US EPA RECORDS CENTER REGION 5
1004970

Michigan Act 64
Operating License Reapplication
Volume 1

prepared for . . .

Dynecol, Inc.
Detroit, Michigan
MID 074259565

September, 1988
Revised June, 1989
Revised December, 1989

WW Engineering & Science
Williams & Works, WW Facilities Group ,EDI Engineering & Science
Grand Rapids, and Allen Park, MI; Omaha, NE

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SECTION A

ACT 64 OPERATING LICENSE APPLICATION

This section contains the Dynecol, Inc. Act 64 operating license application which delineates the hazardous wastes which are treated and stored at the facility. The information submitted in this application is in accordance with the requirements of Michigan Act 64, Rule 299.9504(1) which incorporates 40 CFR 270.13 by reference. This submittal supersedes all prior Part A application submittals made by Dynecol, Inc.

ACT 64 OPERATING LICENSE APPLICATION

RATIONALE FOR REVISIONS TO PRIOR PART A APPLICATIONS

In accordance with the Resource Conservation and Recovery Act (RCRA) in November, 1980, Dynecol Inc. submitted an application for a hazardous waste permit (EPA Form 1 General and EPA Form 3 RCRA, which together are called the Part A application). The Part A application was subsequently revised in October, 1984.

The Michigan Department of Natural Resources (MDNR) Operating License application (Form 1 and Form 3), which is being submitted as part of this Act 64 Operating License application, has been revised to reflect the following changes to the 1984 Part A application.

Form 3, page A-4, Item III, Lines 1 and 2

The amount of tank storage has been changed from 80,000 gallons to 34,000 gallons. The remainder, 46,000 gallons, has been transferred from tank storage to container storage.

Form 3, page A-6, Item IV, Lines 11, 12, 13, and 14

The EPA Hazardous Waste Codes F006, F019, 001D and 003D have been added to the types of waste that will be stored and/or treated in tanks at Dynecol. The waste codes contained in Appendix A, C.1a-C.1d will be stored in the container storage facility.

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Required under authority of Act 64 PA 1979 as amended and Act 136, PA

FORM 1 GENERAL

DNR

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: F MI D 074259565 D

APPLICATION FOR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITY CONSTRUCTION PERMIT OR OPERATING LICENSE

II. CONSTRUCTION PERMIT OR OPERATING LICENSE APPLICATION (check one)

A. ☐ CONSTRUCTION PERMIT APPLICATION

B. ☒ OPERATING LICENSE APPLICATION

If this is an operating license application, mark an X in the appropriate box:

1. ☐ FIRST APPLICATION (NEW FACILITY)
2. ☐ FIRST APPLICATION (EXISTING FACILITY)
3. ☒ RENEWAL APPLICATION
4. ☐ APPLICATION FOR LICENSE REVISION
5. ☐ RESEARCH, DEVELOPMENT & DEMONSTRATION LICENSE APPLICATION

III. NAME OF FACILITY

1 SKIP DYNECOL INC

V. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 BIERMANN FRANK PRESIDENT	313 571 7140

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX: 3 6520 GEORGIA

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 DETROIT	MI	48211

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: 5 6520 GEORGIA

B. COUNTY NAME: WAYNE

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 DETROIT	MI	48211	

VIB. TITLEHOLDER OF LAND

A. NAME: 8 PVS CHEMICALS INC

E. STREET OR P.O. BOX: 1001 HARPER AVE

F. CITY OR TOWN	G. STATE	H. ZIP CODE	D. PHONE (area code & no.)
8 DETROIT	MI	48213	A 313 921 1200

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST	B. SECOND
7 8999 (specify) Services, NEC (see Item XII)	7 (specify)
C. THIRD	**D. FOURTH**
(specify)	7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: 8 DYNECOL INC

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☒ NO

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other", specify.)*
F = FEDERAL, M = PUBLIC *(other than federal or state)*, S = STATE, O = OTHER *(specify)*, P = PRIVATE: P (specify)

D. PHONE *(area code & no.)*: A 313 571 7140

E. STREET OR P.O. BOX: 6520 GEORGIA

F. CITY OR TOWN: 8 DETROIT | G. STATE: MI | H. ZIP CODE: 48211

IX. INDIAN LAND — Is the facility located on Indian lands? ☐ YES ☒ NO

IX. OWNERSHIP

A. NAME: 8 PVS CHEMICALS INC

E. STREET OR P.O. BOX: 11001 HARPER AVE

F. CITY OR TOWN: 8 DETROIT | G. STATE: MI | H. ZIP CODE: 48213 | D. PHONE *(area code & no.)*: A 313 921 1200

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*: 9 N N/A	D. PSD *(Air Emissions from Proposed Sources)*: 9 P N/A
B. UIC *(Underground Injection of Fluids)*: 9 U N/A	E. OTHER *(specify)*: 9 - AIR PERMIT (specify) See Appendix A.1
C. RCRA *(Hazardous Wastes)*: 9 R N/A	E. OTHER *(specify)*: 9 SEWER DISCHARGE (specify) See Appendix A.1

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. 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 precise requirements. SEE ATTACHED FIGURES

XII. NATURE OF BUSINESS *(provide a brief description)*

1. TRANSPORTER -Off-site transportation of hazardous waste (by highway).
2. STORAGE - Holding of hazardous waste for a tempory period, at the end of which the hazardous waste is treated, and/or disposed of.
3. TREATMENT - Technique or process, including neutralization, designed to change the physical, chemical, or biological character of composition of hazardous waste, so as to neutralize such waste or as to render such waste non-hazardous.

XIII. FEE INFORMATION (check A or B)

A. ☐ CONSTRUCTION PERMIT FEE

1. ☐ COST OF REVIEW
2. ☐ FIXED FEE (complete the following) — FEE

a. Check type of facility:

- ☐ Land Disposal ($9,000) — $_____
- ☐ Incineration or other treatment ($7,200) — $_____
- ☐ Storage ($500) — $_____

b. Site size _____ acres (see fee schedule) — $_____

c. Projected waste volume (see fee schedule)

_____ Gallons/day — $_____

OR _____ Cubic yards/day — $_____

d. Hydrogeological characteristics for land disposal

- ☐ Natural Clay
- ☐ Sand
- ☐ Compacted Clay
- ☐ Artificial Liner — $_____

e. For treatment or storage facilies:
Is there surface water on the site?

- ☐ No
- ☐ Yes ($75) — $_____

TOTAL FIXED FEE COST: — $_____

B. ☒ OPERATING LICENSE FEE — $ 500.00

XIV. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Frank J. Biermann President		

XV. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Allan A. Schlumberger Vice President	Allan A. Schlumberger	6/20/89

XVI. TITLEHOLDER OF LAND CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Allan A. Schlumberger Vice President	Allan A. Schlumberger	6/20/89

Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

FORM 3 RCRA

DNR

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

I. EPA I.D. NUMBER: F M I D 0 7 4 2 5 9 5 6 5

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED 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 revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

C 8 — YR. 7 6 — MO. 0 9 — DAY 1 5

FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

☐ 2. NEW FACILITY *(Complete item below.)*

YR. — MO. — DAY

FOR NEW FACILITIES PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION

XX 1.

☐ 2.

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY — For each code entered in column A enter the capacity of the process.

1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP T/A C 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	46,000	G		7				
2	S 0 2	34,000	G		8				
3	T 0 1	144,000	G		9				
4					10				

Continued from the front.

III. PROCESSES *(continued)*

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

N/A

IV. DESCRIPTION OF HAZARDOUS WASTES

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

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

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

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

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

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.
2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

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

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

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

LINE 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)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K054	900	P	T03 D80	
-2	D002	400	P	T03 D80	
X-3	D001	100	P	T03 D80	
X-4	D002				included with above

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
W M I D 0 7 4 2 5 9 5 6 5 — T/A/C 1	W DUP — T/M/C 2 — DUP

V. DESCRIPTION OF HAZARDOUS WASTES (continued)

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)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	D002	11,520,000	P	S02 T01	
2	D004	5,760,000	P	S02 T01	
3	D005	5,760,000	P	S02 T01	
4	D006	5,760,000	P	S02 T01	
5	D007	5,760,000	P	S02 T01	
6	D008	5,760,000	P	S02 T01	
7	D009	5,760,000	P	S02 T01	
8	D010	5,760,000	P	S02 T01	
9	D011	5,760,000	P	S02 T01	
10	K062	224,640,000	P	S02 T01	
11	F006	2,880,000	P	S02 T01	Waste must contain less than 20 mg/l total cyanides
12	F019	2,880,000	P	S02 T01	Waste must contain less than 20 mg/l total cyanides
13	001D	5,760,000	P	S02 T01	
14	003D	5,760,000	P	S02 T01	
15		1,772,000	P	S01	See Table A.1 for listing of all waste codes which potentially are
16					stored in the container storage facility.
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. *(enter from page 1)*

F	M	I	D	0	7	4	2	5	9	5	6	5		6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*. see attached fi

VI. PHOTOGRAPHS

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

I. FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
42 23 035	083 01 056

VIII. GENERAL INFORMATION

Attach each of the following as separate attachments to the application:

1. General facility description
2. Chemical & physical analysis
3. Waste analysis plan
4. Security procedures
5. Inspection schedule
6. Contingency plan
7. Preparedness/prevention
8. Traffic information
9. Location information
10. Training program
11. Closure/post-closure plan
12. Cost estimates
13. Liability mechanism
14. Financial assurance
15. Topographic map

IX. SUPPLEMENTAL INFORMATION

Attach for all applications:

1. Hydrogeological report
2. Environmental assessment
3. Environmental monitoring program
4. Engineering plans

Attach for operating license applications only:

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

X. FACILITY SPECIFIC INFORMATION

Attach the required technical information for each of the following:

1. Containers
2. Tanks
3. Incineration or thermal treatment
4. Treatment
5. Surface impoundments
6. Waste piles
7. Landfills
8. Land treatment

Continued from page 4.

V. FACILITY DRAWING (see page 4)

SEE FIGURE A.1 SITE LOCATION MAP

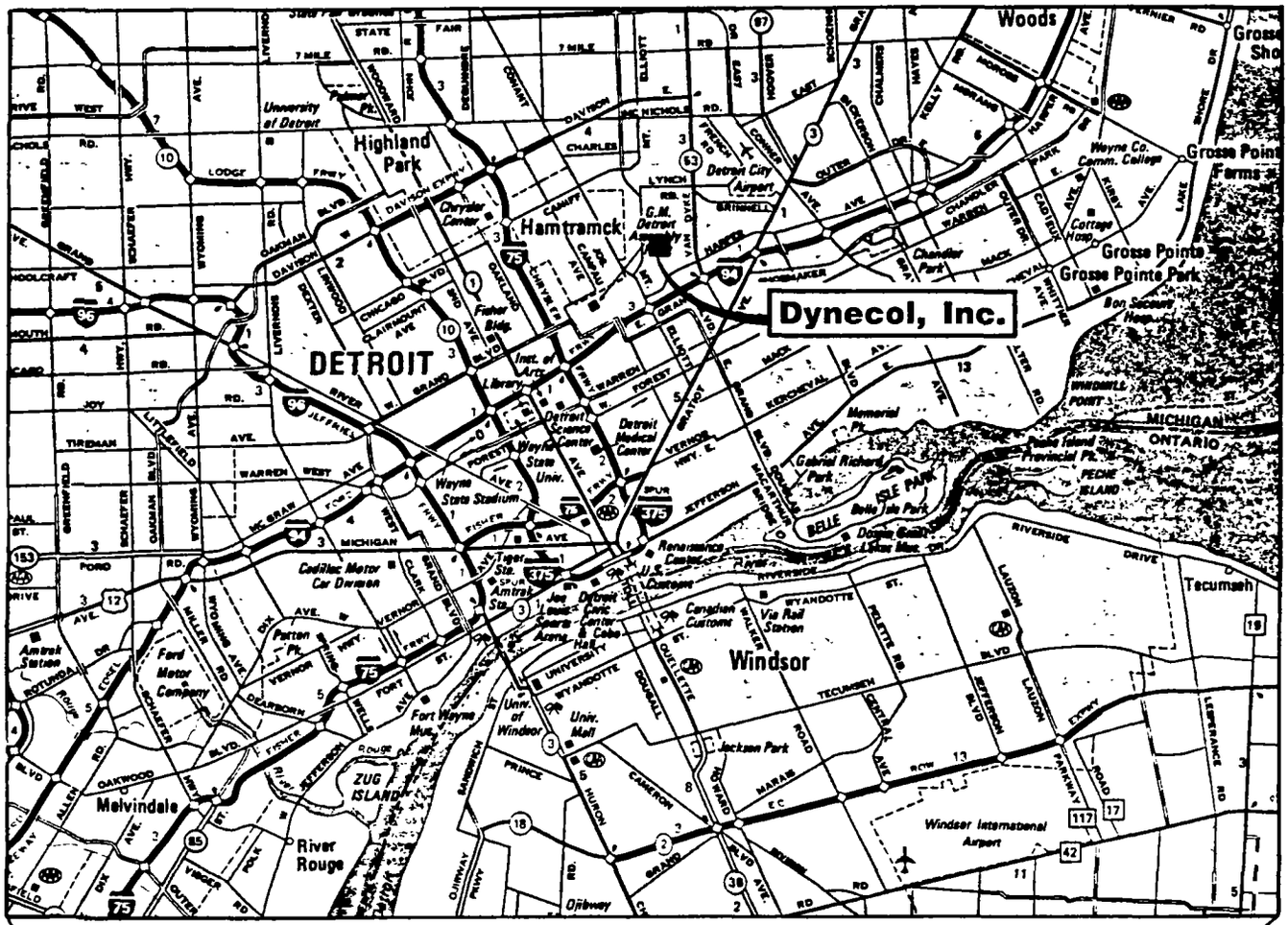
Figure A.2 SITE MAP

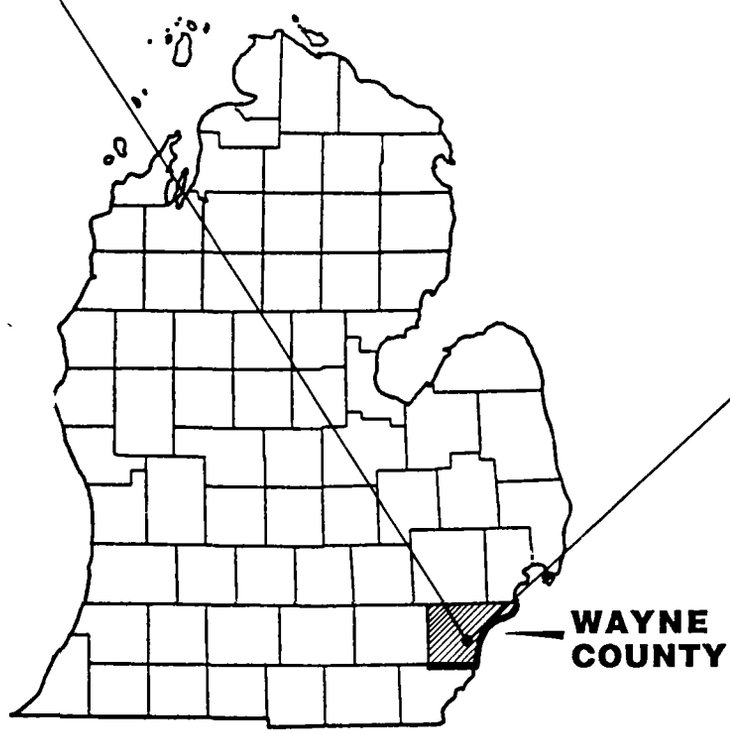
APPENDIX A.1 OTHER ENVIRONMENTAL PERMITS

APPENDIX A.1a INSTALLATION PERMITS FOR CAUSTIC RECYCLE SCRUBBER AND ACID STORAGE TANKS

APPENDIX A.1b DETROIT WATER AND SEWERAGE DISCHARGE PERMIT

APPENDIX A.2 FACILITY PHOTOGRAPHS





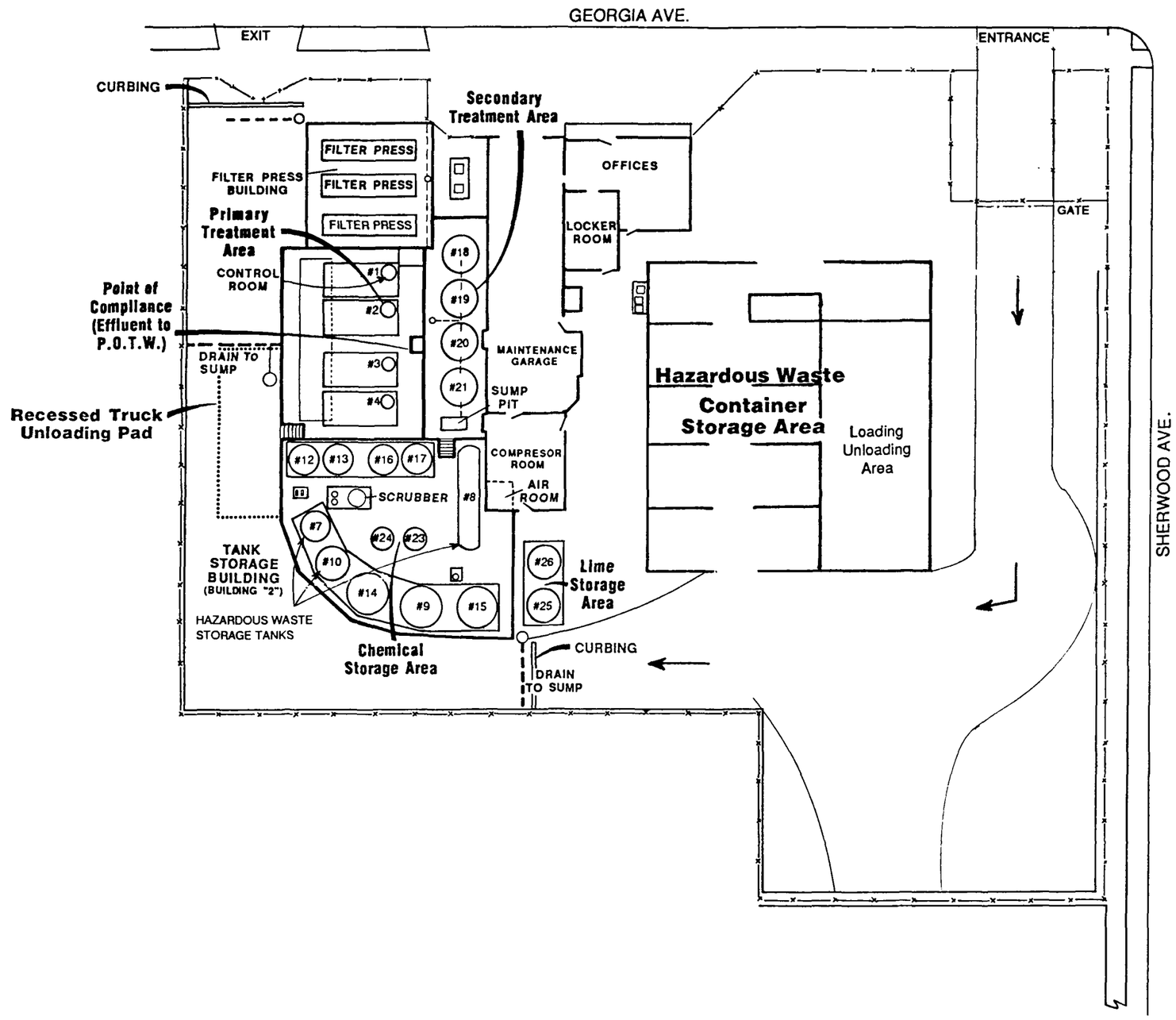
Figures A.1, B.1, E.1, J.1

Site Location Map

Dynecol, Inc.
Detroit, Michigan

May, 1988 20878

EDI Engineering & Science



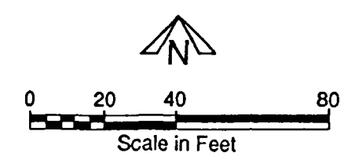


Figure A.2, B.3, G.1, F.1

Site Map

Dynecol, Inc.
Detroit, Michigan

November, 1989 20878

EDI Engineering & Science

Pages A-12, B-5, G-3, F-15

Table A.1

Hazardous Waste Types for Storage in Containers
(Appendix C.1)

APPENDIX C.1

Acceptable Hazardous Wastes Types - Container Storage Facility

APPENDIX C.1a
CHARACTERISTICALLY HAZARDOUS WASTES AND HAZARDOUS WASTES FROM NON-SPECIFIC SOURCES

Generic Waste Codes Acceptable for Bulking

F001	F005
F002	F006
F003	F019
F004	F024

Generic Waste Codes Acceptable for Storage Only

F007	F010
F008	F011
F009	F012

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Acceptable for Bulking	Waste Description
D002	Y	Inorganic solutions, pH $\leq$ 2.0 or pH $\geq$ 12.5
D004	Y	Inorganic solution & sludges, arsenic
D005	Y	Inorganic solution & sludges, barium
D006	Y	Inorganic solution & sludges, cadmium
D007	Y	Inorganic solution & sludges, chromium
D008	Y	Inorganic solution & sludges, lead
D009	Y	Inorganic solution & sludges, mercury
D010	Y	Inorganic solution & sludges, selenium
D011	Y	Inorganic solution & sludges, silver
D012	Y	Characteristic of EP toxicity, Endrin
D013	Y	Characteristic of EP toxicity, Lindane
D014	Y	Characteristic of EP toxicity, Methoxychlor
D015	Y	Characteristic of EP toxicity, Toxaphene
D016	Y	Characteristic of EP toxicity, 2, 4-D
D017	Y	Characteristic of EP toxicity, 2.4.5-TP
001D	Y	Inorganic solution & sludges, copper
003D	Y	Inorganic solution & sludges, zinc

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Waste Description
D001	Characteristic of ignitability
D003	Characteristic of reactivity

APPENDIX C.1B
HAZARDOUS WASTE CODES FROM SPECIFIC SOURCES

Hazardous Waste Codes from Specific Sources

K Waste Codes Acceptable for Bulking

K001	K017	K029	K116	K037	K049
K002	K018	K095	K117	K038	K050
K003	K019	K096	K118	K039	K051
K004	K020	K030	K136	K040	K052
K005	K021	K083	K071	K041	K061
K006	K022	K103	K073	K098	K062
K008	K023	K104	K106	K042	K069
K009	K024	K085	K031	K043	K100
K010	K093	K105	K032	K099	K084
K011	K094	K111	K033	K123	K101
K013	K025	K112	K034	K124	K102
K014	K026	K113	K097	K125	K086
K015	K027	K114	K035	K126	K087
K016	K028	K115	K036	K048	

K Waste Codes Acceptable for Storage Only

K007
K060

APPENDIX C.1c
DISCARDED COMMERCIAL CHEMICAL PRODUCTS, OFF-SPECIFICATION SPECIES, CONTAINER RESIDUES, AND SPILL RESIDUES

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Chemical Abstract Number	Acceptable For Bulking	Description
P001	81-81-2	Y	Warfarin & salts,
P005	107-18-6	Y	Allyl alcohol
P022	75-15-0	Y	Carbon disulfide
P028	100-44-7	Y	Benzene, (chloromethyl)
P037	60-57-1	Y	Dieldrin
P047	534-52-1	Y	4,6-Dinitro-o-cresol, & salts
P051	72-20-8	Y	Endrin
P059	76-44-8	Y	Heptachlor
P077	100-01-6	Y	p-Nitroaniline

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
P002	591-08-2	Acetamide, n-(aminothioxomethyl)-
P004	309-00-2	Aldrin
P008	504-24-5	4-Aminophyridine
P009	131-74-8	Ammonium picrate (R)
P010	7778-39-4	Arsenic acid H3AsO4
P013	542-62-1	Barium cyanide
P016	542-88-1	Methane, oxybis(chloro-
P017	598-31-2	Bromoacetone
P020	88-85-7	Phenol, 2-(1-methylpropyl)-4,6-nitro
P021	592-01-8	Calcuim cyanide
P024	106-47-8	p-Chloroaniline
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide Cu(CN)
P030		Cyanides (soluble cyanide salts)
P031	460-19-5	Cyanogen
P033	507-77-4	Cyanogen chloride
P034	131-89-5	Phenol, 2 cyclohexyl-4,6-dinitro
P036	696-28-6	Dichlorophenylarsine
P038	692-42-2	Diethylarsine
P039	298-04-0	Disulfoton
P040	297-97-2	O,O-Diethyl O-pyrazinyl
P041	311-45-5	Diethyl p-nitrophenyl phosphate
P042	51-43-4	Epinephrine
P043	55-91-4	Diisopropylflourophosphate(DFP)
P044	60-51-5	Dimethoate
P045	39196-18-4	2-Butanone, 3,3 dimenthyl
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P048	51-28-5	Phenol, 2,4,-dinitro
P049	514-53-7	Dithiobiuret
P054	151-56-4	Aziridine
P057	640-19-7	Fluroacetamide
P058	62-74-8	Fluroacetic acid, sodium salt
P060	465-73-6	Isodrin
P062	757-58-4	Hexaethyl tetraphosphate
P064	624-83-9	Methane, isocyanato-
P066	16752-77-5	Methomyl
P068	60-34-4	Hydrazine, methyl
P069	75-86-5	2-Methyllactonitrile
P071	298-00-0	Methyl parathion
P072	86-88-4	Alpha-Naphthylthiourea
P074	557-19-7	Nickel cyanide
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P088	145-73-3	Endothall
P092	62-38-4	Mercury, (acetato-O)phenyl
P097	52-85-7	Famphur
P098	151-50-8	Potassium cyanide
P099	506-61-6	Potassium silver cyanide
P101	107-12-0	Ethyl cyanide
P102	107-19-7	Propargyl alcohol
P103	630-10-4	Selenourea
P104	506-64-9	Silver Cyanide
P105	26628-22-8	Sodium azide

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
P106	143-33-9	Sodium cyanide
P109	3689-24-5	Tetraethyldithiopyrophosphate
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Ammonium vanadate
P121	557-21-1	Zinc Cyanide
P122	1314-84-7	Zinc phosphide Zn3P2

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Chemical Abstract Number	Acceptable For Bulking	Description
U002	67-64-1	Y	Acetone (I)
U003	75-05-8	Y	Acetonitrile (I,T)
U007	79-06-1	Y	Acrylamide
U008	79-10-7Y	Y	Acrylic Acid (I)
U009	107-13-1	Y	Acrylonitrile
U012	62-53-3	Y	Aniline (I,T)
U019	71-43-2	Y	Benzene (I,T)
U025	111-44-4	Y	Dichloroethyl ether
U029	74-83-9	Y	Methyl bromide
U031	71-36-3	Y	n-Butyl alcohol (I)
U036	57-74-9	Y	Chlordane, alpha & gamma isomers
U037	108-90-7	Y	Chlorobenzene
U041	106-89-8	Y	Epichlorohydrin
U044	67-66-3	Y	Chloroform
U045	74-87-3	Y	Methyl chloride (I,T)
U052	1319-77-3	Y	Cresol (Cresylic acid)
U055	98-82-8	Y	Cumene (I)
U056	110-82-7	Y	Cyclohexane (I)
U057	108-94-1	Y	Cyclohexanone (I)
U067	106-93-4	Y	Ethylene dibromide
U070	95-50-1	Y	o-Dichlorobenzene
U071	541-73-1	Y	m-Dichlorobenzene
U072	106-46-7	Y	p-Dichlorobenzene
U073	91-94-1	Y	3,3'-Dichlorobenzidine
U076	75-34-3	Y	Ethane, 1,1-dichloro-
U077	107-06-2	Y	Ethane, 1,2-dichloro-
U078	75-35-4	Y	1,1-Dichloroethylene
U079	156-60-5	Y	1,2-Dichloroethylene
U080	75-09-2	Y	Methylene chloride
U083	78-87-5	Y	Propylene dichloride
U093	60-11-7	Y	p-Dimethylaminoazobenzene
U102	131-11-3	Y	Dimethyl Phthalate
U103	77-78-1	Y	Dimethyl sulfate
U105	121-14-2	Y	2,4-Dinitrotoluene
U106	606-20-2	Y	2,6-Dinitrotoluene
U107	117-84-0	Y	Di-n-octyl phthalate
U108	123-91-1	Y	1,4-Dioxane
U112	141-78-6	Y	Ethyl acetate (I)
U113	140-88-5	Y	Ethyl acrylate (I)
U117	60-29-7	Y	Ethyl ether (I)
U122	50-00-0	Y	Formaldehyde
U123	64-18-6	Y	Formic acid (C,T)
U125	98-01-1	Y	Furfural (I)
U129	58-89-9	Y	Lindane
U131	67-72-1	Y	Hexachloroethane
U134	7664-39-3	Y	Hydrofluoric acid (C,T)
U138	74-88-4	Y	Methyl iodide
U140	78-83-1	Y	Isobutyl alcohol (I,T)
U144	301-04-2	Y	Lead acetate
U147	108-31-6	Y	Maleic anhydride

U151	7439-97-6	Y	Mercury
U154	67-56-1	Y	Methanol (I)

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Chemical Abstract Number	Acceptable For Bulking	Description
U159	78-93-3	Y	Methyl ethyl ketone (MEK)(I,T)
U161	108-10-1	Y	Methyl isobutyl ketone (I)
U165	91-20-3	Y	Naphthalene
U167	134-32-7	Y	1-Naphthalenamine
U168	91-59-8	Y	2-Naphthalenamine
U169	98-95-3	Y	Nitrobenzene (I,T)
U171	79-46-9	Y	Nitropropane
U183	608-93-5	Y	Pentachlorobenzene
U188	108-95-2	Y	Phenol
U190	85-44-9	Y	Phthalic Anhydride
U191	109-06-8	Y	Pyridine, 2-methyl-
U196	110-86-1	Y	Pyridine
U201	108-46-3	Y	Resorcinol
U202	81-06-2	Y	Saccharin, & salts
U204	7783-00-8	Y	Selenious acid
U205	7488-56-4	Y	Selenium sulfide
U207	95-94-3	Y	1,2,4,5-Tetrachlorobenzene
U208	630-20-6	Y	1,1,1,2-Tetrachloroethane
U209	79-34-5	Y	1,1,2,2-Tetrachloroethane
U210	127-18-4	Y	Tetrachloroethylene
U211	56-23-5	Y	Carbon tetrachloride
U213	109-99-9	Y	Tetrahydrofuran (I)
U214	563-68-8	Y	Thallium (I) acetate
U215	6533-73-9	Y	Thallium (I) carbonate
U220	108-88-3	Y	Toluene
U221	25376-45-8	Y	Toluenediamine
U223	26471-62-5	Y	Toluene disocyanate (R,T)
U225	75-25-2	Y	Bromoform
U226	71-55-6	Y	Methyl chloroform
U227	79-00-5	Y	1,1,2-Trichloroethane
U228	79-01-6	Y	Trichloroethylene
U239	1330-20-7	Y	Xylene (I)
U244	137-26-8	Y	Thiram
U248	81-81-2	Y	Warfarin, & salts, when present at concentrations of 3% or less
U328	95-53-4	Y	o-Toluidine
U353	106-49-0	Y	p-Toluidine
U359	110-80-5	Y	Ethylene glycol monoethyl ether

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
U001	75-07-0	Acetaldehyde (1)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U010	50-07-7	Mitomycin C
U011	61-82-8	Amitrole
U014	492-80-8	Auramine
U015	115-02-6	Azaserine
U016	225-51-4	Benz[c]acridine
U017	98-87-3	Benzal chloride
U018	56-55-3	Benz[a]anthracene
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U021	92-87-5	Benzidine
U022	50-32-8	Benzo[a]pyrene
U024	111-91-1	Dichloromethoxy ethane
U026	494-03-1	Chlornaphazin
U027	108-60-1	Dichloroisoprophy ether
U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U032	13765-19-0	Calcium chromate
U033	353-50-4	Carbonic oxyfluoride
U034	75-87-6	Acetaldehyde, Trichloro-
U035	305-03-3	Chlorambucil
U038	510-15-6	Chlorobenzilate
U039	59-50-7	Phenol, 4-chloro-3-methyl-
U042	110-75-8	2-Chloroethyl vinyl ether
U043	75-01-4	Vinyl Chloride
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	Phenol, 2-chloro-
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U050	218-01-9	Chrysene
U051		Cresote
U058	50-18-0	Cyclophosphamide
U059	20830-81-3	Daunomycin
U060	72-54-8	DDD
U061	50-29-3	DDT
U062	2303-16-4	Diallate
U063	53-70-3	Dibenz[a,h]anthracene
U064	189-55-9	Dibenzo[a,i]pyrene
U068	74-95-3	Methane, dibromo-
U069	84-74-2	dibutyl phthalate
U074	764-41-0	1,4-Dichloro-2-butene (I,T)
U075	75-71-8	Dichlorodifluoromethane
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U084	542-75-6	1,3-Dichloropropene
U085	1464-53-5	2,2'-Bioxirane

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
U086	1615-80-1	Hydrazine, 1,2-dimethyl-
U087	3288-58-2	Phosphorodithioic acis, O,O-diethyl
U088	84-66-2	Diethyl Phthalate
U089	56-53-1	Diethylstibesterol
U090	94-58-6	Dihydrosafrole
U091	119-90-4	3,3'-Dimethoxybenzidine
U092	134-40-3	Dimethylamine (I)
U094	57-97-6	7,12-Dimethylbenz[a]anthracene
U095	119-93-7	3,3'-Dimethylbenzidine
U096	80-15-9	Hydroperoxide, 1-methyl-1-phenylethy
U097	79-44-7	Dimethylcarbamoyl chloride
U099	540-73-8	Hydrazine, 1,2-dimethyl-
U101	105-67-9	2,4-Dimethylphenol
U109	122-66-7	Hydrazine, 1,2-dimethyl-
U110	142-84-7	Dipropylamine (I)
U111	621-64-7	Di-n propylnitrosamine
U114	111-54-6	Carbamodithioic acid, 1,2-ethanediyl
U115	75-21-8	Oxirane (I,T)
U116	96-45-7	Ethylenethiourea
U118	97-63-2	Ethyl methacrylate
U119	62-50-0	Ethyl methanesulfonate
U120	206-44-0	Fluoranthene
U121	75-69-4	Methane, trichlorofluoro-
U124	110-00-9	Furfuran (I)
U126	765-34-4	Glycidyladehyde
U127	118-74-1	Hexachlorobenzene
U128	87-68-3	Hexachlorobutadiene
U132	70-30-4	Phenol, 1,1'-methylenebis[3,4,6-tric
U133	302-01-2	Hydrazine (R,T)
U135	7783-06-4	Hydrogen sulfide
U136	75-60-5	Cacodylic acid
U137	193-39-5	Indeno[1,2,3-cd]pyrene
U139	9004-66-4	Iron dextran
U141	120-58-1	Isosafrole
U143	303-34-4	Lasiocarpine
U145	7446-27-7	Lead phosphate
U146	1335-32-6	Lead subacetate
U148	123-33-1	Maleic hydrazide
U149	109-77-3	Malononitrile
U150	148-82-3	Melphalan
U152	126-98-7	Methacrylonitrile (I,T)
U153	74-93-1	Methanethiol (I,T)
U155	91-80-5	Methapyrilene
U156	79-22-1	Methyl chlorocarbonate (I,T)
U157	56-49-5	3-Methylcholanthrene
U158	101-14-4	4,4-Methylenebis(2-chloroaniline)
U162	80-62-6	Methyl methacrylate (I,T)
U163	70-25-7	MNNG
U164	56-04-2	Methylthiouracil
U166	130-15-4	1,4-Naphthalenedione
U170	100-02-7	Phenol, 4-nitro-

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	Urea, N-ethyl-N-nitroso-
U177	684-93-5	Urea, N-methyl-N-nitroso-
U178	615-53-2	N-Nitroso-N-methylurethane
U179	100-75-4	N-Nitrosopiperidine
U180	930-55-2	Pyrrolidine, 1-nitroso-
U181	99-55-8	5-Nitro-o-toluidine
U182	123-63-7	Paraldehyde
U184	76-01-7	Pentachloroethane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
U186	504-60-9	1-Methylbutadiene (I)
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
U189	1314-80-3	Phosphorus sulfide (R)
U192	23950-58-5	Pronamide
U193	1120-71-4	1,3-Propane sultone
U194	107-10-8	1-Propanamine (I,T)
U197	1-7-51-4	p-Benzoquinone
U200	50-55-5	Reserpine
U203	94-59-7	Safrole
U206	18883-66-4	Streptozotocin
U216	7791-12-0	Thallium (I) chloride
U217	10102-45-1	Thallium (I) nitrate
U218	62-55-5	Thioacetamide
U219	62-56-5	Thiourea
U222	636-21-5	o-Toluidine hydrochloride
U234	99-35-4	1,3,5-Trinitrobenzene (R,T)
U235	126-72-7	Trist (2,3-dibromopropyl)phosphate
U236	72-57-1	Trypan blue
U238	51-79-6	Ethyl carbamate (urethane)
U240	94-75-7	2,4D, salts & esters
U243	1888-71-7	Hexachloropropene
U246	506-68-3	Cyanogen bromide (CN)Br
U247	72-43-5	Methoxychlor
U249	1314-84-7	Zinc phosphpide Zn_3P_2, when present at concentrations of 10% or less

APPENDIX C.1d
MDNR LISTED WASTES

Waste Codes Acceptable for Bulking

Michigan Hazardous Waste Number	Acceptable for Bulking	Description
011U	Y	o-Anisidine
033U	Y	2-Chloroethanol
054U	Y	Dichlorvos
059U	Y	EPN
070U	Y	Hydroquinone
072U	Y	Hypochlorite
101U	Y	Nitrobiphenyl
131U	Y	Styrene
139U	Y	o-Toluidine
150U	Y	p-chlorophenol
155U	Y	Vinylidene chloride
161U	Y	Butylbenzlphthalate
163U	Y	1-chloropropene
172U	Y	1,2,3-Trichlorobenzene
173U	Y	1,2,4-Trichlorobenzene
174U	Y	Urethane

Michigan Hazardous Waste Number	Acceptable for Bulking	Description
001K	Y	Residues, including emission control sludges, from the production process and packaging of 4,4'-methylenebis (2-chloroaniline)
002K	Y	Wash acids generated after the effective date of these rules from the production of 3,3'-Dichlorobenzidine, excluding wash acids that are recycled or any materials that are reclaimed from the wash acids and used feneficially

Waste Codes Acceptable for Storage Only

Michigan Hazardous Waste Number	Description
001U	Actinomycin D
002U	Allyl chloride
003U	2-aminoanthraquinone
004U	Aminoazobenzene
005U	0-aminoazotoluene
006U	4-aminobiphenyl
007U	3-amino-9-ethyl carbazole hydrchloride
008U	1-amino-2-methyl anthraquinone
009U	Anilazine
012U	0-Anisidine hydrochloride
013U	Antimony (when in the form of particles 100
014U	Antimycin A
015U	Barban
016U	Bendiocarb
017U	Benomyl
020U	Bromoxynil
021U	2(p-tert-Buitylphenoxy)-Isopropyl-2-chloroe
022U	Captafol
023U	Captan
024U	Carbaryl
027U	Carbophenothion
028U	Chloramines
029U	Chloropyrifos
034U	3-(Chloromethyl)pyridine hydrochloride
036U	4-chloro-m-phenylenediamine
037U	4-chloro-o-phenylenediamine
038U	Chloroprene
041U	Clonitralid
041U	Cobalt(when in the form of particles 100 microns or less)
042U	Coumaphos
043U	p-Cresidine
044U	Crotoxyphos
046U	Cycloheximide
047U	Demeton
048U	2,4-Diaminoanisole sulfate
049U	4,4'-Diaminodiphenyl ether
050U	2,4-Diaminotoluene
051U	Diazinon
052U	Dichlone
056U	Diethylsulfate
057U	Dinocap
058U	Dioxathion
061U	Ethion
063U	Fensulfothion
064U	Fenthion
065U	Fluchloralin

068U	Hexamethylphosphoramide
071U	N-(2-Hydroxyethyl) ethylenelmine

Waste Codes Acceptable for Storage Only

Michigan Hazardous Waste Number	Description
073U	Isonicotinic acid hydrazine
075U	Lactonitril
076U	Leptophos
078U	Malachite green
079U	Malathion
080U	Mestranol
082U	4,4'-Methylenebis (2-methylaniline)
083U	4,4'-Methylenebis (N,N-dimethylaniline)
086U	1-Methylnaphthalene
088U	Mevinphos
089U	Mexacarbate
090U	Mirex
094U	Naled
095U	1,5-Napthalenediamine
096U	Nickel (when inthe form of particles 100 micr
097U	Niridazole
098U	Nithiazide
099U	5-Nitroacenaphthene
100U	Nitro-o-anisidine
102U	Nitrofen
103U	N-(4-(5-nitro-2-furanyl)-2-thiazolyl)-acetami
106U	p-Nitrosodiphenylamine
108U	N-nitroso-N-phenylhydroxylamine,ammonium salt
110U	Oxydemeton-methyl
113U	Phenazopyridine Hydrochloride
114U	Phenesterin
115U	Phenobarbitol
116U	Phenytoin
117U	Phenytoin sodium
118U	Phosazetim
120U	Phosphamidon
121U	Piperonyl sulfoxide
122U	Polybrominated biphenyls (PBB)
124U	Propiolaclone
127U	Propylthiouracil
128U	Rotenone
129U	Semicarbazide
132U	Sulfallate
134U	TDE
137U	Tetrachlorvinphos
138U	4,4'-Thiodianiline
140U	Triaryl phosphate esters
141U	Trichlorion
142U	Trifluralin
143U	2,4,5-Trimethylaniline
144U	Triamethylphosphate

146U	Ziram
147U	Azinphos-ethyl

Waste Codes Acceptable for Storage Only

Michigan Hazardous Waste Number	Description
148U	Azinphos-methyl
151U	5-chloro-o-toluidene
152U	Methacrylonitrile
154U	Bis (tri-n-butyl tin) oxide
157U	3-amino-9-ethyl carbazole
158U	Aniline hydrochloride
159U	Azobenzene
162U	1-chloro-4-phenoxybenzene
164U	P,P'DDE
165U	N,N'-Diethylhiourea
166U	1,2-Epoxybutane
167U	Kanechlor C
168U	N-Nitrosomethylvinylamine
169U	Octachlorostyrene
170U	Semicarbazide hydrochloride
171U	Tributyltin (and other salts & esters
175U	Vinylbromide

SECTION B

FACILITY DESCRIPTION

This section provides a general description of Dynecol, Inc. as required by Michigan Act 64 Rule 299.9504(1)(c) which incorporates 40 CFR 270.14(b) by reference. This description is intended only to acquaint the permit application reviewer/permit writer with an overview of the facility. More complete details can be found in other parts of this permit application.

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

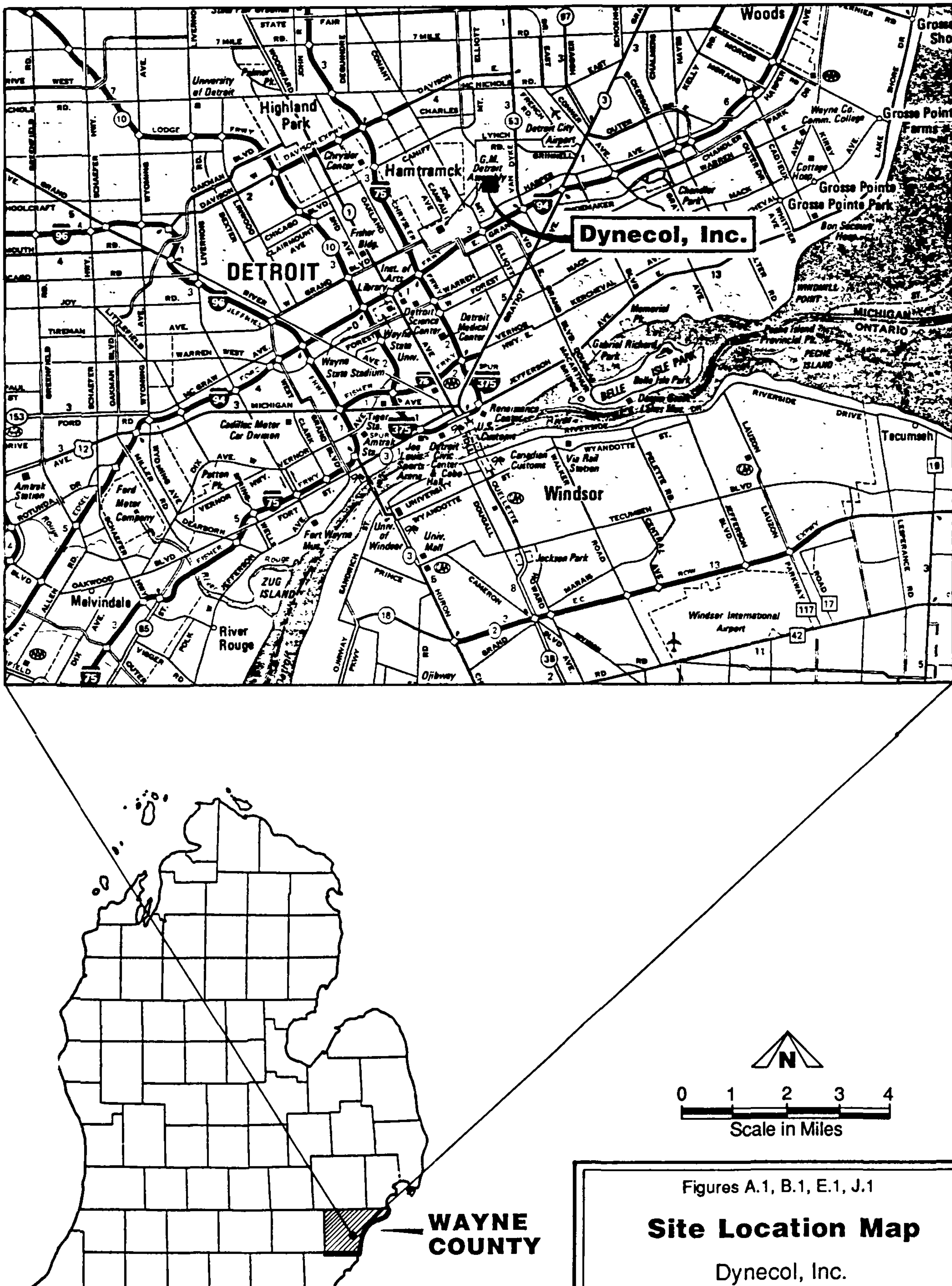
Dynecol, Inc. is a commercial hazardous waste treatment and storage facility located in the City of Detroit in Wayne County, Michigan. The street and mailing address is: 6520 Georgia Street, Detroit, MI 48211. Figure B.1 is a location map and Figure B.2 is a regional topographic map. Figure B.3 is a site plan of the facility showing facility boundaries, major buildings, treatment areas and hazardous waste storage areas. Process and design information for the treatment and storage units is provided in Section D.

Dynecol, Inc. is designed and permitted under Michigan Act 64 to treat 144,000 gallons per day of hazardous wastes and to store up to 80,000 gallons of hazardous wastes. The hazardous wastes received for treatment are inorganic aqueous solutions containing acids, alkalis, and heavy metals. The wastes are identified by EPA hazardous waste numbers K062, D002, D004, D005, D006, D007, D008, D009, D010, D011, F006 and F019, as well as Michigan hazardous waste numbers 001D and 003D. These aqueous inorganic solutions are delivered to the facility in bulk tank trailers. Other materials that are handled at this facility include non-hazardous industrial wastes and recycled materials which are used as effective substitutes for chemical products.

Hazardous wastes are stored and processed in above-ground, corrosion-resistant vessels. Three tanks, having a total combined capacity of 34,000 gallons, are available for segregated storage of hazardous wastes prior to processing. Treated effluent is discharged to the City of Detroit Sanitary Sewer System in accordance with the requirements of Dynecol's Wastewater Discharge Permit (see Section A).

Hazardous wastes are processed at the facility using primary treatment, secondary treatment and solids dewatering. Primary treatment is performed in any of four 20,000-gallon, above-ground tanks by means of chemical oxidation, chemical reduction, and neutralization. Secondary treatment is performed in any of four 20,000-gallon above-ground tanks by means of neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, and lime stabilization. Solids generated from primary and secondary treatment are dewatered by pressure filtration. Solids which may result in a hazardous waste sludge are segregated from those resulting in a non-hazardous sludge. Dewatered solids are discharged from the filters directly into a truck trailer or dump box located beneath each filter. These sludges are disposed of in either a hazardous or a solid waste landfill.

