103-1045
Page Eight

Solution: Brake Fluid

	I.D. Number 2		
	Untreated	Treated	
	2 "U	2 "A"	2 "B"
Original Weight, gms (SSD*)	497.0	508.6	523.3
Final Weight, gms (SSD)	504.2	515.5	530.4
Change (gain/loss) gms	+ 7.1	+ 6.9	+ 7.1
Percent change, weight	+ 1.43	+ 1.36	+ 1.36

Final observations (visual): None of these specimens reveal any visible ill effects.

Compressive Strength Results

Ultimate, lbs.		P.S.I.
2 U	19,800	6,303
2 A	25,250	8,037
2 B	21,500	6,844
Avg A,B	23,375	7,440

Zypex cylinders averaged 18.0% increase in compressive strength, compared to untreated cylinder.

*SSD: Saturated Surface Dry

Xypex Chemical Company
Chemical Resistance Study: Data Sheet
Certificate No. 8103-1045
Page Nine

Solution: Transformer (Mineral) Oil I.D. Number 3

	Untreated	Treated	
	3 "U"	3 "A"	3 "B"
Original Weight, gms (SSD*)	500.0	510.5	531.5
Final Weight, gms (SSD)	505.3	518.2	538.2
Change (gain/loss)gms	+ 5.3	+ 7.7	+ 6.7
Percent change, weight	+ 1.06	+ 1.51	+ 1.26

Final observations (visual): None of these specimens showed any visible ill effects.

Compressive Strength Results

Ultimate, lbs.		P.S.I.
3 U	10,250	6,446
3 A	23,200	7,385
3 B	23,150	7,369
Avg A,B	23,175	7,377

Xypex cylinders averaged 14.4% increase in compressive strength, compared to untreated cylinder.

*SSD: Saturated Surface Dry

Xypex Chemical Company
Chemical Resistance Study: Data Sheet
Certificate No. 8103-1045
Page Ten

Solution: Ethylene Glycol (50%) I.D. Number 4

	Untreated	Treated	
	4 "U"	4 "A"	4 "B"
Original Weight, gms (SSD*	508.8	530.5	526.5
Final Weight, gms (SSD)	515.4	536.7	532.8
Change (gain/loss)gms	+ 6.6	+ 6.2	+ 6.3
Percent change, weight	+ 1.30	+ 1.17	+ 1.20

Final observations (visual): None of these specimens reveal any visible ill effects.

Compressive Strength Results

Ultimate, lbs.		P.S.I.
4 U	18,550	5,905
4 A	23,800	7,576
4 B	24,200	7,703
Avg A,B	24,000	7,639

Xypex cylinders averaged 29.4 increase in compressive strength, compared to untreated cylinder.

*SSD: Saturated Surface Dry

Xypex Chemical Company
Chemical Resistance Study: Data Sheet
Certificate No. 8103-1045
Page Eleven

Solution: Toluene I.D. Number 5

	Untreated	Treated	
	5 "U"	5 "A"	5 "B"
Original Weight, gms (SSD*	499.7	529.0	520.4
Final Weight, gms (SSD)	503.4	532.8	524.8
Charge (gain/loss)gms	+ 3.7	+ 3.8	+ 4.4
Percent change, weight	+ 0.74	+ 0.71	+ 0.85

Final observations (visual): None of these specimens reveal any visible ill effects.

Compressive Strength Results

Ultimate, lbs.		P.S.I.
5 U	10,750	6,605
5 A	23,500	7,480
5 B	24,700	7,862
Avg A,B	24,100	7,671

Xypex cylinders averaged 16.1% increase in compressive strength, compared to untreated cylinder.

*SSD: Saturated Surface Dry

Xypex Chemical Company
Chemical Resistance Study: Data Sheet
Certificate No. 8103-1045
Page Twelve

Solution: Pool Chlorine (Undiluted) I.D. Number 6

	Untreated	Treated	
	6 "U"	6 "A"	6 "B"
Original Weight, gms (SSD*)	489.5	501.0	540.2
Final Weight, gms (SSD)	494.8	505.8	544.1
Change (gain/loss)gms	+ 5.3	+ 4.8	+ 3.9
Percent change, weight	+ 1.08	+ 0.96	+ 0.72

Final observations (visual): Very slight white-yellow chalky surface deposit on both treated samples. No other ill effects noted. The untreated specimen shows no visible ill effects.

Compressive Strength Results

Ultimate, lbs.		P.S.I.
6 U	12,700	7,544
6 A	27,200	8,650
6 B	26,450	8,419
Avg A,B	26,825	8,539

Xypex cylinders averaged 13.2% increase in compressive strength, compared to untreated cylinder.

*SSD: Saturated Surface Dry

Xypex Chemical Company
Chemical Resistance Study: Data Sheet
Certificate No. 8103-1045
Page Thirteen

Solution: Caustic Soda I.D. Number 7

	Untreated	Treated	
	7 "U"	7 "A"	7 "B"
Original Weight, gms (SSD*)	495.4	528.2	525.6
Final Weight, gms (SSD)	502.9	535.2	531.4
Change (gain/loss)gms	+ 7.5	+ 7.0	+ 5.8
Percent change, weight	+ 1.51	+ 1.33	+ 1.11

Final observations (visual): No visible ill effects noted with exception of almost imperceptible white "whiskers" approximately 1/8" long extending from side of cylinder (noted at 10 weeks) on treated specimens only (approx. 5-10 per cylinder).

Compressive Strength Results

Ultimate, lbs.		P.S.I.
7 U	16,100	8,308
7 A	28,700	9,136
7 B	30,800	9,804
Avg A,B	29,750	9,470

Xypex cylinders averaged 14.0% increase in compressive strength, compared to untreated cylinder.

*SSD: Saturated Surface Dry

ATTACHMENT D-5

SECONDARY CONTAINMENT VOLUME CALCULATIONS

ATTACHMENT D-5
SECONDARY CONTAINMENT VOLUME CALCULATIONS

The secondary containment systems include four separate hazardous waste container storage areas. The secondary containment volume calculations for each area are provided below. Dimensions of each area are presented on the drawings enclosed.

Containment Volume Calculations

Purpose: To determine the secondary containment capacity for each area.

Approach: Utilize standard area and volume calculations

Rectangle: $V = w \times l \times h$
Cylinder: $V = \prod \times r^2 \times h$
Cone: $V = 1/3 \times \prod \times r^2 \times h$

For right angle triangles
Tangent of an angle = Opposite side / Adjacent side
Sin of angle = Opposite side / Hypotenuse side

where:
w = width of floor area
l = length of floor area
h = height of curb
r = radius of drum (1.03 ft)

$1\ ft^3$ = 7.48 gallons
$1\ ft^3$ = 1 pallet (estimated)

ATTACHMENT D-5
SECONDARY CONTAINMENT VOLUME CALCULATIONS

Staging Area (6)

The staging area still uses the containment provided by secondary containment pallets. Each pallet is designed to store up to 55 gallons of a spilled material. There will be at least three such pallets at the Facility.

Container Storage Area 7 & 8

(3-½-inch high perimeter curbing)
3,520 gallons (64 x 55 gallon drums)

Floor Area	=	16 ft x 22 ft
	=	352 ft^2
Volume	=	352 ft^2 x (0.29 ft) = 102.1 ft^3
Less Volume of Pallets	=	8 pallets x 1.35 ft^3
	=	10.8 ft^3
Less Volume of Ramp	=	22 ft x 3.125 ft x 0.29 ft x ½
	=	10.0 ft^3
Remaining Volume	=	(102.1 - 10.8 - 10) ft^3 x 7.48 gal / ft^3
	=	608.1 gallons
∴ Secondary Containment Capacity	=	17.3 % of total volume
	=	110.6 % of largest container (550-gallon tote)

Container Storage Area 9

NOTE: Storage area 9 has a curb that is 19 feet in length, 15.5 feet in width and 5.5 inches in height. The curbing is approximately 6 inches wide. Storage capacity: 5,830 gallons (*96 x 55 gallon drums)*

Secondary containment

Floor Area	=	19 ft x 15.5 ft
	=	294.5 ft^2
Volume	=	294.5 ft^2 x (0.458 ft) = 134.9 ft^3
Less Volume of Pallets	=	12 pallets x 1.35 ft^3
	=	16.2 ft^3
Remaining Volume	=	(294.5 - 16.2) ft^3 x 7.48 gal / ft^3
	=	2081.7 gallons
∴ Secondary Containment Capacity	=	35.7 % of total volume
	=	372.4 % of largest container (550-gallon tote)

ATTACHMENT D-5
SECONDARY CONTAINMENT VOLUME CALCULATIONS

Container Storage Area 11

Storage per trailer = 64 drums (3,520 gallons)
Largest container: tote = 550 gallons

Trailer dimensions (see Attachment D-3)
45' length & 94" wide
Unit has a 12" internal containment wall
(Note: for maximum displacement volume containers on vehicle are assumed to be drums)

Dock dimensions:
52 feet long x 16 ½ " depth from beginning of slope x 21'-6" width
For a horizontal length of 52 feet there is a vertical drop of 1.375 feet. The slope is visible in the pictures presented in Attachment A-3. The slope of the dock can be calculated by using geometry.

Tan (angle) = opposite / adjacent = 1.375 / 52 = 0.02644
angle = $\tan^{-1}$ (0.02644) = 1.51^0

Volume contained by trailer

Impact of slope on containment volume
It is necessary to determine if the slope limits the containment of the trailer. Again, geometry is used to calculate the rise for the length of the trailer.

sin (1.51)	=	x / 45'
0.026 x 45'	=	x
x	=	1.18'

This calculation denotes that for a length of 45', the rise would be 1.18 feet. Trailers have a containment wall of 1'; therefore, the containment capacity is reduced due to the angle and the height of the containment wall. Based on a ratio of the lengths to the heights, approximately 7.5 feet at the nose of the trailer will be above the containment wall found at the rear of the trailer.

Empty containment volume

½ x 45' length x 1.2' deep x 7.833' wide x 7.48 gal/ft^3	= 1,582 gallons
Less that portion above the 1-foot containment wall	
[(45-7.5)' x 0.2' + ½ x 7.5' x 0.2'] x 7.833' x 7.48gal;/ft3	= 483.4 gallons
Containment volume	= 1,098.6 gallons

Volume displaced by containers
NOTE: A conservative displacement estimate for the container (drum) is used in determining the containment volume. It is based on the bottom one foot being below the liquid level, with the exception of the last 7.5 feet in the nose of the trailer, as this portion is completely above the containment panel. In reality the amount the container is submerged varies with its distance from the rear of the trailer.

60 drums x [½ x (1'D)^2 x 1'H x 3.1415 x 7.48] = 705 gallons

Remaining volume

= 1098.6- 705gallons
= 393.6 gallons

∴ Minimum Secondary Containment Capacity is met

393.6 / 3,520	=	11.2 % of total volume
550/3,520	=	97 % of largest container

ATTACHMENT D-6
AIR EMISSION STANDARDS

Attachment D-6

TABLE OF CONTENTS

Page

Contents

Subpart AA- Air Emission Standards for Process Vents 3
Standard: Process Vents 3
Subpart BB- Air Emission Standards for Equipment Leaks 3
Standards: Pumps in light liquid service 3
SUBPART CC 3
Waste Determination and Exemptions 3
2.0 Tanks 3
2.1 Tank Size (264.1084(b)) 3
3.0 Containers 3
Level 1 Containers (40 CFR 264.1086(c, g, & h)) 4
Level 2 Containers (40 CFR 264.1086(d, g, & h)) 5
Level 3 Containers 40 CFR 264.1086(e)) 7
4.0 SURFACE IMPOUNDMENTS (40 CFR 264.1085) 7
5.0 RECORD KEEPING (40 CFR 264.1089) 7
5.1 Tanks (40 CFR 264.1089 (b)) 7
5.2 Surface Impoundments (40 CFR 264.1089 (c)) 7
5.3 Level 3 Containers (40 CFR 264.1089 (d)) 7
5.4 Closed Vent Systems (40 CFR 264.1089 (e)) 7
5.5 Unsafe to monitor (40 CFR 264.1089 (g)) 7
Reporting Requirements (40 CFR 264.1090) 8
Exemptions (40 CFR 264.1090(a)) 8
Air Emission Controls (40 CFR 264.1090(b)) 8
Air Emission Control Devices (40 CFR 264.1090(c & d)) 8

Attachment D-6

Subpart AA- Air Emission Standards for Process Vents

Standard: Process Vents
40 CFR 264.1032

The Detrex Corporation Facility (Facility) is not subject to subpart AA, as it does not process any waste at this site.

Subpart BB- Air Emission Standards for Equipment Leaks

Standards: Pumps in light liquid service
40 CFR 264.1052

The Facility is not subject to subpart BB, as it does not operate any pumps in light liquid service.

SUBPART CC – Containers

Waste Determination and Exemptions
(40 CFR 264.1082, .1083, & .1090(f))

The Facility handles hazardous waste for the purpose of storage prior to shipment off site to another permitted TSDF. All hazardous wastes are delivered to the Facility in either non-bulk DOT approved containers (such as drums) or in DOT approved bulk containers (such as tote bins). The average waste concentration of the waste in these containers exceeds the exemption requirements under the standard of 500 ppmw.

The Facility currently treats all wastes as failing to meet the exemption requirements. Therefore, no testing of the hazardous waste is being conducted under this standard.

2.0 Tanks

2.1 Tank Size (264.1084(b))

The Facility does not operate any tanks associated with hazardous wastes. As such this portion of the standard is not applicable.

3.0 Containers

Attachment D-6

Level 1 Containers (40 CFR 264.1086(c, g, & h))

3.1.1 Controls (40 CFR 264.1086(c)(1))

The majority of the containers handled by the Facility are non-bulk DOT approved containers containing hazardous wastes in light material service. The Facility has the ability to also handle bulk DOT level 2 containers as discussed in section 3.2.1. Containers meeting the requirements of DOT approved containers, and subsequently EPA's requirements, are capable of storing materials in light service without any release to the environment.

3.1.2 Closure Devices (40 CFR 264.1086(c)(3))

All closures on DOT containers of hazardous waste will remain securely closed while stored at the facility unless there is a need to open the container to perform operations such as: sampling the waste, transferring retain samples to a disposal container or transferring the waste to another container due to failure of the first container. The Facility does not anticipate having any non-bulk DOT containers utilizing pressure relief bungs to vent excess pressure to the atmosphere. In the event that these types of bungs are used, personnel will visually inspect them prior to placement into the Hazardous waste Storage area to insure they are closed.

When closures are removed for the purpose of performing the work noted above the closure must be replaced under the following conditions, whichever occurs first:

1. When adding waste to a DOT container in one continuous operation, the container will be immediately closed following the placement of the final volume of material into the container;
2. During incremental additions or removals from the container, personnel will immediately replace the closure device when the following conditions are met:
   i. after placement of the final volume of material into the container;
   ii. when no material will be transferred to the container within a 15 minute time period;
   iii. when the employee who is filling or emptying the container leaves the immediate vicinity (immediate vicinity will be defined as the hazardous waste storage area); or
   iv. the process which generates the waste which is being added to the container is shut down.
3. When performing other tasks, such as sampling material from the container, or measuring the quantity of material within the container, closure will be accomplished within 15 minutes of opening the container for these intended purposes.

Attachment D-6

Empty containers meeting the requirements of RCRA empty as denoted under 40 CFR 261.7 will be closed as soon as possible after completion of work.

3.1.3 Inspection (40 CFR 264.1086(c)(4) & 264.1088)

all containers entering the Facility are immediately inspected upon receipt (placement into staging area). This inspection verifies the container is intact per DOT's requirements. The inspection includes verification that all bungs / closure devices are properly sealed, proper bungs are used, and that there is no material on the outside of the container, which would be released to the environment.

In addition to the initial inspection, DOT containers are inspected on a daily and weekly basis as required under Section F of the Permit Application, Procedures to Prevent Hazards. This verifies that containers are still in good condition and that no materials are released to the environment. Copies of inspection records are kept on site for a minimum of three (3) years.

Storage of hazardous waste in DOT containers is expected to be less than one (1) year. In the event that materials are stored on-site for more than one (1) year the condition of the containers, including the closure devices, will be verified by the daily and weekly inspections and recorded on the inspection forms on the anniversary date of acceptance by the Facility.

In the event that a release is detected by the daily or weekly inspection, and the container cannot be repaired, the contents of the material will be transferred to another suitable container as soon as possible. In no event will this transfer occur later than five calendar days after discovery of the defect/release.

Level 2 Containers (40 CFR 264.1086(d, g, & h))

3.2.1 Controls (40 CFR 264.1086(d)(1))

The majority of level 2 containers handled by the Facility are bulk DOT-approved containers (such as totes) containing hazardous wastes in light material service. As such, these containers have met DOT's requirements, and subsequently EPA's requirements, for storage of materials without any release to the environment.

3.2.2 Transferring Methods (40 CFR 264.1086(d)(2))

When transferring waste into or out of bulk containers personnel will utilize good engineering methods which will minimize the release of hazardous wastes to the

environment. The primary method used to accomplish transfers will involve submerged filling.

3.2.3 Closure Devices (40 CFR 264.1086(d)(3))

All closures on DOT containers of hazardous waste will remain securely closed while stored at the Facility unless there is a need to open the container to perform operations such as: adding or transferring hazardous waste into or out of the container, transferring the waste to a storage tank, sampling the waste, or transferring the waste to another container due to failure of the first container.

When closures are removed for the purpose of performing the work noted above the closure must be replaced under the following conditions, whichever occurs first:

1. When adding waste to a DOT container in one continuous operation, the container will be immediately closed following the placement of the final volume of material into the container;
2. When removing waste from a DOT container in one continuous operation, the container will be immediately closed upon the completion of removing waste from the container, unless the container can be classified as RCRA empty as specified in 40 CFR 261.7 (note: These containers will still be treated as holding hazardous materials as required under the DOT's definition of residue);
3. During incremental additions or removals from the container personnel will immediately replace the closure device when the following conditions are met:
   i. after placement of the final volume of material into the container;
   ii. when no material will be transferred to the container within a 15 minute time period;
   iii. when the employee who is filling or emptying the container leaves the immediate vicinity (immediate vicinity will be defined as the hazardous waste storage area); or
   iv. the process which generates the waste which is being added to the container is shut down
3. When performing other tasks such as sampling material from the container, or measuring the quantity of material within the container, closure will be accomplished within 15 minutes of opening the container for these intended purposes.

3.2.4 Inspection (40 CFR 264.1086(d)(4) & 264.1088)

Conditions for inspection of level 2 containers are the same as specified in section 3.1.3.

Attachment D-6

Level 3 Containers 40 CFR 264.1086(e))

This section does not apply as this Facility does not perform waste stabilization.

4.0 SURFACE IMPOUNDMENTS (40 CFR 264.1085)

This Facility does not operate, nor does it intend to operate any surface impoundments.

5.0 RECORD KEEPING (40 CFR 264.1089)

5.1 Tanks (40 CFR 264.1089 (b))

This section does not apply as this Facility does not operate, nor does it intend to operate, any tanks.

5.2 Surface Impoundments (40 CFR 264.1089 (c))

This section does not apply as this Facility does not operate, nor does it intend to operate, any surface impoundments.

5.3 Level 3 Containers (40 CFR 264.1089 (d))

This section does not apply as this Facility does not operate, nor is it permitted to perform any waste stabilization in containers using level 3 controls

5.4 Closed Vent Systems (40 CFR 264.1089 (e))

This section does not apply as this Facility does not operate, nor does it intend to operate any Closed Vent Systems.

5.5 Unsafe to monitor (40 CFR 264.1089 (g))

This section does not apply as there are no tanks used in hazardous waste operations.

Attachment D-6

Reporting Requirements (40 CFR 264.1090)

Exemptions (40 CFR 264.1090(a))

At present, all containers are being managed as under the regulations, therefore, 264.1090(a) does not apply

Air Emission Controls (40 CFR 264.1090(b))

If there is a non-compliance event, such as but not limited to:

- storing waste having a vapor pressure in excess of the allowable pressure of either the equipment or 76.6 kPa;
- waste being stored or heated to a temperature above the that used to determine the maximum vapor pressure;
- if the control device is removed from service for more than 240 hours / year for planned routine maintenance;
- the control device malfunctions;

A written report will be submitted to the Regional Administrator within 15 calendar days of the time that Facility Personnel become aware of the occurrence. The report will include the following information:

- Facility name and address;
- description of noncompliance event and cause of the noncompliance;
- date of discovery of noncompliance and date noncompliance occurred;
- actions taken to correct the noncompliance situation; and
- actions taken to prevent reoccurrence of noncompliance.

Air Emission Control Devices (40 CFR 264.1090(c & d))

This section does not apply as this Facility does not operate, nor does it intend to operate any Closed Vent Systems tied to control devices.

Subpart CC Operating Log Form

List the containers found not to be totally sealed, or leaking during the initial inspection, within 24 hours of arrival at the facility.

List each container, the problem, and the attempt of repair, and sign

_____ _____

Signature Date of initial inspection

_____

Print name

Container Tracking Number(s): _____

Problem(s): _____

_____

_____

Attempt of Repair: _____

_____

_____

_____ _____

Signature Date Repaired

_____

Print name

This form stays in the active file until the container is sealed or the material is transferred to another container. Sign and date the form when work is complete (this must be completed within 5 days). After completion, this form is to be included in the operating log as a record of compliance.

This is to certify the annual visual inspection of the fixed roof tank and closure devices to for defects that could result in air pollutant emissions.

_____ Tank is free of visible cracks, holes or gaps in the roof or between the roof or between the roof and walls; and there are no broken, damaged, cracked seals or gaskets; or missing hatches, covers, caps or other closure devices.

_____ A defect has been detected and shall be repaired in accordance with the requirements of 40 CFR 264.1089 K.

_____ Conservation vent remains installed and sealed.

Date of Annual Inspection _____

Inspection performed by _____

Defects noted:

Defect Repaired: Date _____ Signature _____

SECTION E

ENVIRONMENTAL MONITORING

SECTION E
TABLE OF CONTENTS
ENVIRONMENTAL MONITORING

ENVIRONMENTAL MONITORING 3
E-1 HYDROGEOLOGIC REPORT 4
E-1a Interim Status Period Groundwater Monitoring 4
E-1b Identification of Uppermost Aquifer [Rule299.9506(1)(b)] 4
E-1c Identification of Aquifers Utilized 4
E-1d Other Aquifers [Rule 299.9506(d)] 5
E-1e Hazardous Waste Management Area 6
E-1f Contaminant Plume Description 6
E-2 GROUNDWATER MONITORING PROGRAM WAIVER 7
E-3 ANNUAL SOIL MONITORING PROGRAM WAIVER 8

ATTACHMENTS

ATTACHMENT E-1 HYDROGEOLOGIC REPORT & WELL LIST
ATTACHMENT E-2 TOPOGRAPHIC MAP
ATTACHMENT E-3 FACILITY PLAN
ATTACHMENT E-4 LIST OF HAZARDOUS WASTES
ATTACHMENT E-5 ENGINEER'S CERTIFICATION

SECTION E

ENVIRONMENTAL MONITORING

This section of the operating license application provides a hydrogeologic report pertaining to the Facility (12886 Eaton Ave., Detroit, Michigan), as required by Michigan Act 451 Rule 299.9506(1) and (2). This section also provides a justification for waiver for a groundwater monitoring program and for an annual soil monitoring program pursuant to Rule 299.9611(3) and Rule 299.9611(4), respectively.

It should be noted that this section has been reproduced from a previous submission dated June 24, 1991, with minor modifications to it to accommodate the changes to the operations at the Facility.

E-1 HYDROGEOLOGIC REPORT

[Rule299.9506]

A hydrogeologic investigation, which details the field activities of the investigation and summarizes all the data collected, was conducted at the Facility (Attachment E-1).

Attachment E-2 provides a Plan of Survey completed and certified by Warner Cantrell & Padmos, Inc. The location of the monitoring well and boreholes are shown. The Facility Plan presented in Attachment E-3 locates all hazardous waste management units. In addition to the hydrogeologic report presented in Attachment E-1, the following information is presented to satisfy the requirements of Rule 299.9506(1).

E-1a Interim Status Period Groundwater Monitoring [Rule299.9506(1)(a)]

No interim status groundwater monitoring was required for the hazardous waste container and tank storage areas.

E-1b Identification of Uppermost Aquifer [Rule299.9506(1)(b)]

As discussed in the engineering report presented in Attachment E-1, the uppermost aquifer beneath the Facility property was located at approximately 100 feet below ground surface (557 feet AMSL). The uppermost aquifer consisted of a confined, unconsolidated, sand aquifer with a hydraulic conductivity of approximately 1×10^{-3} cm/sec. The aquifer is overlain by approximately 100 feet of unsaturated lacustrine silty clay/clayey silt with a hydraulic conductivity of less than 1×10^{-7} cm/sec.

It was agreed with the MDNR, prior to and during the hydrogeologic investigation field activities, that due to the hydrogeologic conditions at the Site, only one borehole would be required to be advanced to the underlying aquifer and instrumented as a monitoring well. As such groundwater flow direction and rate were not determined during the hydrogeologic investigation. Groundwater flow in the confined aquifer, however, is assumed to be east-southeast towards Lake St. Clair.

E-1c Identification of Aquifers Utilized [Rule299.9506(1)(c) and (f)]

A well survey was conducted by McDowell and Associates of Ferndale, Michigan. There are no available records of any domestic, municipal, industrial, oil and gas wells and soil borings within a one-mile radius of the Site on record with the Michigan Department of Natural Resourses and Environment (MDNRE - formally the MDEQ and MDNR).

As discussed in Section J-2 of this Operating License Application, the City of Detroit covers much of Wayne County, deriving its water from surface sources. As such, very little groundwater is exploited in Wayne County. Of the 42 communities in Wayne County, 38

of these communities purchased water from another community, and four of these communities were supplied by surface water (EPA, 1981).[1] No community in the County reported the use of groundwater as a municipal supply source. Within five miles of the Site, no major water course or water body exists.

E-1d Other Aquifers [Rule 299.9506(d)]

As discussed in Section K-2 of this operating license application, material in Wayne County consists primarily of silts and clays with the occasional glacial moraine deposits. This thick layer of lacustrine material mantles a bedrock of sandstones, limestones, shales and dolomites. The downward sequence of the various bedrock formations beneath Wayne County includes the following:

Mississippian

Coldwater Shale - This unit exists at the northwest corner of Wayne County. The unit outcrops and subcrops in this area. The unit generally has low permeability.

Devonian

Berea Sandstone - This moderately fine grained sandstone can be 100 feet in thickness in spots.

Traverse Group - This alternating sequence of shales and limestones outcrops in the central portions of Wayne County.

Dundee Limestone - This unit is a fossiliferous limestone with high permeability.

Detroit River Group - This group includes sandstones, limestones and dolomite.

Sylvania Sandstone - This unit outcrops in the southeast reaches of Michigan.

Silurian

Bass Leland Group - This group is composed of fine grained dolomites.

Of the formations listed above, the following formations are reported to be used as a water supply source in Wayne County: Berea Sandstone, Traverse Group, Dundee Limestone, Detroit River Group, and the Sylvania Sandstone.

Several injection wells are located within the state of MI. As of 01.22.09 there were 707 Brine Disposal Wells, nine Gas Injection Wells, 2436 for Gas Storage, eight Other Injection Wellsm abnd 528 Water Injection Wells. the information was obtained from the MDNRE website (http://www.michigan.gov/deq/0,1607,7-135-3311-9311--,00.html). Documentation of the current well search is provided in Attachment E-1.

---

(1) "Hydrogeology for Underground Injection Control in Michigan: Part 1, 1981" USEPA.

As discussed in Section E-1c, no community reported the use of groundwater as a municipal supply source. A number of non-community sources outside the Detroit City limits however have been recorded. Those geologic units capable of supplying water are summarized above. The table below summarizes the information as provided by the EPA (1981). [1]

Aquifer System	*# of Wells*	*Depth (ft)*	*Capacity (gpm)*
Glacial Drift Aquifer	15	62 - 122	13 - 4,000
Berea Sandstone	2	207 - 234	5 - 30
Traverse Group	1	126	100
Dundee Limestone	1	183	110
Detroit River Group	5	28 - 102	15 - 41
Sylvania Sandstone	2	66 - 135	50 - 300
Silurian-Devonian	1	475	40

The water quality from the bedrock aquifers is normally good. Water which is extracted from greater depths tends to have higher sulfate concentrations due to the presence of gypsum at depth. Limestone bedrock aquifers also tend to have increases in total dissolved solids. In general, however, natural groundwaters in Wayne County have inorganic concentration measurements below EPA established guidelines.

E-1e Hazardous Waste Management Area [Rule 299.9506(1)(e)]

The hazardous waste container storage areas, the drum loading/unloading area and product drum storage area are located on the figure presented as Attachment E-3. As is discussed subsequently in Section E-2, the Facility requests to maintain its waiver from groundwater monitoring. Therefore, the point of compliance, as defined under the provisions of 40 CFR § 264.95, and the location of groundwater monitoring wells as required under the provisions of 40 CFR § 264.97 are not applicable. The information, to the extent possible, required under the provisions of 40 CFR § 270.14(c)(2) was presented and discussed in Section E-1(b).

E-1f Contaminant Plume Description [Rule 299.9506(g)]

As stated in Section E-1(a) no interim status groundwater monitoring was required for the hazardous waste container and tank storage areas.

E-2 GROUNDWATER MONITORING PROGRAM WAIVER

[Rule 299.9611(3)]

a waiver is requested from the Director pursuant to Rule 299.9611(3) from the requirement under Rule 299.9611(2)(a) for a detection monitoring program which meets the requirements of Rule 299.9612 and the provisions of 40 CFR § 264.98.

As discussed in Section D-1, the hazardous waste container storage areas, for which this operating license is being applied for, are located inside a totally enclosed building, or on box trailers with secondcary containment. The building/trailer provides protection from precipitation and run-on into the secondary containment system. The building floor, which encompasses the Facility, is constructed of concrete. The concrete curbing is protected with a sealent/coating which is impervious to the wastes to be stored in the area. There are no floor drains or other such openings in the secondary containment area.

All existing expansion joints and any cracks in storage areas, in the building floor will be cleaned out and saw cut if necessary to provide a clean opening. Subsequently, all expansion joints and any cracks will be filled with a compatible chemically resistant flexjoint sealant. The selected sealant will be installed in accordance with the manufacturer's specifications. The concrete slab and container storage area diking, with sealed joints, will serve as an impervious containment structure, thus eliminating the potential for the release of spilled liquids from within the Facility.

In summary, the management of the hazardous wastes container storage areas, limits the impact of potential spills to a properly designed and maintained secondary containment systems within the building. Secondary containment of the loading/unloading area is also in place. No ignitable, reactive or incompatible wastes are stored within the same storage area within the Facility.

In the unlikely event of a release of hazardous waste, clean-up procedures as detailed in the Contingency Plan (see Section G) and presented below would be immediately implemented.

a) Clean-up of released waste: The waste will be collected via use of absorbent material for small spills. The contaminated material will then be placed in open-top containers and transported off site for treatment/disposal at permitted facilities. For large spills, the waste will be collected and placed into containers or a tank truck if large enough in nature. The balance shall be cleaned up with absorbent material as stated above.

b) Decontamination: Following cleanup with absorbent material, the affected area of the secondary containment area will be swept and all sweepings will be containerized. The pad may be subsequently decontaminated by steam/hot water cleaning. Any wash waters generated will be collected and transported off site for treatment/disposal at permitted facilities.

c) Cleanup of Contamination Soil: Should the spill or release occur outside the secondary containment area (i.e. external to the building or loading/unloading area), cleanup will be accomplished by a firm specializing in such procedures. All visually contaminated soils, where practical (i.e., excavations may be restricted by building foundations), will be excavated and disposed of as appropriate, at a permitted hazardous waste facility.

The potential for a release to soil, discussed above, will be effectively eliminated by the provisions of secondary containment for the loading/unloading area. Nevertheless, as discussed in Section E-1b and in the hydrogeologic report presented in Attachment E-1, the uppermost aquifer beneath the Facility property is located at approximately 100 feet below ground surface (557 feet AMSL). The uppermost aquifer is overlain by approximately 100 feet of unsaturated lacustrine silty clay/clayey silt with a hydraulic conductivity of less than 1×10^{-7} cm/sec. There is approximately three to four feet of sand and gravel fill and native material overlying the clay. There were no perched zones noted in or above the clay. There were no fractures noted in the clay and the average moisture content of the clay being at 15 percent, would preclude the potential of fractures with the exception of desiccation cracks at the upper clay surface, during dry months.

Therefore, it can be concluded that, in the extremely unlikely event of a spill or release occur to the soils underlying or surrounding the secondary containment area, the 100 feet of low permeability clay would mitigate the release of any hazardous constituents to the uppermost aquifer. The solvents stored at the Facility include those materials stored in Attachment E-4. For these compounds to enter the clay, they must overcome the capillary or breakthrough pressure that would exist at the compound-clay interface. Clay has historically been shown to provide a barrier to the downward migration of non-aqueous phase liquids. Moreover, any aqueous phase contaminant that may result from dissolution processes, will be taken up as part of the porous medium through adsorption. This process of adsorption in conjunction with the unsaturated nature of the clay, will severely retard the migration of the aqueous phase contaminant.

E-3 ANNUAL SOIL MONITORING PROGRAM WAIVER

A waiver is requested from the Director pursuant to Rule 299.9611(4) from the requirement under Rule 299.9611(2)(c) for an annual soil monitoring program.

The only handling of hazardous wastes outside of the boundries of the Facility itself is the loading and unloading of wastes at the dock door and the transfer of containers between box trailers at storage area #11. The Facility has not accepted hazardous wastes in bulk trailers for well over 10 years. Wastes are delivered to the Facility by truck in DOT approved containers and are unloaded at the loading dock along the east side of the building (see Attachment E-3). Containers are transferred with a forklift from the truck directly to the staging area and then to a container storage area..

A concrete pad directly underlies the loading/unloading area where the truck sits during the unloading operation. Peripheral drive-over concrete curbing is installed around the concrete pad. All expansion joints and any existing cracks in the concrete pad have been cleaned out and saw cut where necessary to provide a clean opening. Subsequently, all expansion joints and any cracks have been filled with a compatible chemically resistant flexjoint sealant. The selected sealant has been installed in accordance with the manufacturer's specifications. The concrete pad and peripheral concrete curbing, with sealed joints, provide control against the contact of any potentially spilled liquids with the surrounding ground surface. A certification from Robert Davis on the installation of the concrete curbing is found in Attachment E-5.

To date there have been no recorded spills of hazardous waste on the unloading area or surrounding soils.

Absorbent material is currently present and will continue to remain present to collect spillage from the concrete pad if it should occur during any hazardous waste transfer operations.

In addition, all unloading operations are conducted under the supervision of Facility personnel. The area is inspected at the conclusion of unloading operations to ensure no spillage has occurred.

ATTACHMENT E-1

HYDROGEOLOGICAL REPORT
&
WELL LIST

Department of NATURAL RESOURCES and ENVIRONMENT

MICHIGAN.GOV Michigan's Official Web Site

Well Type and Status with Counts

Well Type and Status Codes and Counts

These are the type and status codes used in our database

Well Type

code	definition
BDW	Brine Disposal Well
DH	Dry Hole
GAS	Gas
GBD	Gas & Brine Disposal
GC	Gas Condensate
GIW	Gas Injection Well
GS	Gas Storage
LHL	Lost hole
LOC	Location only - not yet completed
LPG	Liquid Petroleum Gas
M	mineral well (any starting with an "M")
MNB	Mineral Well
OBS	Observation
OIL	Oil
OTH	Other
OTI	Other Injection
WIW	Water Injection Well

Well Status

code	definition
ACT	Active
DC	Drilling Complete
PB	Plugged Back
PLA	Plugging Approved (Properly plugged and site restored)
PLC	Plugging Completed (Plugged but site needs restoration and approval)
PR	Producing
PW	Permitted Well - not yet drilled
SI	Shut In
SUS	Suspended
TA	Temporarily Abandoned
TP	Terminated Permit
WC	Well Complete

Counts

The counts were generated on **Jan 22, 2009** and will give you a general idea of what kind of wells and how many we have in Mic The totals change from day to day as new wells and drilled and old ones plugged. These counts do not include mineral wells or v that were drilled before permits were first issued in 1927. The grand total is higher than the number of permits issued in Michigar because of kicks, sometimes a well has several directional kicks from one hole, and so the same permit number gets counted mc once. These counts reflect API numbers, not permit numbers.

Type	<>	ACT	DC	OW	PB	PLA	PLC	PR	PW	SI	SUS	TA	TP	WC	Tot
BDW		707				240	35			23		11		10	
DH	3			3	22	21996	249			2	1	32		44	2
GAS	1			2	9	1815	93	10327		109	1	116		211	1
GBD					3	2		31							
GC					2	78	4	54		2		5			
GIW		9				3									

GS		2436				465	113							17	
GSO		547					48								
LHL						16	13							1	
LOC			150		2	15	18		885			7	6723	1	
LPG		42				11	5								
NA	1											1		2	
OBS		34			3	182	7			1		9		1	
OIL	1			11	21	9033	366	3640		229	5	182		33	1
OTH		3				3	1			2		2		1	
OTI		8				21	5					3			
WIW		528			14	182	21			22		27		1	
Total	6	4314	150	16	76	34062	978	14052	885	390	7	395	6723	322	6

These counts were generated on Jan 6, 2010, giving an idea of how much things have changed in one year.

Well_Typ	<>	ACT	DC	LHL	OW	PB	PLA	PLC	PR	PW	SI	SUS	TA	TP	UNK	WC
BDW		723			1		370	48			18		6		1	7
DH					2	27	21478	207			4	1	29			37
GAS	1			1	2	8	1933	136	10588		114	1	100			119
GBD						3	2		23							
GC					1	4	78	4	57		2		4			
GIW		9					3									
GS		2415					472	148								
GSO		520				2	4	63								
LHL	1						21	15								
LOC			62			1	14	24		761		6	26	6876		1
LPG		42					11	5								
MDW		1					1									
MNB		8					5									
MSW							1	1								
MTW							1									
NA												1	3			3
OBS		31					185	8			1		8			
OIL					8	22	9587	372	3655		238	4	169			43
OTH		5					2	2			2					
OTI		8					17	3					3			
WIW		516				13	186	31			19		28			
	2	4278	62	1	14	80	34371	1067	14323	761	398	13	376	6876	1	210

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TABLE OF CONTENTS

Page

1.0 INTRODUCTION 4
1.1 OBJECTIVES 4

2.0 FIELD ACTIVITIES 5
2.1 MONITORING WELL INSTALLATION 5
2.2 SOIL BORING INVESTIGATION 6
2.3 GEOTECHNICAL ANALYSIS 6
2.4 EQUIPMENT CLEANING 6
2.5 WELL DEVELOPMENT 6
2.6 HYDRAULIC RESPONSE TESTING 7
2.7 GROUND SURVEY 7

3.0 RESULTS 7
3.1 GEOLOGY 7
3.2 HYDROGEOLOGY 8

4.0 CONCLUSIONS 9

NOTE: ALL FIGURES AND TABLES ARE FOUND AT THE END OF THE TEXT BEFORE THE APPENDICIES

LIST OF FIGURES

FIGURE 1.1 SITE LOCATION

FIGURE 1.2 FACILITY PLAN

LIST OF TABLES

TABLE 2.1 GEOTECHNICAL SOIL SAMPLING SUMMARY

TABLE 2.2 WELL DEVELOPMENT SUMMARY

TABLE 3.1 MOISTURE CONTENT SUMMARY

TABLE 3.2 ATTERBERG LIMITS SUMMARY

LIST OF APPENDICES

APPENDIX A STRATIGRAPHIC AND INSTRUMENTATION LOGS

APPENDIX B LABORATORY DATA REPORTS

APPENDIX C WELL RESPONSE TEST DATA

1.0 INTRODUCTION

In April, 1989, Conestoga-Rovers and Associates (CRA), on behalf of Detrex Corporation (Detrex), conducted a hydrogeological investigation for the facility located at 12886 Eaton Avenue in Detroit, Michigan. Figure 1.1 locates the facility and Figure 1.2 presents a facility plan.

In August, 1988, CRA submitted, on the behalf of Detrex, an Act 64 Operating License Application for the facility to the Michigan Department of Natural Resources (MDNR). In December, 1988, the MDNR completed a review of the operating license application and determined that a hydrogeologic report was necessary.

The requirements of the hydrogeologic investigation are specified in Act 64, Rule 229.9506(1) and (2). During a meeting with the MDNR on March 27, 1989, it was agreed that due to the size of the facility (approximately 1 acre), three soil borings would be adequate to define soil conditions at the facility. It was also discussed and agreed to by the MDNR that due to the hydrogeologic conditions expected at the facility (extensive clay deposits extending to depth, only one borehole would be advanced to the underlying aquifer and instrumented as a monitoring well. The other two borings would only be required to be completed to a minimum depth of 30 feet and subsequently backfilled with cement/bentonite grout. The above conditions, were in fact encountered at the facility, and during the active drilling program, communication with the MDNR (via telephone conversations) confirmed the requirements of the hydrogeologic investigation field activities.

1.1 OBJECTIVES

The objectives of the hydrogeologic investigation were as follows:

1. identify the uppermost aquifer beneath the facility property; and

2. define soil and groundwater conditions beneath the facility which includes the geotechnical and hydraulic properties of the subsurface geology.

This report presents all pertinent information required under Act 64, Rule 299,9506(1) and discusses the field activities and results of the hydrogeological investigation pursuant to Act 64, Rule 299.9506(2).

2.0 FIELD ACTIVITIES

During the week of April 3, 1989, CRA conducted a hydrogeologic investigation. The investigation involved the installation of one monitoring well and two soil borings to characterize the geology and hydrogeology at the facility. Drilling was performed by McDowell and Associates, Ferndale, Michigan using a CME 55 drill rig.

The following sections of this report describe the field activities conducted during the investigation. In general, all field activities were done in accordance with CRA's Work Plan dated March 1989.

2.1 MONITORING WELL INSTALLATION

One monitoring well (BH-MW1-89) was installed east of the building to define the uppermost aquifer and groundwater elevation. Figure 1.2 locates the monitoring well.

The borehole was advanced using 4 1/4 inch I.D. hollow stem augers to a depth of 60 feet below the ground surface. At this depth, augering became inefficient due to the clay rich sediment. The drilling method was then switched to mud rotary using a 3 7/8 inch tricone drilling bit.

Continuous soil samples were collected for subsequent geotechnical analysis from ground surface to 30 feet below grade with prec-leaned, 2-inch diameter stainless steel split spoons. Soil samples were then collected at five foot intervals until the uppermost aquifer was encountered at a depth of 99 feet below the ground surface. Two shelby tubes were also collected from this borehole for vertical permeability analysis at depths of 30 to 32 feet and 54 to 56 feet below grade. Perched groundwater was not encountered during drilling.

Upon completion of the borehole, a monitoring well was installed approximately 12 feet into the sand aquifer at a depth of 111 feet below the ground surface. The well was constructed of 10 feet, 0.010 inch slotted, schedule 80, 2-inch diameter flush threaded PVC, joined to 2-inch diameter schedule 80 flush threaded PVC riser pipe A sand pack of quartz sand (No. 20) was placed around and 20 feet above the well screen. A 5-foot bentonite pellet seal was placed over the sand pack. The remaining annulus was tremie grouted to surface with a bentonite/cement grout. The well was completed below grade with a lockable cap and a flush mounted protective casing

A Stratigraphic and instrumentation log for BH-MW1-89 is provided in Appendix A.

2.2 SOIL BORING INVESTIGATION

Two soil borings (BH2-89 and BH3-89) were performed south and west of the building, respectively. Figure 1.2 locates the borings. The boreholes were advanced using 4 1/4-inch hollow stem augers. Continuous soil samples were collected using pre-cleaned stainless steel spoons to a depth of 30 feet below grade with one additional soil sample collected at 35 feet below grade. During the soil boring investigation perched groundwater was not encountered. Selected soil samples were submitted for moisture content, grain size distribution and Atterberg limits analysis.

Upon completion of the boreholes, the boreholes were backfilled to ground surface with bentonite/cement grout.

Stratigraphic logs for BH2-89 and BH3-89 are presented in Appendix A.

2.3 GEOTECHNICAL ANALYSIS

Soil samples were collected for moisture content, grain size distribution, Atterberg limits and permeability analysis. The analyses were performed by McDowell and Associates.

Table 2.1 lists the samples collected, their location, depth and analyses performed. The resulting lab reports are presented in Appendix B.

2.4 EQUIPMENT CLEANING

Prior to drilling and between boreholes the drill rig, augers, drill rods and associated equipment were cleaned with a high pressure-low volume hot water wash.

The split spoons and monitoring well screen and riser pipe were cleaned further with an isopropanol and distilled water rinse.

2.5 WELL DEVELOPMENT

Monitoring well BH-MW1-89 was developed and stabilized using a "Geoguard" oil-less air lift bladder pump. Approximately 58 gallons were removed in an attempt to bring the well to a silt free condition. After 52 gallons were removed, the evacuated

water was measured for pH and conductivity until three consecutive and consistent readings were obtained.

A well development summary is presented on Table 2.2.

2.6 HYDRAULIC RESPONSE TESTING

After well development, a single well response test was performed on BH-MW1-89 to determine hydraulic conductivity of the aquifer at the well screen. A falling head response test was performed by introducing a pre-cleaned (isopropanol and distilled water rinse) PVC rod into the well. Water level response was measured using a electric water level tape.

The data were analyzed by the method described in Hvorslev, 1951. The data and subsequent graph are presented in Appendix C.

2.7 GROUND SURVEY

Upon completion of the hydrogeologic investigation the monitoring well and two boreholes were surveyed by Warner, Cantrell and Padmos, Inc. of Farmington Hills, Michigan on April 10, 1989. Ground elevations and top of well casing elevation were measured and corrected to U.S.G.S. datum. The U.S.G.S. datum elevations are presented on the Stratigraphic and instrumentation logs.

3.0 RESULTS

3.1 GEOLOGY

The Detrex facility is located in an area of low topographic relief which is defined as a lacustrine plain deposit. The facility appears to be within the lacustrine plain based on the grain size distribution of the subsurface sediments (Appendix B).

The facility is underlain with approximately 100 feet of lacustrine silty clay/clayey silt. The lacustrine sediment can be described as brown to gray, hard to stiff silty-clay with little sand and a trace of gravel. The upper four feet of sediment is poorly graded sand/silty sand fill.

Table 3.1 presents the moisture content of samples collected from BH-MW1-89, BH2-89 and BH3-89. The moisture content of 31 sediment samples ranges from 27% to 4% with a mean of 15%.

Four lacustrine sediment samples were analyzed to determine the Liquid and Plastic Limits, and Plasticity Index. The results are presented on Table 3.2. Based on the results of the Atterberg limits test, the lacustrine sediment is classified as an inorganic silty clay to clayey silt with slight to low plasticity.

The lacustrine sediment is underlain by a glacio-fluvial deposit of poorly graded sand/silty sand of an undetermined thickness. The sand has a moisture content of 12% to 13% (Table 3.1). Atterberg limits were not performed on the sand sediment.

3.2 HYDROGEOLOGY

The uppermost aquifer encountered beneath the facility is the unconsolidated sand aquifer which was encountered at an elevation of approximately 557 feet AMSL. The sand aquifer is classified as a confined aquifer with the lacustrine sediment acting as the confining layer. The groundwater potentiometric surface is at an elevation of approximately 605.18-feet AMSL. Therefore, the potentiometric surface of the sand aquifer is approximately 47-feet higher than the clay/sand boundary.

The hydraulic conductivity of the sand aquifer at the well screen was determined, by the single well response test, to be approximately 1×10^{-3} cm/sec. (Appendix C).

Groundwater flow direction was not determined during this investigation since only one well was installed. However, it is reasonable to assume that the regional groundwater flow is east-southeast towards Lake St. Clair.

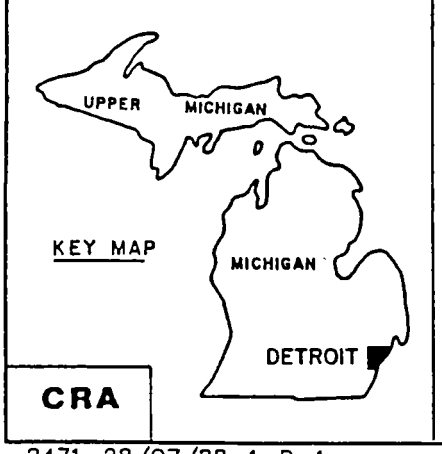
The vertical permeability of the lacustrine sediment was determined by a constant head permeameter test. Two tests were performed on samples collected at depths of 30-32 and 54-56 feet below the ground surface in BH-MW1-89. Based on the these tests the vertical permeability of the lacustrine sediment ranges from 5.0×10^{-7} cm/sec to 2.6×10^{-8} cm/sec (Appendix B).