As part of this Act 64 operating license reapplication, Dynecol is transferring a part of their permitted storage capacity from the existing tank storage facility to a new container storage facility.



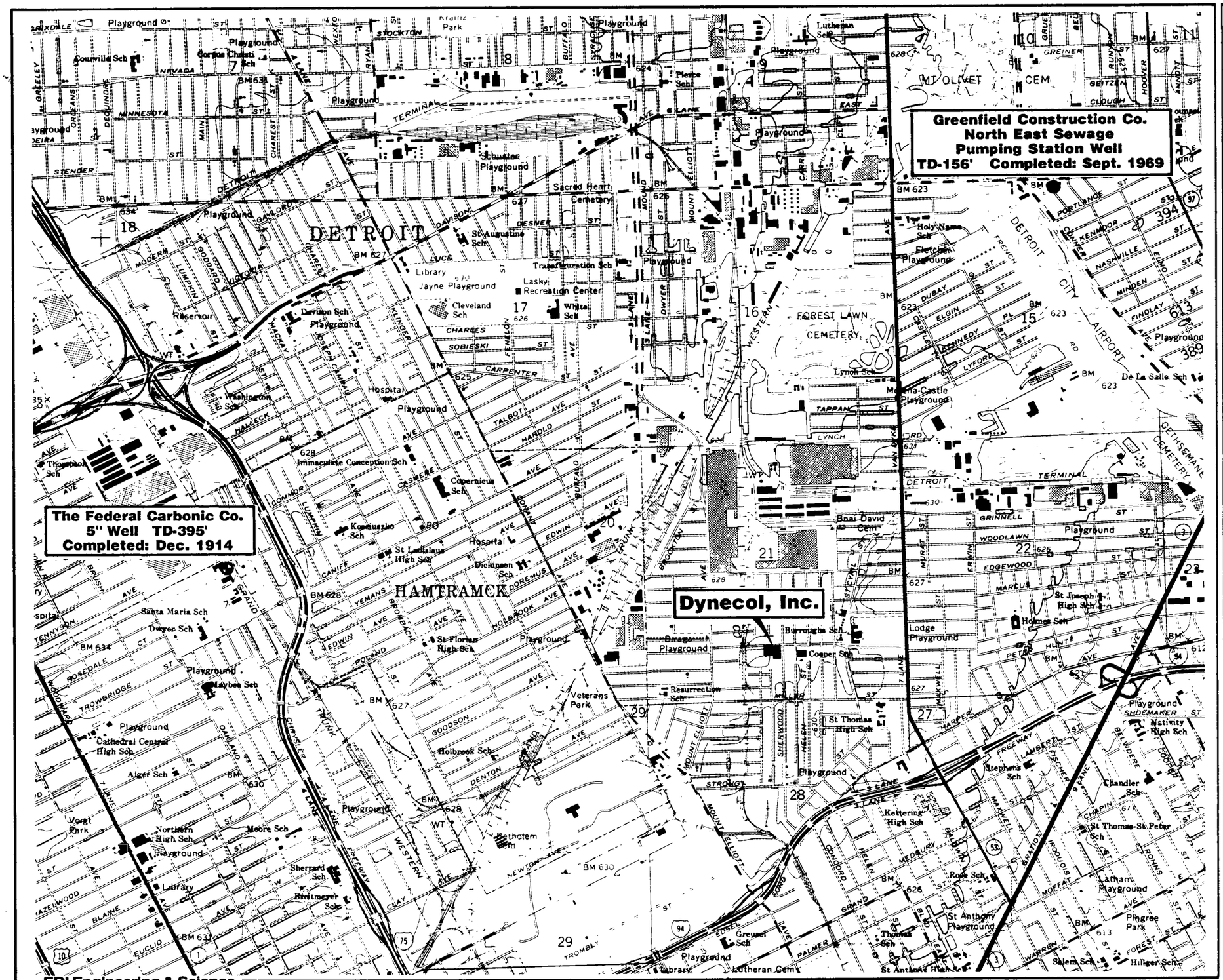
Figures A.1, B.1, E.1, J.1

Site Location Map

Dynecol, Inc.
Detroit, Michigan

May, 1988 20878

Pages A-11, B-3, E-3, J-4



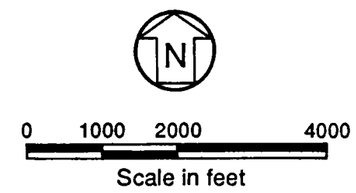


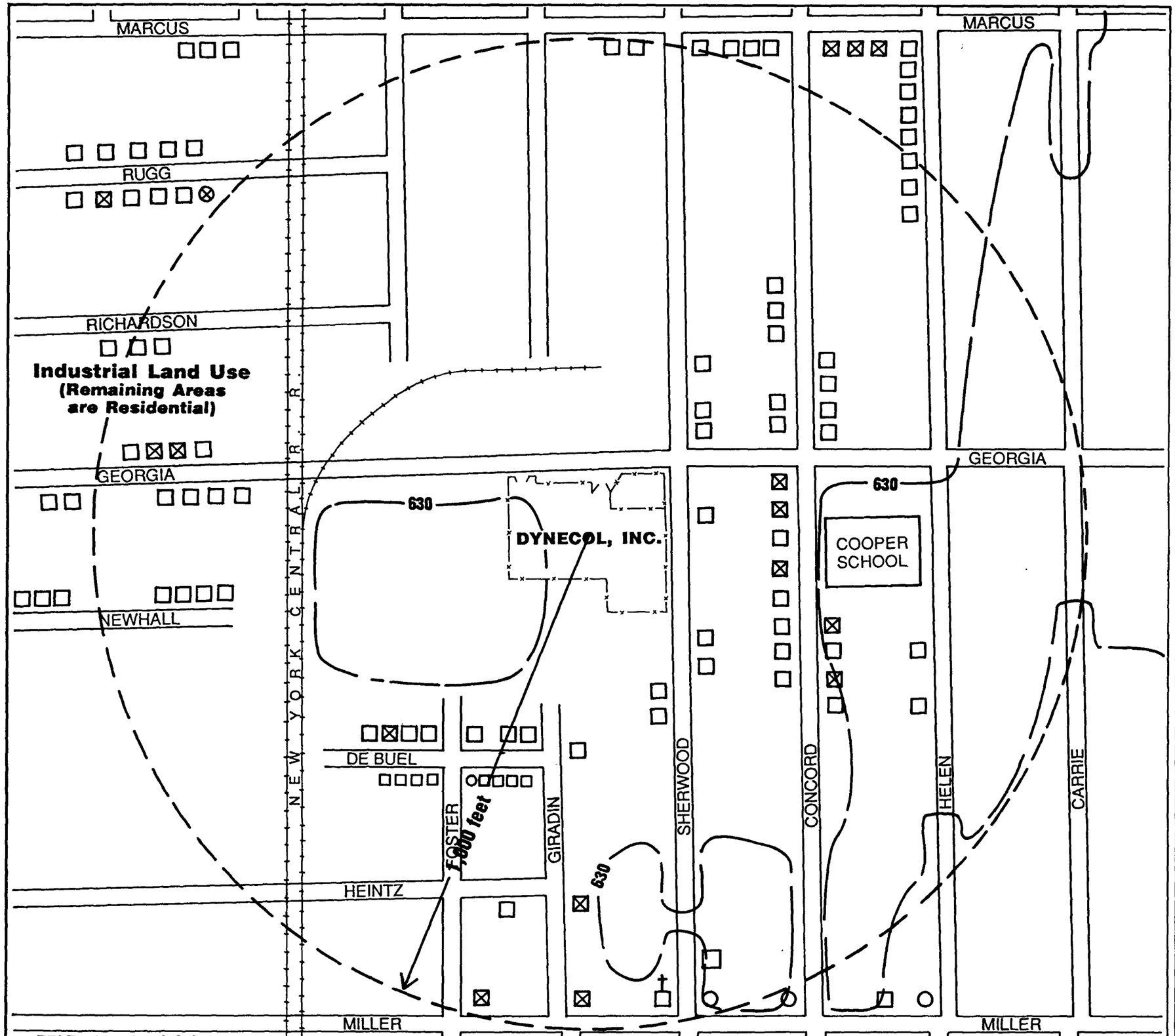
Figure B.2, E.3

Regional Topographic Map

Dynecol, Inc.
Detroit, Michigan

April, 1988

20878



LEGEND

- Legal Boundary/Access Control
- 630 – Topographic Contour Line (USGS Elevation)
- Occupied Residence
- Abandoned Building
- Church
- Store / Bar

N

0 100 200 400
Scale in feet

Traced from Highland Park, Michigan
USGS 7.5 Minute Quadrangle Map
with Five Foot Contour Interval (1968)

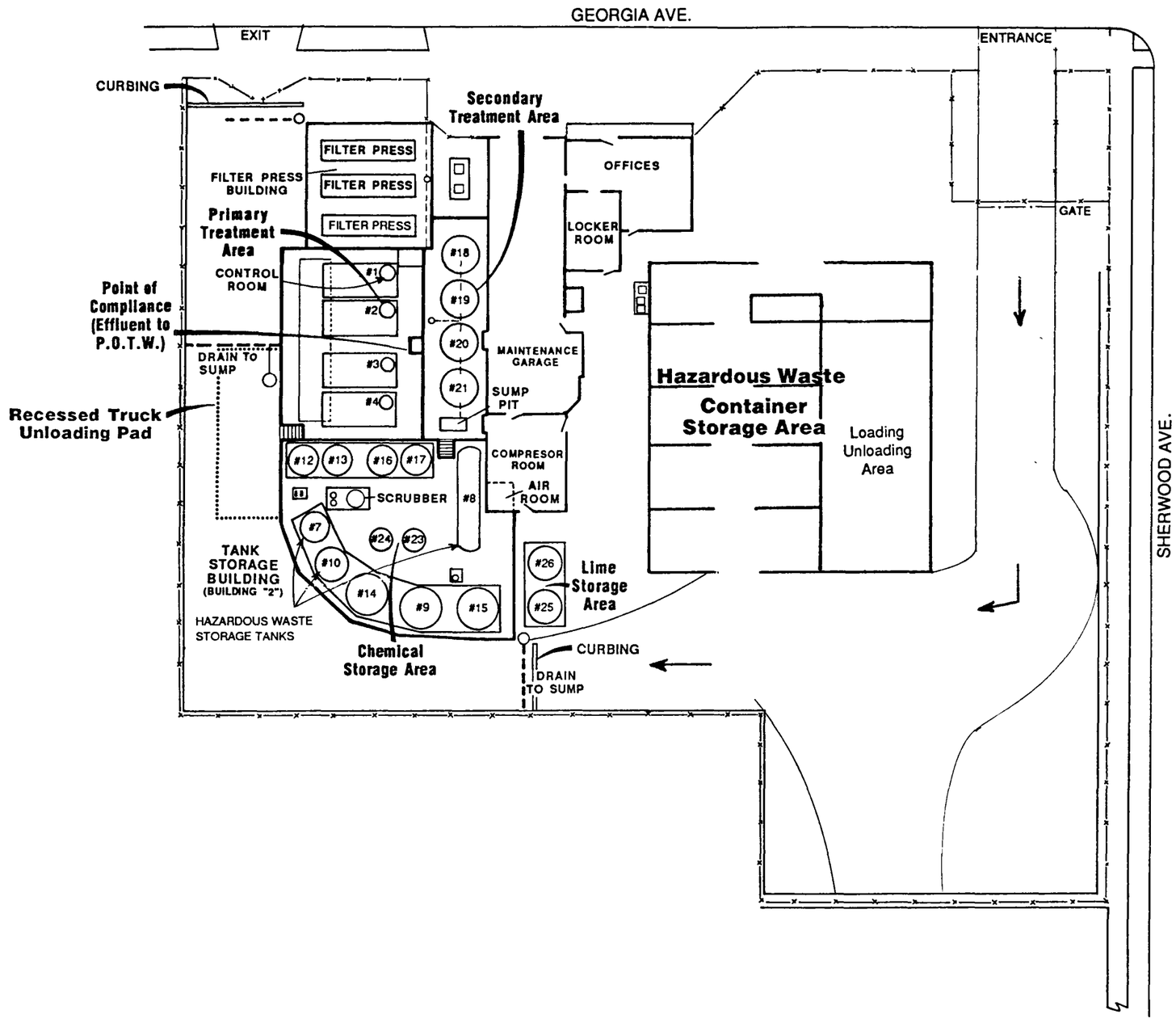
Figure B.5/E.4

Local Topographic Map

Dynecol, Inc.
Detroit, Michigan

April, 1988

20878



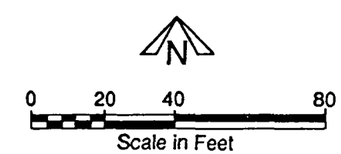


Figure A.2, B.3, G.1, F.1

Site Map

Dynecol, Inc.
Detroit, Michigan

November, 1989 20878

EDI Engineering & Science

For purposes of clarity, the operating license reapplication has been written in the present tense, as will be the case after construction of the container storage facility. The hazardous waste container storage facility at Dynecol receives and stores hazardous wastes in 500-gallon totes, 55-gallon drums, or smaller containers. The facility has been designed to contain flammable liquids, in accordance with applicable BOCA, NFPA, and NEC codes for Class I, II, and III liquids. The facility consists of two loading docks, eight isolation storage bays, and a waste bulking and transfer area. Process and design information is provided in Section D.

Incoming wastes are sorted into compatible waste groups and are stored in designated storage bays. Compatible wastes are bulked in the bulking area. The bulking and transfer area is adequately ventilated and equipped with a fume hood and an air emission control system.

The container storage facility has been designed to have a storage capacity of 46,000 gallons for hazardous wastes (equivalent to 836 55-gallon drums) in eight separate storage bays. As described in detail in Section D, each storage bay is capable of storing two levels of 60 drums. Some wastes are temporarily stored in this facility until they are shipped off site to an appropriate disposal, recovery, or recycling facility. Other hazardous wastes may be transferred to and treated in Dynecol's waste treatment facility.

In summary, the regulated portion of the Dynecol facility consists of the following:

- Two unloading areas with spill collection and containment structures (the container storage unloading area is enclosed);
- Four primary treatment vessels (20,000 gallons each) with a concrete secondary containment area;
- Four secondary treatment vessels (20,000 gallons each) located within a building which provides secondary containment;
- Three storage tanks located within a building having concrete secondary containment;
- Three filter presses located within a building which has a drainage system to a secondary containment area; and
- An enclosed container storage facility with capacity for 46,000 gallons (equivalent to 836, 55-gallon drums) in eight bays with secondary containment.

B-2 TOPOGRAPHIC MAP [40 CFR 270.14(b)(19)]

The information required by 40 CFR 270.14(b)(19) (a topographic map showing contours at a 1:200 scale and a distance of 1,000 feet around the facility) is provided in Figure B.3. A two-foot contour interval for the topographic map is not practical due to the flatness of the site where

local relief is not more than one foot between property lines, and the pattern of surface flow is restricted to on-site infiltration. A regional topographic map that includes the Dynecol facility and surrounding areas is contained in Figure B.2. Other information provided in association with the topographic map is summarized in the following sections.

B-2a 100-Year Floodplain

The Dynecol facility is not located within the boundary of a 100-year floodplain. This determination was made after consulting the Flood Insurance Rate Map prepared under the National Flood Insurance Program for this area. Figure B.4 highlights the panel in which the Dynecol facility is located, a Zone C, which represents areas of minimal flooding (Zone A is within the 100-year floodplain and Zone B is between the 100-year and 500-year floodplain). The National Flood Insurance Program did not develop Zone C area panels due to minimal flooding within these areas.

B-2b Surrounding Land Uses

The facility is located within a mixed industrial and residential area. Immediately north, west, and south of the facility are areas of industrial activities and east of the facility are residential neighborhoods. Residential land uses also border along the northeastern and southeastern edges of the facility with a school located one block east of the facility (see Figure B.5). A rail line is also found about 500 feet west of the Dynecol facility. Additional information regarding surrounding land uses is provided in the environmental assessment (Section J-2h).

B-2c Hazardous Waste Management Facilities Boundaries

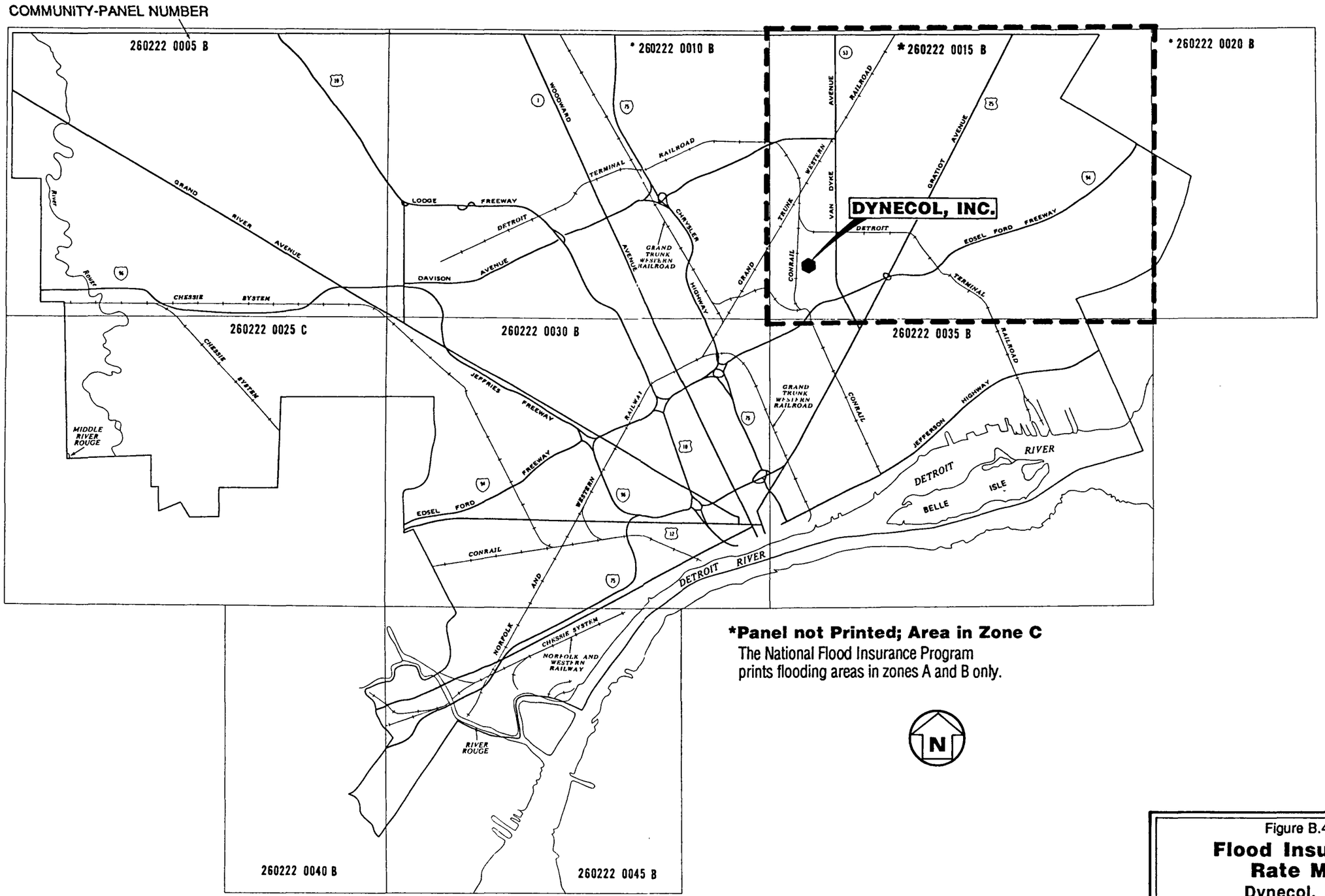
The Dynecol facility occupies approximately 1.7 acres of land in the southeast quarter of the southwest quarter of Section 21, Township 1 South, Range 12 East in Wayne County, Michigan. Figure B.3 delineates the boundaries of the existing and the hazardous waste management units as well as for the Dynecol facility as a whole.

B-2d Wind Rose

Figure B.6 contains a wind rose compiled from 1948-1978 data collected at the Detroit City Airport, located approximately two miles northeast of the Dynecol facility, indicating the predominant wind direction for this area is from the southwest and west.

B-2e Access Control

The Dynecol facility is surrounded on all sides by a six-foot chain-link fence with a barbed wire top. Access to the facility is controlled at four points, all located along Georgia Street: an automatic slide gate for vehicular access to the facility (next to the offices); another automatic slide gate for vehicles exiting on the west (next to the filter press building); a pedestrian doorway to the facility's offices; and one roll-up door for vehicles entering the maintenance garage.



***Panel not Printed; Area in Zone C**

The National Flood Insurance Program prints flooding areas in zones A and B only.

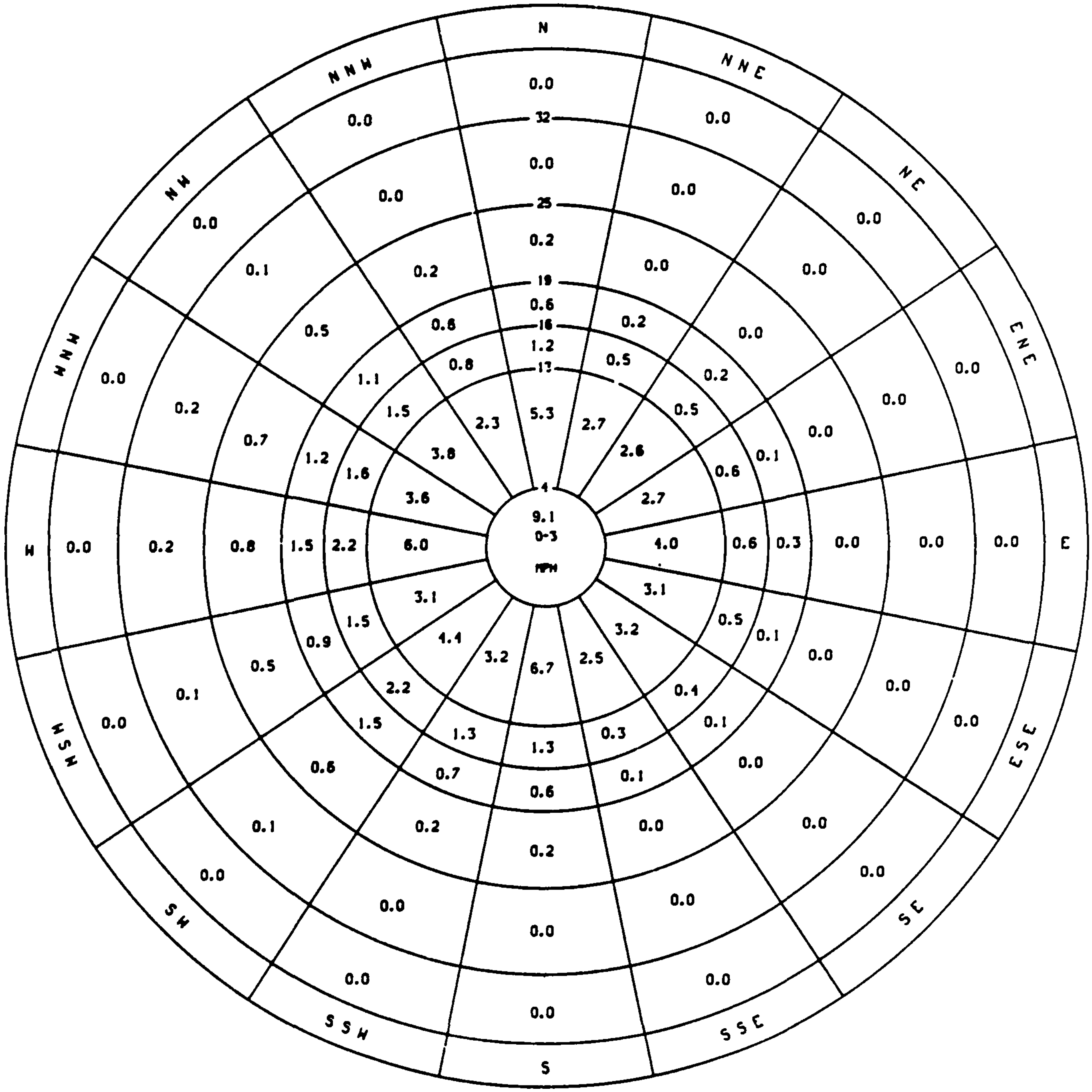
Figure B.4

Flood Insurance Rate Map

Dynecol, Inc.

Detroit, Michigan

June, 1989 20872



EDI Engineering & Science

Figure B.6

WIND ROSE

(Compiled from 1948-1978 Data)

Dynecol, Inc.

Detroit, Michigan

June, 1989 20878

A gate in the southwest corner of the facility, where a former rail spur was located, is locked at all times. Access control points are illustrated on Figure B.3.

B-2f Injection and Withdrawal Wells.

The site has no injection or withdrawal wells. All water used at the site and within the surrounding neighborhoods is supplied by the City of Detroit. A review of public records revealed no domestic ground water supply wells within a two-mile radius of the Dynecol facility.

B-2g Treatment and Storage Areas, Buildings, and Other Structures

Figure B.3 illustrates the locations of the hazardous waste treatment and storage areas, buildings, and other structures on the Dynecol site.

B-2h Recreation Areas

Recreation areas located within a half mile of the Dynecol facility include Cooper Elementary School, Burroughs School, Resurrection School, and the Biraga Playground (Figure B.2).

B-2i Runoff Control Systems

Site drainage and surface runoff are controlled by concrete and asphalt pavement and storm sewers. A low curbing is located along the western and southern border of the site to control surface runoff from the facility. Trenches located across the driveways collect any surface flow before leaving the site. Hazardous waste treatment and storage areas and the container storage facility unloading area are enclosed and protected from the weather to prevent any accumulation of precipitation, with the exception of the 4 primary tanks. The 4 primary tanks, 80,000 gallons of total capacity, have secondary containment of 100,000 gallons. The dike walls surrounding the tank area and unloading area also prevent the release of any runoff to off-site areas. These runoff control systems are identified in Appendix D-2d..

B-2j Access and Internal Roads

Access to the plant is restricted to Georgia Street. Vehicular traffic within the facility is limited to the parking lot, the container storage facility, the treatment and storage tanks, and the filter press building (see Figure B.3). Vehicle circulation on the site is restricted to a one-way direction, from east to west. Figure B.3 also illustrates vehicle entrance and exit points.

B-2k Storm, Sanitary, and Process Sewers

Treated process wastewaters are discharged to the City of Detroit's wastewater treatment plant. Sanitary wastes and storm water runoff from the facility are also discharged to the wastewater treatment plant through a combined sewer line. The locations of these sewer lines are identified in Appendix D.1a, sheet C2.

B-2l Loading and Unloading Areas

Hazardous wastes received for treatment are unloaded from bulk tank trailers in a recessed truck unloading pad along the waste treatment building. The unloading pad is provided with spill control structures and equipment to contain and remove any spills or leaks. Containers of hazardous wastes are loaded and unloaded under a roof within the container storage facility. Containerized wastes may also be transferred into bulk tankers within this facility as described in Section D. This loading and unloading area is equipped with spill control structures and equipment to contain and remove any spills or leaks. The location of the loading and unloading areas are illustrated on Figure B.4.

B-2m Fire Control Facilities.

There are three fire hydrants close to the Dynecol facility. A hydrant is located at the southwest corner of Georgia and Sherwood Avenues, 350 feet south of Georgia Street on Sherwood Avenue, and 250 feet north of Georgia Street on Sherwood Avenue. The fire department can be on the Dynecol site within five minutes.

B-2n Surface Waters

There are no surface water features or wetlands on or nearby the Dynecol facility. The nearest surface water is the Detroit River located approximately four miles southeast of the Dynecol facility.

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

B-3a Seismic Standard

The seismic standard is not applicable to facilities located in Michigan.

B-3b Floodplain Standard

The facility is not located within a 100-year floodplain (see Section B-2a and Figure B.4).

B-4 TRAFFIC PATTERNS

Vehicles coming to and leaving from the Dynecol facility utilize I-94, Mt. Elliott Avenue and the section of Georgia Street between Mt. Elliott and the facility. Vehicular access to the facility is from Georgia Street located along the northern edge of the site. Entrance to the facility is limited to vehicles at the gates located on the west side of the facility. Vehicles enter at this gate and travel east to the facility's exit at the eastern gate. All traffic on this site is directed to proceed in a one-way direction from east to west, with one-way signs posted at strategic locations. Stop signs are not necessary because of the one-way flow, as illustrated in Figure G.2.

The surfacing of access roads at the Dynecol facility is concrete. The load-bearing capacity of this surface is sufficient to handle the expected volume and estimated weight of the truck traffic using the facility. Vehicle parking areas are surfaced with gravel.

It is estimated that existing traffic volume at the facility is twenty-two private passenger vehicles per day, approximately fifteen waste and material transporting trucks per day, and two to four vendor trucks per day.

SECTION C

WASTE CHARACTERISTICS

This section describes the chemical and physical nature of the hazardous wastes stored and treated at Dynecol and the Waste Analysis Plan for sampling, testing, and evaluating the wastes to ensure that sufficient information is available for the safe handling of the wastes. The information submitted is in accordance with the requirements of Michigan Act 64 Rule 299.9504(1)(c) which incorporates 40 CFR 270.14(b)(2) and (3) by reference.

C-1 CHEMICAL AND PHYSICAL ANALYSES [40 CFR 270.14(b)(2) AND 264.13(a)]

Dynecol operates two hazardous waste storage areas, one for tanks and one for containers, and a hazardous waste treatment system. The container storage area serves as a transfer station for containerized waste from off-site generators. These wastes are temporarily stored at Dynecol prior to being transported to an off-site treatment or disposal facility or treated on-site.

The hazardous waste treatment system is used to treat aqueous solutions containing acids, alkalis, and heavy metals. There are three hazardous waste storage tanks which are used for storage of wastes prior to treatment.

C-1a List of Hazardous Wastes Managed at the Container Storage Facility

The container storage facility consists of two loading docks, eight isolation bays, and a waste bulking and transfer area. It is designed to contain any leaks or spills from the storage containers and to prevent rain or run-on from entering the facility. No ignition sources are allowed in or near the area. Details on the containers, the storage facility, and personnel training are provided in other sections of this license application.

The hazardous wastes that are stored in the container storage facility are listed in Appendices C.1a through C.1d. The hazard code for each waste is also listed. The following wastes and waste categories are not accepted at the facility:

- Wastes containing dioxins,
- Wastes containing greater than 50 ppm PCBs,
- Radioactive wastes,
- Wastes considered extremely hazardous, and
- Explosive wastes.

Prior to receipt of wastes for storage, waste characterization summaries for each waste type are provided to Dynecol by the generator and are retained in Appendix C.2. This information is available for inspection upon request.

C-1b List of Hazardous Wastes Managed at the Hazardous Waste Treatment and Tank Storage Facility

Aqueous solutions containing acids, alkalis, and heavy metals are accepted at Dynecol for storage and treatment in tanks. These wastes are delivered to the facility in bulk tank trailers and are stored and processed in above-ground corrosion resistant tanks with secondary containment. Primary treatment of these wastes includes chemical oxidation, chemical reduction, and neutralization. Secondary treatment of the corrosive or metal-bearing wastes includes neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, and lime stabilization. Wastewater is discharged to the Detroit wastewater treatment system. Solids generated by these processes are treated if necessary and disposed of at

an appropriate landfill. Details on the tanks, secondary containment structures, treatment processes, and personnel training are provided in other sections of this license application.

The types of hazardous wastes treated and stored at Dynecol's waste treatment facility are described briefly below. The wastes and basis for hazard designation are summarized in Table C-1. Appendix C.3 contains waste characterization summaries for each waste.

C-1b(i) Listed Hazardous Wastes

- **Spent pickle liquor from steel finishing operations (K062).** Spent pickle liquors may contain dilute sulfuric acid or hydrochloric acid. These solutions are defined as "spent" because the acid content of the pickle liquor is too low to effectively clean steel in the generator's pickling process. During the course of the pickling operation, the acid may dissolve small quantities of heavy metals, depending upon the type steel that is processed.

  Spent pickle liquors received at this facility enter the plant at a typical temperature of 100°F. The typical concentrations of acids in a spent solution are 5 percent sulfuric acid by weight and 3 percent hydrochloric acid by weight. Various heavy metals in varying concentrations may also be contained in this waste material.

- **Process wastes from electroplating operations (F006).** The sludges generated from the treatment of these wastes may contain various heavy metals. The influent waste streams may also be acidic or alkaline in nature. Waste streams designated as F006 are *not* accepted for treatment at Dynecol if the concentration of cyanide exceeds 20 ppm.

- **Process wastes from chemical conversion coating of aluminum (F019).** The sludges generated from the treatment of these wastes may contain various heavy metals. The influent waste streams are liquid, aqueous, inorganic and free-flowing solutions. Waste streams designated as F019 are *not* accepted for treatment at Dynecol if the concentration of cyanide exceeds 20 ppm.

C-1b(ii) Characteristically Hazardous Wastes

- **Hazardous waste exhibiting the characteristics of corrosivity (D002).** Liquid inorganic solutions may exhibit the characteristic of corrosivity by being either acidic with a pH of 2.0 or less or may be alkaline having a pH of 12.5 or more.

- **Hazardous wastes exhibiting characteristics of EP toxicity** [arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), silver (D011), copper (001D), and zinc (003D)]. These waste include inorganic solutions and sludges. They are typically acidic aqueous solutions and contain varying concentrations of metals.

TABLE C.1
CORROSIVE AND METAL-BEARING WASTES TREATED AT DYNECOL

Waste Description	Hazardous Waste Code	Basis for Hazard Designation
Spent pickle liquor from steel finishing operations	K062	Corrosive and Toxic
Process wastes from electroplating operations	F006*	Toxic
Process wastes from the chemical conversion coating of aluminum	F019*	Toxic
Liquid inorganic solutions	D002	Corrosive
Inorganic solutions and sludges	D004	EP toxic for arsenic
Inorganic solutions and sludges	D005	EP toxic for barium
Inorganic solutions and sludges	D006	EP toxic for cadmium
Inorganic solutions and sludges	D007	EP toxic for chromium
Inorganic solutions and sludges	D008	EP toxic for lead
Inorganic solutions and sludges	D009	EP toxic for mercury
Inorganic solutions and sludges	D010	EP toxic for selenium
Inorganic solutions and sludges	D011	EP toxic for silver
Inorganic solutions and sludges	001D	EP toxic for copper
Inorganic solutions and sludges	003D	EP toxic for zinc

* The sludges that are generated from treating these process wastes are listed

C-1b(iii) Residuals from the Treatment Process.

Treated effluent is discharged to the Detroit wastewater treatment facility in accordance with pretreatment ordinance requirements. The effluent is exempt from hazardous waste regulations under the domestic sewage exclusion in 40 CFR 261.4(a)(1)(i).

Heavy metal hydroxides and other stabilized products of precipitation are dewatered and fixed by pressure filtration in the final treatment step. The dewatered solids from the treatment of characteristically hazardous inorganic solutions and sludges from spent pickle liquor from steel finishing operations may exhibit the characteristic of EP toxicity. Waste pickle liquor sludge generated by lime stabilization is not listed under the derived from rule because it was delisted by the U.S. EPA (40 CFR 261(c)(2)(i)(A)).

The dewatered solids from the treatment of electroplating process wastes and aluminum chemical conversion coating wastes and from the decontamination cycle are defined as listed hazardous wastes (F006 and F019) and may contain various heavy metals and low concentrations of cyanide.

C-1c Chemical Materials Stored and Used On-Site

Other chemical materials which are not solid wastes and which will be recycled or reused as effective substitutes for commercial chemical products are also handled at this facility. These materials are stored at the facility prior to use or prior to shipment to other facilities for use as commercial chemical product substitutes in accordance with 40 CFR 261.2(e)(ii). These materials are not accumulated speculatively and are not solid wastes when recycled. These materials include iron salt solutions and chemicals which are recovered and used as substitutes for commercial chemical products.

Other chemicals which are used for the treatment and processing of hazardous wastes are also present at the facility. These reagents include:

- sodium hydroxide solutions;
- hydrated lime;
- lime slurry;
- potassium hydroxide;
- magnesium hydroxide; and
- other chemical reagents which may be required.

C-2 WASTE ANALYSIS PLAN

All hazardous wastes stored or treated at Dynecol are properly characterized prior to acceptance. Generators are required to provide a complete waste characterization, including chemical analysis when appropriate. This information may be verified by an inspection of the generator's facility.

Dynecol then screens each incoming shipment and may analyze representative samples of the wastes for "finger print" parameters. In the event that the screening process indicates that the waste is not consistent with the manifest or the waste characterization, the waste will be re-characterized to determine if it is acceptable. Wastes are also recharacterized annually to ensure that the waste has not changed significantly.

All sampling and analytical work performed by Dynecol or an off-site generator is done in accordance with "Test Methods of Solid Waste, Physical/Chemical Methods", 3rd Edition (U.S. EPA Office of Water and Waste Management, SW - 846, 1986). Wastes will be characterized as follows:

- General waste identification,
- Waste description - chemical composition and physical form,
- Waste characterization - listed or characteristic,
- Process by which the waste was generated,
- Hazard designation,
- Quantity,
- Flash point and other characteristics,
- Physical characteristics, and
- Land disposal restrictions.

Table C.2 shows the information which must be recorded on waste evaluation form.

C-2a Parameters and Rationale [40 CFR 264.13(b)(1)]

The hazardous wastes stored and treated at Dynecol have been evaluated to determine the analytical parameters that apply to each waste. The analytical parameters and the selection rationale for the wastes stored at the container storage facility are provided in Appendix C.4. Table C.3 lists the hazardous wastes treated or stored at the hazardous waste treatment and tank storage facility, the applicable analytical parameters, and the rationale for their selection.

TABLE C.2

INFORMATION RECORDED ON WASTE EVALUATION FORM

Facility Information

US EPA ID number
Company name
Plant, etc.
Address
Contact person
Telephone

Transporter Information (if known)

US EPA ID number
Name
Address
City, state, zip
Contact person
Telephone (AC)

Business/Mailing/Broker Information
(if different from facility information)

Company name
Plant, etc.
Address
City, state, zip
Contact Person
Telephone (AC) (Ext)

Waste Characterization
U.S. EPA/MDNR Waste Code
Waste common name
Description of process generating waste
Hazard designation

Hazardous Waste Numbers Constituent Composition Information Physical Characteristics

Color
State (solid, liquid, sludge, dust)
Percent solids (for sludges)
Layer separation
Specific gravity
Flashpoint
pH
Percent halogenated organics
Percent non-halogenated organics

Other Characteristics

Reactive
Explosive
Shock sensitive
Pyrophoric
Strong oxidizer
Auto ignitable
Cyanide concentration
Sulfide concentration
PCB concentration
EP toxicity

Shipping Information

Dot shipping name
Hazard class
UN/NA #
Shipping volume and frequency

TABLE C.3
WASTE CHARACTERIZATION
SAMPLING AND ANALYTICAL METHODS FOR WASTES ACCEPTED FOR TREATMENT AND STORAGE IN TANKS

Parameter	Section/Method	Reference
Sampling Tanks		
COLIWASA	1.2.1.1 or equiv.*	1
Weighted bottle	1.2.1.2 or equiv.	1
Dipper	1.2.1.3 or equiv.	1
Sampling Solids		
Trier	1.2.1.5 or equiv.	1
Scoop/shovel	1.2.1.7 or equiv.	1
Extraction Procedure	2.1.4	1
E.P. Toxic Metals		
Arsenic	7061 (AA, Gaseous Hydride) or equiv.	1
Barium	7080 (AA, Direct Aspiration) or equiv.	1
Cadmium	7130 (AA, Direct Aspiration) or equiv.	1
Chromium, total	7190 (AA, Direct Aspiration) or equiv.	1
Chromium, hex.	7196 (Colorimetric) or equiv.	1
Copper	7210 (AA, Direct Aspiration) or equiv.	1
Lead	7420 (AA, Direct Aspiration) or equiv.	1
Mercury	7470 (Manual Cold Gas Vapor Technique) or equiv.	1
Selenium	7741 (AA, Gaseous Hydride) or equiv.	1
Silver	7760 (AA, Direct Aspiration) or equiv.	1
Zinc	7950 (AA, Direct Aspiration) or equiv.	1
Other Parameters		
Total Cyanide	9010 (Colorimetric, Manual) or equiv.	1
Sulfides	9030 or equiv.	1
pH	9040 (Electrometric Measurement) or equiv.	1
Flash point	1010 or 1020 (Pensky-Martens Closed Cup Method or Setaflash Closed Cup Method for Determining Ignitability) or equiv.	1
BOD	507 or equiv.	2
COD	508 or equiv.	2
Oil and grease	503 or equiv.	2
Total organic carbon	505 or equiv.	2
Phenol	510 or equiv.	2
Acidity	402 or equiv.	2
Alkalinity	403 or equiv.	2
Iron	315 or equiv.	2
Nickel	321 or equiv.	2

References:

1. SW-846, EPA, "Test Methods for Evaluation of Solid Wastes - Physical/Chemical Methods," 3rd Edition.
2. "Standard Methods for the Examination of Water and Wastewater," AWWA, 15th Edition.

* Any equivalent method proposal will be pre-approved by MDNR.

C-2b Test Methods [40 CFR 264.13 (b)(2)]

Generators are responsible for providing the required waste characterization information. Appendix C-4 and Table C.3 also list the test methods that are used to measure the appropriate analytical parameters. Generators must use these approved methods. Any verification sampling performed by Dynecol also employs these methods.

Some waste types may not require characterization by chemical analysis because the composition of the wastes can be readily determined from the process by which they are generated. For example, chemical analysis may not be required for a U078 (1,1-dichloroethylene waste) if a valid material safety data sheet is provided.

Lab packs, small containers of hazardous waste in overpacked drums, are characterized by the generator during packing. The generator is responsible for providing waste characterization information on the contents of each lab pack. The generator is also responsible for:

- Packaging the hazardous waste in non-leaking inside containers which are compatible with the wastes and are tightly and securely sealed;
- Using inside containers and over packs that satisfy Department of Transportation (DOT) hazardous materials regulations;
- Using an adequate amount of compatible absorbent material;
- Placing incompatible wastes in separate containers;
- Treating reactive wastes, other than cyanide or sulfide-bearing wastes, prior to packaging; and
- Sorting wastes into groups that can be disposed of in a similar manner.

C-2c Sampling Methods [40 CFR 264.13(b)(3)]

The sampling and analytical methods for bulk and container shipments are described below. These methods were selected for their simplicity, ability to detect unacceptable wastes, ability to obtain a representative sample, and consistency with U.S. EPA test methods. All samples collected at the facility are obtained by trained facility employees. Generators are required to use these methods unless an alternate method is approved by Dynecol.

C-2c(i) Containers

For each container sampled, a single sample that represents the entire depth of the container along its axis is obtained . Equipment used for sampling containerized wastes includes weighted bottles, composite liquid wastes samplers (COLIWASAS), thiefs, and triers. COLIWASAS and weighted bottles are used for sampling liquids and slurries. Dry, granular wastes are sampled with a drum thief. Moist or sticky solids are sampled with a trier. These sampling methods are detailed in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" 3rd Edition (U.S. EPA Office of Water and Waste Management, SW-846, 1986) and are summarized below.

A COLIWASA is a glass, plastic, or metal tube with an end closure that can be opened and closed while the tube is submerged (see Figure C.1). This sampling device is useful for free-flowing liquids and slurries contained in drums. It is especially useful for sampling wastes that consist of several immiscible liquid phases. The COLIWASA is lowered into the waste at a rate slow enough to permit the level of liquid inside and outside the sampler to remain the same. When the sampler hits the bottom, the stopper is closed. In this manner, a sample is obtained that is representative of the entire depth of the waste.

A weighted bottle consists of a glass or nonreactive plastic bottle with an attached sinker or weight, a stopper, and a line which is used to lower, raise, and open the bottle. It is used to sample liquids and slurries. Figure C.2 depicts a weighted bottle sampler.

A thief consists of two slotted concentric tubes usually made of stainless steel or brass (see Figure C.3). The outer tube has a conical pointed top which permits the sampler to penetrate the material being sampled. The inner tube is rotated to open and close the sampler. A thief is used to sample dry granules or powdered wastes whose particle diameter is less than one-third the width of the slots.

A trier consists of a tube cut in half lengthwise with a sharpened tip that allows the sampler to cut into sticky solids and loose soil (see Figure C.4). The trier is then rotated to cut a core of the waste. A trier samples moist or sticky solids having a particle diameter less than one-half the diameter of the trier.

c-2c(ii) Roll-off Boxes

Three random samples are collected by use of trier from the sludge roll-off boxes and the samples are composited prior to analysis.

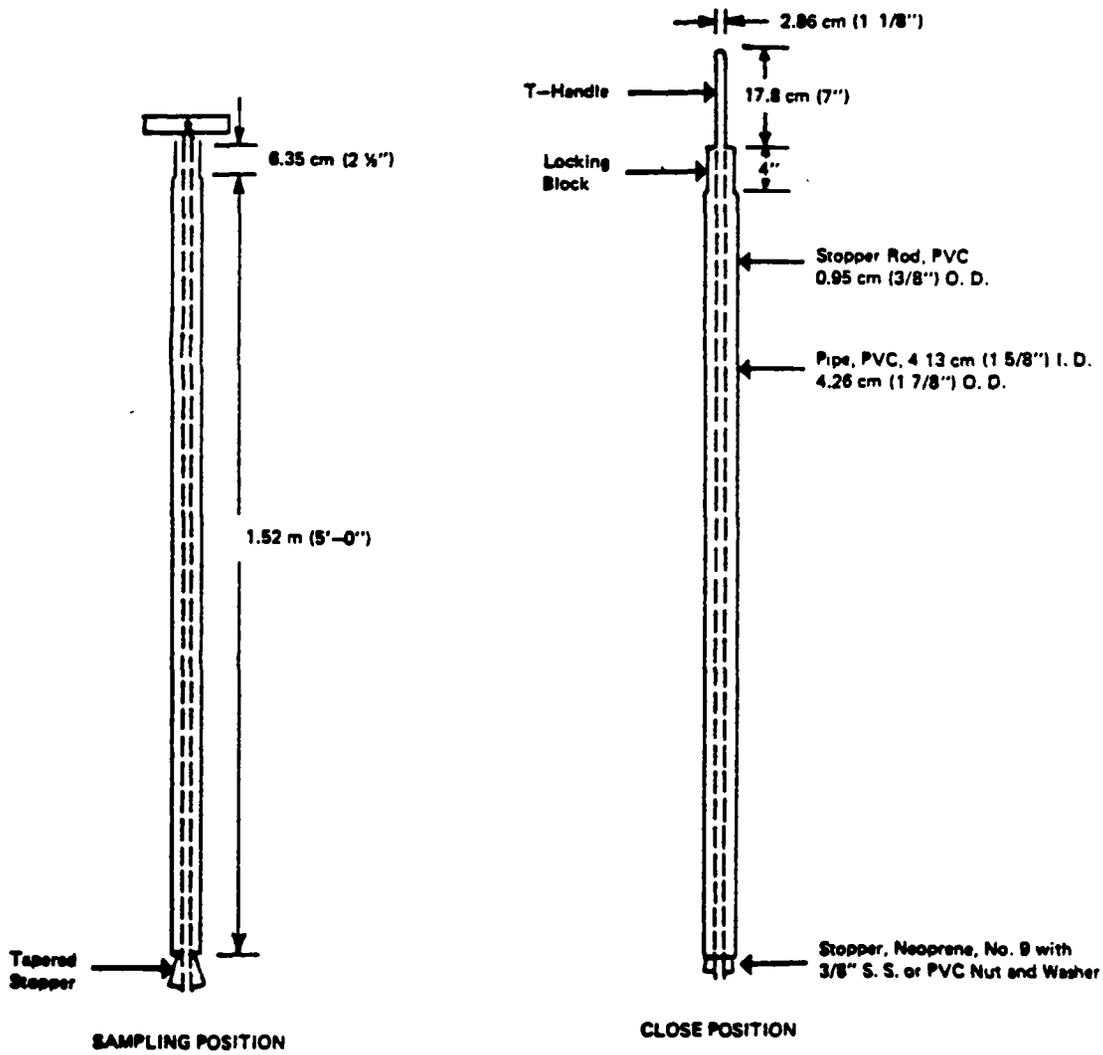


Figure C.1

Composite Liquid Waste Sampler (Coliwasa)

Dynecol

Detroit, Michigan

June, 1989 20878

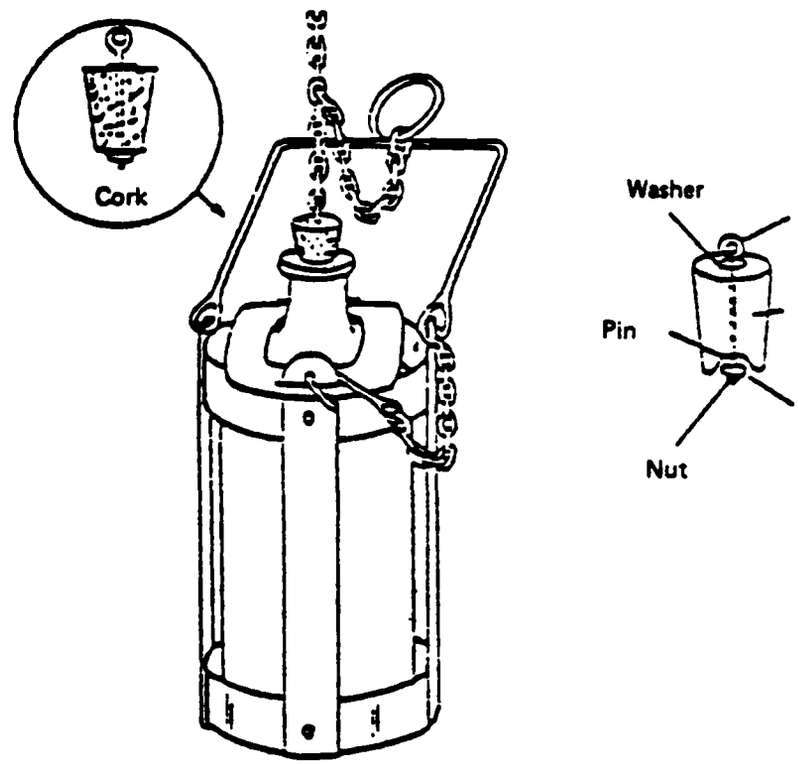


Figure C.2

Weighted Bottle Sampler

Dynecol
Detroit, Michigan

June, 1989 20878

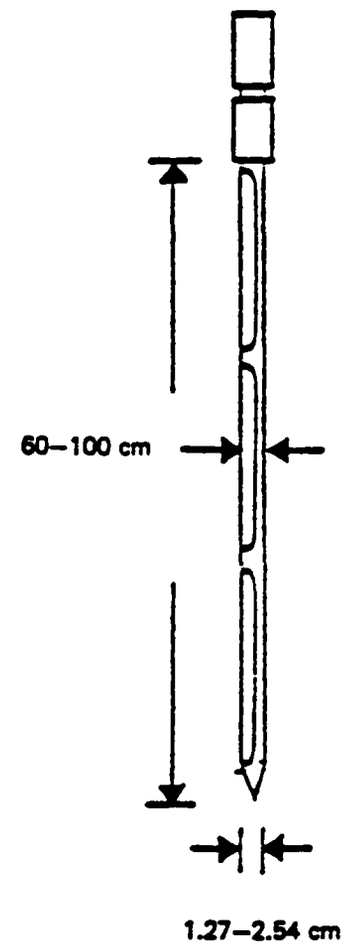
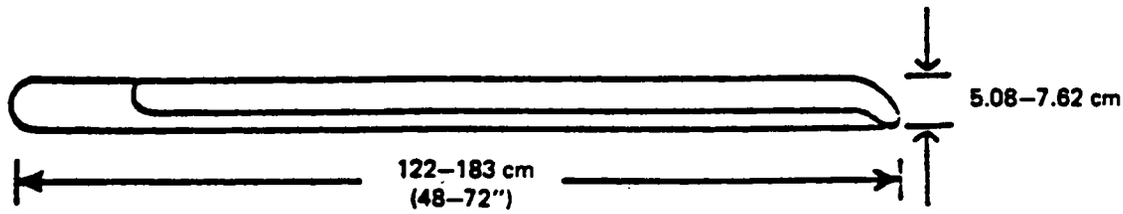


Figure C.3

Thief Sampler

Dynecol
Detroit, Michigan

June, 1989 20878



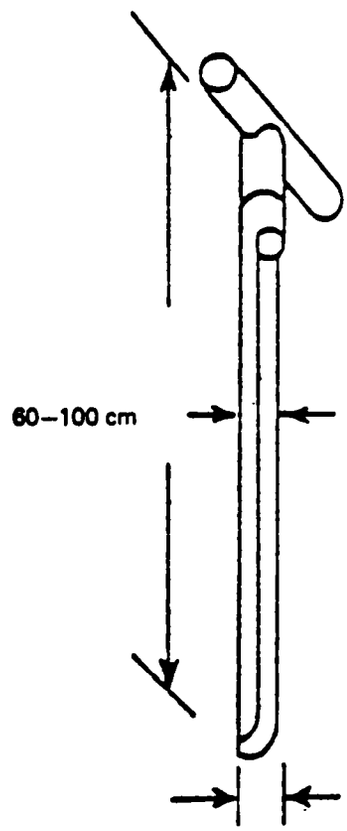


Figure C.4

Sampling Triers

Dynecol
Detroit, Michigan

June, 1989 20878

C-2c(ii) Bulk Shipments

Bulk tankers are sampled in a manner which ensures that the samples are representative. A composite liquid waste sampler (COLIWASA) is used to sample nonhomogeneous or stratified liquids. A weighted bottle is used for sampling homogeneous or completely mixed liquids. These methods are summarized above and are described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", 3rd Edition. (U.S. EPA Office of Water and Waste Management, SW-846, 1986)

C-2d Frequency of Analyses [40 CFR 264.13 (b)(4)]

Dewatered solids from the treatment of characteristically hazardous inorganic solutions and from spent pickle liquor from steel finishing operations are analyzed for EP toxicity on a periodic basis, prior to disposal, to determine if they are characteristically hazardous. Waste pickle liquor sludge generated by lime stabilization is not listed under the derived from rule (40 CFR 261(c)(2)(i)(A)) and may be disposed of as a nonhazardous solid waste unless it is characteristically hazardous.

Dewatered solids from the treatment of electroplating wastes (F006) are also analyzed on a periodic basis to determine if the sludge meets best demonstrated available technology (BDAT) treatment standards for F006 wastes (see Section C-4). When the BDAT treatment standards for cyanide wastes outlined in the second third scheduled waste proposed rule become effective, the dewatered F006 solids will be analyzed for total and amenable cyanide on a batch basis prior to disposal.

No BDAT treatment standards are currently in effect for F019 sludges. Sludges from the treatment of aluminum chemical conversion coating wastes are analyzed on a batch basis for certain metals (see Section C-4). The sludge is also analyzed for total and amenable cyanides.

The frequency of analysis for wastes generated off-site and received by Dynecol for treatment or storage is described in Section C-2e.

C-2e Additional Requirements for Wastes Generated Off-Site [40 CFR 264.13(a)(3)(ii), (a)(4), (b)(5) and (c)]

Dynecol has developed a stringent program for evaluating wastes generated off-site. This program includes waste characterization requirements for generators, screening procedures, and waste re-characterization requirements. Generator waste characterization requirements are outlined in Section C-2. The screening and re-characterization procedures are described below.

C-2e(i) Shipment Screening [40 CFR 264.13(a)(4)]

Dynecol inspects each shipment of hazardous waste from off-site generators to determine whether it matches the identity of the waste(s) specified on the manifest. The objectives of this screening process are:

- Identify restricted wastes that cannot be accepted;
- Ensure compliance with the facility's permit;
- Allow shipment of wastes from the facility in compliance with U.S. Department of Transportation (DOT) regulations;
- Identify incompatible wastes;
- Ensure that wastes will be placed in compatible containers, tanks, and storage facilities;
- Identify the appropriate treatment, disposal, recovery, or recycling facilities for the wastes;
- Identify ignitable or reactive containerized wastes; and
- Ensure safe operation of the facility.

Shipment screening includes checking the completeness and correctness of the manifest and visually inspecting the shipment and comparing it with the manifest. A shipment screening form is used to record relevant information. The following records are accessible and readily available to all operating personnel who are responsible for inspecting and unloading incoming shipments of hazardous waste:

- A copy of the most recent waste characterization report for each waste stream;
- Dynecol's Waste Analysis Plan.

Completeness of manifest. Acceptance of a waste shipment is based on a correctly completed manifest by the generator of the waste. When a waste shipment arrives at Dynecol, the manifest is reviewed to ensure it is accurate and complete. At a minimum, the following information must be on each manifest:

- a manifest document number;
- the generator's name;
- each transporter's name and EPA identification number;
- the destination of the waste shipment, including address and EPA identification number;
- an alternative hazardous waste management facility, address, and EPA identification number;
- a Department of Transportation shipping name and number;
- the quantity or volume of waste in the shipment;
- the number and type of containers in the shipment; and
- a signed, dated certification of the shipment's content.

The completeness of the land disposal restriction notification and certification form, if applicable, is also checked whenever a waste shipment arrives at Dynecol (a copy of the form is included in Appendix C-5). The following information on the form is reviewed upon receipt of the waste shipment:

- manifest document number;
- generator name;
- generator identification number;
- authorized signature;
- date; and
- check marks for all substances and their respective treatment standards applicable to the identified waste stream.

Visual Inspection. Each shipment is visually inspected to determine if:

- the number and type of containers match the manifest;
- the shipment labels/placards match the manifest;
- there are any irregularities with the shipment (e.g., leaking, bulging, or corroding containers); or
- any wastes that cannot be accepted are present.

Wastes Accepted for Treatment and Storage in Tanks. In addition to the general waste characterization procedures outlined above, wastes which are accepted for treatment at Dynecol are subjected to treatment screening. The appearance of the sample, the sample odor, and the pH of the sample are compared to the retained reference sample. Wastes which are accepted for treatment will also be analyzed for applicable waste verification parameters.

Comparison to Retained Reference Sample. A recent sample of the waste stream typically produced by generator which is contained in a clear plastic 8 ounce jar and labeled with the name of the generator, the date of the sample, and the hazardous waste number of the material is provided by the generator. The appearance of the sample as determined by visual inspection is compared with that of the retained sample of the material including: color, clarity, phase separation, and suspended and settled solids.

Sample Odor. Odor of the sample compared with that of the retained sample including: organic or solvent type odors and any other unusual odor.

Inspection and testing procedures are modified slightly whenever a load of F006 or F019 waste is delivered to the facility which has not been certified to contain no detectable amount of cyanide. The odor of a sample of this material is not inspected, and cyanide testing is conducted prior to unloading.

pH. pH of the sample is compared to both the retained sample and the waste characterization analysis. pH is determined by using a calibrated pH meter in accordance with Method 9040 of SW846 or by using litmus paper sensitive to 0.5 pH units.

Fingerprint Analyses. Each waste shipment that passes the initial inspection steps outlined above will be sampled, and the samples will be analyzed for waste verification parameters. The selection of these waste verification parameters is based on the need to identify restricted wastes and waste characteristics that will affect the treatability of the wastes at Dynecol. Sampling procedures are described in Section C-2c(ii) of this Waste Analysis Plan.

Waste verification parameters are a subset of the parameters required for proper waste characterization. The waste verification parameters and tests for wastes to be treated at Dynecol are pH, volatile organic compounds, percent solids, pumpability, and cyanide (for F006 and F019 wastes only).

Waste shipments are only accepted for treatment when the following finger print analyses criteria are met:

Parameter	Criteria	Evaluation Method
pH	normally acidic waste stream is less than 7.0 normally alkaline waste stream is greater than 7.0	standard pH meter standard pH meter
organic content	no evidence of phase separation no uncharacteristic organic or solvent odor	visual smell
solids content	within ± 10 percent of retained sample and waste analysis form	visual
pumpability	consistent with retained sample and waste analysis form	visual-stir test
cyanides	contains less than 20 ppm	colormetric (9010,9030 or equiv.)

In addition to these waste characterization procedures, the generator's site and processes are reviewed prior to accepting a waste for treatment to determine all potential hazardous contaminants, as well as possible variations in the levels of contaminants and the proper hazardous waste designation. Management personnel are interviewed regarding the description and characterization of the materials and any variations that may occur.

For electroplating and aluminum conversion coating process wastes that are being considered for treatment at Dynecol, the generator's facility is inspected and evaluated in order to determine the potential for cyanide contamination in the waste stream. If there is no possibility of cyanide or cyanide compounds in the waste stream, it will be so designated in the waste characterization report and will be verified by the initial waste analysis.

If there is a possibility of cyanide or its compounds entering the waste stream the wastes must be analyzed to determine if the waste containing greater than 20 ppm of cyanide or its compounds. Wastes that exceed this concentration will not be accepted for treatment at Dynecol.

Wastes Accepted for Storage in Container Storage Area. Randomly selected containers from each arriving load of a waste from a generator are sampled to confirm waste characteristics and according to C-5 of this section: Compatibility Evaluation Procedure. The frequency of sampling will be based upon the following criterion: ten percent of all containers per waste code, per generator and per shipment. Drums are selected for sampling using the simple random sampling methods for containers described in "Test Methods for Evaluating Solid Wastes Physical/Chemical Methods", 3rd Edition (U.S. EPA Office of Water and Waste Management, SW-846, 1986) Section 1.4.1. Simple random sampling requires use of the random numbers table and procedures presented in Table C.4.

The volume of the containers is typically 30 or 55 gallons and the contents are accessible for sampling through the opened top or bung. Since each load of similar material from a generator is considered homogeneous, representative samples can be obtained by sampling a vertical volume from a randomly selected subset of drums in the shipment. For shipments of less than 100 drums the number of samples taken equals square root of the number of drums in the shipment. For shipments of 100 or more drums, 10 percent of the drums are sampled.

Lab-packs are always packed at the generator's facility and are packed by trained chemists using specific procedures. An inventory of all wastes put in each lab pack is made at the time of packing, and this inventory is the information that is used to screen the waste.

Table C.4
Random Numbers

03	47	43	73	86	36	96	47	36	61	46	98	63	71	62
97	74	24	67	62	42	81	14	57	20	42	53	32	37	32
16	76	62	27	66	56	50	26	71	07	32	90	79	78	53
12	56	85	99	26	96	96	68	27	31	05	03	72	93	15
55	59	56	35	64	38	54	82	46	22	31	62	43	09	90
16	22	77	94	39	49	54	43	54	82	17	37	93	23	78
84	42	17	53	31	57	24	55	06	88	77	04	74	47	67
63	01	63	78	59	16	95	55	67	19	98	10	50	71	75
33	21	12	34	29	78	64	56	07	82	52	42	07	44	38
57	60	86	32	44	09	47	27	96	54	49	17	46	09	62
18	18	07	92	46	44	17	16	58	09	79	83	86	19	62
26	62	38	97	75	84	16	07	44	99	83	11	46	32	24
23	42	40	64	74	82	97	77	77	81	07	45	32	14	08
52	36	28	19	95	50	92	26	11	97	00	56	76	31	38
37	85	94	35	12	83	39	50	08	30	42	34	07	96	88
70	29	17	12	13	40	33	20	38	26	13	89	51	03	74
56	62	18	37	35	96	83	50	87	75	97	12	25	93	47
99	49	57	22	77	88	42	95	45	72	16	64	36	16	00
16	08	15	04	72	33	27	14	34	09	45	59	34	68	49
31	16	93	32	43	50	27	89	87	19	20	15	37	00	49

HOW TO USE THE TABLE OF RANDOM NUMBERS:

1. Segregate the containers (i.e., drums) according to waste types, and generator based on available information.

2. Number the containers containing the same waste types consecutively, starting from 01.

3. Determine the number of samples required. For more than 100 containers, sample 10% of the containers. For shipments of 100 fewer containers, the number of containers to sample equals the square root of the number of containers.

4. Using the set of random numbers above, choose any number as a starting point.

5. From this number, go down the column, then to the next column to the right, or go in any predetermined direction until you have selected the appropriate number of drums to sample, with no repetitions. Larger numbers are ineligible. (For example, if you wish to sample 5 drums out of a shipment of 20, and you choose 19 as the starting point on column four, the next eligible numbers as you go down this column are 12 and 04. So far you have chosen only three eligible numbers. Proceed to the next column to the right. Going down and starting from the top of this column, the next eligible numbers are 12 and 13. But 12 is already chosen. Proceeding to the sixth column, the next eligible number is 16. Your five random numbers, therefore, are 19, 12, 04, 13 and 16. The drums with corresponding numbers should be sampled.

C-2e(ii) Waste Re-Characterization

All wastes are re-characterized after the initial waste characterization analysis as follows:

- After 12 months have elapsed since the previous waste characterization analysis was performed; or
- When the facility is notified by the generator, or has reason to believe that the process generating the waste has changed and the composition of the waste is affected; or
- When the facility inspection and analyses of the waste stream, as received, does not match the waste designated on the accompanying manifest form.

Wastes are also re-characterized whenever a shipment screening is inconsistent with the allowable waste characteristics or when the waste shipment is not consistent with the manifest or visual characteristics of previous shipments from the waste stream and a retained sample. If such discrepancies are noted, the generator is contacted. The waste may be reevaluated or rejected based on this communication. If there are still discrepancies following this evaluation the generator is again contacted and the waste is completely re-characterized. The waste shipment is rejected by the facility if this procedure indicates the waste cannot be safely handled or the facility is not permitted to handle the waste. The waste shipment is accepted following this recharacterization if the facility can safely handle it within the constraints of the facility's permit.

C-2f Additional Requirements for Ignitable, Reactive, or Incompatible Wastes [40 CFR 264.13(b)(6) and 40 CFR 264.17]

No ignitable or reactive wastes are accepted for treatment or storage in tanks at Dynecol. The prevention of accidental ignition of wastes in the container storage area is ensured by the following:

- Refusing explosive wastes.
- Prohibiting smoking or open flames in the container storage area and loading and unloading areas.
- Posting no smoking signs.

- Advising employees of these prohibitions as part of the orientation training conducted prior to beginning employment.
- Providing fire extinguishers and sprinkler systems to ensure immediate response to fires.
- Training personnel in fire response procedures to provide immediate response to fires.
- Using spark-proof equipment.

Potentially reactive or incompatible wastes are carefully managed to avoid accidental adverse reactions. The design of the container storage facility allows reactive and incompatible wastes to be properly isolated and contained.

C-3 Quality Assurance/Quality Control

C-3a Program Goals

The goal of the Quality Assurance/Quality Control program is to provide accurate and precise data on the physical and chemical properties of wastes so that the wastes are handled safely, treated effectively, and the facility is operated in compliance with its license. This is accomplished by ensuring that:

- The wastes are properly identified and characterized.
- Wastes which do not meet Dynecol's criteria are not accepted.

C-3b Sampling Program

Designated personnel are trained to sample waste shipments. Section H of this license application contains information on the training program. The operations manager evaluates the employees' sampling skills quarterly. Records are kept of these evaluations of employees.

Sampling equipment is inspected for decontamination and operability before each shipment is sampled. Each inspection is documented, noting any problems and corrective actions taken.

Each group of samples from a waste shipment is sent to Dynecol's laboratory with a chain-of-custody form (see Figure C.5). This form includes the generator's name, shipment type, date, time of sampling, sample type, number of containers, and the sampler's name. Each container is completely labeled with appropriate information. A field logbook of all sampling activity is also kept.

C-3c Analysis Program

Laboratory personnel have been trained to perform the analytical procedures outlined in Table C.4. The employees' analytical skills are checked with blanks, standards or replicates that are included in each analysis and records are kept of these results.

Lab personnel document the receipt of each sample. Samples are stored according to their expected content until analysis. Screening samples are analyzed promptly to avoid delays in shipment processing. Characterization/re-characterization samples are analyzed depending on their storage life. Sample identification numbers are assigned to all samples and replicates that are analyzed. The quality assurance/quality control procedures for analyses follow those outlined for each test method in SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (U.S. EPA, Office of Water and Waste Management, SW-846, 1986) or other EPA-approved methods. All test results are documented on a characterization form and are kept on file at Dynecol.

Analytical equipment is inspected and serviced semi-annually and routinely checked before each analysis. Leftover or used samples are returned to storage for proper disposal.

C-3d Data Evaluation

Analytical data are evaluated as part of the screening and acceptance procedures for waste shipments. The data are compared to screening tests of previous shipments of the waste stream, other samples of the same shipment, and to waste characterization data. Any discrepancies that cannot be attributed to normal sampling or laboratory variation are investigated further.

The chain-of-custody form and sample shipment are examined by laboratory personnel. If the shipment is consistent with the form and other information, a sample analysis request sheet is completed, and the chain-of-custody form is signed. The samples are preserved as appropriate, although in most cases analysis occurs within 24 hours of receipt of the sample and preservation is not necessary. The chain-of-custody form and sample analysis request form are retained, and all aspects of chain of custody within the laboratory are documented. Each sample is numbered as part of the sample tracking system. Test results are forwarded to a manager for evaluation and filing.

C-3e References

Hatayama, H.K., J.J. Chen, E. R. de Vera, R.D. Stephens, and P.L. Storm. 1980. A Method for Determining the Compatibility of Hazardous Wastes. EPA-600/2-80-076. U.S. Environmental Protection Agency. Cincinnati, Ohio.

U.S. Environmental Protection Agency. "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods". U.S. EPA Office of Water and Waste Management, SW-846, 1986)

U.S. Environmental Protection Agency. 1984. Waste Analysis Plans. A Guidance Manual. EPA/530-SW-84-012. Office of Solid Waste.

C-4 LAND DISPOSAL RESTRICTIONS [40 CFR 268]

C-4a Restricted Wastes Treated at the Waste Treatment Facility

Three waste streams which are treated or generated at Dynecol are potentially subject to land disposal restrictions (LDR), spent pickle liquor from steel finishing operations (K062), sludges from treating electroplating wastes (F006), and sludges from treating aluminum chemical conversion coating operation wastes (F019). The other inorganic solutions and sludges treated at this facility are characteristically hazardous and are not currently subject to LDR's (i.e.: until the third third scheduled wastes rules are promulgated). Characteristically hazardous liquid wastes, including free liquids associated with any solid or sludge, that contain specific metals at concentrations greater than or equal to the levels specified in Table C.5 are, however, subject to California list land disposal prohibitions.

C-4a(i) Applicable Treatment Standards

The effluents from the treatment of spent pickle liquors from steel finishing operations, electroplating wastes, aluminum chemical conversion coating operation wastes and characteristically hazardous wastes are not subject to land disposal restrictions because the treated effluent is discharged to the Detroit wastewater treatment plant in accordance with the domestic sewage exclusion in 40 CFR 261.4(a)(i).

The F006 sludges from the treatment of electroplating wastes are subject to land disposal restrictions. The best demonstrated available technology (BDAT) standards for F006 non-wastewaters are provided in Table C.6. These treatment standards are based on the performance of a stabilization process using cement kiln dust as a binding agent.

TABLE C.5

CALIFORNIA LIST WASTES

1. Liquid hazardous wastes having a pH less than or equal to two (2.0).

2. Liquid hazardous wastes containing polychlorinated biphenyls (PCBs) at concentrations greater than or equal to 50 ppm.

3. Liquid hazardous wastes that are primarily water and contain halogenated organic compounds (HOCs) in total concentration greater than or equal to 1,000 mg/l and less than 10,000 mg/l HOC's.

4. Liquid hazardous wastes including free liquids asociated with any solid or sludge, containing the following metals (or elements) or compounds or these metals (or elements) at concentrations greater than or equal to those specified below:

   (i) Arsenic and/or compounds (as As) 500 mg/l;
   (ii) Cadmium and/or compounds (as Cd) 100 mg/l;
   (iii) Chromium (VI/and/or compounds (as Cr VI) 500 mg/l;
   (iv) Lead and/or compounds (as Pb) 500 mg/l;
   (v) Mercury and/or compounds (as Hg) 20 mg/l;
   (vi) Nickel and/or compounds (as Ni) 134 mg/l;
   (vii) Selenium and/or compounds (as Se) 100 mg/l;
   (viii) Thallium and/or compounds (as Tl) 130 mg/l.

5. Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing free cyanides at concentrations greater than or equal to 1,000 mg/l.

Table C.6

BDAT Treatment Standards for F006

[Nonwastewaters]

Constituent	(mg/kg)	Total Composition TCLP (mg/l)
Cadmium	N/A	0.066
Chromium (total)	N/A	5.2
Lead	N/A	0.51
Nickel	N/A	0.32
Silver	N/A	0.072
Cyanides (total)	Reserved	Reserved

The F019 sludges from the treatment of aluminum chemical conversion coating operation wastes are soft hammer wastes which are not currently subject to a BDAT treatment standard. The U.S. EPA has proposed BDAT treatment standards for F019 non-wastewaters in the land disposal restrictions for second third scheduled wastes (54 Fed. Reg. 1069 (1989)). The non-wastewater standards for metals are based on lime precipitation followed by filtration and stabilization (see Table C.7). The cyanide standard is based on electrolytic oxidation followed by alkaline oxidation.

The residuals resulting from the treatment of corrosive and metal-bearing characteristically hazardous liquid wastes are not subject to California list requirements. These solids from the treatment processes employed at Dynecol no longer meet the statutory definition of a California list waste.

C-4a(ii) Waste Analysis Requirements

The F006 sludges are analyzed on a batch basis for the constituents listed in Table C.6 using the toxicity characteristic leachate procedure (TCLP). Although there are currently no BDAT treatment standards for F019 wastes these sludges are analyzed for the metals listed in Table C.7 using the TCLP. The F019 sludges are also analyzed for total and amenable cyanides.

C-4a(iii) Soft Hammer Certification Requirements

Although the U.S. EPA has not established BDAT treatment standards for F019 wastes, these wastes may still be land disposed under certain conditions. The landfill must meet minimum technological requirements and the generator must demonstrate that he or she has investigated the availability of treatment capacity and has determined that land disposal is the only practical alternative currently available. This "soft-hammer" applies until the U.S. EPA sets treatment standards or until May 8, 1990. After this date, wastes without established treatment standards will be banned from land disposal.

The proposed treatment standards for F019 are identical to the existing treatment standards for F006, with the exception of proposed limits for total and amenable cyanide. Cyanides will probably not be present above the proposed standards because of the stringent cyanide limitations imposed by Dynecol. F019 sludges that meet the proposed treatment standards contain concentrations of regulated constituents at the most protective levels achievable by practically available technologies. This approach is consistent with the U.S. EPA's definition of "treatment" which does not require treatment for treatment's sake (53 Fed. Reg. 31180, 1988).

For F019 sludges that meet the proposed treatment standard Dynecol will submit to the U.S. EPA, Region V Regional Administrator and the MDNR a demonstration which shows that further treatment would yield little or no environmental benefit. Dynecol will also provide the following certification:

Table C.7

PROPOSED BDAT TREATMENT STANDARDS
METAL FINISHING SLUDGES SUBCATEGORY FOR F019

[Nonwastewaters]

Constituent	Total Composition (mg/kg)	TCLP (mg/l)
Cyanides (total)	110	N/A
Cyanides (amenable)	0.064	N/A
Cadmium	N/A	0.066
Chromium	N/A	5.2
Lead	N/A	0.51
Nickel	N/A	0.32
Silver	N/A	0.072

> "I certify under penalty of law that the requirements of 40 CFR 268.8(a)(1) have been met and that disposal in a landfill or surface impoundment is the only practical alternative to treatment currently available. I believe that the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Dynecol will submit a copy of the demonstration and certification to the receiving facility with the initial waste shipment. The certification alone will be submitted with each subsequent shipment, provided that the conditions of the certification remain unchanged.

F019 sludges which do not meet the proposed treatment standards will be treated using practically available technologies if treatment capacity is available. Possible treatment technologies include stabilization with cement kiln dust and lime precipitation. If it is determined that there is no practically available treatment for the F019 sludges, Dynecol will prepare a demonstration which outlines why treatment capacity was unavailable and will submit the following certification to the U.S. EPA, Region V Regional Administrator and the MDNR:

> "I certify under penalty of law that the requirements of 40 CFR 268.8(a)(1) have been met and that disposal in a landfill or surface impoundment is the only practical alternative to treatment currently available. I believe that the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

If it is determined that there are practically available treatments for the F019 sludges, Dynecol will contract to use the technology which yields the greatest environmental benefit. Dynecol will submit a demonstration to the U.S. EPA, Region V Regional Administrator which discusses the benefits of the chosen technology. The following certification will also be provided:

> "I certify under penalty of law that the requirements of 40 CFR 268.8(a)(1) have been met and that I have contracted to treat my waste (or will otherwise provide treatment) by the practically available technology which yields the greatest environmental benefit, as indicated in my demonstration. I believe that the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Dynecol will submit a copy of the demonstration and the certification to the receiving facility. With each subsequent waste shipment, only the certification will be submitted, provided that the conditions of the certification remain unchanged.

C-4a(iv) Storage Requirements

The influent wastes and treatment residuals are stored solely for the purpose of the accumulation of such quantities of hazardous wastes as necessary to facilitate proper treatment or disposal. These wastes are not stored for more than one year. Treatment residuals are typically disposed of in less than 90 days. All containers and tanks are clearly marked to identify their contents and storage start dates.

C-4a(v) Recordkeeping

Dynecol maintains a copy of the notice, if applicable, required by the generator under 40 CFR 268.7 in the operating record. Waste analysis data are also kept on file.

Dynecol maintains copies of all notices, certifications, demonstrations, waste analysis data, and other applicable documentation for treatment residues which are sent to off-site treatment, storage, or disposal facilities. These files are kept for a minimum of 5 years.

C-4a(vi) Manifests

Any treatment facility which is to receive the wastes subject to land disposal restrictions is notified in writing of the appropriate treatment standard for each shipment. The F006 notice, which is provided in Appendix C-5, includes the following information:

- the EPA hazardous waste number,
- the corresponding treatment standard,
- the manifest number, and
- waste analysis information.

C-4b Restricted Wastes Stored in the Container Storage Facility

The container storage area serves as a transfer station for containerized wastes from off-site generators. As such, Dynecol accepts a wide variety of listed and characteristically hazardous wastes for temporary storage. Appendices C.6 and C.7 list the wastes which are currently subject to land disposal restrictions. Appendices C. 8 and C.9 list the second and third third scheduled wastes which will be subject to land disposal restrictions in the future.

C-4b(i) Applicable Treatment Standards

The spent solvent wastes, California list wastes, and certain first third scheduled wastes are subject to BDAT treatment standards. These treatment standards are codified in 40 CFR 268 Subpart D. As stated in Section C-1a, Dynecol does not accept wastes containing dioxins or wastes with PCB concentrations greater than 50 ppm.

The generator is responsible for providing a notice which lists the appropriate treatment standard. Since Dynecol does not treat any of these wastes, the notice, with the applicable treatment standard and waste analysis information, is provided to the treatment or disposal facility.

C-4b(ii) Waste Analysis Requirements

The generator is responsible for characterizing his or her wastes prior to shipping them to Dynecol. The generator must test his or her waste or an extract of the waste using approved test methods or must use knowledge of the waste, to determine if the waste is subject to land disposal restrictions. This waste analysis information and the accompanying notice must be submitted to Dynecol for review and approval.

If a generator determines that his or her waste is restricted and that the waste does not meet applicable treatment standards, the generator must supply a notice with the following information:

- EPA Hazardous Waste Number;
- The corresponding treatment standards and all applicable prohibitions set forth in 268.32 or RCRA section 3004(d);
- The manifest number associated with the shipment of waste; and
- Waste analysis data, where available.

If the generator determines that the waste is restricted and that the waste may be land disposed without further treatment, a notice with the following information must be submitted:

- EPA Hazardous Waste Number;
- The corresponding treatment standards and all applicable prohibitions set forth in 268.32 or RCRA section 3004(d);
- The manifest number associated with the shipment of waste; and
- Waste analysis data, where available.

The generator must also provide the following certification:

> I certify under penalty of law that 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 and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA section 3004(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.

C-4b(iii) Soft Hammer Certification Requirements

For soft hammer wastes with no applicable BDAT treatment standard that are destined for land disposal, Dynecol will make a good faith effort to locate and contract with treatment and recovery facilities practically available which provide the greatest environmental benefit. If it is determined that there is no practically available treatment for the waste, Dynecol will prepare a demonstration which outlines why treatment capacity was unavailable and will submit the following certification to the U.S. EPA, Region V Regional Administrator and the MDNR:

> "I certify under penalty of law that the requirements of 40 CFR 268.8(a)(1) have been met and that disposal in a landfill or surface impoundment is the only practical alternative to treatment currently available. I believe that the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Dynecol will submit a copy of the demonstration and the certification to the receiving facility. With each subsequent waste shipment, only the certification will be submitted, provided that the conditions of the certification remain unchanged.

If it is determined that there are practically available treatments for the waste, Dynecol will contract to use the technology which yields the greatest environmental benefit. Dynecol will submit a demonstration to the U.S. EPA, Region V Regional Administrator which discusses the benefits of the chosen technology. The following certification will also be provided:

> "I certify under penalty of law that the requirements of 40 CFR 268.8(a)(1) have been met and that I have contracted to treat my waste (or will otherwise provide treatment) by the practically available technology which yields the greatest environmental benefit, as indicated in my demonstration. I believe that the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Dynecol will submit a copy of the demonstration and the certification to the receiving facility. With each subsequent waste shipment, only the certification will be submitted, provided that the conditions of the certification remain unchanged.

C-4b(iv) Storage Requirements

The containerized wastes are stored solely for the purpose of the accumulation of such quantities of hazardous wastes as necessary to facilitate proper treatment or disposal. These wastes are not stored for more than one year. All containers are clearly marked to identify their contents and storage start dates.

C-4b(v) Recordkeeping

Dynecol maintains a copy of the notice required by the generator under 40 CFR 268.7 in the operating records. Waste analysis data is also kept on file.

Dynecol maintains copies of all notices, certifications, demonstrations, waste analysis data, and other applicable documentation for treatment residues which are sent to off-site treatment, storage, or disposal facilities. These files are kept for a minimum of 5 years.

C-5 COMPATIBILITY EVALUATION PROCEDURE FOR CONTAINERIZED STORAGE FACILITY

Many containerized wastes which may be potentially stored at Dynecol are considered incompatible and must be properly segregated even during short-term storage to minimize or eliminate the potential for release of toxic gases, explosion or fire. Dynecol adheres to the following compatibility evaluation to maintain the proper segregation of containerized wastes stored in the container storage facility.

Since the waste characteristics must be fully defined prior to acceptance of a waste, Dynecol's "Waste Analysis Form" which is completed by the generator is the primary source of waste characterization information. Table C.8 summarizes the waste characterization criteria and the order of consideration Dynecol uses to screen and label each waste prior to storage. In addition, randomly selected containers from each arriving load are sampled to confirm the waste characteristics presented by the generator as described in Section C-2e.

C-5A CHARACTERIZATION SCHEME

Wastes are evaluated according to the following characterization scheme and either rejected or placed into a storage bay labeled for that waste type.

1. Initial Acceptability Test: The following waste types are not accepted under any circumstances:

    •Radioactive Wastes

    •Dioxin Wastes

    •Explosive Wastes

- Extremely Hazardous Wastes (refer to the approved waste code listing in Section A, Table A.1). "Extremely hazardous wastes" are considered to be those wastes which are not found in Table A.1).

- PCB Wastes over 50 parts per million (ppm)

2. Cyanide Wastes are defined as those wastes containing greater than 20 ppm cyanide and are stored in a separate bay labeled "Cyanide Waste". This bay is located in one corner of the container storage building and acid-bearing wastes are not stored adjacent to or across the aisle from the cyanide bay.

3. Wastes with an oxidation potential of 50 millivolts (mV) or higher when measured in a 0.001 Normal solution of ferrous ammonium sulfate are considered to be oxidizing wastes. Waste with a pH of less than two standard units are labeled a "Corrosive Oxidizer", whereas wastes with a pH greater than 2 are labeled "Non-Corrosive Oxidizer".

4. Wastes with a pH of two or less will be stored in a bay labeled "Corrosive Acid". Wastes having a pH of 12.5 or higher are labeled and stored as "Corrosive Base".

5. Flammable wastes are defined as having a flash point of less than 100°F. All flammable wastes are isolated in a bay labeled "Flammable Waste".

6. All wastes which exhibit reactive characteristics with water are stored separately in a bay labeled "Water-Reactive Wastes".

7. Wastes considered organic and non-flammable are stored in a bay labeled "Non-Flammable Organics".

Following the characterization and labeling of all incoming wastes, the containerized waste will be moved into isolated storage bays. Several different waste types may be stored in the same bay based upon the Compatibility Matrix (see Table C.9). When more than one waste type is stored within the same bay, placards indicating each waste type will be posted. In addition, for ease of managing and checking storage within bays, different waste types will always be separated by row (i.e., different waste types will not be mixed within a row).

TABLE C.8
CHEMICAL CHARACTERIZATION HIERARCHY
FOR STORAGE IN THE HAZARDOUS WASTE CONTAINER STORAGE FACILITY

Waste Characterization	PCB	Cyanide	Oxidation Potential	pH	Flash Point	Water Reactive	Non-Flam Organic	Label
Radioactive	*	*	*	*	*	*	*	Reject
Dioxins	*	*	*	*	*	*	*	Reject
Explosive	*	*	*	*	*	*	*	Reject
Extremely Hazardous Material**	*	*	*	*	*	*	*	Reject
PCB	≥50ppm	*	*	*	*	*	*	Reject
Cyanide	<50ppm	≥20ppm	*	*	*	*	*	Cyanide Waste
Corrosive Oxidizer	<50ppm	<20ppm	≥50mV	0-2	*	*	*	Corrosive Oxidizer
Non-Corrosive Oxidizer	<50ppm	<20ppm	≥50mV	3-14	*	*	*	Non-Corrosive Oxidizer
Corrosive Acid	<50ppm	<20ppm	<50mV	0-2	*	*	*	Corrosive Acid
Corrosive Base	<50ppm	<20ppm	<50mV	12.5-14	*	*	*	Corrosive Base
Flammable	<50ppm	<20ppm	<50mV	3-12.5	≥100°F	*	*	Flammable Waste
Water Reactive	<50ppm	<20ppm	<50mV	3-12.5	<100°F	Yes	*	Water-Reactive Waste
Non-Flammable	<50ppm	<20ppm	<50mV	3-12.5	<100°F	No	Yes	Non-Flammable Organic
Dilute Aqueous Waste	<50ppm	<20ppm	<50mV	3-12.5	<100°F	No	No	Dilute Aqueous Waste

* Result irrelevant: prior category has greater importance.
** Extremely hazardous wastes are considered to be those hazardous wastes which are not found in Table A.1, Section A, "Approved Hazardous Wastes for Container Storage"

TABLE C.9
COMPATIBILITY MATRIX FOR WASTE STORAGE
WITHIN ISOLATION BAYS

Waste Characteristic	Cyanide Wastes	Corrosive Oxidizers	Non-Corrosive Oxidizers	Corrosive Acids	Corrosive Bases	Flammables	Water Reactives	Non-Flammables	Dilute Aqueous Wastes
Cyanide Wastes	C	X	X	X	C	X	X	X	C
Corrosive Oxidizers	X	C	C	X	X	X	X	X	C
Non-Corrosive Oxidizers	X	C	C	X	C	X	X	X	C
Corrosive Acids	X	X	X	C	X	X	X	X	C
Corrosive Base	C	X	C	X	C	X	X	X	C
Flammables	X	X	X	X	X	C	C	C	C
Water Reactives	X	X	X	X	X	C	C	X	X
Non-Flammables	X	X	X	X	X	C	X	C	C
Dilute Aqueous Wastes	C	C	C	C	C	C	X	C	C

X = incompatible
C = compatible

SECTION D

PROCESS INFORMATION

The information provided in this section is submitted in accordance with the requirements of Michigan Act 64, Rules 299.9508(1)(b), 299.9504(1)(g), 299.9504(2), 299.6614, and 299.6615 which incorporate the provisions of 40 CFR 270.15 and 270.16 by reference. This section discusses specific process information used by Dynecol, Inc. to treat and store hazardous waste in the hazardous waste treatment tank area and the tank and container storage areas. All process equipment and containment structures are also described in this section. Supporting information, calculations, drawings, material specifications, basis of design and process capacity summaries are located in Appendices D.1 and D.2.

D-1 CONTAINERS [40 CFR 270.15]

Dynecol, Inc. stores containers of hazardous wastes in a facility which has been specifically designed for this type of hazardous waste storage. The containers that are stored in the facility are typically 30- or 55-gallon drums and are not larger than 500-gallon totes. The wastes are temporarily stored within the facility until they are accepted for off-site disposal treatment or on-site treatment.

D-1a Description of the Container Storage Facility

The hazardous waste container storage facility occupies a centrally located and formerly undeveloped area of the Dynecol site (to the east of the treatment facility) and has a minimum fifty-foot setback from all property lines (refer to Drawing C.2 of Appendix D.1b.).

The 85-foot by 94-foot structure is constructed of an insulated built-up steel deck with twelve-inch concrete block walls for 4-hour fire protection. The service and garage doors are 1-hour fire rated. Access to the building is limited to vehicles at the loading docks within the southeastern corner of the structure and to pedestrians at five locations along the north, east, and south sides of the facility. Door operators are located in non-explosive areas. The interior areas of the building are heated between 40°F to 50°F in the winter with 4,800 cfm of air flow per NFPA standards, and are cooled by ventilation fans in the summer with an increased air flow of 8,600 cfm.

The storage facility consists of two loading docks, eight isolation storage bays and a waste bulking and transfer area. The 31-foot by 80-foot loading/unloading area located in the southeast corner of the facility is roofed but without side walls. Wall skirting is provided as a barrier against precipitation infiltration. In addition, the loading and unloading area is situated within the container storage building with exposure in a non-predominant wind direction. Spill containment structures are provided in this area to capture any spills or leaks. The floor coating is acid, caustic, and organic resistant in the containment area as well as in the dock area. The loading docks are equipped with bumpers and hydraulic levelers.

The container storage area consists of eight, 18-foot by 20-foot isolation bays constructed of continuously poured concrete to provide for the separate storage of incompatible or reactive wastes (see Drawing A.1 of Appendix D.1b). Each bay holds up to 120 drums (6,600 gallons) on a maximum of two levels of pallets with 18 to 24 inches of aisle space provided between each row of drums and walls. Storage of the containers on pallets facilitates inspection of the container storage area for leaks. In bays storing flammable liquids, containers are stored no greater than 12 feet from the main aisle. Each bay has been designed and constructed to contain a spill or leak of 766 gallons, more than 10

percent of the total maximum volume of hazardous wastes that are stored in each bay. Each bay contains a blind sump that can be used to remove spilled waste from the bay. The total floor surface area in each bay is constructed of concrete with a continuous chemical-resistant coating including the bottom six inches of the walls separating the storage bays. The bay divider walls are six feet high to eliminate any releases from containers stored on the second level from exiting the storage bay.

The waste bulking and transfer area is used to consolidate small quantities of certain compatible wastes into containers and to bulk containerized wastes into bulk tankers for transport off-site. Section C, Waste Analysis Plan, provides a listing of the waste types which may be bulked. This area is equipped with a fume hood and an air emission control system consisting of a blower, a wet scrubber, and a passive activated carbon system. Tanker truck vapor recovery vents are also provided to capture tanker emissions and pass them through the emission control system. The bulking area is coated with a continuous chemical-resistant coating. A secondary containment system for restricting any potential spills or leaks is provided in this area, including a blind sump for collecting any spills. In the event of a spill in the bulking and transfer area which could produce vapors that would settle to the floor, a low level exhaust system has been installed to exhaust 1,000 cfm from near the floor. This system has been designed to be manually activated in the bulking area.

All transfer piping within the bulking area is two-inch Teflon-lined pipe with a schedule 10 ductile iron outer shell. The sizing of this pipe is based on the pumping of 50 gpm of waste liquid with a specific gravity of 1. All pipe joints are flanged. The exterior of the pipe is painted with an epoxy-based, chemical-resistant paint and is labeled according to its use designation. Three pipe lines are provided from the transfer area to the loading area; one each for acids, caustics, and organics.

Ventilation air within the transfer and bulking area is supplied at a rate of 1,000 cfm and is withdrawn through the three barrel transfer station ventilators. A side stream from the heating unit supplies the required heated air during the winter months. The barrel transfer stations have been designed according to the guidelines presented in the Industrial Ventilation Manual of the American Conference of Governmental Industrial Hygienists. Each station withdraws 300 cfm of air which provides adequate velocity across the container opening to capture any fugitive emissions from the top of the container. The low level exhaust system, started by the operator, captures vapors that may settle near the floor.

All electrical components within the container storage area are explosion-proof. A grounding system has been installed in the bulking and transfer area to allow containers to be grounded during transfer operations. Electrical service lines and conduits are

routed overhead with no conduits or wiring penetrating the walls of the storage bays. A separate room (the mechanical room) for the facility's controls is isolated from any potential explosion area since the equipment in this room is not explosion-proof.

Compressed air piping is a schedule 40 galvanized system with threaded joints. Compressed air is supplied by an existing compressor in another on-site building. A one-inch compressed air drop line is provided to all blind sumps to allow a portable air diaphragm pump to remove any liquids from the sumps. All pumps are positive displacement, air diaphragm design, and able to pump 50 gpm (see Drawing M.1 of Appendix D.1b).

Potable water supply to the storage facility is provided through a service main, metered according to the City of Detroit standard metering requirements. Interior water piping is schedule 40 galvanized steel pipe. Fire protection water supply to the sprinkler system is from an eight-inch water main. Below-grade piping is ductile iron while above-grade piping is schedule 40 galvanized steel. The sprinkler system is a wet-type, closed-head, automatic operation with a flow switch and an electric alarm bell on the building's exterior. The capacity of this sprinkler system is 0.30 gpm/sf with an allowance of 750 gpm for fire department streams. An outside post indicator valve (PIV) with electric monitor switch is available at the facility. The fire protection system layout is shown on Drawing FP.1 of Appendix D.1b.

Short-term parking for vehicles that load or unload hazardous waste containers into or out of the storage facility is provided adjacent to the storage facility. A portion of the surface of this parking area is bituminous pavement and a portion is crushed stone (gravel). All roof drains and site runoff are piped to storm sewers. The floor elevation of the building is set six inches above the existing grade to prevent the infiltration of surface runoff into the building.

D-1b Description of Containers [40 CFR 264.171 and 264.172]

The primary containment devices that are used to store hazardous wastes in the storage facility are 500-gallon totes, 55-gallon metal drums, or smaller containers that are lined as appropriate for the wastes. Containerized hazardous wastes are received by Dynecol in lab packs or other containers and may be consolidated after the compatibility of these wastes has been clearly determined. The contents of any container that is in unsatisfactory condition or incompatible with the container are promptly placed in a compatible container in good condition.

All drums containing hazardous wastes are clearly and accurately labeled as to the container's contents. All empty containers are labeled "Empty" with previous contents and the date emptied included on the label. Following waste bulking operations, all

containers are closed and resealed to eliminate the potential of vapor emissions until they are taken off-site for disposal or reuse. For containers holding non-hazardous wastes, a "Non-Hazardous Waste" label is affixed to the container to indicate its contents.

In the event that container repackaging is necessary due to container corrosion damage or leakage, an 85-gallon recovery (overpack) drum is utilized to contain a leaking or potentially leaking drum.

D-1c Container Management Practices [40 CFR 264.173]

Incoming hazardous wastes destined for temporary storage at Dynecol are characterized to ensure that the wastes can be safely stored, handled, mixed and eventually accepted by other hazardous waste management facilities. A detailed description of the compatibility testing procedures and characterization scheme is contained in Section C, Waste Characteristics. Rejected waste shipments are returned to the generator. Accepted containers are placed in storage where they will remain sealed until they are removed for shipment, unless unusual circumstances require that the drum be opened again. The containers in storage are not opened, handled, or stored in a manner that could cause a leak, spill, or rupture.

Those waste shipments that are to be combined and transferred to other containers or are to be bulked into tankers are taken to the waste bulking area. Once the transfer operation is complete, each container is appropriately labelled and moved to a storage bay designated for storing the identified waste type.