4.0 CONCLUSIONS

Based on the hydrogeologic investigation, the following conclusions are presented:

1) The facility is underlain with approximately 100 feet of lacustrine silty clay/clayey silt with a vertical hydraulic conductivity of less than 1×10^{-7} cm/sec.

2) The uppermost aquifer beneath the site is a confined, unconsolidated, sand aquifer, which was encountered at approximately 100 feet below ground surface (557 feet AMSL). The hydraulic conductivity of the uppermost aquifer is approximately 1×10^{-3} cm/sec.



CRA

figure 1.1
SITE LOCATION
Detrex Corporation
Eaton Avenue Facility, Detroit

2471-28/07/88-1-D-1

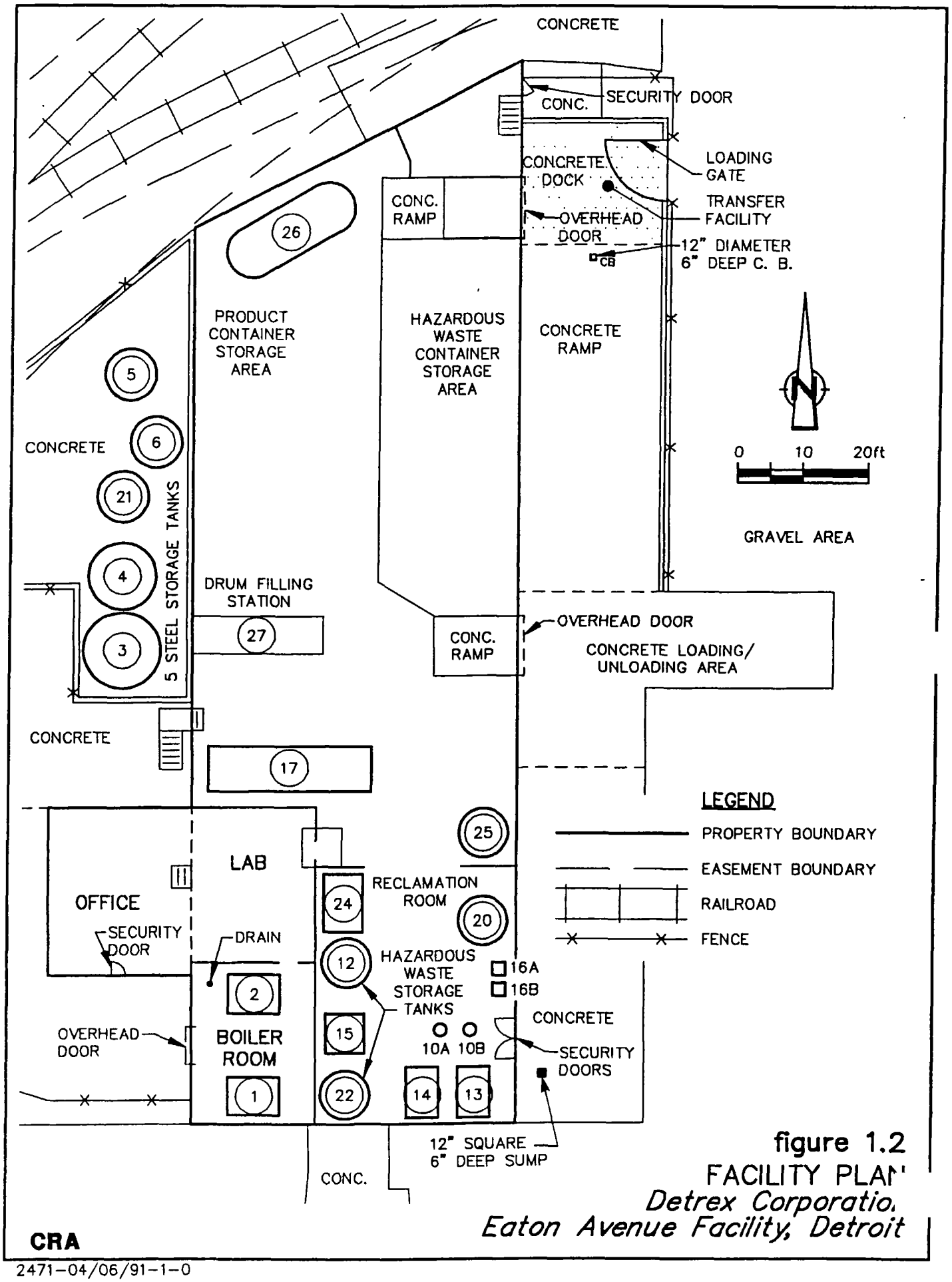


figure 1.2
FACILITY PLAN
Detrex Corporation
Eaton Avenue Facility, Detroit

CRA

2471-04/06/91-1-0

TABLE 2.1

GEOTECHNICAL SOIL SAMPLING SUMMARY
EATON AVENUE FACILITY, DETROIT, MICHIGAN

Location	*Depth (ft.bgs)*	*Analysis*
BH-MW1-89	2-4	Moisture Content
	6-8	Moisture Content
	10-12	Moisture Content
	14-16	Moisture Content
	18-20	Moisture Content
	22-24	Moisture Content
	26-28	Moisture Content
	30-32	Permeability, Grain-Size Distribution, Atterburg Limits and Moisture Content
	39-41	Moisture Content
	49-51	Moisture Content
	54-56	Permeability, Grain-Size Distribution, Atterburg Limits and Moisture Content
	59-61	Moisture Content
	69-71	Moisture Content
	79-81	Moisture Content
	89-91	Moisture Content
	99-101	Moisture Content
	109-111	Grain-Size Distribution
BH2-89	2-4	Moisture Content; Grain-Size Distribution
	6-8	Moisture Content
	10-12	Moisture Content
	14-16	Moisture Content
	18-20	Moisture Content
	22-24	Moisture Content; Atterberg Limits
	26-28	Moisture Content
	34-36	Moisture Content; Grain-Size Distribution
	22-24	Moisture Content; Atterberg Limits
	26-28	Moisture Content
	34-36	Moisture Content; Grain-Size
BH3-89	2-4	Moisture Content
	6-8	Moisture Content
	10-12	Moisture Content
	14-16	Moisture Content
	18-20	Moisture Content
	22-24	Moisture Content; Atterberg Limits
	26-28	Moisture Content
	34-36	Moisture Content; Grain-Size Distribution

Notes:

Moisture Content according to ASTM D 422-63
Permeability according to ASTM D2434-68
Grain-Size Distribution according to ASTM D422-63
Atterberg Limits according to ASTM D423-66 and ASTM D424-59

TABLE 2.2

WELL DEVELOPMENT SUMMARY
EATON AVENUE FACILITY, DETROIT, MICHIGAN

Well	*Gallons Removed*	*pH*	*Conductivity (µhmos)*	*Clarity*
BH-MW1	52	9.4	600	silty
	53	9.1	500	silty
	55	9.0	500	silty
	56	8.9	500	silty
	57	8.9	500	cloudy
	58	8.9	500	slightly cloudy

TABLE 3.1

MOISTURE CONTENT SUMMARY
EATON AVENUE FACILITY, DETROIT, MICHIGAN

Location	*Depth (ft. bgs.)*	*Moisture %*
BH-MW1	2-4	27.0
	6-8	14.0
	10-12	13.0
	14-16	14.0
	18-20	14.0
	22-24	15.0
	26-28	15
	30-32	12
	39-41	13
	49-51	15
	54-56	10
	59-61	23
	69-71	12
	79-81	14
	89-91	4
	99-101	13
	109-111	12
BH2	2-4	16
	6-8	14
	10-12	13
	14-16	14
	18-20	14
	22-24	14
	26-28	15
	34-36	15
BH3	2-4	17
	6-8	12
	10-12	13
	14-16	13
	18-20	14
	22-24	13
	26-28	12
	34-36	12

TABLE 3.2

ATTERBERG LIMITS SUMMARY
EATON AVENUE FACILITY, DETROIT, MICHIGAN

Location	*Depth (ft. bgs)*	*Liquid Limit*	*Plastic Limit*	*Plasticity Index*
BH-MW1	30-22	23.2	14.8	8.4
MW1	54-56	23.4	14.6	8.8
BH2	22-24	23.5	12.7	10.8
BH3	22-24	24.0	12.8	11.2

APPENDIX A

STRATIGRAPHIC AND INSTRUMENTATION LOGS

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-1)

PROJECT NAME: ~~COLDSHIELD~~ – DETROIT
PROJECT NO.: 2471
CLIENT: DETREX CORPORATION
LOCATION: EAST SIDE OF BUILDING

HOLE DESIGNATION: BH-MW1-8 (Page 1 o
DATE COMPLETED: APRIL 5, 1
DRILLING METHOD: 4-1/4" ID HSA/ 3-7/8" MR
CRA SUPERVISOR: B. SANDBERG

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	STATE	'N' VALUE
	GROUND SURFACE	656.3				
	REFERENCE ELEVATION (Top of Riser)	656.09	ROAD BOX	1SS		18
	Dark gray sand and gravel with some clay, wet, FILL	653.3		2SS		20
5.0	SM (SAND), fine grained, silty, trace clay, dry to moist	651.3	CEMENT/ BENTONITE GROUT	3SS		20
	CL (CLAY), little silt, trace gravel, mottled blue-brown, stiff, dry			4SS		41
10.0	Moist		8.0"ø BOREHOLE	5SS		58
				6SS		78
	Little silt, trace sand and gravel, blue, moist			7SS		37
15.0				8SS		30
				9SS		23
20.0				10SS		23
				11SS		11
				12SS		31
25.0				13SS		27
			2"ø PVC PIPE	14SS		
30.0	Collected Shelby tube			15SS		26
				1ST		
35.0				16SS		28
40.0				17SS		31
45.0				18SS		31
50.0		605.2		19SS		38
55.0	Collected Shelby tube			2ST		
60.0		596.3		20SS		16
65.0	CL (CLAY), trace sand and gravel, gray, stiff, moist		4.0"ø BOREHOLE	21SS		17
				22SS		

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-1)

PROJECT NAME: ~~GOLDSHIELD~~ – DETROIT

PROJECT NO.: 2471

CLIENT: DETREX CORPORATION

LOCATION: EAST SIDE OF BUILDING

HOLE DESIGNATION: BH–MW1–89 (Page 2 of 2)

DATE COMPLETED: APRIL 5, 1989

DRILLING METHOD: 4–1/4" ID HSA/ 3–7/8" MR

CRA SUPERVISOR: B. SANDBERG

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
				21SS		17
70.0	CL (CLAY), gray, soft, wet		CEMENT/ BENTONITE GROUT; 4.0"ø BOREHOLE	22SS		23
75.0				23SS		20
80.0			BENTONITE PELLET SEAL	24SS		24
85.0				25SS		24
90.0			SAND PACK	26SS		14
95.0				27SS		14
	6" gravel seam @ 558.3' AMSL					
100.0	SM (SAND), fine to very fine grained, silty, trace gravel, gray, dense, wet	557.3		28SS		83
105.0			WELL SCREEN			
110.0				29SS		100
	END OF HOLE @ 111.0 FT. BGS	545.3				
115.0	NOTES: 1. Borehole advanced to 596.3 ft. AMSL using 4–1/4" ID hollow stem auger. 2. Drilling was advanced beyond this depth using 3–7/8" dia. Tricone bit.		SCREEN DETAILS: Screened Interval: 555.3' to 545.3' AMSL Length – 10' Diameter – 2" Slot # – 10 Material – PVC Sand Pack Interval: 575.3' to 545.3' AMSL Material – Sand			
120.0						
125.0						
130.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-2)

PROJECT NAME: GOLDSHIELD – DETROIT
PROJECT NO.: 2471
CLIENT: DETREX CORPORATION
LOCATION: SOUTH SIDE OF BUILDING

HOLE DESIGNATION: BH2-89
DATE COMPLETED: APRIL 5, 1989
DRILLING METHOD: 4-1/4" ID HSA
CRA SUPERVISOR: B. SANDBERG

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	654.6				
	Sand, clay and gravel mixture, discolored, no odor		8.0" BOREHOLE	1SS		14
3.0				2SS		8
	CL (CLAY), some silt, little gravel, mottled texture, brown-blue, stiff, damp	650.6	CEMENT/ BENTONITE GROUT	3SS		36
6.0	Brown			4SS		59
9.0				5SS		64
				6SS		67
12.0				7SS		44
	CL (CLAY), silty, trace gravel, gray-blue, moist, stiff					
15.0				8SS		3
				9SS		33
18.0				10SS		35
21.0				11SS		31
				12SS		42
24.0				13SS		27
27.0				14SS		29
				15SS		29
30.0						
33.0	Sandy					
				16SS		23
36.0	END OF HOLE @ 36.0 FT. BGS	618.6				
39.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-3)

PROJECT NAME: ~~GOLDSHIELD~~ – DETROIT
PROJECT NO.: 2471
CLIENT: DETREX CORPORATION
LOCATION: WEST SIDE OF BUILDING

HOLE DESIGNATION: BH3-89
DATE COMPLETED: APRIL 6, 1989
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: B. SANDBERG

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	655.5				
	Six inch concrete driveway Sand, gravel, brick, discolored, organic odor, wet, FILL Sand and gravel mixture, black, wet		8.0"ø BOREHOLE	1SS 2SS		
3.0		651.0	CEMENT/ BENTONITE GROUT			
	CL (CLAY), some silt, trace sand and gravel, brown, moist			3SS		27
6.0				4SS		54
9.0				5SS		65
				6SS		82
12.0	Blue clay			7SS		53
15.0				8SS		42
				9SS		30
18.0				10SS		37
21.0	Some silt, little sand			11SS		27
				12SS		41
24.0				13SS		30
27.0				14SS		33
				15SS		33
30.0						
33.0						
				16SS		35
36.0	END OF HOLE @ 36.0 FT. BGS	619.5				
39.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

APPENDIX B

LABORATORY DATA REPORTS

McDOWELL & ASSOCIATES
21355 Hatcher Avenue
Ferndale, Michigan 48220

Phone: (313) 399-2066
Fax: (313) 399-2157

Rec'd CRA
MAY

April 24, 1989

Conestoga-Rovers & Associates, Ltd.
651 Colby Drive Waterloo
Ontario, Canada N2V1C2

Job No. 89-171

Attention: Mr. Steve Crossman

Subject: Laboratory Test Data
Goldshield Solvents
Detroit, Michigan

Gentlemen:

In accordance with your request we have performed laboratory tests on the soil samples from the subject project. The results are shown on the attached Gradation Curves, summary sheet of Moisture Contents and summary sheet of Atterberg Limit Test Results. Permeability tests are in progress and results will be forwarded as soon as they are completed.

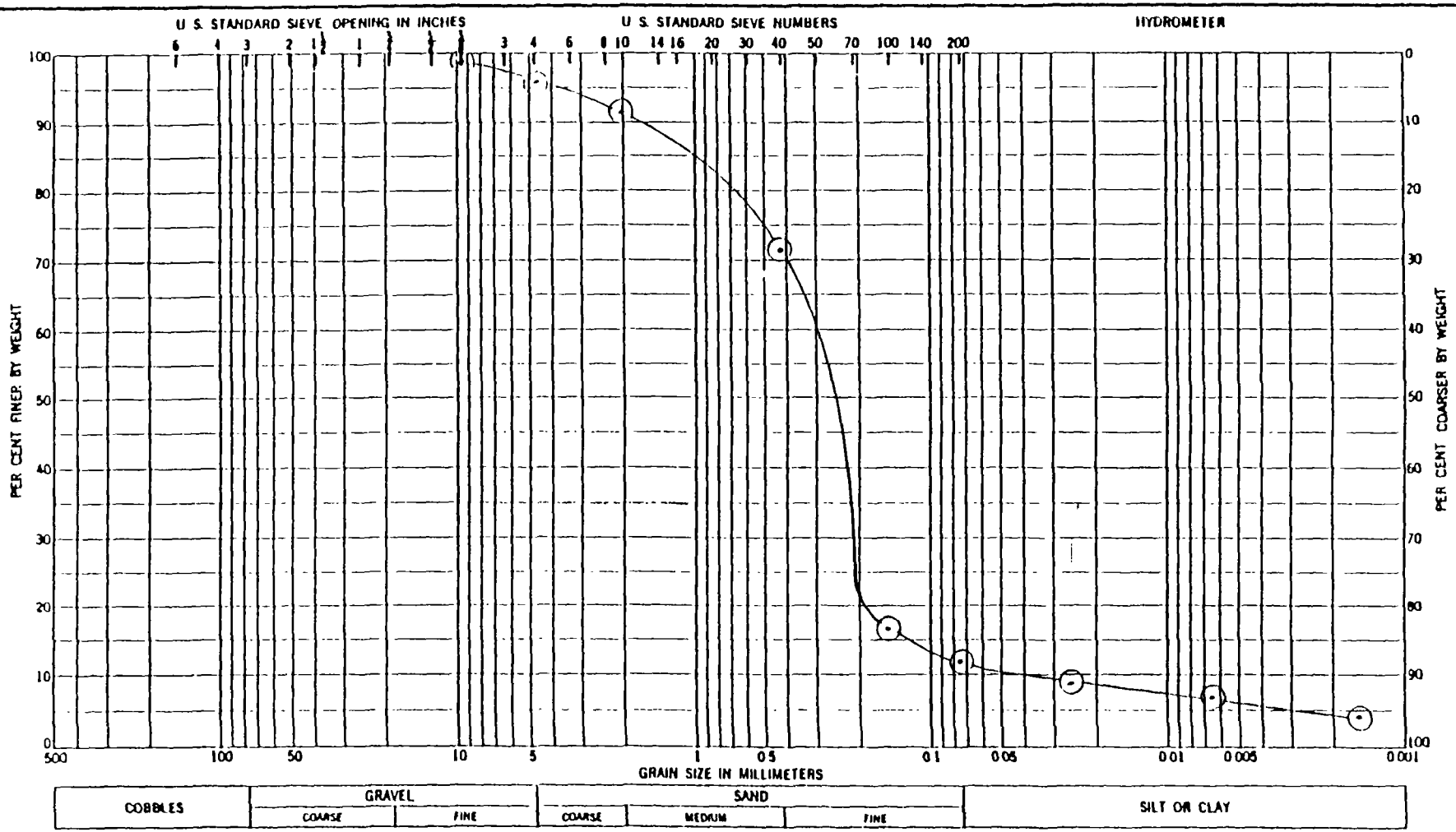
If you have any questions, or if we can be of further service, please feel free to call.

Very truly yours,

McDOWELL & ASSOCIATES

Jack F. Geerlings, P.E.

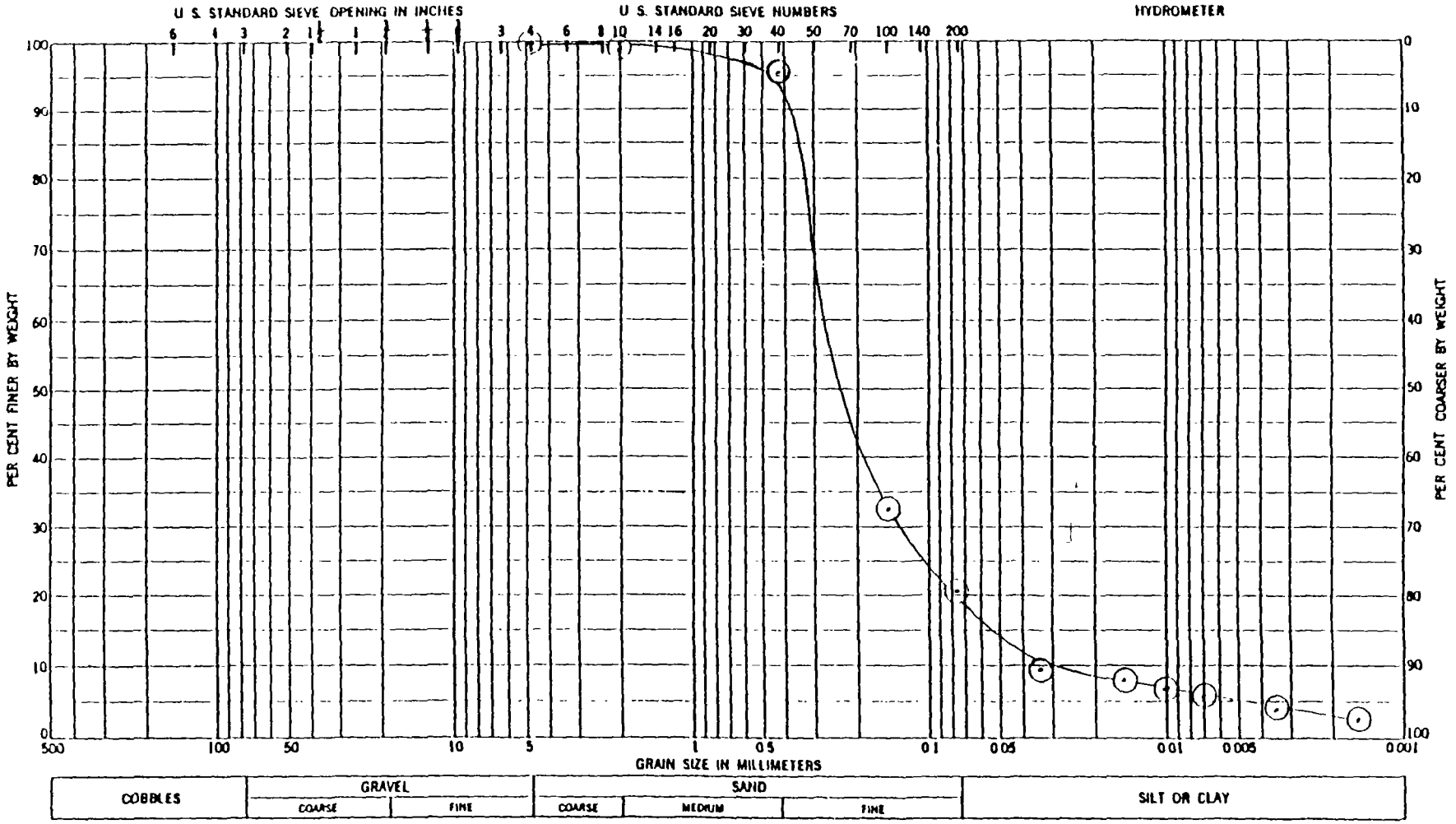
JFG:jc



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
MW1-EE	110'	SM	12			

Goldshield Solvents
89-171

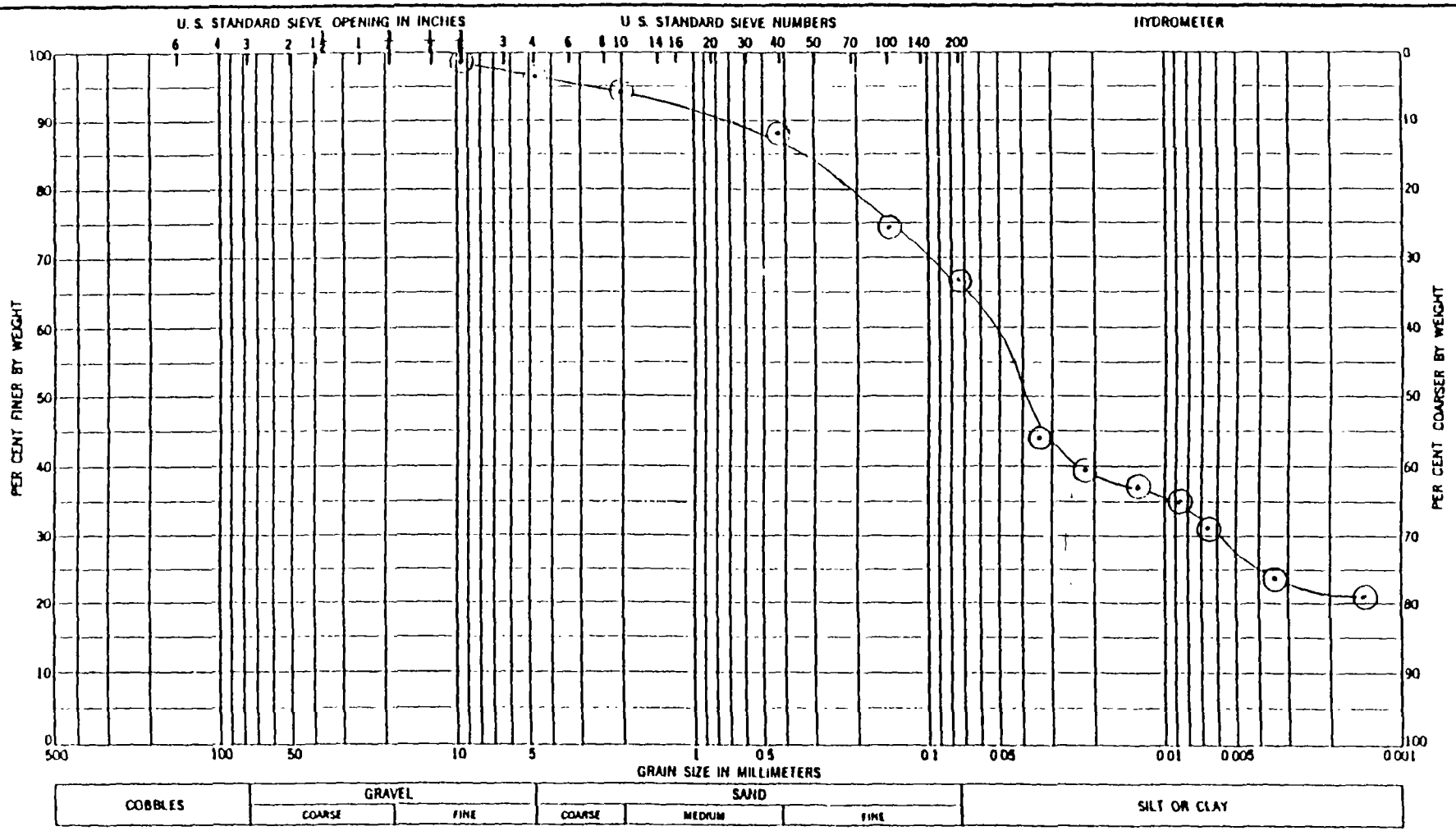
GRADATION CURVES



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
BH-3B	3'	SP-SM	17			

Goldshield Solvents
89-171

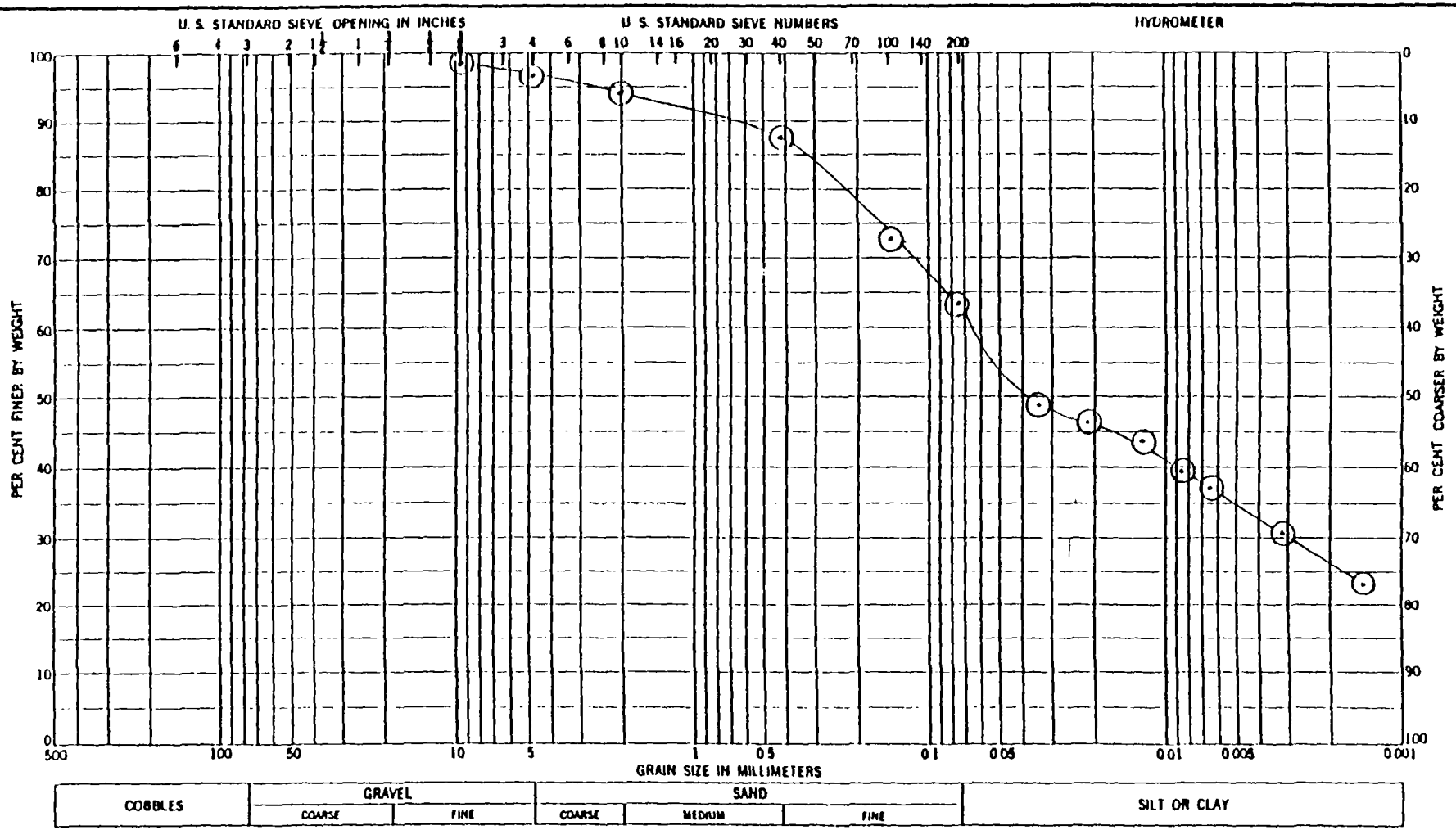
GRADATION CURVES



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
BH-2P	35'	SM	15			

Goldshield Solvents
89-171

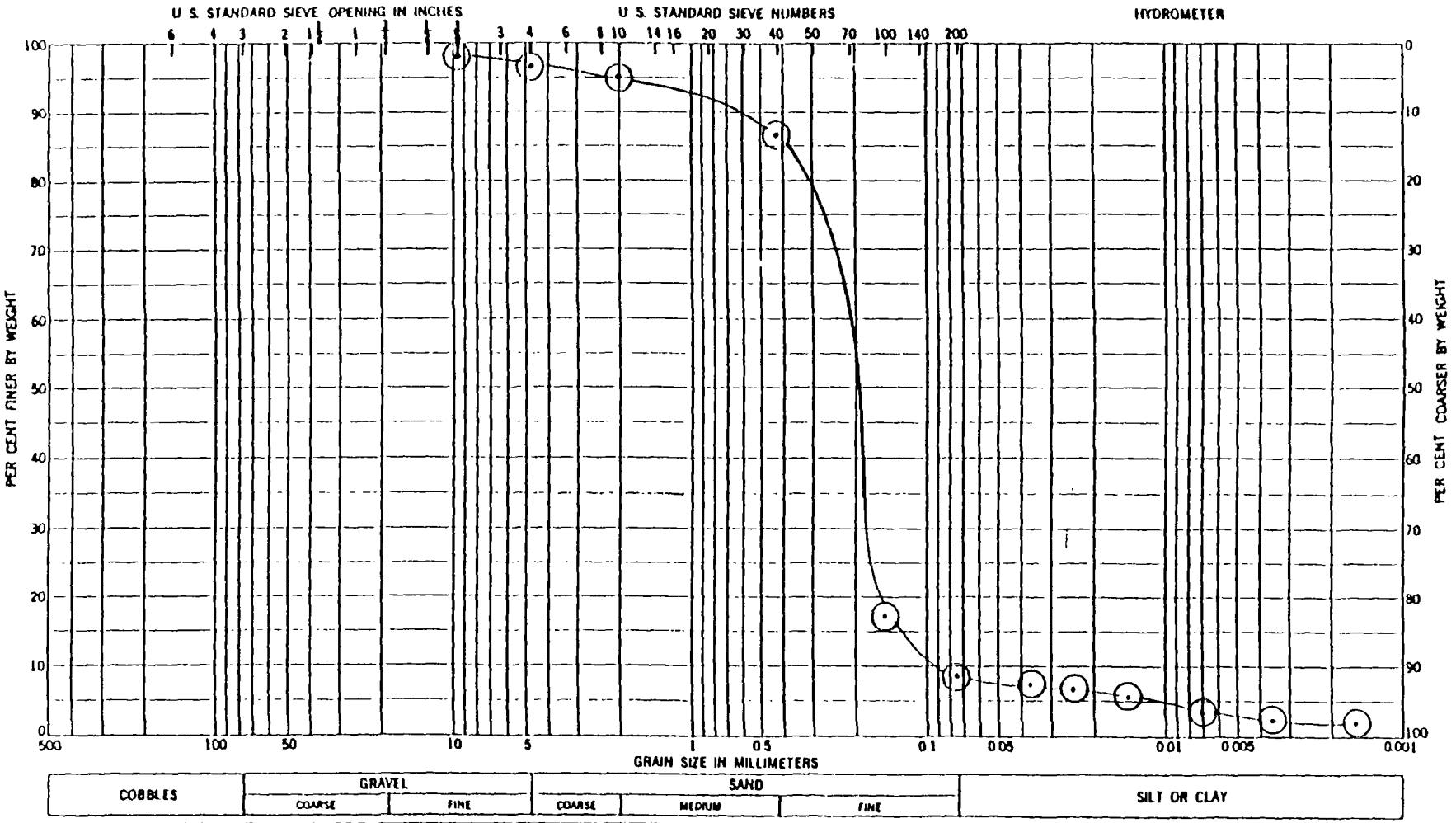
GRADATION CURVES



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
BH-3P	35'	SM	12			

Goldshield Solvents
89-171

GRADATION CURVES



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
2B	3'	SP-SM	16			

Goldshield Solvents
89-171

GRADATION CURVES

Job No. 89-171

MOISTURE CONTENTS

Sample No.	Depth	% Moisture
MW-1	B	27
	D	14
	F	13
	H	14
	J	14
	L	15
	N	15
	P	12
	R	13
	T	15
	U	10
	V	23
	X	23
	Z	24
	BB	4
	DD	13
	EE	12
BH-2	B	16
	D	14
	F	13
	H	14
	J	14
	L	14
	N	15
	P	15
BH-3	B	17
	D	12
	F	13
	H	13
	J	14
	L	13
	N	12
	P	12

JOB NO. 89-171

ATTERBERG LIMITS RESULTS

BORING/SAMPLE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
MW1P	23.2	14.8	8.4
MW1U	23.4	14.6	8.8
BH2L	23.5	12.7	10.8
BH3L	24.0	12.8	11.2

McDOWELL & ASSOCIATES
21355 Hatcher Avenue
Ferndale, Michigan 48220
Phone: (313) 399-2066
Fax: (313) 399-2157

Rec'd CRA
MAY 5 1989

May 4, 1989

Conestoga-Rovers & Associates, Ltd.
651 Colby Drive
Waterloo, Ontario, Canada N2V1C2

Job No. 89-171

Attention: Mr. Steve Crossman

Subject: Water Well Record Survey and
Permeability Test Results
Goldshield Solvents
Detroit, Michigan

Gentlemen:

We have requested from the Michigan Department of Natural Resources all available well water records for the subject site area. They have only two (2) well records for the entire township T1S, R11E known as Greenfield Township. A copy of each well is attached herein for your use.

Triaxial Permeability Test Results are listed on the table below:

1P	5.0×10^{-7} cm/sec
1C	2.6×10^{-8} cm/sec

If you have any questions, or if we can be of any further service, please feel free to call.

Very truly yours,

McDOWELL & ASSOCIATES

Daniel A. Kaniarz

Daniel A. Kaniarz, P.E.

DAK:jc

WAYNE COUNTY
INDUSTRIAL WATER SUPPLY

November 6, 1947

Mr. Andrew Mozola
5086 Talbot Avenue
Detroit 12, Michigan

Dear Andy:

I was sorry to miss you in Detroit, November 1. I was not armed with your telephone number and could not find the name in the directory or I would have telephoned you in the afternoon.

The well being drilled at the Parke, Davis and Company Warehouse, 3220 Bellevue Avenue, just south of Mack Avenue, is for cooling water, and they require 400 GPM. Their log so far is as follows:

Blue clay	14'	-	120'
Hardpan	123'	-	146'
Quicksand, almost dry	146'	-	151'
Hardpan	151'	-	156'
Water sand	156'	-	157'
Gray Traverse sand rock	157'	-	158'
Gray Traverse sand rock	158'	-	200'

This log appears very similar to the log of the well at the Stroh's Brewery on Gratiot Avenue, of which you have a copy. They do not care about the quality of the water, and I advised that they go down to the Sylvania at approximately 700 feet. They intend to case off the Monroe black water, and this will afford a sample of uncontaminated Sylvania water, which will be quite an addition to our knowledge. If you can drop in on them occasionally during the drilling, we shall appreciate it.

Very truly yours

GEOLOGICAL SURVEY DIVISION
John G. Rulison
Hydrogeologist

JGR:aos

Highland Park (Wayne County)

Ford Motor Company Well

Location: T. 1 S., R. 11 E., 48 feet south of north property line and 6 feet west of West Brush Street-line of Ford Motor Company, Woodward Avenue, Highland Park.

Elevation: About 633 feet above sea level.

Record by: R. A. Smith from samples furnished by W. H. Smith of Ford Motor Company

	Thickness (Feet)	Depth (~~Feet~~)
No record	230	230
Devonian:		
Traverse:		
Gray, soft, shale calcareous and fossiliferous between 270 and 280 feet	70	300
Hard gray limestone, some gray shale or "soapstone"	5	305
Hard gray crystalline limestone	5	310
Bell:		
Soft, calcareous, light gray shale or "soapstone", very smooth grained	40	350
Dundee:		
Hard, light gray, crystalline limestone. Sample 350 to 355 badly rusted	10	360
Hard, white to light gray and buff crystalline limestone with dark brown and black streaks and laminae of bituminous matter. Two to three per cent of pure white sand, grains very rounded in samples 470 to 475 feet.	115	475
Very hard, crystalline, light gray pyritic and sandy limestone. Many very small crystals of pyrite and 5% or more of pure white quartz sand with rounded grains of uniform size similar to Sylvania	5	480
Buff bituminous and white to light grayish buff limestone. Buff limestone is very sandy appearing, but contains very little sand. Crinoidal from 485 to 490 feet	10	490
Detroit River:		
Chiefly white, earthy looking dolomite, with fine laminae of pyritic and black bituminous matter. A little buff bituminous limestone apparently from Dundee above	5	495
Buff bituminous limestone and native sulphur	10	505
White, light gray, and buff bituminous limestone and native sulphur	5	510
Light gray dolomite	5	515
Light gray to buff dolomite	5	520
Light grayish buff to dark buff dolomite and dolomitic limestone	10	530
White and buff dolomite and dolomitic limestone	5	535
Hard buff granular dolomite and dolomitic limestone	5	540

(over)

	Thickness (Feet)	Depth (Fee
Detroit River, continued		
Hard, light buff dolomite	15	555
Buff bituminous dolomite	15	170
White and light buff dolomite	5	575
Light buff and buff dolomite, and some black shale	5	580
Light buff dolomite, pure white anhydrite and gypsum	5	585
Light buff to buff dolomite and much pure white anhydrite	15	600
Dark buff dolomite	5	605
Light buff dolomite	5	610
Chiefly white dolomite, some light buff	10	620
Light gray, earthy looking dolomite	5	625
Buff crystalline dolomite	5	630
Light buff crystalline dolomite, sandy-about 5% of pure white quartz sand, grains rounded	15	645
White and very light buff dense grained dolomite	10	655
Light buff dolomite	5	660
Buff gray argillaceous dolomite with streaks and laminae of black bituminous shale	5	665
Light buff and white finely crystalline dolomite	15	680
Light buff dolomite and pure white anhydrite-25% anhydrite	10	690
Light grayish buff fine grained dolomite with black bituminous laminae	5	695
Very light gray grayish buff, and white dolomite	5	700
Buff dolomite with black bituminous streaks and soft white chalky limestone	5	705
Dark grayish buff dolomitic limestone	5	710
Grayish buff limestone. The limestone from about 705 to 730 feet may be the Anderdon beds	5	715
Buff limestone with much white chalky limestone	5	720
Light buff limestone	5	725
Light buff to buff limestone and dark buff bituminous dolomite	5	730
Dark gray dolomite and some light buff limestone	5	735
Sample from 735 to 745 missing-very probably dolomite	10	745
Grayish buff dolomite and considerable shaly white limestone	5	750
Grayish buff dolomite and dolomitic limestone	25	775
Buff gray dolomite	10	785
Sylvania:		
Pure white sandstone of uniform sized grains of white or colorless quartz. A little mixture of buff dolomite from above	5	790
Pure white sandstone-sample badly rusted from fragments of the drill	30	820
White dolomitic sandstone. 80% pure white quartz sand	5	825
Pure white sandstone	25	850
Pure white sandstone and gray sandy dolomite	5	855
Gray sandy dolomite-pure white rounded sand grains embedded in a dolomitic matrix	5	860

APPENDIX C

WELL RESPONSE TEST DATA

SINGLE WELL RESPONSE TEST

WELL NO:	MW-1	DATE:	04-06-89
JOB #:	2471	SLUG LT:	5 FT
CLIENT:	GOLD SHIELD,DET.	SCREEN LT:	10 FT
SWL:	50.91 b. T.O.C.	SCREEN DIA:	0.17 FT

FALLING TIME (SEC)	W/L	dH	LOG dH
0.00	50.91	1.00	0.00
12.00	50.00	0.73	-0.14
44.00	50.40	0.41	-0.39
88.00	50.60	0.25	-0.61
133.00	50.70	0.17	-0.77
200.00	50.80	0.09	-1.06
298.00	50.85	0.05	-1.32
420.00	50.90	0.01	-2.10

Regression Output:FALLING

Constant	0.00
Std Err of Y Est	0.14
R Squared	0.95
No. of Observations	6.00
Degrees of Freedom	5.00

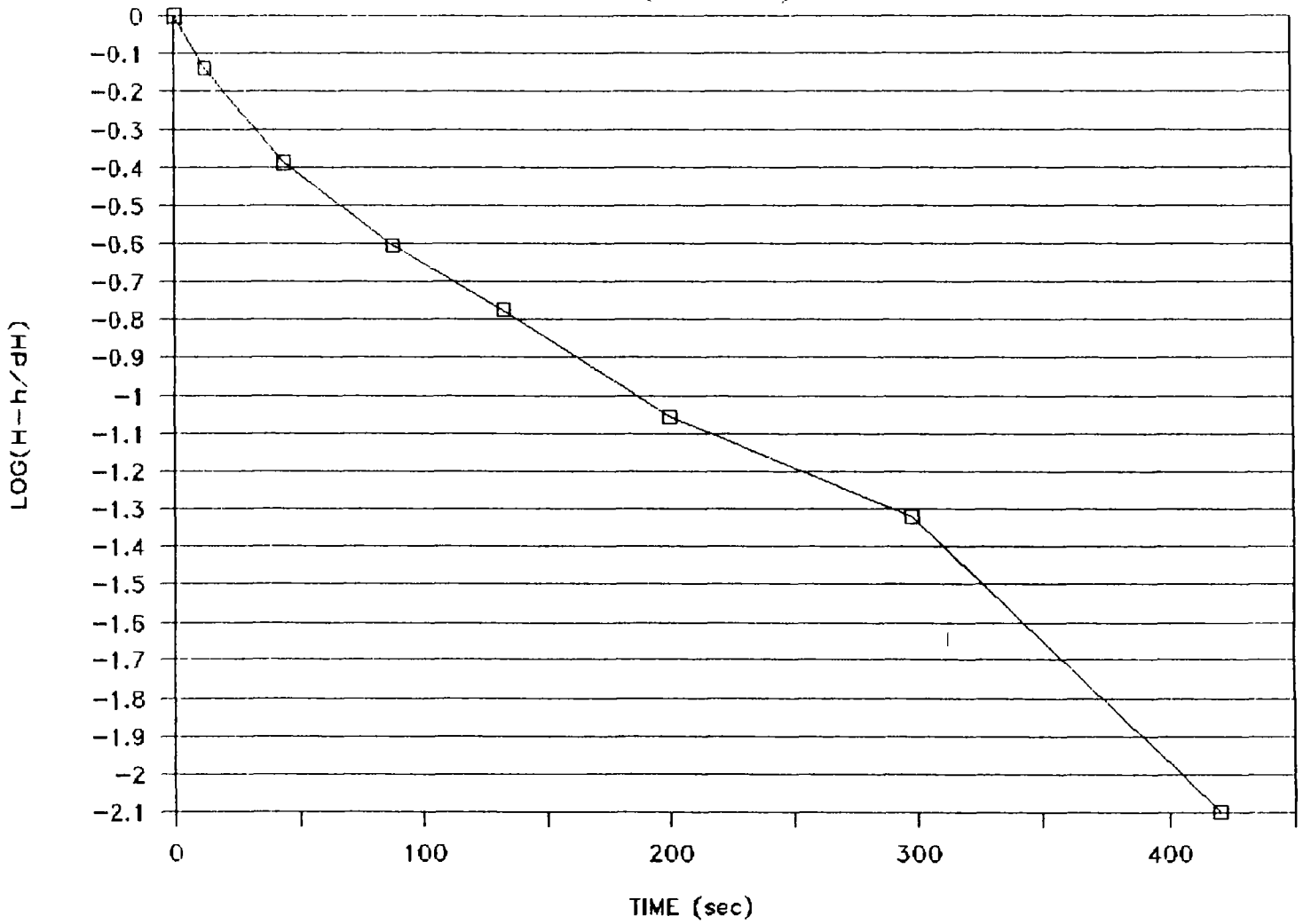
X Coefficient(s)	-0.00
Std Err of Coef.	0.00

HVORSLEV LAG TIME = 86.60

K= 9.94E-04 cm/sec

SINGLE WELL RESPONSE TEST FOR WELL MW-1

REF NO. 2471 (04/06/89) FALLING



ATTACHMENT E-2

TOPOGRAPHIC MAP

ATTACHMENT E-3

FACILITY PLAN

ATTACHMENT E-3
FACILITY LAYOUT

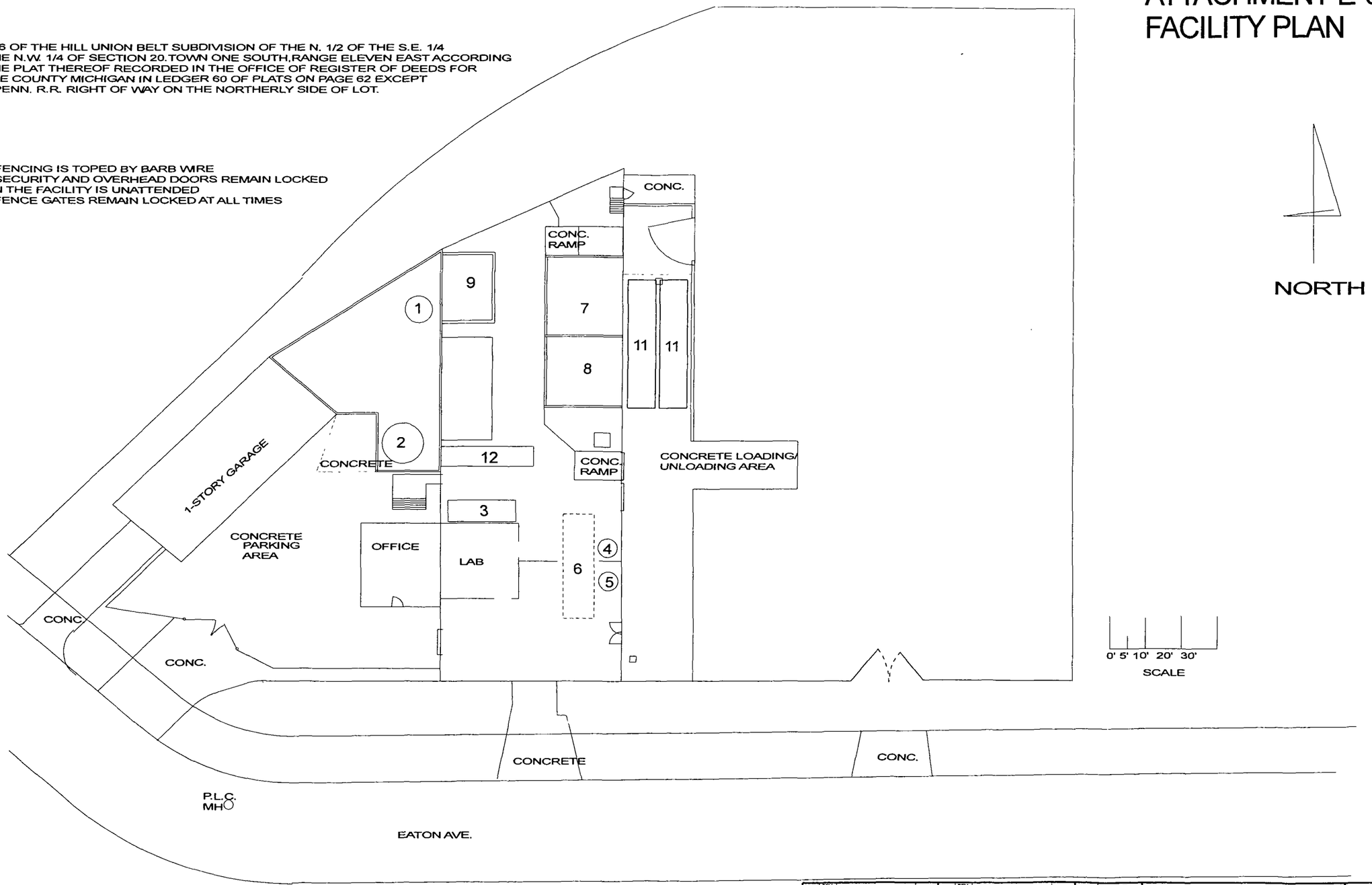
ID #	Equipment Name	Description
1	20,000 gal. Carbon steel Tank	Storage tank for Trichloroethylene
2	4,500 gal. Carbon Steel Tank	Storage tank for Trichloroethylene
3	5,000 gal. Carbon Steel Tank	Storage of Non-Hazardous Wastes.
4	3,000 gal. 316 stainless steel Tank	Storage of Non-Hazardous Wastes.
5	2,500 gal. 316 Stainless Steel Tank	Storage of Non-Hazardous Wastes
6	Staging area	Sampling (containers weighed as needed)
7-9	Interior Hazardous Waste Storage	Active
11	Exterior Hazardous Waste Storage	Storage of Flammables
12.	Drum Filling Station	Product Drumming Station.