Incompatible and reactive wastes are segregated in separate storage bays on top of a paved and impervious surface covered with a chemical-resistant coating. During storage, sufficient aisle space of 18 to 24 inches is maintained to provide access. Container labels face the aisle and are clearly visible. In order to detect spills and leaks and to prevent the containers from contacting any standing liquids, the containers are stored directly on top of pallets in good condition, no more than two stacked layers high. In addition, this limited drum stacking arrangement, along with a six-foot high bay dividing wall, prevents a punctured drum that has been elevated above the containment structure from overshooting the secondary containment system and contaminating areas outside of the storage bay. As noted above, wastes are evaluated for compatibility prior to storage or bulking activities. These procedures are detailed in Section C, Waste Characteristics.

The storage bays, waste bulking area, and loading/unloading areas regularly undergo routine inspections to detect any actual releases or any conditions that could result in a release. If the inspection identifies an unsatisfactory condition, such as an actual release or the potential for a release, remedial actions as specified in the Contingency Plan (Section G) and the facility's spill plan are promptly implemented.

When an appropriate facility to treat, recycle, recover, or dispose of the containerized hazardous wastes has accepted the wastes, the containers are removed from the storage bay by trained Dynecol facility personnel, transferred to licensed vehicles, and manifested according to state and federal regulations.

D-1d Secondary Containment System Design and Operation [40 CFR 264.175(a)]

A secondary containment system is designed and constructed for each of the eight storage bays, the waste bulking area, and the loading/unloading areas in the hazardous waste container storage facility. These secondary containment systems are constructed of concrete and are free of cracks or gaps and sufficiently impervious to contain any leaks and spills until the release is detected, and appropriate response actions are initiated. All floor surfaces in the proposed facility, including the secondary containment structures, are covered with a continuous chemical-resistant coating.

Each of the eight container storage bays measure 18 feet by 20 feet and hold no more than 120, 55-gallon containers. The bays are sloped to drain and remove liquids resulting from any leaks and spills. The 1,170-gallon capacity of the storage bay exceeds the requirement for secondary containment to be able to contain 10% of the total maximum volume (total volume of 6,600 gallons) of waste stored in the area (see Appendix D.1d.). Run-on is prevented from entering the storage bays by the roof and side walls of the building and by the concrete areas surrounding the facility that are sloped away from the building. All containers holding free liquids are stored at least four feet from the edge of the aisle if stored one pallet high and at least eight feet if stored two pallets high in order to contain the liquid stream of a punctured drum within the secondary containment structure.

Each storage bay has a blind sump that is used to remove any spilled or leaked material from the bay. A portable air diaphragm pump operated through a one-half-inch compressed air drop line at each blind sump is used to pump out materials in the sumps. Routine inspections of these sumps identify when a release has occurred and appropriate response procedures are then followed in removing this release from the secondary containment system.

The waste bulking area, which measures approximately 25 feet by 35 feet, also possesses a secondary containment system for capturing and removing any released materials. A blind sump is located in the center of the area with the chemical-resistant floors sloped to direct any releases to this sump.

The secondary containment system for the facility's loading and unloading area consists of a blind sump located near to the loading dock. Concrete chemical-resistant floors in this area are sloped toward this sump.

D-1e Removal of Liquids from Containment System [40 CFR 270.15(a) and 264.175(b)(5)]

Run-on is prevented from entering the container storage facility by the roof and walls of the building and by the adjacent concrete areas that are sloped away from the building to direct drainage towards the site's storm sewers.

The containment areas are inspected daily to detect any leaks or spills. If any accumulated liquids are detected, the liquids will be promptly sampled and analyzed for hazardous waste constituents. It will also be determined whether the source of the liquids is a listed hazardous waste or whether any liquids were in contact with a listed hazardous waste, based on the waste types stored in the bay. The accumulated liquids will be removed within 24 hours, placed in drums, and stored in an appropriate storage bay if it is determined that these liquids are hazardous wastes. If these liquids are determined to be non-hazardous wastes, they will be removed and disposed of in an appropriate manner.

D-2 TANKS [40 CFR 270.16]

D-2a Description of Tanks

The hazardous waste treatment system at Dynecol has been designed to process 144,000 gallons per day of hazardous wastes. The processing and storage of these hazardous wastes takes place in above-ground, corrosion resistant vessels. Three tanks are available for segregated storage of hazardous wastes prior to processing, with a combined capacity totaling 34,000 gallons. Primary treatment takes place in any one of four 20,000-gallon tanks by means of chemical oxidation, chemical reduction, and neutralization. Secondary treatment takes place in any one of another four 20,000-gallon tanks by means of neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, and lime stabilization. Table D.1 provides a summary of all regulated tanks (treatment and storage).

The horizontal 20,000-gallon primary treatment tanks (Tanks #1 through #4) are rubber-lined, steel tanks measuring twenty-four feet long with a twelve-foot diameter. The vertical 20,000-gallon secondary treatment tanks (Tanks #18 through #21) are fiberglass reinforced plastic with cone bottoms. The tanks measure 21 feet, eight inches high, with a twelve-foot diameter and are equipped with a six-inch bottom nozzle and 24-inch side and top manholes.

TABLE D.1

SUMMARY DESCRIPTION OF REGULATED TANKS

Tank Number	Volume (Gallons)	Dimensions	Construction Materials	Usage	Date Installed	Feed System	Safety Cutoff	By-Pass	Shell Thickness	Pressure Control
1	20,000	12'D x 24'L	rubber-lined steel	primary treatment	1976	flex hose	high-level controls solenoid valve	overflow to secondary containment	0.240"	vent to atmosphere
2	20,000	12'D x 24'L	"	primary treatment	1976	"	"	"	0.240"	"
3	20,000	12'D x 24'L	"	primary treatment	1980	"	"	"	0.240"	"
4	20,000	12'D x 24'L	"	primary treatment	1980	"	"	"	0.240"	"
7	10,000	10'D x 17'L	stainless steel	hazardous waste storage	1984	"	high-level controls transfer pump	"	0.086(top) 0.115(shell) 0.158(bottom)	"
8	12,000	8'D X 32'L	rubber-lined steel	hazardous waste storage	1984	CPVC	high-level alarm	"	0.240"	"
10	12,000	12'D x 14'L	fiberglass	hazardous waste storage	1984	"	high-level controls transfer pump	"	0.310"(top) 0.255"(shell) 0.365"(bottom)	"
18	20,000	12'D x 22'H	FRP	secondary treatment	1985	CPVC	high-level controls transfer pumps	"	0.495	"
19	20,000	12'D x 22'H	"	"	"	"	"	"	"	"
20	20,000	12'D x 22'H	"	"	"	"	"	"	"	"
21	20,000	12'D x 22'H	"	"	"	"	"	"	"	"

D = diameter; L = length; H = height
FRP = fiberglass reinforced plastic
CPVC = chlorinated polyvinyl chloride

Tanks #7, #8, and #10 are regulated hazardous waste storage tanks. The individual capacities, dimensions, and other pertinent information regarding each tank is reported in Table D.1.

The storage tanks, Tanks #12 through #17 and #22 through #26, are non-regulated tanks which serve in various roles of support for the treatment operation. A general description of their function and size are listed as follows:

- Tanks #12, #13, #16, and #17 are each 25,800-gallon vertical fiberglass reinforced plastic tanks measuring 35 feet high with an 11-foot diameter. All four tanks store recycled ferrous chloride which has been treated on-site. The treatment process consists of a closed loop filtration operation which is separate from other treatment operations at this facility.

- Tank #14 is a 14,000-gallon steel tank used to store lime slurry prior to use in the waste treatment process. The tank measures 12 feet high by 14 feet in diameter.

- Tank #15 is a 27,600-gallon steel tank used to store liquid caustic soda (sodium hydroxide) prior to use in the waste treatment process. The tank is 24 feet high by 14 feet in diameter.

- Tank #22 is a 1,000-gallon vertical fiberglass reinforced plastic tank measuring eleven feet, six inches high, with a four-foot diameter and possessing an overflow nozzle. This tank is located in the lower level of the filter press building and is used as a mild acid cleaning solution holding tank for both filter presses.

- Tank #23 is a 6,000-gallon lime slurry tank measuring 16 feet high, with an 8-foot diameter.

- Tank #24 is a vertical 6,000-cubic-foot carbon steel tank measuring 16 feet high with an 8-foot diameter. Tank #24 is used as a holding tank for storing city water as needed for facility requirements.

- Tanks #25 and #26 are vertical 50,000-gallon/each carbon steel tanks measuring 60 feet high with a 12-foot diameter and cone bottom. The tanks are used to store dry lime.

A certification of capability for the hazardous waste tank storage and treatment facility is provided in Appendix D-2e.

D-2b Tank Corrosion and Erosion [40 CFR 270.16(e)]

The characteristics of tank construction and lining materials for all tanks are compatible with stored materials, treatment reagents, and hazardous wastes to reduce the effects of tank corrosion and erosion. The primary treatment tanks are lined with Triflex rubber as a corrosion-resistant barrier.

D-2c Hazardous Waste Treatment Operations

The waste treatment processes undertaken at the Dynecol facility include primary treatment, secondary treatment, and solids dewatering. These treatment processes result in the detoxification of the water contained in the initial solutions, stabilization of toxic constituents, and the fixation of the constituents into a solid mass that is reduced in volume and is safer to handle and dispose of in an approved landfill. The following discussion describes the handling procedures for hazardous wastes which are stored and processed in tanks at the Dynecol facility.

D-2c(i) Delivery and Receipt of Materials

Hazardous wastes are delivered to the treatment facility in bulk tankers or are received in containers at the container storage area. Vehicles arriving at the facility are unloaded only within designated areas in the plant which are provided with spill control structures and equipment to contain spills or leaks. Prior to unloading a shipment of hazardous waste, the accompanying manifest and land disposal restriction certification is inspected, and a sample of the tanker's or container's contents is tested to verify that the waste received is the same as that described on both the accompanying manifest and the waste characterization report on file at the facility (see Waste Analysis Plan). The contents of the tanker are either removed by pressurization of the tanker with air or a pump system and containers are unloaded with fork lifts and drum handlers.

D-2c(ii) Storage of Hazardous Wastes Prior to Treatment

If all of the primary treatment vessels are in service and unable to receive incoming waste, one of three storage vessels, designated for specific types of wastes, will receive the incoming waste material. These hazardous waste storage vessels, identified as Tanks #7, #8, and #10, are used to store hazardous waste until a primary waste treatment vessel becomes available to process the waste, normally within less than 24 hours.

D-2c(iii) Primary Treatment

After receipt and verification of the hazardous wastes, wastes that are destined for treatment are transferred into one of four 20,000-gallon primary treatment vessels. These

vessels are identified as Tanks #1, #2, #3 and #4. Each of the four primary treatment vessels is a 20,000-gallon, rubber-lined, steel vessel that is situated in a horizontal position, above-ground, and within a concrete secondary containment area which provides for 100,200 gallons of containment capacity. Each of these vessels has been fabricated with a large diameter vent pipe. The vent pipe is manifolded into an induced air chemical recycle scrubber/condenser that has been designed to efficiently handle the maximum volume of air, vapor, and mist which could be simultaneously produced from each of the four vessels.

The treatment processes carried out in primary treatment vessels are batch rather than continuous processes, and include chemical oxidation, chemical reduction, and neutralization. Chemical oxidation is accomplished by injecting air at a pressure of 30 pounds per square inch (psi) into each primary treatment vessel through air spargers distributed throughout the bottom of each of these vessels. Air is used to oxidize iron and other cations in order to improve the condition of the sludge for subsequent filtration and to reduce the volume of solids that will require disposition.

Chemical reduction is required whenever hexavalent chromium is present in a waste stream. Wastes containing hexavalent chromium are first processed to chemically reduce chromium to the trivalent state. Hexavalent chromium, when placed in an aqueous solution containing excess acid and ferrous ion, is reduced to the trivalent oxidation state. The trivalent chromium can then be readily precipitated with lime from the solution in the secondary treatment process.

Oxidation and reduction are then followed by neutralization in the primary treatment process. Acidic solutions are treated with various alkaline solutions, such as sodium hydroxide solution or a lime slurry, to a minimum pH of 5.0. This primary batch treatment process is carried out in Tanks #1, #2, #3 or #4 by:

- pumping treatment reagents to a designated process vessel;
- agitating the waste and reagent mixture using air from spargers which are in place at the bottom of each vessel; and
- providing adequate retention time to allow the reaction mixture to equalize at a minimum pH of 5.0.

D-2c(iv) Secondary Treatment

The secondary treatment vessels are identified as Tanks #18, #19, #20 and #21. Each of the four vessels is a 20,000-gallon, fiberglass-reinforced plastic (FRP), cone-bottom vessel that rests in a vertical position, above-ground, and is enclosed within a building

and located within a concrete secondary containment system providing 33,300 gallons of containment capacity.

The secondary treatment processes carried out in any of the four secondary treatment vessels are batch rather than continuous processes, and include neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, and lime stabilization. The treatment reagent used in this secondary treatment step is a lime slurry or another alkaline solution. These secondary treatment process reactions detoxify the original solution by removing the toxic heavy metals from the liquid phase and stabilizing them in a solid phase.

The secondary waste treatment process is carried out by the addition of lime slurry or alkaline solutions, and by thoroughly agitating the waste and reagent mixture using the two mechanical mixers which are present at each vessel. The process is concluded when the appropriate pH is obtained to complex and precipitate the inorganic contaminants.

The lime or alkaline solutions that are added during the secondary treatment process react with the heavy metals to form heavy metal hydroxides which are insoluble and will then precipitate from solution. Once precipitated, the heavy metals are no longer dissolved in the aqueous phase, and the liquid portion is then detoxified. The precipitated heavy metal hydroxides are encapsulated and chemically fixed in a matrix of excess lime, iron hydroxide and other inert, non-hazardous solid materials. The excess lime, which will remain in the solid state through subsequent processing and disposal, will stabilize the resulting dewatered sludge.

D-2c(v) Dewatering

In the final processing step, the heavy metal hydroxides and other stabilizing products of the precipitation reaction are dewatered and fixed by pressure filtration. Pressure filtration compresses the material into a solid mass which contains 50% or less of moisture. In this final form, the toxic components which were present in the initial solutions are tightly bound in the solid mass. The stabilized, fixated and dewatered solids resist leaching of toxic heavy metals from the solid mass during acid extraction testing. Prior to disposal of the dewatered solids off-site, the solids are sampled and evaluated for hazardous waste characteristics (see Section C).

There are three recessed chamber filter presses on site. Each filter press has a processing capacity of about 167 cubic feet of dewatered sludge per cycle. These presses are located on the second floor of a two-story filter building, with the first floor used to receive sludge roll-off boxes.

The dewatering and filtration process is carried out in batches staggered among any of the three filter presses. After secondary treatment is complete, the contents of a secondary treatment vessel are pumped into the filter press by means of an air diaphragm pump. The completion of the filtration cycle is indicated by the feed pump discharge whenever a pressure of 100 psi is reached and no more liquid can be pumped. The filter is then opened, and dewatered sludge is allowed to fall into the sludge-hauling trailer or roll-off box located directly below each filter. The dewatered sludge is transported to an acceptable facility for ultimate disposal.

The dewatered sludge roll-off box area below the filter presses is cleaned daily and additionally as necessary to prevent the track-out of sludges. Wash waters are collected in the sump and reprocessed through the treatment system.

The listed hazardous wastes, F006 and F019, generate a sludge which is by definition a hazardous waste. These waste streams are segregated from all other waste streams delivered to the Dynecol facility. To assure proper segregation of these listed wastes during treatment and disposal, the following procedures have been implemented.

- Waste loads delivered to the facility which are identified as F006 and F019 and are found to be acceptable for treatment, are unloaded into Tank #1 for primary treatment. Tank #2 may, if necessary, be used for segregated primary treatment as a backup.

- After primary treatment in Tank #1 (or Tank #2), the listed waste is pumped into Tank #18 for secondary treatment. Tank #19 may, if necessary, be used for segregated treatment as a backup.

- After secondary treatment in Tank #18 (or Tank #19), the treated waste is dewatered through Filter Press B. The dewatered solids from Filter B are collected in a container designated for disposal at a licensed hazardous waste facility.

- To decontaminate all process tankage and equipment used in the treatment of F006 or F019 wastes, the following procedure is used:

  A volume of non-F-listed waste will be processed through all tankage, piping and dewatering equipment to be decontaminated. The non-F-listed waste volume shall be sufficient to fill the largest tank scheduled for decontamination to the high level control setting. The waste volume will be processed through primary

and secondary treatment in a manner appropriate for that waste type, including dewatering in the filter presses.

Dewatered solids from the decontamination process are collected and handled in the same manner as the F006 and F019 dewatered solids.

The contents of this container are manifested as F006 and F019, as appropriate, and shipped to a licensed hazardous waste facility for disposal. An operating log is used to track the movement of each waste load received at the facility. This log is used by operating personnel to track and control the movement of F006 and F019 waste loads through the process equipment, and to repeat the process cycle through the same equipment during the decontamination cycle. The log is also used by management to verify that segregation and decontamination procedures are being properly implemented.

D-2d Tank Management Practices [40 CFR 270.16(d) and (e), 264.194(b)]

Various operating practices and controls are implemented by Dynecol to prevent overfilling. Waste material is transferred manually from the primary treatment tank to a designated secondary treatment vessel through a flexible hose and the use of a ten horsepower pump. Each treatment tank has its own pipeline with fittings and valves properly labeled. The following equipment and devices are used for monitoring and controlling safety cut-off during material flows: level switch, pneumatic activated valve with manual override and limit switches, manual valve, and solenoid valve. To control the pressure, the following devices are used: pressure indicating transmitter, manual pumping, and atmospheric vents. High level alarms and indicator lights are automatically activated whenever a secondary tank reaches capacity during material feeding. Common valves and pipes are designed so that material flows cannot cross over. An alarm will sound, which cannot be easily silenced, whenever a sequence of events is not followed during material flow.

In the primary treatment tanks a high-level sensor control activates/deactivates the solenoid control valve on the compressed air piping system. Since compressed air is used to off-load tanks to the primary tanks, this control system will automatically prevent the overfill of the primary tanks.

Secondary tanks are equipped with two high-level sensors. The first, set at approximately the 8,250-gallon level, will automatically shut off the transfer pumps from the primary tank system. A second high-level sensor will activate an audible alarm at the 17,600-gallon level.

High-level sensors in tanks #7 and #10 are set at the 90 percent full level and will automatically deactivate the transfer pumps. Tank #8 is used only for storage of wash and sump waters prior to treatment or disposal. This tank is equipped with a high-level alarm. Overfill piping from tank #8 returns to the sump in a closed loop.

D-2e Hazard Potential

D-2e(i) Potential for Waste Material to Generate Extreme Heat During Processing

No extreme heat is generated during the processing of waste materials handled at this facility. Heat is generated in primary treatment due to the neutralization reaction between acidic and alkaline reagents. In the worst case, a waste containing 15 percent H_2SO_4 neutralized with a solution containing 25 percent NaOH would result in a temperature rise of 50°F. The neutralization reaction is exothermic and releases 13,700 calories per mole of water produced ("College Chemistry" 5th Ed., W.H. Nebergall, D.C. Heath and Co., 1972). This is equivalent to 1,376 BTU per pound of water produced in the reaction. The most extreme situation in the neutralization of spent acids is the treatment of a 10,000-gallon batch of solution having the maximum concentration of acid (15 percent H_2SO_4) and using 25 percent NaOH solution as the treatment reagent. Temperature rise is determined, as shown below, for the highest concentration acid solutions:

Type of Acid Solution	**H_2SO_4**	**HCL**	**HNO_3**
Maximum acid concentration	15%	5%	15%
Weight of Solution (10#/gal)	100,000#	100,000#	100,000#
Weight 100% acid	15,000#	5,000#	15,000#
Weight 25% NaOH (10#/gal)	49,000#	21,000#	38,100#
Weight of mixture (m)	149,400#	121,000#	138,100#
Weight H_2O produced	5,510#	2,465#	4,290#
Heat (#H_2O x 1,376), Q BTU	7.6×10^6 BTU	3.4×10^6 BTU	5.9×10^6
°T=Q/(mxCp) (Cp=1.0 BTU/#OF)	51.0°F	27.8°F	42.7°F

D-2e(ii) Potential for Waste Material to Generate Extreme Pressure

No extreme pressure is generated during the processing of waste materials handled at this facility. Neither the waste materials nor the treatment reagents react to form gases as products of the reaction. Temperature increases during reaction may produce some water vapor, but the boiling temperature of the waste materials is never approached. The tanks in which treatment takes place are always maintained at atmospheric pressure due by venting to a scrubber which itself is vented to the atmosphere.

D-2e(iii) Potential for Waste Material to Produce Fire or Explosion

There is no potential for the waste materials, treatment reagents, or products of any reactions to be flammable or explosive in the tanks.

D-2e(iv) Potential for Waste Material to Produce Violent Reactions

There is no potential for the waste materials or treatment reagents to produce violent chemical or physical reactions in the tanks.

D-2e(v) Potential for Waste Material to Produce Uncontrolled Toxic Mists, Fumes, Gases or Dust in Sufficient Quantities to Threaten Human Health

There is no potential for the waste materials or treatment reagents to produce uncontrolled toxic dust at this facility. With the exception of dry lime, all hazardous waste and treatment reagents are liquids. Dry lime is stored in silos and slurried with water within a silo building. The silo and handling building is provided with induced draft ventilation and dust is removed from air exhausted to the atmosphere by baghouse air filtration.

Mists containing hazardous waste fumes or gases could be generated during the transfer of raw waste material from incoming tankers into primary treatment tanks and during aeration in the primary tanks. Any mists, fumes or gases which may be generated at these particular times are vented into the chemical recycle scrubber/condenser. The scrubber/condenser prevents any of these materials from being discharged to the atmosphere. Secondary processing and solids dewatering do not produce mists, fumes or gases.

In the very unlikely event of a massive spill of hazardous wastes, a spray may be generated for a brief period of time while the material is impacting the floor of the facility containment area or unloading pad or driveway. In a worst-case situation, a massive spill of hydrochloric acid at 104°F and 5 percent HCl concentration could emit HCl into the atmosphere at concentrations approaching the ceiling limit for exposure to

HCl of 5.0 ppm. In response to a spill of this magnitude, the employees would implement the Contingency Plan/Emergency Procedures as identified in the Section G. Employees will be provided with personal protective equipment, as specified in Section G.

Because the vapor pressures of both sulfuric and nitric acid are much less than the vapor pressure of HCl, massive spills of these materials would pose no air quality problems for employees or the general public.

The vapor pressure of hydrochloric acid at 40°C and 5 percent concentration is 0.0043 mmHg. The concentration of HCl in air immediately above and in equilibrium with this HCl solution is:

$$0.0043 \text{ mm Hg}/760 \text{ mm Hg} = 5.7 \times 10^{-6} \text{ mole HCl/mole air}$$
$$= 5.7 \text{ ppm of HCl}$$

Note that the concentration of HC1 would theoretically equal this value in a very thin layer of air above the solution. Dilution with air above this thin layer will result in HCl concentration at breathing level, about five feet above the spill, to be much less than the theoretically calculated concentration.

D-2e(vi) Potential for Waste Material to Damage the Structural Integrity of a Containment Vessel

There is little potential for waste material or treatment reagents to damage the structural integrity of the vessels used to store or treat the hazardous wastes processed at this facility. All vessels are either constructed of corrosion-resistant material or are lined with corrosion-resistant linings. Materials handled at the facility and placed in tanks will not react with or otherwise damage the integrity of the tanks.

D-2f Unloading Procedures for Incompatible Wastes

To prevent incompatible wastes from coming in contact in the same tank, the following procedure is used. The procedure affects only the primary treatment system because: 1) following primary treatment, the wastes are all considered compatible and 2) the secondary tanks are discharged via a bottom drain in a cone-bottomed tank; therefore, a tank heel is not a factor.

1. For strong acids and alkalis: If a strong acid (pH <2) is to be unloaded into a primary treatment tank which was previously used to treat a strong alkali waste, the treatment tank will be flushed thoroughly and the pH of any remaining heel will be treated by adding acid until a pH less than 8.0 is achieved.

   If a strong alkali waste (pH >12) is to be unloaded into a primary treatment tank which was previously used to treat a strong acidic waste, the treatment tank will be flushed thoroughly and the pH of any remaining heel will be treated by adding lime slurry until a pH greater than 6.0 is achieved.

2. For ammonia containing wastes: prior to unloading an ammonia containing waste, the pH of any remaining tank heel will be adjusted to a pH less than 7.0.

3. For chlorine containing wastes: prior to unloading a chlorine containing waste, the pH of any remaining tank heel will be adjusted to greater than pH of 7.0.

4. For sulfide/sulfite containing wastes: prior to unloading a sulfide/sulfite bearing waste, the pH of the remaining tank heel will be adjusted to pH 7.0 or higher.

Specific treatment and unloading procedures are defined for each waste stream prior to acceptance for treatment at this facility. The waste analysis record and the treatment procedures are maintained on file for further future reference by operating staff.

D-2g Containment and Detection of Releases

Concrete dike walls that have been lined with a corrosion-resistant coating completely surround and enclose the process and storage tanks, providing secondary containment capacity of 150% of the total volume of the hazardous wastes contained in the tanks. The four 20,000-gallon primary treatment tanks are located within a concrete diked structure that provides secondary containment for 100,159 gallons (five times the capacity of the largest container). The four 20,000-gallon secondary treatment tanks are located within a building possessing concrete secondary containment for 32,948 gallons (more than 150% of the capacity of the largest container). The storage tanks are located in Building A within a containment structure that is able to contain 98,032 gallons (more than 150% the capacity of the largest tank).

Appendix D-2d contains illustrations, dimensions, and calculations for the secondary containment structures that are provided for the treatment and storage tanks at the Dynecol facility.

SECTION F

Pull and replace all of Section F

SECTION F

PROCEDURES TO PREVENT HAZARDS

The information provided in this section is submitted in accordance with the requirements of Michigan Act 64, Rule 299.9504(c) which incorporates 40 CFR 270.14(b)(4), (5), (6), (8), and (9) by reference. Other regulations addressed to complete this section include 40 CFR 264.14, 264.15, 264.17, 264.174, 264.194 and 264 Subpart C. Items discussed include: general security provisions; inspection schedule; spill prevention, control, and countermeasures plan; and prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

F-1 SECURITY [40 CFR 270.14(b)(4) and 264.14]

F-1a Waiver of Preparedness and Prevention Requirements [40 CFR 264.14(a) and 270.14(b)]

Dynecol, Inc. does not wish to request a waiver of either the preparedness and prevention requirements or the requirements regarding injury or violation by an intruder, as contained under 40 CFR 264, Subpart C.

F-1b Security Procedures and Equipment [40 CFR 264.14(b) and (c)]

The Dynecol facility is completely surrounded by a six-foot chain-link fence with a barbed wire top. The four access points into the facility, all fronting on Georgia Street are located as follows:

- one automatic sliding gate on the east side of the facility near the office for vehicle traffic entering the facility from Georgia Street;
- one automatic sliding gate on the west side of the facility near the filter press building for vehicle traffic exiting the facility onto Georgia Street;
- one pedestrian doorway leading into the main office area from Georgia Street; and
- one roll-up door for vehicle traffic leading into the maintenance garage from Georgia Street.

Additionally, there is a gate at the southwest corner of the site where a former railroad spur entered the site. This gate is kept locked at all times.

The two main access points for vehicular traffic entering and exiting the facility are controlled by the automatic sliding gates which can be operated from stations within the Dynecol facility. These access points are also monitored by low-light surveillance cameras from the three monitoring stations within the facility. Access to the facility is controlled and monitored from the main office, the security area (during weekends), and the control room. Operation of the gates can be controlled from within the facility or by authorized company and security personnel who are issued control keys.

The facility is staffed twenty-four hours per day, five days per week by Dynecol personnel. Site security is controlled by facility personnel 24 hours per day during week days. At all other times when the facility is not in operation, it is staffed by contracted security personnel. Site security is controlled 24 hours per day during weekends and holidays by either contracted security personnel or facility personnel. Routine security surveillance includes inspection of the facility, equipment, and property, including

fences, gates, doors, and lighting. All access points are locked and secured when the facility is not in operation.

Hazardous wastes are delivered to this site in vehicles operated by either company employees, subcontractors, or common carriers. Vehicles are permitted access to the facility only if prior arrangements have been made with Dynecol management personnel and if they are cleared by Dynecol personnel upon arrival at the facility.

Danger and warning signs are posted on the east and west vehicle entrance and exit gates and along other points on the fence at the perimeter of the site. The sign plates read "Danger Unauthorized Personnel Keep Out" and can be read from all angles of approach and from a distance of 25 feet. Entry to the facility by unauthorized vehicles or pedestrians is prohibited and ensured by these security measures.

F-2 INSPECTION SCHEDULE [40 CFR 270.14(b)(5), 264.15, 264.174, 264.194, and 264.33]

F-2a General Inspection Requirements

The facility structures and equipment, including monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment, are inspected routinely by plant personnel, to identify malfunctions, deterioration, operator errors, and any other situation which may lead to the release of hazardous materials or a threat to human health or the environment. An "Inspection Report Form" has been developed for use during facility inspections. This form specifies the areas to be inspected, the frequency of each type of inspection and the type of problems to look for. The inspector, when identifying a problem, is required to specify the type of problem identified, the remedial action required, and to notify management in order to implement remedial action. Completed inspection report forms and the schedule of inspections are kept at the facility's office. The types of problems that are looked for during the inspection in each area of the facility are outlined in Tables F.1 and F.2. The inspection frequency is also contained in this table. Copies of inspection forms can be found in Appendix F.1.

F-2b Specific Inspection Requirements

F-2b(i) Tank Inspection

The hazardous waste treatment and storage tanks are inspected daily and an inspection log is maintained. The shell, seams, and lining of each tank are visually inspected for any signs of erosion, corrosion, or leaks. The tank containment structures, such as the dikes, walls, floors, loading pad, sumps and spill transfer equipment, are inspected daily for erosion, cracks, leaks, malfunctions, as pumps, piping, hoses, valves, and fittings are

TABLE F.1

INSPECTION SCHEDULE
HAZARDOUS WASTE TREATMENT AND STORAGE TANKS

Equipment	Type of Problem	Frequency
Tank shells	erosion or corrosion cracks leaks operator error	weekly
Tank lining	erosion or corrosion cracks leaks	monthly
Tank overfill control systems	inoperable malfunctioning	monthly
Material transfer	corrosion leaks malfunction	daily
Material handling	malfunction damage operator error	daily
Electrical	malfunction damage operator error	daily
Containment structure	erosion cracks leaks	daily
Spill transfer	malfunction damage operator error	daily
Monitoring	malfunction damage operator error	daily
Security	damage malfunction	weekly
Safety/emergency	no access malfunction out of place reload	weekly
Monitoring wells	damage secure	weekly
Effluent discharge sampler	malfunction damage	weekly

TABLE F.2

INSPECTION SCHEDULE

HAZARDOUS WASTE CONTAINER STORAGE FACILITY

Equipment	Type of Problem	Frequency
Containers	corrosion leaks labeling quantity by waste type	weekly
	improper segregation	daily
Containment area leakage	evidence of spills or leaks liquid in containment area	daily
structural	cracks or other deterioration of containment coatings	daily
Area fire extinguisher	operability and previous use	monthly
	not in proper location	weekly
Warning signs	standing and legible	weekly
Loading/unloading	leaks spills cracks	daily

also inspected for any signs of corrosion, leaks, malfunctions, or operator errors. The area immediately surrounding the tanks is inspected weekly to detect signs of leakage.

Other equipment associated with the treatment and storage tanks at the facility that is routinely inspected include electrical equipment (circuit breakers and control panels), material handling equipment (mixer, air compressors, filter presses, silos, and dryer), monitoring equipment (gauges), security equipment (fencing, gates and lighting), and safety and emergency equipment (eye washes, showers, water supply valves, alarms, fire extinguishers, air packs, freight box, and front-end loader).

F-2b(ii)Container Inspection.

The hazardous waste container storage facility is checked at the frequency specified in the inspection schedule. The number, condition, labeling, and spacing of each drum in the storage bays are noted. Each drum is also checked for corrosion, damage, excessive wear, and leakage. The container loading and unloading area is inspected daily to determine if any releases have occurred. Potential types of problems that may be encountered in the container storage area are provided on the inspection form to help ensure a thorough inspection.

F-2c Remedial Action

If inspections reveal that non-emergency maintenance is needed, it will be completed as soon as possible to preclude further damage and reduce the need for emergency repairs. If a hazard is imminent or has already occurred, as revealed during the course of an inspection or at any time between inspections, remedial action will be implemented immediately. If indicated by the situation, Dynecol personnel will notify the appropriate authorities as described in the Contingency Plan (Section G). In the event of an emergency involving the release of hazardous constituents to the environment, response efforts will be directed towards containing the hazard, removing it, and decontaminating the affected area according to the procedures outlined in the Contingency Plan.

During an inspection of the hazardous waste treatment and storage tanks and container storage facility, if a tank or container holding hazardous wastes is found to be in poor condition (such as apparent structural defects or evident corrosion and leakage), the hazardous waste is transferred to another tank or container in good condition. In the case of a drum, the drum and hazardous waste are transferred to, and contained within, a salvage or recovery drum.

F-2d Inspection Log

Records of all inspections are kept in the facility's main office. These inspection records are maintained for at least three years.

F-3 EQUIPMENT REQUIREMENTS [40 CFR 270.14(b)(6) and 264.32]

F-3a Internal Communication [40 CFR 264.32(a)]

An internal alarm system and a voice communication system capable of providing immediate emergency signals to facility personnel are available on the site. The facility is equipped with emergency alarm actuator buttons that when depressed provide an alarm signal which is audible throughout the plant. The locations of the alarm actuators are indicated in Table G.2 and Figure G.1 (Section G).

Internal communication is provided by means of the plant telephone system. Telephones are located in the office area, the maintenance garage, the compressor room, Building A, and the control room. The container storage facility is also equipped with a telephone.

F-3b External Communication [40 CFR 264.32(b)]

External communications are also provided through the plant telephone system (as described in Section F-3a above).

F-3c Access to Communication and Alarm Systems (40 CFR 265.34)

All facility personnel involved in any transfer operations have immediate access to the internal alarm system actuator buttons. The alarm actuator buttons and telephones are located, as previously described, in areas where personnel would be working during these operations. These alarm actuator buttons and telephones are always accessible since all walkways to them, and the areas surrounding them, are maintained free and clear of any obstructions.

In the unlikely event that there is just one employee on the premises when the facility is in operation, this employee has immediate access to the telephones which are equipped with outside lines.

F-3d Emergency Equipment

Portable fire extinguishers are located throughout the facility. Each fire extinguisher is classified for class A, B, and C fires, has a capacity of 20 pounds, and is multipurpose for dry chemical uses. Their locations at the facility are illustrated in Figure G.1 and summarized in Table G.2 (Section G).

Portable spill control equipment and materials include:

- A three-quarter yard front-end loader for use in deploying soda ash and in spill cleanup, stored in the facility parking area on the east side of the plant.

- A freight box containing soda ash bags.
- Portable gasoline powered and air-driven diaphragm pumps, and related portable hosing, located in the maintenance building.

Decontamination equipment and personal safety equipment are provided at the facility as follows: emergency showers and eyewash fountains located at the north wall of the compressor room, at the south side of the scrubber within Building 2, and in the primary treatment area and truck unloading area; and two Scott Air Packs, containing a 30 minute air supply located on the north wall of the compressor room.

The container storage facility has at least three fire extinguishers located in the bulking area, the container storage bays, and the loading and unloading area. A spill control cart is kept in the mechanical room and is available to respond to spills of various characteristics within the facility. The spill cart contains inert absorbent materials, spark-proof shovel, containment materials, and empty containers for spill residues plus personal protective equipment. A portable pump is also available to remove spills from the containment sumps.

F-3e Water for Fire Control [40 CFR 264.32(d)]

Water is provided to the facility from City of Detroit water supply mains, and enters the facility at a pressure of 50-60 psi. Water supply is available within the plant at the following locations:

Water Supply Valve Size	Location
1"	Maintenance garage at office door
1"	Maintenance garage, east wall
1"	Maintenance garage, east door
1"	Compressor room, east door
1"	Compressor room, south wall
3"	Compressor room, south wall
3"	Maintenance garage, west wall
3"	Containment area, east wall

Water hoses are available at the facility and are accessible for immediate use. The hoses are stored in the maintenance garage when not in use.

The container storage facility is equipped with an automatic, wet-type, closed head sprinkler system that is supplied by an eight-inch water main with water pressure less

than 60 psi. Capacity is 0.30 gpm/sf plus an allowance of 750 gpm for fire department streams. A flow switch and electric alarm bell is located on the building's exterior.

F-3f Aisle Space Requirements [40 CFR 264.35]

Access into the facility and movement within the facility is maintained free and clear of obstructions in order to allow movement of spill control and decontamination equipment within the plant. Aisles and walkways between tanks and equipment in both the storage and process areas are maintained free and clear of obstructions in order to provide unobstructed movement of personnel and portable emergency equipment within these areas. Within the container storage facility, an aisle space of at least eighteen inches is maintained between stored drums. Containers with flammable wastes are placed no further than twelve feet from the main aisle.

F-3g Emergency Equipment Inspection and Maintenance

All facility alarm systems, fire protection equipment, spill control equipment, and decontamination equipment are inspected, tested, and maintained on a regular basis to help ensure proper operation during an emergency per the inspection schedule (see Table F.1).

The internal alarm system is inspected and tested monthly. Each emergency alarm actuator button is inspected to verify that access to the button remains unobstructed. Each button is then tested to ensure its proper operation. Any obstructions identified during inspection are promptly removed, and any malfunction identified during testing is immediately repaired.

The telephone system, which is used for both routine business and emergency communications, is tested daily during its routine usage. Any malfunctions are immediately reported to the telephone utility and prompt repair service is requested.

The portable fire extinguishers are inspected regularly. The inspection consists of verifying that each fire extinguisher is located in its designated location and that access to the fire extinguisher is unobstructed. The pressure gauge is checked to see that proper pressure is maintained. The container, mechanical parts, nozzle, locking pin, etc. are examined for corrosion, damage, tampering, and leaks. Testing and recharging is completed according to manufacturer's instructions by a qualified professional maintenance service and pertinent data is recorded on each fire extinguisher at the time of service.

The portable spill control equipment (front-end loader, portable pumps, spill cart, and soda ash) are inspected weekly. The front-end loader and portable pumps are inspected for proper location and unobstructed access and are tested for proper operation.

The personal protective equipment is inspected and tested regularly. The emergency showers and eyewash fountains are inspected to assure unobstructed access and to verify proper operation. The two Scott Air Packs are inspected to assure unobstructed access, placement in designated locations, and absence of corrosion, damage, leaks and tampering. Scott Air Pack testing and recharge is carried out according to the manufacturer's instructions by a qualified professional maintenance service.

Water supply valves and hoses are inspected and tested regularly. Inspection and testing of valves include verification of unobstructed access and proper operation. Inspection and testing of hoses includes storage in an accessible location and freedom from corrosion or leakage.

F-4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT [40 CFR 270.14(b)(8)]

F-4a Unloading Operations [40 CFR 270.14(b)(8)(i)]

F-4a(i) Process and Storage Tanks

Hazardous wastes are delivered to the tank treatment and storage areas of the facility via bulk tank trailers. Incoming waste loads enter the facility at the east gate and proceed to the recessed truck unloading pad located on the west side of the facility. The following unloading procedures are implemented whenever bulk wastes are unloaded at the Dynecol facility:

- After tank truck has come to a complete stop, brakes are set.
- Driver remains in direct visual observance of transfer operations at all times during loading or unloading operation. The operation is not left unattended.
- Prior to transfer operations the tank is checked by visual observation to insure there is sufficient capacity for a material transfer.
- Fill pipes are inspected for leakage after loading or unloading has commenced and after the procedure has been completed. Pails and absorbent materials are available in case a leak develops during this procedure.
- The volume of material loaded or unloaded is recorded.

During unloading operations, any spills or leaks are promptly removed by the use of industrial absorbent or washed into a sump located in the unloading area. The unloading pad is curbed and sloped to prevent the run-off of spilled materials.

F-4a(ii)Container Storage Facility

Containers of hazardous wastes are delivered to the container storage facility at the two loading docks located in the southeast corner of the building. The transfer of these containers after storage to vehicles which will transport the wastes to off-site treatment, recovery, or disposal facilities also takes place at these loading docks. A graded ramp allows for the smooth and accessible movement of drums to and from the loading/unloading area of the facility. The loading docks have structures to contain any spills or leaks that may occur during loading or unloading operations. The docks are equipped with hydraulic levelers and bumpers. The procedures for loading or unloading containerized hazardous wastes follow the same procedures outlined for the tanks. Smoking is not allowed during the loading or unloading of ignitable or reactive wastes.

F-4b Runoff [40 CFR 270.14(b)(8)(ii)]

Concrete dike walls have been constructed to enclose and contain the treatment and storage tanks and prevent the escape of any spill or contaminated runoff. Eight-inch concrete curbing located at the property line surrounds the west and south sides of the facility and prevents any spills or runoff from flowing off of the site. Concrete trenches are cut across the width of the driveway at two locations (south and east side) to prevent any spills or runoff from exiting the site. Two sumps are provided, fed by the driveway trenches, which are drained by pumps that discharge to the tanks inside of the secondary containment area. Surface runoff is controlled by concrete and asphalt surfaces that direct runoff to sumps, trenches, and storm drains.

Spill control structures, including the dike walls surrounding the tank area and the unloading area, the curbing along the west and south fence, the two trenches across the driveway, and the two spill collection sumps, are inspected daily for corrosion, cracks, and signs of spills or leaks.

Runoff from the waste handling areas in the container storage facility is prevented due to the presence of a roof over these areas, including the loading/unloading area.

F-4c Water Supplies [40 CFR 270.14(b)(8)(iii)]

The contamination of water supplies is averted at the facility by the prevention of spills, leaks, or contaminated runoff from discharging onto unprotected ground. The containment structures, drainage control features, and spill response procedures all serve to reduce the potential of water supplies becoming contaminated from waste handling activities at the site.

F-4d Equipment and Power Failure [40 CFR 270.14(b)(8)(iv)]

Treatment processes and all other facility operations rely on properly functioning equipment and a reliable supply of electricity. All processing equipment is checked prior to starting up the process to assure that it is in good operating condition. Valves, pumps, pipes, monitoring instruments, switches, alarms, indicator lights, and other process equipment are checked according to an operating sequence that establishes steps to be followed when beginning treatment processes. Any malfunctioning equipment will be identified and compared to a troubleshooting guide that helps to pinpoint the cause of the problem. Routine maintenance, according to an established schedule, also assures that equipment in good condition is available during treatment processes.

If a power failure occurs at the facility, all treatment processes cease operation. No adverse results will occur from a power failure.

F-4e Personal Protective Equipment [40 CFR 270.14(b)(8)(v)]

The personal protective equipment that is available to facility personnel to prevent exposure to hazardous waste include Scott air packs, safety glasses, hard hats, boots, aprons, and gloves. An emergency blanket, first-aid supplies, eye-wash stations and emergency showers are also available to minimize injuries in the event that an employee would require these items. Employees are trained in the proper use of this equipment and in the chemical and physical hazards of the wastes that are treated and stored at the facility.

F-5 PRECAUTIONS TO PREVENT IGNITION OR REACTION OF IGNITABLE OR REACTIVE WASTES [40 CFR 270.14(b)(9) AND 264.17]

A variety of precautions have been implemented at the Dynecol facility to prevent the ignition or reaction of ignitable or reactive wastes. One of the first of these precautions is the characterization of incoming wastes through a thorough waste analysis program that provides accurate and precise information on the physical and chemical properties of the waste so that the waste can be handled safely according to its identified properties. The waste analysis program also assures that certain waste types that will not be accepted by Dynecol, such as radioactive and explosive wastes and wastes containing more than 20 ppm of cyanide, are appropriately identified. Waste characterization determines which wastes can be compatibly and safely mixed. Additionally, waste characterization also determines where wastes can be stored to avoid reactions occurring during storage from incompatible waste types. Based on waste characterization, Dynecol will reject shipments if it is determined that the waste cannot be safely handled by the facility. The segregation of incompatible waste types is achieved through the use of separate storage bays in the container storage building. Separate secondary containment systems also reduces the chance of incompatible wastes mixing.

Areas at the facility where ignitable or reactive wastes are being stored are appropriately identified through the use of labels and signs. "No Smoking" signs are prominently displayed wherever a hazard exists from ignitable or reactive wastes. The wastes are also separated or protected from sources of ignition, such as open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks, spontaneous ignition, and radiant heat. If any type of work is to be done in these waste storage areas, a "hot permit" must first be obtained from the facility's plant manager to ensure that all work within the storage areas conform to these necessary hazard prevention procedures.

F-5a General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Wastes [40 CFR 270.14(b)(9) and 264.17(b)]

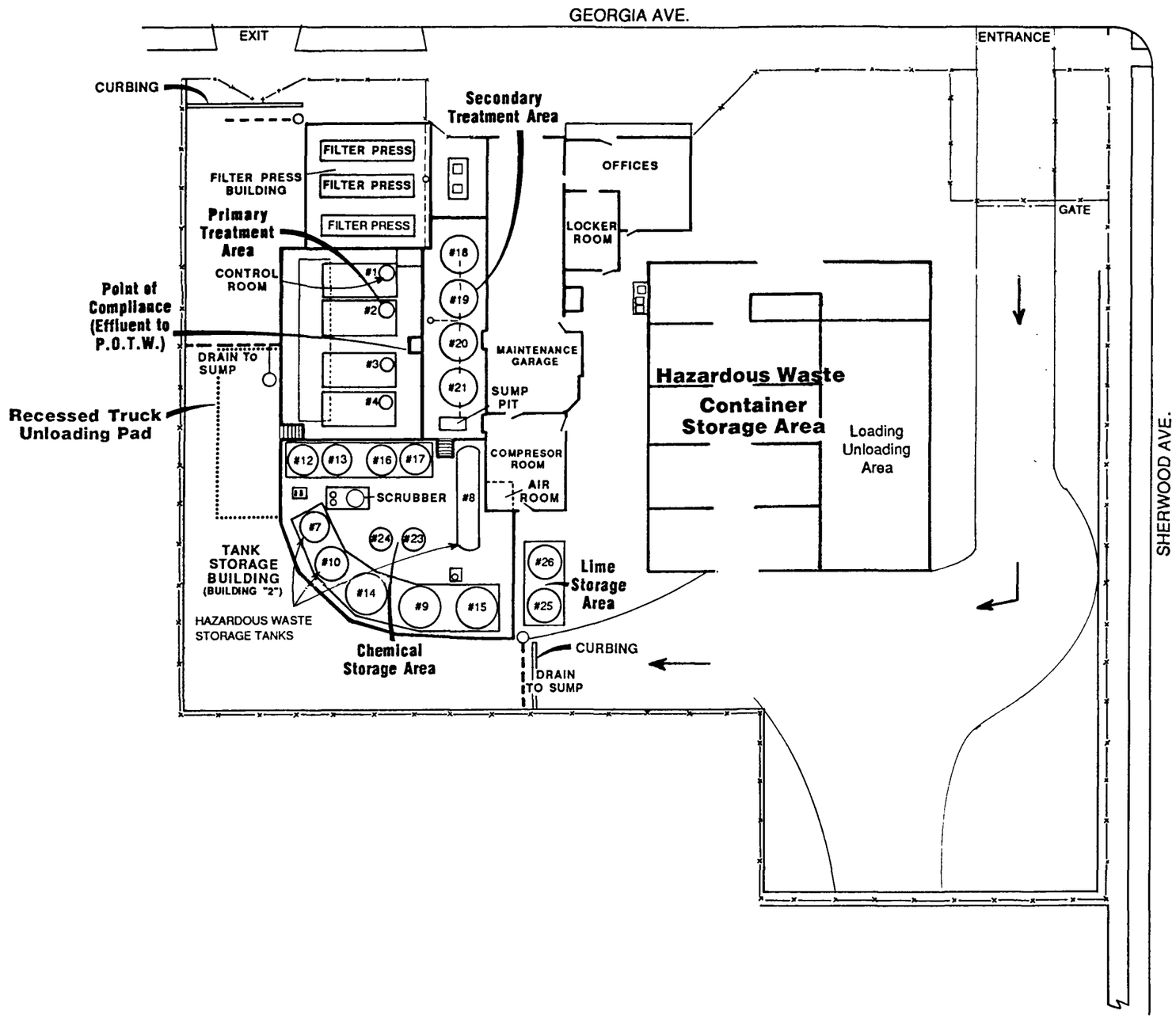
The procedures and precautions discussed in Section F-5 are routinely implemented to prevent the ignition or reaction of ignitable or reactive wastes during handling so that the following reactions do not occur:

- the generation of extreme heat or pressure, fire or explosions, or violent reactions;
- the production of uncontrolled flammable fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
- the production of uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
- damage to the structural integrity of the device or facility; or
- any reactions that result in a threat to human health or the environment.

Precautions, such as the characterization of wastes received at the facility, are undertaken to prevent the accidental mixing of incompatible wastes and other materials. Another procedure that can be utilized to prevent the accidental mixture of incompatible wastes is to combine very small quantities of those wastes being considered for mixing to determine their compatibility. This procedure is accomplished under a hood in Dynecol's laboratory. Employees are trained in safe waste handling procedures, including those procedures for handling ignitable and reactive wastes.

F-5b Management of Ignitable or Reactive Wastes in Containers [40 CFR 270.15(c) and 264.176]

Containers of ignitable or reactive wastes are stored in separate storage bays within the container storage facility. Figure F.1 demonstrates that the storage of these containers takes place more than 50 feet away from the facility's property lines. The labeling,



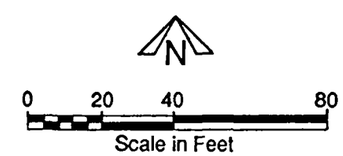


Figure A.2, B.3, G.1, F.1

Site Map

Dynecol, Inc.
Detroit, Michigan

November, 1989 20878

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Pages A-12, B-5, G-3, F-15

sealing, handling, stacking, and storing of these containers are done in a manner that minimizes the possibility of these wastes experiencing any fires, explosions or reactions.

F-5c Management of Incompatible Waste in Containers [40 CFR 270.15(d) and 264.177]

Several precautionary measures have been implemented for the hazardous waste container storage facility to assure that incompatible wastes do not come into contact with each other. Wastes are not placed into unwashed containers which formerly held incompatible wastes or materials. All empty containers are labeled to indicate their previous contents and when they were emptied and cleaned. Incompatible wastes are stored in separate storage bays with separate containment systems within the facility. The Waste Analysis Plan provides a description of the procedures Dynecol follows in assuring that incompatible wastes are properly isolated in the storage bays. These storage bays are enclosed within the floor, roof, and walls of the container storage facility and the wastes stored within this facility are effectively separated from any incompatible wastes or materials that may be stored nearby outside of the facility.

F-5d Management of Ignitable or Reactive Wastes in Tanks [40 CFR 270.16(f) and 264.198]

Ignitable wastes are not treated at Dynecol nor are they stored in tanks. There is no potential for a waste material treated or stored in a tank to generate extreme pressure or to react with other wastes or materials to form hazardous gases. Tanks in which treatment takes place are always maintained at atmospheric pressure as a result of tank venting to a scrubber which is vented to the atmosphere. Any hazardous waste fumes or gases that could be generated during the transfer of incoming wastes from tankers into the treatment tanks, or during aeration in the primary treatment tanks, are vented into the chemical recycle scrubber/condenser. Wastes containing cyanide in excess of 20 ppm are not accepted for treatment by Dynecol, and incoming waste streams are tested to assure that such wastes are not handled at the facility.

F-5e Management of Incompatible Wastes in Tanks [40 CFR 270.16(f) and 264.199(b)]

Incompatible wastes and materials are not stored in the same tank or in an unwashed tank that previously held an incompatible material or waste. Various waste management procedures ensure that incompatible wastes and materials are not placed in the same tank, such as has been set forth in the Waste Analysis Plan (see Section C), as is explained during employee training programs, and as is provided in the placement and labeling of storage tanks at the facilities. These various plans and programs serve as methods for preventing the mixing of incompatible materials or wastes in the treatment and storage tanks at the Dynecol facility.

SECTION E

GROUND WATER MONITORING SYSTEMS

This section describes the ground water monitoring systems that will be implemented at the Dynecol facility in accordance with 40 CFR Part 264 of Subpart F and Michigan Act 64 Rule 612(1)(b).

E-1 INTRODUCTION

The Dynecol, Inc. facility functions as a commercial hazardous waste treatment facility located in Detroit, Michigan (Figure E.1). Dynecol currently receives wastes, typically corrosive and metal-bearing aqueous waste streams, which are treated and/or stored in tanks on site. The treated effluent is discharged to the City of Detroit sanitary sewer system. Any sludges resulting from the process are disposed of in either a hazardous or solid waste landfill. Waste treatment activities at Dynecol involve primarily pickle liquor neutralization. The process consists of metals and solids removal and pH adjustment. As part of this Act 64 Operating License Reapplication, Dynecol is transferring storage capacity from the existing tank storage and treatment facility to a container storage area.

All treatment and storage of hazardous wastes at Dynecol is carried out in enclosed tanks. These tanks rest upon treated concrete slabs and are contained within concrete walled dikes. Specific dimensions and containment volumes of the diked areas within the treatment facility are outlined in Section D, Process Information. The truck unloading operations take place upon a recessed concrete pad (Figure E.2). This pad is further contained by curbed perimeter and lateral, recessed drains which flow to recovery sumps.

The following is a hydrogeological investigation in support of the Act 64 Operating License Reapplication for Dynecol's facility.

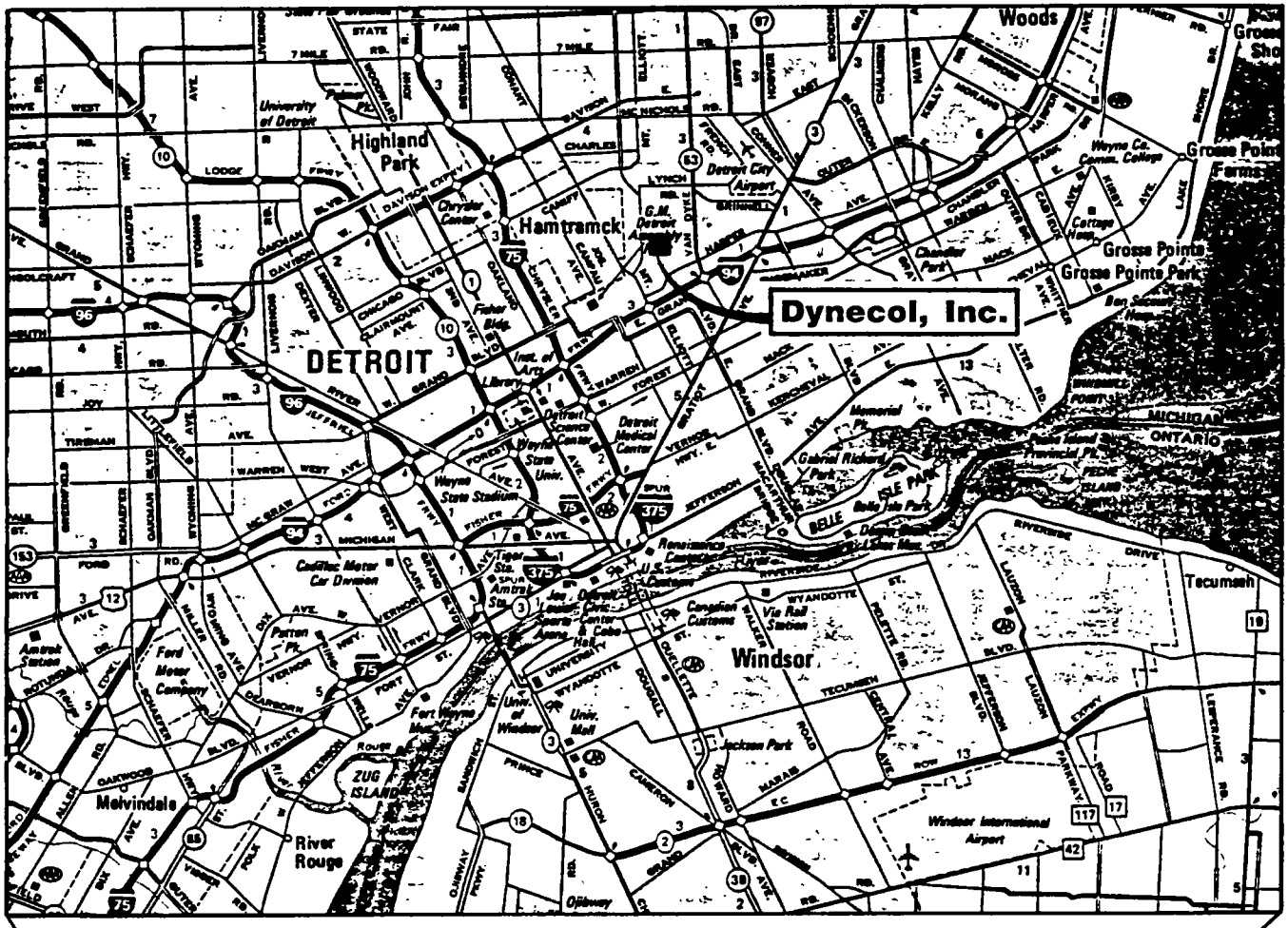
E-1a Site Location

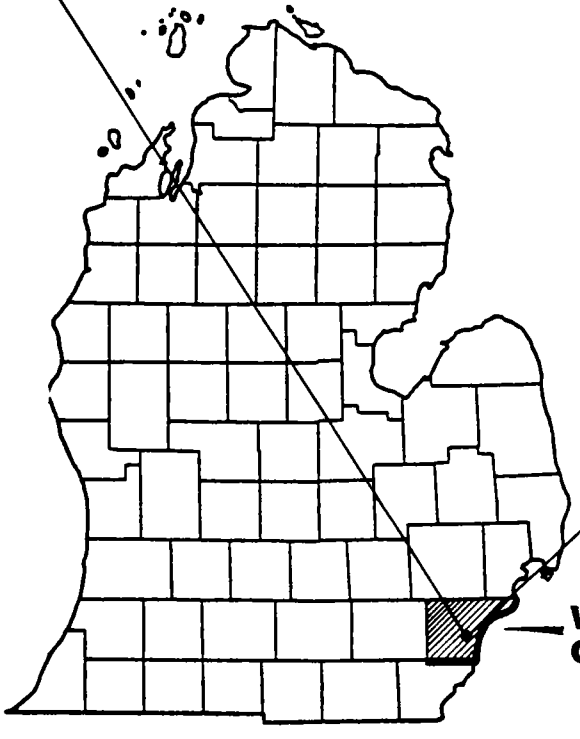
The Dynecol facility occupies approximately 1.7 acres of land in the SE 1/4 of the SW 1/4 of Section 21, Township 1 S, Range 12 E, Wayne County Michigan (Figure E.3). The site is located approximately one mile east of Hamtramck, Michigan in a mixed industrial/residential area (see Figure E.4). A more thorough description of land use in the surrounding area can be found in Section J, Environmental Assessment.

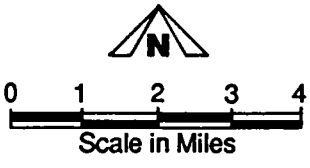
E-1b Purpose

The purpose of this hydrogeological report is to fulfill the requirements associated with Dynecol's Operating License Reapplication including the requirements for a hazardous waste container storage area/transfer station. The following are the goals of the hydrogeological report as they relate to Dynecol's facility:

- determine the areal and vertical extent of soils which may assimilate and transmit hazardous waste constituents in the event of a release;







Figures A.1, B.1, E.1, J.1

Site Location Map

Dynecol, Inc.
Detroit, Michigan

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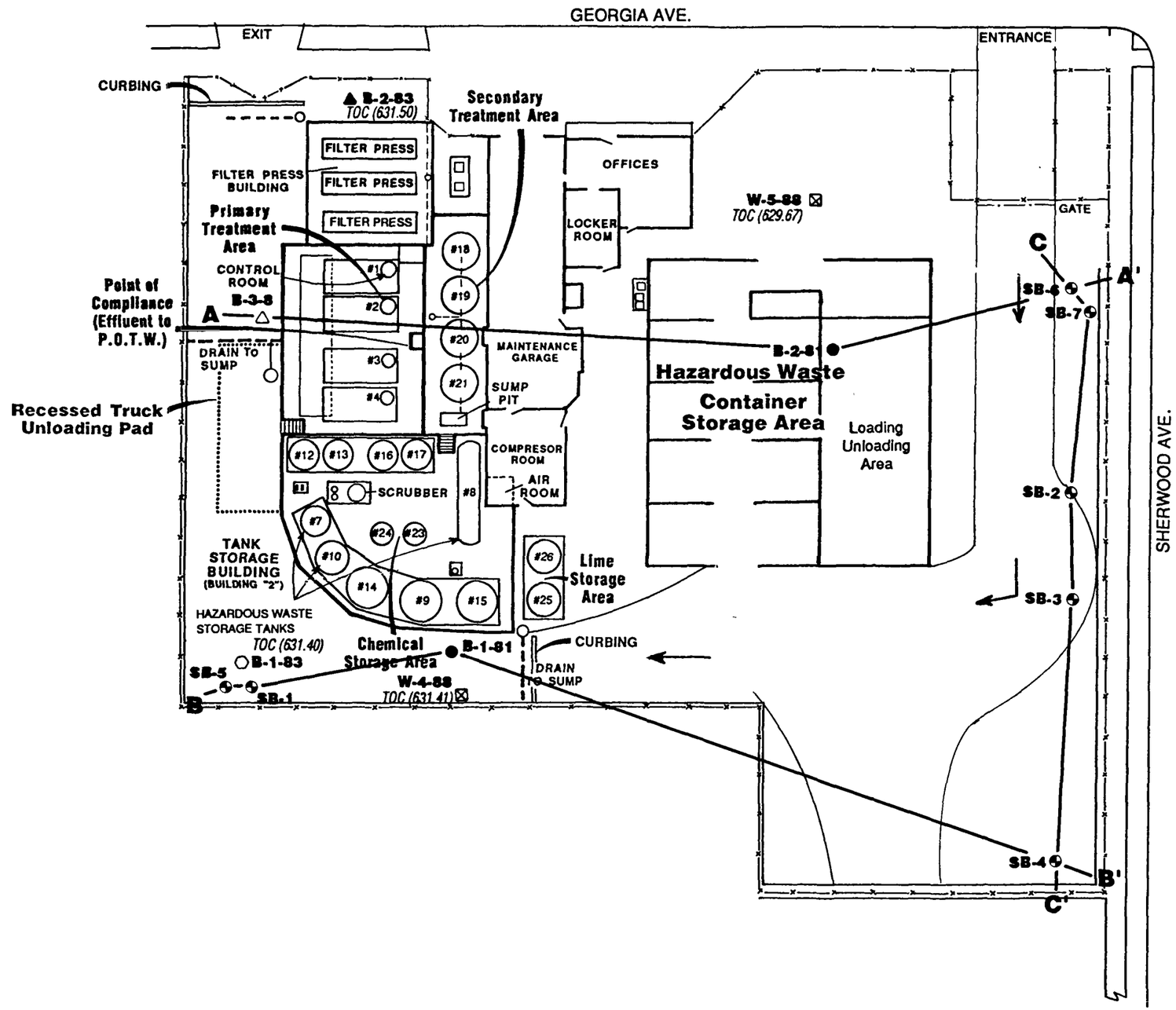

LEGEND

- ● Soil Boring (previous study)
- △ Soil Boring Converted to Monitoring Well (7/81)
- ▲ Monitoring Welll (previous study)
- ◐ Soil Boring
- ⊠ Monitoring Well
- TOC (631.40) Top of Casing Elevation in Feet (USGS)
- A—A' Cross Section Trace
- ○ Piezometer

N

0 20 40 80

Scale in Feet

Figure E.2 L.1

Site Map

Boring/ Monitoring Well Location

Dynecol, Inc.
Detroit, Michigan

November, 1989 20878

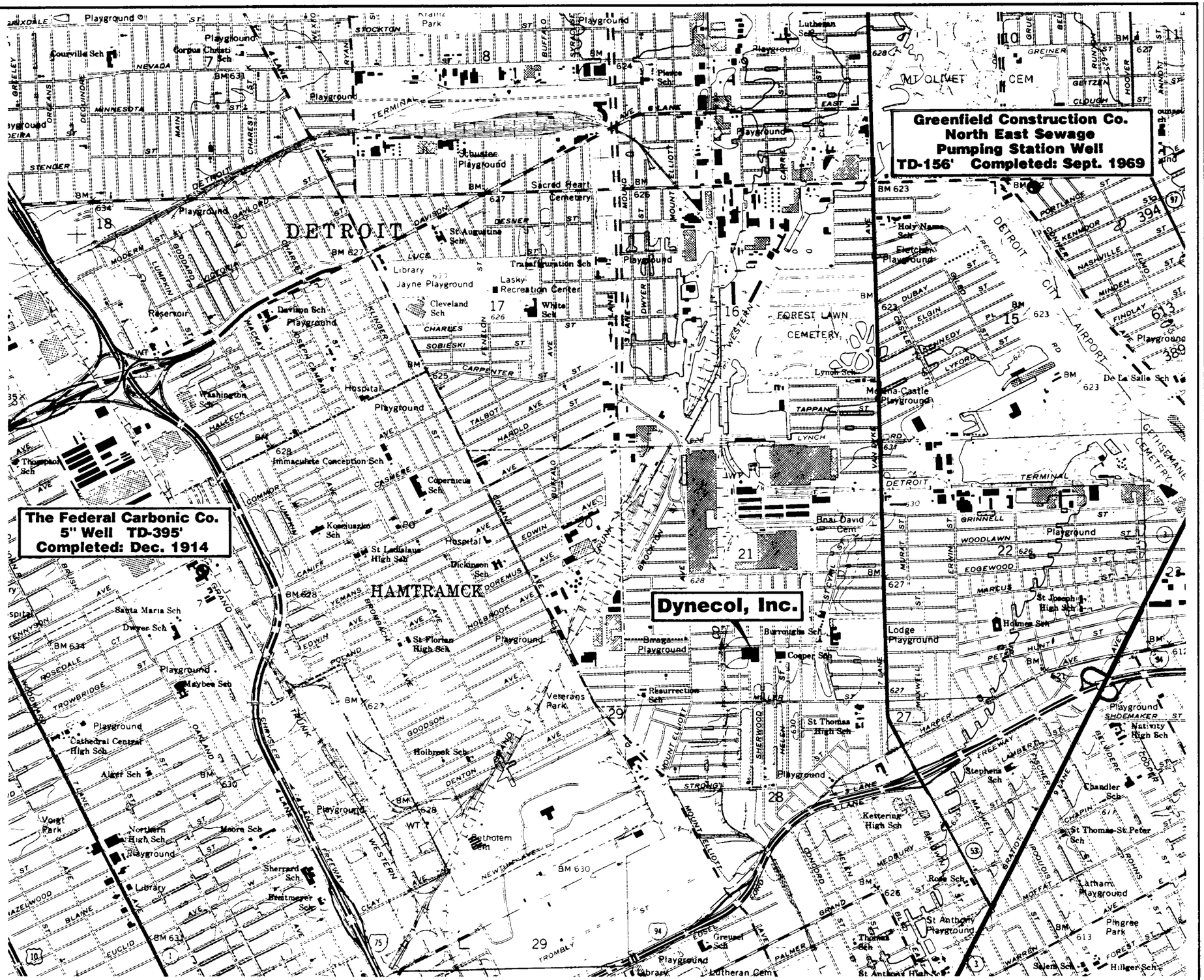

Figure B.2, E.3

Regional Topographic Map

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Detroit, Michigan

April, 1988 20878

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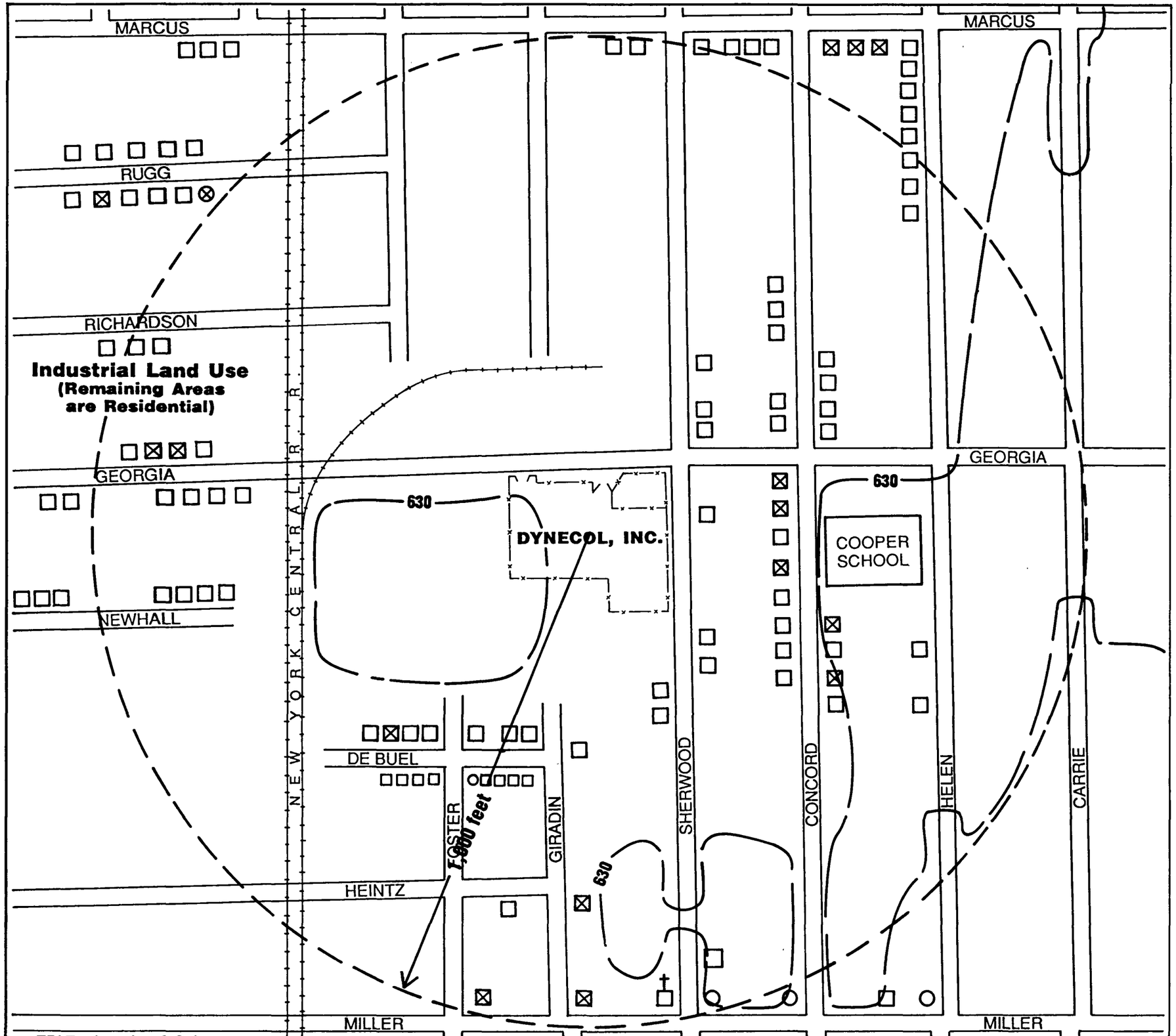

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LEGEND

- Legal Boundary/Access Control
- 630 – Topographic Contour Line (USGS Elevation)
- Occupied Residence
- Abandoned Building
- Church
- Store / Bar

N

0 100 200 400
Scale in feet

Traced from Highland Park, Michigan
USGS 7.5 Minute Quadrangle Map
with Five Foot Contour Interval (1968)

Figure B.5/E.4

Local Topographic Map

Dynecol, Inc.
Detroit, Michigan

April, 1988

20878

- To ~~define the "uppermost" aquifer~~ and any aquifers hydraulically connected within the upper 60 feet of soils beneath Dynecol's facility; and

- To provide a summary of pre-application ground water monitoring data [Rule 506, 1(a)] from the existing monitoring system as well as additional soil analyses performed during this study.

E-1c Scope of Work

Tasks accomplished in this investigation to aid in the preparation of this report include:

- Compiling existing data;
- Drilling seven exploratory soil borings;
- Geophysically logging two 60-foot soil borings; and
- Conducting soil pH and conductivity analyses on 90 split-spoon soil samples obtained while drilling the soil borings referenced above.

The types of existing data collected include:

- Records of existing wells within a two-mile radius of the site;
- Existing geologic reports and maps; and
- Topographic maps.

E-1d Summary of Previous Investigations

~~Four soil borings were drilled at Dynecol, Inc. by a consultant in July, 1981.~~ The previous work was conducted in an attempt to locate the uppermost aquifer beneath the site and to define the depth and nature of the perched water intervals. ~~Three (3) of these~~ borings were advanced ~~to a depth of 36 feet, and one~~ (1) was advanced ~~to a depth of ten feet~~. These borings are sufficiently documented in Section 2 of the existing Application for Operating License Renewal and Amendments to incorporate into this investigation. When referencing the borings installed by the previous consultant in this report, the year of construction was added to the end of the existing nomenclature for clarity. A summary of soil boring specifications is provided in Table E.1.

~~Soil boring~~ B-3-81 ~~was converted to a monitoring well (B-3) in July 1981~~. The well was constructed with ~~two-inch diameter PVC casing and a bronze well point,~~ with the ~~screened interval set at a depth of 16-19 feet below grade~~. The well presently has a four-inch galvanized steel surface casing (installed in the summer of 1984 to accommodate the pouring of concrete over the area) fitted with a flush mount cap. The concrete around the well head is sloped to direct surface run-off away from the well. The well is located within the existing, contained truck unloading pad (see Figure E.2).

Table E.1
Summary of Soil Boring Specifications

Soil Boring I.D.	Date	By	Depth (Feet)	Split-Spoon Sampling Interval (Sample Length/Boring Length) (Feet)
SB-1-88	3/88	EDI[1]	20	1.5/2.5
SB-2-88	3/88	EDI	20	1.5/2.5
SB-3-88	3/88	EDI	20	1.5/2.5
SB-4-88	3/88	EDI	60	1.5/2.5
SB-5-88	3/88	EDI	60	1.5/2.5
SB-6-88	3/88	EDI	60	1.5/2.5
SB-7-88	3.88	EDI	43.5	38.5-40; 41.5-43
B-1-81	7/81	HMA[2]	36	1.5/5
B-1A-81	7/81	HMA	10	NS
B-2-81	7/81	HMA	36	1.5/5
B-3-81	7/81	HMA	36	1.5/5

1 EDI Engineering & Science, Grand Rapids, Michigan

2 HMA Consultants, Inc., Detroit, Michigan

Two additional monitoring wells ~~(B-1-83 and B-2-83) were installed in May, 1983~~. These wells were installed to an approximate depth of ~~8 to 9 feet below the surface~~. The wells consist of slotted PVC pipe encased in a protective casing and were designed to monitor the quality of the perched water zones in the fill material. A well construction sketch is located in Appendix E.1. A summary of monitoring well specifications is presented in Table E.2.

E-2 METHODS OF FIELD INVESTIGATION

The following is a summary of methodologies utilized in the Spring 1988 field investigation of the Dynecol facility conducted by EDI Engineering & Science.

E-2a Monitoring Wells

Two monitoring wells were installed during the 1988 field investigation (W-4-88, W-5-88). The wells consist of ~~two-inch diameter, 5-foot long, 7-slot, continuous wire-wound~~, stainless ~~steel screens, set at a depth of 3 to 8 feet below grade~~. The screens are attached to ~~PVC casing leading up to the surface~~ where the wells are fitted with internally locking flush mount caps.

The wells were drilled with a 4-inch diameter hand auger to a depth of 8 feet below grade. This total depth is two feet below the base of the fill, slightly penetrating the lacustrine clay unit. The annular space around the well was backfilled with a silica sand pack around the screened interval and sealed above the screen with granular bentonite grout. A well construction sketch for monitoring wells W-4-88 and W-5-88 is presented in Figure E.5 and detailed monitoring well installation reports are located in Appendix E.1.

E-2b Soil Borings

A total of seven soil borings were drilled during the 1988 field investigation. The borings were drilled utilizing a 4 1/4-inch I.D. by 8 1/2-inch O.D. (SB-1, SB-2, SB-3, SB-4, SB-5, SB-6) or a 6 1/4-inch I.D. by 12-inch O.D. (SB-7) continuous flight, hollow-stem auger. E~~ighteen-inch split-spoon~~ ~~soil~~ samples (following the ASTM Standard Penetration Test D1586 Method) ~~were collected at 2.5-foot intervals~~ in advance of the lead auger. A summary of soil boring specifications is provided in Table E.1, and detailed soil boring logs are presented in Appendix E.1.

When semi-saturated soils were encountered in the split-spoon sampler, the auger was advanced one foot and left standing in the boring for up to 30 minutes in an attempt to allow ground water to enter the boring. Any standing water that may have accumulated was sampled with a Teflon bailer. The bore hole was then bailed dry prior to further

Table E.2

Summary of Monitoring Well Specifications

Monitoring Well I.D.	Installation Date	Installed By	Screened Interval (Feet Below Ground Surface)	Top of Casing Elevation in Feet (USGS)
W-4-88	5/88	EDI[1]	3-8	631.41
W-5-88	5/88	EDI	3-8	629.67
B-1-83*	5/83	SME[2]	2-9**	631.40
B-2-83	5/83	SME	2-8**	632.79
B-3-81	7/81	HMA[3]	16-19	631.50

NS not sampled

* well proposed to be abandoned due to cement grout contamination

** screened interval inferred from well installation sketches

1 EDI Engineering & Science, Grand Rapids, Michigan

2 Soil and Material Engineers, Inc., Livonia, Michigan

3 HMA Consultants, Inc., Detroit, Michigan

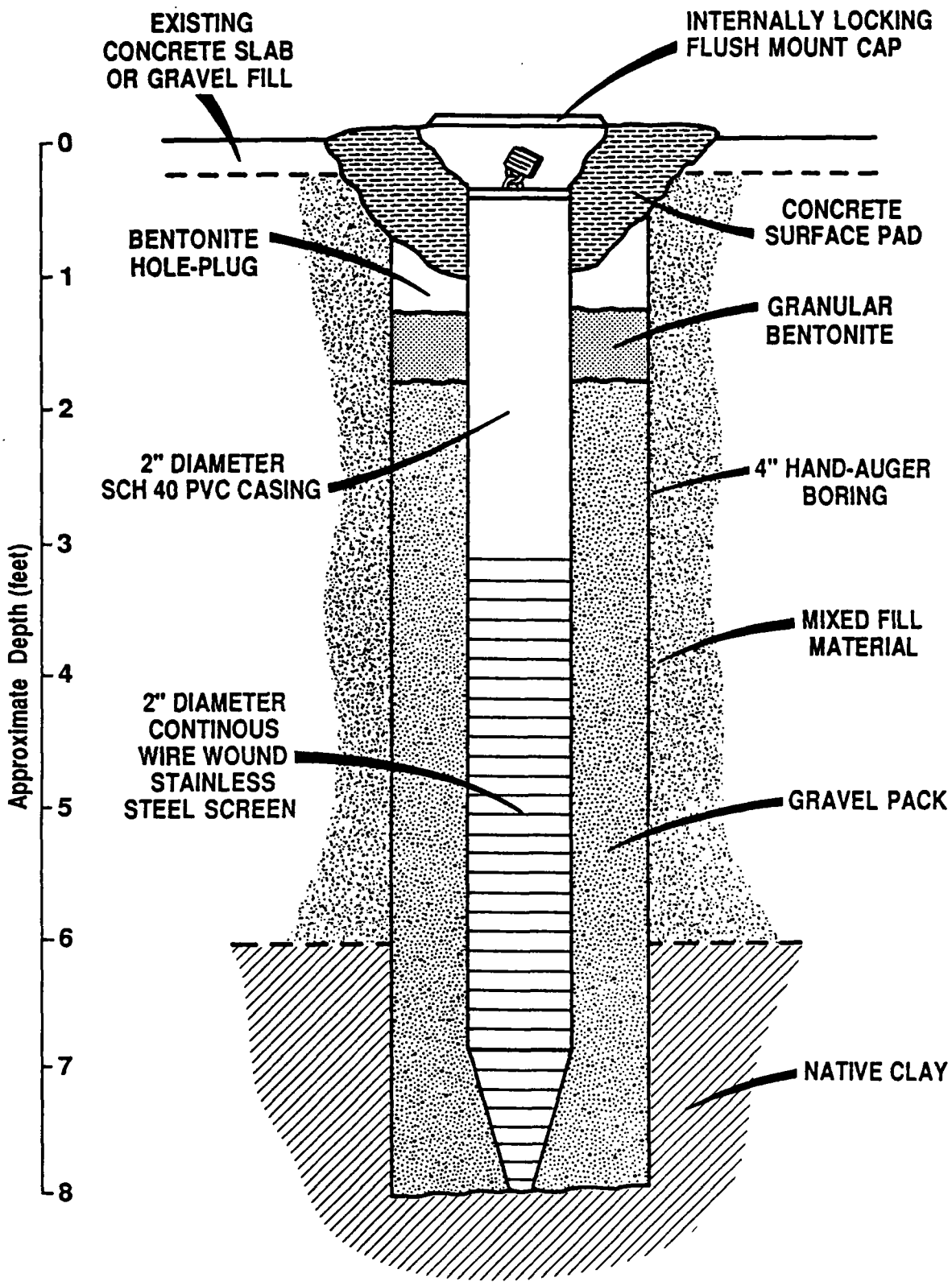

Figure E.5

Monitoring Well Construction
(W-4-88 and W-5-88)

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Detroit, Michigan

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advancement of the augers to limit potential cross contamination between perched water zones.

The sixty-foot borings (SB-4, SB-5, and SB-6) were geophysically logged for natural gamma ray emissions. Initially, the logging device was lowered into the open borehole (SB-4), but collapse of the borehole prohibited an effective logging run. Subsequent logs (SB-5 and SB-6) were run through the hollow-stem auger. Copies of geophysical logs are provided in Appendix E.2.

E-2c Soil Sampling and Analysis

Each 18-inch, split-spoon soil sample was scanned with an Hnu photoionization detector (P.I.D.) equipped with a 10.2 eV lamp to determine the relative levels of volatile organic compounds (VOC's) present in the subsurface soils. No detectable levels of volatile organic vapors were noted in any of the samples.

A representative composite sample of each 18-inch split-spoon sample was obtained for soil pH and specific conductance analyses. Samples were placed in covered 150 ml plastic containers and analyzed in the field on the same day they were sampled. Duplicate samples were collected in 8 oz. glass jars for future reference of lithologic features and as a backup should the original samples have been lost or contaminated prior to analysis. Soil samples were analyzed for pH utilizing EPA Method 9045 for non-calcareous soils. Soil samples were analyzed for specific conductivity by applying criteria of EPA Method 205 to EPA Method 9045 sample preparation techniques. Standard operating procedures for soil pH and conductance are provided in Appendix E.3.

The pH meter was calibrated utilizing buffered laboratory standards of known pH of 7 and 10. These standards were chosen because of the expectation that they would bracket the pH of the soil samples. Care was taken to store the deionized water utilized in Method 9045, the buffered standard solutions, and the soil samples in similar environments to ensure that sample temperatures were within 2°C of the buffered standard solutions. The conductance meter was calibrated utilizing a standard solution of 1,413 umhos/cm at 25°C. All conductivity readings measured in the field were corrected to a conductivity at 25°C by applying the following relationship:

$$\text{conductivity @ } 25^{\circ}\text{C} = \frac{K}{1 + 0.0191(t-25)}$$

where K = measured conductivity

t = temperature of sample, °C

E-2d Decontamination

Split-spoon samplers were rinsed with clean water and wiped dry with a clean cloth between soil sampling events. Between each individual soil boring all drilling and sampling equipment was steam cleaned. Teflon bailers were steam cleaned and allowed to air dry between each attempted sampling event within any semi-saturated soil zones encountered.

E-2e Elevation Survey

The elevations of all soil boring locations were surveyed using standard surveying techniques. A benchmark located near the intersection of Miller and Mount Elliott was converted from the Detroit City datum to a USGS elevation utilizing a correction factor of +479.755 feet. ~~All elevations are referenced to USGS datum.~~ A benchmark was affixed to the power pole across Georgia Street from the Dynecol site after the survey loop was closed for potential future reference.

E-3 HYDROGEOLOGICAL CONDITIONS

E-3a Topography

The regional topography is displayed in Figure E.3. The original topography of northeastern Wayne County has been highly altered by development activities in the region. The closest approximation to the pre-development topographic conditions comes from W.H. Sherzer's 1913 Geological Report on Wayne County. Sherzer describes the elevation of the region as varying from 620 to 640 feet with the crests of dune ridges reaching the latter height. Most of these ridges have been leveled to a thin veneer of sandy soils at the surface through building activities. ~~The topography of Dynecol's site has a total relief of less than two (2) feet across the facility.~~ With the exception of the parking area along the eastern perimeter of the facility, the entire site is covered with concrete.

E-3b Regional Soil Features

Due to the extensive development of northeastern Wayne County, detailed soils maps are not available. A general soil map of Wayne County compiled in 1976 by the U.S. Department of Agriculture, Soil Conservation Service describes the region around the Dynecol facility as a boundary area between the Pewamo-Blount-Metamora soil association and the Belleville-Selfridge-Tedrow loamy substratum association. Both of these soil associations are composed of nearly level to gently sloping, very poorly drained to somewhat poorly drained soils with fine to moderately coarse substrata.

Soil maps with infiltration rates for southeastern Michigan published by the United States Geological Survey (Twenter, 1975) show the northeast portion of Wayne County as being associated with Brookstun, Blount, Hoytville, Toledo and Colwood soil types. This grouping of soil types has a reported characteristic infiltration rate of one to two inches per hour.

E-3c Regional Hydrogeology

The region surrounding the area of investigation is positioned over the southeast flank of the Michigan basin. The stratigraphic succession beneath the site consists of Precambrian crystalline basement rocks overlain by Paleozoic sedimentary rock followed by glacial deposits.

E-3c(i) Bedrock Geology

The Paleozoic section present beneath northeastern Wayne County consists predominantly of Silurian and Devonian carbonates, evaporitic-carbonates, shales, and occasional sandstones. The bedrock surface beneath the site is comprised of carbonates and shales of the Devonian Traverse Group. These Paleozoic rocks dip gently toward the center of the basin (to the northwest) at an angle of generally less than one degree. The total thickness of these rocks is approximately 5,000 feet.

E-3c(ii) Bedrock Hydrogeology

Ground water in the Paleozoic bedrock generally occurs under artesian conditions. Water is held in storage and migrates through pore spaces (primary porosity) and along fractures, joints, and bedding planes (secondary porosity) within the limestone and sandstone units of the bedrock. The water quality is variably mineralized depending upon numerous factors, including the presence of hydrocarbons, local mineral composition of the rock, and the hydrodynamic relationship with the overlying glacial drift.

E-3c(iii) Glacial Geology

The glacial drift deposits present in the region range in thickness from 150-200 feet. The term "glacial drift" embraces all types of sediment deposited during the Pleistocene glacial epoch by ice, meltwater streams, glacial lakes, and wind. Dynecol's facility is underlain by predominantly lakebed (lacustrine) clay deposits and possibly some water reworked moraine material. Mozola (1969) shows nearly entirely lacustrine clay for a one-mile radius around the Dynecol site, with occasional occurrences of (in descending order) muck and peat, beach ridge sands, and lacustrine sand. Drilling records from two nearby bedrock-penetrating wells indicate that nearly the entire thickness of the glacial

sediment is comprised of clay. Locations of these wells are shown in Figure E.3 and drilling logs are provided in Appendix E.4.

E-3c(iv) Glacial Hydrogeology

The availability of ground water from glacial sediments in the region surrounding Dynecol is limited. There are no reported uses of ground water from glacial sediments anywhere within a two-mile radius of the Dynecol facility. Sherzer (1913) described water bearing stratum of sand or gravel at depths varying from 10 to 180 feet within the lacustrine clay deposits of Hamtramck Township (T1S, R12E). Efforts to utilize these water sources for domestic wells commonly necessitated forming a reservoir in the clay and allowing the water from the sand units to seep in. No regional aquifer system has been defined in the area.

E-3c(v) Municipal Water Supplies

~~The entirety of Wayne County is served by the Detroit Metro Water Department~~. The source of water for this system is derived from Lake Huron, with an additional intake from the Detroit River. A review of public records revealed ~~no domestic ground water supply wells within a two-mile radius of Dynecol's facility~~. The closest municipal ground water well field is located in Rochester, Michigan, 22 miles north-northwest of the Dynecol facility. Therefore, no regional ground water quality background data is available.

E-3d Site-Specific Geology

Dynecol's property overlies glacial deposits which are consistent with regional depositional patterns. The sediments were evaluated using information gathered from the eleven soil borings and five monitoring wells summarized in Table E.1 and Table E.2. Detailed soil boring logs are included in Appendix E.1. Generally, the ~~soil types encountered beneath the Dynecol facility~~ can be divided into the following three groups:

- ~~Mixed fill unit;~~
- L~~acustrine clay~~ unit; and
- L~~acustrine sand/silt~~ subunit.

E-3d(i) Mixed Fill Unit

The mixed fill unit exists as a ~~thin veneer of sand, gravel, and clay~~ on Dynecol's property. The composition of the fill material is variable, but locally appears to be comprised of texturally distinct layers. The ~~thickness of this unit varies from 1 to 8 feet~~. The relative thickness of the unit is depicted in cross sections A-A', B-B', and C-C'

(Figures E.6, E.7, and E.8). The lateral distribution of the various textural units within the mixed fill unit is dramatically depicted in the fence diagram (Figure E.9). The mixed fill unit is predominantly clay in the northern portion of Dynecol's facility; and contains some sandy intervals in the south and southeastern portion of the site.

E-3d(ii) Lacustrine Clay Unit

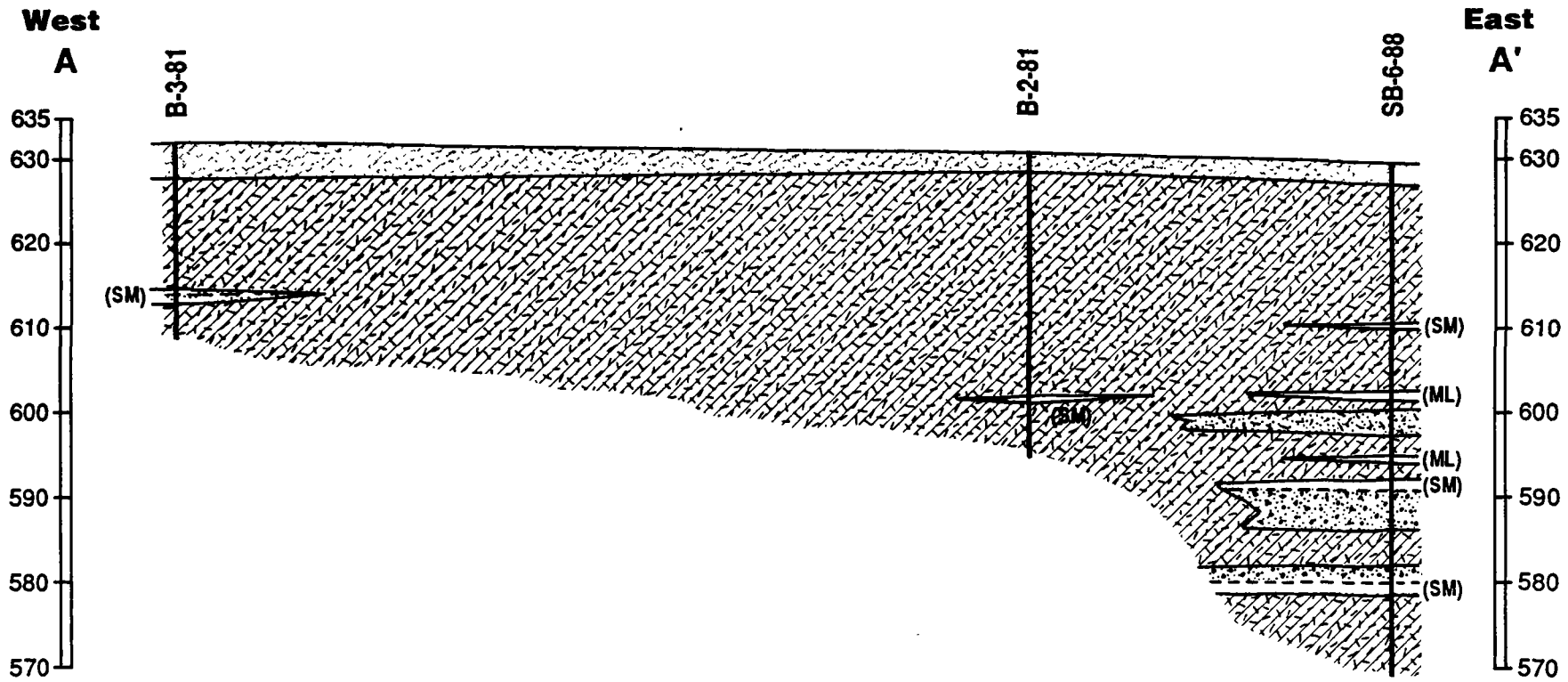
The lacustrine clay unit lies immediately beneath the mixed fill unit. The lacustrine clay unit was deposited under near shore, shallow water environments within a glacial lake. Unabraded gastropod tests were recovered in split-spoon samples of the clay, indicating limited transport of the fossils which would concur with the lacustrine clay designation. The clay is commonly silty and occasionally contains gravel suggesting that a portion of the sediment was derived from wave reworked moraine material.

Analyses ~~performed on lacustrine clay samples from borings B-1-81, B-2-81, and B-9-81~~ during previous investigations include water content, Atterberg limit tests, and ~~falling~~ head ~~permeabilities~~. The water content of the clay ranged from 9-16 percent. The results of the Atterberg limit tests indicate a liquid limit of 20.0 percent and a plastic limit of 13.2 percent. The plasticity index was found to be 6.8. The coefficient of permeability, determined from the falling head permeability tests ranged from ~~1.25×10^{-8} to 1.60×10^{-8} cm/sec~~. Based upon these analyses, standard penetration tests performed during drilling, and a visual inspection of the clay during soil boring activity, a Unified Soil Classification of CL (clay with low liquid limit) was determined for the lacustrine clay unit.

~~The lacustrine clay unit extends from immediately beneath the fill to more than sixty (60) feet below surface grade on Dynecol's property. The clay is virtually homogeneous to a depth of 20 feet (elevation of 610 feet) at which point local, discontinuous intervals of lacustrine sand and silt are encountered~~ (see Figures E.6, E.7, and E.8).