ATTACHMENT E-3
FACILITY PLAN

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

NOTES:

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV NO.	CHANGE RECORD	BY	DATE	REV NO.	CHANGE RECORD	BY
				08.21.10	1	current site layout 06_2010	DDC

DR.	E.L.R.
CHK.	~
APR.	
SCALE	DATE
1/16"=12'	12/98

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No. 9601

DWG. No

EATON AVE.

ATTACHMENT E-4

LIST OF HAZARDOUS WASTES

ATTACHMENT E-4

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Ignitable Wastes	D001 (I)
Corrosive Waste	D002 (C)
Arsenic	D004 (T)
Barium	D005 (T)
Cadmium*	D006 (T)
Chromium	D007 (T)
Lead	D008 (T)
Mercury	D009 (T)
Selenium*	D010 (T)
Silver	D011 (T)
Endrin	D012 (T)
Benzene	D018 (T, I)
Carbon Tetrachloride	D019 (T), U211(T)
Chlorobenzene	F002 (T, I), D021(T, I), U037(T, I)
Chloroform	D022 (T), U044(T)
1,4-Dichlorobenzene	D027 (T), U072(T)
1,2-Dichloroethane	D028 (T, I), U077(T, I)
1,1-Dichloroethylene	D029 (T, I), U078(T, I)
2,4-Dinitrotoluene	D030 (T)
Heptachlor*	D031 (T)
Hexachlorobenzene	D032 (T), U127(T)
Hexachloroethane	D034 (T), U131(T)
Methyl Ethyl Ketone	D035 (T, I), F003 (I)
Nitrobenzene	D036 (T)
Tetrachloroethylene	F001 (T), F002(T), D039 (T), U210(T)
Trichloroethylene	F001(T), F002(T), D040 (T), U228(T)
Vinyl Chloride	D043 (T, I)
Ortho-Dichlorobenzene	F002 (T)
1,1,2,2-Tetrachloroethane	U209(T)
1,1,1,2-Tetrachloroethane	U208(T)
Dichlorodifluoromethane	U075(T)
1,1-Dichloroethane	U076(T, I)
1,1,1-Trichloroethane	F001(T), F002(T), U226(T)
Dichloromethane (Methylene Chloride)	F001 (T), F002 (T), U080(T)
Monofluoromethane	F001 (T), F002 (T)

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT E-4

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Trichlorofluoromethane	F001(T), F002(T), U121(T)
Trichloromonofluoromethane	F001 (T), F002 (T)
1,1,2-trichloro-1,2,2-trifluoroethane	F002 (T)
Xylene	F003 (I)
Acetone	F003 (I)
Ethyl Acetate	F003 (I)
Ethyl Benzene	F003 (I)
Ethyl Ether	F003 (I)
n-Butyl Alcohol	F003 (I)
Cyclohexanone	F003 (I)
Methyl Isobutyl Ketone	F003 (I), U161 (I)
Methanol	F005 (I)
Toluene	F005 (T, I)
Methyl Ethyl Ketone	F005 (I,T)
Carbon Disulfide	F005 (H, I)
Isobutanol	F005 (I,T)
Pyridine	F005 (T, I)

Wastewater treatment sludges from electroplating operations except from the following processes: F006

1. sulfuric acid anodizing of aluminum;
2. tin plating on carbon steel;
3. zinc plating (segragated basis) on carbon steel;
4. aluminum or zinc-aluminum plating on carbon steel;
5. cleaning/stripping associated with tin, zinc and
6. aluminum plating on carbon steel; and
7. chemical etching and milling of aluminum.

Waste water treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process F019

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT E-5

ENGINEER'S CERTIFICATION

A-Hach E-5

ROBERT J. DAVIS, P.E.
CONSULTING ENGINEER
2410 BOOK TOWER
DETROIT, MICHIGAN 48226
TELEPHONE 965-7474

CERTIFICATION

FACILITY NAME:

DEPA SITE CODE:

U.S. EPA ID NO.: MID 091605972

PART B PERMIT LOG #113

PERMIT (OR MODIFICATION) ISSUANCE DATE: 06/29/92

PERMIT CONDITION NO. REQUIRING CERTIFICATION:

For purposes of meeting Act 64 Permit Requirements, the Detrex Corporation has installed a coating system covering their truck load-unload area at the Eaton Avenue Facility. The following operations were performed:

Installation of New Curb - Concrete Work:
Installed 1/2" x 4-1/2" expansion type anchor bolts 18" on center and tied a continuous #4 rebar to the anchor bolts. A new 4" high by 12" wide curb was placed with the rebar in the center. The concrete used was 7 bag mix (4000 psi nominal). A broom finish was given to the concrete to promote traction of truck traffic.

The existing curbing was saw cut as necessary to provide a smooth edge which could be sealed.

Coating Work:
The cracks, control, and expansion joints were routed out to 1/2" wide x 1" deep with a Windsor Model JAW-1A crack router. All concrete surfaces were sandblasted with 12 x 40 quartz. After removal of remaining spent abrasive, all concrete surfaces were water blasted with 2500 psi pressure to remove any remaining particulate matter. High pressure air was used to promote drying of the slabs and to insure complete removal of any particulate matter.

Once completely dry, the cracks in the interior of the structure were sealed with ICO Fill Patch material (an epoxy sealant). The cracks around the perimeter where little or no truck traffic is present were filled with ICO Caulk X. A backer rod was used in the crack next to the building. All sealants were allowed to cure 24 hours prior to the application of the ICO Guard Coating.

ICO Guard Coating was applied to all concrete surfaces as a base/adhesive coat. It was applied at 6-8 mils in thickness. The ICO Guard Coating was allowed to cure for 24 hours prior to the application of the Seibert-Oxidenmo VIC Coating. After 24 hours, the VIC Coating was applied to all concrete surfaces at approximately 8 mils thickness. 12 x 40 quartz was broadcast onto the surface to provide a non-skid finished surface. The coating was allowed to tack up as per manufacturer's instructions prior to the next application. After approximately 2 - 3 hours time elapsed, the coating was sufficiently tacky to apply the second coat in the same fashion as the preceding. The following day the same procedure was utilized. The finished system consists of approximately 6-8 mils of epoxy with approximately 32 mils of urethane top coat.

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 Owner/Operator

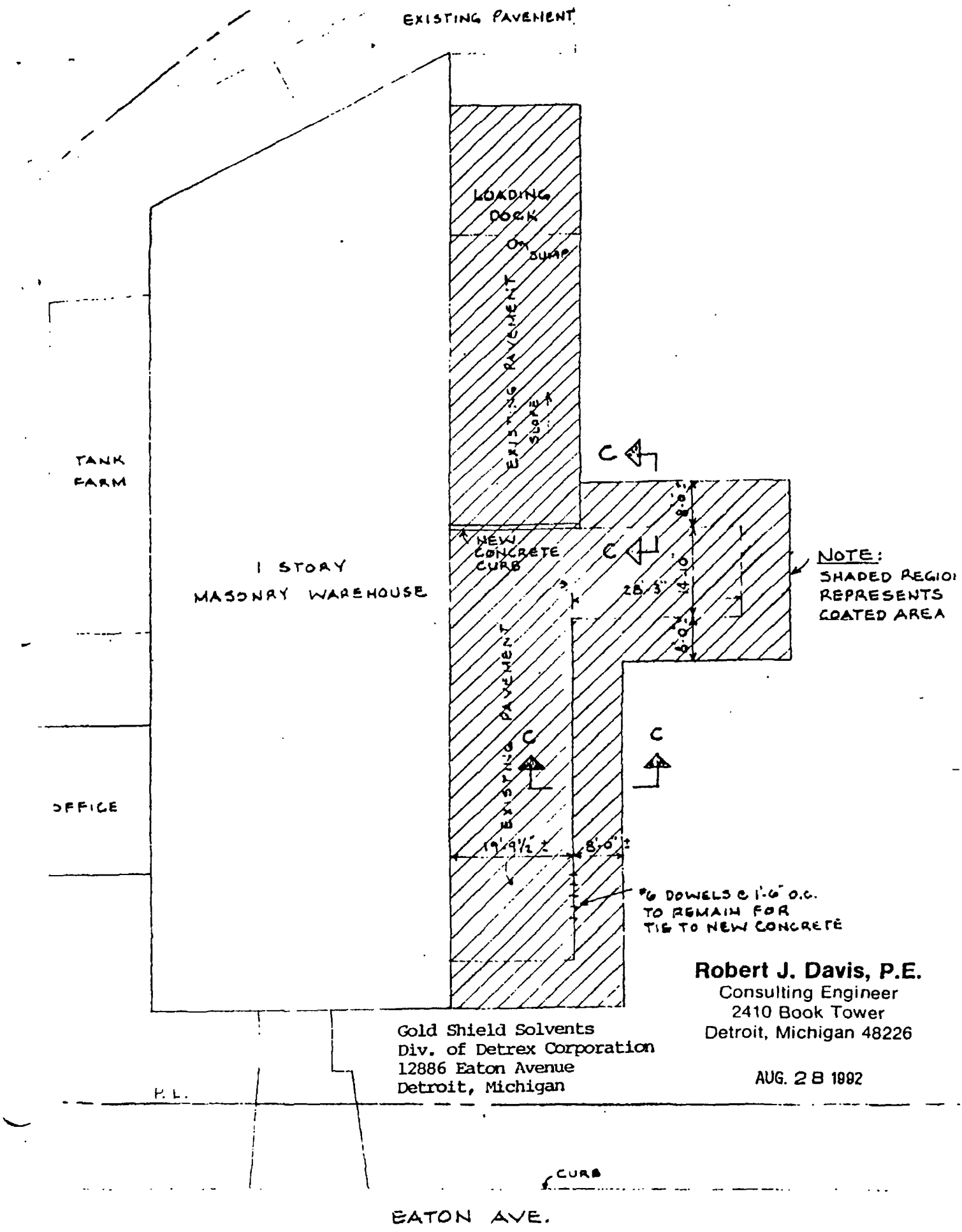
Name and Title

Signature of Registered P.E.

Robert J. Davis, No. 6556
Name of Registered P.E. and Michigan Registered Number

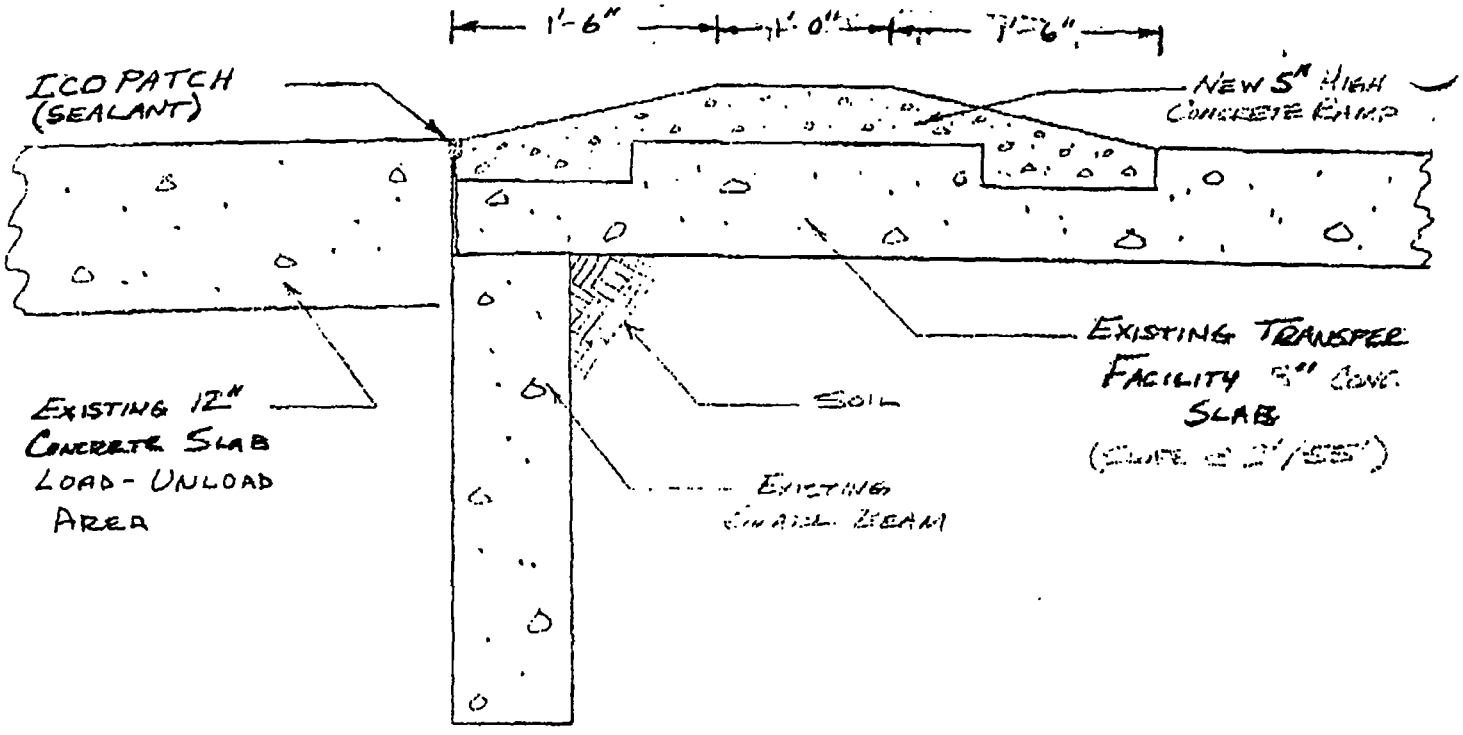
August 28, 1992
Date

(P.E. Seal)


EXISTING PAVEMENT
LOADING DOCK
SUMP
EXISTING PAVEMENT
TANK FARM
C
NEW CONCRETE CURB
C
1 STORY MASONRY WAREHOUSE
28'-3"
14'-10"
8'-0"
8'-0"
NOTE:
SHADED REGION REPRESENTS COATED AREA
EXISTING PAVEMENT
C
C
OFFICE
19'-9½"
8'-0"
#6 DOWELS @ 1'-6" O.C. TO REMAIN FOR TIE TO NEW CONCRETE
Robert J. Davis, P.E.
Consulting Engineer
2410 Book Tower
Detroit, Michigan 48226
Gold Shield Solvents
Div. of Detrex Corporation
12886 Eaton Avenue
Detroit, Michigan
AUG. 28 1992
P.L.
CURB
EATON AVE.

DETREX CORP. SOLVENTS DIV.

EATON AVE. FACILITY



SCALE 1" = 1'-0"

SECTION F

PROCEDURES TO PREVENT HAZARDS

TABLE OF CONTENTS

PROCEDURES TO PREVENT HAZARDS 3
F-1 SECURITY 4
F-1a SECURITY PROCEDURES AND EQUIPMENT 4
F-1a(1) 24-Hour Surveillance System 4
F-1a(2)(a) Barrier 4
F-1a(2)(b) Means To Control Entry 5
F-1a(3) Warning Signs 5
F-1b WAIVER 5
F-2 INSPECTION SCHEDULE 6
F-2a GENERAL INSPECTION REQUIREMENTS [40 CFR 270.14(b)(5), 264.15(a) and (b), 264.33] 6
F-2a(1) Types of Problems 6
F-2a(2) Frequency of Inspections 7
F-2b SPECIFIC INSPECTION REQUIREMENTS 7
F-2b(1) Container Inspection 7
F-3 WAIVER OF DOCUMENTATION OF PREPAREDNESS AND PREVENTION REQUIREMENTS 8
F-3a EQUIPMENT REQUIREMENTS 8
F-3a(1) Internal Communication 8
F-3a(2) External Communications 8
F-3a(3) Emergency Equipment 9
F-3a(4) Water For Fire Control 10
F-3b AISLE SPACE REQUIREMENTS 10
F-4 PREVENTATIVE PROCEDURES, STRUCTURES, AND EQUIPMENT 10
F-4a LOADING / UNLOADING OPERATIONS 10
F-4b RUN-OFF CONTROL 11
F-4c WATER SUPPLIES 11
F-4d EQUIPMENT AND POWER FAILURE 11
F-4e PERSONAL PROTECTION EQUIPMENT 12
F-5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE AND 12
INCOMPATIBLE WASTES 12
F-5a PRECAUTIONS TO PREVENT IGNITION OF IGNITABLE WASTES OR REACTIVE WASTES 12
F-5b PRECAUTIONS TO PREVENT COMMINGLING OF INCOMPATIBLE WASTES 13
F-5c MANAGEMENT OF IGNITABLE OR REACTIVE WASTES IN CONTAINERS 14
F-5d MANAGEMENT OF INCOMPATIBLE WASTES IN CONTAINERS 14

LIST OF ATTACHMENTS

ATTACHMENT F-1 LIST OF HAZARDOUS WASTES
ATTACHMENT F-2 HAZARDOUS WASTE GROUPS & COMPATIBILITY CHART
ATTACHMENT F-3 SECURITY PRECAUTIONS
ATTACHMENT F-4 INSPECTION SCHEDULE
ATTACHMENT F-5 TYPICAL INSPECTION RECORDS
ATTACHMENT F-6 LOCATION OF EMERGENCY AND SAFETY EQUIPMENT

SECTION F

PROCEDURES TO PREVENT HAZARDS

This section of the license application provides a description of the procedures implemented at the Detrex Corporation Facility (Facility) located in Detroit, Michigan to prevent the possibility of a hazard such as the formation of toxic gases, evolution of extreme heat and/or explosions from occurring.

This information is provided pursuant to Michigan Act 451 Rule 299.9504(1) which incorporates 40 CFR § 270.14(b)(4), (5), (6), (8), and (9) by reference. The applicable section(s) of the Federal Regulations (40 CFR) is referenced as appropriate.

F-1 SECURITY
[40 CFR 264.14, 270.14(b)(4)]

F-1A SECURITY PROCEDURES AND EQUIPMENT
[40 CFR 270.14(b)(4), 264.14]

F-1a(1)24-Hour Surveillance System
[40 CFR 264.14(b)(1)]

The hazardous waste management operations at the Facility involve storage of DOT - approved containers. All hazardous waste activities are performed within a single secure building or in secured trailers. Therefore, 24-hour surveillance is not provided. The building is however, equipped with an alarm system tied to doors within the office and warehouse. Windows within the office area are barred to prevent entry. The alarm system provides notice when there is a failure of the system, including failure of exterior doors being properly closed.

F-1a(2)(a) Barrier
[40 CFR 264.14(b)(2)(i)]

The active portions of the hazardous waste storage areas are completely enclosed by either an 8-foot high chain-linked fence or a building of block construction. All entryways (including doors and loading docks) are locked after business hours or when the Facility is unattended. The loading dock by the hazardous waste staging area has a gate, as shown in a photograph in Attachment A-3, that can be used when the overhead door is open to prevent unauthorized entrance into the warehouse area.

An 8-foot high chain-link fence with razor wire surrounds much of the Facility. This in conjunction with the building prevents unauthorized entrance by people and animals to the interior hazardous waste storage areas. A separate fence surrounds the flammable storage area (see photographs in Attachment A-3). Attachment F-3 provides a Facility plan illustrating security precautions. These measures prevent any individual from either entering the facility or obtaining access to areas where hazardous materials or wastes are stored. This precludes the need to provide fencing around the entire facility.

F-1a(2)(b) Means To Control Entry
[40 CFR 264.14(b)(ii)]

Attachment A-3 provides photos illustrating some of the access control devices at the Facility. Security doors to the office and overhead doors to active portions of the Facility remain locked when the building is unattended. Access to warehouse areas is controlled via gates and passage doors, which can only be opened from the inside.

All flammables stored at the Facility will occur on trailers,surrounded by an 8-foot high chain link fence and gate. The gate will remain locked at all times except when moving vehicles into or out of this area. In addition, the trailers will be closed during hours when the Facility is not attended. These measures will eliminate any access to this area except through the warehouse and then only during operating hours.

In addition, visitors enter the Facility via the security door to the office. Visitors, including other employees who do not work at this office, are requested to sign a log to denote their arrival and departure times.

F-1a(3) Warning Signs
[40 CFR 264.14(c)]

Warning signs which bear the legend Danger - Unauthorized Personnel Keep Out are posted at each entrance of the active portion of the Facility. These warning signs are to be posted in sufficient numbers to be seen from any approach to the active portion of the Facility from a minimum distance of 25 feet. A photograph of one such sign is shown in Attachment A-3.

F-1B WAIVER
[40 CFR 264.14 (a)]

The above noted security precautions are considered to be sufficient to prevent unauthorized access to hazardous waste management areas. The Facility is provided with a physical barrier <u>and</u> a means to control entry. Therefore, a waiver of security procedures and equipment requirements per 40 CFR §264.14(a) is not necessary.

F-2 INSPECTION SCHEDULE
[40 CFR 270.15, 270.14(b)(5)]

F-2A GENERAL INSPECTION REQUIREMENTS
[40 CFR 270.14(B)(5), 264.15(A) AND (B), 264.33]

Facility personnel conduct daily inspections of the hazardous waste storage areas, and loading / unloading areas after receipt of waste, for leaking or deteriorating containers. Regular scheduled inspections of the entire Facility are completed on a weekly basis. These inspections include all container handling equipment, security measures, emergency response equipment (i.e. spill control equipment, fire protection equipment and monitoring equipment), and communication and first-aid equipment,.

It is important to note that all of the hazardous waste management units are contained either within a single enclosed building, or in the flammable storage area that is secured by a fence with the gate locked, except when moving vehicles. Thus, personnel are almost continually working within or near the areas, and are encouraged to be observant at all times.

F-2a(1) Types of Problems
[40 CFR 264.15(b)(3)]

Based on the nature of the operations at the Facility, the primary concern is the occurrence of leaks and/or spills. Inspection schedules for monitoring secondary containment areas and loading and unloading areas were developed with the goal of promptly identifying leaks or spills. Safety and emergency equipment inspection schedules are based in part upon verification that adequate quantities are in place and the equipment being operational. As such, each item of emergency equipment will be checked. For example, the phone system will be checked to insure that individual units are operational and outside lines are available. Other items like drum pumps and drum hand trucks are checked to insure that they are present and in good working order. Attachment F-4 presents the typical schedule for inspection and identifies the various items to be inspected and the types of things to be inspected.

Attachment F-5 shows an example of a typical daily and weekly/monthly inspection logs which will be used at the Facility. The logs are discussed in greater detail in section F-2d. During inspections, employees will use the inspection schedule (Attachment F-4), along with their knowledge of the Facility and process equipment. The forms are designed to encourage personnel to include their observations when examining specific items, rather than just checking off a form. Other facilities have used similar forms with excellent results. Each inspection record is kept on file at the Facility for a minimum of three years.

Any deteriorating or malfunctioning equipment, or structure identified during an inspection will be remedied (i.e., repaired or replaced) to ensure that the problem does not lead to a human health or environmental hazard. If a hazard is determined to be potentially imminent, the remedy will be taken immediately upon discovery.

F-2a(2) Frequency of Inspections
[40 CFR 264.15(b)(4)]

It should be noted that the Facility will only be inspected during days that it is open for operation.

Attachment F-4 includes the frequency of inspection for each item. The frequency of inspection is based on:

1) the probable deterioration of equipment based on use and handling,
2) the probability of equipment deterioration or operator error resulting in an incident which is harmful to human health or the environment, and
3) regulatory requirements.

F-2B SPECIFIC INSPECTION REQUIREMENTS
[40 CFR 270.14(b)(5), 264.15(b)(4)]

The following sections outline specific inspection requirements.

F-2b(1) Container Inspection
[40 CFR 264.174, 264.1086(c)(4)(iii)]

Hazardous waste containers are inspected prior to acceptance to ensure they meet the criteria for acceptance. The containers are also inspected daily for signs of leaks or deterioration and to ensure the containers are properly marked and labeled. When a defect is detected for a container, its closure device, or its cover, Facility personnel will make note of the finding in the inspection and attempt repair on the container within 24 hours. If it is determined that repairs are not possible, or if the repair cannot be completed within 5 days, the Facility will either over-pack the container or transfer the hazardous waste to a suitable container.

F-3 WAIVER OF DOCUMENTATION OF PREPAREDNESS AND PREVENTION REQUIREMENTS

[40 CFR 270.14(b), 264.32(a) Through 264.32(d)]

Detrex Corporation does not wish to request a waiver of the preparedness and prevention requirements under 40 CFR Part 264 Subpart C. Requirements of this Subpart are also addressed in the Contingency Plan found in Section G of this license application.

The Detroit Fire Department (DFD) is familiar with the hazardous waste management operation, and with the Contingency Plan for the Facility (see Section G-6).

F-3A EQUIPMENT REQUIREMENTS

[40 CFR 270.14(b), 264.32]

F-3a(1) Internal Communication

[40 CFR 264.32(a)]

Internal communication may be accomplished via hand held two-way radios/cell phones, by verbal communication, PA system, or by some other means (such as air horns). Since the hazardous waste storage areas are adjacent to the lab area and the office, and the entire Facility is relatively small, communication can usually be most effectively achieved verbally in the event of an emergency.

F-3a(2) External Communications

[40 CFR 264.32(b)]

Storage areas and the office areas are equipped with telephones, which can be used to request emergency assistance. The locations of the telephones are shown in Attachment F-6. The flammable storage area is next to the building allowing verbal communication and in addition there is a telephone located near the access door to area 11 as seen in Attachment F-6.

In addition, Facility Personnel working in the warehouse or arriving prior to normal operating hours, generally also carry cell phones as a means of communication.

F-3a(3) Emergency Equipment
[40 CFR 264.32(c)]

Location of Facility emergency equipment is shown in Attachment F-6. This equipment includes:

1) Absorbent Material;
2) First-Aid Kit;
3) Eye Wash/Safety Shower;
4) PPE;
5) Fire Extinguishers;
6) Main Electrical & Gas Disconnects;
7) Gloves; and
8) Boots.

All emergency and safety equipment is routinely inspected and tested in accordance with the inspection schedules provided in Section F-2a to ensure its proper operation in the event of an emergency. Any equipment requiring decontamination after use in a response will be performed using an appropriate cleaning agent (e.g., steam cleaning, scrubbing with hot water, sand blasting, etc.), which will be selected, based on the characteristics of the released material.

Decontamination of equipment after use will also depend upon the type of equipment. For PPE (like gloves), soap and water may be enough. Supplies used in decontamination such as brushes, soap, buckets which are available from local stores will be maintained at the Facility. Other decontamination equipment needed to perform specific jobs or for use on larger equipment may be contracted out to local emergency response agencies that have the equipment necessary to perform larger decontamination jobs.

Wastes generated from the decontamination process, if determined to be a hazardous waste, will be packaged in DOT-approved containers and stored in the hazardous waste containment area approved for that material. If decontamination of the storage area is required, the Facility Manager will place the material in the staging area and make arrangements to have it removed as soon as possible.

F-3a(4) Water For Fire Control
[40 CFR 264.32(d)]

There are two fire hydrants, serviced by an 8-inch diameter watermain, located near the Facility along Eaton Avenue. The nearest is only about 25 feet south of the south end of the Facility.

A review of the new codes being included in this application indicates that the Facility is not at an increased risk of fire or explosion.

F-3B AISLE SPACE REQUIREMENTS
[40 CFR 264.35]

Hazardous wastes will be stored in the container storage areas in single rows (i.e., 4 feet) with 24 -inch minimum aisle spaces between each row (See photographs in Attachment A-3). The use of single aisles will permit room for inspection of the containers and the detection of release. In addition, this space will allow for the unobstructed movement of personnel, fire protection equipment, and spill control equipment utilized at the Facility. Containers can be moved for spill cleanup and container decontamination as necessary.

F-4 PREVENTATIVE PROCEDURES, STRUCTURES, AND EQUIPMENT
[40 CFR 270.14(b)(8)]

F-4A LOADING / UNLOADING OPERATIONS
[40 CFR 270.14(b)(8)(i)]

The loading/unloading of containerized hazardous wastes occurs at the middle overhead door on the east side of the building. The dock area is diked with a concrete ramp to maintain secondary containment while allowing for movement of containers. Containerized wastes are unloaded and placed in the staging area pending screening as per the waste analysis plan (Section C).

Containers of hazardous waste are primarily transported into and about the warehouse by a forklift. Hand trucks and other material handling practices also allow for movement of DOT containers inside the hazardous waste storage areas.

All loading / unloading operations are conducted under the supervision of personnel. In addition, the transport vehicle and the loading/unloading area are inspected immediately following a transfer to ensure all wastes have been removed and no spillage has occurred during movement of the waste.

F-4B RUN-OFF CONTROL
[40 CFR 270.14(b)(8)(ii)]

The hazardous waste container storage areas are located within an enclosed building or within secured trailers that are closed during non-business hours. This prevents accumulation of run-on waters in the hazardous waste storage areas. As presented in Section B of this operating license application, surface runoff is directed away from the building structure in all areas except along a portion of the east wall. A 12-inch square, 6-inch deep sump is located within the concrete loading/unloading area to provide a means of removing accumulated stormwater. A similar catchbasin is also located within the Flammable Storage Area (#11). The accumulated stormwater (runoff) is visually inspected prior to discharge. If the water meets the conditions for discharge, it is transferred into the municipal sanitary/storm sewer system. If the water fails to meet discharge requirements it will be collected and containerized for off-site disposal in accordance with Federal, State and local regulations.

F-4C WATER SUPPLIES
[40 CFR 270.14(b)(8)(iii)]

All water at this Facility is received from the municipal water main previously noted in Section B-2a(9) and F-3a(4). Contamination of the water supply is not possible since the secondary containment systems will hold all leaks or spills at the Facility, and thus will not come into contact with the water supply. In addition, the Facility has a backflow prevention device on the potable water supply line.

F-4D EQUIPMENT AND POWER FAILURE
[40 CFR 270.14(b)(8)(iv)]

Failure of power, or of other equipment at this Facility would, in the worst case, cause the hazardous waste operations at the Facility to be suspended.

The building alarm system is provided with an emergency back-up battery to ensure its continued operation during periods of power outage. This will insure that the alarm system continues to provide security and fire protection.

F-4E PERSONAL PROTECTION EQUIPMENT
[40 CFR 270.14(b)(8)(v)]

Personal protective equipment (PPE) is provided at the Facility to prevent exposure of personnel to hazardous waste. This equipment includes appropriate protective clothing and eye protection, a safety shower, and an emergency eyewash to be used in the event a person is splashed with waste. The Facility has a telephone system, an intercom system and two-way radios/cell phones that can be used to warn personnel in the event of an emergency.

The location of emergency equipment available at the Facility is shown on Attachment F-6.

F-5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE AND INCOMPATIBLE WASTES
[40 CFR 270.14(b)(9)]

A list of waste codes managed at the Facility is provided in Attachment F-1. All incoming wastes are tested as part of the Screening Procedures (see Section C) to ensure that reactive wastes are not inadvertently accepted. Procedures are also in place to insure that wastes are not stored with any other material, which could react with it in the event of a leak or spill.

F-5A PRECAUTIONS TO PREVENT IGNITION OF IGNITABLE WASTES OR REACTIVE WASTES
[40 CFR 270.14(b)(9), 264.17(a)]

The Facility does not accept Reactive Wastes.

Ignitable containerized wastes will be stored in container storage area number 11 (shown in Attachment F-3). The area meets all applicable Fire Codes and is also located more than 50 feet from the property line.

Precautions taken by the Facility to prevent ignition of flammable wastes include separation and protection of ignitable wastes from ignition sources such as open flames, cutting and welding operations, hot surfaces, spontaneous ignition sources (such as heat-producing chemical reactions and radiant heat sources), frictional heat, and sparks. Only spark proof tools will be utilized when handling potentially ignitable wastes in containers. Bonding and grounding as appropriate will be used to help reduce the potential for fires and explosions due to static electricity. Warning signs with the legend 'No Smoking' are posted conspicuously in the area designated for handling and storage of ignitable waste.

To prevent the incompatibility issue of flammables (F003, F005 & D001) with oxidizers (D001) the Facility will not accept any oxidizers unless there is one empty trailer available to store this material. Prior to storing any flammables on this trailer, all oxidizers will be removed.

F-5B PRECAUTIONS TO PREVENT COMMINGLING OF INCOMPATIBLE WASTES [40 CFR 270.14(b)(9), 264.17(b)]

The Facility handles all permitted wastes such that incompatible waste types are segregated, handled and stored separately once they are received. . Incompatible waste types have been determined for all proposed and current waste codes in accordance with the US Department of Commerce's National Technical Information Service (NTIS) document *A Method for Determining the Compatibility of Hazardous Waste*, publication number PB80-221005. The following incompatibility considerations were evaluated when separation guidelines were established.

Classifications and separations of the waste types are based on chemical family. It should be noted that many chemicals exhibit characteristics associated with several chemical families due to their composition (i.e. Chlorobenzene is classified as a halogenated compound due to the presence of a chlorine molecule and is classified as an aromatic compound due to its benzene structure). Therefore, the compatibility evaluation of two chemicals, at times, involves more than two chemical family comparisons. Furthermore, during the evaluation of waste types, each currently accepted and proposed chemical was evaluated with respect to:

1) its chemical family characteristic(s); and
2) its potential incompatibility with every other currently accepted and proposed chemical characteristic.

To insure the potential for incompatibilities do not occur, the Facility will take the following actions to ensure incompatible wastes do not end up in the same storage area:

1. Post the chart contained in Attachment F-2 as a reference guide to determine compatibility of different waste streams. Use the chart prior to placing any new RGN into the storage area.
2. Post each RGNs present within a given storage area, or use a tracking system (e.g. computer) to record and generate a list of RGNs in each containment area.
3. Prior to scheduling for a waste to be delivered to the Facility, determine the RGNs of the incoming waste stream from the profile sheet. Compare the RGNs with those already at the Facility to see if incompatibilities exist. If a potential incompatibility

problem exists between the wastes already in a given storage area and the waste to be accepted, make alternative arrangements for pickup and disposal.

4. Upon acceptance, mark the reactivity number(s) (RGNs) of the material on each DOT container near the hazardous waste marking;
5. Double check the new incoming waste against the list of RGNs in a given storage area prior for incompatibility problems. If a potential incompatibility problem exists between the wastes already in a given storage area and newly accepted wastes, then an alternate storage area will be sought or in the wastes will be rejected.

The procedure noted above is designed to preclude the need for designating storage areas for specific waste streams.

To address any concerns related to the potential for waste to 'squirt' from a failed container, the layout of storage areas 7 through 9 have been revamped to allow for at least 3 feet clearance between the edge of a container and an adjacent hazardous waste storage area. Experience has shown that failed containers holding free liquids are not able to project liquids if there is minor damage to the container, as they will weep rather than flow. This is because closed containers that fail below the liquid line rapidly develop a vacuum as liquids leave the container; leaks that occur near the liquid / air interface of a container open to the atmosphere lack the necessary head pressure to project any distance. Therefore in the worst case, containers on the second level will only project if the puncture is a gaping hole at the bottom of the container.

F-5C MANAGEMENT OF IGNITABLE OR REACTIVE WASTES IN CONTAINERS [40 CFR 270.15(c), 264.176]

This Facility does not accept any reactive wastes.

F-5D MANAGEMENT OF INCOMPATIBLE WASTES IN CONTAINERS [40 CFR 270.15(d), 264.177]

Incompatible waste types are segregated and stored in secondary containment areas, which are separated by curbing. This will prevent the mixing of incompatible wastes in the event of an accidental release. This should preclude one or more of the following incidents:

1) Generation of extreme heat or pressure, fire or explosions, or violent reactions;
2) Production of uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;

ATTACHMENT F-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Ignitable Wastes	D001 (I)
Corrosive Waste	D002 (C)
Arsenic	D004 (T)
Barium	D005 (T)
Cadmium*	D006 (T)
Chromium	D007 (T)
Lead	D008 (T)
Mercury	D009 (T)
Selenium*	D010 (T)
Silver	D011 (T)
Endrin	D012 (T)
Benzene	D018 (T, I)
Carbon Tetrachloride	D019 (T), U211(T)
Chlorobenzene	F002 (T, I), D021(T, I), U037(T, I)
Chloroform	D022 (T), U044(T)
1,4-Dichlorobenzene	D027 (T), U072(T)
1,2-Dichloroethane	D028 (T, I), U077(T, I)
1,1-Dichloroethylene	D029 (T, I), U078(T, I)
2,4-Dinitrotoluene	D030 (T)
Heptachlor*	D031 (T)
Hexachlorobenzene	D032 (T), U127(T)
Hexachloroethane	D034 (T), U131(T)
Methyl Ethyl Ketone	D035 (T, I), F003 (I)
Nitrobenzene	D036 (T)
Tetrachloroethylene	F001 (T), F002(T), D039 (T), U210(T)
Trichloroethylene	F001(T), F002(T), D040 (T), U228(T)
Vinyl Chloride	D043 (T, I)
Ortho-Dichlorobenzene	F002 (T)
1,1,2,2-Tetrachloroethane	U209(T)
1,1,1,2-Tetrachloroethane	U208(T)
Dichlorodifluoromethane	U075(T)
1,1-Dichloroethane	U076(T, I)
1,1,1-Trichloroethane	F001(T), F002(T), U226(T)
Dichloromethane (Methylene Chloride)	F001 (T), F002 (T), U080(T)
Monofluoromethane	F001 (T), F002 (T)

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT F-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Trichlorofluoromethane	F001(T), F002(T), U121(T)
Trichloromonofluoromethane	F001 (T), F002 (T)
1,1,2-trichloro-1,2,2-trifluoroethane	F002 (T)
Xylene	F003 (I)
Acetone	F003 (I)
Ethyl Acetate	F003 (I)
Ethyl Benzene	F003 (I)
Ethyl Ether	F003 (I)
n-Butyl Alcohol	F003 (I)
Cyclohexanone	F003 (I)
Methyl Isobutyl Ketone	F003 (I), U161 (I)
Methanol	F005 (I)
Toluene	F005 (T, I)
Methyl Ethyl Ketone	F005 (I,T)
Carbon Disulfide	F005 (H, I)
Isobutanol	F005 (I,T)
Pyridine	F005 (T, I)

Wastewater treatment sludges from electroplating operations except from the following processes: F006

1. sulfuric acid anodizing of aluminum;
2. tin plating on carbon steel;
3. zinc plating (segragated basis) on carbon steel;
4. aluminum or zinc-aluminum plating on carbon steel;
5. cleaning/stripping associated with tin, zinc and
6. aluminum plating on carbon steel; and
7. chemical etching and milling of aluminum.

Waste water treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process F019

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT F-2

HAZARDOUS WASTE GROUPS & COMPATIBILITY CHART

ATTACHMENT F-2

HAZARDOUS WASTES GROUPS

Reactivity Group Number	*Group Name and Constituents*
	Corrosive Materials
1, 2, 3	**Acids**
10	**Caustics**
4	**Alcohols and Glycols**
	1-Butanol
	iso-Butyl alcohol
	Methanol
	n-Butyl Alcohol
7	**Amines, Aliphatic and Aromatic**
	Pyridine
13	**Esters**
	Ethyl Acetate
14	**Ethers (All Isomers)**
	Ethyl Ether
16	**Aromatic Hydrocarbons**
	Benzene
	Toluene
	Xylene
	Ethyl Benzene
17	**Halogenated Organics**
	Freons
	Hexachloroethane
	Endrin
	Carbon tetrachloride
	Chlorobenzene (distillation or fractionation column bottoms)
	Chloroform
	1,4-Dichlorobenzene
	1,2-Dichloroethene
	1,1-Dichloroethylene
	Hexachlorobenzene
	Heptachlor
	Tetrachloroethylene
	Trichloroethylene
	1,1,1-Trichloroethane
	Dichloromethane
	Trichlorofluoromethane
	Chlorinated Fluorocarbons
	Vinyl Chloride
	1,1,2,2-Tetrachloroethane
	1,1,1,2-Tetrachloroethane
17	**Halogenated Organics**
	Dichlorodifluoromethane

ATTACHMENT F-2

HAZARDOUS WASTES GROUPS

Reactivity Group Number	*Group Name and Constituents*
	1,1-Dichloroethane
19	**Ketones** **Methyl Ethyl Ketone** **Acetone** **Cyclohexanone** **4-Methyl-2-pentanone**
20	**Mercaptans and Other Organic Sulfides (All Isomers)** **Carbon Disulfide**
21-24	**Metals** **Arsenic (24)** **Barium (21, 24)** **Cadmium (23, 24)** **Chromium (23, 24)** **Lead (23, 24)** **Mercury (24)** **Selenium (22, 24)**
27	**Nitro Compounds** **2,4-Dinitrotoluene** **Nitrobenzene**
28	**Hydrocarbons, Aliphatic, Unsaturated (All Isomers)** **Xylene**
29	**Hydrocarbons, Aliphatic, Saturated**
31	**Phenols** **Phenol**
101	**Combustible and Flammable Materials** **Ignitable Waste**

ATTACHMENT F-3

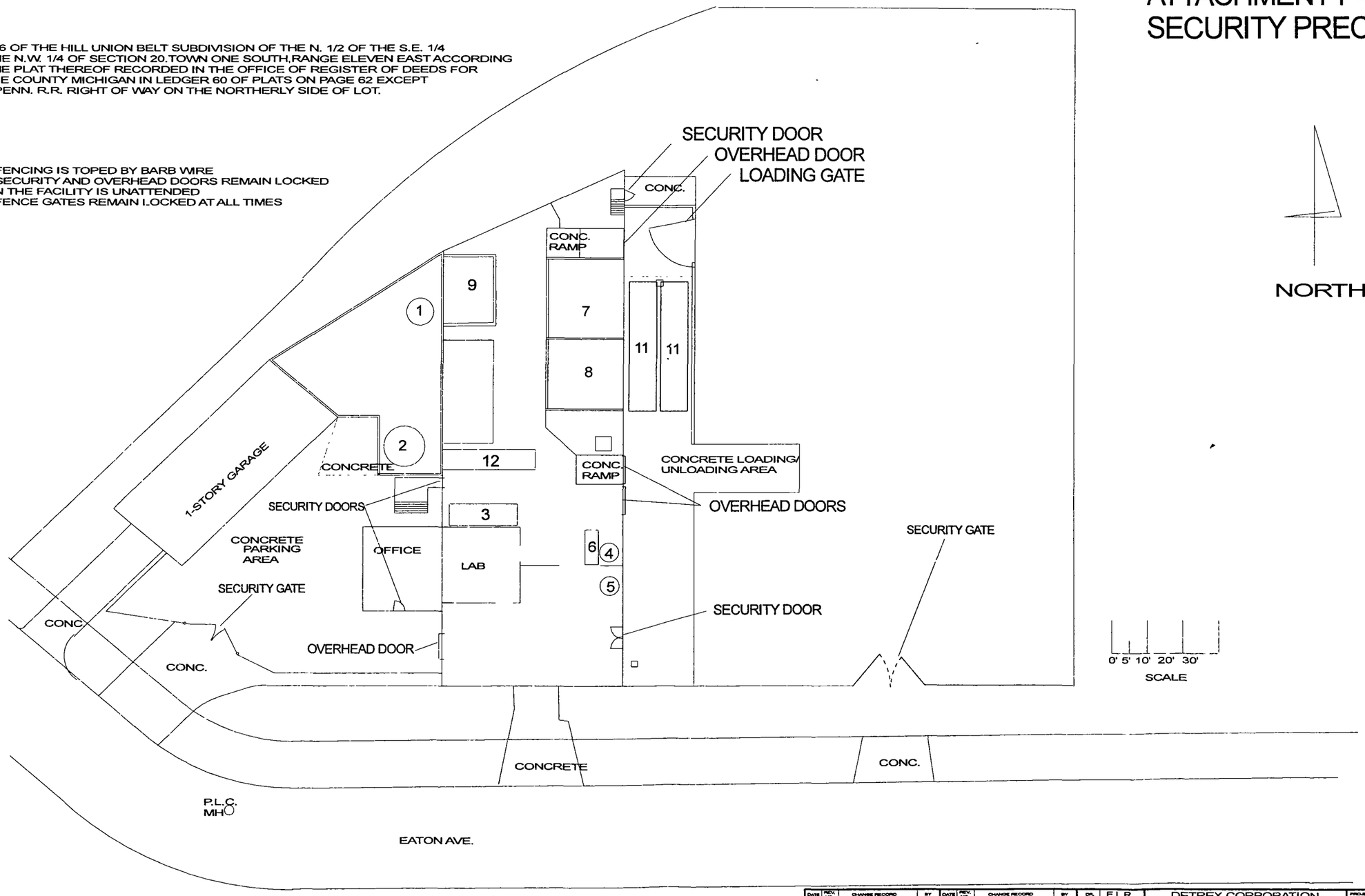
SECURITY PRECAUTIONS

ATTACHMENT F-3
SECURITY PRECAUTIONS

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

NOTES:

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV. NO.	CHANGE RECORD	BY	DATE	REV. NO.	CHANGE RECORD	BY
				08.31.10	1	current site layout.07_2010	DDC

DR.	E.L.R.
CHK.	~
APR.	
SCALE	DATE
1/16"=12'	12/98

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No. 9601

DWG. No. EATON AVE.

ATTACHMENT F-4

INSPECTION SCHEDULE

ATTACHMENT F-4

HAZARDOUS WASTE INSPECTION SCHEDULE

Items	*Type of Problem*	*Inspection Frequency*
Hazardous waste container storage areas (6, 7, 8, 9, & 11)	- Leaking containers - Bungs secure / properly secured - Corrosion on containers - Proper stack height - Proper labeling/marking - Adequate Aisle space	Daily
Secondary Containment	- Base free of cracks and intact - Presence of Free Liquid	Daily
Loading/unloading area & Flammable Storage Dock Area	- Spills - No cracks / Leaks, joints intact	Daily
Sump Pump	- Operational - **Available** - Leaks	Weekly
Container handling equipment (fork lift, grapple, pallet jack, drum hand cart)	- Operational - Available	Daily, when used
Absorbent material	- Adequate supply	Weekly
Barriers to prevent entry		
Doors	- Open freely - Locks function	Daily
Signs	- Present	Weekly
Fences	- Intact	Weekly
Alarm System	- operational	Weekly
Personnel Protective Equipment (gloves, aprons, goggles, face shields)	- Adequate supply	Weekly

ATTACHMENT F-4

HAZARDOUS WASTE INSPECTION SCHEDULE

Items		*Type of Problem*	*Inspection Frequency*
Fire Protection-			
Extinguisher	-	Available	
	-	Loss of pressure	Weekly
Eye wash station/ safety shower	-	Functions	Weekly
	-	Scale or rust in water	
First Aid Kit	-	Available	Weekly
	-	Adequate supplies	
Communication equipment			
Telephones	-	Operational	Weekly
Intercom	-	Operational	Weekly
Decontamination Equipment	-	Adequate supplies	Weekly

ATTACHMENT F-5

TYPICAL INSPECTION RECORD

BF :H LOCATION: _____ WEEK ENDING: _____

FACILITY DAILY INSPECTION FORM

INDICATE CONDITIONS

INSPECTION ITEM	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Hazardous Waste Container Storage Areas (6, 7, 8, 9, & 11)					
Loading / Unloading & Flammable Storage Areas					
Container Handling Equipment					
Barriers to prevent entry					
Signature					
Date					
Time					

Comments concerning problems or potential problems (include: specific storage area/item of concern, date, time, and nature of repairs or remedial actions taken to mitigate problems):

NOTE: REFER TO HAZARDOUS WASTE INSPECTION SCHEDULE FOR DETAILS ON TYPES OF PROBLEMS WHICH MAY BE ENCOUNTERED

HAZARDOUS WASTE INSPECTION SCHEDULE

Items		*Type of Problem*	*Inspection Frequency*
Hazardous waste container storage areas (6, 7, 8, 9, & 11)	-	Leaking containers	Daily
	-	Bungs secure / properly secured	
	-	Corrosion on containers	
	-	Proper stack height	
	-	Proper labeling/marking	
	-	Adequate Aisle space	
Secondary Containment	-	Base free of cracks and intact	Daily
	-	Presence of Free Liquid	
Loading/unloading area & flammable storage area dock	-	Spills	Daily
	-	No cracks / Leaks, joints intact	
Container handling equipment (fork lift, grapple, pallet jack, drum hand cart)	-	Operational	Daily, when used
	-	Available	
Barriers to prevent entry			
Doors	-	Open freely	Daily
	-	Locks function	

BRANCH LOCATION: _____ WEEK ENDING: _____

FACILITY WEEKLY INSPECTION FORM

INDICATE CONDITIONS

Equipment to inspect	possible problems	status / condition
Personnel Protective Equipment	Quantity and availability	
Eye Wash / Safety Showers	Quantity and availability	
First Aid Kit	Quantity and availability	
Communication Equipment	Quantity and availability	
Emergency Lighting	Operational *on monthly basis*	
Fire Protection	Quantity and availability	
Absorbent Materials	Quantity and availability	
Barriers to prevent entry	Equipment is operational	
Sump pump	Equipment is operational	
Alarm System	Equipment is operational	
Signature, Date, Time		

Comments concerning problems or potential problems (include: date, time, and nature of repairs or remedial actions taken to mitigate problems):

NOTE: REFER TO HAZARDOUS WASTE INSPECTION SCHEDULE FOR GREATER DETAILS ON TYPES OF PROBLEMS WHICH MAY BE ENCOUNTERED

HAZARDOUS WASTE INSPECTION SCHEDULE

Items	*Type of Problem*	*Inspection Frequency*
Personnel Protective Equipment (gloves, aprons, goggles, face shields)	- Adequate supply	Weekly
Eye wash station/ safety shower	- Functions - Scale or rust in water	Weekly
First Aid Kit	- Available - Adequate supplies	Weekly
Communication equipment		
Telephones, Intercom	- Operational	Weekly
Fire Protection-		
Extinguisher	- Available	
	- Loss of pressure	Weekly
Absorbent material	- Adequate supply	Weekly
Barriers to prevent entry		
Signs	- Present	Weekly
Fences	- Intact	Weekly
Sump Pump (Loading/Unloading area)	- Operational - Available - Leaks	Weekly
Alarm System	- Operational	Weekly

ATTACHMENT F-6

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT

Attachment F-6

EMERGENCY EQUIPMENT

1. Communications System

- telephone/public address system (notify in-house staff and external agencies)

2. Fire Control Systems and Equipment

- fire extinguishers - for combustibles, flammables, liquids, and electrical fires;
- fire hydrants - 1 hydrant located approximately 50 feet out from the facility building

3. Spill Control Equipment

- absorbent material - approximately 5 gallons absorbed per bag
- drum pump
- brooms, shovels (part of operational supplies used for housekeeping, which may also be used in event of release. These are not stored in any specific location)

4. Health and Medical Emergency Equipment/Supplies

- protective clothing (aprons, coveralls)
- eye wash/safety shower - adequate supply of fresh water for flushing eyes and skin
- first-aid stations
- safety glasses
- gloves (cotton, leather, rubber)
- boots

5. Material Handling Equipment

- Lift Truck
- Drum Hand Truck

Attachment F-6

EMERGENCY EQUIPMENT LEGAND

LEGEND	DESCRIPTION
AH	Air Horn
AM	Absorbent Material
B	Boots
DP	Drum Pump
ED	
EWS	Eye Wash Station
FAK	First Aid Kit
FE	Fire Extinguisher
G	Gloves
GG	Goggles
MED	Main Electrical Disconnect
MGD	Main Gas Disconnect
SS	Safety Shower
T	Telephone

ATTACHMENT F-6
EMERGENCY EQUIPMENT

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

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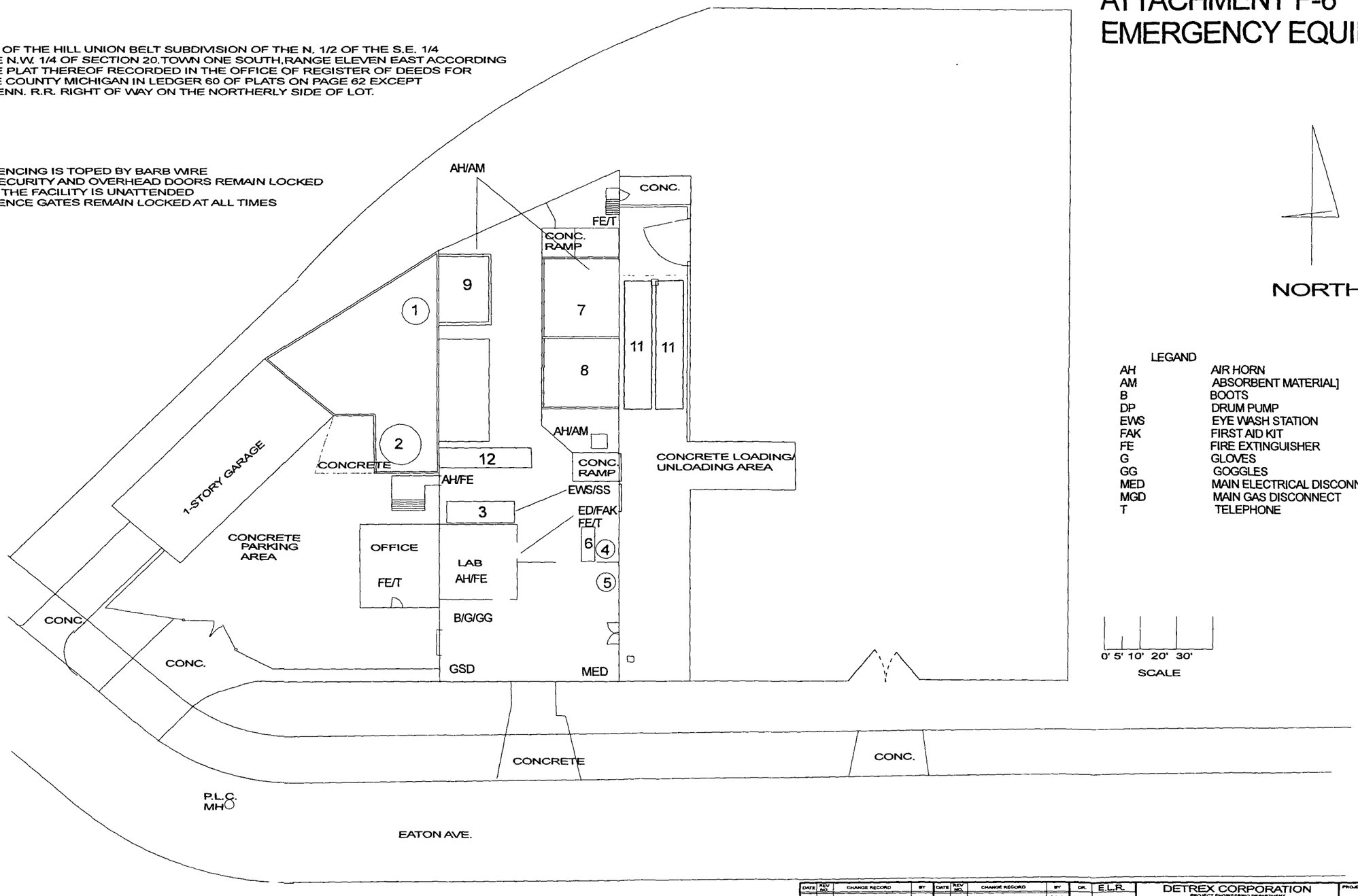


LEGAND

AH	AIR HORN
AM	ABSORBENT MATERIAL]
B	BOOTS
DP	DRUM PUMP
EWS	EYE WASH STATION
FAK	FIRST AID KIT
FE	FIRE EXTINGUISHER
G	GLOVES
GG	GOGGLES
MED	MAIN ELECTRICAL DISCONNECT
MGD	MAIN GAS DISCONNECT
T	TELEPHONE

DATE	REV NO.	CHANGE RECORD	BY	DATE	REV NO.	CHANGE RECORD	BY
				08.21.10	1	current site layout 07_2010	DDC

DR. E.L.R.
CHK. —
APR.
SCALE 1/16"=1'-0" DATE 12/96

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD, MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No. 9601
DWG. No.

EATON AVE.

HAZARDOUS WASTE FACILITY PART B PERMIT APPLICATION

DETREX CORPORATION
12886 EATON AVE.
DETROIT, MI
MID 091 605 972

BOOK 2 OF 2

DNRE
AUG 1 0 2010
ENVIRONMENTAL RESOURCE MANAGEMENT DIVISION

SECTION G

CONTINGENCY PLAN

DNRE
AUG 10 2010
ENVIRONMENTAL RESOURCE
MANAGEMENT DIVISION

TABLE OF CONTENTS

Page

CONTINGENCY PLAN 3
G-1 GENERAL INFORMATION 4
G-2 EMERGENCY COORDINATORS 5
G-3 IMPLEMENTATION 6
G-4 EMERGENCY ACTIONS 7
G-4a NOTIFICATION 8
G-4b IDENTIFICATION OF HAZARDS MATERIALS 8
G-4c ASSESSMENT 9
Specific Assessment of Possible Hazards to Human Health or the Environment 9
G-4d CONTROL PROCEDURES 10
G-4d(1) Fire and/or Explosion 11
G-4d(2) Accidental Release, Liquid 11
G-4d(3) Accidental Release Vapor 13
G-4e PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS OR RELEASES 13
G-4f STORAGE AND TREATMENT OF RELEASED MATERIAL 14
G-4g INCOMPATIBLE WASTES 14
G-4h POST-EMERGENCY EQUIPMENT MAINTENANCE 15
G-4i CONTAINER SPILLS AND LEAKAGE 16
G-5 EMERGENCY EQUIPMENT 17
G-6 COORDINATION AGREEMENTS 17
G-7 EVACUATION PLAN 17
G-8 REQUIRED REPORTS 18
G-9 AMENDMENTS TO THE CONTINGENCY PLAN 19

LIST OF ATTACHMENTS

ATTACHMENT G-1 EMERGENCY COORDINATORS
ATTACHMENT G-2 EMERGENCY RESPONSE AGENCIES/AUTHORITIES
ATTACHMENT G-3 FACILITY PLAN
ATTACHMENT G-4 EMERGENCY AND SAFETY EQUIPMENT
ATTACHMENT G-5 LIST OF WASTES AND SEGRAGATION CHART
ATTACHMENT G-6 EVACUATION ROUTES & PRIMARY AND ALTERNATE MEETING AREAS
ATTACHMENT G-7 COORDINATION AGREEMENT ACKNOWLEDGMENTS

SECTION G

CONTINGENCY PLAN
[40 CFR 270.149(b)(7), 264.50 through 264.56, 264.52(b)]

This Contingency Plan has been prepared for the Detrex Corporation Facility (Facility) located in Detroit, Michigan. The Contingency Plan has been designed to minimize hazards to human health or the environment and describes the actions Facility personnel will take in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents at the Facility.

The information is provided pursuant to Michigan Act 451 Rule 299.9607 which incorporates 40 CFR Part 264 Subpart D by reference. The applicable section(s) of the Federal Regulations (40 CFR) is referenced as appropriate.

G-1 GENERAL INFORMATION

This Contingency Plan has been provided for the Treatment Storage and Disposal Facility (TSDF) owned and operated by Detrex Corporation at the following location:

Detrex Corporation
12886 Eaton Avenue
Detroit, Michigan 48227
Telephone: (313) 491-4550

The Facility is classified as TSDF and operates under EPA identification number MID 091605972.

The hazardous waste management operations involve container storage; the Facility will also combine/commingle NON-RCRA and Non-hazardous wastes. Wastes will be received in DOT-approved containers and stored in appropriate storage areas to prevent combining or commingling of incompatible wastes in the event of a release.

The entire operation is located within a single enclosed building or in trailers designated as the flammable storage area. A Facility plan showing the location of the hazardous waste management units is provided in Attachment G-3.

This Contingency Plan contains emergency provisions to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents for the entire Facility. A copy of this Contingency Plan and all revisions will be maintained at the Facility.

G-2 EMERGENCY COORDINATORS
[40 CFR 264.52(d), 264.55]

If an imminent or actual emergency is discovered, the Emergency Coordinator (EC) (either on the Facility premises or on call) will be immediately notified. The primary EC will be contacted first; if he/she is not available, the alternate(s) will be contacted (in the order listed) until one is reached. A list of ECs telephone numbers is provided in Attachment G-1 and will be posted in key areas of the Facility. For security purposes, the ECs addresses and the location where phone numbers are posted are not presented in the Contingency Plan.

Personnel who discover an imminent or actual emergency shall take responsibility for notifying an EC. At least one of the designated ECs will either be at the Facility or on call and available to respond to an emergency seven (7) days per week. They will be typically able to reach the Facility within approximately 30 minutes of being contacted. It is important to note that this Facility does not process or treat any wastes; therefore the potential for an emergency in a non-operational time is remote.

The EC and the alternates are thoroughly familiar with all aspects of the Contingency Plan, all operations and activities at the Facility, the location and characteristics of wastes handled, the locations of all records within the Facility, and the Facility layout. They have the authority to commit the resources necessary to implement the Contingency Plan. The EC or the alternate(s) will coordinate and direct all response efforts and personnel.

In the event that the Detroit Fire Department (DFD) responds to an emergency at the Facility, the DFD Supervisor assumes the duties and authorities of the Emergency Coordinator. The Supervisor and the EC then act together to coordinate and direct the response effort. The plant EC's principal authority is to effectively provide the DFD Supervisor with comprehensive and detailed information concerning plant operations and the location and characteristics of materials handled.

A listing of the emergency response agencies and organizations, which may be called upon to provide emergency assistance at the Facility, is provided in Attachment G-2 with the appropriate contact numbers.

The local Police, DFD and the local Hospital are familiar with, and have a copy of the most current Contingency Plan for the Facility (see Section G-6).

G-3 IMPLEMENTATION
[40 CFR 264.52(a), 264.56(d)]

The provisions of this Contingency Plan must be carried out immediately whenever there is an imminent or actual incident, such as fire, explosion, or release of hazardous waste or hazardous waste constituents, which could adversely affect human health or the environment. This would include spills that are known to have reached surface or groundwaters. Minor leaks or spills in the hazardous waste storage areas (i.e., small quantity within a containment area that can easily be managed and cleaned by the personnel and equipment at hand) would not normally trigger the formal implementation of the Contingency Plan but would be managed by the EC or the alternate(s). Leaks or spills will only trigger formal implementation of the Contingency Plan, should the EC determine that such leaks or spills represent an imminent or actual threat to human health or the environment, or if the release reaches surface or groundwaters. Emergency methods addressed in the Contingency Plan, and the personnel training conducted for contingency procedures, are applicable to any potential minor leak or spill.

Also, a fire in the incipient stage will not normally trigger the formal implementation of the Contingency Plan since Facility personnel have been trained in a fire extinguisher program, as defined under OSHA 1910 Subpart L. An incipient fire is defined as a fire which can be extinguished with approximately two 20-pound fire extinguishers. Fires in the incipient stage will only trigger implementation of the Contingency Plan should the EC determine that such fires represent an imminent or actual threat to human health or the environment.

The following section offers the EC guidelines to evaluate the implementation of the Contingency Plan.

The Contingency Plan will be implemented in the following situations:

A. Fire and/or Explosion

1. A fire caused the release of toxic fumes (based on G-4c);
2. The fire spreads and could possibly ignite materials or other locations on site or could cause heat-induced explosions;
3. The fire could possibly spread to off-site areas;
4. Contaminant could spread from the use of water or water and chemical fire suppressants external to the Facility; or
5. An explosion has occurred or an imminent danger exists that an explosion could occur at the Facility.

B. Spill or Material Release

1. The spill could result in the release of toxic liquids or vapors, thus causing a fire or gas explosion hazard or health hazard; or
2. The spill is major and could result in soil contamination and/or groundwater pollution.

If the EC determines that the Facility has had a release, fire, or explosion which could threaten human health or the environment, has knowledge that a release has reached surface water or groundwater , or if there is a need to bring in outside agencies/organizations, he/she will report his/her finding as follows:

1. If his/her assessment of the emergency indicates that evacuation of the surrounding local areas may be advisable, the EC will immediately notify the DFD at 911, MDN RE via Pollution Emergency Alerting System (PEAS), and any other appropriate authorities as deemed necessary including the National Response Center.

2. Immediately contact all other appropriate departments, agencies and organizations with designated response orders to relate to them the specific information they require to respond (see Section G-4a).

3. Contact Detrex Risk Management Department.

G-4 EMERGENCY ACTIONS
[40 CFR 264.56]

Actions taken by Facility Personnel will be contingent on the type of emergency at the site. In the event of a fire, Facility personnel will determine if the fire is still in the incipient stages. If the fire can be extinguished using fire extinguishers, the Contingency Plan is not activated and the EC is notified after dealing with the situation. If the fire cannot be put out, the Contingency Plan is automatically activated and on-site personnel will contact the DFD. The EC will be subsequently notified after the evacuation is complete.

In the event of the emergency is associated with an expolosion or spill / release, the EC or his/her alternate will be contacted immediately and will:

1. Determine whether to formally implement the Contingency Plan based upon the criteria set forth in Section G-3 (i.e. potential threat to human health or the environment).
2. Immediately warn Facility personnel and appropriate emergency response authorities if it is an imminent or actual emergency, involving sudden or non-sudden release by fire, explosion, or otherwise so as to threaten human health or the environment. The procedures listed below with regard to appropriate notification of the proper authorities shall be followed as soon as possible once the safety of personnel is assured.
3. Determine the origin, location, nature, and extent of the problem.
4. Establish a command post from which to coordinate and direct the overall emergency response effort.

5. Inform other personnel of the situation.

G-4A NOTIFICATION
[40 CFR 264.56(a)]

1. Once immediate concerns involving human health and the environment have been addressed by the emergency response personnel the EC will immediately notify the appropriate national, state (including the MDNRE's PEAS (Pollution Emergency Alerting System)), and/or local departments, agencies and organizations with designated response roles, including the Risk Management Department (see Attachment G-2).

2. When notifying response agencies and organizations noted above, the EC will furnish the following information:

   a) Name and telephone number of individual reporting the incident;
   b) Name, address, telephone number, and EPA ID # of the Facility;
   c) The name, telephone number, and the owner/operators name for the Facility (PEAS requirement);
   d) Date, time and type (e.g., release, fire) of incident;
   e) Name and quantity of material(s) involved and to what extent;
   f) The extent of injuries, if any;
   g) The amount of recovered material, if any, and its disposition;
   h) The possible, hazards to human health or the environment; and
   i) The types of response actions taken.

G-4B IDENTIFICATION OF HAZARDS MATERIALS
[40 CFR 264.56(b)]

In the event of an emergency situation, the EC or his/her alternate will be contacted immediately. Upon notification, the EC will take the necessary steps to immediately identify the character, exact source, amount and aerial extent of any released materials.

The EC and the alternate(s) are familiar with the characteristics of all hazardous wastes handled at the Facility and have access to the appropriate waste characterization information kept on file in the office. They also have access to the Operating Record, which contains up-to-date information on the inventory of hazardous wastes at the Facility.

Based upon the EC's knowledge of the types and locations of all hazardous wastes at the Facility, and on a thorough visual inspection of the situation, an accurate identification of the hazardous materials existing in an emergency situation will be possible.

G-4C ASSESSMENT
[40 CFR 264.56(c), 264.56(d)]

Upon discovery or notification of an emergency situation, the EC will assess possible hazards to human health or the environment that may have resulted from the release, fire or explosion. This assessment shall consider both direct and indirect effects of the release, fire, or explosion, including the effects of any toxic, irritating, or asphyxiating gases that were generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire and heat-induced explosions.

The procedure for assessing possible hazards includes:

1. Identification of hazardous properties of the materials involved or by-products thereof.
2. Determination of threat to human health or the environment, both on site and off site.
3. Assessment of any environmental conditions (e.g., windspeed and direction) that may contribute to the magnitude of the hazard.
4. Determination of the readiness and availability of response equipment, both on-site and off-site.

SPECIFIC ASSESSMENT OF POSSIBLE HAZARDS TO HUMAN HEALTH OR THE ENVIRONMENT

Although each potential threat to human health or the environment will be evaluated/assessed by the EC or alternate(s) on a case-by-case basis, the following five scenarios have been developed to provide general guidance to the EC or the alternate(s). These and other possible scenarios may be discussed during training. In the event a situation occurs that is not covered in one of these scenarios, and the EC or alternate(s) are not absolutely sure of appropriate protective steps, the EC or alternates are directed to error on the conservative side and implement the Contingency Plan.

1. Emergencies that result in a spill or release of hazardous material, which cannot be controlled by plant employees but will be contained by the secondary containment system, shall not be deemed a hazard to human health or the environment.

2. Emergencies which result in the release of gases which cannot be controlled by the employees but can be contained by the building, to the extent that the amount escaping to the surrounding areas are below hazardous levels, then the release will not be considered a threat to the environment, but may be considered a threat to human health only for those responding to the incident.

3. Emergencies which result in a liquid spill or release of hazardous material which cannot be controlled by personnel or the secondary containment system, but does not reach sanitary/storm drains, ponds, creeks, rivers or other bodies of water which are used for irrigation of food crops or can otherwise enter aquifers or reservoirs which are used for human consumption, shall be considered a hazard to the environment but not necessarily to human health.

4. Emergencies, which satisfy the criteria in 3 above and may possibly reach sanitary/storm drains, ponds, creeks, rivers or other bodies of water, which are used for irrigation of food crops or can otherwise enter aquifers or reservoirs which in turn are used for human consumption shall be considered a hazard to the environment and to human health.

5. In the event that a major gaseous release escapes the boundaries of the Facility or if the material has a flash point of less than 100° F (i.e., flammable liquid) and may create an explosion/fire, the release will be considered a threat to human health and the environment.

If the EC or alternate(s) determines that the release, fire, or explosion could threaten human health or the environment, or has knowledge of a release reaching surface or groundwaters, the EC will proceed with the notification procedures detailed in Section G-4a of this Contingency Plan.

The EC or alternate(s) will evaluate information regarding the following:

1. The quantity of material released (from visual observations and Facility records);
2. The characteristics of the material (including physical and chemical properties, toxicity information from reference sources such as the handbooks for chemical substance from NIOSH or ACGIH, etc.); and
3. The potential for employee exposure (such as the generation of vapor/mists or dermal contact).

This information will be used to determine if there is a need to evacuate personnel from the Facility. Once the concern for the safety of Facility personnel is taken into account, the EC or alternate will use the above information, along with such items as the zoning map, the wind rose, and sewer location maps found in Attachments B-2 through B-4 to determine if there could be a threat to human health and/or the environment outside of the Facility. If a concern does exist, the local emergency response agencies will be contacted. The local agencies will then determine if a need for evacuation does indeed exist.

G-4D CONTROL PROCEDURES
[40 CFR 264.52(a)]

Potential accidents are classified into three general areas:

1. Fire and/or explosion involving hazardous waste or hazardous waste constituents.
2. Accidental release in a liquid form of hazardous waste or hazardous waste constituents.
3. Accidental release in the form of a vapor of hazardous waste or hazardous waste constituents.

G-4d(1) Fire and/or Explosion

The hazardous waste management containment areas are accessible to fire-fighting and other emergency equipment. Response procedures in the event of a fire and/or explosion will be as follows:

1. Facility Personnel will notify the office via telephone or other communication methods (example, verbal);
2. If a fire is minor (i.e. in incipient stage), Facility fire-fighting equipment such as a fire extinguisher will be used to extinguish the fire. Location and type of fire extinguishers at the Facility are shown in Attachment G-4;
3. The EC, or in their absence the alternate, will be notified;
4. In the event that Step 3 fails to control the fire, Steps 5, 6 and 7 will be implemented and all employees will immediately vacate the premises. Personnel will meet and be accounted for at the primary or alternate meeting area.
5. For explosions and major fires, the DFD will be contacted at 911, as well as other authorities as deemed necessary.
6. Any operating units, such as pumps, etc., would be shut down as expeditiously as possible, if safe to do so. The type of equipment the Facility operates is such that an emergency shut down will not create a potential for problems.
7. If time permits, and personnel will not be placed into danger, power from the main disconnects will be shut down (locations shown on Attachment G-4).
8. The EC has the authority to direct other necessary actions as required.
9. An "all clear" signal will be given when the fire and/or explosion has been extinguished and the personnel's safety is no longer endangered.
10. After a fire and/or explosion has been extinguished, cleanup procedures will commence. All emergency equipment used must be replaced, repaired, recharged or otherwise be in good operating condition and placed in the appropriate location before normal operations resume.

G-4d(2) Accidental Release, Liquid

If an accidental release of liquid occurs which cannot be controlled with absorbent material, the following steps will be taken:

1. Facility Personnel will notify the office via telephone or other communication methods.
2. The EC, or in their absence the alternate, will be notified. Appropriate Emergency Response Agencies (i.e., Emergency Spill Cleanup) as listed in Attachment G-2, will be notified as deemed necessary.
3. The exact source and type of release of hazardous waste or hazardous waste constituents will be determined.
4. All pump(s) contributing to the release will be shut off, keeping the safety of the responders in mind.
5. Any section(s) of pipe contributing to the release will be isolated by closing the appropriate valve(s).
6. If the discharge is from a container, the container will be turned, if possible, to orient the leak toward the top if it will reduce or stop the discharge until such a time as the drum can be properly overpacked.
7. A temporary dike of absorbent material will be placed around the discharge area.
8. All doors to the outside will be opened if the vapor(s) associated with the release are minor in nature as found in G-4d(3).
9. If there is a major release of product, which may endanger human health, personnel will be evacuated from the building. Personnel will meet and be accounted for at the primary or alternate meeting area.
10. Clean-up procedures will be implemented which may include notification of a spill clean-up firm, furnishing the clean-up crew with physical and/or chemical properties of waste and amount of waste released.

    a. Clean-up of released material: The liquid will be collected via use of absorbent material or other methods for small spills. The contaminated material will then be placed in DOT-approved containers for transportation off site for treatment/disposal at permitted facilities. For large spills, the material will be collected with a pump and placed in DOT-approved containers for reclamation or disposal. Explosion-proof electrical equipment will be used in the event the material is assessed as being combustible or flammable. The balance of the spilled material will be cleaned with absorbent material or other methods as stated above.

    b. Decontamination: Following cleanup, the affected area of the secondary containment area will be swept and all sweepings will be containerized. The area, when necessary, would be decontaminated by a triple steam/hot water wash. Proper decontamination of an impacted area will be verified by the collection of water sample after the triple rinse process. The sample will be analyzed for the constituents present in the released material and the results compared to the appropriate Federal or State Drinking Water Standards.

       wash waters and any other waste generated in condjunction with the decontamination will be collected in DOT containers and processed, or

transported off site for treatment/disposal at permitted facilities, if testing indicates it is a RCRA waste.

c. Cleanup of Contaminated Soil: Should the spill or release occur outside the secondary containment area (i.e., external to the building), cleanup will be accomplished by a group specializing in such procedures. All visually contaminated soils, where practical, will be excavated and disposed as appropriate, at a permitted hazardous waste facility. Building foundations may restrict any excavations. In the event an excavation is restricted by a building foundation, Detrex will work with MDNRE to determine an appropriate response.

11. Emergency equipment used will be decontaminated, replaced, repaired, recharged or otherwise be in good operating conditions and placed in the appropriate location before operations resume.

G-4d(3) Accidental Release Vapor

1. Facility Personnel will notify the office via phone or another communication method;
2. The EC or one of the alternate(s) will be notified;
3. The exact source and type of released hazardous waste or hazardous waste constituent will be determined, if possible, by using Facility records and operator knowledge;
4. All doors to the outside will be opened, if the release is minor in nature;
5. If the release is major (could cause a fire/explosion outside the Facility, or could affect human health), the DFD will be contacted via 911. Any operating units such as air conditioning or heating systems, pumps, etc. will be shut down as expeditiously as possible, if deemed safe to do so. Personnel will be evacuated from the building and will meet at the primary or alternate meeting area. Appropriate Emergency Response Agencies as listed in Attachment G-2 will be notified as deemed necessary; and
6. Clean up procedures will be initiated.

G-4E PREVENTION OF RECURRENCE OR SPREAD OF FIRES, EXPLOSIONS OR RELEASES
[40 CFR 264.56(e)]

Actions to prevent the recurrence or spread of fires, explosions or releases may include:

1. Halt operations and continue to monitor the Facility hourly, if possible, until assured that no problems may develop due to the emergency shut down.

2. Any containers contributing to a release will be emptied or otherwise be removed. Any product tanks contributing to a release will be removed from service until repaired.
3. Collecting and containing released wastes.
4. Use non-sparking tools and use bonding/grounding as appropriate.
5. Protecting the area from open flame or heat generating activities.
6. Upgrading daily and weekly inspection forms, if necessary.

All reasonable safety procedures will be followed prior to resuming operations.

G-4F STORAGE AND TREATMENT OF RELEASED MATERIAL [40 CFR 264.56(g)]

Immediately after an emergency, the EC will make arrangements for proper treatment, storage and/or disposal of all water and contaminated materials resulting from the release, fire or explosion. In the event that equipment is needed to help contain, collect, store, and treat the released wastes, the EC, or the alternate will:

1. evaluate the type and quantity of material(s) released;
2. determine if the necessary equipment is in-house;
3. contact outside agencies, such as those in Attachment G-2 to provide assistance and equipment;
4. transfer material to empty DOT-approved container(s) (an on-site supply is available) or to a storage tank which is either empty or contains compatible material;
5. if necessary, a bulk transport unit may also be utilized for temporary storage; and
6. characterize and dispose of the wastes at a properly permitted facility.

Care shall be taken to consider potential waste incompatibilities (see Section F-5) when handling released material.

All resulting wastes generated will be considered a RCRA hazardous waste consistent with the characteristics of wastes present within the Facility at the time of the emergency. The wastes will be managed as a RCRA waste unless it can be demonstrated to be non-regulated.

G-4G INCOMPATIBLE WASTES [40 CFR 264.56(h)(1)]

water reactive wastes are not accepted at the Facility, therefore any water from cleaning or potential fire fighting activities will not create a compatibility problem in any area.

The Facility handles all permitted wastes such that incompatible waste types are segregated, handled and stored separately. Incompatible waste types have been determined for all waste codes in accordance with the US Department of Commerce's National Technical Information Service (NTIS) document *A Method for Determining the Compatibility of Hazardous Waste*, publication number PB80-221005.

Many chemicals exhibit characteristics associated with several chemical families due to their composition (i.e. Chlorobenzene is classified as a halogenated compound due to the presence of a chlorine molecule and is classified as an aromatic compound due to its benzene structure). Therefore, the compatibility evaluation of two chemicals, at times, involves more than two chemical family comparisons. Furthermore, during the evaluation of waste types, each is evaluated with respect to:

1. its chemical family characteristic(s); and
2. its potential incompatibility with every other chemical characteristic.

To insure the potential for incompatibilities do not occur, the Facility will take the following actions to ensure incompatible wastes do not end up in the same storage area:

1. Post the chart contained in Attachment G-5 as a reference guide to determine compatibility of different waste streams. Use the chart prior to placing any new RGN into the storage area.
2. Post each RGNs present within a given storage area, or use a tracking system (e.g., computer) to record and generate a list of RGNs in each containment area.
3. Determine the RGNs of incoming wastes. Compare the RGNs with those already at the Facility to see if incompatibilities exist. If this system indicates a potential incompatibility problem between the wastes already in a given storage area and the waste to be accepted, make alternative arrangements for pickup and disposal.
4. mark the reactivity number(s) (RGNs) of the material on each DOT container near the hazardous waste marking;
5. Double check the new incoming waste against the list of RGNs in a given storage area prior for incompatibility problems. Use alternate storage areas if incompatibilities exist.

In the event of a release of hazardous waste into a container storage area, no additional wastes may be placed in that containment area until the release is cleaned up.

G-4H POST-EMERGENCY EQUIPMENT MAINTENANCE [40 CFR 264.56(h)(2)]

After an emergency event, or as required during the emergency response, all emergency equipment utilized in the affected area will be decontaminated or replaced so that it is suitable

for future use. Prior to resuming operations, an inspection of all utilized safety equipment will be conducted. All proper authorities will be notified that the post-emergency equipment maintenance has been performed and operations will resume.

G-4I CONTAINER SPILLS AND LEAKAGE [40 CFR 264.52, 264.171]

Any container identified to have a leak will be removed from service. If any contents remain in the container, the contents will be pumped out to another container or placed in an overpack container. The container will then be managed in accordance with 40 CFR 261.7. Any released waste will be cleaned up within 24 hours of discovery.

G-4J NOTIFICATION PRIOR TO COMMENCEMENT OF OPERATIONS [40 CFR 264.52, 264.171]

Before operations are resumed, the EC or their alternate will perfrom an inspection of the site to ensure that all emergency equipment is in good working order or has been replaced. The EC will then notify the EPA, DNRE, and local authorities that post-emergency equipment maintenance has been performed and operations at the facility will be resumed.

G-5 EMERGENCY EQUIPMENT
[40 CFR 264.52(e)]

The type and physical location of Facility's emergency equipment, including fire equipment, spill control equipment, and medical treatment supplies are shown in Attachment G-4. A brief description of each aspect of the Emergency Equipment is also found in Attachment G-4.

G-6 COORDINATION AGREEMENTS
[40 CFR 264.52(c), 264.37]

The layout of the Facility, the entrances to the Facility, possible evacuation routes, copies of the Contingency Plan, and other aspects of the Facility have been submitted to the DFD, the hospital and Emergency Spill Response company (companies) that may be utilized in an emergency (see Attachment G-2.). Properties of the hazardous wastes/materials handled at the Facility and their associated hazards have been provided in Tier II reports.

Each person, or the chief officer of each department, agency, or organization which receives a copy of the Contingency Plan is asked to sign a Coordination Agreement form to acknowledge that he/she reviewed the plan, understood their department's, agency's or organization's role under the plan, and that all members of their department, agency, or organization will be informed of the plan's content and their individual responsibilities. The copy of the Contingency Plan and the request for signed acknowledgment is sent by certified mail to each organization or is hand delivered. The certified mail receipts and returned signed acknowledgments, where available, are kept in the Facility office.

A copy of this contingency plan has been forwarded to the appropriate agencies and acknowledgment agreements, where available, have been included in Attachment G-7.

G-7 EVACUATION PLAN
[40 CFR 264.52(f)]

If an emergency occurs which Facility Personnel cannot adequately respond to, the Emergency Coordinator will signal employees to evacuate the Facility. Employees will exit the Facility by the most expeditious route. Provided in Attachment G-6 is a Facility Plan showing evacuation routes. the Facility is small enough that verbal communication will be helpful in directing an evacuation. , the announcement of an emergency will be accomplished by voice communication, intercom, or some other device such as an air horn. When the intercom is used, the EC or alternate will make an announcement at least three times. An example of how this may be accomplished as follows.

ATTENTION! ATTENTION! REPORT TO THE PRIMARY/ SECONDARY DESIGNATED AREA AS THERE IS A FIRE/SPILL/EXPLOSION/ETC. [DENOTE THE AFFECTED AREA IF APPLICABLE].

Once outside the building, employees will assemble at the primary or alternate meeting area or other designated area. The EC or the alternate will then notify the proper emergency response teams. The EC, based on this assessment, may deviate from established procedures in order to effectively and safely respond to emergency situations.

G-8 REQUIRED REPORTS

[40 CFR 264.56(j)]

As required, any emergency event requiring implementation of the Contingency Plan will be reported in writing to the appropriate Regional Administrator and the director within fifteen (15) days of the event. This report will, at minimum, contain:

1. Name, address, and telephone number of the owner or operator;
2. Name, address, and telephone number of the Facility;
3. Date, time, and type of incident (i.e., fire, explosion);
4. Name and quantity of materials involved;
5. The extent of injuries, if any;
6. The assessment of actual or potential hazards to human health or the environment, where this is applicable; and
7. Estimated quantity and disposition of recovered material that resulted from the incident.
8. As required, for any release that has reached the sewer drains, a written report shall be submitted within five days to the DWSD Industrial Waste Control Division.

The EC or a member of the Risk Management Department will submit, and retain on file, reports to the appropriate agencies and all applicable information relevant to the event for which the Contingency Plan was implemented.

The EC or a member of the Risk Management Department will also inform the appropriate departments, agencies, and authorities that cleanup is complete before operations at the Facility resume.

Detrex will place in the operating record all reports of any incident that requires implementing the Contingency Plan.

G-9 AMENDMENTS TO THE CONTINGENCY PLAN
[40 CFR 264.54]

The Contingency Plan will be reviewed and immediately amended, if necessary, whenever:

1. The Facility permit is revised;
2. The plan fails in an emergency;
3. The list of emergency coordinators changes;
4. The list of emergency equipment changes;
5. The Facility alters its design, construction, operation, maintenance, or other circumstances in a way materially increasing the potential for fires, explosions or releases of hazardous waste/or hazardous waste constituents;
6. The actions/responses necessary to comply in an emergency situation change; or
7. If required due to changes in the regulations.

All changes in this plan will be sent to every person, agency, department and organization on the contingency plan distribution list within 30 days of the effective date of the change.

ATTACHMENT G-1

EMERGENCY COORDINATORS

ATTACHMENT G-1
EMERGENCY COORDINATORS

NAME	JOB TITLE	WORK PHONE	EMERGENCY PHONE NUMBER
Primary			
Casey McCausland	Facility Manager	(313) 491-4550	(313) 363-0948 (C)
Alternate(s)			
Mike Shimko	Driver/Warehouse	(313) 491-4550	(313) 647-1768 (C)
Jim Goodrich	Waste Coordinator	(313) 491-4550	(810) 678-8094 (H) (313) 363-3413 (C)

ATTACHMENT G-2

EMERGENCY RESPONSE AGENCIES / AUTHORITIES

ATTACHMENT G-2
EMERGENCY RESPONSE AGENCIES / ORGANIZATIONS

NAME	ADDRESS	PHONE NUMBER
Detroit Police Department	Commanding Officer 2ND Precinct 13530 Lesure Detroit MI 48227	911 (313) 596-5200 (general)
Detroit Fire Department	Engine # 30 16600 Meyers Detroit MI 48235	911 (313) 596-2900 (general)
Grace Hospital	Ms. Robert Smythe Director of Operations Sinai-Grace Hospital Administration 6071 W. Outer Drive Detroit, MI 48235	(313) 966-3300
National Response Center		1-800-424-8802
Detrex Corporation Risk Management Group	24901 Northwestern Hwy., 410 Southfield MI 48075	(248) 358-5800 (main) 800-424-9300 (CHEMTREC - 24 hr. emergency phone #)
Detroit City LEPC	Harry Brown	313-596-2921
(PEAS) Michigan Pollution Emergency Altering System		1-800-292-4706
SERC		517-373-8481
MDEQ, Waste Management Division – Detroit Office	MDEQ, 27700 Donald Court Warren, MI 48092-2793	(586) 753-3700
Detroit Water & Sewer Department (DWSD) System Control Center	303 South Livernois Detroit MI 48209	(313) 224-4775 (313) 267-9000 - 24hr reporting (313) 267-6000 - 24hr reporting
Coast Guard		313-566-5337
Region V (OIL SPILL)	230 South Dearborn Street Chicago, Illinois 60604	(312) 353-2000
Emergency spill Clean-Up Companies		
Marine Pollution Control	8631 W. Jefferson Detroit MI 48209	(313) 849-2333 (800) 521-8232
K & D Industrial Services, Inc.	6470 Beverly Plaza Romulus, MI 48174	(734) 729-3350

ATTACHMENT G-3

FACILITY PLAN

ATTACHMENT G-3
FACILITY LAYOUT

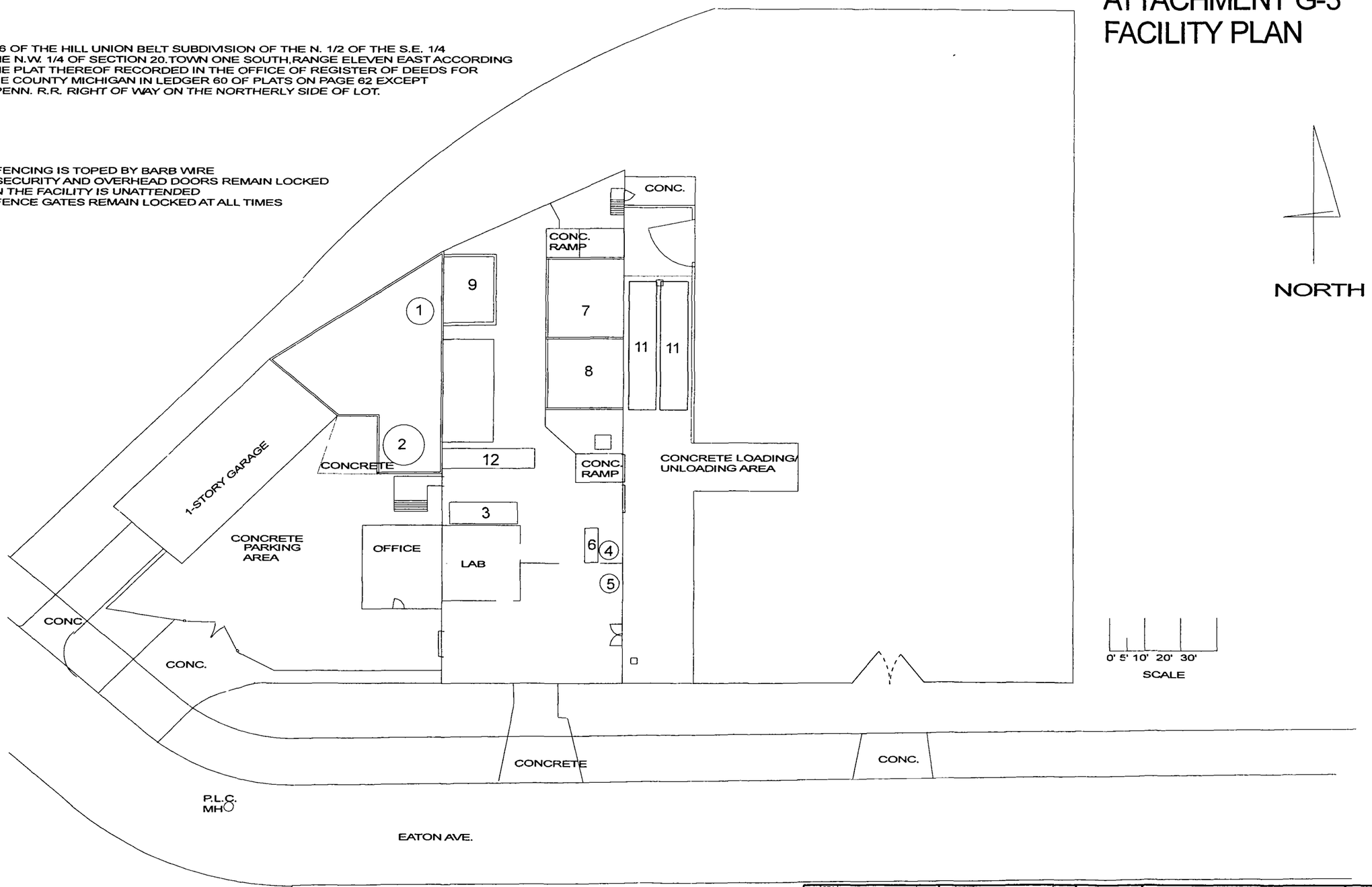
ID #	Equipment Name	Description
1	20,000 gal. Carbon steel Tank	Storage tank for Trichloroethylene
2	4,500 gal. Carbon Steel Tank	Storage tank for Trichloroethylene
3	5,000 gal. Carbon Steel Tank	Storage of Non-Hazardous Wastes.
4	3,000 gal. 316 stainless steel Tank	Storage of Non-Hazardous Wastes.
5	2,500 gal. 316 Stainless Steel Tank	Storage of Non-Hazardous Wastes
6	Staging area	Sampling (containers weighed as needed)
7-9	Interior Hazardous Waste Storage	Active
11	Exterior Hazardous Waste Storage	Storage of Flammables
12.	Drum Filling Station	Product Drumming Station.

ATTACHMENT G-3
FACILITY PLAN

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

NOTES:

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV NO.	CHANGE RECORD	BY	DATE	REV. NO.	CHANGE RECORD	BY
				04.21.10	1	current site layout.07_2010	DDC

DR.	E.L.R.
CHK.	~
APR.	
SCALE	DATE
1/16"=12"	12/98

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No. 9601

DWG. No

EATON AVE.