E-3d(iii) Lacustrine Sand/Silt Sub-Unit

~~The lacustrine sand/silt sub-unit occurs as isolated stringers of silt and sand within the lacustrine clay unit.~~ The factors controlling the deposition of these relatively coarser-grained sediments include an available source of sand and silt, the relative energy level of the environment of deposition, and the bathymetric configuration of the glacial lake bed. Textural characteristics of the sediment indicate a Unified Soil Classification (USC) of predominantly ML (silt with low liquid limit) and SM (silty sand) with occasional occurrences of SM-SP (silty sand-poorly graded sand). The spatial distribution of the lacustrine sand/silt is subdivided in cross sections A-A', B-B', and C-C' (Figures E.6, E.7, and E.8) into the associated USC soil types. The existing data indicate that intervals



LEGEND

- Fill
- Silty Clay-Clay (CL)
- Silty, Clayey Sands (ML)
- Silty Sand (SM)
- Fine- Medium Sand with Interbedded Silty Sand (SM-SP)

0 20 40 80

Scale in feet

Vertical Exaggeration 2X

Figure E.6

Geologic Cross Section A - A'

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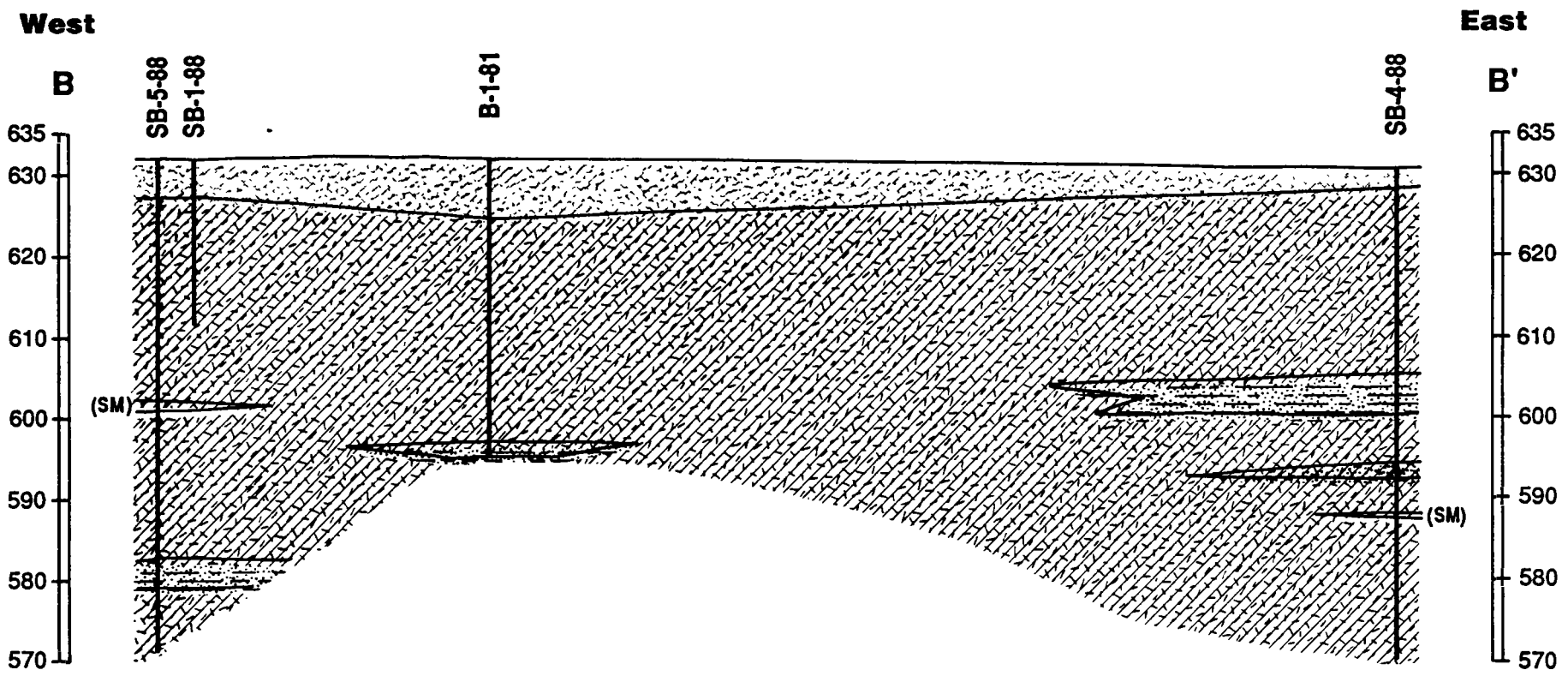

LEGEND

- Fill
- Silty Clay-Clay (CL)
- Silty, Clayey Sands (ML)
- Silty Sand (SM)
- Fine- Medium Sand with Interbedded Silty Sand (SM-SP)

0 20 40 80
Scale in feet

Vertical Exaggeration 2X

Figure E.7
Geologic Cross Section B - B'
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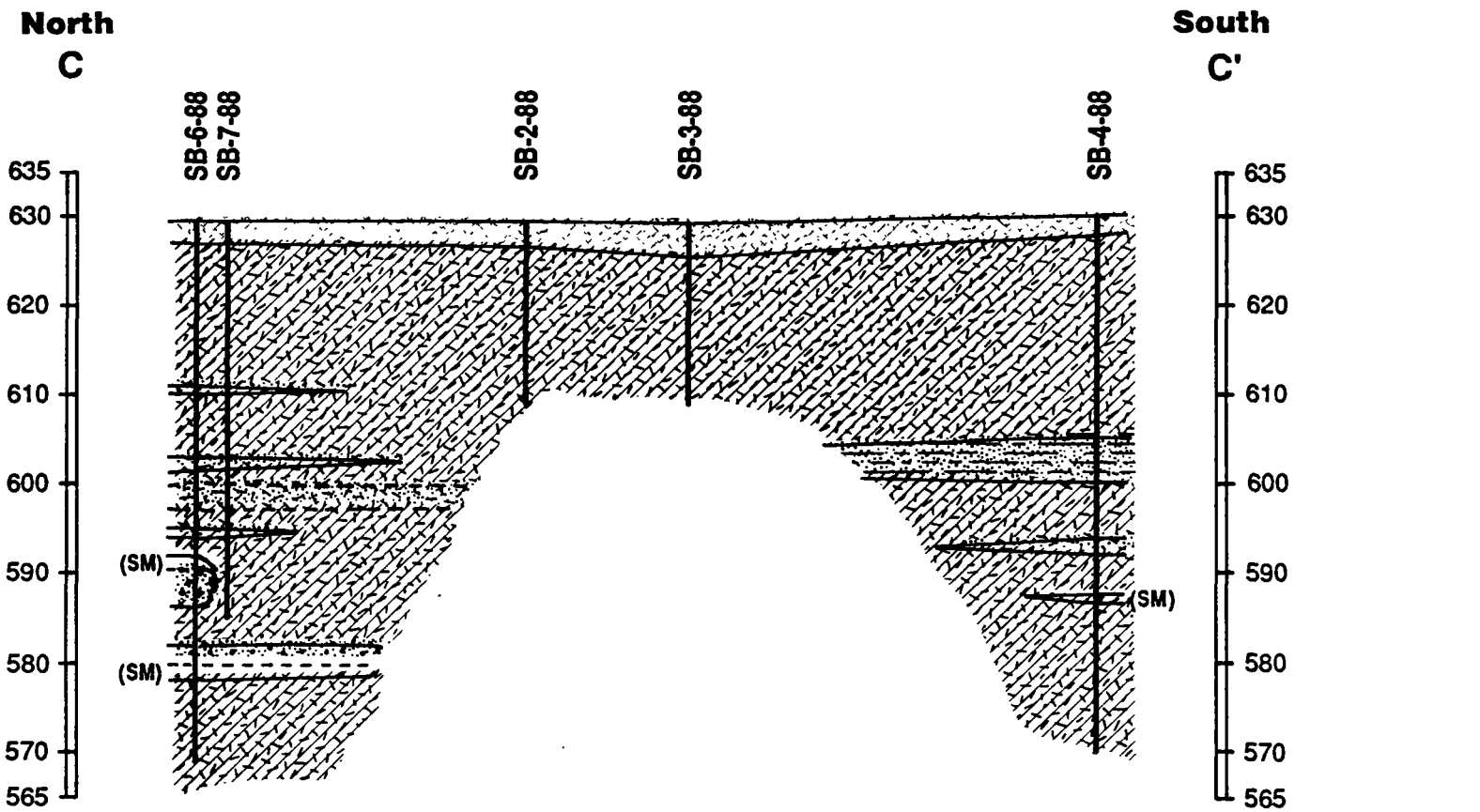

LEGEND

- Fill
- Silty Clay-Clay (CL)
- Silty, Clayey Sands (ML)
- Silty Sand (SM)
- Fine- Medium Sand with Interbedded Silty Sand (SM-SP)

Figure E.8
Geologic Cross Section C - C'
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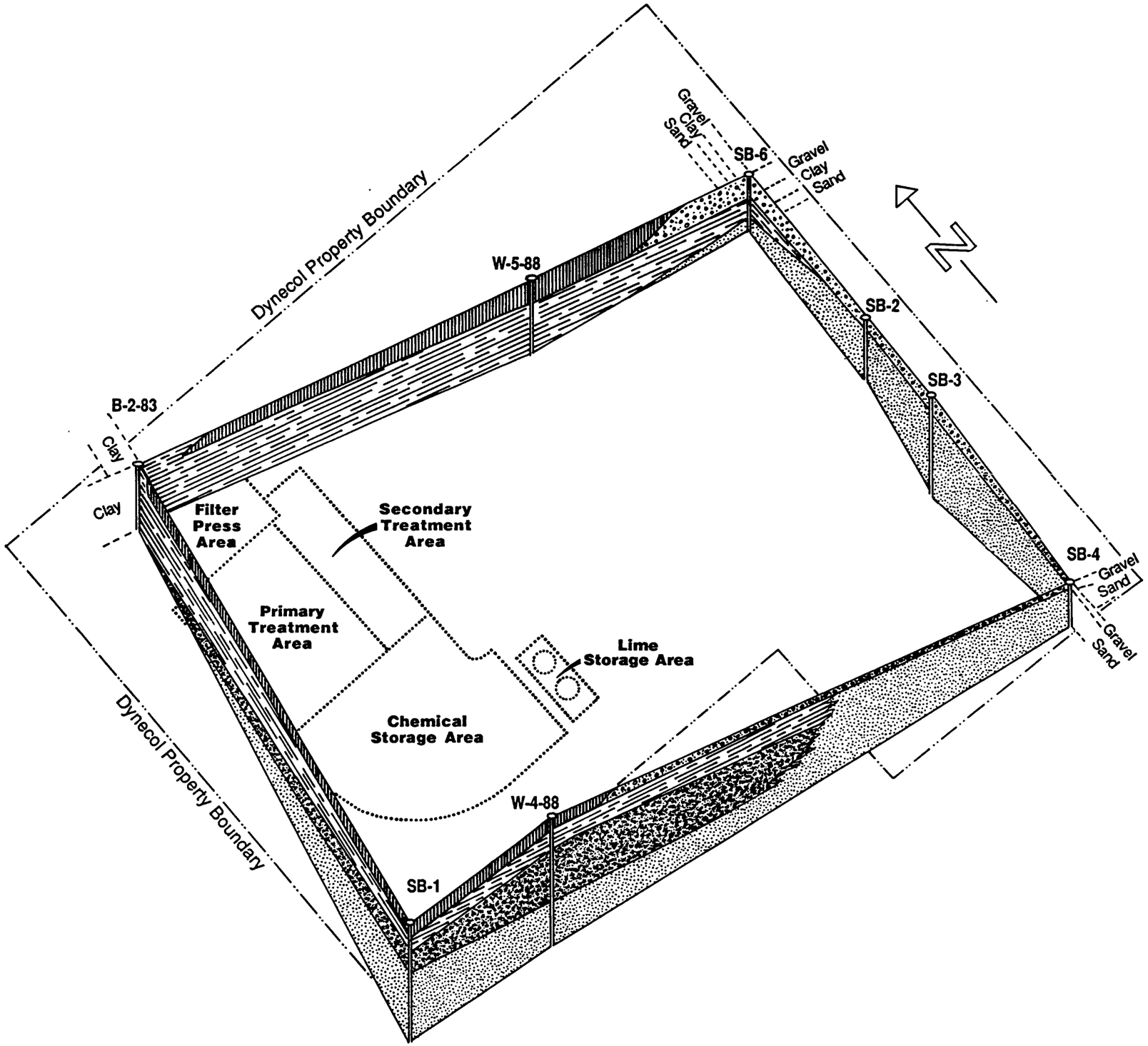

Legend

- Gravel
- Concrete
- Clay
- Slag / Cinders
- Sand

Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 5'
Vertical Exaggeration = 8x

Figure E.9

Fence Diagram Depicting Composition of Mixed - Fill Unit

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of the lacustrine sand/silt subunit have limited lateral continuity, none of which extend across the entirety of Dynecol's property.

E-3e Site-Specific Hydrogeology

One of the objectives of this investigation was to identify the uppermost aquifer, and those aquifers hydraulically connected, beneath Dynecol's facility. Part 22 of the General Rules of the Michigan Water Resources Commission (Act 245) defines a usable aquifer as "an aquifer, or that portion of an aquifer or aquifer system that is capable of providing water in sufficient quantity and satisfactory quality...to serve one or more protected uses." (Act 245 Rule 323.2203). Protected uses include individual, public, municipal, agricultural, or industrial water supplies. Act 245 also defines an aquifer as "underground water-bearing earth materials through which ground water moves in sufficient quantity to serve as a source of water supply" (Act 245 Rule 323.2202). These definitions are similar to the definition of an aquifer provided in RCRA. 40 CFR 260.10 defines an aquifer as "a geologic formation, group of formations or part of a formation capable of yielding a significant amount of ground water to wells or springs." The following is an analysis of the hydrogeologic characteristics and water-bearing potential of the identified geologic units beneath Dynecol's facility.

E-3e(i) Mixed Fill Unit

Infiltration of precipitation may periodically form a thin saturated to semi-saturated zone within the mixed fill unit. The quantity of water contained within the fill, as well as the ability of that water to flow, is dependent upon the textural nature of the fill. The typically heterogeneous nature of fill material limits a hydrogeologic interpretation of ground water flow and water quality characteristics. However, field experience on this site has established that the occurrence of perched ground water is very sporadic.

Four shallow wells are screened within and just below the mixed fill unit on Dynecol's property (B-1-83, B-2-83, W-4-88, W-5-88). Historical water level data from these wells is erratic, suggesting poor hydraulic connection, if any, within the mixed fill unit across the site. A summary of water level data is presented in Table E.3. Water level data for these isolated, sporadic occurrences of perched ground water zones cannot accurately be evaluated to calculate flow direction or flow rates in accordance with Act 64, Rule 506.1(b)(c)(d) or to derive the water level contour map specified in Act 64, Rule 506, 2(c).

The shallow ground water in the mixed fill unit does not satisfy any of the aquifer definitions referenced above as the mixed fill unit is not capable of yielding ground water of sufficient quantity to serve as a source of water supply. There are no known wells in the mixed fill unit other than monitoring wells, and it is highly unlikely that any

Table E.3

Summary of Water Level Data

Date	B-1-83 (TOC = 631.40') Depth Below TOL	B-1-83 (TOC = 631.40') W.L. Elevation	B-2-83 (TOC = 631.50) Depth Below TOC	B-2-83 (TOC = 631.50) W.L. Elevation	B-3-81 (TOC=632.79') Depth Below TOC	B-3-81 (TOC=632.79') W.L. Elevation
07/22/83	8.52	622.88	5.23	626.27	3.67	629.12
06/11/84	4.00	627.40	3.42	628.08	3.33	629.46
09/20/85	3.63	627.77	NA	NA	4.75	628.04
03/27/86	3.94	627.46	7.08	624.42	6.31	626.48
07/18/86	2.96	628.44	NA	NA	4.67	628.12
10/03/86	1.88	629.52	NA	NA	4.67	628.12
02/10/87	3.81	627.59	NA	NA	4.83	627.96
03/04/87	3.42	627.98	6.81	624.69	4.67	628.12
06/03/87	3.56	627.84	NA	NA	5.12	627.67
09/01/87	2.96	628.44	NA	NA	4.63	628.16
12/03/87	2.77	628.63	NA	NA	4.77	628.02
03/03/88	3.08	628.32	NA	NA	4.90	627.89

NA water level not available--dry well.

production wells will be constructed in the mixed fill unit in the future due to the extremely low, inconsistent ground water yield of the fill.

E-3e(ii) Lacustrine Clay Unit

The lacustrine clay unit is typically unsaturated with occasional zones of partial saturation where it is in contact with isolated perched water intervals of the lacustrine sand/silt sub-unit. The unit has a low permeability (1.25×10^{-8} to 1.60×10^{-8} cm/sec) and is not considered an aquifer because it will not yield a significant quantity of water. Recharge of the lacustrine clay unit is limited to very slow infiltration from low-lying zones within the mixed fill unit. The quantity of water entering the clay is considered very minimal as the clay serves as an effective barrier to any substantial vertical migration. Generally, the water content of the clay decreases with depth as observed through drilling activities and confirmed with laboratory analyses on samples for borings B-1-81 and B-3-81 (see Appendix E.1).

E-3e(iii) Lacustrine Sand/Silt Unit

The stringers of lacustrine sand and silt contained within the lacustrine clay occasionally appear saturated through visual inspection of split-spoon core samples. Whether the water content is sufficient to overcome capillary forces within the silty soils to provide "free water" is uncertain. The potential for significant recharge to these isolated sands and silts is low due to their isolation within the surrounding lacustrine clay unit. Therefore, intervals of the lacustrine sand/silt sub-unit are not considered usable aquifers due to their inability to produce a significant quantity of water. A summary of occurrences of the lacustrine sand/silt sub-unit is provided in Table E.4.

The borehole gamma log of SB-5-88 appears to show a sandy or silty unit between 25.5 and 30 feet below ground level (see Appendix E.2). Split-spoon soil samples from 26-25.5 feet and 28.5-30 feet below ground level in SB-5-88 did not contain a sandy or silty unit, however. Additionally, the blow counts recorded from the split-spoon sampler penetration were consistent with those obtained in the lacustrine clay unit. Therefore, the lower gamma counts recorded over the 25.5 to 30-foot depth interval are not considered a representation of the presence of the lacustrine sand/silt subunit in that interval.

E-3f Summary of Site-Specific Hydrogeology

None of the identified geologic units within the initial sixty (60) feet of sediment encountered beneath Dynecol's facility comply with the previously referenced definitions of an aquifer. The mixed fill unit is a limited and inconsistent source of perched ground water. The mixed fill unit also immediately underlies Dynecol's facility. Therefore, the only viable leak detection system in the event of a failure of the secondary containment at

Table E.4

Summary of Occurrences of Lacustrine Sand/Silt Subunit Intervals

Boring I.D.	Elevation of Interval (USGS)	Thickness (feet)	USC	Observations
SB-4-88	604.7-600.2	4.5	SM	S-S*
	594.2-592.7	1.5	ML	S-S
	588.2-588.0	0.2	SM	S-S
SB-5-88	602.13-601.13	1.0	SM	S-S
	583.23-579.93	3.3	SM	S-S
SB-6-88	610.9-610.7	0.2	SM	S-S
	602.3-601.3	1.0	ML	dry
	600.8-597.3	3.5	ML	S-S
	595.3-594.8	0.5	ML	dry
	592.3-590.8	1.5	SM	S-S
	590.8-586.3	4.5	SM-SP	sample obtained; pH=8.37
	582.3-582.1	0.2	SM	dry
	581.9-580.3	1.6	SM-SP	S-S
	580.3-578.8	1.5	SM	S-S
B-1-81	598-596**	2.0	SM	driller reports: "small amount of water"
B-2-81	603-602.8**	0.2	SM	driller reports: "moist sand"
B-3-81	615-613**	2	SM	saturated (presently screened by monitoring well B-3-81)

---

* S-S = semi-saturated, but no ground water sample obtained.

** estimated elevation

the site is to monitor the perched water intervals within the mixed fill unit and consider the mixed fill unit as the uppermost "aquifer" for the purposes of this application. Detailed monitoring plans to accomplish this task are outlined in Section L, Environmental Monitoring Plans.

E-4 SITE SOIL AND GROUND WATER QUALITY

E-4a Results of Soil Analyses

The quality of subsurface soils was evaluated by analyzing a total of 90 soil samples obtained with a split-spoon sampler collected from six boring locations drilled in March, 1988. Soil pH and specific conductivity analyses were performed during the field investigation in accordance with the methodologies described in Section E-2c, Soil Sampling and Analysis. A summary of the results of these analyses is presented in Table E.5.

The soil pH results were statistically analyzed in two distinct sample populations (1. mixed fill material; 2. native soils). Results of these statistical analyses are summarized below.

	Mean of pH Values (Y)	Number of Samples (N)	Standard Deviation(s)	Range of Acceptable pH Values (Mean+2s)
Mixed fill material	8.64	7	1.06	6.52-10.76
Native soils	8.78	83	.50	7.78-9.78

None of the soil pH values for the fill material exceeded the statistically acceptable range. Two out of the 83 soil pH values for native soils exceeded their acceptable range (Boring SB-1, sample interval 6-7.5 feet, pH = 7.71; ~~boring SB-2, sample interval 6 feet - 7.5 feet, pH = 12.22~~). These statistical exceedances are not considered a significant soil contamination problem due to their isolated occurrences and containment within low permeability lacustrine clays.

Statistical analyses were not performed on the specific conductivity results since a standardized methodology is not available for the analysis on soils. The specific conductivity tests were run primarily for correlative purposes against the soil pH values.

E-4b Summary of Ground Water Quality

The ground water quality of shallow, perched water intervals at the Dynecol facility has been monitored since 1982. The parameters which were monitored include major cations

Table E.5
Summary of Field Analysis for Soil pH and Conductivity

Sampled Interval (ft)	pH (Standard Units)						Conductivity (umhos/cm @ 25°C)					
	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
1-2.5	7.77F	10.44F	8.68F	9.51F	-	7.95F	524	1030	343	493	-	442
3.5-5	7.40F	8.24	8.76F	8.79	-	8.29	370	844	199	440	-	413
6-7.5	7.71	12.22	8.83	8.04	-	8.81	548	1593	243	320	-	316
8.5-10	7.96	8.55	8.54	8.28	8.02	8.32	429	202	206	223	526	253
11-12.5	8.12	8.65	8.64	8.29	-	8.65	206	206	156	210	-	212
13.5-15	8.32	8.62	8.56	8.53	8.34	8.56	195	230	152	184	197	255
16-17.5	8.22	8.87	9.06	8.60	-	8.56	176	216	187	174	-	242
18.5-20	8.42	8.95	8.91	8.77	-	8.64	190	184	204	194	-	239
21-22.5	-	-	-	8.83	8.75	8.80	-	-	-	174	154	216
23.5-25	-	-	-	8.50	8.80	8.97	-	-	-	175	176	212
26-27.5	-	-	-	8.53	8.84	9.03	-	-	-	202	161	197
28.5-30	-	-	-	8.88	9.00	9.11	-	-	-	180	154	183
31-32.5	-	-	-	9.00	9.01	9.12	-	-	-	169	154	146
33.5-35	-	-	-	8.98	9.00	9.14	-	-	-	182	152	149
36-37.5	-	-	-	8.75	8.98	9.11	-	-	-	195	169	159
38.5-40	-	-	-	8.75	9.06	9.04	-	-	-	160	170	178
41-42.5	-	-	-	8.95	9.14	9.01	-	-	-	182	200	192
43.5-45	-	-	-	8.95	9.14	9.12	-	-	-	242	214	175
46-47.5	-	-	-	8.63	8.89	9.05	-	-	-	250	215	174
48.5-50	-	-	-	8.54	8.92	8.98	-	-	-	251	198	218
51.52-5	-	-	-	8.55	9.09	9.01	-	-	-	244	206	219
53.5-55	-	-	-	8.59	8.79	9.03	-	-	-	237	203	212
56-57.5	-	-	-	8.57	9.17	9.04	-	-	-	304	219	220
58.5-60	-	-	-	8.57	8.93	9.00	-	-	-	258	208	262

F denotes sample of fill material

and anions (calcium, chloride, nitrites, sodium, sulfate), trace metals (arsenic, chromium, lead, mercury, nickel, zinc), and the indicator parameters pH and specific conductivity. A summary of analytical data gathered from the existing monitoring system is presented in Table E.6. Laboratory data sheets are located in Appendix E.5.

The water quality of each monitoring well is statistically compared against itself for evaluating water chemistry changes of ground water samples. ~~During interim status, analytical results from the first four quarterly sampling events were used to establish a background value. The mean and standard deviations were calculated from this background data and acceptable results must not exceed the sum of the mean plus two standard deviations.~~ A statistical summary of the background data for each well utilizing the statistical method employed during interim status is presented in Table E.7. This type of statistical method is applied due to the lack of hydraulic communication between perched ground water zones, subsequently prohibiting the determination of an "upgradient" well as background. Another reason for this type of analysis is the heterogeneous nature of the fill material in which most of the monitoring wells are screened. A more detailed statistical analysis of analytical data will be employed at Dynecol under this permit. The revised methodology is presented in Section L, Environmental Monitoring Plans.

E-4b(i) Lacustrine Sand/Silt Sub-Unit

The ground water quality of one interval of the lacustrine sand/silt sub-unit is monitored by well B-3-81. This well typically becomes dry after purging one casing volume and, in the past, has been sampled the following day after allowing water to seep into the well. With the exception of one isolated statistical exceedance of arsenic in March, 1986, no water quality problems have been observed in this well. The pH values have fluctuated between 6.65-8.74 with occasional statistical exceedances. These pH fluctuations are attributed to the well purging and sampling methodologies employed, which routinely result in ground water samples with varying degrees of stagnancy. Field analysis of fresh, representative ground water samples is necessary to produce statistically reliable measurements of pH.

~~The ionic strength of ground water obtained from well B-3-81 is considerably lower than ground water obtained from the mixed fill unit (wells B-1-83 and B-2-83).~~ This is readily observable in the stiff diagrams depicted in Figure E.10.

E-4b(ii) Mixed Fill Unit

The ground water quality of the mixed fill unit is monitored by wells B-1-83, B-2-83, W-4-88, and W-5-88. Groundwater was sampled from monitoring well W-4-88, following well construction and development in May 1988. Chemical analyses performed upon

ALL CONCENTRATIONS REPORTED IN MG/L EXCEPT pH (s.u.) AND SPEC. COND. (umhos/cm)

SAMPLE POINT	ANALYSES BY (QTR. SAMPLED)	DATE	pH	ARSENIC	CALCIUM	CHLORIDE	CHROMIUM	LEAD	MERCURY	NICKEL	NITRATES	SODIUM	SPEC COND	SULFATE	ZINC	ALK	BARIUM	CARBONATE	CADMIUM	COPPER	IRON	BICARBS	MANGANESE	POTASSIUM	MAGNESIUM	ORTH PNSE	NITRITE	NO3 + NO2	NH3
WELL B-1	WAS 1ST QTR.	22-Jul-83	6.75	<.005	42.92	<1	<.006	<.04	<.005	<.1	<.02	237.86	3000	<1	0.53														
WELL B-1	A+B 2ND QTR.	28-Feb-84	6.8	<.02	437	1100	<.01	<.1	<.05	<.01	1.5	656	3630	242.6	0.521														
WELL B-1 *	A+B 3RD QTR.	05-Jun-84	6.6	<.02	486.7	780	0.023	<.1	<.01	0.085	2.95	347.9	3870	708.6	0.039														
WELL B-1 *	DNR	05-Jun-84	6.3	0.0023	417	820	<.05	<.05	<.0005	0.06		313	2500	480	<.05	220	<1	<5	<.02	<.02	0.29	220	4	26.2	51	<.01	0.02	0.03	1.3
WELL B-1 *	DNR	05-Jun-84	6.3	0.0026	402	820	<.05	<.05	<.0005	0.06		332	2500	450	<.05	210	<1	<5	<.02	<.02	0.44	210	4.3	29	39.5	<.01	0.02	0.02	1.3
WELL B-1	A+B 4TH QTR.	08-Oct-84	11	<.001	105.7	675	<.01	<.01	<.002	0.091	0.22	330	2630	140	0.052														
WELL B-1	A+B	03-Apr-85	11.53	<.1	581.2	438.8	<.01	<.01	<.05	<.01	0.14	738.1	6300	1094	0.014														
WELL B-1	A+B	22-Jul-85	11.67	<.1	613.6	1240	<.01	<.05	<.05	0.046	<.1	536.9	5180	443.3	0.013														
WELL B-1	DNR	24-Jul-85	11.6	0.0105	316	942	<.05	<.05	<.0005	0.05		428	3990	358	0.065	251		82	0.075	0.06	8.55	<5		158	1.7	0.03	0.01	0.01	9
WELL B-1	A+B	20-Sep-85	11.91	<.1	42.13	920	0.013	<.01	<.05	<.01	<.1	404.4	4150	210	0.06														
WELL B-1	A+B	10-Jan-86		<.1			<.01	<.05	<.1	<.02					0.012														
WELL B-1	A+B	26-Mar-86	11.95	0.361	568.2	1053	<.01	<.1	0.156	<.02	<.1	391.8	5300	82.83	0.07														
WELL B-1	A+B	18-Jul-86	11.87	<.1	629.6	993.7	<.01	<.1	<.05	0.142	0.838	51.1	6550	227.9	0.084														
WELL B-1	A+B	03-Oct-86	11.92	<.075	654.4	431.9	<.015	<.075	<.05	<.02	0.9832	108.4	5100	206.4	<.005														
WELL B-1	A+B	10-Feb-87	11.91	<.1	367.5	628.8	<.01	<.05	<.05	<.02	5.02	248.9	3250	119	0.072														
WELL B-1	A+B	04-Mar-87	12.05	<.05	558.9	536.8	<.01	<.05	<.05	0.043	0.6422	237.7	3950	108.8	0.084														
WELL B-1	A+B	03-Jun-87	12.06	<.1	461.4	662.7	<.01	<.1	<.1	<.05	0.699	295.9	4000	136.5	0.054														
WELL B-1	A+B	01-Sep-87	11.91	<.1	584.6	460.1	<.01	<.05	<.1	<.05	0.2615	230.4	3600	207.8	0.098														
WELL B-1	A+B	03-Dec-87	12.02	<.25	503.5	513.35	<.02	<.25	<.25	<.1	<.01	142.1	3250	151.4	0.083														
WELL B-1	A+B	03-Mar-88	11.82	<.1	427.1	816.85	0.01	<.05	<.05	<.05	0.3333	379.6	3700	67.55	0.091														
WELL B-1	A+B	03-Jun-88	11.85	<0.25	245.8	758.2	<0.04	<0.2	<0.25	<0.1	0.2289	284	3800	91.73	0.302														
WELL B-2	WAS 1ST QTR.	22-Jul-83	6.55	<.005	29.25	<1	<.5	<.04	<.005	<.1	0.4	298.23	3000	<1	0.3														
WELL B-2	A+B 2ND QTR.	28-Feb-84	6.72	<.02	498	480	<.01	<.1	<.05	0.037	0.65	165	2420	412.2	1.404														
WELL B-2 *	A+B 3RD QTR.	05-Jun-84	6.5	<.02	649.7	850	<.01	<.1	<.01	0.048	3.05	270.1	4200	818	0.097														
WELL B-2 *	DNR	05-Jun-84	6.6	0.0013	557	320	<.05	<.05	<.005	<.05		269	2500	560	0.12	340	<1	<5	<.02	<.02	0.21	340	1.7	28.2	62	0.01	0.02	3.9	0.17
WELL B-2	A+B 4TH QTR.	03-Apr-85	7.09	<.1	267	196.6	<.01	<.01	<.05	0.021	0.23	116.3	1980	568.4	0.02														
WELL B-2	A+B	22-Jul-85	7.48	<.1	106.7	30	0.02	<.05	<.05	<.02	<.1	22.58	760	15.9	0.062														
WELL B-2	A+B	26-Mar-86	7.44	0.21	240.7	170.1	<.01	<.1	0.067	<.02	<.1	128.3	1590	238.2	0.041														
WELL B-2	A+B	04-Mar-87	7.2	<.05	413.4	149.3	<.01	<.05	<.05	0.063	0.1303	125.8	1950	749.5	0.211														
WELL B-2	A+B	03-Jun-88	7.67	<0.25	169.1	87.48	0.059	<.02	<.25	<0.1	1.6395	68	1100	64.38	0.22														
WELL B-3	WAS	01-Jun-82	7.25	<.002	345	370	<.1	<.05	<.005	<.02	<.1	130	2240	340	9.56														
WELL B-3	WAS	31-Jan-83	6.9	<.005	101.8	980	<.2	<.05	<.005	<.01	0.1	331.2	1400	272.3	0.18														
WELL B-3	WAS 1ST QTR.	22-Jul-83	6.65	<.005	11.56	<1	0.65	<.04	<.005	<.1	<.1	92.6	1000	<1	0.37														
WELL B-3	A+B 2ND QTR.	28-Feb-84	7.04	<.02	133	129	0.399	<.1	<.05	<.02	0.4	75.57	826	180.4	1.317														
WELL B-3 *	A+B 3RD QTR.	05-Jun-84	7.7	<.02	76.82	100	<.01	<.1	<.01	0.044	2.1	57.91	730	126	0.188														
WELL B-3 *	DNR	05-Jun-84	8.4	0.0008	54.8	96	<.05	<.05	<.0005	<.05		53.2	700	79	<.05	110	<1	12	<.02	<.02	<.1	99	0.06	3.3	17.8	0.02	<.01	0.01	0.38
WELL B-3	A+B 4TH QTR.	08-Oct-84	7.71	<.001	32.97	100	<.01	<.01	<.002	<.02	<.1	73.81	590	80	0.026														
WELL B-3	A+B	03-Apr-85	8.15	<.1	41.49	97.24	<.01	<.01	<.05	<.01	0.38	48.76	565	67.6	0.035														
WELL B-3	A+B	22-Jul-85	8.03	<.1	66.35	76	<.01	<.05	<.5	<.02	0.18	49.88	530	60.4	0.043														
WELL B-3	A+B	20-Sep-85	7.87	<.1	298	72	<.01	<.01	<.05	0.036	<.1	48.73	530	92	0.072														
WELL B-3	A+B	10-Jan-86		<.1			<.01	<.05	<.1	<.02					0.029														
WELL B-3	A+B	26-Mar-86	8.33	0.107	51.29	74.52	<.01	<.1	<.05	<.02	<.1	51.48	570	60.36	0.108														
WELL B-3	A+B	18-Jul-86	7.7	<.1	62.98	73.24	0.024	<.1	<.05	0.06	0.0323	315.8	720	66.14	0.087														
WELL B-3	A+B	03-Oct-86	8.33	<.075	41.47	74.52	<.015	<.075	0.02	<.02	0.1049	49.87	540	53.2	<.005														
WELL B-3	A+B	10-Feb-87	8.74	<.1	53.74	74.41	<.01	<.05	<.05	<.02	0.4334	53.83	515	66.2	0.073														
WELL B-3	A+B	04-Mar-87	7.94	<.05	52.71	72.115	<.01	<.05	<.05	0.034	0.1147	61.62	520	73.6	0.104														
WELL B-3	A+B	03-Jun-87	8.25	<.1	59.87	70.91	<.01	<.1	<.1	<.05	0.4682	54.27	560	61.56	0.329														
WELL B-3	A+B	01-Sep-87	8.56	<.1	49.09	69.7	<.01	<.05	<.1	<.05	0.0361	66.21	470	46.31	0.491														
WELL B-3	A+B	03-Dec-87	8.47	<.25	54.09	62.22	<.02	<.25	<.25	<.1	<.1	51.71	385	48.41	0.1														
WELL B-3	A+B	03-Mar-88	8.25	<.1	43.74	87.34	0.01	<.05	<.05	<.05	0.2777	41.28	395	45.54	0.118														
WELL B-3	A+B	03-Jun-88	8.16	<.25	47.74	69.78	0.062	<.2	<.25	<.1	1.274	42	530	54.89	0.304														

* = DATA THAT HAS BEEN SPILT SAMPLED

Table E.6

Summary of Analytical Data

Dynecol, Inc.
Detroit, Michigan

May, 1988 20878

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STATISTICAL SUMMARY OF ANALYTICAL DATA FOR THE FIRST FOUR QUARTERS

SAMPLE POINT	ANALYSES BY (QTR. SAMPLED)	DATE	pH	ARSENIC value*	ARSENIC stat**	CALCIUM	CHLORIDE value	CHLORIDE stat	CHROMIUM value	CHROMIUM stat	LEAD value	LEAD stat	MERCURY value	MERCURY stat	NICKEL value	NICKEL stat	NITRATES value	NITRATES stat	SODIUM	SPEC COND	SULFATE value	SULFATE stat	ZINC
WELL B-1	WAS 1ST QTR.	22-Jul-83	6.75	<.005	0	42.92	<1	0	<.006	0	<.04	0	<.005	0	<.1	0.1	<.02	0	237.86	3000	<1	0	0.53
WELL B-1	A+B 2ND QTR.	28-Feb-84	6.8	<.02	0.02	437	1100	1100	<.01	0.01	<.01	0.01	<.05	0.05	<.01	0	1.5	1.5	656	3630	242.6	242.6	0.521
WELL B-1	A+B 3RD QTR.	05-Jun-84	6.6	<.02	0	486.7	780	780	0.023	0.023	<.1	0	<.01	0	0.085	0.085	2.95	2.95	347.9	3870	708.6	708.6	0.039
WELL B-1	A+B 4TH QTR.	08-Oct-84	11	<.001	0.001	105.7	675	675	<.01	0	<.01	0.01	<.002	0.002	0.091	0.091	0.22	0.22	330	2630	140	140	0.052
		TOTAL	31.15		0.021	1072.32		2555		0.033		0.02		0.052		0.276		4.67	1571.76	13130		1091.2	1.142
		MEAN	7.79		0.005	268.080		638.750		0.008		0.005		0.013		0.069		1.168	392.940	3282.500		272.800	0.286
		VARIENCE	4.593958		0.0000	51130.986		214006.2		0.0001		0.00003		0.0006		0.0016		1.8495	33080.1384	323825		94296.45	0.076841
		STD. DEV.	2.143352		0.0098	226.12161		462.6080		0.0109		0.0057735		0.0246		0.0401		1.3599	181.879461	569.0562362		307.0772	0.277203
		2 STD. DEV. + MEAN	12.07420		0.0249	720.32323		1563.966		0.0300		0.0165470		0.0623		0.1493		3.8874	756.698922	4420.612472		886.9545	0.839906
WELL B-2	WAS 1ST QTR.	22-Jul-83	6.55	<.005	0	29.25	<1	0	<.5	0.5	<.04	0.04	<.005	0	<.1	0.1	0.4	0.4	298.23	3000	<1	0	0.3
WELL B-2	A+B 2ND QTR.	28-Feb-84	6.72	<.02	0.02	498	480	480	<.01	0	<.01	0	<.05	0.05	0.037	0.037	0.65	0.65	165	2420	412.2	412.2	1.404
WELL B-2	A+B 3RD QTR.	05-Jun-84	6.5	<.02	0	649.7	850	850	<.01	0.01	<.1	0.1	<.01	0	0.048	0.048	3.05	3.05	270.1	4200	818	818	0.097
WELL B-2	A+B 4TH QTR.	03-Apr-85	7.09	<.1	0.1	267	196.6	196.6	<.01	0	<.01	0	<.05	0.05	0.021	0.021	0.23	0.23	116.3	1980	568.9	568.9	0.02
		TOTAL	26.86		0.12	1443.95		1526.6		0.51		0.14		0.1		0.206		4.33	849.63	11600		1799.1	1.821
		MEAN	6.715		0.03	360.9875		381.65		0.1275		0.035		0.025		0.0515		1.0825	212.4075	2900		449.775	0.45525
		VARIENCE	0.071366		0.0022	73670.250		136308.2		0.0462		0.001675		0.0008		0.0008		1.7502	7392.68289	925600		117829.9	0.414004
		STD. DEV.	0.267145		0.0476	271.42264		369.1994		0.2151		0.040926		0.0288		0.0296		1.3229	85.9807123	962.0810776		343.2636	0.643432
		2 STD. DEV. + MEAN	7.249290		0.1252	903.83278		1120.048		0.5577		0.116853		0.0827		0.1107		3.7284	384.368924	4824.162155		1136.302	1.742114
WELL B-3	WAS 1ST QTR.	22-Jul-83	6.65	<.005	0	11.56	<1	0	0.65	0.65	<.04	0	<.005	0	<.1	0.1	<.1	0	92.6	1000	<1	0	0.37
WELL B-3	WAS 2ND QTR.	28-Feb-84	7.04	<.02	0.02	133	129	129	0.399	0.399	<.1	0.1	<.05	0.05	<.02	0	0.4	0.4	75.57	826	180.4	180.4	1.317
WELL B-3	A+B 3RD QTR.	05-Jun-84	7.7	<.02	0	76.22	100	100	<.01	0	<.1	0	<.01	0	0.044	0.044	2.1	2.1	57.91	730	126	126	0.182
WELL B-3	A+B 4TH QTR.	08-Oct-84	7.71	<.001	0.001	32.97	100	100	<.01	0.01	<.01	0.01	<.002	0.002	<.02	0.02	<.01	0.01	73.81	590	80	80	0.026
		TOTAL	29.1		0.021	253.75		329		1.059		0.11		0.052		0.164		2.51	299.89	3146		386.4	1.895
		MEAN	7.275		0.0052	63.4375		82.25		0.2647		0.0275		0.013		0.041		0.6275	74.9725	786.5		96.6	0.47375
		VARIENCE	0.2719		0.0000	2873.9590		3193.583		0.1004		0.0023583		0.0006		0.0014		0.9983	201.188691	29649		5831.306	0.335810
		STD. DEV.	0.521440		0.0098	53.609319		56.51179		0.3169		0.0485626		0.0246		0.0374		0.9991	14.1840999	172.1888498		76.36299	0.579491
		2 STD. DEV. + MEAN	8.317880		0.0249	170.65613		195.2735		0.8987		0.1246253		0.0623		0.1159		2.6258	103.340699	1130.877699		249.3259	1.632733

*=THE VARIABLE "VALUE" REPRESENTS THE REPORTED ANALYTICAL RESULTS
**=THE VARIABLE "STAT" REPRESENTS THE CORRESPONDING VALUE USED IN STD. DEV. CALCULATION

Table E.7

Statistical Summary of Analytical Data for the First Four Quarters of Ground Water Monitoring

Dynecol, Inc.
Detroit, Michigan

May, 1988 20878

The water quality of each monitoring well is statistically compared against itself for evaluating water chemistry changes of ground water samples. Analytical results from the first four quarterly sampling events are used to establish a background value. The mean and standard deviations are calculated from this background data and acceptable results must not exceed the sum of the mean plus two standard deviations. A statistical summary of the background data for each well is presented in Table E.7. This statistical method is applied due to the lack of hydraulic communication between perched ground water zones, subsequently prohibiting the determination of an "upgradient" well as background. Another reason for this type of analysis is the heterogeneous nature of the fill material in which most of the monitoring wells are screened. A more detailed discussion of statistical analysis of analytical data is presented in Section L, Environmental Monitoring Plans.

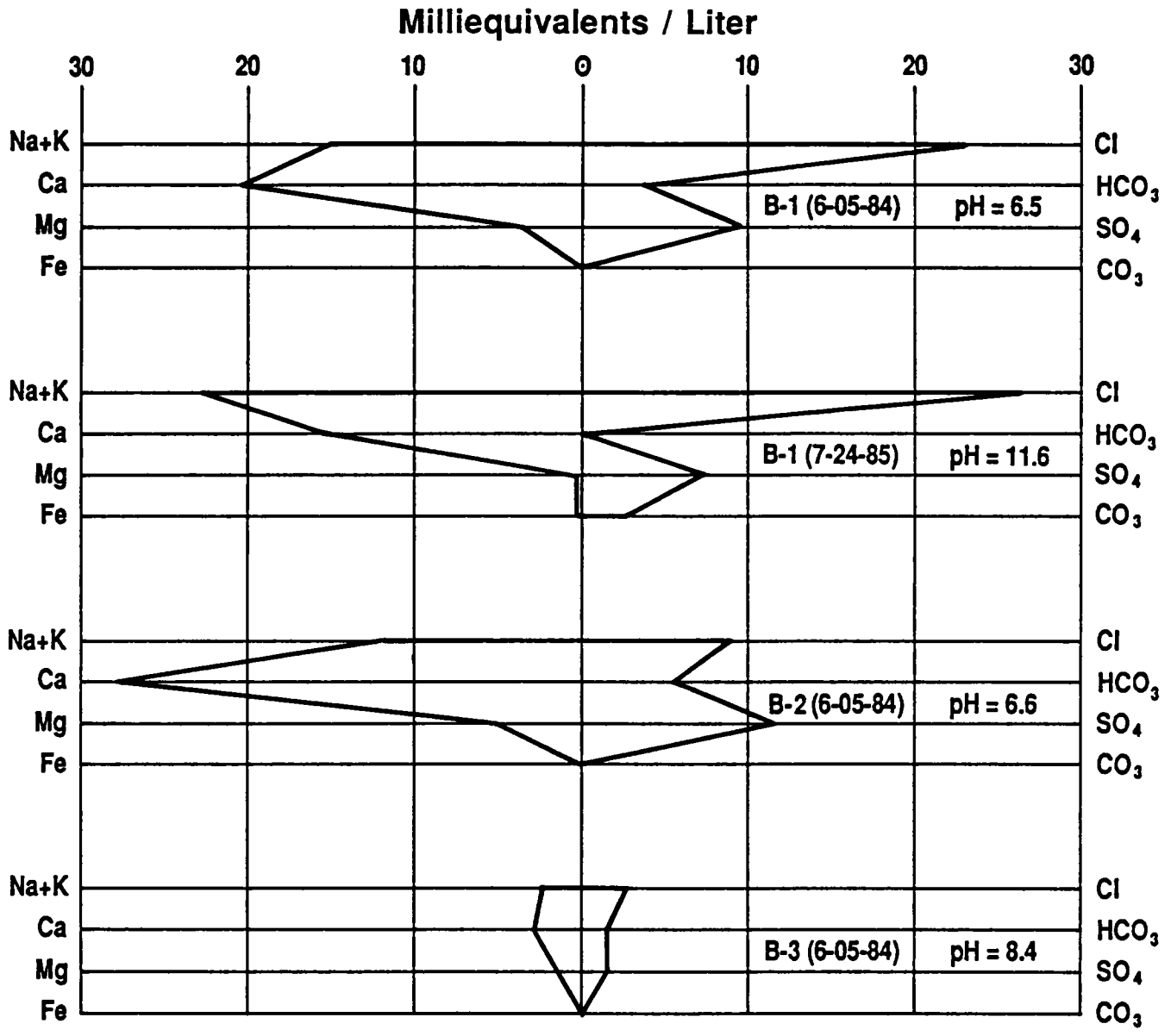
E-4b(i) Lacustrine Sand/Silt Sub-Unit

The ground water quality of one interval of the lacustrine sand/silt sub-unit is monitored by well B-3-81. This well typically becomes dry after purging one casing volume and, in the past, has been sampled the following day after allowing water to seep into the well. With the exception of one isolated statistical exceedance of arsenic in March, 1986, no water quality problems have been observed in this well. The pH values have fluctuated between 6.65-8.74 with occasional statistical exceedances. These pH fluctuations are attributed to the well purging and sampling methodologies employed, which routinely result in ground water samples with varying degrees of stagnancy. Field analysis of fresh, representative ground water samples is necessary to produce statistically reliable measurements of pH.

The ionic strength of ground water obtained from well B-3-81 is considerably lower than ground water obtained from the mixed fill unit (wells B-1-83 and B-2-83). This is readily observable in the stiff diagrams depicted in Figure E.10.

E-4b(ii) Mixed Fill Unit

The ground water quality of the mixed fill unit is monitored by wells B-1-83, B-2-83, W-4-88, and W-5-88. Groundwater was sampled from monitoring well W-4-88, following well construction and development in May 1988. Chemical analyses performed upon these groundwater samples included: major ion, dissolved metals, volatile organic scans (MDNR scan 1 and 2) and field pH and conductivity. These analyses were conducted to enable an initial evaluation of groundwater quality within the mixed fill unit in the vicinity of monitoring well W-4-88. Analytical results from these analyses are located in



$$\text{MEQ/L} = \frac{\text{Concentration (mg/l)}}{\text{Atomic Weight}} \times \text{Valence}$$

Figure E.10

Stiff Diagrams

Dynecol, Inc.
Detroit, Michigan

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these groundwater samples included: major ion, dissolved metals, volatile organic scans (MDNR scan 1 and 2) and field pH and conductivity. These analyses were conducted to enable an initial evaluation of groundwater quality within the mixed fill unit in the vicinity of monitoring well W-4-88. A~~nalytical results from these analyses~~ are located in ~~Appendix A.5.~~

No ground water sample was obtainable from W-5-88 following installation in May 1988. This well will probably be recurrently dry due to the low permeability of the silty clay surrounding the screened interval.

The only statistical exceedances observed in wells B-1-83 and B-2-83 were for arsenic (wells B-1-83 and B-2-83, March 1986) and mercury (well B-1-83, March 1986), on the same date that arsenic was observed in ground water from well B-3-81. The fact that all statistical exceedances observed in the historical data occurred in one sampling event is questionable and may indicate that contamination of sampling equipment by waste materials within the plant occurred. Decontamination procedures for this sampling event are not documented. The only other ground water chemistry anomaly is the elevated pH levels observed in well B-1 beginning in October, 1984.

E-4b(iii) Evaluation of Elevated pH Values from Monitoring Well B-1-83.

Beginning in the fourth quarter of "background" sampling, the pH of ground water obtained from well B-1-83 increased from a mean of 6.7 to a value of >11. Other chemical changes noted from ground water samples were directly associated with re-establishing equilibrium conditions (a reduction of bicarbonate concentration and increase in carbonate concentration; a reduction in magnesium concentration attributable to precipitation of magnesium compounds). These relationships are evident when comparing stiff diagrams from 6-5-84 and 7-24-85 (see Figure E.10).