ATTACHMENT G-4

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT

Attachment G-4

EMERGENCY EQUIPMENT

1. Communications System

- telephone/public address system (notify in-house staff and external agencies)

2. Fire Control Systems and Equipment

- fire extinguishers - for combustible / flammable, liquids and electrical fires;
- fire hydrants - 1 hydrant located approximately 50 feet out from the facility building

3. Spill Control Equipment

- absorbent material - approximately 5 gallons absorbed per bag
- drum pump
- brooms, shovels (part of operational supplies used for housekeeping, which may also be used in event of release. These are not stored in any specific location)

4. Health and Medical Emergency Equipment/Supplies

- protective clothing (aprons, coveralls)
- emergency lighting (10 - 30 minutes lighting for escape)
- eye wash/safety shower - adequate supply of fresh water for flushing eyes and skin
- first-aid stations
- safety glasses
- gloves (cotton, leather, rubber)
- boots

5. Material Handling Equipment

- Lift Truck
- Drum Hand Truck

ATTACHMENT G-4
EMERGENCY EQUIPMENT

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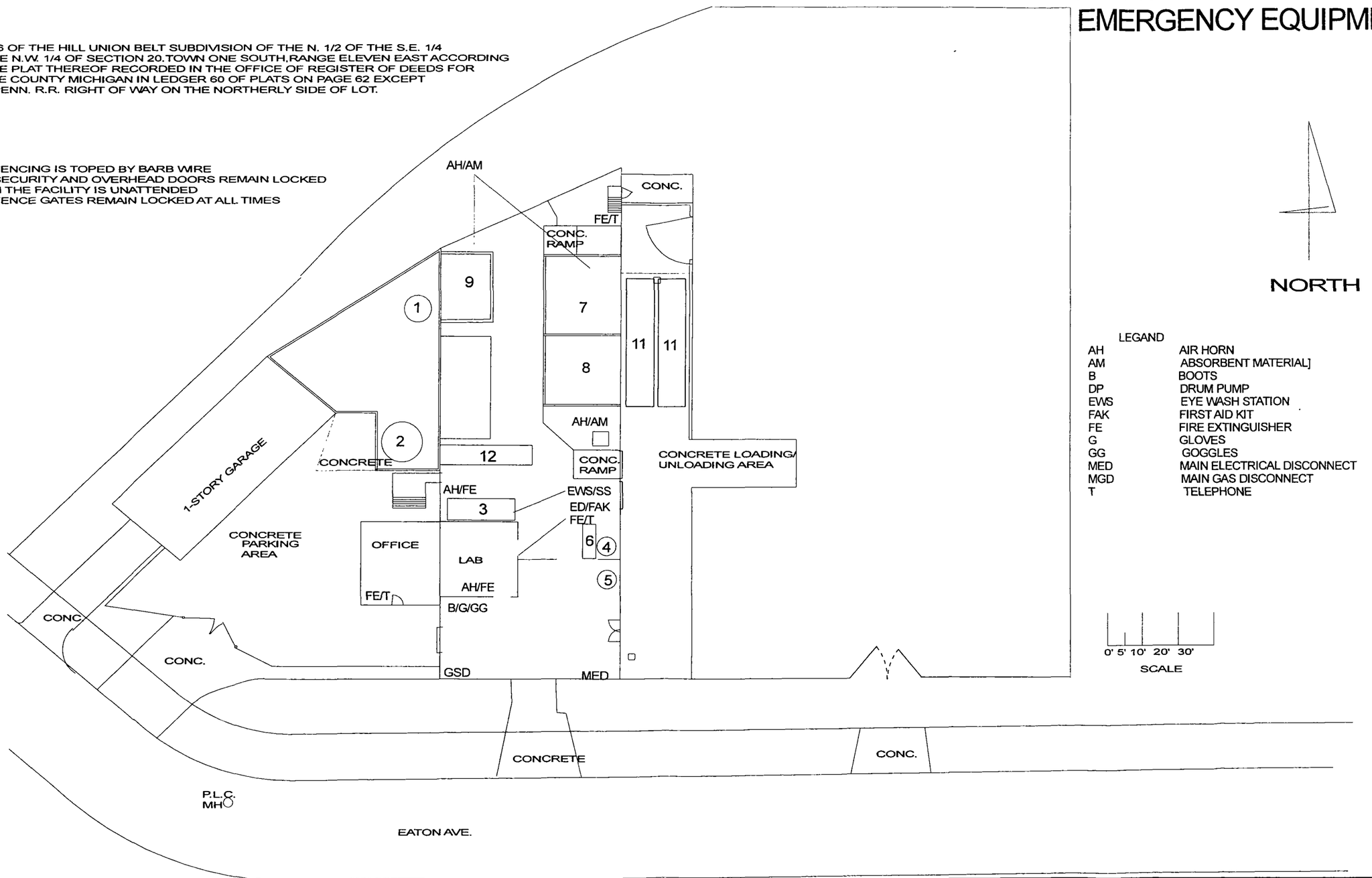

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				06.21.10	1	current site layout 07_2010	DDC

DR.	E.L.R.
CHK.	~
APR.	
SCALE	DATE
1/16"=12'	12/96

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No. 9601

DWG. No.

EATON AVE.

ATTACHMENT G-5

LIST OF WASTES AND SEGRAGATION CHART

Date 07.10 10
Revision: 10-1

Attachment: G-5
DETREX HAZARDOUS WASTE COMPATABILITY CHART

REACTIVITY CODE	CONSEQUENCES
H	HEAT
F	FIRE
G	INNOCUOUS AND NON-FLAMMABLE GAS GENERATION
GT	TOXIC GAS GENERATION
GF	FLAMMABLE GAS GENERATION
S	SOLUBILIZATION OF TOXIC SUBSTANCES
E	EXPLOSTION

REACTIVITY GROUP NUMBER	1	2	3	4	7	10	13	14	16	17	19	20	21	22	23	24	27	28	29	31	101
1																					
2																					
3		H,G																			
4	H	H, F	H, P																		
7	H	H, GT	H																		
10	H	H	H																		
13	H	H, F																			
14	H	H, F																			
16		H,F																			
17	H,GT	H,F,GT			H, GT	H,GF															
19	H	H,F				H															
20	GT, GF	H, F, GT								H	H										
21	GF, H, F	GF, H, F	GF, H, F	GF, H, F	GF, H	GF, H	GF, H			GF, H	GF, H	GF, H									
22	GF, H, F	GF, H, F	GF							H, E	GF, H	GF, H, F									
23	GF, H, F	GF, H, F				GF, H				H, E		GF, H, F									
24	S	S	S		S	S															
27		H, F, GT				H, E															
28	H	H, F												H, E							
29		H, F																			
31	H	H, F																			
101	H, G	H, F, GT																			

ATTACHMENT G-5

HAZARDOUS WASTES GROUPS

Reactivity Group Number	*Group Name and Constituents*
	Corrosive Materials
1, 2, 3	**Acids**
10	**Caustics**
4	**Alcohols and Glycols**
	1-Butanol
	iso-Butyl alcohol
	Methanol
	n-Butyl Alcohol
7	**Amines, Aliphatic and Aromatic**
	Pyridine
13	**Esters**
	Ethyl Acetate
14	**Ethers (All Isomers)**
	Ethyl Ether
16	**Aromatic Hydrocarbons**
	Benzene
	Toluene
	Xylene
	Ethyl Benzene
17	**Halogenated Organics**
	Freons
	Hexachloroethane
	Endrin
	Carbon tetrachloride
	Chlorobenzene (distillation or fractionation column bottoms)
	Chloroform
	1,4-Dichlorobenzene
	1,2-Dichloroethene
	1,1-Dichloroethylene
	Hexachlorobenzene
	Heptachlor
	Tetrachloroethylene
	Trichloroethylene
	1,1,1-Trichloroethane
	Dichloromethane
	Trichlorofluoromethane
	Chlorinated Fluorocarbons
	Vinyl Chloride
	1,1,2,2-Tetrachloroethane
	1,1,1,2-Tetrachloroethane
17	**Halogenated Organics**
	Dichlorodifluoromethane

ATTACHMENT G-5

HAZARDOUS WASTES GROUPS

Reactivity Group Number	*Group Name and Constituents*
	1,1-Dichloroethane
19	**Ketones** **Methyl Ethyl Ketone** **Acetone** **Cyclohexanone** **4-Methyl-2-pentanone**
20	**Mercaptans and Other Organic Sulfides (All Isomers)** **Carbon Disulfide**
21-24	**Metals** **Arsenic (24)** **Barium (21, 24)** **Cadmium (23, 24)** **Chromium (23, 24)** **Lead (23, 24)** **Mercury (24)** **Selenium (22, 24)**
27	**Nitro Compounds** **2,4-Dinitrotoluene** **Nitrobenzene**
28	**Hydrocarbons, Aliphatic, Unsaturated (All Isomers)** **Xylene**
29	**Hydrocarbons, Aliphatic, Saturated**
31	**Phenols** **Phenol**
101	**Combustible and Flammable Materials** **Ignitable Waste**

ATTACHMENT G-6

EVACUATION ROUTES & PRIMARY AND ALTERNATE MEETING AREAS

ATTACHMENT G-6
EVACUATION ROUTES

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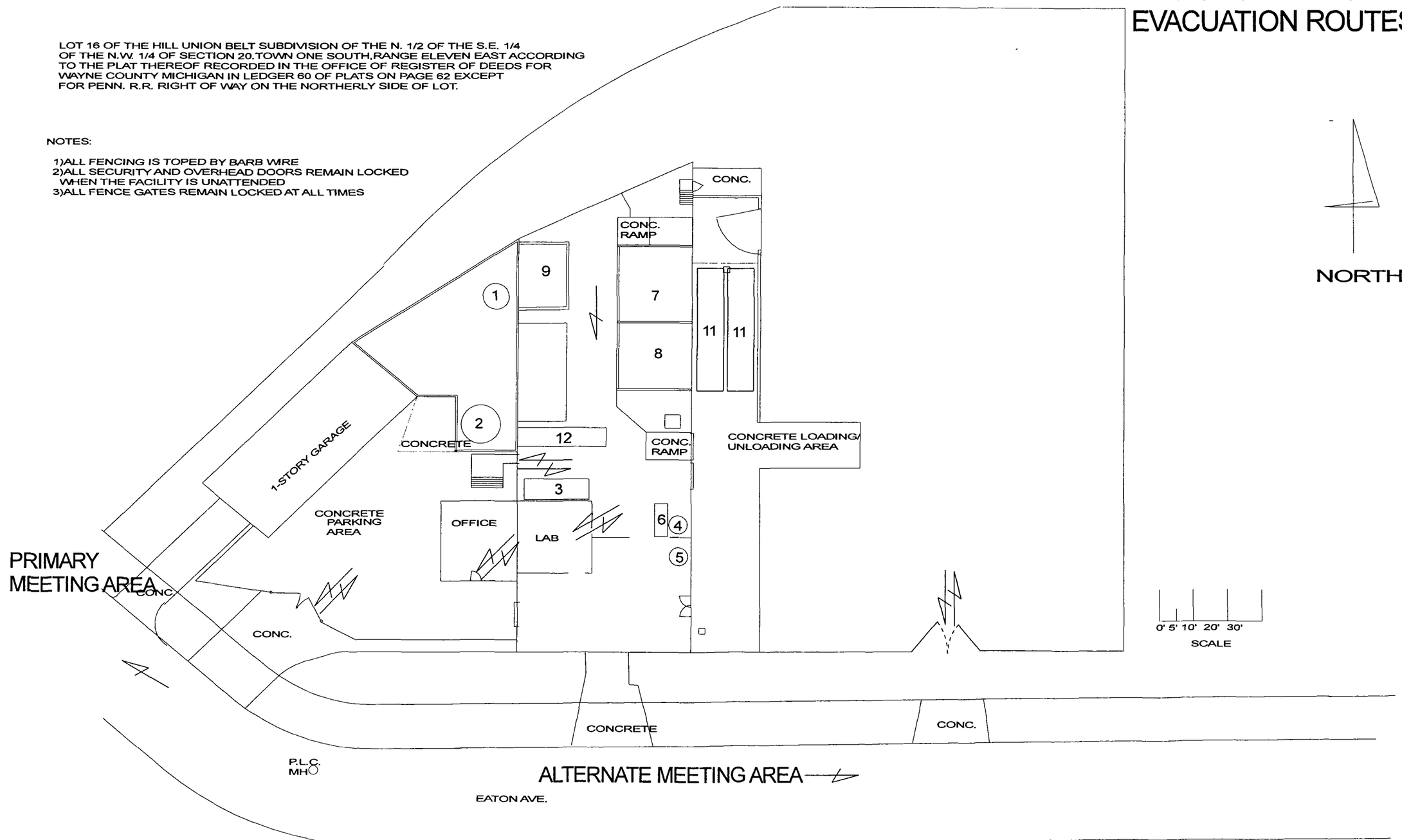

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				06.21.10	1	current site layout 07_2010	DDC

DR.	E.L.R.
CHK.	~
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SCALE	DATE
1/16"=12"	12/96

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No. 9601

DWG. No.

ATTACHMENT G-7

COORDINATION AGREEMENT ACKNOWLEDGMENTS

October 17, 2000

VIA: Certified Mail
«Sal» «FirstName» «LastName»,
«Title»
«Company»
«Address1»
«City» «State» «PostalCode»

Re: Contingency Plan.
Detrex Corporation
12886 Eaton Av.
Detroit MI 48227

Dear «Sal» «LastName»:

Detrex Corporation has updated its Contingency Plan according to the requirements of Act 451, part 111. As a listed Emergency Responder / Organization Detrex Corporation is providing you with a copy of the latest version of our Contingency Plan.

In order to verify your receipt of the Plan, please sign the attached Acknowledgment Form and return it in the enclosed envelope. Please feel free to contact me should you have any questions regarding the revised Contingency Plan.

Sincerely,

David Craig - CHMM, CET
Manager of Environmental and Safety Compliance

cc:
MDEQ, Hazardous Waste Section
Facility
File

HAZARDOUS WASTE TSDF CONTINGENCY PLAN
ACKNOWLEDGEMENT FORM

I, «FirstName» «LastName» of «Company», acknowledge receipt of Detrex Corporation's Contingency Plan Dated July 10, 2010. I have reviewed the document and understand Detrex's need for my company as an Emergency Responder/Organization in the event that such services are needed. I further acknowledge that this Plan has been reviewed with key response personnel in my company and that the document is being maintained on file for future reference.

_____	_____
Signature of Emergency Responder	
_____	David Craig, CHMM
Print Name and Title	Mgr. Environmental & Safety Compliance
_____	_____
Date	Date

SECTION H

PERSONNEL TRAINING

TABLE OF CONTENTS

Page

PERSONNEL TRAINING 3
H-1 OUTLINE OF THE TRAINING PROGRAM 4
H-1a JOB TITLES/JOB DESCRIPTIONS 4
H-1b TRAINING CONTENT, FREQUENCY, AND TECHNIQUES 5
H-1 c TRAINING DIRECTOR 5
H-1 d RELEVANCE OF TRAINING TO JOB POSITION 5
H-1e TRAINING FOR EMERGENCY RESPONSE 6
H-2 IMPLEMENTATION OF TRAINING PROGRAM 7

LIST OF ATTACHMENTS

ATTACHMENT H-1 JOB DESCRIPTIONS
ATTACHMENT H-2 CORPORATE COMPLIANCE TRAINING PROGRAM OUTLINE
ATTACHMENT H-3 CURRICULUM VITA - TRAINING DIRECTOR
ATTACHMENT H-4 TYPICAL TRAINING ACKNOWLEDGMENT FORM

SECTION H

PERSONNEL TRAINING
[40 CFR 270.14(b)(12), 264.16]

This section outlines the personnel training program completed by all personnel at Detrex Corporation's Facility (Facility) located in Detroit, Michigan. The information is provided pursuant to Michigan Act 451 Rule 299.9504(1)(c) which incorporates 40 CFR 270.14(b)(12) and 264.16 by reference. The applicable section(s) of the State and Federal Regulations are referenced as appropriate.

H-1 OUTLINE OF THE TRAINING PROGRAM
[40 CFR 264.16(a)(1)]

Detrex Corporation has developed a personnel training program for training personnel in the safe handling of the hazardous wastes received at the Facility. This compliance program incorporates the existing Facility training program with expanded coverage of relevant subject areas including training required to comply with appropriate requirements of DOT, OSHA and EPA. The training consists of study, on-the-job training, and competence evaluation. Personnel must successfully complete the full training program before working unsupervised in the Facility. This occurs within 6 months of being hired or being transferred to a new position at the Facility. The training program provides each employee with a firm knowledge of how to handle the hazardous wastes and also how to react, in the event of an emergency situation, to protect human health and the environment.

H-1A JOB TITLES/JOB DESCRIPTIONS
[40 CFR 264.16(d)(1), 264.16(d)(2)]

Detrex Corporation maintains the following documents and records at the Facility:

1) The job title, experience requirements, and job descriptions for each position related to Hazardous Waste Management activities at this Facility are provided in Attachment H-1. A list of personnel currently filling these positions is available at the Facility.
2) An outline of the type and amount of both introductory and continuing training given to personnel for each position related to hazardous waste management.
3) Records certified by the Training Director, that document the training has been completed by Facility Personnel.

Detrex Corporation maintains training records of former personnel involved with hazardous waste management for 3 (three) years from the date they last worked at the Facility and will maintain training records on current personnel until closure of the Facility.

Personnel receive the training necessary for him/her to perform his/her required job functions. For example, operators may receive training in such responsibilities as Emergency Action and Contingency Plans, fire protection, lockout/tagout, and lift truck operations. The Emergency Coordinator and alternate receive training under the Emergency Action and Contingency Plans. These individuals are also familiar with operations at this Facility, and are able to provide information to emergency responders as well as helping direct responses to emergencies.

H-1B TRAINING CONTENT, FREQUENCY, AND TECHNIQUES
[40 CFR 264.16(c) and (d)(3)]

The program was developed by Detrex Corporation for training personnel in the safe handling of hazardous wastes includes study, on-the-job training, and/or competence evaluation. Provisions are made for updating or revising the training program as necessary to ensure compliance with regulatory guidelines, changing Facility conditions, and organizational changes.

An outline of Detrex's Corporate compliance training program is provided in Attachment H-2. This outlines all aspects of the training program, providing personnel with the information required for the safe execution of his or her responsibilities.

Personnel are not allowed to work unsupervised prior to completing introductory training. In addition, a refresher training program is conducted by Detrex Corporation once each calendar year for all personnel.

H-1 C TRAINING DIRECTOR
[40 CFR 264.16(a)(2)]

The Corporate Training Director for Detrex Corporation will be responsible for ensuring the existing personnel training program is updated and ensuring all personnel involved in hazardous waste management activities receive adequate training. As necessary, qualified independent persons or organizations may be contracted to assist in the training program. The curriculum vita for the individual currently filling this position is in Attachment H-3.

H-1 D RELEVANCE OF TRAINING TO JOB POSITION
[40 CFR 264.16(a)(2)]

Contents of the training program are tailored to each position. For example, warehousemen receive training in applicable DOT, OSHA, and EPA regulations regarding the handling of Hazardous Chemicals, Materials, and wastes. The outline provided in Attachment H-2 is designed to provide a gerneral overview of the items covered in various training sessions. The level of detail provided to an individual depends on their responsibilities. For example, the warehouseman may receive training regarding the issues of time periods for storage of hazardous waste but may not necessarily be trained regarding the status of generators classifications or the retention requirements for paperwork.

In addition, all personnel receive some level of training with regards to the Contingeny Plan. The level of training is dependent on the individuals responsibilities. Individuals who are listed as the Emergency Coordinator or the alternate would be trained in all the requirements of the plan and their responsibilities under the plan; others may only be provided information on the aspects of non-emergency response or the evacuation procedures.

The following are examples of training individuals in certain job positions will receive:

The Facility Manager may receive training in areas such as, the Operation, Inspection and Recordkeeping for: Safety Equipment, Transportation and Material Handling Equipment and Contingency Plan Procedures. The Facility Manager will also ensure that proper response is given to any deficiencies identified during inspections (e.g. repair or replace defective equipment).

The Office Coordinator may receive training in areas such as: record keeping, the manifesting of hazardous waste shipments, inventory, and appropriate components of the Contingency Plan.

The Warehouseman may receive training in areas such as the operation of: Safety Equipment, Emergency Equipment, and Forklift or other material handling equipment, and appropriate components of the Contingency Plan.

Warehouseman may receive training in areas such as the operation of: Safety, Emergency and Material Handling Equipment, and all DOT requirements related to transportation of hazardous materials.

The Waste Coordinator may receive training in areas such as the operation of: Safety Equipment, Emergency Equipment, the operation of material handling equipment, and appropriate components of the Contingency Plan.

Personnel, whose job is directly related to the handling of Hazardous Waste, receive training in the proper use of personnel protective equipment (PPE) including direction on when the equipment is to be worn. These individuals are also trained to respond to non-routine conditions by being familiar with the Contingency Plan.

H-1E TRAINING FOR EMERGENCY RESPONSE
[40 CFR 264.16(a)(3)]

This training program is designed to ensure that personnel not only handle hazardous wastes in a safe manner, but also properly respond to emergency situations. The program trains hazardous waste handling/management personnel to maintain compliance under both normal and non-rotine operating conditions, and emergency conditions.

As noted above, personnel receive training in areas which are specific to their jobs as it relates to the handling of hazardous waste.

Emergency response procedures, as described in detail in Section G-4 of this permit application, consist of a number of steps.

1) Warn all Facility Personnel of emergency situations.
2) Notification of appropriate state or local agencies with designated response roles if necessary.

3) Identification of the nature and source of released material and assessment of potential hazards to human health or the environment.

4) Proper use of personnel protective equipment.

5) Implementation of appropriate control procedure(s) based on type of accident to reduce potential for environmental impact (i.e. release outside of containment structures).

6) Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment.

7) Procedures to respond to a fire.

8) Procedures to respond to potential groundwater contamination incidents.

9) Cleanup of affected area and emergency equipment.

10) Storage and disposal of released material.

The training plan implemented by Detrex Corporation involves study and on-the-job training in the proper emergency response procedures and the proper use of all personnel protective equipment.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

[40 CFR 264.16(b), (d)(4) and (e)]

When an individual is hired to fill a specific position (i.e. Warehouseman), the employee is aquatinted with the written training program for the position he/she is to fill. No individual hired to work at the Facility, or transferred to a new position that requires skills he/she does not possess, will be allowed to work unsupervised at the Facility prior to the completion of the training program. Personnel are given at least 40 hours of on-the-job training within 6 months of hiring or filling the new position.

Personnel are required to meet annually for reviews and updates of this training program and to discuss and study the following subjects:

1. All hazardous wastes currently being handled at the Facility, noting any changes in waste type, volume, source, characteristics, or location that have occurred during the past year;

2. The status of operating conditions and procedures noting any areas where there are problems or potential for problems. Personnel participate in developing effective solutions;

3. The requirements contained in the Facility's operating permit, noting any changes that have occurred during the past year. Areas where maintenance or compliance is a problem are identified and discussed, and effective solutions are sought; and

4. Incidents that have occurred in the past year that warranted use of the Contingency Plan. This review focuses on the cause of the incident and identification of steps to be taken to prevent or to ensure better handling of such events in the future.

Records certified by the Training Director will be kept on site documenting that the required training has been completed. A representative copy of the form signed by Facility Personnel after they have completed their initial or annual refresher training is provided in Attachment H-4. These records will be kept until closure of the Facility for current personnel and for 3 years from the date of termination for former personnel.

ATTACHMENT H-1

JOB DESCRIPTIONS

JOB DESCRIPTIONS

POSITION TITLE: **Facility Manager**

FACILITY: Detroit Michigan

SUMMARY: Responsible to plan, direct, and coordinate the day to day operations of the Facility with respect to the proper storage, and shipment of both product and hazardous waste materials.

VERIFICATION:

Experience: Leadership, communication skills, decision-making abilities, motivational skills, and experience in:
- Plant operations, including environmental and regulatory exposure;
- Working knowledge of transportation operations; and
- Understanding of sales and marketing situations and be able to support the Sales/Marketing groups as needed.

Education: Associates / Bachelors degree in a related field such as hazardous waste management, process control, or regulatory compliance is preferred.

Reports to: President

RESPONSIBILITIES:

Marketing Operations:

1. Supervises pick-up of wastes where Detrex is the designated facility.
2. Supervises and directs employees involved in handling of hazardous wastes. Assure good industrial practices are followed in a manner to protect employee's safety and the environment.
3. Supervise operation of the warehouse.
4. Supervise/direct the dispatch and routing of the company's fleet of hazardous material vehicles.

Environmental and Regulatory Responsibilities:

Responsibility for on-site hazardous waste management as follows:

(1) Serves as Emergency Coordinator or alternate.
(2) Supervises all record keeping operations and preparation of hazardous waste manifests.
(3) Supervises employees when on-site sampling is performed.

JOB DESCRIPTIONS

(4) Supervises employees who screen hazardous wastes, when performed on site.
(5) Supervises employees who handle the record keeping of daily and weekly Facility inspection reports to insure compliance with the regulations and the permit.
(6) Acts as one of the contacts for the MDNRE and USEPA.
(7) Responsible for maintaining training levels of branch personnel.
(8) Responsible for regulatory compliance in operation of the Part B facility.
(9) Generates, or assists Risk Management, in the preparation of reports required by the permit, or other applicable laws

JOB DESCRIPTIONS

POSITION: **Office Coordinator**

FACILITY: Detroit Michigan

SUMMARY: Under the direction of the Facility Manager, is responsible for invoice to the customer for both solvent and waste. Check in and start cover sheets on waste shipments. Performs general office duties.

VERIFICATIONS:

Experience: Administrative experience with background in accounting preferred.

Education: Minimum of high school degree or equivalent

Reports To: Facility Manager

RESPONSIBILITIES:

1) May act as one of the facility's alternate Emergency Coordinators.
2) Start and maintain customer information packets for each waste shipment that is received. These packets will include:
   a) Cover Sheet with necessary information completed.
   b) Letter to the generator noting ability to accept waste
   c) Generator Waste Profile Sheet.
   d) Copy of the waste manifest(s).
   e) Customer purchase order(s).
   f) Any other information pertaining to waste shipment(s).
3) Help in the Scheduling of incoming shipments of waste.
4) Maintain and control invoice/customer files.
5) Maintain inventory for material stored in the warehouse.
6) Provides back up to the Waste Coordinator and Driver/Warehouseman to ensure that all shipments of waste received at the Facility are properly manifested, labeled, marked with accumulation start date, sampled, and logged in. Also performs bench top fingerprint analysis and may also perform other analytical work or prepare the sample for shipment to appropriate analytical facility if additional analytical is needed

JOB DESCRIPTIONS

POSITION: **Warehouseman**

FACILITY: Detroit Michigan

SUMMARY: Handles hazardous waste in accordance with the latest rules and regulations. Emphasis is also placed on the development of "Better Ways" to operate the Facility in a more efficient manner.

VERIFICATIONS:

Experience: Knowledge of hazardous waste management, including handling and storage of hazardous waste preferred. Experience in maintenance of related equipment, and in the operation of a forklift preferred.

Education: High school degree or equivalent

Reports to: Facility Manager

RESPONSIBILITIES:

1. May act as an alternate Emergency Coordinator.
2. Comply with Detrex procedures for the transfer, storage, and handling of hazardous waste. This includes completion of all specified training courses.
3. Monitor the hazardous waste storage area for problems, (leaks, etc.). Address problems in a timely fashion.
4. Unload in-coming shipments of waste and store in the proper location in accordance with Detrex Facility part "B" permit.
5. Insure labels and markings remain intact until the containers are shipped off site for disposal.
6. Sample wastes received at the Facility in accordance with the Facility's WAP.
7. Provide the Office Coordinator information on the wastes received and wastes shipped from the Facility so that records may be maintained.
8. Make daily and weekly inspections and complete forms as necessary.
9. Perform additional duties/special projects as directed by the Facility Manager.

JOB DESCRIPTIONS

POSITION: **Waste Coordinator**

FACILITY: Detroit Michigan

SUMMARY: Position is responsible for ensuring that the Facility operates within the Hazardous Waste Operational Parameters specified in the Facility Part B Section C, the Waste Analysis Plan (WAPP).

VERIFICATION:

Experience: Experience in operations of various lab equipment as needed to perform the required tests as outlined in the Waste Analysis Plan.

Education: Associates degree, although a bachelors degree is preferred.

Reports to: Facility Manager

HAZARDOUS WASTE RESPONSIBILITIES

Work with the Warehouseman and Drivers to ensure that all shipments of waste received at the Facility are properly manifested, labeled, marked with accumulation start date, sampled, and logged in. Also performs analytical work or prepare the sample for shipment to appropriate analytical facility, including applicable paperwork, and bench top fingerprint analysis are performed.

Perform other analytical analysis as required.

ATTACHMENT H-2

CORPORATE COMPLIANCE TRAINING PROGRAM OUTLINE

ANNUAL RCRA REVIEW

General permit conditions

There are three (3) parts to the operating permit: the permit application, the permit issued by MDENR, and the Federal Government. Information below applies to all parts.

1. **Detrex Application**
    a. Section A: part A Application
    b. Section B; general information
    c. Section C: Lab and testing requirements
    d. Section D: operating parameters
    e. Section E: N/A
    f. Section F: procedures to prevent hazards (i.e., inspections
    g. Section G: Contingency Plan
    h. Section H: Training requirements
    i. Section I: Closure Plan
    j. Section J-N: other fed laws; SWMUs; Subparts AA, BB, CC; operator cert; substantial compliance

2. **Federal (Subpart AA, BB, & CC)**
    a. Subpart AA – Testing of Process Vents – NOT APPLICABLE
    b. Subpart BB – Testing of Valves & Fitting – NOT APPLICABLE
    c. Subpart CC – Containers – APPLICABLE
        i. drums
            1. Closed except when adding waste
            2. No leaks
            3. Inspection upon arrival for good condition (exempt if in good DOT container)
            4. Failed container (see attached sheet)
            5. Transfer within 24 hours
            6. Not on site for more than 1 year (365 days)

3. **State Permit**
    a. Builds on Permit Application. Both application and the permit are necessary to allow authorization for the site to operate. Remainder of time spent outlining requirements of application and the permit itself.

4. **RCRA Permit Facility Records (retained until closure unless otherwise noted)**
    a. Burden Reduction – Federal and MI acceptance
    b. Closure cost update (annual- generally provided in January)
    c. PLL (Pollution Liability Insurance) (annual – in June. Put in permit)
    d. Training records – keep until closure of site or 3 years after individual is no longer an employee.
    e. Inspections (permit): daily and weekly (keep for three years)
    f. List of employees filling each RCRA (section H of permit) position
    g. Records of activating Contingency Plan
    h. Records of spills or releases and letters to agency
    i. Generator files (profile, letter to generator, land ban form, profile updates, analytical, etc.)

ANNUAL RCRA REVIEW

j. Manifests (3 years)
k. Facility record of shipments to and from site (closure)
l. Rejected wastes
    i. Maintain record
    ii. New manifest requirements
m. Waste Minimization program and annual certification statement.

5. **Other recordkeeping (R) and postings (P) requirements**
    a. Emergency phone numbers and evacuation routes (P).
    b. Manifests – 3 years if log kept (R).
    c. Compatibility Chart (P, R)
    d. Used Oil (R)
        i. Used Oil Log
        ii. 35 day storage limit – need to notify oil company when starting to fill tank.
        iii. Marketer issues
    e. Universal Waste (40 CFR 273-batteries(part 266 or 273), electric lamps, pesticides, devices containing elemental mercury.(R)
        i. Facilitate environmentally sound collection and proper recycling or treatment. Ease the regulatory burden on collection and reduce the quantity of these wastes going to municipal solid waste landfills or combustors. Ensure wastes go to appropriate treatment or recycling facilities.
    f. Storm Water (R)
    g. Lift Truck inspections (R)
    h. OSHA & DOT training (R).
    i. HAZCOM Poster (P)
        i. location of MSDSs
        ii. responsible party
    j. Employment Posters (P)
    k. Tier II Reports (submit to agencies by March 1st)(R)
    l. Form R reports (Submit to agencies by July 1st) – not required for this site as do not exceed limits for triggering reporting (process/otherwise use) (R)
    m. OSHA 300 logs (posted from Feb 1 – April 30) (R)
    n. Transporter (PCT): trip tickets, driver logs, etc. (R)
    o. Air Permit (PCT) – non for Eaton site

6. **Waste acceptance requirements**
    a. Waste codes in permit only
    b. Generator files
        i. Profile (go over sections of profile & who is responsible)
            1. Verify accuracy and completeness
            2. Descriptive and broad within knowledge limits, etc.
            3. Reactivity Group Number & Segregation Chart (section f of permit app)
            4. Waste stream composition (before acceptance)
                a. Metals 'analysis' for chlorinated solvents: (per C3(a)2 of application) one time analysis or use generator knowledge.
                b. Defensible backup documentation.

ANNUAL RCRA REVIEW

ii. Annual re-certification letter or new profile
iii. Land ban (initial and annual – permit requirement).
    1. Determination if wastewater or non-waste water.
        a. WW: wastes that contain less than 1% Total Organic Carbon AND less than 1 % by weight Total Suspended Solids
    2. Need to include manifest number of first shipment on form (268.7).
    3. 90% reduction or 10X rule for treatment (aspect of nonhaz not requiring the LDR as it is already below treatment standards).
    4. Soil & contained in rule (soil is never hazardous only that which is contained in it).
iv. Letter to generator on ability to accept waste stream
v. Obtain and run analysis on initial sample of waste prior to first shipment

c. Waste analysis & screening of each container in shipment – maintain 3 years (fed)
    i. Staging area for sampling.
        1. 10 containers max, excludes rejects.
    ii. QAPP – specifies procedures for obtaining samples and types of equipment used (do you use unique numbers to identify samples?)
    iii. Dedicated sampling equipment by waste type.
    iv. Checking results against profile sheet and land ban for acceptability.
    v. Sampling of a waste streams: composite (C) of up to 10 containers vs. discrete (D), 10% of number of containers rounded to next whole number per received stream per generator.
    vi. Visual – done on individual containers for color, consistency, and physical state.
    vii. Physical testing (done per parameter test sheet attach C-5)
        1. Specific Gravity (C) – performed for internal purposes.
        2. Flammability – (D) provides verification that wastes are in fact non-flammable.
        3. pH Testing – (D) provides verification of corrosivity of wastes for storage purposes.
        4. Water Reactivity – (D) verifies that the waste stream does not react with water.
        5. Cyanide Spot Test – verifies no reactive cyanide.
        6. Compatibility test – provides compatibility verification for similar waste streams that are to be commingled / stored.
        7. Paint Filter Test – determine if a solid waste contains free liquid.

d. Facility waste log (tracking program)
    i. Container inventory (up to 550 gallon totes)
        1. each container tracking marking (what info does it contain)
        2. log of containers in each given storage area
    ii. Waste discrepancy report (> 10% by weight or 1 container – no bulk, waste code, unresolved waste)
    iii. Waste throughput.
    iv. Containers per generator
    v. Manifest # in and out
    vi. Other

e. Wastes rejected
    i. Failing visual inspection. NOTE: may not alone trigger rejection of waste.

ANNUAL RCRA REVIEW

ii. Failing physical testing.
iii. Physical retest (discrete vs. composite).

7. **Training**
   a. Annual RCRA Review
      i. Definitions used in RCRA (see definition page)
         1. Solid wastes
         2. Hazardous Wastes (FKDUP)
            a. listed wastes
            b. characteristic wastes
      ii. special permit conditions
         1. none noted
      iii. Community right to know concerns (CERCLA & SARA)
         1. Initial notification under
         2. List of materials on site – Tier II (March 1st)
         3. Form R for emissions
      iv. Past year operating conditions, discuss and denote the following (section H):
         1. Permit Changes
         2. Changes in volume or type of waste
         3. Any site operational problems or activation of CP
         4. Other
      v. Contingency Plan (review of facility and DOT plans)
         1. Sudden & accidental vs. non-sudden occurrences
         2. Events triggering activation of plan
            a. Fire
            b. Spill release: Incidental vs. activation
            c. Explosion
            d. Release from site or inability to respond
            e. RQ
         3. Internal notification methods
         4. Notification requirements (DTRX and outside agencies/organizations)
            a. Items to include as part of initial notification: entities name, location, date, time, material, amount, duration, injuries, etc.
            b. Initial notification 30 minutes or less (by state).
            c. Who to notify (Attachment G-1 & 2)
            d. Letter to state 5/15 rule.
         5. Evacuation routes & meeting places (primary and alternate)
         6. Purpose of visitor sign-in book
         7. Emergency coordinators:
            a. roles,
            b. responsibilities,
            c. response time, and
            d. assistant to outside agencies
         8. Ability to respond – scenarios (include issue of incompatible wastes/HAZMAT)
            a. Methods of containment
            b. Power shutoff

ANNUAL RCRA REVIEW

c. Location of emergency spill supplies
d. Safety of first responder
e. GW contamination – how to address (section H)

9. Requirements after activation of Contingency Plan
   a. All supplies replaced/repaired prior to starting operations
   b. Reports to state with 5/15 days

b. Procedures to prevent hazards
   1. Compatibility
   2. Segregation chart & table

c. OSHA – Emergency Action Plan, PPE, LO/TO, Fire Extinguisher, HAZCOM, etc.
d. DOT – Hazardous Materials: shipping and transporting (PCT)

8. **Inspections (section F of permit app): daily and weekly (keep for three years)**
   a. safety equipment (attach 4)
      i. quantity, location, and operable
   b. containers & container storage areas
      i. closed and not leaking
      ii. Subpart CC inspection
         1. initial offsite acceptance container inspection
         2. Failed container report
         3. Reports for containers more than one year old
      iii. aisle requirements (2 ½ feet)
      iv. marking facing aisle
      v. stacking limitations
      vi. containment systems (including coating)
      vii. stripping of center of aisle
      viii. storage volume limitations (13,750 gallons total)
         1. 3,530 gallons storage area 7
         2. 3,530 gallons storage area 8
         3. 5,280 gallons storage area 9
         4. 3,530 gallons per containment trailer in storage area 11
         5. 550 gallons staging area 29; Rejected containers do not count toward total.
      ix. generator accumulation start date (MDEQ request)
      x. Water Infiltration – run on and run off (Containment Trailers)
         1. Run-on
         2. 25-year storm event
         3. Storm water discharge from back down dock
   c. facility security measures
      i. in place and working – doors, fences, alarms
      ii. gate closed on overhead door when not in warehouse

9. **Miscellaneous operating requirements / other**
   a. Transporter must remain on site until the waste has been accepted.
   b. Manifest is ONLY SIGNED if the waste is acceptable!!!!
   c. posting of reactivity chart and storage area tracking by code
   d. Waste minimization program and Waste Min Statement annual signed by officer
   e. Satellite container

ANNUAL RCRA REVIEW

i. No accumulation start date
ii. Denoted as 'satellite container'
iii. Waste codes stored in container
iv. Closed except when adding waste
v. Control of operator (location, visual site)
vi. Limit of storage to 55 gallons or one quart accut toxic by waste stream
vii. Able to have more than one waste stream in same area as long as separated by at least 5 feet.

10. **Container requirements for Hazardous Materials (HM)**
    a. DOT Approved container for HM (allows exemption under Subpart CC).
    b. Filling (outage / ullage requirements)
    c. Markings (HAZARDOUS WASTE (HW) MARKING – 110 gal, accumulation start date, no conflicting markings, single HW marking on non-bulk, HW Marking on, etc.)
    d. Labels (represents hazard class)
        i. same side of package as Marking
        ii. no conflicting Labels
        iii. must represent hazard in package
    e. Condition
        i. Damage - No real reduction in physical capacity of container
        ii. NO HM on outside of container
        iii. Proper closures (bungs, rings, bolts, etc.) & tightened
        iv. Reuse permitted but shipper must inspect first to ensure in good condition and suitable for HM being shipped.
    f. Paperwork requirements
        i. General requirements – cert statement, emergency phone number, erg info, HM first or HM column, RQ, etc.
        ii. Empty packages, description on shipper, markings / labels
        iii. Shippers (2 years) – DOT requirement
        iv. Manifests – (3 years)shipping description (ID, PSN (description), HC (subsidiary HC), PG
        v. Land band (3 years)
    g. Notice to customers for MSDSs – OSHA & PCT
    h. bi-annual reports (in some states annual)

11. **Site Maintenance**
    a. Construction requirements of storage areas 7 - 9
        i. Maintain coating in intact condition
        ii. Paint lines on the floor to denote the center line of each row (contrasting color)
    b. Construction requirements of storage area 29
        i. Maintain coating in intact condition
        ii. Paint lines on the floor to denote the center line of each row in storage area 9 (contrasting color).

ATTACHMENT H-3

CURRICULUM VITAE - TRAINING DIRECTOR

DAVID D. CRAIG, CHMM

EDUCATION / EXPERIENCE

DOT, IATA & ICAO training Transportation Management Group, Inc. Lansing, MI	2008/2006
Environmental Chemistry QA/QC Basic & Advanced RTI Laboratories, Inc. Livonia, MI	2007
Homeland Security Rules: Avoiding Technical/Legal Pitfalls ABS Consulting	2007
Essentials of Risk Management Lawrence Technical University Southfield, MI	2001
DOT Drug and Alcohol Compliance Workshop J.J. Keller Grand Rapids, MI	1995
Industrial Storm Water Training MDNR, Water Quality Group Livonia, MI	1995
HAZWOPER, 40 Hour Certification New Environment, Inc.	1994
Certified HAZWOPER Trainer Workshop New Environment, Inc.	1994
Annual RCRA Compliance Course Engineers Review, Inc. Romulus, MI	1994
Implementation of TQM Workshop GMI Engineering & Management Institute Flint MI	1992
Fundamentals of Quality Management for Small Business US Chamber of Commerce Flint, MI	1992
Plant Level Environmental Compliance Executive Enterprises Chicago, IL	1991
Short Run SPC Hydra-Matic (UAW/GM) Ypsilanti, MI	1990
SARA III/WRTK Training Seminar Environmental Resource Center Chicago, IL	1989
Qualified Observer of Visible Emissions Training MDNR Air Pollution Control Division Wayne, MI	1989
Planning and Managing of Warehouse Operations Temple University Philadelphia, PA	1989
BS, Chemical Engineering University of Michigan Ann Arbor, MI	1981

CAREER HISTORY

DETREX CORPORATION, Southfield MI **1993-Present**
Chemical and related fields.

Manager of Environmental and Safety Compliance 1995-Present
Responsible for all aspects of Environmental Compliance within the company. Report directly to the Director of Risk Management.

- Generate RCRA permits for Treatment, Storage, and Disposal Facilities
- Manage all aspects of the transportation of hazardous waste, including permitting of trucks
- Training Director for the Company
- Manage the company's fleet of vehicles and trucks

Corporate Environmental and Safety Engineer, Southfield MI 1993-1995
Responsible for assisting the Corporate Manager of Regulatory Compliance in completion of RCRA programs.

- Assisted in the drafting of revised safety programs for all facilities;
- Assist in the auditing of Detrex and third party facilities to insure compliance with all Governmental Regulations;
- Assist in the training of all facility personnel in applicable OSHA, EPA, and DOT programs;
- Developed newsletter to inform all facilities of new pending or promulgated regulations as found in the Federal Register.

LOCKHART CHEMICAL, Allison park PA **1991-1993**
Manufacturer of Sulfonates and Coatings used in the formulation of end use products for the steel and auto industries.

Regulatory Engineer, Flint MI
Operated as Lab Manager for facility, managed plant security, developed and implemented safety programs, activated safety committee, obtained CAA permits from the MDNR, and completed all governmental reports.

- Developed safety programs;
- Developed Waste Tracking Program;
- Obtained a AC Construction and Operating permit associated with an Incinerator;
- Brought facility into compliance with all governmental reporting requirements.

QUAKER CHEMICAL, Conshohocken PA **1988-1991**
A chemical specialty manufacturer of products used in the steel and automotive industries. Annual revenues in excess of $200 MM.

Environmental/Safety Manager Detroit MI 1989-1991

Audited contractors, generated reports for governmental agencies, obtained equipment permits, developed and performed training programs, and worked directly with insurance carriers to resolve concerns. Acted as the Statistical Process Control (SPC) Coordinator for the Detroit Facility.

- Implemented procedural changes to reduce contaminants (fat, oil, and grease, BOD, and metals) by over 10 % in effluent discharged under pre-treatment permit;
- Developed Safety programs for various OSHA regulations;
- Managed local quality programs essential in helping obtain quality awards (Rouge Steel Q-1 and Double Eagle);

- Utilized SPC to reduce the Out of Specification (OOS) over ten fold in one key intermediate resulting in a decease in OOS in one product line by over 30%;
- Chaired SPC and safety committees, and participated in Employee Involvement Group.

Production Supervisor Detroit MI 1988-1989
Responsible for all aspects of the manufacturing operations producing nine to ten million pounds per month. These responsibilities included scheduling, answering customer inquiries, troubleshooting equipment problems, and interfacing with quality control.

- Achieved 100% on-time shipment of same day orders;
- Shipped over 90% of all orders within 3 days of receipt;
- Reduced carrier demurrage by over 50 % saving $30,000 per year;
- Directed expansion of operations from one to two shifts;
- Developed training programs for new hires;

ANDERSON DEVELOPMENT COMPANY, Adrian MI **1981-1988**
A specialty chemical manufacturer of proprietary and contracted products, from major chemical companies, used in the manufacture of industrial and consumer products.

Production Manager , Activated Carbon Plant 1985-1988
Managed a semi-works plant utilizing high temperature chemical process to produce an ultra high surface area carbon. Plant was managed during construction and startup.

- Applied new technology to a manufacturing process achieving over $500,000 in sales;
- Directed a 24 hour operations of 12 employees.

Production Manager, Prepolymer and Intermediate Division 1981-1985
Managed production of proprietary products and custom products for outside firms. Worked with the plant manager and research group on generating cost estimates for scale up of new projects. Responsibilities included inventory control, scheduling, billing, conducting safety meetings, and assuming the role of plant manager as needed.

- Supervised 14 employees in a 24 hour per day, 5 day operation
- Reduced on-site waste to below EPA' 90 day limit.

ORGANIZATIONS / CERTIFICATIONS

Certified Industrial Storm Water Operator 1995
MDNR, Water Quality Group Livonia MI

Certified Hazardous Materials Manager (CHMM) #5631 **1994**
Institute of Hazardous Materials Management Detroit MI

American Institute of Chemical Engineers 1981

ATTACHMENT I-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Ignitable Wastes	D001 (I)
Corrosive Waste	D002 (C)
Arsenic	D004 (T)
Barium	D005 (T)
Cadmium*	D006 (T)
Chromium	D007 (T)
Lead	D008 (T)
Mercury	D009 (T)
Selenium*	D010 (T)
Silver	D011 (T)
Endrin	D012 (T)
Benzene	D018 (T, I)
Carbon Tetrachloride	D019 (T), U211(T)
Chlorobenzene	F002 (T, I), D021(T, I), U037(T, I)
Chloroform	D022 (T), U044(T)
1,4-Dichlorobenzene	D027 (T), U072(T)
1,2-Dichloroethane	D028 (T, I), U077(T, I)
1,1-Dichloroethylene	D029 (T, I), U078(T, I)
2,4-Dinitrotoluene	D030 (T)
Heptachlor*	D031 (T)
Hexachlorobenzene	D032 (T), U127(T)
Hexachloroethane	D034 (T), U131(T)
Methyl Ethyl Ketone	D035 (T, I), F003 (I)
Nitrobenzene	D036 (T)
Tetrachloroethylene	F001 (T), F002(T), D039 (T), U210(T)
Trichloroethylene	F001(T), F002(T), D040 (T), U228(T)
Vinyl Chloride	D043 (T, I)
Ortho-Dichlorobenzene	F002 (T)
1,1,2,2-Tetrachloroethane	U209(T)
1,1,1,2-Tetrachloroethane	U208(T)
Dichlorodifluoromethane	U075(T)
1,1-Dichloroethane	U076(T, I)
1,1,1-Trichloroethane	F001(T), F002(T), U226(T)
Dichloromethane (Methylene Chloride)	F001 (T), F002 (T), U080(T)
Monofluoromethane	F001 (T), F002 (T)

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT H-4

TYPICAL TRAINING ACKNOWLEDGMENT FORM

40 CFR 262.34 HAZARDOUS WASTE GENERATORS REVIEW AND 40 CFR 264.16 PERSONNEL TRAINING

Last Date of Review and Person Reviewing:

Name (print)	**Signature**

INSTRUCTOR:_____

DATE:_____

SECTION I

CLOSURE PLAN

TABLE OF CONTENTS

CLOSURE PLAN, POST-CLOSURE PLAN AND FINANCIAL REQUIREMENTS 3
I-1 CLOSURE PLAN 4
I-1 a CLOSURE PERFORMANCE STANDARD 5
I-1 b PARTIAL CLOSURE AND FINAL CLOSURE ACTIVITIES 5
I-1 c MAXIMUM WASTE INVENTORY 5
I-1 d SCHEDULE OF CLOSURE 6
I-1d(1) Time Allowed for Closure 6
I-1d(1)(a) Extensions For Closure Time 6
I-1 e CLOSURE PROCEDURES 6
I-1e(1) Inventory Removal 6
I-1e(2) Disposal or Decontamination of Equipment, Structure and Soils 7
I-1e(3) Closure of Container Storage Areas 7
I-1e(4) Closure of loading / unloading area 8
I-2 POSTCLOSURE PLAN/CONTINGENT POST-CLOSURE 9
I-3 NOTICES REQUIRED FOR DISPOSAL FACILITIES 9
I-3 a CERTIFICATION OF CLOSURE 9
I-3 b SURVEY PLAT 10
I-3 c POST-CLOSURE CERTIFICATION 10
I-3 d POST-CLOSURE NOTICES 10
I-4 CLOSURE COST ESTIMATE 10
I-5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE 11
I-6 POSTCLOSURE COST ESTIMATE 11
I-7 FINANCIAL ASSURANCE MECHANISM FOR POST CLOSURE 11
I-8 LIABILITY REQUIREMENTS 11
I-8 a COVERAGE FOR SUDDEN ACCIDENTAL OCCURRENCES 12
I-8 b COVERAGE FOR NON-SUDDEN ACCIDENTAL OCCURRENCES 12
I-9 USE OF STATE-REQUIRED MECHANISMS 12
I-9 a USE OF STATE-REQUIRED MECHANISMS 12
I-9 b STATE ASSUMPTION OF RESPONSIBILITY 12

LIST OF ATTACHMENTS

ATTACHMENT I-1 LIST OF HAZARDOUS WASTES
ATTACHMENT I-2 FACILITY PLAN
ATTACHMENT I-3 CLOSURE SCHEDULE
ATTACHMENT I-4 SOIL SAMPLING AND ANALYSIS PLAN
ATTACHMENT I-5 CLOSURE COST ESTIMATE
ATTACHMENT I-6 FINANCIAL ASSURANCE MECHANISM
ATTACHMENT I-7 LIABILITY INSURANCE

SECTION I
CLOSURE PLAN, POST-CLOSURE PLAN AND FINANCIAL REQUIREMENTS

This section identifies operational activities for the Detrex Corporation Facility (Facility) located in Detroit, Michigan which are necessary to completely close the hazardous waste storage areas at the end of their intended operating lives. This section also covers partial closure, including removal of a single containment area. A post-closure plan is not required because this is not a disposal facility; therefore, all wastes will be removed at closure.

The information in this section is provided in accordance with Michigan Act 451 Rule 299.9613 which incorporates 40 CFR Part 264, Subpart G, by reference. The applicable section(s) of the State and Federal Regulations are referenced where applicable.

I-1 CLOSURE PLAN

[40 CFR 270.14(b)(13), 264.112(a)(1) and (2)]

Prior to partial or final closure of the Facility, Detrex Corporation (Detrex) is likely to submitt to the State an ammendment to the current closure plan. The Facility will maintain on-site a copy of the closure plan, and all revisions to the plan, until the certification of closure completeness has been submitted and accepted by MDEQ. Detrex will notify the director at least 60days prior to the date final closure of the Eaton Ave. Facility is expected to begin.

Attachment I-1 provides a listing of all the approved waste codes. A Facility Plan identifying all hazardous waste management units is provided in Attachment I-2.

Upon completion of closure activities, Detrex will submit a certification to the Director of MDNRE, verified by both Detrex and an independent registered professional engineer, that the Facility has been closed in accordance with the specifications in the approved Closure Plan. The closure document will be certified in accordance with 40 CFR § 270.11(d) and include, at minimum, the following.

1. Manifests (or some type of manifest/waste removal summary) of where and how much waste was shipped off-site from closure activities.
2. Certification statement by the owner/operator and an independent registered engineer. All independent registered professional engineer certificates will have an original stamp on at least one copy.
3. Summary of decontamination procedures (pressure wash, steam clean/hot water wash, etc.) and how waste water was disposed.
4. Summary analysis (include time table, soil and groundwater results, weather conditions, runoff controls, equipment decontamination, etc.).
5. Results of all tests used to determine clean closure (chart, tables, lab sheets).
6. Statistical comparisons on sampling results compared to background.
7. Sampling and analysis procedures (specify references).
8. Final depth and elevations of excavations of wastes and soils.
9. Properly labelled and easily identified sampling grid stations (map); including background stations.
10. Summary of final remeidal action performed considering material used and/or future land use. If clean closure cannot be achieved (e.g. contaminated soils to water table and groundwater results show contamination) this summary item should be used to address the post closure program and/or corrective action.
11. A copy of the approved Closure Plan and letter of closure approval.

I-1 a CLOSURE PERFORMANCE STANDARD

[40 CFR 264.111]

This Closure Plan is designed to ensure that the Facility will be closed in a manner that achieves the following:

1) Minimizes the need for further maintenance;
2) Controls minimize or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, or hazardous constituents to the ground or surface waters or to the atmosphere; and
3) Complies with the closure requirements of 40 CFR 264.111, including, but not limited to, the requirements of the regulations under 40 CFR § 264.178 - removal of all hazardous waste and residues from containment system.

At the time of final closure, the entire waste inventory will be transported to an off-site licensed hazardous waste management facility. The complete removal of the entire hazardous waste inventory and the decontamination of the hazardous waste management units will ensure the achievement of the performance standard.

I-1 b PARTIAL CLOSURE AND FINAL CLOSURE ACTIVITIES

[40 CFR 264.112(b)(1) through (b)(7)]

At such times in the operating life of the Facility, equipment may be updated, replaced, or if different operations commence, partial closure of the Facility may occur. Closure procedures for partial closure would be essentially the same as those stipulated in this Closure Plan for final closure, as appropriate to the unit scheduled for partial closure. In the event of a partial closure, MDNRE will be notified at least 60 days prior to initiating closure activities.

I-1 c MAXIMUM WASTE INVENTORY

[40 CFR 264.112(b)(3)]

The maximum inventory of hazardous wastes that can be stored in this Facility at any time is 13,750 gallons. The maximum amount allowed in each area is as follows:

Container Storage Area #7	3,520 gallons	(64 x 55-gallon drums)
Container Storage Area #8	3,520 gallons	(64 x 55-gallon drums)
Container Storage Area #9 (includes area 6)	5, 830 gallons	(106 x 55-gallon drums)
Container Storage Area #11	7,040 gallons	(128 x 55-gallon drums)

To allow for flexability, the Facility is opting to utilize variable storage capacity for all hazardous waste storage areas. Under this senario, the amount of material that may be stored in any storage area is limited to its maximum storage as stated above, or that amount

necessary to prevent the Facility from exceeding its maximum allowable storage of 13,750-gallons. As an example, if 64 drums are stored in area 7, the remaining storage capacity of the Facility would be 10,230 gallons.

I-1 d SCHEDULE OF CLOSURE

[40 CFR 264.112(b)(6)]

Detrex does not anticipate completing final closure of the Detroit, Michigan Facility prior to expiration of this Operating License. A conceptual closure schedule is provided in Attachment I-3. It is believed that final closure could be conducted by a qualified independent contractor in a period of approximately 180 days.

I-1d(1) Time Allowed for Closure

[40 CFR 264.112(b)(2), 264.113(a) and (b)]

Within 90 days after receipt of the final volume of hazardous wastes, and at the direction of the Board of Directors of Detrex, final closure activities will be initiated. These activities will be completed within 180 days of initiation; the tasks and time required for partial closure would follow those given in the Closure Plan. The approximate time frame for each task is provided in Attachment I-3. The Director will be notified by Detrex 60 days before beginning final closure. Final closure will be certified by both Detrex and an independent, qualified, registered professional engineer.

I-1d(1)(a) Extensions For Closure Time

[40 CFR 264.113(a) and (b)]

Detrex does not anticipate requiring an extension for closure time for the Facility. In the event this becomes necessary, a request will be made to the Director by Detrex meeting the requirements of 40 CFR 264.113(a).

I-1 e CLOSURE PROCEDURES

[40 CFR 264.112, 264.114]

I-1e(1) Inventory Removal

[40 CFR 264.112(b)(3)]

At the time of partial closure of one or more of the hazardous waste management units, the hazardous wastes from the unit(s) designated for closure may be:

1) placed in the container storage area; or

2) transferred to a transport vehicle (in containers or transferred to a bulk tank truck) and transported off site to a properly permitted facility.

At final closure, the entire remaining inventory of hazardous wastes would be processed in the same manner. It is likely hazardous wastes would be sent off-site to a permitted facility for recovery or combined/commingled and transported to a RCRA-permitted TSDF.

I-1e(2) Disposal or Decontamination of Equipment, Structure and Soils

[40 CFR 264.112(b)(4), 264.114]

The procedures to decontaminate Facility equipment and structures are described in the following applicable sections. If sampling of underlying soils are required, as determined under this plan and with consultation with the MDNRE, then the procedures as found in Attachment I-4 would be followed.

I-1e(3) Closure of Container Storage Areas

[40 CFR 264.178, 264.112(b)(3), 270.14(b)(13)]

During closure, the remaining container inventory may either be transferred to bulk transport units for transportation to a properly permitted facility or shipped from the Facility in the original containers. The final determinatino will be based on the total cost of disposal, inclusive of manpower to process (load) the wastes. Empty containers previously containing hazardous waste will be either sent to a reconditioner to be recycled or sent to a facility for 'disposal'.

Following the removal of the container inventory, the interior and exterior container storage areas and their respective secondary containment systems will be swept. This will include containment storage areas 6, 7, 8, 9, and the flammable storage trailers (11), if final closure is being performed. Subsequently, the area designated for closure will be carefully inspected to identify any potential cracks, gaps, or unsealed joints in the secondary containment area. Any cracks, gaps or unsealed joints will be repaired prior to proceeding with decontamination to ensure that all rinse water is contained.

The secondary containment areas will then be decontaminated by a floor wash/scrubbing operation followed by a triple rinse. Contaminated media generated will be collected using pumps, sponges, and/or another method, placed in DOT-approved containers, and transported off-site. Wastes will be sent to a permitted TSDF unless waste characterization sampling indicates alternate disposal is appropriate. It is noted that during partial closure, hazardous wastes generated may be managed in an on-site hazardous waste management unit. Solid wastes which are not generated from hazardous waste may be managed in an appropriate location at the Facility.

Decontamination of the secondary containment areas will be verified by collecting a sample of the final rinsate from each secondary containment area and submitting the sample for analysis of the all chemicals of concern (COC). Analyses will be by an approved method of SW-846. The "cleanup" level will be based on the environmental remediation parameters found in Part 201 of Act 451 as adopted by referenece in Part 111, at the time of closure.

Chemcials of Concern will be based on the approved waste codes found in Attachment I-1, for which the facility has record of accepting. This list of chemicals and their associated cleanup level will be submitted to MDNRE for review and approval prior to initiation of any cleanup or sampling. COCs that have never been accepted at the facility it will not be included into the test parameters.

In the event that test results indicate that a COC listed in Part 201 of Act 451 still exists above the required criteria for inhalation, ingestion or ingestion, further cleaning, as necessary, would be performed.

Once decontamination is complete, soil sampling for COCs beneath any cracks, gaps or unsealed joints, beyond the work already conducted under the RFIWP, may be required. Detrex will submit to MDNRE all proposed sampling locations for review and approval prior to the initiation of any sampling event. The preservation method for the soil will be based on the COC. VOCs will be collected using Method 5035 or EnCore Sampler. Methods for preserving semivolitals and metals will be based on the analytical test methods listed in SW-846, specifically method 6010 for metals and method 8270B for semivolitals. At each sampling location, the boreholes will be advanced through the fill material, the native soil, and completed in the top of the clay. Split-spoon samples, will be analyzed using a PID/FID meter and collected near the surface, the end of boring and at the level where the highest PID/FID reading was obtained. Following sampling collection, each borehole will be backfilled with a bentonite/clay mixture.

In the event a piece of equipment can not be decontaminated to the required cleanup level agreed to between Detrex and MDNRE, the piece of equipment will be characterized and disposed at an appropriately permitted facility. However, this would not be the case with the trailers used as storage area 11, if they are going to be placed back into service for the transportation of Hazardous Materials. In such a case, all that is needed is a single cleaning to ensure gross contamination does not exist.

All equipment used during decontamination ,which may have come in contact with potentially contaminated substances or a potentially contaminated surface, will also be decontaminated prior to demobilization from the site. The decontamination of equipment may also involve steam cleaning or a hot water wash. The washwater will be collected in an appropriate manner and handled as described above.

I-1e(4) Closure of loading / unloading area

[40 CFR 264.178, 264.112(b)(3), 270.14(b)(13)]

The entire outdoor concrete loading / unloading area and the dock below the flammable storage trailers will be swept and subsequently cleaned and sampled using the same protocols described above in section I-1e(3), for the container storage area and associated secondary containment system. however, as the dock did not serve as a secondary containment area, decontamination a given standard is not required.

The soil sampling, conducted as part of partial or final closure,will be based on information in the closure plan, work already perfromed under former RFIWPs and on consultation with the MDNRE, WMD. Boreholes may be required at the sump in the loading/unloading area and under the flammable storage trailers, and at the locations where any significant cracks are observed. Proposed location will be provided to the MDNRE for review and approval prior to initiating any sampling activities.

The same method for obtaining and perserving samples as found in I-1(e)3 will be used.

I-2 POSTCLOSURE PLAN/CONTINGENT POST-CLOSURE

[40 CFR 270.14(b)(13)]

Post-closure care will not be required for this Facility since all hazardous wastes will be removed at final closure.

I-3 NOTICES REQUIRED FOR DISPOSAL FACILITIES

I-3 a CERTIFICATION OF CLOSURE

[40 CFR 264.115, 264.280]

The Facility is not a disposal facility; however, within 60 days of completion of either partial or final closure, a closure certification document will be submitted to the Director regarding the area(s) closed. The document will certify that the Facility has been closed in accordance with the approved closure plan. The certification will be signed by Detrex and by an independent registered professional engineer.

Documentation supporting the independent registered engineer's certification will be furnished to the Director in accordance with R 299.9613(3), including:

1. The results of all sampling and analysis;
2. Sampling and analysis procedures;
3. A map showing the location where samples were obtained;
4. Any statistical evaluations of sampling data;

5. A summary of waste types and quantities removed from the site and the destination of these wastes; and
6. If soil has been excavated, the final depth and elevation of the excavation and a description of the fill material used.

I-3 b SURVEY PLAT

[40 CFR 264.116]

Since the Facility is not a disposal facility and no hazardous wastes will remain after final closure, a survey plat is not required.

I-3 c POST-CLOSURE CERTIFICATION

There will be no post-closure period, therefore this is not applicable to this Facility.

I-3 d POST-CLOSURE NOTICES

[40 CFR 270.14(b)(14), 264.119]

There will be no post-closure period, therefore this is not applicable to this Facility.

I-4 CLOSURE COST ESTIMATE

[40 CFR 270.13(b)(15), 264.142]

The closure cost information is presented in accordance with proper requirements. The estimate assumes closure procedures are completed by a third party at the time that the Facility closure would be most expensive (i.e. maximum inventory). The total closure cost for the Facility is estimated at **$ 93,020.00** (2010 dollars). The closure cost estimate breakdown is provided in Attachment I-5. Closure activities include removal of waste inventory, decontamination, and closure certification.

Final closure activities include the removal of inventory from container storage areas and closure certification. The closure of one of the hazardous waste management units will involve only those costs directly associated with the unit.

The closure cost estimate assumptions made are as follows:

1) All hazardous waste storage areas are full to capacity at the time of closure.
2) All hazardous waste will be transported off site to a permitted facility in accordance with all State and Federal regulations.

3) The fact that the hazardous waste may have potential economic value has been ignored.
4) Costs are based on 2010 current year costs. All labor rates reflect commercial rates and include fringe benefits, payroll burden, and taxes.
5) Total costs include a 10 percent contingency for administrative and 15 percent contingency for miscellaneous operating costs.
6) The costs are based on a point in the operating life of the Facility when the extent and manner of operation would make closure most expensive.

This closure cost estimate will be maintained at this Facility. It will be revised whenever a change in the closure plan affects the cost of closure. It will be adjusted annually as required by pertinent regulations, or when the types/quantity of waste received at the Facility change.

I-5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE

[40 CFR 270.14(b)(15) & 264.143]

Financial assurance for closure costs is provided by an appropriate mechanism closure as found under Michigan's Act 64 Rule 299.9703. A copy of the most recent mechanism is provided in Attachment I-6.

I-6 POSTCLOSURE COST ESTIMATE

[40 CFR 270.14(b)(6)]

Post-closure care will not be required for this Facility since all hazardous wastes will be removed at final closure.

I-7 FINANCIAL ASSURANCE MECHANISM FOR POST CLOSURE

[40 CFR 270.14(B)(16)]

Financial assurance is not necessary since post-closure care is not required.

I-8 LIABILITY REQUIREMENTS

[40 CFR 270.14(b)(17) & ACT 451 RULE 299.9710]

I-8 a COVERAGE FOR SUDDEN ACCIDENTAL OCCURRENCES

[ACT 451 RULE 299.9710(1)]

A copy of proof of liability insurance is provided in Attachment I-7. This provides an endorsement of certification of appropriate insurance coverage pursuant to Michigan's ACT 451 RULE 299.9710.

I-8 b COVERAGE FOR NON-SUDDEN ACCIDENTAL OCCURRENCES

[ACT 451 RULE 299.9710(2)]

The Facility does not have a surface impoundment, landfill or land treatment facility; hence, coverage for non-sudden accidental occurrence is not required.

I-9 USE OF STATE-REQUIRED MECHANISMS

[40 CFR 270.14(b)(18)]

I-9 a USE OF STATE-REQUIRED MECHANISMS

[40 CFR 270.14(b)(18) ACT 451, RULE 299.9710(3)]

The liability insurance provided for in Section I-8a meets all necessary Federal and State requirements.

I-9 b STATE ASSUMPTION OF RESPONSIBILITY

[40 CFR 270.14(b)(18)]

Detrex does not intend to request State assumption of the legal or financial responsibilities for the Facility.

ATTACHMENT I-1

LIST OF HAZARDOUS WASTES

ATTACHMENT I-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Ignitable Wastes	D001 (I)
Corrosive Waste	D002 (C)
Arsenic	D004 (T)
Barium	D005 (T)
Cadmium*	D006 (T)
Chromium	D007 (T)
Lead	D008 (T)
Mercury	D009 (T)
Selenium*	D010 (T)
Silver	D011 (T)
Endrin	D012 (T)
Benzene	D018 (T, I)
Carbon Tetrachloride	D019 (T), U211(T)
Chlorobenzene	F002 (T, I), D021(T, I), U037(T, I)
Chloroform	D022 (T), U044(T)
1,4-Dichlorobenzene	D027 (T), U072(T)
1,2-Dichloroethane	D028 (T, I), U077(T, I)
1,1-Dichloroethylene	D029 (T, I), U078(T, I)
2,4-Dinitrotoluene	D030 (T)
Heptachlor*	D031 (T)
Hexachlorobenzene	D032 (T), U127(T)
Hexachloroethane	D034 (T), U131(T)
Methyl Ethyl Ketone	D035 (T, I), F003 (I)
Nitrobenzene	D036 (T)
Tetrachloroethylene	F001 (T), F002(T), D039 (T), U210(T)
Trichloroethylene	F001(T), F002(T), D040 (T), U228(T)
Vinyl Chloride	D043 (T, I)
Ortho-Dichlorobenzene	F002 (T)
1,1,2,2-Tetrachloroethane	U209(T)
1,1,1,2-Tetrachloroethane	U208(T)
Dichlorodifluoromethane	U075(T)
1,1-Dichloroethane	U076(T, I)
1,1,1-Trichloroethane	F001(T), F002(T), U226(T)
Dichloromethane (Methylene Chloride)	F001 (T), F002 (T), U080(T)
Monofluoromethane	F001 (T), F002 (T)

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT I-1

LIST OF HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Trichlorofluoromethane	F001(T), F002(T), U121(T)
Trichloromonofluoromethane	F001 (T), F002 (T)
1,1,2-trichloro-1,2,2-trifluoroethane	F002 (T)
Xylene	F003 (I)
Acetone	F003 (I)
Ethyl Acetate	F003 (I)
Ethyl Benzene	F003 (I)
Ethyl Ether	F003 (I)
n-Butyl Alcohol	F003 (I)
Cyclohexanone	F003 (I)
Methyl Isobutyl Ketone	F003 (I), U161 (I)
Methanol	F005 (I)
Toluene	F005 (T, I)
Methyl Ethyl Ketone	F005 (I,T)
Carbon Disulfide	F005 (H, I)
Isobutanol	F005 (I,T)
Pyridine	F005 (T, I)

Wastewater treatment sludges from electroplating operations except from the following processes: F006

1. sulfuric acid anodizing of aluminum;
2. tin plating on carbon steel;
3. zinc plating (segragated basis) on carbon steel;
4. aluminum or zinc-aluminum plating on carbon steel;
5. cleaning/stripping associated with tin, zinc and
6. aluminum plating on carbon steel; and
7. chemical etching and milling of aluminum.

Waste water treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process F019

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT I-2

FACILITY PLAN

ATTACHMENT I-2
FACILITY LAYOUT

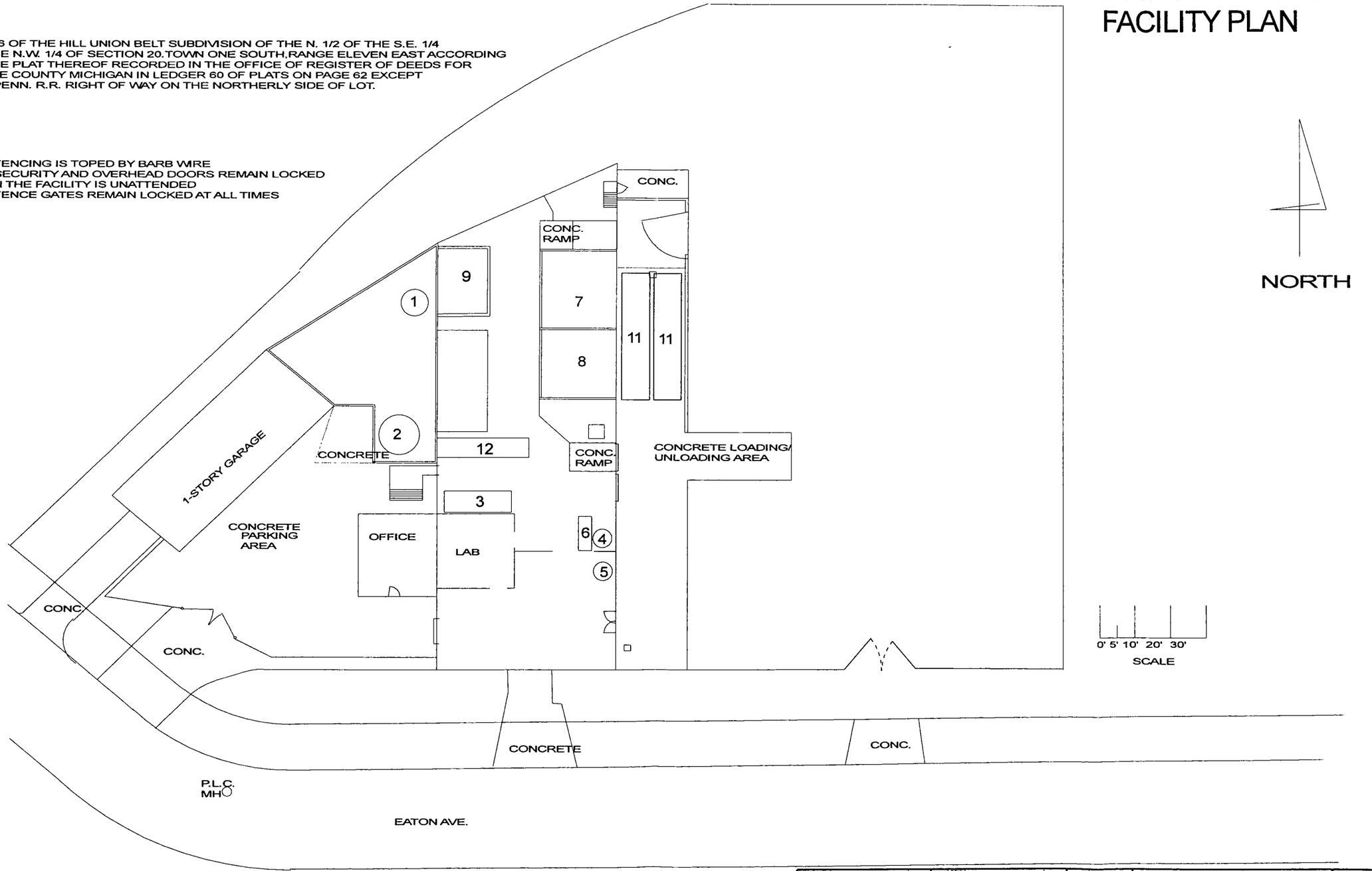
ID #	Equipment Name	Description
1	20,000 gal. Carbon steel Tank	Storage tank for Trichloroethylene
2	4,500 gal. Carbon Steel Tank	Storage tank for Trichloroethylene
3	5,000 gal. Carbon Steel Tank	Storage of Non-Hazardous Wastes.
4	3,000 gal. 316 stainless steel Tank	Storage of Non-Hazardous Wastes.
5	2,500 gal. 316 Stainless Steel Tank	Storage of Non-Hazardous Wastes
6	Staging area	Sampling (containers weighed as needed)
7-9	Interior Hazardous Waste Storage	Active
11	Exterior Hazardous Waste Storage	Storage of Flammables
12.	Drum Filling Station	Product Drumming Station.

ATTACHMENT I-2
FACILITY PLAN

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

NOTES:

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV. NO.	CHANGE RECORD	BY	DATE	REV NO.	CHANGE RECORD	BY
				08.21.10	1	current site layout.07_2010	DDC

DR.	E.L.R.
CHK.	—
APR.	
SCALE	DATE
1/16"=12"	12/96

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48086

EATON AVE. FACILITIES
GENERAL LAYOUT

PROJECT No. 9601

DWG No.

EATON AVE.

ATTACHMENT I-3

CLOSURE SCHEDULE

ATTACHMENT I-3
CLOSURE SCHEDULE
EATON AVE.

ACTIVITY	DAYS																	
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
Receipt of final volume of Hazardous Waste																		
Removal of final container inventory																		
Decontamination of interior container storage areas (7, 8, 9 & 29)																		
Cleaning and decontamination of loading and unloading area and flammable storage area (11)																		
Removal /disposal / treatment of sweepings and waste waters																		
Completion of closure and certification submittal to Director																		

ATTACHMENT I-4

SOIL SAMPLING AND ANALYSIS PLAN

Contents

SAMPLE COLLECTION AND ANALYSIS PROTOCOLS 3
1. GENERAL SAMPLING PROTOCOLS 3
2. SUBSURFACE SOIL SAMPLING 3
3 SAMPLE LABELING AND CONTROL 3
Sample shipment 3
Chain-of-custody-records 4
4 EQUIPMENT CLEANING PROTOCOLS 4

SAMPLE COLLECTION AND ANALYSIS PROTOCOLS

1. GENERAL SAMPLING PROTOCOLS

The following protocols will be employed during all sampling throughout this program:

1. Prior to drilling the initial and all subsequent locations, the drilling rig and all drilling equipment will be cleaned according to the protocol set forth in section 4.
2. All sampling instruments and equipment used in collecting samples for chemical analysis will be cleaned in accordance with the protocols presented in Section 4 prior to sampling at each location
3. A new pair of disposable gloves will be used at each location to be sampled for chemical analysis. Additional glove changes will be undertaken as warranted.

Additional protocols specific to each sampling method are presented in the following sections.

2. SUBSURFACE SOIL SAMPLING

Subsurface soil sampling will be conducted according to the following protocols:

1. Split-spoon soil samples collected for analysis will be obtained and prepared in the following manner:
   a. The split-spoon sampler will be removed to a sample preservation station and opened
   b. Using clean cutting tool a thin section will be removed from the top and bottom of the core and discarded as shown in Figure 1
   c. The remaining core will be cut in half longitudinally. ~~From the center of the core a continuous soil sample will be taken~~.
2. Sample containers will be prepared using washing procedures that meet or exceed the requirements of the specific methods or disposable clean containers will be used. Sample containers will be shipped to the site in sealed containers from a single lot of prepared jars.
3. A blind, duplicate sample will be collected for every 15 samples.

3 SAMPLE LABELING AND CONTROL

Sample labeling and control will be consistent with the MDNRE~~Q~~ and USEPA requirements and procedures. These procedures are discussed below.

Sample shipment

All samples will be placed in coolers and iced to $4^{O}C$ ($\pm 2^{O}C$) after collection and labeling. The groundwater and soil samples will be placed in separate coolers. All samples will be delivered to the laboratory within 24 hours of sample collection.

Detrex or the sampling team will transport samples to the analytical laboratory or the samples will be packed and sealed in an ice cooler as noted above with the chain of custody placed inside the cooler for shipment.

The attached Table presents a summary of sample collection, preservation and shipping requirements established for both water and soil matrices.

Chain-of-custody-records

Chain-of-custody-records will be used to track all samples from the time of sampling to the arrival at the laboratory.

4 EQUIPMENT CLEANING PROTOCOLS

Prior to mobilization, the drilling rig and all associated equipment will have been thoroughly cleaned to remove oil, grease, mud, and other foreign matter. In addition, before initialing drilling at each location, the augers, cutting bits, samplers, drill steel and associated equipment will be thoroughly cleaned to prevent potential cross-contamination from the previous drilling location. Rinse water from the drill rig cleaning will be discharged to surface away from the borehole locations. The equipment will be inspected after cleaning and prior to initiation of drilling. Cleaning will be accomplished by flushing and wiping the components to remove all visible sediments followed by a thorough rinsing. Special attention will be given to the threaded sections of the drill rods.

All equipment used for collection of samples for chemical analysis including bailers, pumps, and trowels or split-spoons will be disposable or cleaned between each sampling location / interval according to the following protocol.

Rinse with deionized water;
Rinse with Isopropanol;
Rinse with deionized water; and
Allow to air dry.

The bottom three feet of the water level measuring equipment will be cleaned prior to use in each well with Isopropanol and deionized water rinse.

Rinse water from the collection equipment decontamination will be containerized and characterized for eventual disposal in accordance with Federal & State Regulations.

Equipment will be protected from all forms of solvent contact between final rinse and initial use.

Table 1
FIELD QUALITY CONTROL PROCEDURES

MATRICIES	TRIP BLANK	FIELD BLANK/RINSATE	BLIND DUPLICATE	MATRIX SPIKE/ MATRIX SPIKE DUPLICATES (1)
Soil	--	--	1	1

(1) ADDITIONALLY A SAMPLE (THREE TIMES THE DESIGNATED VALUE) WILL BE COLLECTED FOR MATRIX SPIKING PURPOSES.

Table 2
SAMPLE COLLECTION, PRESERVATION, AND SHIPPING PROTOCOL SUMMARY

MATRIX	PARAMETER	BOTTLES/JARS	PRESEVATIVES	HOLDING TIME (1)	SHIPPING	PACKAGING
Soil	TCL VOCs	250 ml glass jar with Teflon lid	Iced to $4^{O}C$ ($\pm 2^{O}C$)	14 days	Personal delivery or other method	Cooler & cushioning

(1) sample holding time will be calculated from the time of sample collection.

ATTACHMENT I-5

CLOSURE COST ESTIMATE

The closure cost estimate is based on a total capacity of 13,750 gallons (250 drums) inclusive of all storage areas.

CONTAINMENT STORAGE AREAS

1. Transfer Waste inventory in DOT Containers to Transport Vehicles and sweep secondary containment areas (1 1/2 days)

· Technician: 1 man	$521.40
· Forman: 1 man	$606.54
· Protective safety equipment @ $150/man day (level c)	$600.00
Subtotal 1	**$1,727.94**

2. Steam Clean Secondary Containment Areas (6, 7, 8, 9, 11) (2 days) * note: trailers will be reused for transportation of hazarodus materials after initial cleaning.

· Hot-water power washer ($ 500/day)	$1,000.00
· Technician: 2 men	$1,390.40
· Forman: 1 man	$808.72
· Engineer 1 man	$1,709.84
· Protective safety equipment @ $150/man day (level c)	$900.00
Subtotal 2	**$5,808.96**

3. Verification Sampling and Analysis

· 14 rinsate samples including 2 field blanks VOCs	$1,834.80
· 14 rinsate samples including 2 field blanks Metals	$4,184.40
· Chemist 1 manday	$404.36
Subtotal 3	**$6,019.20**

4. Transportation and Disposal of Wastes
(cost for disposal @ $160 / drum)

· Inventory: 13,750 gallons (250 drums)	$40,000.00
· Washwater disposal 440 gallons (8 drums)	$1,280.00
· Soil/Sluge disposal 110 gallons (2 drums)	$320.00
· Transportation: 4 loads @ 2,000/load	$8,000.00
Subtotal 4	**$49,600.00**

CLOSURE CERTIFICATION

- Consultant: (generation of closure report) 6 days @ $1,200/day	$7,200.00
- Consultant: on site individual to witness cleaning (2 days)	$1,709.84
- Equipment rental (FID/PID Meter) @ $ 250/day	$500.00
- Miscellaneous expenses	$2,000.00
SUBTOTAL	**$11,409.84**

SUBTOTAL	$74,565.94
ADMINISTRATION 10%	$7,456.59
CONTINGENCY (15%)	$11,184.89
TOTAL CLOSURE COST	**$93,207.43**

ATTACHMENT I-6

FINANCIAL ASSURANCE MECHANISM

COPY

ATTACHMENT 1-6

PERFORMANCE BOND

Bond Number: 201912

Total Penal Sum of Bond: $85,000

Effective Date: April 26, 2000

EPA Identification Number: MID 091 605 972

Closure Costs: $85,000.00
Post-Closure Costs: $-0-

Name and Location: Detrex Corp. – Solvent Division
12886 Eaton Avenue
Detroit, Michigan 48227
Wayne County

Detrex Corporation, a Michigan corporation, 24901 Northwestern Highway, Suite 500, Southfield, Michigan 48075, as Principal and Evergreen National Indemnity Company, an insurer authorized to transact the business of surety and fidelity insurance in the State of Michigan and an acceptable surety on federal bonds as listed in Circular 570 of the United State Department of Treasury, as Surety, are firmly bound unto the Director of Environmental Quality (the "Director"), on behalf of the State of Michigan, his successors or successors in office, or his authorized representative, in the above penal sum, lawful money of the United States of America, for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally.

WHEREAS, the Principal is required under Part 111, Hazardous Waste Management, of 1994 PA 451, as amended, Michigan's Natural Resources and Environmental Protection Act (Part 111), to have an operating license to own or operate each hazardous waste management facility identified above; and

WHEREAS, the Principal is required to provide financial assurance for the closure, post-closure, or corrective action of each facility identified above as a condition of the Administrative Rules promulgated pursuant to Part 111 and as a condition of licensure;

NOW, THEREFORE, the conditions of this obligation are such that if the Principal shall faithfully perform closure, whenever required to do so, of each facility for which this bond guarantees closure, in accordance with the closure plan and other requirements of an operating license as such plan and operating license may be amended, pursuant to all applicable laws, statutes, rules and regulations, as such laws, statutes, rules and regulations may be amended;

And, if the Principal shall faithfully perform post-closure of each facility for which this bond guarantees post-closure, in accordance with the post-closure and operating license may be amended, pursuant to all applicable laws, statutes, rules and regulations, as such laws, statutes, rules and regulations may be amended;

And, if the Principal shall faithfully perform corrective action at each facility for which this bond guarantees corrective action, in accordance with the corrective action program and other requirements of an operating license or order, as such program and operating license or order, as such program and operating license or order may be amended, pursuant to all applicable laws, statutes, rules and regulations, as such laws, statutes, rules and regulations may be amended;

Or, if the Principal shall provide alternate financial assurance as specified in the Administrative Rules promulgated pursuant to Part 111, and obtain the Director's written approval of such assurance within 90 days after the date notice of cancellation is received by both the Principal and the Director from the Surety, then this obligation shall be null and void, otherwise it is to remain in full force and effect.

The Surety shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above.

In the event that the Director, in accordance with the Administrative Rules promulgated pursuant to Part 111, issues a written Notice of Violation or other order to the Principal indicating that the Principal has failed to properly execute its closure responsibilities for a facility for which this bond guarantees performance of closure, the Surety shall either perform closure in accordance with the closure plan and other operating license requirements, or make payment of the closure amount guaranteed by this bond for closure of the facility to the Director.

In the event that the Director, in accordance with the Administrative Rules promulgated pursuant to Part 111, issues a written Notice of Violation or other order to the Principal indicating that the Principal has failed to properly execute its post-closure responsibilities for a facility for which this bond guarantees performance of post-closure, the Surety shall either perform post-closure in accordance with the post-closure plan and other operating license requirements, or make payment of the post-closure amount guaranteed by this bond for post-closure of the facility to the Director.

In the event that the Director, in accordance with the Administrative Rules promulgated pursuant to Part 111, issues a written Notice of Violation or other order to the Principal indicating that the Principal has failed to properly execute its corrective action responsibilities for a facility for which this bond guarantees performance of corrective action, the Surety shall either perform corrective action in accordance with the corrective action plan and other operating license requirements, or make payment of the corrective action amount guaranteed by this bond for corrective action of the facility to the Director.

The Surety hereby waives notification of amendments to closure, post-closure, and corrective action plans, licenses, orders, applicable laws, statutes, rules and regulations and agrees that no such amendment shall in any way alleviate its obligation on this bond, except for adjustments in the closure, post-closure, and corrective action plans that cause increases or decreases in the penal sum contained herein.

When the current closure, post-closure, or corrective action cost estimate(s) increase to an amount more than the penal sum, the Principal, within 60 days after the increase, shall either cause the penal sum to be increased to any amount at least equal to the current closure, post-closure, and corrective action cost estimate(s), and submit evidence of such increase to the Director, or obtain other financial assurance as specified in the Administrative Rules promulgated pursuant to Part 111. When the current closure, post-closure, or corrective action cost estimate(s) decrease(s), the penal sum may be reduced to the amount of the current closure, post-closure, or corrective action cost estimate(s) following written approval by the Director.

The liability of the Surety shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond, but in no event shall the obligation of the Surety hereunder exceed the amount of said penal sum.

The Surety may cancel the bond by sending notice of cancellation by certified mail to the Principal and to the Director, provided, however, that cancellation shall not occur during the one hundred twenty (120) days beginning on the date of receipt of the notice of cancellation by the Principal and the Director, as evidenced by the return receipts.

Provided further, that this Performance Bond may be drawn upon and the Surety agrees to honor this bond should the Principal fail to provide the Director with an extension of this bond, or an acceptable replacement bond, or an alternative form of financial assurance as specified in the Administrative Rules promulgated pursuant to Part 111, and acceptable to the Director, not less that sixty (60) days prior to the expiration or cancellation hereof.

The Principal may terminate this bond by sending written notice to the Surety, provided, however, that no such notice shall become effective until the Surety receives written authorization for termination of the bond from the Director, or his authorized representative.

This bond shall be and continue in force for a period beginning with the effective date of the bond and terminating when canceled by the Surety in accordance with the cancellation provisions above, or when the Surety receives written authorization for termination of the bond from the Director. Upon determination of the Director or his authorized representative that any of the foregoing conditions have not been complied with, he shall recourse to the rights created under this bond.

In witness whereof, the Principal and the Surety have executed this Performance Bond and have affixed their seals and have attached the justification or power of attorney as of the day and date first above written.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety and that the wording of this surety bond is identical to the wording provided by the Director on the date this bond was executed.

Sealed with our seals, dated the 26th day of April, 2000.

Principal: **DETREX CORPORATION**

By: VICE PRESIDENT - FINANCE
(Title)

(Corporate Seal)

Surety: **EVERGREEN NATIONAL INDEMNITY COMPANY**
10055 Sweet Valley Drive
Valley View, OH 44125

State of Incorporation: Ohio
Liability Limit: $85,000.00

By: Kathleen P. Price
Kathleen P. Price, Attorney-In-Fact

(Corporate Seal)

Bond Premium: $1,445.00

EVERGREEN NATIONAL INDEMNITY COMPANY
CLEVELAND, OHIO
POWER OF ATTORNEY

PRINCIPAL Detrex Corporation EFFECTIVE DATE April 26, 2000

CONTRACT AMOUNT $85,000.00 AMOUNT OF BOND $ 85,000.00

POWER NO. 201912

KNOW ALL MEN BY THESE PRESENTS: That the Evergreen National Indemnity Company, a corporation in the State of Ohio does hereby nominate, constitute and appoint: Daniel J. Needham, Kathy J. Goe, Patricia A. Wall, Debra A. Erickson, Kathleen P. Price, Jill Calfee, Jeffrey L. Booth, Laurie A. Krokos, Julie K. Thornton and Felicia P. Young its true and lawful Attorney(s)-In-Fact to make, execute, attest, seal and deliver for and on its behalf, as Surety, and as its act and deed, where required, any and all bonds, undertakings, recognizances and written obligations in the nature thereof, PROVIDED, however, that the obligation of the Company under this Power of Attorney shall not exceed One Million Dollars ($1,000,000.00).

This Power of Attorney is granted and is signed by facsimile pursuant to the following Resolution adopted by its Board of Directors on the 23rd day of February, 1994:

"RESOLVED, That any two officers of the Company shall have the authority to make, execute and deliver a Power of Attorney constituting as Attorney(s)-in-fact of such persons, firms, or corporations as may be selected from time to time.
FURTHER RESOLVED, that the signatures of such officers and the Seal of the Company may be affixed to any such Power of Attorney or any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company; and any such powers so executed and certificate by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN WITNESS WHEREOF, the Evergreen National Indemnity Company has caused its corporate seal to be affixed hereunto, and these presents to be signed by its duly authorized officers this 23rd day of February, 1994.

EVERGREEN NATIONAL INDEMNITY COMPANY

Craig L. Stout, President

Roswell P. Ellis, Treasurer

EVERGREEN NATIONAL INDEMNITY COMPANY CORPORATE SEAL 1939 OHIO

Notary Public)
State of Ohio) SS:

On this 23rd day of February, 1994, before the subscriber, a Notary for the State of Ohio, duly commissioned and qualified, personally came Craig L Stout and Roswell P. Ellis of the Evergreen National Indemnity Company, to me personally known to be the individuals and officers described herein, and who executed the preceding instrument and acknowledged the execution of the same and being by me duly sworn, deposed and said that they are the officers of said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and signatures as officers were duly affixed and subscribed to the said instrument by the authority and direction of said Corporation, and that the resolution of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at Cleveland, Ohio, the day and year above written.

NOTARIAL SEAL STATE OF OHIO

Gregory N. Miracle, Attorney
Notary Public State of Ohio
My Commission has no expiration date Section 147.03 R.C.

State of Ohio) SS:

I, the undersigned, Secretary of the Evergreen National Indemnity Company, a stock corporation of the State of Ohio, DO HEREBY CERTIFY that the foregoing Power of Attorney remains in full force and has not been revoked; and furthermore that the Resolution of the Board of Directors, set forth herein above, is now in force.

Signed and sealed in Cleveland, Ohio this 26th day of April, 2000

Anne L. Meyers, Secretary

EVERGREEN NATIONAL INDEMNITY COMPANY CORPORATE SEAL 1939 OHIO

Any reproduction or facsimile of this form is void and invalid.

Evergreen
National Indemnity Co.

CERTIFICATE
1999

The following financial information was excerpted from the Statutory Annual Statement filed by Evergreen National Indemnity Company with the Ohio Department of Insurance on March 1, 2000.

STATEMENT OF INCOME

Direct Written Premium	$26,490,511
Reinsurance Assumed	10,932,725
Reinsurance Ceded	31,339,381
Net Written Premium	6,083,855
Change in Unearned	474,477
Net Earned Premium	6,558,332
Losses & LAE Incurred	4,294,589
Commission Expense	1,702,107
Other Expenses	1,289,972
Underwriting Gain/(Loss)	(728,336)
Investment Gain	1,243,621
Other Income/(Expense)	(7,300)
Income Before FIT	507,985
Federal Income Tax	(13,500)
Net Income	$521,485

BALANCE SHEET

Assets	
Invested Asset	$25,747,425
Agents' Balances (net of Reins.)	(2,546,052)
Reinsurance Recoverables	5,428,281
Other Assets	1,204,223
Total Assets	$29,833,877
Liabilities & Surplus	
Unearned Premium Reserve	$ 2,472,956
Loss & LAE Reserves	7,404,655
Other Liabilities	6,380,578
Total Liabilities	$16,258,189
Surplus	$13,575,688

I hereby certify that the above information is that contained in the Statutory Annual Statement filed by Evergreen National Indemnity Company with the Ohio Department of Insurance ending December 31, 1999.

Kurt Weiland, Assistant Secretary

INS 102 (2/93) State of Michigan Department of Commerce

CERTIFICATE OF AUTHORITY

Company Admissions Division
Michigan Insurance Bureau
P. O. Box 30220
Lansing, MI 48909-7720

Date: November 15, 1995

THIS IS TO CERTIFY, that

EVERGREEN NATIONAL INDEMNITY COMPANY
(an Ohio stock insurer)
NAIC No. 12750

is authorized in Michigan to transact the business of Section 606; Section 610 (including Sections 614, 616 and 620); subsections (a), (b) (including automobile and liability and excluding workers' compensation), (c), (d), (e), (f), (g), and (h) of Section 624(1); and Section 628

of P.A. 218 of 1956 as amended, "The Michigan Insurance Code," so long as the insurer continues to conform to the authority granted by this certificate, its corporate articles, the requirements of P.A. 218 of 1956 and all amendments to it and any limitations, conditions or other matters which have been agreed to from time to time between the insurer and the Commissioner.

If issued to a domestic, foreign, or alien insurer, this Certificate of Authority shall be automatically revoked 90 days after the insurer or an affiliated insurer is made subject to formal delinquency proceedings, unless the insurer requalifies for a Certificate of Authority. If issued to a foreign insurer, this Certificate of Authority shall be automatically revoked 90 days after a change in control, unless the insurer requalifies for a Certificate of Authority.

This Certificate of Authority is granted subject to the laws of the State of Michigan.

Commissioner of Insurance

ATTACHMENT I-7

LIABILITY INSURANCE

SECTION J

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

TABLE OF CONTENTS

Page

Contents

J-1 SOLID WASTE MANAGEMENT UNITS 3
J-1a CHARACTERIZE THE SOLID WASTE MANAGEMENT UNIT 3
J-1a(1) Container Storage Area 3
J-1a(2) Generator Accumulation Tank 4
J-1a(3) Waste Handling Area 4
J-1a(4) Waste Recycling Operation 4
J-1a(5) Flammable Storage Area 4
J-1a(6) Generator Accumulation 5
J-2 RELEASES 5
J-2a CHARACTERIZE RELEASES 5
LOCATION OF SOLID WASTE MANAGEMENT UNITS 6
LIST OF FORMER PERMITTED HAZARDOUS WASTES 8

LIST OF ATTACHMENTS

ATTACHMENT J-1 LIST AND LOCATION OF SOLID WASTE MANAGEMENT UNITS

ATTACHMENT J-2 LIST OF FORMER PERMITTED HAZARDOUS WASTES

SECTION J

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

This section provides information on the condition of all past and present solid waste management units as required by Michigan ACT 451 RULE 299.9629.

J-1 SOLID WASTE MANAGEMENT UNITS [40 CFR 270.14(D)(1), 264.101]

The solid waste management units (SWMU's) presently operational at the Detrex Corporation facility include the following:

1) Container Storage Areas; and
2) Waste Handling Area;

Each of these solid waste management units is identified on a facility plan provided in Attachment J-1.

J-1a CHARACTERIZE THE SOLID WASTE MANAGEMENT UNIT

J-1a(1) Container Storage Area

The container storage areas are located entirely within an enclosed building structure or within enclosed trailers. Containers in inside container storage areas are placed on a concrete slab floor, complete with peripheral concrete curbing and access ramps to provide adequate secondary containment. The floor slab is free of all gaps, there are no expansion or control joints, and the slab has no floor drains or other such openings. Further details on the container storage areas are presented in Section D of this license application.

Trailers utilize secondary containment to prevent release of materials to the environment in the event of container failure.

Hazardous Waste containers are stored in the designated storage areas. The secondary containment volume for the each storage area exceeds the minimum required 10% of the quantity of stored materials.

The container storage area has been in operation since 1977. The maximum volume of hazardous waste that may be stored in the container storage areas is currently 13,750 gallons (250 x 55 gallon drums). A list of each of the former permitted (i.e., prior to current license application) hazardous wastes and the appropriate Hazardous Waste Identification Numbers of the waste is presented in Attachment J-2.

MDNRE has approved the closure of the recycling operation at this Facility.

J-1a(2) Generator Accumulation Tank

The hazardous waste recycling operation used a single 5,000 gallon storage vessel for the accumulation of still bottoms remaining at the end of the distillation procedures. This unit was closed in 1996 at the same time as that of the recycling unit.

J-1a(3) Waste Handling Area

The receiving area, indicated on the facility plan in Attachment J-1, is utilized for the transfer of containers of wastes, received from off-site facilities, to the container storage areas. It previously had also been used for the transfer of waste from the still bottoms tank to a tanker truck for off-disposal.