Numerous publications have reported elevated pH values in water samples collected from monitoring wells with poorly placed annular seals or excess cement/bentonite grout material. (Barcelona and others, 1986; Gibb, 1987; Colangelo and others, 1987; Colangelo and others, 1986; Dunbar and others, 1985: Evans and Ellingson, 1988; Jennings, 1987). Grout contamination is particularly prevalent in monitoring wells screened in sediments with low permeability (due to incomplete flushing), wells with annular seals in the unsaturated zone (due to dehydration of bentonite), and wells grouted with improperly mixed cement slurries. An annotated bibliography of references citing cement grout contamination of monitoring wells is provided in Section E-6.

Monitoring well B-1-83 is screened in a low permeability interval with its annular sealed in the unsaturated zone, and lacks documentation of proper cement grout preparation. The area surrounding well B-1-83 was covered with gravel when the well was installed in

May, 1983. During the summer of 1984 this area was covered with concrete (B. Pepin, Personal communication). The subsequent sampling event in October, 1984 was the initial detection of the elevated pH values. The combination of well construction techniques and potential for well disturbance or contamination during paving activities leads to the conclusion that the elevated pH levels observed in well B-1-83 are likely a result of cement grout contamination. Therefore, this well will be utilized exclusively as a piezometer to monitor the static water level elevation within the shallow ground water zone.

E-5 SUMMARY

Analyses of soil types and hydrogeological relationships beneath the Dynecol, Inc. facility reveal very limited potential for infiltration and subsurface migration of a hazardous waste in the event of a release. The low permeability of the underlying sediment and the secondary containment of storage and treatment units provide adequate protection against ground water and soil contamination. Additionally, the results of soil borings on the site revealed no usable aquifer exists within the upper 60 feet of soils beneath Dynecol's facility.

Although the mixed fill unit is an inconsistent and limited source of perched ground water, this unit is considered the uppermost aquifer present at the site. Therefore, a leak detection system in the form of monitoring wells within the mixed fill will be implemented to comply with regulatory requirements (40 CFR, Part 264, Subpart F; Act 64 Rule 612(1)(b)). Details on the methodologies and procedures of this monitoring system are outlined in Section L, Environmental Monitoring Plans.

E-6 ANNOTATED BIBLIOGRAPHY OF REFERENCES CITING CEMENT GROUT CONTAMINATION OF MONITORING WELLS

Numerous publications have reported elevated pH values in water samples collected from monitoring wells with poorly placed annular seals or excess cement/bentonite grout material. The following is a summary of published information on the problem.

Barcelona, M.J. and Helfrich, J.A. November 1986. Well Construction and Purging Effects on Ground Water Samples, Environmental Science and Technology Vol. 20, No. 11, pp. 1179-1184.

Conducted laboratory experiments on cement grout materials and compared results to an upgradient monitoring well with an anomalous pH value of 12.7. Experimental data indicated that cement/bentonite grout was capable of producing solutions with pH >13. Their analysis on the ground water from the upgradient monitoring well showed no significant elevated levels of major ionic species (which is what we observed in B-1) to explain the 12.7 pH value.

Gibb, J.P. 1987. How Drilling Fluids and Grouting Materials Affect the Integrity of Ground Water Samples From Monitoring Wells, Opinion 1. Ground Water Monitoring Review, Vol. 7, No. 1, pp. 33-35.

Describes methods to be utilized to avoid grout contamination of monitoring wells. Also describes the effect on pH of improperly hardened cements.

Colangelo, R. V. and Lytwynyshyn, G.R., 1987. Cement Bentonite Grout and its Effect on Water Quality Samples: A Field Test of Volclay Grout in Proceedings of the First National Outdoor Action Conference on Aquifer Restoration, Ground Water Monitoring, and Geophysical Methods, NWWA, pp. 345-359.

Reported that problems of elevated pH values arise in monitoring wells with cement/bentonite grout mixtures that are screened in low permeability clay units. The problems observed in landfill monitoring wells in Iowa were screened in clay units with hydraulic conductivity ranging from 1×10^{-6} to 1×10^{-9} cm/sec, which correspond to reported values of native soils at Dynecol

Colangelo, R.W., Cannestra, R.B. and Morehouse, J.T. 1986. The Effects of Water Quality Data Due to Annular Space Material and Monitoring Well Specifications. Ninth Annual Madison Waste Conference Municipal and Industrial Waste. pp. 100-120.

Presented data collected from monitoring wells and from laboratory extraction tests on cement-bentonite grout mixtures. The data indicated elevated pH (>12) in water quality samples due to the effects from cement/bentonite grout.

Dunbar, D., Tuchfeld, H., Siegal, R. and Sterbentz, R. 1985. Ground Water Quality Anomalies Encountered During Well Construction. Ground Water Monitoring Review. Vol. S, No. 3.

Concluded that cement-bentonite grout caused elevated pH levels in two monitoring wells of a hazardous waste management facility's ground water monitoring system. They also noted that these occurrences coincided with areas of low permeability and low ground water flow velocity conditions.

Evans, L. G. and Ellingson, S.B., 1988. The Formation of Cement Slurry Bleed-water and Minimizing Its Effect on Water Quality Samples in Proceedings of the Ground Water Geochemistry Conference, February, 1988. Association of Ground Water Scientists and Engineers (NWWA), pp. 377-389.

Associates grout contamination of monitoring wells to excess mix-water used in preparation of the grout. This creates alkaline water (bleed-water) which separates from the slurry and percolates along the casing. They propose quality control measures to take in grout preparation to minimize the potential for contamination.

Jennings, K.V.B., 1987. How Drilling Fluids and Grouting Materials Affect the Integrity of Ground Water Samples from Monitoring Wells, Opinion 2. Ground Water Monitoring Review, Vol. 7, No. 1, pp. 36-38.

Addresses the problem of incomplete hydration of bentonite seals in the unsaturated zone, resulting in leaky annular spaces. Also discusses the practice of jettisoning excess grout material into borehole when the calculated volume of cement needed is overestimated. This can result in forcing cement into the formation or the filter pack adjacent to the screen.

E-7 ADDITIONAL REFERENCES CITED IN SECTION E

Larson, J.D., 1976. Soil Survey of Wayne County Area, Michigan. United States department of Agriculture Soil Conservation Service, 83 pp.

Mazola, A.J., 1969. Geology for Land and Groundwater Development in Wayne County, Michigan: Michigan Geological Survey Report Inv. 3, 25 pp.

Sherzer. 1913. Geological Report on Wayne County, Michigan; Michigan geological and Biological Survey. Publication 12 Geological Series 9, 388 pp.

SECTION F

PROCEDURES TO PREVENT HAZARDS

The information provided in this section is submitted in accordance with the requirements of Michigan Act 64, Rule 299.9504(c) which incorporates 40 CFR 270.14(b)(4), (5), (6), (8), and (9) by reference. Other regulations addressed to complete this section include 40 CFR 264.14, 264.15, 264.17, 264.174, 264.194 and 264 Subpart C. Items discussed include: general security provisions; inspection schedule; spill prevention, control, and countermeasures plan; and prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

F-1 SECURITY [40 CFR 270.14(b)(4) and 264.14]

F-1a Waiver of Preparedness and Prevention Requirements [40 CFR 264.14(a) and 270.14(b)]

Dynecol, Inc. does not wish to request a waiver of either the preparedness and prevention requirements or the requirements regarding injury or violation by an intruder, as contained under 40 CFR 264, Subpart C.

F-1b Security Procedures and Equipment [40 CFR 264.14(b) and (c)]

The Dynecol facility is completely surrounded by a six-foot chain-link fence with a barbed wire top. The four access points into the facility, all fronting on Georgia Street are located as follows:

- one automatic sliding gate on the east side of the facility near the office for vehicle traffic entering the facility from Georgia Street;
- one automatic sliding gate on the west side of the facility near the filter press building for vehicle traffic exiting the facility onto Georgia Street;
- one pedestrian doorway leading into the main office area from Georgia Street; and
- one roll-up door for vehicle traffic leading into the maintenance garage from Georgia Street.

Additionally, there is a gate at the southwest corner of the site where a former railroad spur entered the site. This gate is kept locked at all times.

The two main access points for vehicular traffic entering and exiting the facility are controlled by the automatic sliding gates which can be operated from stations within the Dynecol facility. These access points are also monitored by low-light surveillance cameras from the three monitoring stations within the facility. Access to the facility is controlled and monitored from the main office, the security area (during weekends), and the control room. Operation of the gates can be controlled from within the facility or by authorized company and security personnel who are issued control keys.

The facility is staffed twenty-four hours per day, five days per week by Dynecol personnel. Site security is controlled by facility personnel 24 hours per day during week days. At all other times when the facility is not in operation, it is staffed by contracted security personnel. Site security is controlled 24 hours per day during weekends and holidays by either contracted security personnel or facility personnel. Routine security surveillance includes inspection of the facility, equipment, and property, including

fences, gates, doors, and lighting. All access points are locked and secured when the facility is not in operation.

Hazardous wastes are delivered to this site in vehicles operated by either company employees, subcontractors, or common carriers. Vehicles are permitted access to the facility only if prior arrangements have been made with Dynecol management personnel and if they are cleared by Dynecol personnel upon arrival at the facility.

Danger and warning signs are posted on the east and west vehicle entrance and exit gates and along other points on the fence at the perimeter of the site. The sign plates read "Danger Unauthorized Personnel Keep Out" and can be read from all angles of approach and from a distance of 25 feet. Entry to the facility by unauthorized vehicles or pedestrians is prohibited and ensured by these security measures.

F-2 INSPECTION SCHEDULE [40 CFR 270.14(b)(5), 264.15, 264.174, 264.194, and 264.33]

F-2a General Inspection Requirements

The facility structures and equipment, including monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment, are inspected routinely by plant personnel, to identify malfunctions, deterioration, operator errors, and any other situation which may lead to the release of hazardous materials or a threat to human health or the environment. An "Inspection Report Form" has been developed for use during facility inspections. This form specifies the areas to be inspected, the frequency of each type of inspection and the type of problems to look for. The inspector, when identifying a problem, is required to specify the type of problem identified, the remedial action required, and to notify management in order to implement remedial action. Completed inspection report forms and the schedule of inspections are kept at the facility's office. The types of problems that are looked for during the inspection in each area of the facility are outlined in Tables F.1 and F.2. The inspection frequency is also contained in this table. Copies of inspection forms can be found in Appendix F.1.

F-2b Specific Inspection Requirements

F-2b(i) Tank Inspection

The hazardous waste treatment and storage tanks are inspected daily and an inspection log is maintained. The shell, seams, and lining of each tank are visually inspected for any signs of erosion, corrosion, or leaks. The tank containment structures, such as the dikes, walls, floors, loading pad, sumps and spill transfer equipment, are inspected daily for erosion, cracks, leaks, malfunctions, as pumps, piping, hoses, valves, and fittings are

Table F.1

Inspection Schedule
Hazardous Waste Treatment and Storage Tanks

Equipment	Type of Problem	Frequency
Tank shells	erosion or corrosion cracks leaks operator error	weekly
Tank lining	erosion or corrosion cracks leaks	monthly
Material transfer	corrosion leaks malfunction	daily
Material handling	malfunction damage operator error	daily
Electrical	malfunction damage operator error	daily
Containment structure	erosion cracks leaks	daily
Spill transfer	malfunction damage operator error	daily
Monitoring	malfunction damage operator error	daily
Security	damage malfunction	weekly
Safety/emergency	no access malfunction out of place reload	weekly

Table F.2

Inspection Schedule

Hazardous Waste Container Storage Facility

Equipment	Type of Problem	Frequency
Containers	corrosion leaks labeling quantity by waste type	weekly
Containment area	evidence of spills or leaks liquid in containment area cracks or other deterioration	weekly
Area fire extinguisher	operability and previous use not in proper location	monthly weekly
Warning signs	standing and legible	weekly
Loading/unloading	leaks spills cracks	daily

also inspected for any signs of corrosion, leaks, malfunctions, or operator errors. The area immediately surrounding the tanks is inspected weekly to detect signs of leakage.

Other equipment associated with the treatment and storage tanks at the facility that is routinely inspected include electrical equipment (circuit breakers and control panels), material handling equipment (mixer, air compressors, filter presses, silos, and dryer), monitoring equipment (gauges), security equipment (fencing, gates and lighting), and safety and emergency equipment (eye washes, showers, water supply valves, alarms, fire extinguishers, air packs, freight box, and front-end loader).

F-2b(ii)Container Inspection.

The hazardous waste container storage facility is checked at the frequency specified in the inspection schedule. The number, condition, labeling, and spacing of each drum in the storage bays are noted. Each drum is also checked for corrosion, damage, excessive wear, and leakage. The container loading and unloading area is inspected daily to determine if any releases have occurred. Potential types of problems that may be encountered in the container storage area are provided on the inspection form to help ensure a thorough inspection.

F-2c Remedial Action

If inspections reveal that non-emergency maintenance is needed, it will be completed as soon as possible to preclude further damage and reduce the need for emergency repairs. If a hazard is imminent or has already occurred, as revealed during the course of an inspection or at any time between inspections, remedial action will be implemented immediately. If indicated by the situation, Dynecol personnel will notify the appropriate authorities as described in the Contingency Plan (Section G). In the event of an emergency involving the release of hazardous constituents to the environment, response efforts will be directed towards containing the hazard, removing it, and decontaminating the affected area according to the procedures outlined in the Contingency Plan.

During an inspection of the hazardous waste treatment and storage tanks and container storage facility, if a tank or container holding hazardous wastes is found to be in poor condition (such as apparent structural defects or evident corrosion and leakage), the hazardous waste is transferred to another tank or container in good condition. In the case of a drum, the drum and hazardous waste are transferred to, and contained within, a salvage or recovery drum.

F-2d Inspection Log

Records of all inspections are kept in the facility's main office. These inspection records are maintained for at least three years.

F-3 EQUIPMENT REQUIREMENTS [40 CFR 270.14(b)(6) and 264.32]

F-3a Internal Communication [40 CFR 264.32(a)]

An internal alarm system and a voice communication system capable of providing immediate emergency signals to facility personnel are available on the site. The facility is equipped with emergency alarm actuator buttons that when depressed provide an alarm signal which is audible throughout the plant. The locations of the alarm actuators are indicated in Table G.2 and Figure G.1 (Section G).

Internal communication is provided by means of the plant telephone system. Telephones are located in the office area, the maintenance garage, the compressor room, Building A, and the control room. The container storage facility is also equipped with a telephone.

F-3b External Communication [40 CFR 264.32(b)]

External communications are also provided through the plant telephone system (as described in Section F-3a above).

F-3c Access to Communication and Alarm Systems (40 CFR 265.34)

All facility personnel involved in any transfer operations have immediate access to the internal alarm system actuator buttons. The alarm actuator buttons and telephones are located, as previously described, in areas where personnel would be working during these operations. These alarm actuator buttons and telephones are always accessible since all walkways to them, and the areas surrounding them, are maintained free and clear of any obstructions.

In the unlikely event that there is just one employee on the premises when the facility is in operation, this employee has immediate access to the telephones which are equipped with outside lines.

F-3d Emergency Equipment

Portable fire extinguishers are located throughout the facility. Each fire extinguisher is classified for class A, B, and C fires, has a capacity of 20 pounds, and is multipurpose for dry chemical uses. Their locations at the facility are illustrated in Figure G.1 and summarized in Table G.2 (Section G).

Portable spill control equipment and materials include:

- A three-quarter yard front-end loader for use in deploying soda ash and in spill cleanup, stored in the facility parking area on the east side of the plant.

- A freight box containing soda ash bags.
- Portable gasoline powered and air-driven diaphragm pumps, and related portable hosing, located in the maintenance building.

Decontamination equipment and personal safety equipment are provided at the facility as follows: emergency showers and eyewash fountains located at the north wall of the compressor room, at the south side of the scrubber within Building 2, and in the primary treatment area and truck unloading area; and two Scott Air Packs, containing a 30 minute air supply located on the north wall of the compressor room.

The container storage facility has at least three fire extinguishers located in the bulking area, the container storage bays, and the loading and unloading area. A spill control cart is kept in the mechanical room and is available to respond to spills of various characteristics within the facility. The spill cart contains inert absorbent materials, spark-proof shovel, containment materials, and empty containers for spill residues plus personal protective equipment. A portable pump is also available to remove spills from the containment sumps.

F-3e Water for Fire Control [40 CFR 264.32(d)]

Water is provided to the facility from City of Detroit water supply mains, and enters the facility at a pressure of 50-60 psi. Water supply is available within the plant at the following locations:

Water Supply Valve Size	Location
1"	Maintenance garage at office door
1"	Maintenance garage, east wall
1"	Maintenance garage, east door
1"	Compressor room, east door
1"	Compressor room, south wall
3"	Compressor room, south wall
3"	Maintenance garage, west wall
3"	Containment area, east wall

Water hoses are available at the facility and are accessible for immediate use. The hoses are stored in the maintenance garage when not in use.

The container storage facility is equipped with an automatic, wet-type, closed head sprinkler system that is supplied by an eight-inch water main with water pressure less

than 60 psi. Capacity is 0.30 gpm/sf plus an allowance of 750 gpm for fire department streams. A flow switch and electric alarm bell is located on the building's exterior.

F-3f Aisle Space Requirements [40 CFR 264.35]

Access into the facility and movement within the facility is maintained free and clear of obstructions in order to allow movement of spill control and decontamination equipment within the plant. Aisles and walkways between tanks and equipment in both the storage and process areas are maintained free and clear of obstructions in order to provide unobstructed movement of personnel and portable emergency equipment within these areas. Within the container storage facility, an aisle space of at least eighteen inches is maintained between stored drums. Containers with flammable wastes are placed no further than twelve feet from the main aisle.

F-3g Emergency Equipment Inspection and Maintenance

All facility alarm systems, fire protection equipment, spill control equipment, and decontamination equipment are inspected, tested, and maintained on a regular basis to help ensure proper operation during an emergency.

The internal alarm system is inspected and tested monthly. Each emergency alarm actuator button is inspected to verify that access to the button remains unobstructed. Each button is then tested to ensure its proper operation. Any obstructions identified during inspection are promptly removed, and any malfunction identified during testing is immediately repaired.

The telephone system, which is used for both routine business and emergency communications, is tested daily during its routine usage. Any malfunctions are immediately reported to the telephone utility and prompt repair service is requested.

The portable fire extinguishers are inspected regularly. The inspection consists of verifying that each fire extinguisher is located in its designated location and that access to the fire extinguisher is unobstructed. The pressure gauge is checked to see that proper pressure is maintained. The container, mechanical parts, nozzle, locking pin, etc. are examined for corrosion, damage, tampering, and leaks. Testing and recharging is completed according to manufacturer's instructions by a qualified professional maintenance service and pertinent data is recorded on each fire extinguisher at the time of service.

The portable spill control equipment (front-end loader, portable pumps, spill cart, and soda ash) are inspected weekly. The front-end loader and portable pumps are inspected for proper location and unobstructed access and are tested for proper operation.

The personal protective equipment is inspected and tested regularly. The emergency showers and eyewash fountains are inspected to assure unobstructed access and to verify proper operation. The two Scott Air Packs are inspected to assure unobstructed access, placement in designated locations, and absence of corrosion, damage, leaks and tampering. Scott Air Pack testing and recharge is carried out according to the manufacturer's instructions by a qualified professional maintenance service.

Water supply valves and hoses are inspected and tested regularly. Inspection and testing of valves include verification of unobstructed access and proper operation. Inspection and testing of hoses includes storage in an accessible location and freedom from corrosion or leakage.

F-4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT [40 CFR 270.14(b)(8)]

F-4a Unloading Operations [40 CFR 270.14(b)(8)(i)]

F-4a(i) Process and Storage Tanks

Hazardous wastes are delivered to the tank treatment and storage areas of the facility via bulk tank trailers. Incoming waste loads enter the facility at the east gate and proceed to the recessed truck unloading pad located on the west side of the facility. The following unloading procedures are implemented whenever bulk wastes are unloaded at the Dynecol facility:

- After tank truck has come to a complete stop, brakes are set.
- Driver remains in direct visual observance of transfer operations at all times during loading or unloading operation. The operation is not left unattended.
- Prior to transfer operations the tank is checked by visual observation to insure there is sufficient capacity for a material transfer.
- Fill pipes are inspected for leakage after loading or unloading has commenced and after the procedure has been completed. Pails and absorbent materials are available in case a leak develops during this procedure.
- The volume of material loaded or unloaded is recorded.

During unloading operations, any spills or leaks are promptly removed by the use of industrial absorbent or washed into a sump located in the unloading area. The unloading pad is curbed and sloped to prevent the run-off of spilled materials.

F-4a(ii)Container Storage Facility

Containers of hazardous wastes are delivered to the container storage facility at the two loading docks located in the southeast corner of the building. The transfer of these containers after storage to vehicles which will transport the wastes to off-site treatment, recovery, or disposal facilities also takes place at these loading docks. A graded ramp allows for the smooth and accessible movement of drums to and from the loading/unloading area of the facility. The loading docks have structures to contain any spills or leaks that may occur during loading or unloading operations. The docks are equipped with hydraulic levelers and bumpers. The procedures for loading or unloading containerized hazardous wastes follow the same procedures outlined for the tanks. Smoking is not allowed during the loading or unloading of ignitable or reactive wastes.

F-4b Runoff [40 CFR 270.14(b)(8)(ii)]

Concrete dike walls have been constructed to enclose and contain the treatment and storage tanks and prevent the escape of any spill or contaminated runoff. Eight-inch concrete curbing located at the property line surrounds the west and south sides of the facility and prevents any spills or runoff from flowing off of the site. Concrete trenches are cut across the width of the driveway at two locations (south and east side) to prevent any spills or runoff from exiting the site. Two sumps are provided, fed by the driveway trenches, which are drained by pumps that discharge to the tanks inside of the secondary containment area. Surface runoff is controlled by concrete and asphalt surfaces that direct runoff to sumps, trenches, and storm drains.

Spill control structures, including the dike walls surrounding the tank area and the unloading area, the curbing along the west and south fence, the two trenches across the driveway, and the two spill collection sumps, are inspected daily for corrosion, cracks, and signs of spills or leaks.

Runoff from the waste handling areas in the container storage facility is prevented due to the presence of a roof over these areas, including the loading/unloading area.

F-4c Water Supplies [40 CFR 270.14(b)(8)(iii)]

The contamination of water supplies is averted at the facility by the prevention of spills, leaks, or contaminated runoff from discharging onto unprotected ground. The containment structures, drainage control features, and spill response procedures all serve to reduce the potential of water supplies becoming contaminated from waste handling activities at the site.

F-4d Equipment and Power Failure [40 CFR 270.14(b)(8)(iv)]

Treatment processes and all other facility operations rely on properly functioning equipment and a reliable supply of electricity. All processing equipment is checked prior to starting up the process to assure that it is in good operating condition. Valves, pumps, pipes, monitoring instruments, switches, alarms, indicator lights, and other process equipment are checked according to an operating sequence that establishes steps to be followed when beginning treatment processes. Any malfunctioning equipment will be identified and compared to a troubleshooting guide that helps to pinpoint the cause of the problem. Routine maintenance, according to an established schedule, also assures that equipment in good condition is available during treatment processes.

If a power failure occurs at the facility, all treatment processes cease operation. No adverse results will occur from a power failure.

F-4e Personal Protective Equipment [40 CFR 270.14(b)(8)(v)]

The personal protective equipment that is available to facility personnel to prevent exposure to hazardous waste include Scott air packs, safety glasses, hard hats, boots, aprons, and gloves. An emergency blanket, first-aid supplies, eye-wash stations and emergency showers are also available to minimize injuries in the event that an employee would require these items. Employees are trained in the proper use of this equipment and in the chemical and physical hazards of the wastes that are treated and stored at the facility.

F-5 PRECAUTIONS TO PREVENT IGNITION OR REACTION OF IGNITABLE OR REACTIVE WASTES [40 CFR 270.14(b)(9) AND 264.17]

A variety of precautions have been implemented at the Dynecol facility to prevent the ignition or reaction of ignitable or reactive wastes. One of the first of these precautions is the characterization of incoming wastes through a thorough waste analysis program that provides accurate and precise information on the physical and chemical properties of the waste so that the waste can be handled safely according to its identified properties. The waste analysis program also assures that certain waste types that will not be accepted by Dynecol, such as radioactive and explosive wastes and wastes containing more than 20 ppm of cyanide, are appropriately identified. Waste characterization determines which wastes can be compatibly and safely mixed. Additionally, waste characterization also determines where wastes can be stored to avoid reactions occurring during storage from incompatible waste types. Based on waste characterization, Dynecol will reject shipments if it is determined that the waste cannot be safely handled by the facility. The segregation of incompatible waste types is achieved through the use of separate storage bays in the container storage building. Separate secondary containment systems also reduces the chance of incompatible wastes mixing.

Areas at the facility where ignitable or reactive wastes are being stored are appropriately identified through the use of labels and signs. "No Smoking" signs are prominently displayed wherever a hazard exists from ignitable or reactive wastes. The wastes are also separated or protected from sources of ignition, such as open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks, spontaneous ignition, and radiant heat. If any type of work is to be done in these waste storage areas, a "hot permit" must first be obtained from the facility's plant manager to ensure that all work within the storage areas conform to these necessary hazard prevention procedures.

F-5a General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Wastes [40 CFR 270.14(b)(9) and 264.17(b)]

The procedures and precautions discussed in Section F-5 are routinely implemented to prevent the ignition or reaction of ignitable or reactive wastes during handling so that the following reactions do not occur:

- the generation of extreme heat or pressure, fire or explosions, or violent reactions;
- the production of uncontrolled flammable fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
- the production of uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
- damage to the structural integrity of the device or facility; or
- any reactions that result in a threat to human health or the environment.

Precautions, such as the characterization of wastes received at the facility, are undertaken to prevent the accidental mixing of incompatible wastes and other materials. Another procedure that can be utilized to prevent the accidental mixture of incompatible wastes is to combine very small quantities of those wastes being considered for mixing to determine their compatibility. Employees are trained in safe waste handling procedures, including those procedures for handling ignitable and reactive wastes.

F-5b Management of Ignitable or Reactive Wastes in Containers [40 CFR 270.15(c) and 264.176]

Containers of ignitable or reactive wastes are stored in separate storage bays within the container storage facility. Figure F.1 demonstrates that the storage of these containers takes place more than 50 feet away from the facility's property lines. The labeling,

sealing, handling, stacking, and storing of these containers are done in a manner that minimizes the possibility of these wastes experiencing any fires, explosions or reactions.

F-5c Management of Incompatible Waste in Containers [40 CFR 270.15(d) and 264.177]

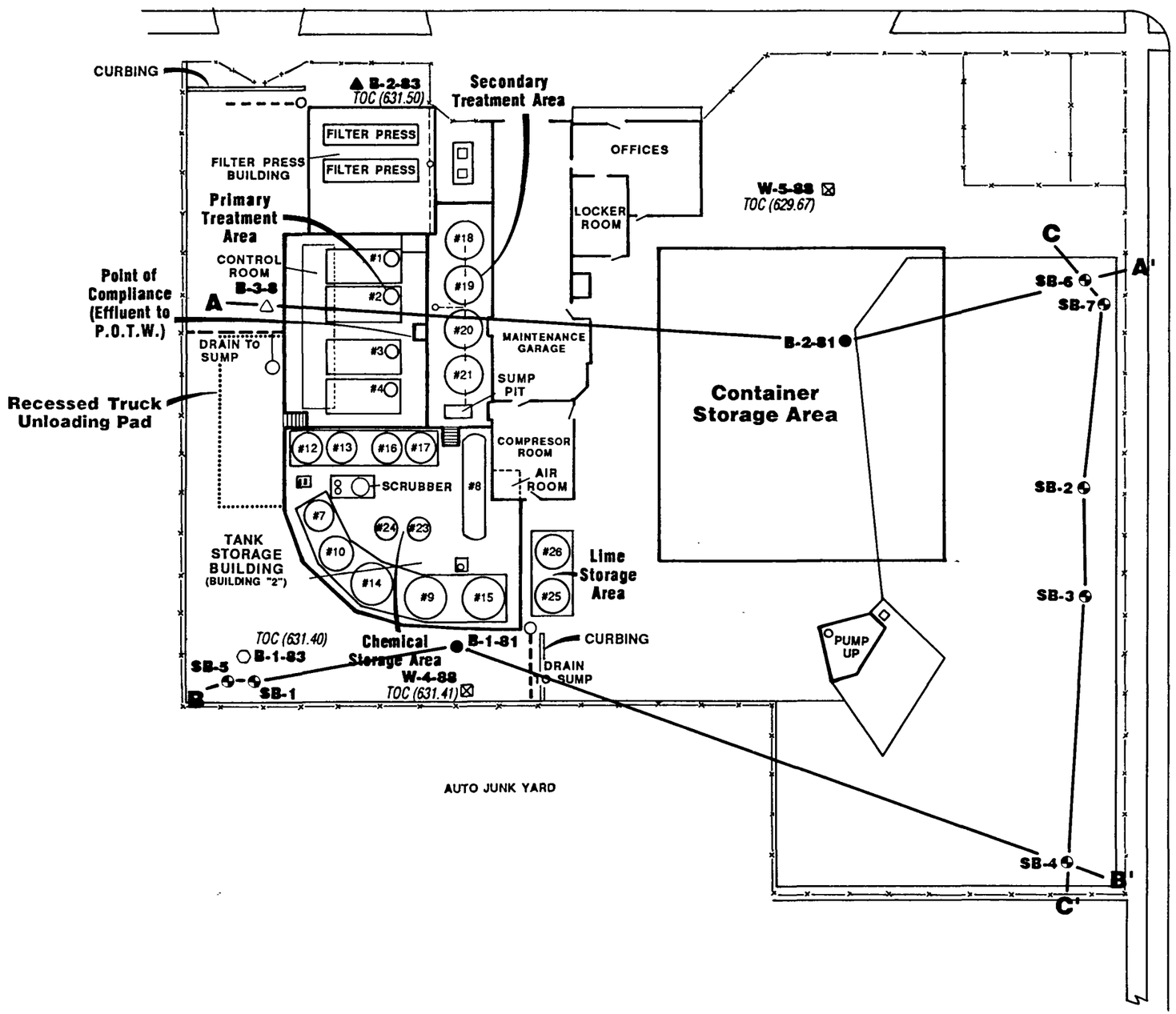
Several precautionary measures have been implemented for the hazardous waste container storage facility to assure that incompatible wastes do not come into contact with each other. Wastes are not placed into unwashed containers which formerly held incompatible wastes or materials. All empty containers are labeled to indicate their previous contents and when they were emptied and cleaned. Incompatible wastes are stored in separate storage bays with separate containment systems within the facility. These storage bays are enclosed within the floor, roof, and walls of the container storage facility and the wastes stored within this facility are effectively separated from any incompatible wastes or materials that may be stored nearby outside of the facility.

F-5d Management of Ignitable or Reactive Wastes in Tanks [40 CFR 270.16(f) and 264.198]

Ignitable wastes are not treated at Dynecol nor are they stored in tanks. There is no potential for a waste material treated or stored in a tank to generate extreme pressure or to react with other wastes or materials to form hazardous gases. Tanks in which treatment takes place are always maintained at atmospheric pressure as a result of tank venting to a scrubber which is vented to the atmosphere. Any hazardous waste fumes or gases that could be generated during the transfer of incoming wastes from tankers into the treatment tanks, or during aeration in the primary treatment tanks, are vented into the chemical recycle scrubber/condenser. Wastes containing cyanide in excess of 20 ppm are not accepted for treatment by Dynecol, and incoming waste streams are tested to assure that such wastes are not handled at the facility.

F-5e Management of Incompatible Wastes in Tanks [40 CFR 270.16(f) and 264.199(b)]

Incompatible wastes and materials are not stored in the same tank or in an unwashed tank that previously held an incompatible material or waste. Various waste management



LEGEND

- ● Soil Boring (previous study)
- △ Soil Boring Converted to Monitoring Well (7/81)
- ▲ Monitoring Welll (previous study)
- ⊕ Soil Boring
- ⊠ Monitoring Well
- TOC (631.40) Top of Casing Elevation in Feet (USGS)
- A—A' Cross Section Trace
- ○ Piezometer

N

0 20 40 80

Scale in Feet

Figures A.2, E.2, G.1, I1, L.1, F.1

Site Map

Dynecol, Inc.
Detroit, Michigan

March, 1988 20878

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procedures ensure that incompatible wastes and materials are not placed in the same tank, such as has been set forth in the Waste Analysis Plan (see Section C), as is explained during employee training programs, and as is provided in the placement and labeling of storage tanks at the facilities. These various plans and programs serve as methods for preventing the mixing of incompatible materials or wastes in the treatment and storage tanks at the Dynecol facility.

SECTION G

CONTINGENCY PLAN

ACT 64 OPERATING LICENSE REAPPLICATION

for

DYNECOL, INC.
6520 GEORGIA STREET
DETROIT, MICHIGAN 48211

MID 074259565

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SECTION G

CONTINGENCY PLAN

This Contingency Plan has been prepared in accordance with the requirements of 40 CFR 270.14(b)(7) and 264 Subpart D to establish the necessary planned procedures to be followed in the event of an emergency situation at the facility, such as fire, explosion, severe weather, or any unplanned sudden or non-sudden release of hazardous waste constituents to the air, soil, or surface water.

As required by 40 CFR 264.53, a copy of this Contingency Plan (and all amendments to the plan) is maintained at the facility and has been submitted to the local police department, fire department, and local emergency response teams that may be called upon to provide emergency service (see Section G-6).

G-1 GENERAL INFORMATION [40 CFR 264.51]

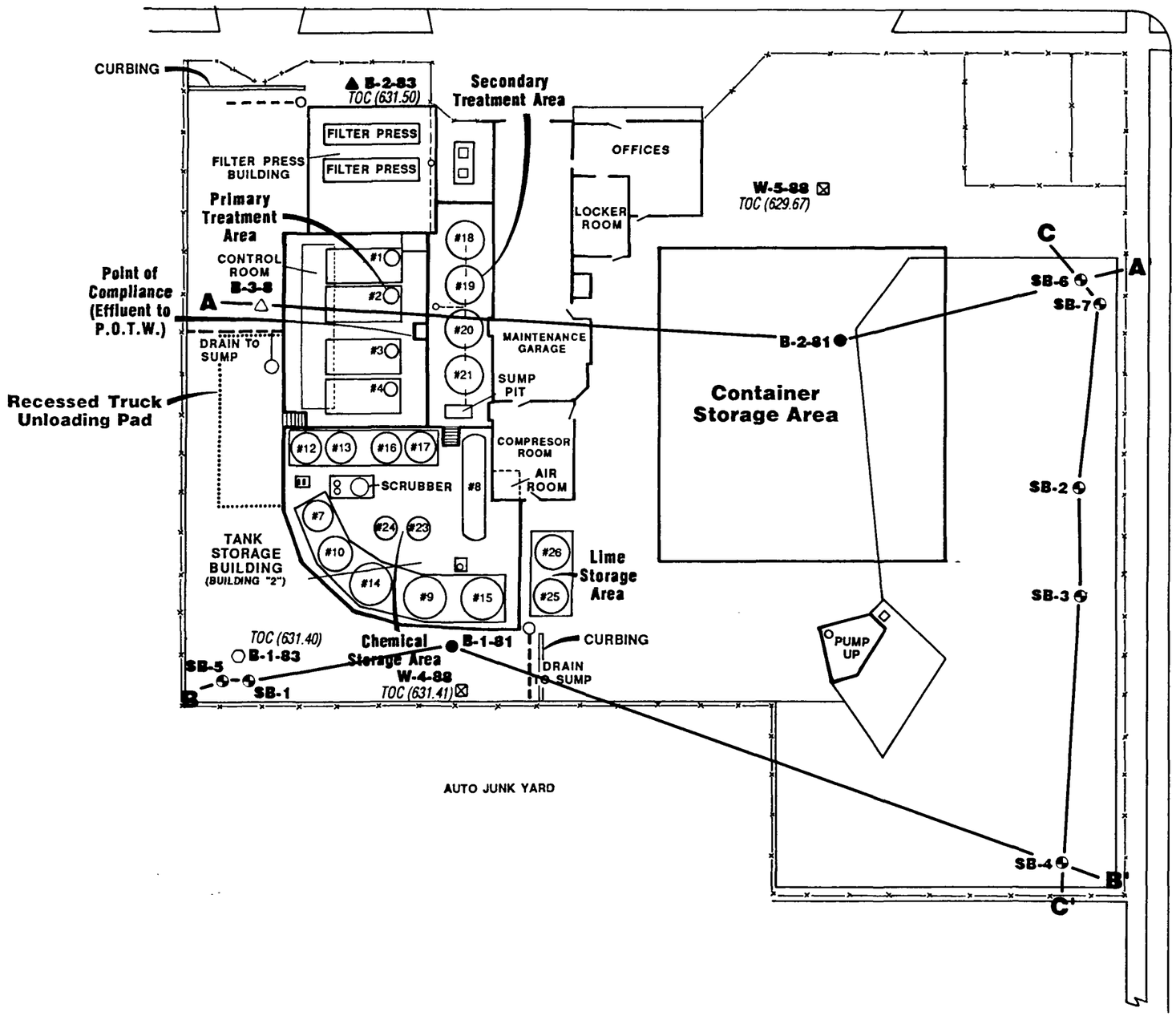
The plans and procedures described herein have been prepared in accordance with the applicable regulations and have been designed to minimize hazards to human health and the environment from any unplanned, sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil or surface water via the public sewer system. The procedures established in this plan have been developed to protect Dynecol employees, properties, and the general public and will be implemented by plant personnel in the event of a potential or actual release of hazardous waste or hazardous waste constituents which may threaten human health or the environment.

Dynecol, Inc. is located at 6520 Georgia in Detroit, Michigan. The facility treats and stores certain hazardous waste streams in tanks and stores containerized hazardous wastes in an enclosed building prior to disposal or treatment at designated facilities. Figure G.1 contains a general site plan of the Dynecol facility, illustrating the hazardous waste treatment and storage tank locations and the location of the container storage facility.

G-2 EMERGENCY COORDINATORS [40 CFR 264.52(d) and 264.55]

At all times there is at least one employee, either on the facility premises or on call and within a reasonable travel distance of the facility, with the responsibility for coordinating all emergency response measures. The list of Emergency Coordinators is contained in Table G.1. Qualified persons have been designated as the primary and alternate Emergency Coordinators. Their names, addresses, and telephone numbers (office and home) are arranged in the order in which they would assume the responsibilities of Emergency Coordinator.

If an emergency situation develops at the facility, the discoverer must immediately contact the primary Emergency Coordinator or alternate Emergency Coordinator if the primary Emergency Coordinator is unavailable. The primary and alternate Emergency Coordinators are thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the location and characteristics of wastes handled at the facility, the location of all records within the facility, and the facility layout. The Emergency Coordinators have complete authority to commit the resources of the company that may be needed to carry out the Contingency Plan. The Emergency Coordinator's responsibilities are specified under the emergency response procedures contained in this plan.



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- ○ Piezometer

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Scale in Feet

Figures A.2, E.2, G.1, I1, L.1, F.1

Site Map

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Table G.1

Emergency Notification Telephone Numbers

	Name/ Address	Office Phone	Home Phone
1.	Emergency Coordinators		
	Frank Biermann, Primary 240 Grosse Pointe Boulevard Grosse Pointe Farms, MI 48236	(313) 571-7140	(313) 885-1568
	Robert Pepin, 1st Alternate 11724 Grayfield Redford, MI 48239	(313) 571-7140	(313) 534-3492
	Tien Pham, 2nd Alternate 5169 Frazho Road Warren, MI 48041	(313) 571-7140	(313) 756-2383
	Robert MacKinder, 3rd Alternate 41091 Oakhill Drive Mt. Clemens, MI 48044	(313) 571-7140	(313) 263-7465
2.	Spill Cleanup Contractors		
	Great Lakes Environmental 22077 Mound Road Warren, MI 48090	(313) 758-0400	
	Michigan Pumping Service 2619 Superior Trenton, MI 48183	(313) 657-0225	
3.	Fire or Police	911	
4.	Medical Emergency		
	Maybury Medical Clinic 8220 E. McNichols Detroit, MI 48234	(313) 365-8220	

(continued)

Table G.1

Emergency Notification Telephone Numbers

(continued)

	NAME/ ADDRESS	OFFICE PHONE	HOME PHONE
	Holy Cross Hospital 4777 E. Outer Drive Detroit, MI 48234	(313) 369-9100	
5.	Detroit Water and Sewerage Department		
	Industrial Waste Control	(313) 224-4775	
	System Control	(313) 833-4077	
6.	Wayne County Air Pollution Control		
	Business hours	(313) 567-4100	
	Evening hours	(313) 567-8432	
7.	Michigan Department of Natural Resources		
	Spill Response (PEAS)	1-800-292-4706	
	SE Michigan Field Office	(313) 344-4670	
	Lansing Office	(517) 373-2730	
8.	U.S. Environmental Protection Agency		
	National Response Center	1-800-424-8802	
	Local office (Grosse Ile)	(313) 676-6500	
9.	U.S. Coast Guard - Captain of the Port		
	Business hours	(313) 226-7777	
	Evening hours	(313) 226-6870	
10.	Poison Control Center	(313)745-5711 1-800-462-6644	

G-3 IMPLEMENTATION OF CONTINGENCY PLAN [40 CFR 264.51(b) and 264.56(d)]

The decision of the Emergency Coordinator to implement this plan depends upon whether or not the potential or actual incident could threaten human health or the environment. The following situations are provided as guidance to plant personnel as to the conditions or circumstances under which the plan must be implemented:

Fire and/or Explosion

- A fire causes the release of toxic fumes.
- The fire spreads and could possibly ignite materials at other locations on-site or could cause heat-induced explosions.
- The fire could possibly spread to off-site areas.
- The use of water or water and chemical fire suppressant could result in contaminated runoff.
- An explosion has occurred or an imminent danger exists that an explosion could occur, thereby releasing toxic material.

Spill or Release of Hazardous Waste During Unloading Operations

- The spill or release causes bodily injury or is an imminent threat to human health due to the evolution of reactive or toxic liquids, mist, or fumes or contact with reactive or toxic liquid or spray.
- The spill or release has the potential to, or actually does, overflow the secondary containment structures and exits the facility, either alone or in combination with storm water, potentially resulting in off-site soil contamination or water pollution.
- The spill or release is contained on site but could cause either ground water contamination or air pollution.

Spill or Release of Hazardous Waste Within the Secondary Containment Structure

- The spill or release causes bodily injury or is an imminent threat to human health due to the evolution of toxic or reactive liquids, fumes or mist or contact with toxic or reactive liquid or spray.

- The spill or release cannot be immediately transferred to an appropriate tank for storage.
- The spill or release threatens the integrity of storage tanks or other facility equipment or structures.

G-4 EMERGENCY RESPONSE PROCEDURES

The following general procedures have been established for implementation by plant personnel and the Emergency Coordinator in order to efficiently respond to the release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

All emergencies require prompt and deliberate action. In the event of any major emergency, an established set of procedures will be followed. These procedures will be followed as closely as possible. In specific emergency situations, however, the Emergency Coordinator may deviate from established procedures to provide a more effective plan for bringing the situation under control.

G-4a Notification

The list of emergency contacts contained in Table G.1 provides a ready reference for plant personnel and Emergency Coordinators in the event of an imminent or actual emergency situation at the facility which will require immediate response. In the event of an emergency situation, the Emergency Coordinator will be notified first. All other facility personnel, local emergency response agencies, and state and federal authorities will be promptly notified as directed by the Emergency Coordinator.

G-4b Identification of Hazardous Materials [40 CFR 264.56(b)]

The Emergency Coordinator will immediately identify the type, exact source, amount, and extent of any released materials. The Emergency Coordinator is familiar with the facility and the types of wastes which are handled. The initial identification will be made by observation of the material involved, the source, and the location of the release. The tanks, piping, and containers are labeled to facilitate the identification of released materials. If visual identification cannot be made, samples of the released materials will be identified by chemical analysis.

G-4c Assessment [40 CFR 264.56(c) and (d)]

The Emergency Coordinator will assess possible hazards, both direct and indirect, to human health or the environment that may result from the release of the identified material or from the fire or explosion. The assessment will consider the effects of any

gases that may be generated, the effects of hazardous surface runoff from water or chemical agents used to control the fire, and the effects of any chemical or physical reactions on equipment or structures.

If the Emergency Coordinator's assessment indicates that evacuation of local areas may be advisable, the appropriate local authorities will be immediately notified. The Emergency Coordinator will assist these authorities in deciding whether evacuation is indicated and what areas may need to be evacuated. The National Response Center (see Table G.1) will also be immediately notified, and the following information will be provided:

- name and telephone number of reporter;
- name and address of facility;
- time and type of incident (e.g. release, fire, explosion);
- name and quantity of materials involved, to the extent known;
- extent of injuries, if any; and
- possible hazards to human health or the environment, outside of the facility.

G-4d Control Procedures [40 CFR 264.52(a)]

Whenever there is an imminent or actual emergency situation where the potential or actual release of hazardous materials may threaten human health or the environment:

- The plant personnel who discover the situation will activate the emergency alarm system, thereby alerting the Emergency Coordinator or designate who can then contact the Emergency Coordinator by telephone.

- The Emergency Coordinator or designate will contact the appropriate spill cleanup contractors, and state or local agencies, if their assistance is needed.

- In the event that an individual or individuals have come in contact with acids or alkalis, plant personnel will immediately assist the victim to the emergency eyewash or shower where the affected area will be rinsed with water. Other injured personnel will also receive immediate first aid and medical attention. If necessary, the hospital or clinic should be notified immediately. The safety of personnel and other individuals will be the first concern of the Emergency Coordinator.

- All emergency response personnel will utilize personal protective equipment, including gloves, boots, goggles or face shields, aprons, and other equipment appropriate to the emergency.

- All nonessential personnel will be evacuated from the immediate area of the emergency. If total plant evacuation is indicated, the evacuation procedures summarized in Section G-7 will be followed.

- Any processes or operations that may interfere with emergency response will be stopped. Valves, pipes, and other equipment will be monitored for leaks, pressure build-up, gas generation, or ruptures.

- The character, source, and extent of the emergency will be evaluated. The actual or potential release of hazardous wastes will be identified.

- Fire extinguishers or water hoses will be utilized by trained personnel to contain the spread of fire, if appropriate. Upon the arrival of the fire department, the directions of the fire chief will be followed in handling the emergency.

- All measures will be undertaken to prevent the contact of any released materials with incompatible materials, such as corrosive material with water, skin, eyes, and metals and flammable materials with any spark-emitting sources or open flames.

- Released materials that are not contained will be prevented from entering any floor drains, such as through the use of oil booms or dams and inert absorbent materials suitable to the released materials. The release of corrosive materials will be cautiously and slowly neutralized (*acids with an alkaline compound and alkaline solutions with a dilute acidic material*). Spark-proof equipment will be used to remove flammable materials.

- If necessary, the area will be roped off to limit access to the area until the emergency has been cleared and the area cleaned. Ventilation will be provided to the area if indicated by the presence of vapor-emitting materials, such as acids and volatile compounds.

- For emergency situations involving tanks, any materials released into the secondary containment system will be pumped out and disposed of according to applicable regulations. No materials will be placed into a defective tank or associated piping until repairs have been made to eliminate the potential for leakage, corrosion, or explosion.

- For emergency situations involving drums or other containers during storage, any materials released into the secondary containment system will be pumped out and disposed of according to applicable regulations. Leaking or potentially leaking drums and containers will be placed into a recovery drum that will be properly labeled.

- The spill area will be washed with water and appropriate surfactants. After the spill area has been cleaned, the Emergency Coordinator will determine if the area is safe to return to normal use.

- All safety and emergency equipment will be decontaminated and thoroughly cleaned before being placed back into storage. Used spill response materials and those materials that cannot be decontaminated will be appropriately disposed of and replaced with new emergency response materials and equipment.

G-4e Prevention of Recurrence or Spread of Fires, Explosions or Releases [40 CFR 264.56(e)]

During an emergency, the Emergency Coordinator must take all reasonable measures necessary to ensure that fires, explosions or releases do not recur or spread to other areas of the plant or off the plant site. Some actions which might be employed include:

- shut off pumps, valves, or air supply lines if required to stop the release;

- actuate sump pumps to transfer accumulated runoff into available tanks;

- place portable pumps in service to transfer accumulated runoff;

- deploy soda ash or suitable containment materials to erect temporary dams in the path of the flow of released materials; and

- spread suitable neutralizing agents on contained acid spills.