Waste drum handling practices includes the unloading of containers from a truck, using a forklift equipped with a drum handling attachment, and the transfer of these drums to the appropriate area in the container storage area after sampling.

The floor in the receiving area is free of all gaps or any other openings in the same manner as the container storage area.

J-1a(4) Waste Recycling Operation

As noted previously, MDNRE has provided a certification of closure for this unit. Attachment J-1 shows the former location of the distillation stills used at the Facility.

J-1a(5) Flammable Storage Area

The Flammable Storage area, formally the Transfer Station, is located in the North East corner of the Facility. The former transfer station provided the Facility the abiltiy to act as a 10-day transfer station for wastes they lacked the authority to accept. Like the Waste Handling Area of the Facility all containers were handled with a fork truck or hand truck. The containers as part of this operation were not opened but rather are just stored for subsequent transportionat to another site.

The Flammable storage area is located in a concrete dock area that provides containment in the event of a release. The dock is equiped with a sump to allow for accumulated precipitation to be removed. Removal of precipitation is done mannually after visual inspection of the precipitation. The sump also provides a means by which the Facility can remove liquids in the event of a release.

The wastes are sampled and analyzed prior to storage on trailers which provides secondary containment adequate to contain at least 10% of the total volume or largest container. The trailers also provide containment to prevent the aspect of run-on and run-off into the areas where the wastes were held. The maximum amount of flammables that can be stored in this area is 7,040 gallons (e.g. 128 drums).

J-1a(6) Generator Accumulation

The facility, as part of its sampling operation, will generate small amounts of waste. This waste would be handled as a generator and would be stored in the warehouse area along with other wastes according to the reactivity group number of the material being generated.

J-2 RELEASES

J-2a CHARACTERIZE RELEASES

Detrex completed a search of Facility operating records which revealed only three releases which are known to have occurred at the Detroit Michigan facility.

None of the three incidents described above are considered likely to have created a potential impact to the environment (specifically surface water, soil or groundwater). Detrex responded quickly and effectively to each incident.

ATTACHMENT J-1

LIST AND LOCATION OF SOLID WASTE MANAGEMENT UNITS

LIST OF SOLID WASTE MANAGEMENT UNITS

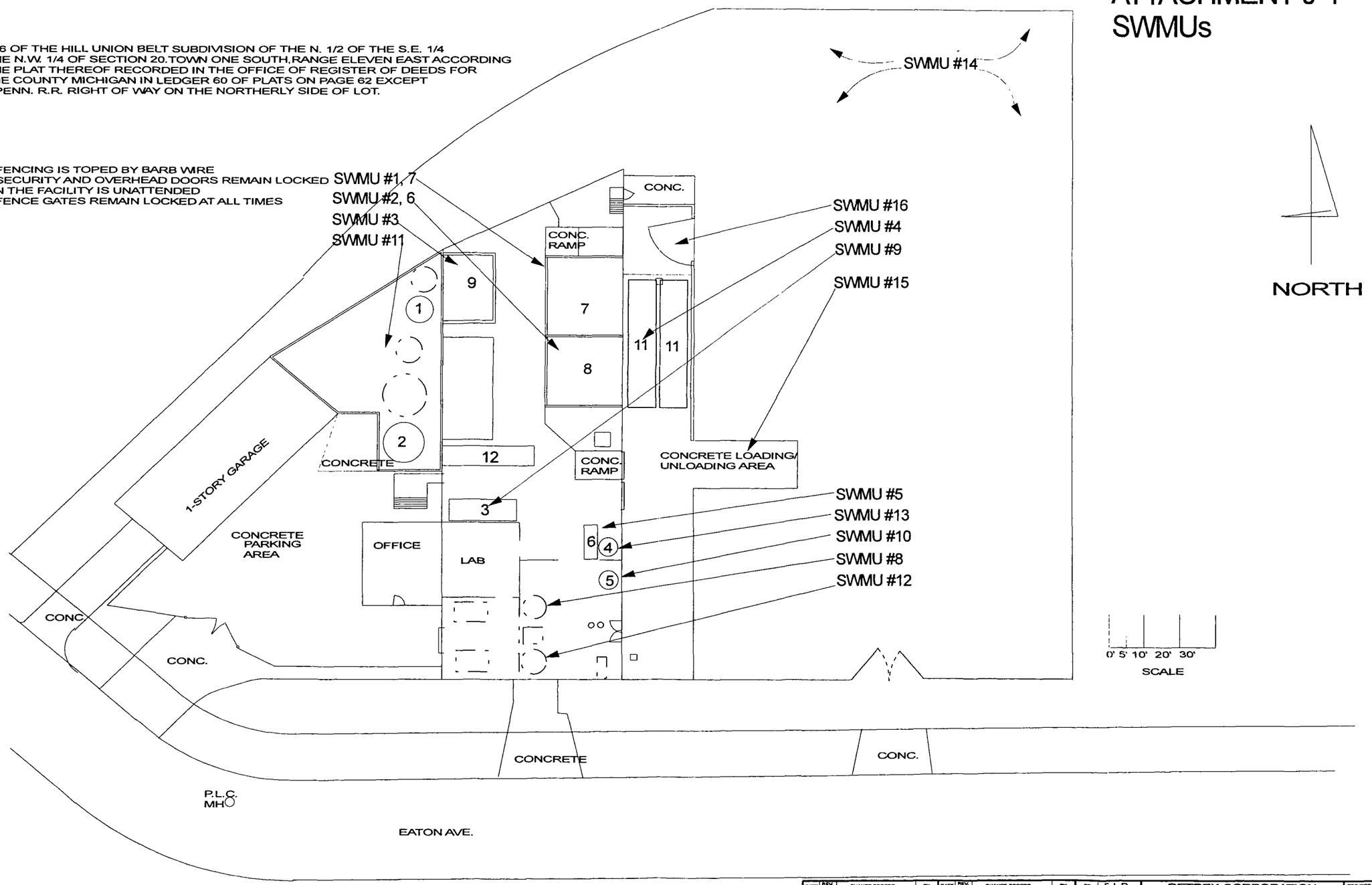
SWMU 1	STORAGE AREA 7
SWMU 2	STORAGE AREA 8
SWMU 3	STORAGE AREA 9
SWMU 4	STORAGE AREA 11
SWMU 5	STAGING AREA
SWMU 6	FORMER LOCATION OF HW STORAGE AREA
SWMU 7	FORMER LOCATION OF HW STAGING AREA
SWMU 8	FORMER 2,000 GALLON NH STORAGE TANK (#12)
SWMU 9	FORMER 5,000 GALLON STILL BOTTOM STORAGE TANK (#17)
SWMU 10	FORMER 2,500 GALLON PRODUCT STORAGE TANK (#20)
SWMU 11	OUTSIDE TANK FARM
SWMU 12	FORMER 4,500 GALLON NH STORAGE TANK (#22)
SWMU 13	FORMER 3,000 GALLON NH STORAGE TANK (#25)
SWMU 14	FORMER RAIL SIDING AND YARD
SWMU 15	CONCRETE LOADING UNLOADING AREA

ATTACHMENT J-1
SWMUs

LOT 16 OF THE HILL UNION BELT SUBDIVISION OF THE N. 1/2 OF THE S.E. 1/4 OF THE N.W. 1/4 OF SECTION 20.TOWN ONE SOUTH,RANGE ELEVEN EAST ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF REGISTER OF DEEDS FOR WAYNE COUNTY MICHIGAN IN LEDGER 60 OF PLATS ON PAGE 62 EXCEPT FOR PENN. R.R. RIGHT OF WAY ON THE NORTHERLY SIDE OF LOT.

NOTES:

1)ALL FENCING IS TOPED BY BARB WIRE
2)ALL SECURITY AND OVERHEAD DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED
3)ALL FENCE GATES REMAIN LOCKED AT ALL TIMES



DATE	REV. NO.	CHANGE RECORD	BY	DATE	REV. NO.	CHANGE RECORD	BY
				08.21.10	1	current site layout.07_2010	DDC

DR.	E.L.R.	DETREX CORPORATION PROJECT ENGINEERING DEPARTMENT SOUTHFIELD MICHIGAN 48086
CHK.	—	
APR.		EATON AVE. FACILITIES GENERAL LAYOUT
SCALE	DATE	
1/16"=12'	12/98	

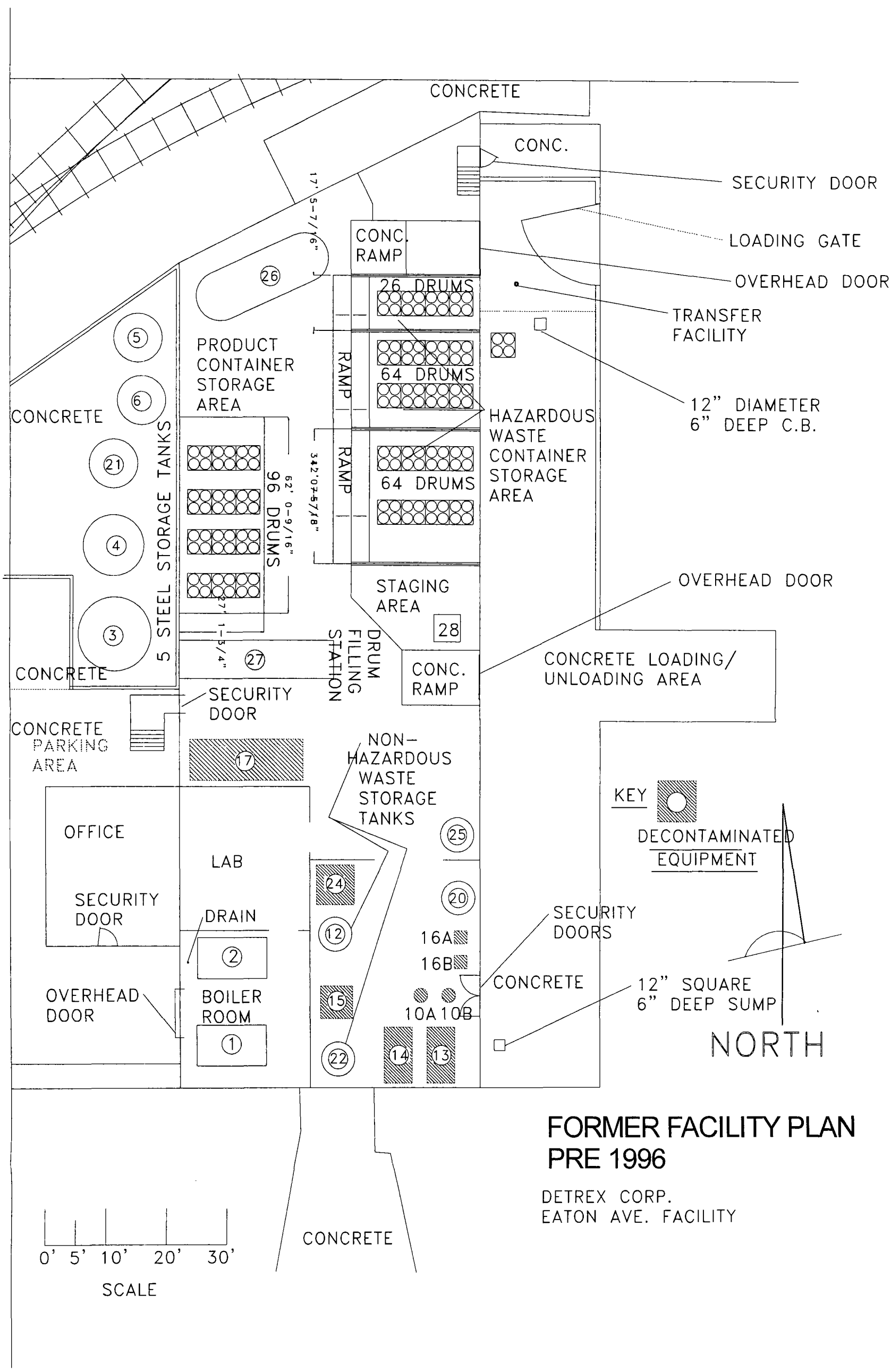
PROJECT No. 9601

DWG No.

EATON AVE.

ATTACHMENT J-1
PRE 1996 FACILITY LAYOUT

ID #	Equipment Name	Description
1.	Clayton Model E-100 Steam Generator	This unit is no longer in service
2.	Air Compressor	In use
3.	20,000 gal. Carbon steel Tank	Storage tank for Trichloroethylene
4.	10,000 gal. Carbon Steel Tank	This tank is currently out of service
5.	4,500 gal. Carbon Steel Tank	This tank is currently out of service
6.	4,500 gal. Carbon Steel Tank	Storage tank for Trichloroethylene
10 A/B	2 – 600 gal. Receiver Tanks	Product Storage Tanks
12.	2,300 gal. Carbon Steel Tank	Used for storage of Non-Hazardous Wastes.
13.	Detrex Model S-350 Still	This unit is currently out of service
15.	DCI Model Dyna-1-100 Still	This unit is currently out of service
16 A/B	Drying Columns	These units are currently out of service
17	5,000 gal. Carbon Steel Tank	Used for storage of Non-Hazardous Wastes.
20	2,500 gal. 316 Stainless Steel Tank	Used for storage Product
21	4,500 gal Carbon steel tank	Used for storage of Non-Hazardous Waste
22	4,500 gal. Carbon Steel Tank	Used for storage of Non-Hazardous Wastes.
25	3,000 gal. 316 stainless steel Tank	Used for storage of Non-Hazardous Wastes.
27	Drum Filling Station	Product Drumming Station. Used for filling 55- gallon drums with product. Unit can fill approximately 30 drums per hour and is operated as necessary
28	Product Blending Vessel	550 gal. Carbon steel vessel utilized for product blending.
29	Roller conveyor	Used to weigh-in containers of waste.
30	Staging Area / Hazardous Waste Storage Area	Area used to store containerized waste that has not yet received full waste screening.
31	Hazardous Waste Storage Area	Storage area for wastes that have full waste screening performed.
32	Transfer Facility	Active



FORMER FACILITY PLAN PRE 1996

DETREX CORP.
EATON AVE. FACILITY

DETREX CORPORATION
PROJECT ENGINEERING DEPARTMENT
SOUTHFIELD MICHIGAN 48075

Attach J-1

ATTACHMENT J-2

LIST OF FORMER PERMITTED HAZARDOUS WASTES

ATTACHMENT J-2

LIST OF FORMER PERMITTED HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Ignitable Wastes	D001 (I)
Corrosive Waste	D002 (C)
Arsenic	D004 (T)
Barium	D005 (T)
Cadmium*	D006 (T)
Chromium	D007 (T)
Lead	D008 (T)
Mercury	D009 (T)
Selenium*	D010 (T)
Silver	D011 (T)
Endrin	D012 (T)
Benzene	D018 (T, I)
Carbon Tetrachloride	D019 (T), U211(T)
Chlorobenzene	F002 (T, I), D021(T, I), U037(T, I)
Chloroform	D022 (T), U044(T)
1,4-Dichlorobenzene	D027 (T), U072(T)
1,2-Dichloroethane	D028 (T, I), U077(T, I)
1,1-Dichloroethylene	D029 (T, I), U078(T, I)
2,4-Dinitrotoluene	D030 (T)
Heptachlor*	D031 (T)
Hexachlorobenzene	D032 (T), U127(T)
Hexachloroethane	D034 (T), U131(T)
Methyl Ethyl Ketone	D035 (T, I), F003 (I)
Nitrobenzene	D036 (T)
Tetrachloroethylene	F001 (T), F002(T), D039 (T), U210(T)
Trichloroethylene	F001(T), F002(T), D040 (T), U228(T)
Vinyl Chloride	D043 (T, I)
Ortho-Dichlorobenzene	F002 (T)
1,1,2,2-Tetrachloroethane	U209(T)
1,1,1,2-Tetrachloroethane	U208(T)
Dichlorodifluoromethane	U075(T)
1,1-Dichloroethane	U076(T, I)
1,1,1-Trichloroethane	F001(T), F002(T), U226(T)
Dichloromethane (Methylene Chloride)	F001 (T), F002 (T), U080(T)
Monofluoromethane	F001 (T), F002 (T)

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

ATTACHMENT J-2

LIST OF FORMER PERMITTED HAZARDOUS WASTES

Waste	*EPA Hazardous Waste Number and Hazard Code*
Trichlorofluoromethane	F001(T), F002(T), U121(T)
Trichloromonofluoromethane	F001 (T), F002 (T)
1,1,2-trichloro-1,2,2-trifluoroethane	F002 (T)
Xylene	F003 (I)
Acetone	F003 (I)
Ethyl Acetate	F003 (I)
Ethyl Benzene	F003 (I)
Ethyl Ether	F003 (I)
n-Butyl Alcohol	F003 (I)
Cyclohexanone	F003 (I)
Methyl Isobutyl Ketone	F003 (I), U161 (I)
Methanol	F005 (I)
Toluene	F005 (T, I)
Methyl Ethyl Ketone	F005 (I,T)
Carbon Disulfide	F005 (H, I)
Isobutanol	F005 (I,T)
Pyridine	F005 (T, I)

Wastewater treatment sludges from electroplating operations except from the following processes: F006

1. sulfuric acid anodizing of aluminum;
2. tin plating on carbon steel;
3. zinc plating (segragated basis) on carbon steel;
4. aluminum or zinc-aluminum plating on carbon steel;
5. cleaning/stripping associated with tin, zinc and
6. aluminum plating on carbon steel; and
7. chemical etching and milling of aluminum.

Waste water treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process F019

Note: Hazard Code based on 40 CFR 261. Wastes may be liquid or solid.

I - Ignitable Waste
H - Acute Hazardous Waste
* - Extremely Hazardous Waste
T - Toxic Waste
C - Corrosive Waste

SECTION K

OTHER FEDERAL LAWS

TABLE OF CONTENTS

Page
OTHER FEDERAL LAWS 3

LIST OF APPENDICES

APPENDIX K-1 COMPLIANCE LETTERS

SECTION K

OTHER FEDERAL LAWS

Other Federal Laws which have been reviewed for compliance include the:

- Wild and Scenic Rivers Act;
- National Historic Preservation Act;
- The Endangered Species Act;
- The Coastal Zone Management Act;
- The Fish and Wild Life Coordination Act;
- NPDES.

Letters noting Detrex's compliance with the first three Acts will be placed into Appendix K-1. Due to the physical location of the facility there will be no impact with regards to the Coastal Zone Management Act.

The Facility discharges all of its rain water collected from the areas surrounding the Facility to the City of Detroit combined sanitary/storm sewars. As such the facility does not have a NPDES permit.

ATTACHMENT K-1

COMPLIANCE LETTERS

K-1

Detrex CORPORATION
PO BOX 5111 • SOUTHFIELD MI 48086-5111 • (248) 358-5800 • FAX (248) 358-5803

June 21, 2000

Ms. Laurie Sargent
MDNR,
Wild Life Division
VIA: Facsimile 517-373-6705

RE: Part B Permit Application
Detrex Corporation
12886 Eaton Ave.
Detroit MI 48227

Dear Ms. Sargent:

As per our phone conversation I am forwarding you a copy of a USGS map showing the approximate location of our Hazardous Waste Facility located in Detroit Michigan. The Latitude and Longitude for the location are 42° 23' 50" and 83° 10' 22" respectively. We are currently renewing our permit and need documentation that operations do not impact any endangered species.

If you need any additional information other than what is provided please feel free to give me a call at 248-358-5800 ext. 131. Correspondence may be directed to my attention at PO Box 5111, Southfield MI 48075.

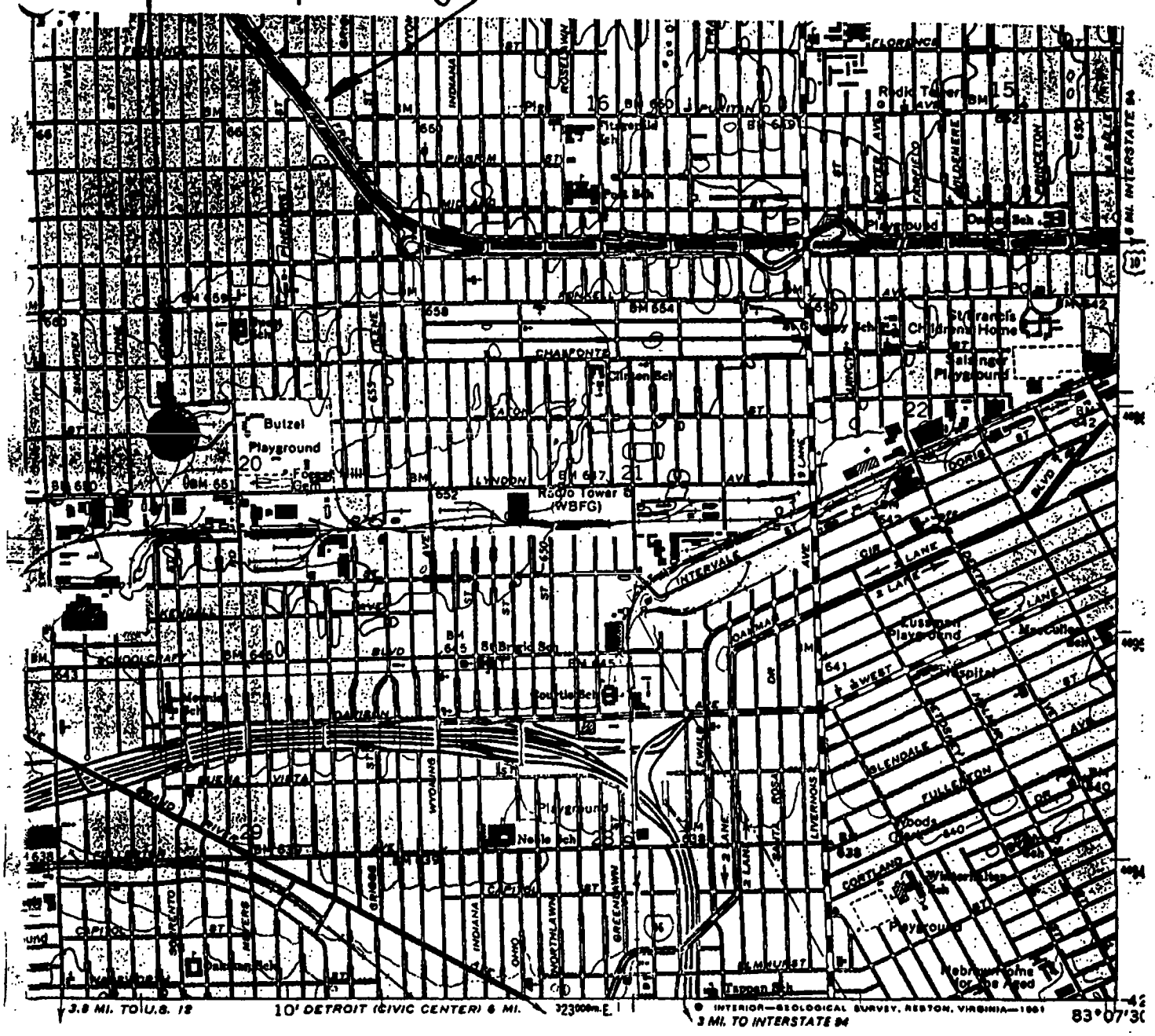
Sincerely,

David Craig, CHMM, CET
Manager of Environmental and Safety Compliance

Location of Facility

ATTACHMENT

Lodge Freeway



1 MILE

6000 7000 FEET

1 KILOMETER

ROAD CLASSIFICATION

Primary highway, all weather, hard surface

Secondary highway, all weather, hard surface

Light-duty road, all weather, improved surface

Unimproved road, fair or dry weather

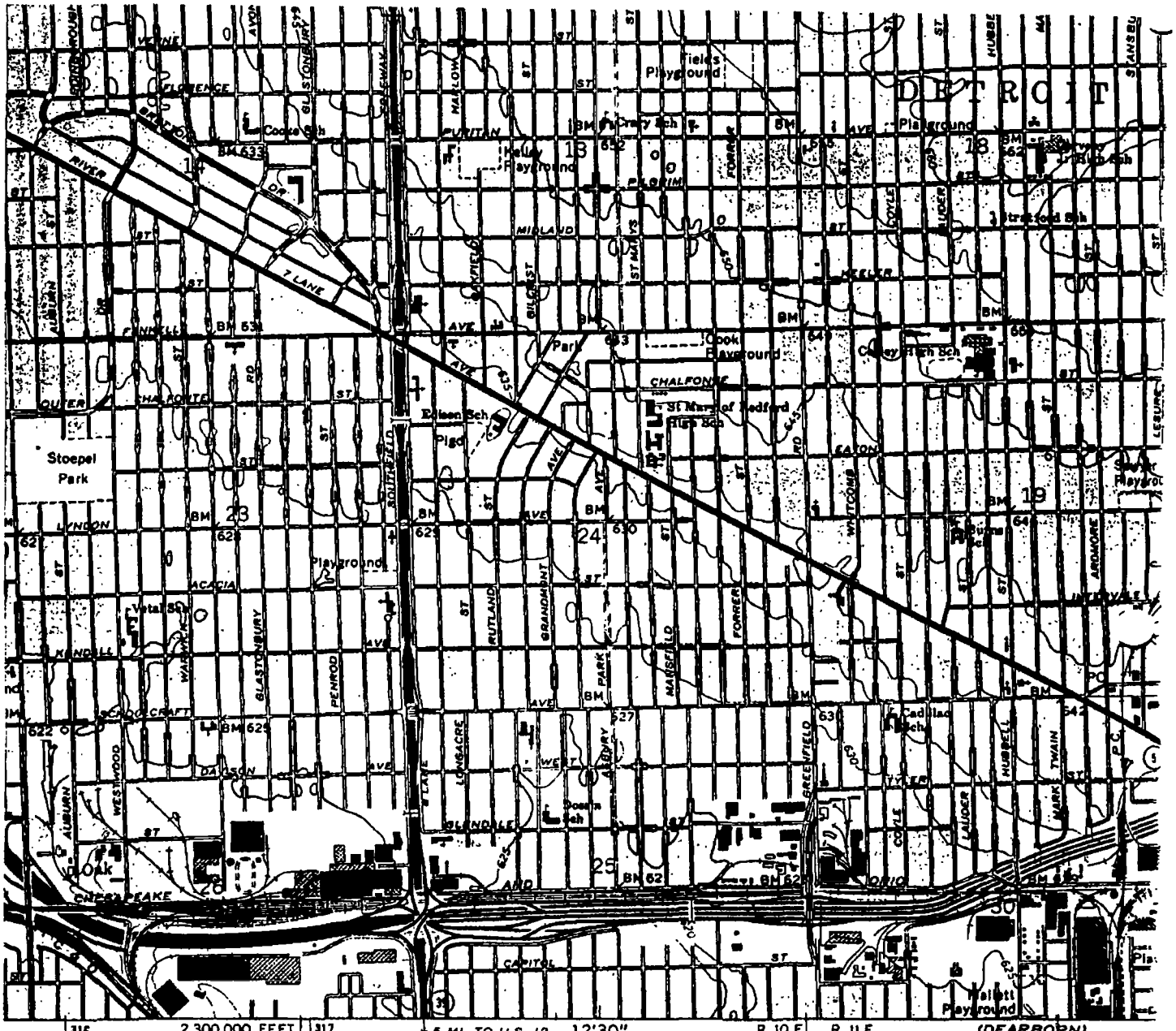
Interstate Route

U. S. Route

State Route

329

SOUTHFIELD FREEWAY



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Detrex CORPORATION

P.O. BOX 5111 • SOUTHFIELD, MI 48086-5111 • (248) 358-5800 • FAX (248) 358-5803

June 21, 2000

Mr. Kurt Newman
MDNR, Fishery Division
Stevens T. Mason Building
PO Box 30446
Lansing MI 48909

RE: Part B Permit Application
Detrex Corporation
12886 Eaton Ave.
Detroit MI 48227

Dear Mr. Newman:

As per our phone conversation of last week, I am forwarding you the following information to define the location of our facility:

- a copy of a USGS map showing the approximate location of our Hazardous Waste Facility located in Detroit Michigan;
- The Latitude and Longitude for the facility, are 42° 23' 50" and 83° 10' 22" respectively.

We are currently renewing our permit and need documentation that operations do not impact any fish or wildlife. At the present time I am unable to contact our permit writer, Ronda Blayer of the Waste Management Division of MDEQ, to confirm exactly what is needed as she is out of the office until June 26th. From past experience with other renewals, all that is required is a letter denoting that operations at our facility will not impact any fish or fisheries.

If you need any additional information other than what is provided please feel free to give me a call at 248-358-5800 ext. 131. Correspondence may be directed to my attention at PO Box 5111, Southfield MI 48075.

Sincerely,

David Craig

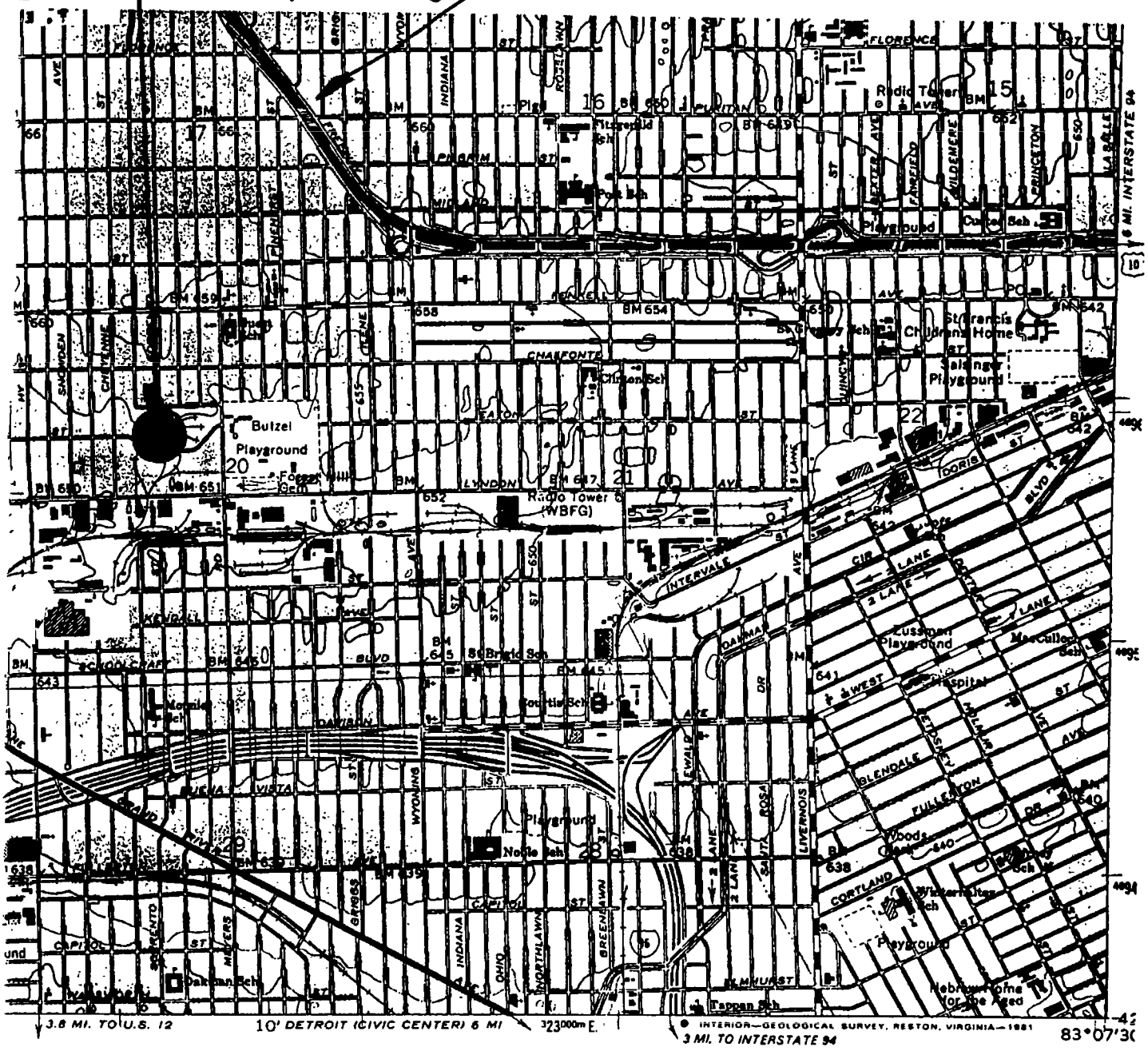
David Craig, CHMM, CET
Manager of Environmental and Safety Compliance

S-Z/TSDF/FAC/MI/DET/PARTB/2000/MI-K-2

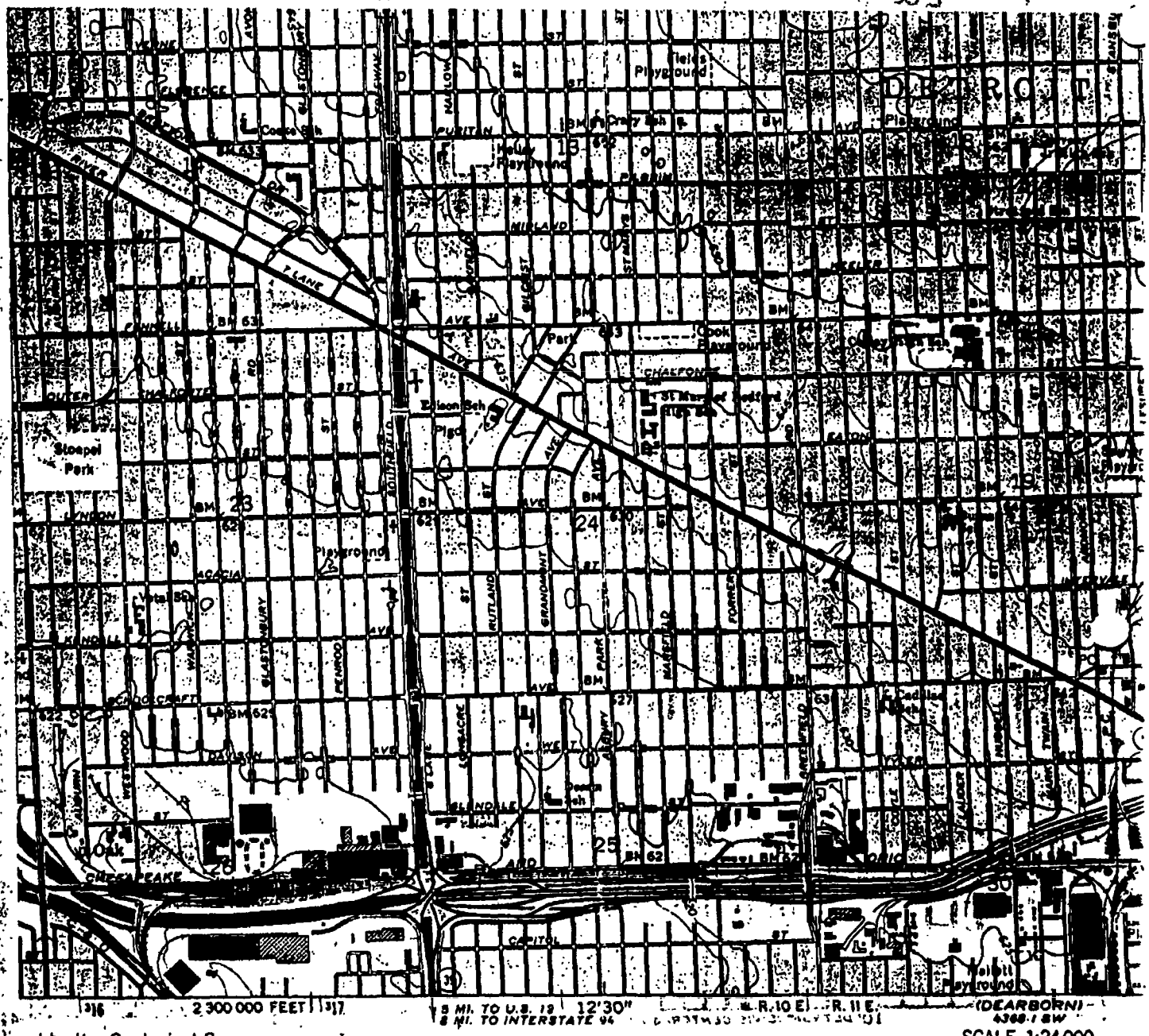
LOCATION of Facility

ATTACHMENT

Lodge Freeway



SOUTHFIELD FREEWAY



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1°29'
26 MILS

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STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
KEITH J. CHARTERS, Chair
RRY C. BARTNIK
NCY A. DOUGLAS
THORNTON EDWARDS, JR.
PAUL EISELE
BOB GARNER
WILLIAM U. PARFET

JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, PO BOX 30028, LANSING MI 48909-7528

K. L. COOL, Director

REPLY TO:
NATURAL HERITAGE
P.O. BOX 30180
LANSING MI 48909

RECEIVED

JUL 2 4 2000

DETREX CORPORATION

July 19, 2000

Mr. David Craig
Detrex Corporation
P.O. Box 5111
Southfield, MI 48075

Dear Mr. Craig:

Your request for information was checked against known localities for special natural features recorded in the Michigan Natural Features Inventory (MNFI) database, which is part of the DNR, Wildlife Division, Natural Heritage Program.

The MNFI database is an ongoing, continuously updated information base, which is the only statewide, comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features. Records in the MNFI database indicate that a qualified observer has documented the presence of special natural features at a site. The absence of records in the database for a particular site may mean that the site has not been surveyed. Records are not always up-to-date, and may require verification. In some cases, the only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey.

The presence of threatened or endangered species does not necessarily preclude development but may require alterations in a development plan. If a threatened or endangered species has the potential to be "taken" or "harmed" by a proposed development or activity, an endangered species permit will be required from the Department of Natural Resources, Wildlife Division.

If the project is located on or adjacent to wetlands, inland lakes, or streams, additional permits may be required. Contact the Michigan Department of Environmental Quality, Land and Water Management Division, P.O. Box 30473, Lansing, MI 48909 (517-373-1170).

The following is a summary of the results of the MNFI review of the site in question: Part B Permit Application – hazardous waste facility, Wayne County, T1S R11E, Section 20.

> The project should have no impact on the special natural features at the location specified if it proceeds according to the plans provided. Please contact me for an evaluation if the project plans are changed.

Thank you for your advance coordination in addressing the protection of Michigan's natural resource heritage. If you have further questions, please call me at 517-373-1263.

Sincerely,

Lori G. Sargent

Lori G. Sargent
Endangered Species Specialist
Wildlife Division

LGS:jao

R 1026E (Rev. 08/06/1999)

SECTION N

ENVIRONMENTAL ASSESSMENT

SECTION N
ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT 1
N-1 NEED FOR AND OBJECTIVE OF EXISTING FACILITY 3
N-2 DESCRIPTION OF EXISTING ENVIRONMENT 4
N-2a Physiography 4
N-2a(1) Topography 4
N-2a(2) Geology 5
N-2a(3) Soils 6
N-2b Climate 6
N-2c Terrestrial Systems 7
N-2d Aquatic Systems 7
N-2e Hydrology 7
N-2f Air Quality (as of 1991) 8
N-2g Aesthetics 10
N-2h Land Use 10
N-2i Archaeological and Historical Resources and Site 10
N-2j Social-Economic Environment (1991) 11
N-3 ALTERNATIVES CONSIDERED 11
N-4 ANTICIPATED ENVIRONMENTAL IMPACT 12
N-5 UNAVOIDABLE ADVERSE IMPACTS 12
N-6 MITIGATING MEASURES 12
N-7 FAILURE MODE ASSESSMENT 13
N-7a Description of System 13
N-7b Definition of Failure 13
N-7c Possible Causes of Failure 13
N-7d Methods for Detection of Failure 13
N-7e Environmental Effects of Failure 14
N-7f Possible Corrective Actions in the Event of Failure 14
N-7g Human Exposure 15

LIST OF ATTACHMENTS

ATTACHMENT N-1 SITE LOCATION
ATTACHMENT N-2 TERRESTRIAL SYSTEMS
ATTACHMENT N-3 ZONING AND LAND USE FIGURES
ATTACHMENT N-4 ENVIRONMENTAL ASSESSMENT LETTER

SECTION N

ENVIRONMENTAL ASSESSMENT

This section of the operating license application provides an environmental assessment on the hazardous waste container storage area design and operation as required by Michigan Act 451 Rule 299.9504(1)(e).

N-1 NEED FOR AND OBJECTIVE OF EXISTING FACILITY

The Detrex Corporation formally specialized in the sale of halogenated hydrocarbon solvents and cleaning equipment, and the recovery (recycling) of solvents from wastes generated in degreasing operations. The recycling operations were discontinued in December of 1995 and the equipment associated with the recovery operation closed under a plan of closure submitted by Hani Hamawi in June of 1996. Likewise Detrex exited the solvent business in 2002, selling the business to the former president of the division.

Currently the hazardous waste management operations involve only storage of DOT containers. The storage areas are used to temporarily store containerized hazardous wastes prior to the wastes being transferred off site to another TSDF for processing or disposal. The storage areas are enclosed within a building that provides a safe and environmentally sound storage area for the wastes. In addition, the entire facility provides diking to retain any hazardous wastes in the unlikely event of a release.

N-2 DESCRIPTION OF EXISTING ENVIRONMENT

The facility is located in north-western Detroit, Michigan. The site location is shown in Attachment N-1.

This section provides a description for the existing environment on and around the Detrex Corporation Facility (Facility).

N-2a Physiography

N-2a(1) Topography

The surface topography of Southeast Michigan as seen today has been influenced by the bedrock topography and by the Wisconsinian glaciation of the late Pleistocene Epoch. Prior to glaciation, the landscape in Southeast Michigan was composed of two physiographic regions: the Thumb Upland area in the Livingston, Oakland and Washtenaw Counties; and the Eric-Huron Lowland in the Monroe and Wayne Counties. The Upper Devonian Berea Sandstone forms the approximate boundary between these two regions. During the advance and retreat of the glaciers, the glaciers established a lobate pattern of subdividing into the Lake Michigan, Saginaw and Lake Erie lobes. The lobe which most strongly affected the southern portions of Michigan (in which we are interested) was the Lake Erie lobe. The Lake Erie lobe preserved or even exaggerated the topographic features present before the glaciation.

The Lake Erie lobe advanced and retreated many times into the inland. As a result of these readvances and retreats, a series of end moraines and pitted and wash plains are now readily evident in the Oakland, Livingston and Washtenow Counties. As the glaciers retreat further, the areas to the southeast, i.e. Monroe, Macomb, St. Clair and Wayne Counties, were overlain by lake bottom deposits and the occasional water-laid moraine. This area is comprised of mainly silts and clays. These lacustrine plains are especially well developed in Wayne (i.e. where the facility is located) and Monroe Counties.

As a result of the glacial activity and the initial bedrock topography, the slope of the landscape is towards the southeast and northwest. In the Genesee and Shiawassee Counties that are northeast of Detroit, the topographic relief is greater. In the same direction, several morainic knolls in the Oakland, Livingston, Macomb and Washtenow Counties have elevations of more than 1,100 feet and a local relief of approximately 600 feet. In contrast, Monroe County, which lies entirely within the lake plain, has only 160 feet of relief. The lowest point in the area is Lake Erie that has an average surface elevation of 568.6 feet.

The Facility in Detroit is located on the flat lacustrine plain. Very little topographic relief exists close to the facility. The area is interrupted only by major

drainage channels and markings of former beaches of glacial lakes. The closest major water course, the River Rouge, is some 5 miles away from the site.

The lands immediately surrounding the Facility are at an approximate elevation of 656 feet AMSL. The building floor, which forms the base of the secondary containment area is an elevation of approximately 659 feet AMSL.

To the west of the Facility, one railroad track moves in a northeast direction. One railroad spur enters the property directly north of the facility building. The elevation of the spur is approximately 656 feet AMSL.

Topographic maps for the Facility are provided in Attachments B-1 and B-2 of this operating license application.

N-2a(2) Geology

As described previously, the main overburden material in Wayne County consists primarily of silts and clays with the occasional glacial moraine deposits. This thick layer of lacustrine material mantles a bedrock of sandstones, limestones, shales and dolomites. The downward sequence of the various bedrock formations beneath Wayne County includes the following:

Mississippian

Coldwater Shale - This unit exists at the northwest corner of Wayne County. The unit outcrops and subcrops in this area. The unit generally has low permeability.

Devonian

Berea Sandstone - This moderately fine-grained sandstone can be 100 feet in thickness in spots.

Traverse Group - This alternating sequence of shales and limestones outcrops in the central portions of Wayne County.

Dundee Limestone - This unit is a fossiliferous limestone with high permeability.

Detroit River Group - This group includes sandstones, limestones and dolomite.

Sylvania Sandstone - This unit outcrops in the southeast reaches of Michigan.

Silurian

Bass Leland Group - This group is composed of fine-grained dolomites.

Of the formations listed above, the following formations are reported to be used as a water supply source in Wayne County: Berea Sandstone, Traverse Group, Dundee Limestone, Detroit River Group, and the Sylvania Sandstone.

Several injection wells are located within Wayne County. As of 01.22.09 there were 707 Brine Disposal Wells, nine Gas Injection Wells, 2436 for Gas Storage, eight Other Injection Wellsm abnd 528 Water Injection Wells. the information was obtained from the MDNRE website (http://www.michigan.gov/deq/0,1607,7-135-3311-9311--,00.html). Specifics on the wells can be found in Attachment E-1.

N-2a(3) Soils

The soils in the Detroit area reflect strong glacial influences with lacustrine clay deposits and minor moraine deposits. Small quantities of sand reflect former beach areas. The composition of the soil provides for substantial strength and stability for structural development.

The Facility is located within the Detroit City Limits; therefore they have little significance in terms of agriculture. The soils at the Facility serve as a base for structures and roads.

N-2b Climate

The climate of Detroit is influenced mainly by its location with respect to major storm tracks and the influence of the Great Lakes.

The major storm tracks occurring in this region originate from the northwest or the southeast of the region. In the winter, the northwest winds bring snowfall accumulations to all parts of Michigan; however, the heaviest precipitation in the City of Detroit is caused by the southeast winds. Although snowfall is the most common form of precipitation, rain, freezing rain and sleet may also occur. In the summer months, the northwest winds carry little precipitation to the City of Detroit. As the storms approach the city, they are often weakened and dissipate. Consequently, the weather is normally warm and humid reaching temperatures of 90°F and higher. Only occasional thunderstorms will alleviate the warm and humid stretches.

The most pronounced lake effect occurs in the winter when arctic air moves across the lakes and is warmed and moistened. This produces an excess of cloudiness but a moderation of cold wave temperatures. On warm summer days, occasional lake breezes help to lower temperatures in the eastern part of the city by 10 to 15 degrees.

Air pollution comes primarily from heavy industry spread along both shores of the waterway from Port Huron to Toledo. Wind dispersion is normally adequate to keep it from becoming a major problem.

Temperatures recorded at Detroit Metropolitan Airport range from -21°F in January 1984 to 102°F in July 1977. The average temperature for Detroit is 48.6°F with an average precipitation of 30.97 inches per year. (The average precipitation is based on a water equivalent measurement.)

N-2c Terrestrial Systems

The Facility is situated on a 0.9-acre property in an industrial district of Detroit. The area is mostly devoid of vegetation and animal or bird life due to the development in the district.

For the purpose of providing an accurate detailed survey of the flora and fauna in the area surrounding the facility, Detrex contracted the firm Environmental Consultants, Inc. of Rochester, Michigan to conduct a site survey. This report, prepared by an experienced biologist, entitled "Terrestrial Systems, Detrex Corporation - Gold Shield Solvents Facility, Detroit, Michigan", is included as Attachment N-2.

N-2d Aquatic Systems

In Wayne County, a total of 52 bodies of water with an areal extent of 5 acres or greater have been documented. Of the 52 bodies, 5 are marshes and 47 are warm water lakes. Together these water bodies comprise only 0.6 percent of the county. However, within 10 miles of the site, no major watercourse or water body exists.

N-2e Hydrology

The City of Detroit covers much of Wayne County. Detroit derives its water from surface sources. As such, very little groundwater is exploited in Wayne County. Of the 42 communities in Wayne County, 38 of these communities purchased water from another community, and four of these communities were supplied by surface water (EPA, 1981). No community reported the use of groundwater as a municipal supply source.

A number of non-community sources outside the Detroit City limits however have been recorded. Those geologic units capable of supplying water were listed in the Geology section. The table below summarizes the information as provided by the EPA (1981).

Aquifer System	*# of Wells*	*Depth (ft)*	*Capacity (gpm)*
Glacial Drift Aquifer	15	62 - 122	13 - 4,000
Berea Sandstone	2	207 - 234	5 - 30
Traverse Group	1	126	100
Dundee Limestone	1	183	110
Detroit River Group	5	28 - 102	15 - 41
Sylvania Sandstone	2	66 - 135	50 - 300
Silurian-Devonian	1	475	40

The water quality from the bedrock aquifers is normally good. Water, which is extracted from great depths, tends to have higher sulphate concentrations due to the presence of gypsum at depth. Limestone bedrock aquifers also tend to have increases in total dissolved solids. In general, however, natural groundwaters in Wayne County have inorganic concentration measurements below EPA established guidelines.

In conclusion, groundwater users are mainly located out of City limits.

Much of the information from this section was taken from a United States Environmental Protection Agency Report entitled "Hydrogeology for Underground Injection Control in Michigan: Part 1, 1981".

N-2f Air Quality (as of 1991)

A Wayne County air quality summary taken from the Michigan Department of Natural Resources "Air Quality Report - 1986", outlines air quality from 1971 to 1986 and is presented below.

> Several networks monitor ambient air in Wayne County. The foremost is the Wayne County Air Pollution Control Division (WCAPC) that is operated by the county health department.
>
> The WCAPC Division operates 20 suspended particulate samplers in Wayne County. Of these sites, two violated the primary annual geometric mean standard during 1986 - one in the City of Detroit (Site 82-005: Annual geometric mean 82 ug/m^3) and one in Dearborn (Site 82-032: Annual geometric mean 103 ug/m^3). A third site located in Detroit (82-091) had an annual geometric mean of 82 ug/m^3 but did not achieve 75% valid data retrieval. These same sites, which are located in a specific problem corridor, have been in violation during all previous years monitored. Years of suspended particulate monitoring data in Wayne County indicate approximately a 50% reduction of the annual average levels. In 1971, only three sites met the health-related standard under the clean air act; however, by 1981 the reverse held true.

None of the WCAPC total suspended particulate sites violated the primary 24-hour suspended particulate standard in Wayne County during 1986. Four Wayne County monitors registered violations of the 24-hour secondary standard; all in the downtown Detroit area. Although this is a slight increase from 1985, it is an improvement over previous years monitored.

Four PM10 monitors, those which measure particulate matter 10 microns or less, are operated by WCAPC in Wayne County. Included are three Detroit, one River Rouge and one Dearborn monitoring sites. The annual arithmetic mean for January through December 1986 ranged from 38 to 55 ug/m^3.

For the past three years the sulfur dioxide monitors in Wayne County met primary and secondary standards. Back in 1983, two excursions of the sulfur dioxide primary 24-hour standard were recorded at a site near ICL Trucking in Detroit. These excursions were running 24-hour averages and are therefore not recorded as a violation of the standard. A dispersion model is being used to identify future potential problems in the area. The other 18 sulfur dioxide sites that monitored County met all applicable standards. During the six years prior to 1983, continuous sulfur dioxide monitors from 14 sites throughout Wayne County indicated compliance with the standards.

The nitrogen dioxide annual standard was met at the two sites that operate in the city of Detroit. However, as was the problem in 1985, equipment malfunction again kept the sites from recording 75% valid data.

As in previous years, WCAPC operates continuous monitors for carbon monoxide. The past two years indicate compliance with the ambient standards. During 1984, one downtown Detroit site recorded a violation of the 8-hour standard. No violations were recorded during 1983. In 1982, one downtown location recorded a violation of the 8-hour standard. Sixteen excursions of the 8-hour standard occurred in 1979 at a downtown location. During both 1978 and 1977 over 70 excursions were recorded in the county - most at the downtown locations.

Monitoring for ozone was conducted at four sites in Wayne County during 1986. All sites were in compliance with the .12-ppm standard as in the previous two years. In 1983, the two Detroit sites exceeded the .12-ppm standard; one site once, and the other site three times. During the summer of 1982, the Allen Park site recorded two excursions of the standard while one Detroit site and the Livonia site

recorded one excursion each. One Detroit location exceeded the ambient 1-hour standard back in 1981.

The Wayne County Air Pollution Control Division operates eight calendar-quarter lead sites. All sites have complied with the standard since 1980, when the site located near the Jeffries Freeway violated the standard. In 1979 the same highway lead site showed violations for two consecutive quarters.

N-2g Aesthetics

The area in which the Detrex facility is located is an intensive industrial area of northwestern Detroit. The aesthetic value of this area is somewhat limited. Within the industrial sector, virtually all plant life occurs as "weedy" growth along fences, railroad tracks, etc.

The Facility is not a source of unreasonable noise or other nuisance factors. The amount of truck and rail traffic to and from this Facility is not inconsistent with other industries in the area. Traffic information, in relation to the movement of hazardous wastes, is discussed in Section B of this operating license application.

N-2h Land Use

Existing land use and zoning in the site area is shown in Attachment N-3. The facility is located in an intensive industrial district (M4) with surrounding single family residential (R1). The nearest residence is located over 300 feet west of the facility.

N-2i Archaeological and Historical Resources and Site

The Facility is an existing industrial operation in an intensive industrial area. The site has been reviewed by the State Historic Preservation Officer (SHPO) of the Michigan Department of State, Michigan History Division. It is the SHPO's opinion that the site is not eligible for listing in the Natural Register of Historic Places. The result of their review is presented in Attachment N-4.

N-2j Social-Economic Environment (1991)

The City of Detroit is a large metropolitan city encompassing a very large land area and a population estimated by the Detroit City Planning Department to be in excess of 1.2 million people.

The economics of the City are based on a largely diversified industrial and commercial structure.

The Facility should not have any direct effect on any aspect of the local economic environment. The Facility should not have any direct impact on local support systems such as school taxes, sewage disposal, or public utilities. Local police, fire and hospital officials have been given copies of the contingency plan for the Facility to assure proper response procedures in the unlikely event of a major incident at the Facility. Small incidents can be handled by in-house emergency procedures.

N-3 ALTERNATIVES CONSIDERED

Wastes are typically received in 55-gallon drums from off-site customers, although other size containers up to 550 gallons are permitted. The Facility provides temporary storage for generator's hazardous wastes in order for them to maintain compliance with the regulations regarding storage and time limitations. Detrex requires the temporary storage to accumulate enough wastes of a particular type to provide for economy of operations. The alternative to this would be to allow generators to store their wastes on-site for longer periods of time prior to shipping off site for disposal.

Detrex now utilizes the two former hazardous waste storage tanks for the storage of solid wastes not meeting the definition of a hazardous waste.

N-4 ANTICIPATED ENVIRONMENTAL IMPACT OF THE EXISTING FACILITY

The storage areas are located within an enclosed building that provides adequate secondary containment. It is relatively free of the potential for negative impacts on topography, geology, climate, air quality, aesthetics, land use, archaeological, historical and social resources in the area.

N-4a Potential Secondary Impacts

The only potential for off-site secondary impacts to occur would be a result of mismanagement of operations that is considered under the failure mode assessment presented in a following section.

N-4b Environmental Review

The Facility has been designed to minimize any potential impacts on the environment. Existing management operations and response procedures have also been designed to minimize potential impacts on the environment.

N-5 UNAVOIDABLE ADVERSE IMPACTS

There will be negligible adverse impacts from the operation of the storage areas, assuming attention is paid to site security, routine inspection and maintenance, proper containment of waste materials, and strict adherence to all applicable State and Federal regulations.

N-6 MITIGATING MEASURES

All feasible alternatives for the temporary storage of hazardous wastes at the Facility have been considered. No other mitigating measures are available. The storage areas themselves are a mitigating measure that reduces the potential of a loss of hazardous waste to the environment.

N-7 FAILURE MODE ASSESSMENT

N-7a Description of System

The Detrex Corporation hazardous waste handling system consists of receiving containerized hazardous wastes, temporarily storing the wastes in a secure container storage area within the single enclosed building, and shipping the wastes off-site to another licensed TSDF for reclamation or disposal. No physical processing or disposal of waste occurs at this site.

N-7b Definition of Failure

A failure within the container storage area could occur as either a leakage of liquids or a leakage of vaporized liquids from the drums.

A failure during on-site transport to and from the outdoor concrete loading/unloading area could also occur as either a leakage of liquids and/or a leakage of vaporized liquids during transfer from the truck to the container storage areas.

N-7c Possible Causes of Failure

The potential failure modes could occur from poorly sealed DOT containers, DOT containers of poor structural integrity, or DOT containers that are accidentally punctured or in some other manner damaged during handling operations.

N-7d Methods for Detection of Failure

The possible modes of failure presented above would either be detected during regular inspections of the storage areas or immediately identified by plant personnel during transfer operations at the loading/unloading area. The storage areas are located within the single building in the vicinity of the process equipment. As such, plant personnel are in or near the storage area during all plant operating hours.

N-7e Environmental Effects of Failure

The possible modes of failure presented in previous sections could cause a release of hazardous waste onto the facility floor in the enclosed structure, or onto the concrete pad at the loading/unloading area.

The building floor, which encompasses the entire facility, is constructed of concrete. . There are no floor drains or other such openings in the secondary containment area. to maintain the integrity of the secondary containment areas, all existing expansion joints and any cracks in the building floor will be cleaned out, saw cut if necessary to provide a clean opening. Subsequently, all expansion joints and any cracks will be filled with a compatible chemically resistant flex joint sealant. The selected coating/sealant will be installed in accordance with the manufacturer's specification. The concrete slab and diking, with sealed joints, will serve as an impervious containment structure, thus eliminating the potential for the release of spilled liquids from within the facility.

A concrete pad directly underlies the total area where the truck sits during the unloading operation. Peripheral drive-over concrete curbing will be installed around the concrete pad. All expansion joints and any existing cracks in the concrete pad will be cleaned out, saw cut as necessary to provide a clean opening. Subsequently, all expansion joints and any cracks will be filled with a compatible chemically resistant flex joint sealant. The selected sealant will be installed in accordance with the manufacturer's specifications. The concrete pad and concrete curbing, with sealed joints, will provide control against the contact of any potentially spilled liquids with the surrounding ground surface.

N-7f Possible Corrective Actions in the Event of Failure

A detailed description of the response actions that will be implemented in the event of a failure is presented in Section G (Contingency Plan) of this operating license application. Section G-4b(2) details the response in the event of an accidental release of liquids and Section G-4b(3) details the response in the event of an accidental release of vapors. Procedures to prevent the occurrence of hazards are described in Section F (Preparedness and Prevention Procedures).

In summary, the Preparedness and Prevention Procedures (Section F) addresses the following:

- Security and alarms
- Inspection requirements and schedule
- Emergency equipment
- Emergency prevention

The Contingency Plan addresses the following:

- Emergency Coordinators
- Notification, identification and assessment
- Control procedures
- Response Procedures
- Emergency procedures
- Evacuation plan

N-7g Human Exposure

The purpose of the 1991 evaluation was to discuss the potential magnitude and nature of the human exposure to chemicals of potential concern specifically; methylene chloride, perchloroethylene, Trichloroethylene, 1,1,1-trichloroethane and trichlorotrifluoroethane; resulting from accidental releases in the workplace. Due to the air regulations the types and amounts of chlorinated solvents handled at the facility has been greatly reduced. Today the Facility typically only deals with Tetrachloroethylene and Trichloroethylene, although it does handle limited amounts of methylene chloride.

Other wastes handled by the Facility will be limited to those meeting the characteristics of corrosivity, flammability or toxicity. Since waste code D001 is a characteristic waste code no toxicity information is available. Toxicity information is readily available on the constituents making up waste code F003 and F005.

The aforementioned halogenated solvents are classified as volatile organic compounds (VOCs). These chemicals are colorless liquids at room temperature which

are primarily used as industrial solvents. They evaporate quickly into the air producing ether-like odors.

The most significant route of exposure is inhalation. These VOCs do not penetrate the skin to any extent. Entry into the body via dermal contact is of minimal concern since VOCs evaporate off the skin quickly and the amount absorbed is usually small unless it is trapped against the skin by clothing or gloves. If direct exposure occurred to undiluted liquid, skin irritation may result.

Exposure to VOCs can be determined by measuring levels in the breath or by monitoring a number of breakdown products (metabolites) in the urine or blood.

These particular VOCs can cause Central Nervous System (CNS) effects producing symptoms from low dose short-term exposure such as dizziness, loss of balance and coordination, sluggishness, lightheadedness, nausea and headaches. However, these symptoms disappear fairly rapidly after exposure stops. Acute exposure to high doses include eye, nose and throat irritation. This demonstrates several warning properties that personnel should be aware of that can prevent prolonged exposure that could cause long-term health impacts.

Methylene chloride, tetrachloroethylene and Trichloroethylene are classified as carcinogens via inhalation route. Mice exposed to chronic low doses of methylene chloride produced lung and liver damage; Trichloroethylene effects include lung damage while tetrachloroethylene effects lead to leukemia and liver lesions.

Table N-1 presents the Threshold Limit Values (TLVs) from the American Conference of Governmental Industrial Hygienists (ACGIH); the Permissible Exposure Limits (PELs) from the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA); and the Maximum Concentration Values in the workplace (MAKs) from the Deutsche Forschungsgemeinshaft (DFG), Federal Republic of Germany, Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area.

In summary, care must be taken when handling the hazardous waste solvents managed at the Detrex facility. Continued exposure to highly elevated concentrations of these solvents in air may cause long-term health impacts, however the substances have warning signs which should prevent long-term exposure.

Exposure to the other classes of waste (D001, D002, F003, F005) handled by Facility personnel would generally create an exposure pathway through dermal contact. Preventions of exposure to these materials is easily accomplished using the appropriate Personal Protective Equipment (PPE). Facility personnel have received training on the proper use and limitations of PPE such as gloves, glasses/faceshields/goggles, hard hats, and protective footware. As such this is not expected to create any foreseeable problems.

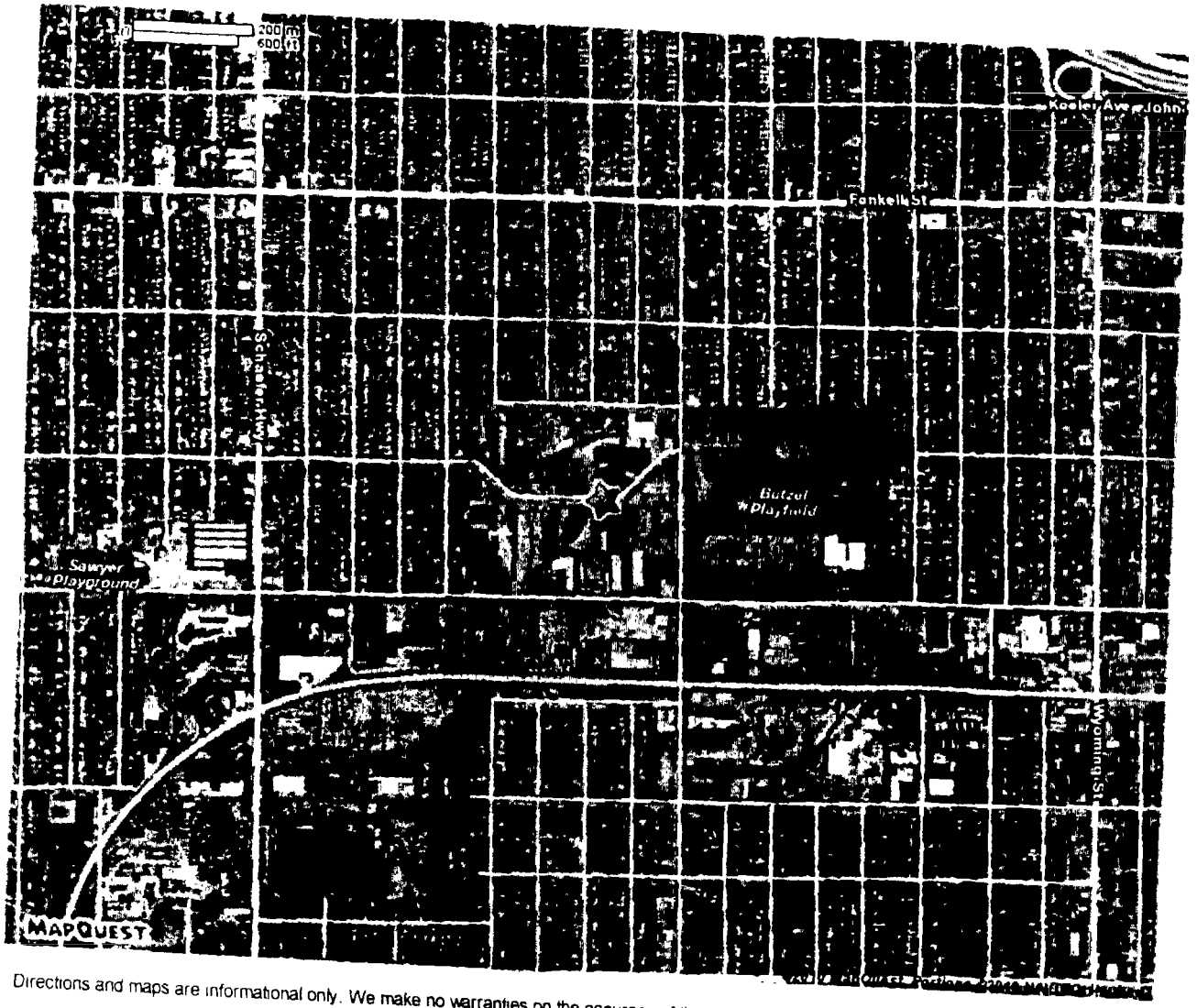
ATTACHMENT N-1

SITE LOCATION

MAPQUEST

Sorry! When printing directly from the browser your directions or map may not print correctly. For best results try clicking the Printer-Friendly button

12886 Eaton St
Detroit, MI 48227-3946



Directions and maps are informational only. We make no warranties on the accuracy of their content, road conditions or route

ATTACHMENT N-2

TERRESTRIAL SYSTEMS

TERRESTRIAL SYSTEMS
DETREX CORPORATION - GOLD SHIELD SOLVENTS FACILITY
DETROIT, MICHIGAN

The Gold Shield Solvents Facility is located in an industrial zone in Northwest Detroit. The study area surrounding the Facility, as shown in the accompanying map, includes residential, commercial, and industrial sectors, as well as a large park and a cemetery. The area was studied on August 1, and 2, 1988.

TERRESTRIAL SYSTEMS

FLORA:

There are no natural plant communities in the usual sense within the study area, with flora being determined by land use within each sector.

Within the industrial (and commercial) zone, which includes the 0.9 acre Gold Shield Solvents Facility, virtually all flora are pioneer species, characterized by their ability to become established on very poor soil under very harsh conditions. Herbacious plants identified in this area include grasses, Yellow Nut Sedge, Milkweed, Goldenrod, Chicory, and Morning Glory. Woody plants, mostly under 5 feet in height, include Cottonwood, Box Elder, Chinese Elm, Sycamore, Mulberry, Raspberry, and Virginia Creeper. Virtually all plant life within the industrial sector occurs as "weedy" growth along fences, railroad tracks, and in out of the way corners. It is apparently cut and sprayed with herbicide regularly. Except for a very few Cottonwoods and Box Elders, no plants seem to be over 2 years old, and provide no animal habitat.

Within the residential area, flora consists of well maintained lawns, and introduced trees and shrubs. The shade trees, mostly Ash, Norway Maple, and Linden, range from 4" to 16" in diameter, and appear to range up to about 40 years in age.

The Butzel playground which lies within the study area is almost entirely grass, except for a few shade trees in the area and around the perimeter.

The cemetery contains an array of plant species similar to that of the residential area, but includes a few somewhat older trees, up to 24" trunk diameter, estimated to be 60 to 70 years old.

FAUNA

While no animal life was observed, the residential areas could be expected to support populations of various songbirds and probably squirrels.

Due to the highly developed and intensely used nature of the study area, it is highly unlikely that any rare or endangered species exist in the vicinity.

AQUATIC SYSTEMS

There are no aquatic systems of any kind within the study area.

Robert Cobb, M.S.
Environmental Consultants, Inc.

ATTACHMENT N-3

SURROUNDING LAND USE
&
ZONING MAP

City of Detroit
Planning and Development Department
2300 Cadillac Tower
Detroit, MI 48226

PLEASE DELIVER THE FOLLOWING PAGES TO:

Name(s): MR DAVID CRAIG

Firm Name:

Telecopier Number (810) 799-7194

Comments: ATTACHED herewith, please find one Copy of MYLAR MAP showing current Zoning Designations for Land bordered by Meyers, Chalfonte, Lyndon, & Cheyenne; As Requested.

City of Detroit Planning and Development Department

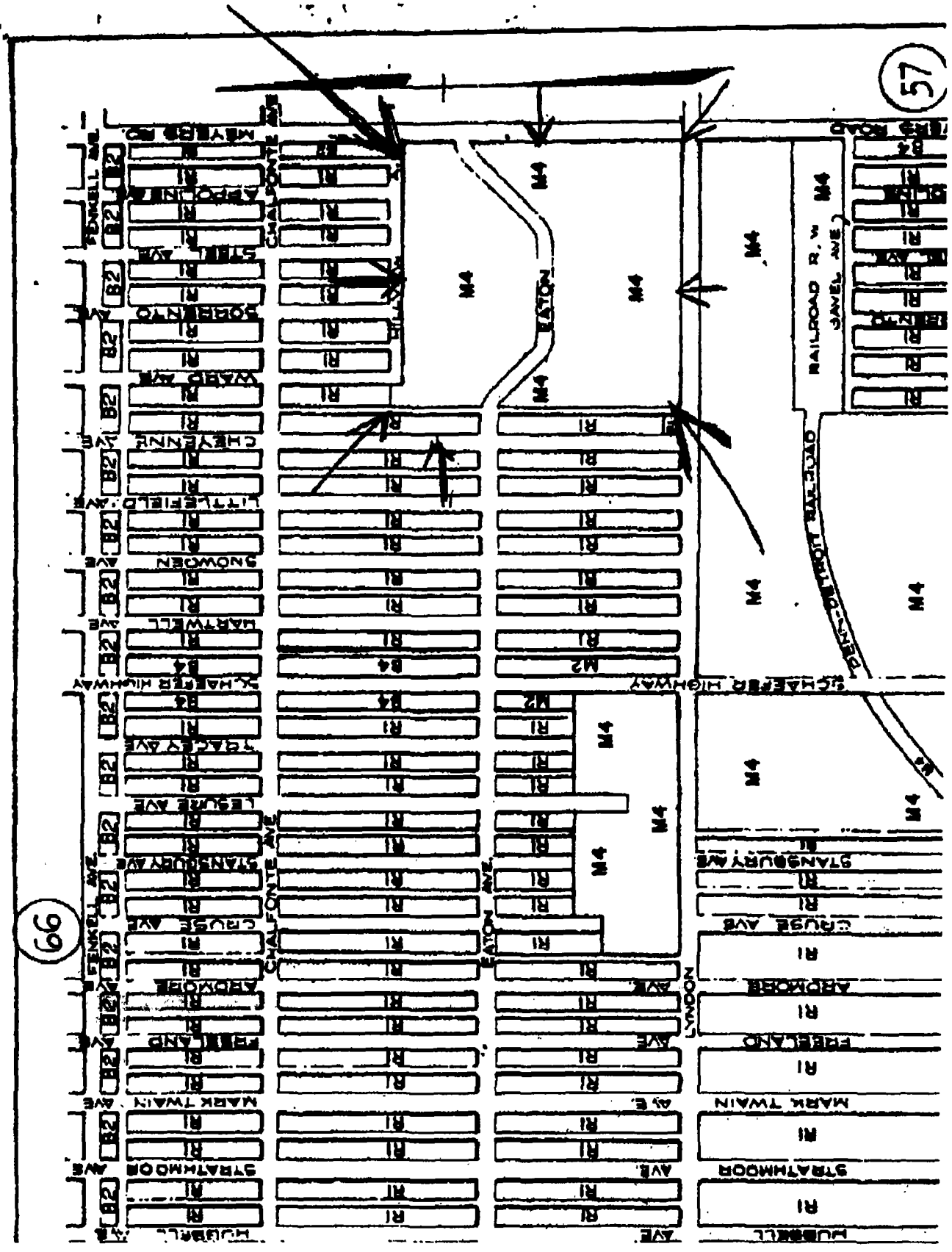
Sender: E. A. Weathersby Date: 10-16-96 Time: 12 55

Number of Pages Transmitted (Including Cover): 2

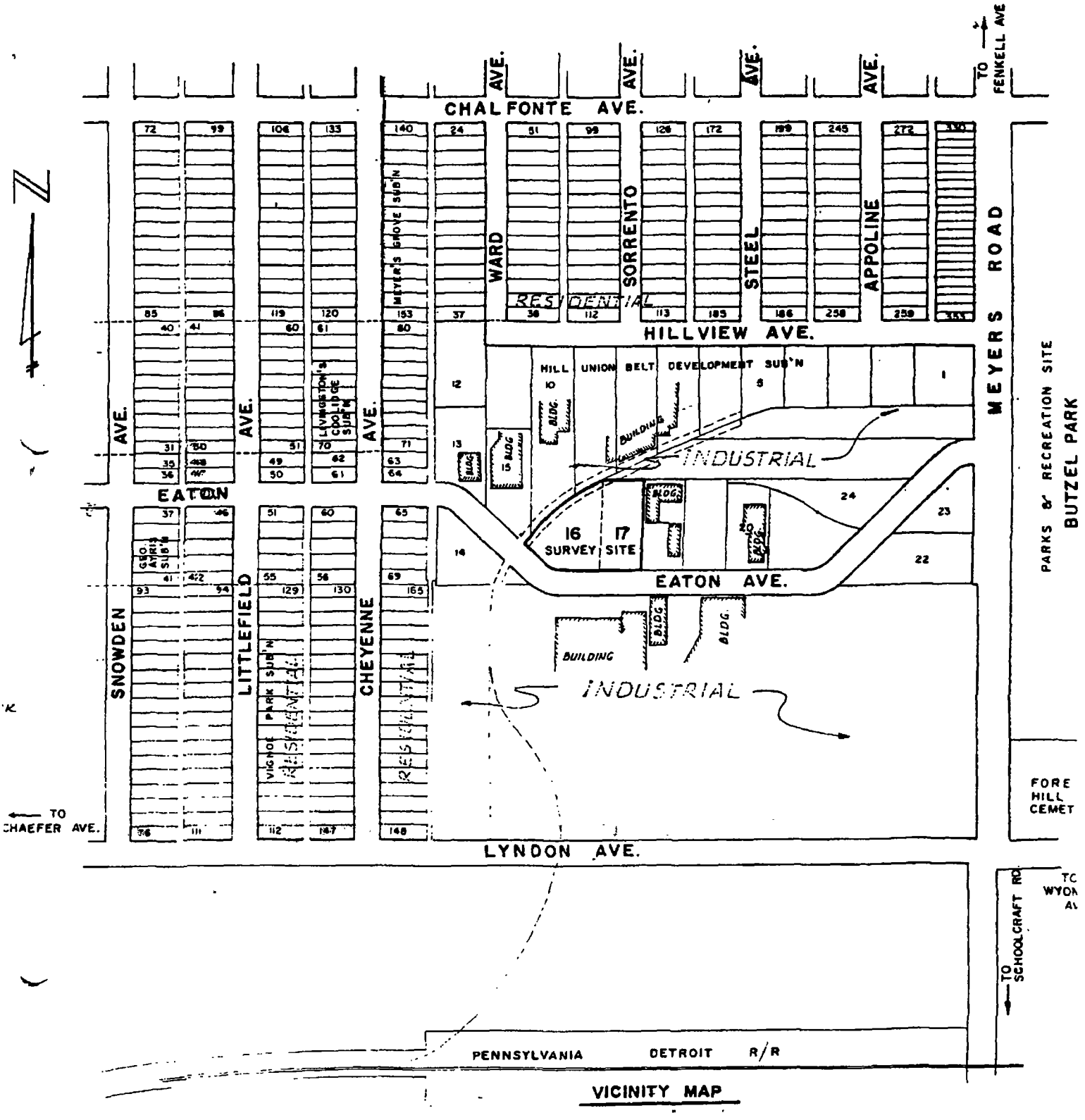
Telephone Number: (313) 224-~~6360~~ 6380 Extension: 224-3518

Telecopier Number: (313) 224-1629

Confidentiality Notice: The documents accompanying this facsimile transmission contain information belonging to the sender which is legally privileged. The information is intended only for the use of the individual(s) or entity(ies) named above. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution or the taking of any action in reliance on the contents of this telecopied information is strictly prohibited. If you have received this facsimile in error, please immediately notify us by telephone to arrange for return of the original documents.


57
66
M4
M2
R1
B2
B4
EATON
LYNDON
CHALFONTE AVE
FENKELL AVE
RAILROAD R.W.
GAVEL AVE
DENN-DETROIT RAILROAD
SCHAEFER HIGHWAY
MEYERS RD.
APPOLINE AVE
STEEL AVE
SORRENTO AVE
WARD AVE
CHEYENNE AVE
LITTLEFIELD AVE
SNOWDEN AVE
HARTWELL AVE
TRACEY AVE
LESURE AVE
STANSBURY AVE
CRUSE AVE
ARDMORE AVE
FREELAND AVE
MARK TWAIN AVE
STRATHMOOR AVE
HUBBELL AVE

ATTACHMENT B-3
EXISTING LAND USE MAP



ATTACHMENT N-4

ENVIRONMENTAL ASSESSMENT LETTER

N-4

MICHIGAN DEPARTMENT OF STATE

RICHARD H. AUSTIN SECRETARY OF STATE

LANSING
MICHIGAN 48918

BUREAU OF HISTORY

ADMINISTRATION, PUBLICATIONS
ARCHAEOLOGY AND HISTORIC
PRESERVATION
208 N. Capitol Avenue
517—373-0510

STATE ARCHIVES
3405 N. Logan Street
517—335-9165

MICHIGAN HISTORICAL MUSEUM
208 N. Capitol Avenue
517—373-3559

August 10, 1988

Mr. Bruce McConnell, B.A.S.C.
Conestoga-Rovers & Associates Limited
651 Colby Drive
Waterloo, Ontario, Canada N2V 1C2

RE: ER-88468 Environmental Assessment-Detrex Corporation Gold Shield Solvents Facility, Detroit, Wayne County

Dear Mr. McConnell:

We have reviewed the above-cited project which includes the above-cited site(s) under authority of the National Historic Preservation Act of 1966, as amended. It is the opinion of the State Historic Preservation Officer (SHPO) that the site(s) is not eligible for listing in the National Register of Historic Places. It is, therefore, further the opinion of the SHPO that this project will not affect any historic properties and is cleared under Federal Regulation 36 CFR 800 for the "Protection of Historic Properties."

Please maintain a copy of this letter with your environmental review record for this project. Should the scope of work change in any way, or if artifacts or bones are discovered, contact this office immediately. This letter evidences your compliance with 36 CFR 800.4 "Identifying Historic Properties," and the SHPO hereby waives your responsibility to notify this office under 36 CFR 800.4(d) with a determination of "No Historic Properties Found."

If you have any questions, please contact Robin S. Peebles, Environmental Review Coordinator, at (517) 335-2721. Thank you for this opportunity to review and comment.

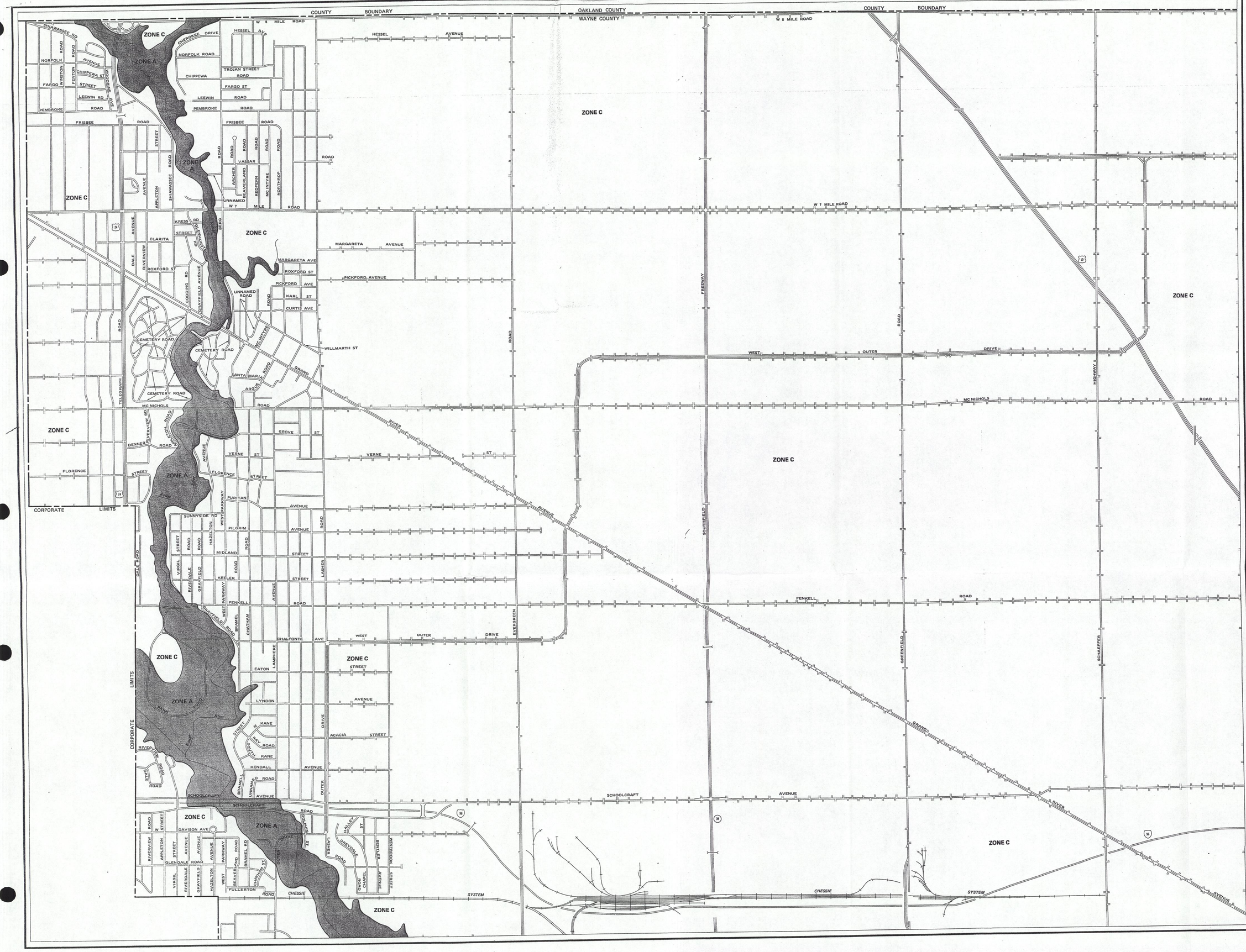
Sincerely,

Martha M. Bigelow
Director, Bureau of History
and
State Historic Preservation Officer

by:

Kathryn B. Eckert, Deputy
State Historic Preservation Officer
Bureau of History

MMB/KBE/JRH/BDC/RSP/cc



KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B / ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation In Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7 ×

River Mile — • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
JULY 26, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
FEBRUARY 7, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
JULY 2, 1981

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
DETROIT,
MICHIGAN
WAYNE COUNTY

PANEL 5 OF 45
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
260222 0005 B

EFFECTIVE DATE:
JULY 2, 1981

federal emergency management agency
federal insurance administration

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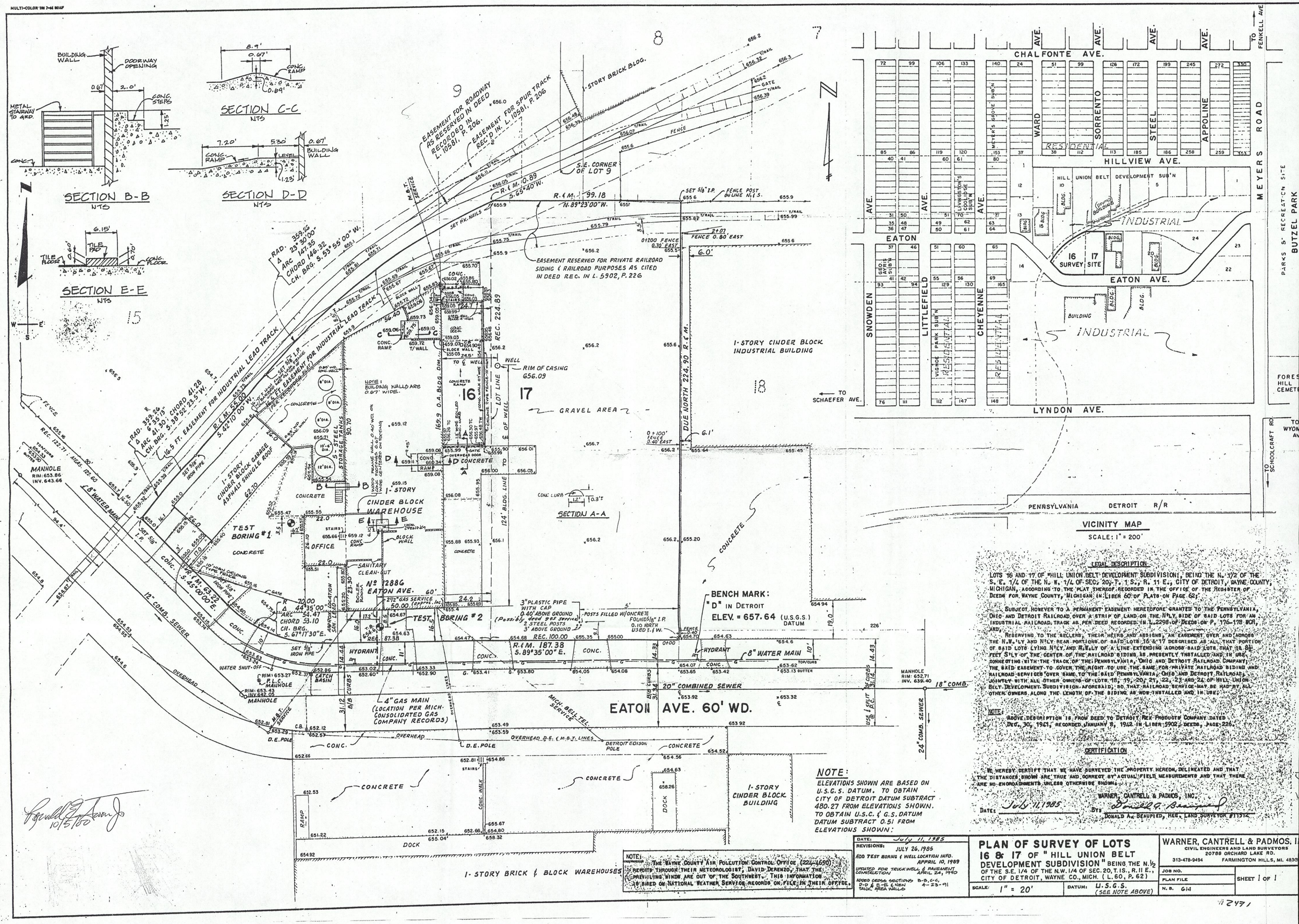

LEGAL DESCRIPTION

LOTS 16 AND 17 OF "HILL UNION BELT DEVELOPMENT SUBDIVISION", BEING THE N. 1/2 OF THE S. E. 1/4 OF THE N. W. 1/4 OF SEC. 20, T. 1 S., R. 11 E., CITY OF DETROIT, WAYNE COUNTY, MICHIGAN, ACCORDING TO THE PLAT THEREOF RECORDED IN THE OFFICE OF THE REGISTER OF DEEDS FOR WAYNE COUNTY, MICHIGAN IN LIBER 60 OF PLATS ON PAGE 62.

SUBJECT, HOWEVER TO A PERMANENT EASEMENT HERETOFORE GRANTED TO THE PENNSYLVANIA, OHIO AND DETROIT RAILROAD, OVER A STRIP OF LAND ON THE N'LY. SIDE OF SAID LOTS FOR AN INDUSTRIAL RAILROAD TRACK AS PER DEED RECORDED IN L. 2298 OF DEEDS ON P. 176-178 BCR, AND;

RESERVING TO THE SELLERS, THEIR HEIRS AND ASSIGNS, AN EASEMENT OVER AND ACROSS THE N.W.'LY AND N'LY REAR PORTIONS OF SAID LOTS 16 & 17 DESCRIBED AS ALL THAT PORTION OF SAID LOTS LYING N'LY AND N.W.'LY OF A LINE EXTENDING ACROSS SAID LOTS THAT IS 81 FEET S'LY OF THE CENTER OF THE RAILROAD SIDING AS PRESENTLY INSTALLED AND IN USE, CONNECTING WITH THE TRACK OF THE PENNSYLVANIA, OHIO AND DETROIT RAILROAD COMPANY; THE SAID EASEMENT TO COVER THE RIGHT TO USE THE SAME FOR PRIVATE RAILROAD SIDING AND RAILROAD SERVICES OVER SAME, TO THE SAID PENNSYLVANIA, OHIO AND DETROIT RAILROAD, JOINTLY WITH ALL OTHER OWNERS OF LOTS 18, 19, 20, 21, 22, 23 AND 24 OF HILL UNION BELT DEVELOPMENT SUBDIVISION AFORESAID; SO THAT RAILROAD SERVICE MAY BE HAD BY ALL OTHER OWNERS ALONG THE LENGTH OF THE SIDING AS NOW INSTALLED AND IN USE.

NOTE: ABOVE DESCRIPTION IS FROM DEED TO DETROIT REX PRODUCTS COMPANY DATED DEC. 30, 1941, RECORDED JANUARY 8, 1942 IN LIBER 5902, DEEDS, PAGE 226.

CERTIFICATION

WE HEREBY CERTIFY THAT WE HAVE SURVEYED THE PROPERTY HEREON, DELINEATED AND THAT THE DISTANCES SHOWN ARE TRUE AND CORRECT BY ACTUAL FIELD MEASUREMENTS AND THAT THERE ARE NO ENCROACHMENTS UNLESS OTHERWISE SHOWN.

WARNER, CANTRELL & PADMOS, INC.

DATE: July 11, 1985 BY: Donald A. Beaupied

DONALD A. BEAUPIED, REG. LAND SURVEYOR #11312

Donald A. Beaupied 10/5/00

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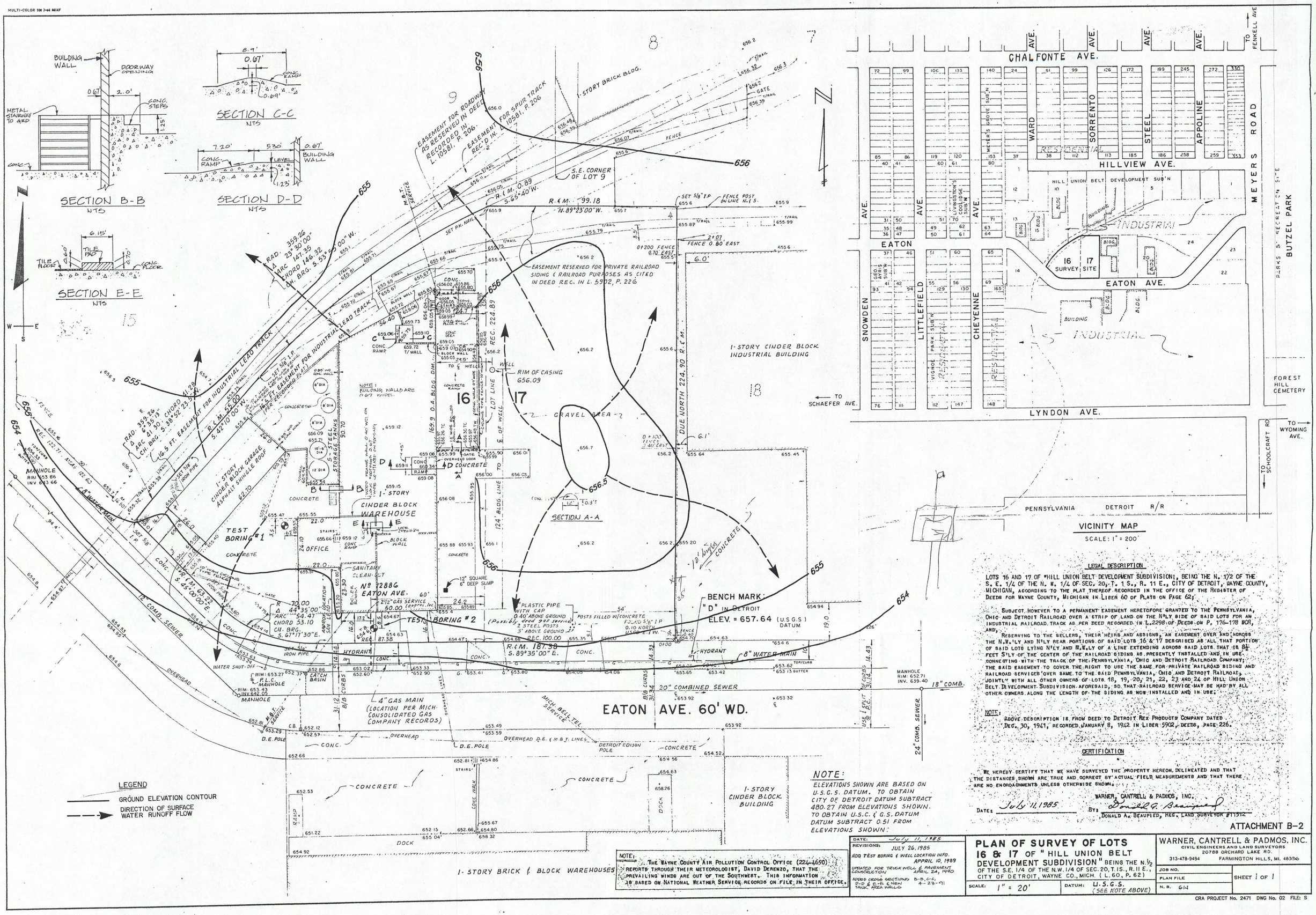

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DATE: July 11, 1985

WARNER, CANTRELL & PADMOS, INC.
BY: Donald A. Beaupied
DONALD A. BEAUPIED, REG. LAND SURVEYOR #11312

NOTE:
ELEVATIONS SHOWN ARE BASED ON U.S.G.S. DATUM. TO OBTAIN CITY OF DETROIT DATUM SUBTRACT 480.27 FROM ELEVATIONS SHOWN. TO OBTAIN U.S.C. & G.S. DATUM DATUM SUBTRACT 0.51 FROM ELEVATIONS SHOWN.

LEGEND
GROUND ELEVATION CONTOUR
DIRECTION OF SURFACE WATER RUNOFF FLOW

NOTE: THE WAYNE COUNTY AIR POLLUTION CONTROL OFFICE (224-4650) REPORTS THROUGH THEIR METEOROLOGIST, DAVID DERENZO, THAT THE PREVAILING WINDS ARE OUT OF THE SOUTHWEST. THIS INFORMATION IS BASED ON NATIONAL WEATHER SERVICE RECORDS ON FILE IN THEIR OFFICE.

DATE: July 11, 1985
REVISIONS: JULY 26, 1985
ADD TEST BORING & WELL LOCATION INFO. APRIL 10, 1989
UPDATED FOR TRUCK WELL & BASEMENT CONSTRUCTION APRIL 24, 1990
ADDED GEOLOGY SECTIONS B-B, C-C, D-D & E-E & NEW TANK AREA WALLS 4-23-91

PLAN OF SURVEY OF LOTS 16 & 17 OF "HILL UNION BELT DEVELOPMENT SUBDIVISION" BEING THE N.½ OF THE S.E. 1/4 OF THE N.W. 1/4 OF SEC. 20, T. 1S., R. 11 E., CITY OF DETROIT, WAYNE CO., MICH. (L. 60, P. 62)

SCALE: 1" = 20' DATUM: U.S.G.S. (SEE NOTE ABOVE)

WARNER, CANTRELL & PADMOS, INC.
CIVIL ENGINEERS AND LAND SURVEYORS
20788 ORCHARD LAKE RD.
313-478-9494 FARMINGTON HILLS, MI. 48336

JOB NO.
PLAN FILE
N. B. 614
SHEET 1 OF 1

ATTACHMENT B-2

CRA PROJECT No. 2471 DWG No. 02 FILE: S