G-4f Storage and Treatment of Released Materials [40 CFR 264.56(g)]

Immediately after an emergency, the Emergency Coordinator will make arrangements for the treatment, storage, or disposal of recovered wastes or any other contaminated materials. The treatment, storage, or disposal of recovered wastes and contaminated materials will be conducted in accordance with applicable regulations governing the management of these materials.

The Emergency Coordinator will determine the regulatory status of the released substance and associated spill cleanup materials. This determination will be made according to the following guidelines:

- If the material is from a spill of a listed hazardous waste, then the cleanup materials, spill residues, and other contaminated materials must be managed as hazardous wastes.

- If the material is from a spill of a commercial chemical product that is listed under RCRA or Act 64, then the cleanup materials, spill residues, and other contaminated materials must be managed as hazardous wastes.

- If the material is from a spill of a waste that possesses hazardous waste characteristics, then the cleanup materials, spill residues, and other contaminated materials must be managed as hazardous wastes *if these materials also possess the hazardous waste characteristics as defined under RCRA and Act 64* (i.e. corrosivity, toxicity, ignitability, and reactivity). Analytical testing may have to be undertaken in order to make this determination

G-4g Incompatible Wastes [40 CFR 264.56(h)(1)]

The Emergency Coordinator will ensure that no wastes which may be incompatible with the released materials are treated, stored, or disposed of until cleanup procedures are completed.

G-4h Post-Emergency Equipment Maintenance [40 CFR 264.56(h)(2)]

After an emergency event, all emergency equipment listed in Section G-5 will be replaced or cleaned so that it is fit for use. Before operations are resumed, an inspection of all safety equipment will be conducted as discussed in Section F-2. The U.S. EPA Regional Administrator, the MDNR, and local authorities will be notified by the Emergency Coordinator that post-emergency equipment maintenance has been performed and operations at the facility will be resumed.

G-4i Container Spills and Leakage [40 CFR 264.171]

Refer to Section G-4d for a detailed description of the emergency response procedures for container spills and leakage. If a container holding hazardous waste is not in good condition or it begins to leak, the hazardous waste from this container will be transferred to a container in good condition. An entire leaking 55-gallon drum may also be placed within a larger recovery drum.

G-4j Tank Spills and Leakage [40 CFR 264.194(c)]

Refer to Section G-4d for a detailed description of emergency response procedures for tank spills and leakage. Any spill or leak from the treatment or storage tanks will be contained within the secondary containment structures that have been provided for each tank.

G-5 EMERGENCY EQUIPMENT [40 CFR 264.52(e) and 264.32]

G-5a Internal Communication [40 CFR 264.32(a)]

An internal alarm system and a voice communications system capable of providing immediate emergency signals to facility personnel are available on the site. The facility is equipped with emergency alarm actuator buttons that provide, when depressed, an alarm signal which is audible throughout the plant. The locations of the alarm actuators are indicated in Table G.2.

Internal voice communication is provided by means of the plant telephone system. Telephones are located in the office area, the maintenance garage, the compressor room, Building A, and the control room. The container storage facility is also equipped with a telephone.

G-5b External Communication [40 CFR 264.32(b)]

External communication is also provided through the plant telephone system (as described in Section G-5a above).

G-5c Access to Communication and Alarm Systems [(40 CFR 265.34)]

All facility personnel involved in any transfer operations have immediate access to the internal alarm system actuator buttons and telephone system. The alarm actuator buttons and telephones are located, as previously described, in areas where personnel would be working during these operations. These alarm actuator buttons and telephones are always accessible since any walkway to them, and the area surrounding them, are maintained free and clear of any obstructions.

In the unlikely event that there is just one employee on the premises when the facility is in operation, this employee will have immediate access to the telephones which are equipped with outside lines.

Table G.2
Emergency Equipment [40 CFR 264.52(e)]

Item	Location
Alarm Actuators	
1	Office area
2	Maintenance garage - west wall
3	Containment wall - S.E. corner
4	Top of primary treatment tanks
5	Bottom of primary treatment tanks
6	Unloading pad
7	Inside Building 2
8	Inside Building 2
9	Inside Building B
10	Inside control room - near door
(11)	Proposed container storage facility
Telephones	Throughout the plant for external and internal communication
Fire Extinguishers	
1	Office, south wall
2	Maintenance garage, office door
3	Maintenance garage, west door
4	Maintenance garage, east door
5	Compressor room, north wall
6	Building 2, near Tank #8
7	Building 2, outside of building
8	Building 2, near Tank #7
9	Fuel tank
(10)	Proposed container storage facility
Water Supply for Fire Control	
1" valve	Maintenance garage at office door
1" valve	Maintenance garage, east wall
1" valve	Maintenance garage, east door
1" valve	Compressor room, east door
1" valve	Compressor room, south wall
3" valve	Compressor room, south wall
3" valve	Maintenance garage, west wall
3" valve	Containment area, east wall

G-5d Emergency Equipment

Portable fire extinguishers are located throughout the facility. Each fire extinguisher is classified for Class A, B and C fires, has a capacity of 20 pounds, and is multipurpose for dry chemical uses. Their locations at the facility are illustrated in Figure G.2 and are summarized in Table G.2.

Portable spill control equipment and materials include:

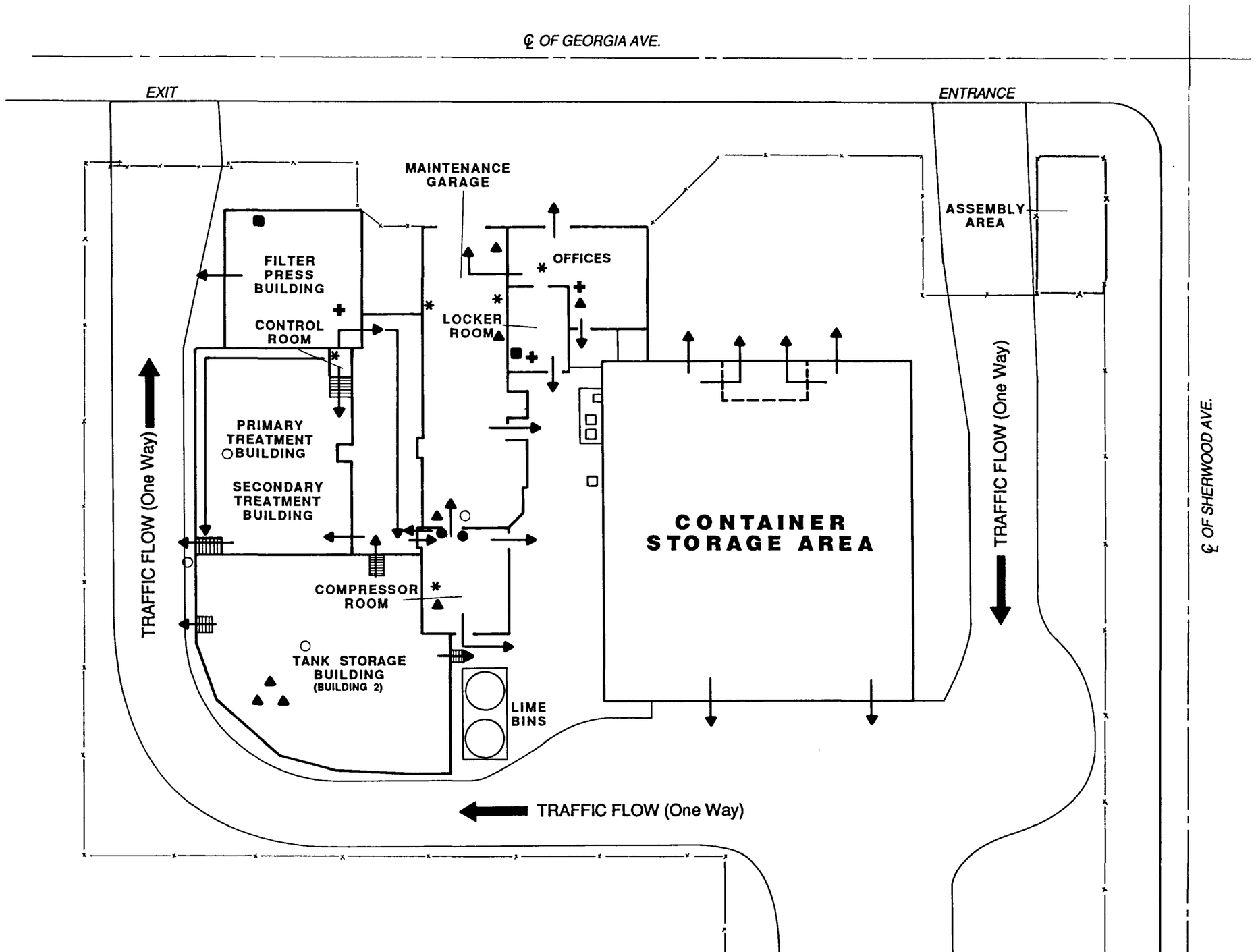
- A three-quarter yard front-end loader for use in deploying soda ash and in spill cleanup, stored in the facility parking area on the east side of the plant;
- A freight box containing soda ash bags, located in the southwest corner of the plant area; and
- Portable gasoline powered pumps, having a capacity of 350 gallons per minute (gpm) each, and related portable hosing, located in the maintenance building.

Decontamination equipment and personal safety equipment are provided at the facility as follows: emergency showers and eyewash fountains located at the north wall of the compressor room, at the south side of the scrubber within Building A, and in the primary treatment area, and two Scott Air Packs, containing a 30 minute air supply located on the north wall of the compressor room.

The container storage facility has a spill control cart which is kept in the mechanical room and is available to respond to spills of various characteristics within the facility. The spill cart contains inert absorbent materials, spark-proof shovel, containment materials, and empty containers for spill residues, plus appropriate personal protective equipment. A portable pump is also available to remove spills from the containment sumps.

G-5e Water for Fire Control [40 CFR 264.32(d)]

Water is provided to the facility from the City of Detroit water supply mains, and enters the facility at a pressure of 50-60 psi. Water supply is available within the plant at the locations indicated in Table G.2. Water hoses are available at the facility and are accessible for immediate use. The hoses are stored in the maintenance garage when not in use.



LEGEND

- ● Scott Air Packs
- ○ Eyewash Shower
- △ Fire Extinguisher
- ■ Personal Protection Equipment
- □ Spill Response Equipment and Material
- * Telephones
- ✚ First Aid Kit
- ← Evacuation Routes

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0 10 20 40

Scale in Feet

Figure G.2

Location of the Emergency Equipment and Evacuation Routes

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Detroit, Michigan

September, 1988

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The container storage facility is equipped with an automatic, wet-type, closed head sprinkler system that is supplied by an eight-inch water main with water pressure less than 60 psi. Capacity is 0.30 gpm/sf plus an allowance of 750 gpm for fire department streams. A flow switch and electric alarm bell are located on the building's exterior.

G-5f Aisle Space Requirements [40 CFR 264.35]

Access into the facility and movement within the facility is maintained free and clear of obstructions in order to allow movement of personnel, fire protection equipment, and spill control and decontamination equipment within the plant. Aisles and walkways between tanks and equipment in both the storage and process areas are maintained free and clear of obstructions in order to provide unobstructed movement of personnel and portable emergency equipment within these areas.

G-5g Emergency Equipment Inspection and Maintenance

All facility alarm systems, fire protection equipment, spill control equipment, and decontamination equipment are inspected, tested, and maintained on a regular basis to ensure proper operation during an emergency. (Section F provides more detail regarding inspection schedules and procedure).

G-6 COORDINATION AGREEMENTS [40 CFR 264.52(c) and 264.37]

Copies of the Contingency Plan have been submitted to the various local emergency response agencies. These agencies were asked to review and comment on the plan. The spill cleanup contractors have been provided with copies of the facility drawing and any available material safety data sheets on each material handled at the facility.

This information has been provided to emergency response agencies in order to familiarize them with the facility layout, the properties of the hazardous waste handled, location of working areas, access routes into and within the facility, possible evacuation routes from the facility, and types of injury or illness which could result from releases of material at the facility.

This information has been submitted to:

Captain Ameer Aazaad
Detroit Fire Department
Fire Marshall Division
250 West Larned Street
Detroit, MI 48226

Mr. Elmer Ligner
Michigan Pumping Service
2619 Superior
Trenton, MI 48183

Mr. Dave Lobbestael
Great Lakes Environmental
22077 Mound Road
Warren, MI 48090-1208

The local hospital and clinic have been contacted to familiarize each with the properties of hazardous waste and other materials which are handled at Dynecol. Material safety data sheets, outlining the potential hazards of these materials, have been submitted to:

Mr. Bill Sherman, Manager
Holy Cross Hospital
4777 East Outer Drive
Detroit, MI 48234

Mr. Horace Lindsay
Maybury Medical Clinic
8830 W. McNichols
Detroit, MI 48221

Documentation that these organizations have received copies of this Contingency Plan can be found in Appendix G.1.

G-7 EVACUATION PLAN [40 CFR 264.52(f)]

The Emergency Coordinator is responsible for determining which emergency situations require plant evacuation. An audio alarm will be used as the warning system to notify plant personnel as to the nature of the emergency and recommended plan of action.

An internal alarm system consisting of emergency alarm actuator buttons located at various areas in the plant provides an alarm signal which is audible throughout the plant. All employees are trained in knowing the locations of these alarm actuator buttons and how to use them in an emergency.

In the event that all reasonable measures fail to control the emergency or if human health or the environment outside of the facility is threatened, the Emergency Coordinator will:

- Commence the signal for plant evacuation and notify employees, contractors, and visitors to evacuate the facility through any of three exits determined to be safe at

the time of the emergency (see Figure G.2 for evacuation routes and designated assembly areas);

- Immediately open the gates and direct that no further entry of visitors, contractors, or trucks be permitted. All vehicle traffic movement within the facility will cease in order to allow the access of emergency equipment;

- Allow any persons to remain or re-enter the facility unless specifically authorized by the Emergency Coordinator. The Emergency Coordinator will then direct and assume responsibility for those persons remaining or re-entering the facility;

- Maintain communication with evacuated supervisors to determine if all employees, contractors, and visitors are present and accounted for in the designated assembly areas. Supervisors will begin to prepare a list of employees present in the assembly areas and those individuals that should be but are not. Accounting for the presence of visitors will be the responsibility of the employees they are seeing and contractors will be the responsibility of those personnel supervising the individual contracts. Truck drivers will be the responsibility of the supervisor where the truck is loading or unloading.

- Receive the final tally of persons not accounted for in the evacuation assembly areas. No attempt will be made to locate persons not accounted for unless it can be done without endangering others and the search has been directed by the Emergency Coordinator.

- Determine whether evacuation of the areas surrounding the facility should be initiated. Local emergency response agencies will be immediately contacted, and the Emergency Coordinator will assist these agencies if it is determined to be necessary to initiate evacuation.

- Give a signal or other notification to indicate that the facility is safe and cleared for re-entry.

G-8 REQUIRED REPORTS [40 CFR 264.56(i) and (j)]

In the event of an emergency situation that requires implementation of the contingency plan, the Emergency Coordinator must make the following notifications:

- Record in the facility's operating record the time, date, and description of any incident that requires the implementation of this plan.

- Notify the EPA Regional Administration and the MDNR Director that the facility has complied with the following provisions:

  - No waste that may be incompatible with the released material has been (or will be) stored, treated or disposed of until cleanup procedures have been completed.

  - All emergency equipment listed in this plan has been (or will be) cleaned and fit for its intended use prior to resumption of operations.

- Within 15 days after the incident, submit a written report to:

  - USEPA - Region V
    230 S. Dearborn Street
    Chicago, IL 60604

  - Director
    Michigan Department of Natural Resources
    Box 30028
    Lansing, MI 48909

  This report must include the following information:

  - Name, address, telephone number of the facility and the owner or operator;
  - Date, time, type of incident;
  - Type and quantity of materials involved;
  - Extent of injuries, if any;
  - Assessment of actual or potential hazards to human health or the environment; and
  - Estimated quantity and disposition of recovered material that resulted from the incident.

G-9 AMENDMENT OF THE CONTINGENCY PLAN [40 CFR 264.54]

This Contingency Plan will be reviewed and amended whenever:

- The facility permit is revised;
- Applicable regulations are revised;
- The plan fails in an emergency;

- The facility changes in design, construction, operation, maintenance or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in any emergency;
- The list of emergency coordinators changes; or
- The list of emergency equipment changes.

SECTION H

PERSONNEL TRAINING

The information contained in this section outlines the personnel training program for Dynecol's hazardous waste treatment and storage facility in accordance with the requirements of Michigan Act 64, Rule 299.9504(12) which incorporates 40 CFR 270.14(b)(12) and 264.16 by reference.

H-1 OUTLINE OF TRAINING PROGRAM [40 CFR 264.16(a)(1)]

Training is provided to Dynecol personnel in order to teach them to perform their duties in a way that ensures that:

- proper operational, maintenance and inspection procedures are routinely implemented to minimize the possibility of a release of hazardous waste or hazardous waste constituents which would threaten human health or the environment; and

- facility personnel are familiar with the provisions of the Contingency Plan/Emergency Procedures, and are able to respond efficiently in the event of an emergency to minimize hazards to human health or the environment.

The introductory and continuing training programs are directed by a person trained in hazardous waste management procedures, who is familiar with the facility, its operations, and the emergency procedures and equipment described in both the Preparedness and Prevention Plan (Section F) and the Contingency Plan (Section G). Table H.1 provides an outline of the hazardous waste management training program for Dynecol, Inc. The training program is designed to ensure that personnel safely handle hazardous wastes and that appropriate procedures are followed in an emergency involving hazardous wastes. This training will take place as a continuously updated version of the introductory version that is provided to each new, temporary, or re-assigned employee.

H-1a Job Titles and Job Descriptions [40 CFR 264.16(d)(1) and 264.16(d)(2)]

Table H.2 provides a summary of the job titles and job descriptions of those positions at Dynecol that involve any aspect of hazardous waste management at the facility.

H-1b Training Content, Frequency, and Technique [40 CFR 264.16(c) and (d)(3)]

The training program consists of instruction in the provisions of both the Preparedness and Prevention Plan (Section F) and the Contingency Plan (Section G). Instruction is supplemented with an employee manual outlining the written Preparedness and Prevention Plan and Contingency Plan.

During the training program, employees are instructed on the hazardous nature of chemicals and chemical wastes in general; the purpose of RCRA and Michigan Act 64 and the importance of maintaining compliance with the hazardous waste regulations; the proper and safe handling and storage procedures for wastes; and emergency response procedures.

Table H.1

Outline of
Hazardous Waste Management Training Program
for Dynecol, Inc.

1. Safety and Health
   a. Health Protection
   b. Safety Procedures

2. Emergency Response
   a. Emergency Evacuation and Emergency Control Program
   b. Contingency Plan
      i) Emergency coordinator
      ii) Emergency procedures
      iii) Emergency communications/phone numbers and alarms
      iv) Location, maintenance, inspections and use of emergency equipment
      v) Waste feed cut-off systems
      vi) Spill response
      vii) Fires and explosions

3. RCRA Standards for Hazardous Waste Management
   a. Introduction to RCRA and Michigan Act 64
   b. Manifesting Requirements
   c. Recordkeeping and Reporting

4. Hazardous Waste Identification
   a. General Properties of Hazardous Wastes
   b. Hazardous Wastes Treated and Stored at Dynecol

5. Storage of Hazardous Waste
   a. Use and Management of Drums
   b. Use and Management of Tanks

6. Treatment of Hazardous Wastes
   a. Primary Treatment
   b. Secondary Treatment

7. Waste Disposal Procedures
   a. Manifest System
   b. Other Records

8. Inspection
   a. General Inspection Requirements
   b. Container Inspection
   c. Tank Inspection
   d. Inspection Logs

9. Analytical Procedures
   a. Representative Sampling Method
   b. EP Toxicity Test
   c. Chemical Analysis Test Method

Table H.2
Waste Management Job Titles and
Description of Waste Management Responsibilities

1. Job Title President

Description of Waste Management responsibilities:

General Manager of the facility and transportation operations; assures compliance with all permits and regulations; manages employees and assets commensurate with financial, legal, social, and environmental business objectives.

2. Job Title Operations Manager

Description of Waste Management Responsibilities:

Assures compliance with all transport regulations; provides financial, administrative and personnel supervision of the business; maintains liaison with customers, suppliers, and regulators; manages transport, people and assets consistent with business objectives.

3. Job Title Plant Manager

Description of Waste Management Responsibilities:

Supervises all aspects of treatment of wastes and subsequent disposal, establishing methods, procedures and controls to assure compliance with applicable regulations and permits; maintains treatment facility in sound working order. Reports to President.

4. Job Title Transportation Manager

Description of Waste Management Responsibilities:

Schedules and supervises transport activities to meet business and customer requirements in a safe and timely manner. Assures compliance with applicable regulations and permits. Reports to Operations Manager.

5. Job Title Chief Operator

Description of Waste Management Responsibilities:

Performs or directs routine plant treatment operations according to established procedures and standards; advises Plant Manager of any non-conforming situations; conducts regular equipment inspections and performs required repairs to maintain plant reliability. Reports to Plant Manager.

A walking tour of the facility, as part of the training program, identifies the location of all emergency equipment and structures available on the site which are specified in the Preparedness and Prevention Plan.

The proper use and inspection of the Scott Air Packs and the numerous fire extinguishers located throughout the facility are demonstrated at this time. Physical and health hazards of chemicals handled at the facility are addressed. Established procedures for the safe handling and use of the chemicals found at the facility are emphasized. On-the-job training is received by all personnel concerning activities appropriate to each job description.

Facility personnel will have completed their training within six months after the date of employment or assignment at the facility. New employees having hazardous waste management responsibilities will be supervised carefully until they have completed the training program. Review of the established training program will be provided annually to all employees. Review may be more frequent if additional equipment or procedures are instituted prior to annual review.

Training records on current personnel are maintained at the facility until facility closure. Training records on former employees are kept for three (3) years from the date the employee last worked at the facility.

H-1c Training Director [40 CFR 264.16(a)(2)]

The hazardous waste training program at Dynecol is directed by Mr. Tien Pham, Plant Manager. Mr. Pham is very knowledgeable about the facility's operations and is familiar with the hazardous waste management regulations. More specifically, Mr. Pham has a B.S. degree and an M.S. degree in chemical engineering, at least three years experience in plant operations, and has attended various training seminars on hazardous waste management regulation and personnel supervision.

H-1d Relevance of Training to Job Position [40 CFR 264.16(a)(2)]

The hazardous waste training program is tailored to the specific job responsibilities of Dynecol personnel. While all personnel involved in hazardous waste management are informed about the general requirements for proper waste management at the facility, such as the prevention of and response to spills, only those personnel directly involved in certain aspects of waste management are specifically trained in the details of certain tasks. For example, the operators of the waste treatment processes are instructed on the maintenance of safe operating procedures for the treatment tanks while personnel in the container storage facility focus more on safe drum handling procedures. On-the-job

training further emphasizes the relationship of the job position to the content, details, and relevance of the training on hazardous waste management.

H-1e Training for Emergency Response [40 CFR 264.16(a)(3)]

The training program covers both normal, everyday operating procedures plus emergency response procedures to be initiated in the event of a potential or actual spill, release, fire , or explosion that endangers public health or the environment. The training program ensures that Dynecol personnel not only manage hazardous waste in a safe manner every day, but also can respond appropriately to an emergency situation at the facility. Those training elements of the program that address non-routine and emergency situations (such as unscheduled shut-downs and start-ups related to storms, power outages, fires, explosions, and spills) include:

- Use of personal protective equipment;
- Procedures for locating, using, inspecting, repairing, and replacing facility emergency and monitoring equipment;
- Key parameters for the automatic waste feed cut-off systems;
- Response procedures for fires and explosions;
- Response procedures for spills;
- Shut-down of operations and power failure procedures; and
- Procedures for plant evacuation and the evacuation of nearby areas.

H-2 IMPLEMENTATION OF TRAINING PROGRAM [40 CFR 264.16(b) AND 264.16(d)(4)]

No employee that has been hired to work at Dynecol will work in an unsupervised position until that employee has received training on hazardous waste management procedures relevant to the job position held by that employee. All new employees will be trained in these procedures within six months of their employment or assignment to the position. Employees are required to review the training program on an annual basis, and sometimes more frequently whenever changes in the regulations or in the plant's operations take place that warrant a more frequent update.

Records documenting this training is maintained for each employee with the name of the employee, job title, job description, date of employment or job assignment, date of training, name and title of instructor, and signatures of instructor and employee contained on a form (see Table H.3) for the record. These records are kept in the facility's office and will be kept until closure of the facility for current employees and for three years from the termination date for former employees.

Table H.3

Employee Waste Management Training Record

Name of Employee: _____

Job Title: _____

Job Description: _____

Date of Employment or Job Assignment: _____

Date of Training Program: _____

Type of training (circle one): Initial Presentation or Annual Review

Name of Instructor: _____

Title of Instructor: _____

Signature of Instructor: _____Date:_____

Employee Certification:

I have received a copy of the Preparedness and Prevention Plan and the Contingency Plan/Emergency Procedures, and I am familiar with the provisions of these documents.

Employee Signature: _____

Date: _____

SECTION I

CLOSURE PLAN, POST-CLOSURE PLAN, AND FINANCIAL REQUIREMENTS

This section is submitted in accordance with the requirements of Michigan Act 64, Section 299.9702(12) which aincorporates 40 CFR 270.14(b)(13-18), 264.110 through 120, 264.178 and 264.197 by reference. This plan identifies all steps necessary to completely close the Dynecol hazardous waste treatment and storage areas at the end of their intended operating life. A post-closure plan is not required because this is not a disposal facility, and all wastes will be removed at closure.

Dynecol will maintain an on-site copy of the approved closure plan and all revisions of the plan until the certification of closure completeness has been submitted and accepted by the MDNR. Dynecol will notify the Director at least 45 days prior to the date partial or final closure is expected to begin. Upon completion of closure, Dynecol will submit to the Director a certification by both Dynecol and an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan as required by 40 CFR 264.115.

I-1 CLOSURE PLAN

I-1a Closure Performance Standard [40 CFR 264.111]

This closure plan for the Dynecol facility has been designed to ensure that the facility will not require further maintenance and controls; that threats to human health and the environment will be minimized or eliminated; and that the escape of hazardous wastes, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground waters, surface waters, or atmosphere will be avoided. The provisions of 40 CFR 264.111 are adopted by reference in Michigan's Act 64, Rule 299.9613.

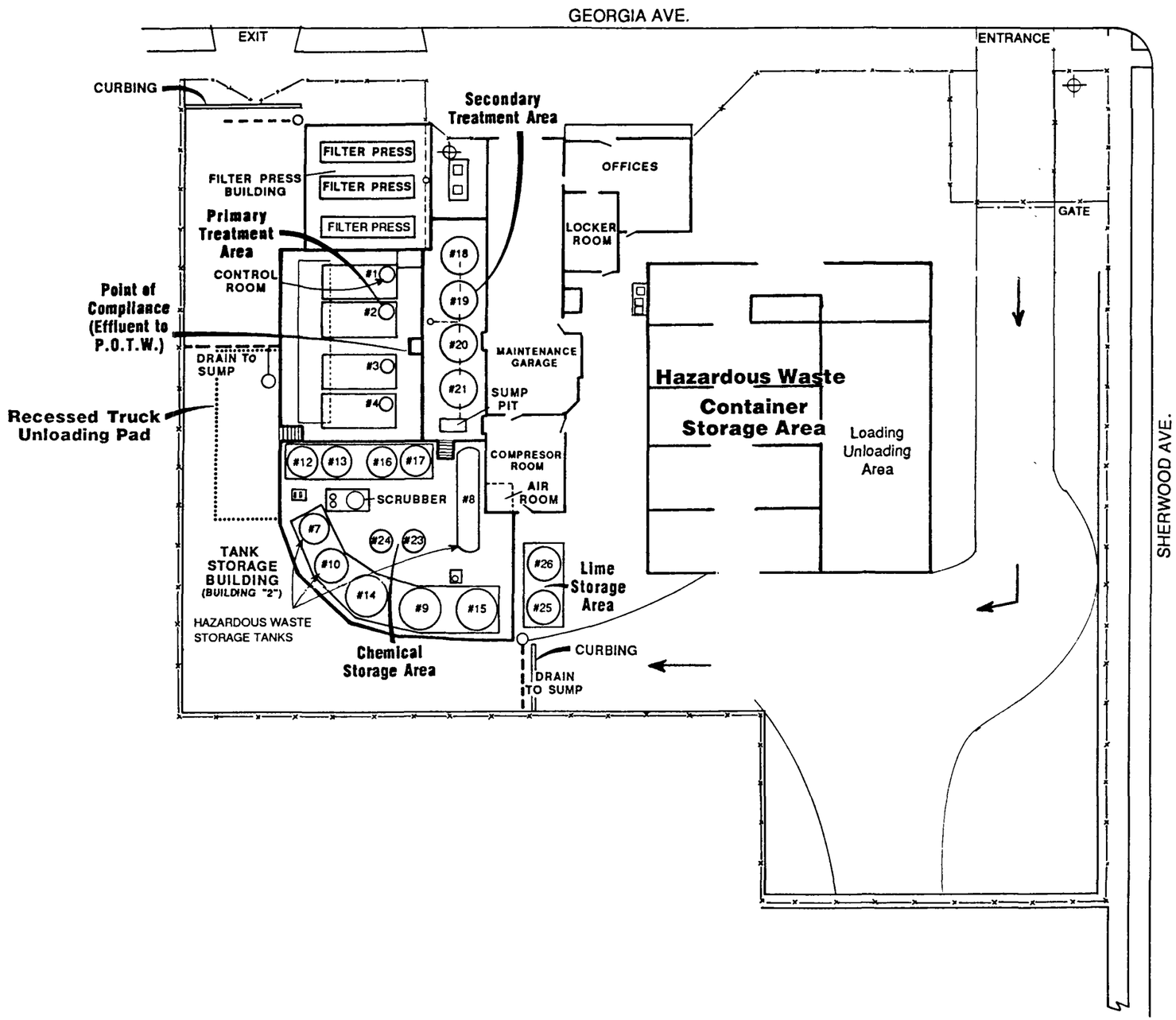
I-1b Partial and Final Closure Activities [40 CFR 264.111(b)(1) and (2)]

No final closure activities are planned at this time. When final closure is initiated, it will follow the procedures outlined in this closure plan which can be implemented at any point during the facility's active life.

I-1c Maximum Waste Inventory [40 CFR 264.111(b)(3)]

Dynecol, Inc. is located at 6520 Georgia Street in Detroit, Michigan. Dynecol operates a treatment facility for corrosive and metal-bearing wastes. Dynecol has expanded its operations from existing tank storage and treatment to include a facility designed for storing containers of various hazardous wastes. These containerized hazardous wastes are stored here until they can be transported off-site for treatment or disposal or treated on-site. Figure I-1 is a site map of the facility. The facility consists of the following waste management components:

- Bulk tanker unloading area with spill collection and containment structures;
- Four primary treatment vessels (20,000 gallons each) with a concrete containment area which provides secondary containment.
- Four secondary treatment vessels (20,000 gallons each) located within a building having concrete secondary containment;
- Three hazardous waste storage tanks located within a building having concrete secondary containment; the combined storage capacity of these three tanks is 34,000 gallons.
- Three filter presses located within a building which has a drainage system to a secondary containment area; and



LEGEND

⊕ Background Boring

N

0 20 40 80

Scale in Feet

Figure I.1

Background Boring Locations

Dynecol, Inc.
Detroit, Michigan

November, 1989 20878

- An enclosed container storage facility with the storage capacity for 46,000 gallons for hazardous wastes (equivalent to 836, 55-gallon drums) in eight separate storage bays with secondary containment.

The maximum inventory of hazardous wastes was determined by assuming that all regulated hazardous waste and storage tanks would be filled to capacity with the liquid wastes typically processed at Dynecol. It was also assumed that the container storage area would contain its maximum capacity of hazardous waste. Treatment will have been accomplished for all liquid hazardous waste in the treatment facility inventory. For purposes of closure it is assumed that 20 cubic yards of hazardous waste residual must be disposed of for each filter press. The maximum waste inventory is provided in Table I.1.

Table I-1
Maximum Waste Inventory

Source	Quantity	Units
Primary treatment	60,000*	gallons
Secondary treatment	33,000**	gallons
Treatment residual	240	cubic yards
Storage Tanks	34,000	gallons
Container Storage Area	46,000	gallons

---

* *Primary tanks are assumed to be 75% filled. The remainder of the tank volume is required for chemical reagent addition.*

** *Secondary tanks are considered full at 8,250 gallons. The remainder of the tank volume is reserved for chemical reagent addition.*

I-1d Inventory Removal, Disposal, and Decontamination of Equipment [40 CFR 264.112(b)(4)]

I-1d(i) Treatment and Storage Tank and Filter Press Areas

All hazardous wastes and hazardous waste residues will be removed from the treatment tanks, storage tanks, filter presses and containment structures at the time of closure. The following actions will be taken to ensure clean closure of the hazardous waste treatment and storage tank areas:

- All hazardous waste remaining in the treatment or storage tanks will be pumped through the treatment process for neutralization by plant personnel. Treated waters will be discharged to the Detroit Water and Sewerage system. The sludge remaining in the tanks, estimated to be not more than 60 cubic yards, will be

dewatered on site and shipped by a licensed hazardous waste transporter to a licensed hazardous waste facility for disposal.

- All treatment tanks (with the exception of one treatment tank reserved for neutralization during closure), storage tanks, filter presses, related pumps and piping, and all containment structures will be triple-rinsed with either a hot water pressure wash or high pressure water.

- All rinse water generated during tank and equipment decontamination will be collected and neutralized in the treatment tank reserved for neutralization during closure. Any sludge generated during rinse water neutralization will be dewatered on-site and then shipped off-site by a licensed hazardous waste transporter to a licensed hazardous waste facility. After sludge dewatering, the filter presses will be decontaminated and the rinse water will be pumped out and shipped off-site by a licensed hazardous waste transporter to an approved treatment facility.

- After all hazardous wastes and rinse waters have been neutralized, the treatment tank reserved for neutralization during closure and related piping and pumps will be triple-rinsed with either a hot water pressure wash or high pressure water. The rinse water will be pumped out and shipped off-site by a licensed hazardous waste transporter to an approved treatment facility.

- Once the treatment tanks, storage tanks, filter presses, and associated equipment are removed, a limited sampling program will be initiated. Since the hazardous waste tanks and filter presses were contained within concrete containment structures and because there is no exposed soil in the area, the sampling will be limited to the containment areas. Concrete cores and underlying soil samples will be taken at any major low spot in the floor. Additionally, if there are any visible cracks in the concrete containment area, these areas would be cored and sampled.

- The concrete will be cored using a six-inch diameter drill according to ASTM-C-42. The concrete will be pulverized and packed into plastic containers. The soil samples will be obtained with a hand auger from a depth of one foot, using the procedures outlined in ASTM D1452-80, "Standard Practice for Soil Investigation and Sampling by Auger Borings". The soil and concrete samples will be analyzed for the parameters listed in Table I.2, based on the types of wastes that were treated and stored in these areas. In accordance with MDNR's October 14, 1987 guidance document entitled "Closure of Tank and Container Storage Areas", the samples will be analyzed first for total metals. If a total metals level is greater

than 20 times its EP toxicity level, the metals in question will be analyzed for EP toxicity.

- The hand auger and drilling equipment will be steam cleaned between sample locations to prevent cross contamination. All rinse water will be collected and placed in drums. A sample of the rinse water will then be analyzed for the parameters listed in Table I.2. The rinse water will be disposed of in accordance with the test results.

- Background samples will be collected from a depth of 1 foot from two areas that are not expected to be affected by the activities associated with hazardous waste treatment and storage areas (see Figure I-1). These samples will be obtained in accordance with MDNR's "How Clean Is Clean?" guidelines. After background levels have been established, the results of the containment area sampling will be compared to background. If the soil samples do not show concentrations which are statistically in excess of background, it will be assumed that no release of hazardous wastes has occurred.

- In the unlikely event that contamination is found at any of the sample locations, excavation will be initiated. A circle with a radius of up to five feet and a depth of two feet will be excavated around each contaminated sample point. This will ensure that any potentially contaminated soil below the original sampling depth will also be removed. Because the sample points are located inside a building, excavation may be restricted by the physical limitations imposed by the foundation of the building.

- After the initial excavation is completed, the contaminated sample locations will be resampled to verify that the area is free of contamination. If any of the samples exceed background, the excavation procedures will be repeated at 0.5-foot intervals until clean closure is documented.

- Excavated soil will be disposed of at a licensed hazardous waste facility or a licensed Type II landfill or placed back into the excavation, depending on the results of the chemical analysis.

I-1d(ii) Container Storage Area

The container storage area was designed and constructed for the sole purpose of storing hazardous wastes. It is designed to contain any spills that may occur without adversely impacting the environment. The container storage area contains eight isolation bays which have poured concrete floors with blind sumps in each bay. Each bay also has chemical-resistant coating and has the required containment capacity of 10 percent of the

TABLE I.2

CONCRETE, SOIL, AND RINSE WATER PARAMETERS

Parameter	Test Method	Reference Number*
Sample Preparation Method		
Extraction procedure (EP) toxicity and structural integrity test		SW 846-1310
pH	9040	SW 846
Sulfide or cyanide-bearing	Section 7.3**	SW 846**
Reaction with acid	-	-
Arsenic	AA, Gaseous Hydride	SW 846-7061
Barium	AA, Direct Aspiration	SW 846-7080
Cadmium	AA, Direct Aspiration	SW 846-7130
Chromium, total	AA, Direct Aspiration	SW 846-7190
Chromium, hex.	AA, Direct Aspiration	SW 846-7196
Copper	AA, Direct Aspiration	SW 846-7120
Lead	AA, Direct Aspiration	SW 846-7420
Mercury	Manual Cold-Vapor Technique	SW 846-7470
Selenium	AA, Gaseous Hydride	SW 846-7741
Silver	AA, Direct Aspiration	SW 846-7760
Zinc	AA, Direct Aspiration	SW 846-7950

* SW-846, EPA "Test Methods for Evaluation of Solid Wastes - Physical/Chemical Methods". 1984.

** Note: If sulfide and / or cyanide concentration is greater than 10 ppm, EPA's "Toxic Gas Generation Reactivity Test for Total Available Cyanide and Sulfide" will be run. If free cyanide > 250 ppm or free sulfide > 500 ppm, then the sample will be considered reactive.

maximum total quantity of hazardous waste that can be stored in the bay. The two loading docks are located under a roof and have the necessary containment for spills and leaks. The isolation bays are located within a metal insulated building which is constructed of double panel walls and a built-up roof. The building also has fan-powered ventilation and is heated during the winter.

The container storage area was carefully designed and constructed to ensure that any releases will be properly contained. If a spill should occur during the operational life of the storage area, the spill response procedures outlined in the contingency plan (Section G) will be followed. Therefore, there is no reason to expect that the containment area will be contaminated at the time of closure or to sample the concrete floor or underlying soil. At the time of closure, documentation relating to the condition of the concrete floor will be provided.

The following steps will be taken to ensure the clean closure of the container storage area:

- All hazardous wastes in the container storage area will be manifested and shipped by a licensed hazardous waste transporter to a licensed hazardous waste facility.
- The concrete pad and containment sumps will be triple-rinsed with either a hot water/pressure wash or high pressure water. The rinse water will be collected and placed into drums after each rinse.
- All rinse water will be discharged to the city sanitary sewer system provided that the rinse water meets the restrictions of the Detroit Water Sewer Department Discharge Limits. If the rinse water does not meet the restrictions, it will be shipped off site by a licensed hazardous waste transporter to an approved treatment facility.

I-1e Schedule for Closure [40 CFR 264.112(a)(4)

This facility does not have a definite final closure date, but the date of final closure is estimated to be the year 2009. Figure I.2 outlines the tasks to be accomplished for closure and provides an approximate schedule of final closure activities. Final closure of the treatment tanks, storage tanks, and container storage areas will take place concurrently.

Dynecol will amend this closure plan whenever changes in operating plans or facility design will affect the closure plan. If a permit modification is requested to authorize a change in operating plans or facility design, a modification to this closure plan will be made at the same time. If a permit modification is not needed to authorize the change, a

FIGURE I.2
SCHEDULE OF FINAL CLOSURE

Days	0	15	30	45	60	75	90	105	120	135	150	165	180
Final volume of waste received	X												
Treatment of the waste			X										
Disposal of sludge				X									
Decontamination of equipment and containment areas					X								
Disposal of rinse waters						X							
Soil Sampling and analyses								X					
Excavation and disposal of contaminated soil												X	
Closure certification													X

request for closure plan modification will be made within 60 days after the change in plans or design takes place.

I-1f Extension for Closure Time [40 CFR 264.113(a) and (b)]

Dynecol does not anticipate requiring an extension for closure time for the closure of the hazardous waste process and storage areas.

I-1g Closure Cost Estimate [40 CFR 270.14(b)(15) and 264.142]

Table I.3 outlines the cost of final closure for the treatment tank, storage tank, and container storage areas. Cost estimates are based upon current quotations from an experienced contractor. The estimated cost is based on the following assumptions:

- the treatment and storage tanks contain their maximum capacities;
- the container storage area contains its maximum capacity;
- all rinse water is assumed to be hazardous; and
- all excavated soil is assumed to be hazardous.

Cost estimates may be adjusted annually to account for inflation, dependent on the annual inflation index. The latest closure cost estimate will be kept at the facility. Cost estimates are based upon current quotations from an experienced contractor.

I-2 POST-CLOSURE PLAN [40 CFR 270.14(b)(13)]

Post-closure care will not be needed at this facility because Dynecol is not a disposal facility and all hazardous waste will be disposed of off-site.

I-3 POST-CLOSURE ESTIMATE [40 CFR 270.14(b)(16) and 264.144]

Dynecol will remove all hazardous waste from the site at the time of closure and will submit a clean closure certification report to the Michigan Department of Natural Resources. Therefore, no post-closure cost estimate is required.

I-4 CLEAN CLOSURE CERTIFICATION [40 CFR 265.115]

Within 60 days of completing final closure, a clean closure certification will be submitted to the Director of the MDNR by certified mail. This certification will state that the treatment and storage tank area and container storage area were closed in accordance with the specifications in the approved closure plan. The certification will be signed by a responsible corporate officer of the owner/operator [40 CFR 270.11] and by an independent registered professional engineer.

The following documentation will be included with the closure certification:

- Manifests or waste removal summaries for the hazardous waste inventory and rinse waters.
- A summary of any procedures that deviated from the approved closure plan.
- Field reports of closure activities including daily time table, weather conditions, and other relevant observations.
- Results of all analytical results used to certify clean closure (lab sheets, chain-of-custody records, QA/QC report, and summary tables).
- A copy of the approved closure plan and letter of closure approval.

Table I.3

**FINAL CLOSURE COST ESTIMATE
FOR TREATMENT AND STORAGE AREAS
AND CONTAINER STORAGE AREA**

Treatment and Storage Areas

1.	Treat 60,000 gallons of raw hazardous waste:		
	(primary tanks #1-4)	@ $0.20/gal	$12,000
	Sludge disposal:	8 loads @ 15 cu yds/load x $85/cu yd	10,200
	Sludge transport:	8 loads @$250/load	2,000
2.	Treat 33,000 gallons of pH adjusted waste:		
	(secondary tanks)	@ $0.15/gal	4,950
	Sludge disposal:	4 loads @ 15 cu yds/load x $85/cu yd	5,100
	Sludge transport:	4 loads @ $250/load	1,000
3.	Treat 34,000 gallons of raw hazardous waste: (3 storage tanks)	@ $0.35/gal	11,900
	Sludge disposal:	4 loads @ 15 cu yds/load x $85/cu yd	5,100
	Sludge transport:	4 loads @ $250/load	1,000
4.	Container Storage Area: loading, transport and disposal of 836, 55-gallon drums of hazardous waste.		
	Load	80 hrs @ $40/hr	3,200
	Transport	21 loads @ $250/load	5,250
	Disposal	836 drums @ $90/drum	75,240

Cleaning, Disposal, Sampling Costs

1.	Tank cleaning and disposal of rinse waters:		
	Labor:	80 hrs @ $60/hr	4,800
	Disposal of rinse water:	20,000 gallons @ $0.35/gal	7,000
2.	Decontamination of filter press floors/walls:	5,100 sq ft @ $0.65/sq ft	3,315
3.	Concrete coring and soil sampling (16 locations):		
	Coring:	16 hours @ $40/hr	640
	Soil sampling:	8 hrs @ $50/hr	400
	Analytical testing:	16 samples @ $200/ea	3,200
4.	Transport/dispose of contaminated soil:	16 yds @ $120/yd	1,920
5.	Decontamination of container storage area:		
	Eight bays:	4,800 sq ft @ $0.65/sq ft	3,120
	Two loading docks:	2,300 sq ft @ $0.65/sq ft	1,495
	Bulking/transfer area:	800 sq ft @ $0.65/sq ft	520

Certification of Closure

1.	Prepare clean closure certification report:	40 hrs @ $60/hr	2,400
2.	Certification by Professional Engineer:	16 hrs @ $70/hr	1,120
		Total Closure Cost:	$166,870

SECTION J

ENVIRONMENTAL ASSESSMENT

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SECTION J

ENVIRONMENTAL ASSESSMENT

This section addresses the environmental assessment requirement of Michigan Act 64, Rule 299.9504(1)(e). The environmental assessment, which includes a failure mode assessment, provides an analysis of the potential major methods by which safe handling of hazardous wastes may fail at Dynecol, Inc.

J-1 NEED FOR AND OBJECTIVE OF CONTAINER STORAGE FACILITY

Dynecol, Inc. is located at 6520 Georgia Street in Detroit, Michigan. The company has been in operation at this site since 1974. The objectives of the processes carried out at the Dynecol facility are to render aqueous solutions of inorganic chemical compounds non-hazardous or less hazardous; to stabilize the solids which result from these processes; and to dewater the stabilized solids in order to reduce the volume of waste ultimately disposed of. The treatment processes which are performed include chemical oxidation and reduction, neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, lime stabilization, dewatering and pressure filtration. These processes are controlled and monitored to ensure complete and adequate treatment of the hazardous wastes received at the facility.

The need for this type of disposal facility in this area is obvious. This region is heavily industrialized with steel production, steel finishing and surface coating (plating, painting, rustproofing, etc.) and metal working. The steel industry, automotive industry and numerous related manufacturing industries generate large quantities of the wastes processed at this facility. There are few facilities in this area properly designed to treat these types of materials. Facilities for recycling or processing of these materials will lead to reduced costs and lower the cost to industry at a time when local industry must be cost-efficient in order to compete in the world market.

Dynecol has transferred a part of their permitted tank storage capacity to a container storage facility. The objectives of the container storage facility are to act as a collection center and transfer station for a wide variety of hazardous wastes. These wastes are received from various sources including industries, schools, hospitals, and local governments, and are tested, sorted, and sent to other facilities for final disposal, recycling, or recovery. These wastes are not treated or permanently disposed of at the facility.

The need for this type of facility was created by the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act (RCRA), which regulates many generators of small quantities of hazardous wastes that were formerly unregulated. Such facilities may include schools, hospitals, laboratories, garages, industries, and other generators. Presently there are few facilities that can accept small quantities of a wide variety of hazardous wastes. There is a need for such a facility to provide economical and safe disposal for these generators of small quantities of hazardous wastes.

J-2 DESCRIPTION OF THE EXISTING ENVIRONMENT

The Dynecol facility is located at 6520 Georgia Street, Wayne County, Detroit, Michigan (T.1.S., R.12E, E 1/4 of SW 1/4 of Section 21). Figure J.1 shows the general location of the site, and Figure J.2 shows the area immediately surrounding the site.

J-2a Physiography

The site is in a flat area formerly occupied by the glacial Great Lakes. The subsoil consists of lacustrine clay and silt, with small areas of lacustrine sand and clay-rich till (Farrand and Bell, 1984).

J-2a(i) Topography

Figure J.2 illustrates the topography of the area. The elevation of the site is about 630 feet above sea level. There is little relief at or near the site, and there are no steep slopes in the area. The area is totally urbanized, and natural drainage courses no longer exist. There are no lakes or streams in the area, which is in a small coastal drainage basin that drains into the Detroit River. Major roads in the area are I-94 (the Edsel Ford Freeway), which is a half mile to the south, and M53 (VanDyke), which is half a mile to the east.

J-2a(ii) Geology

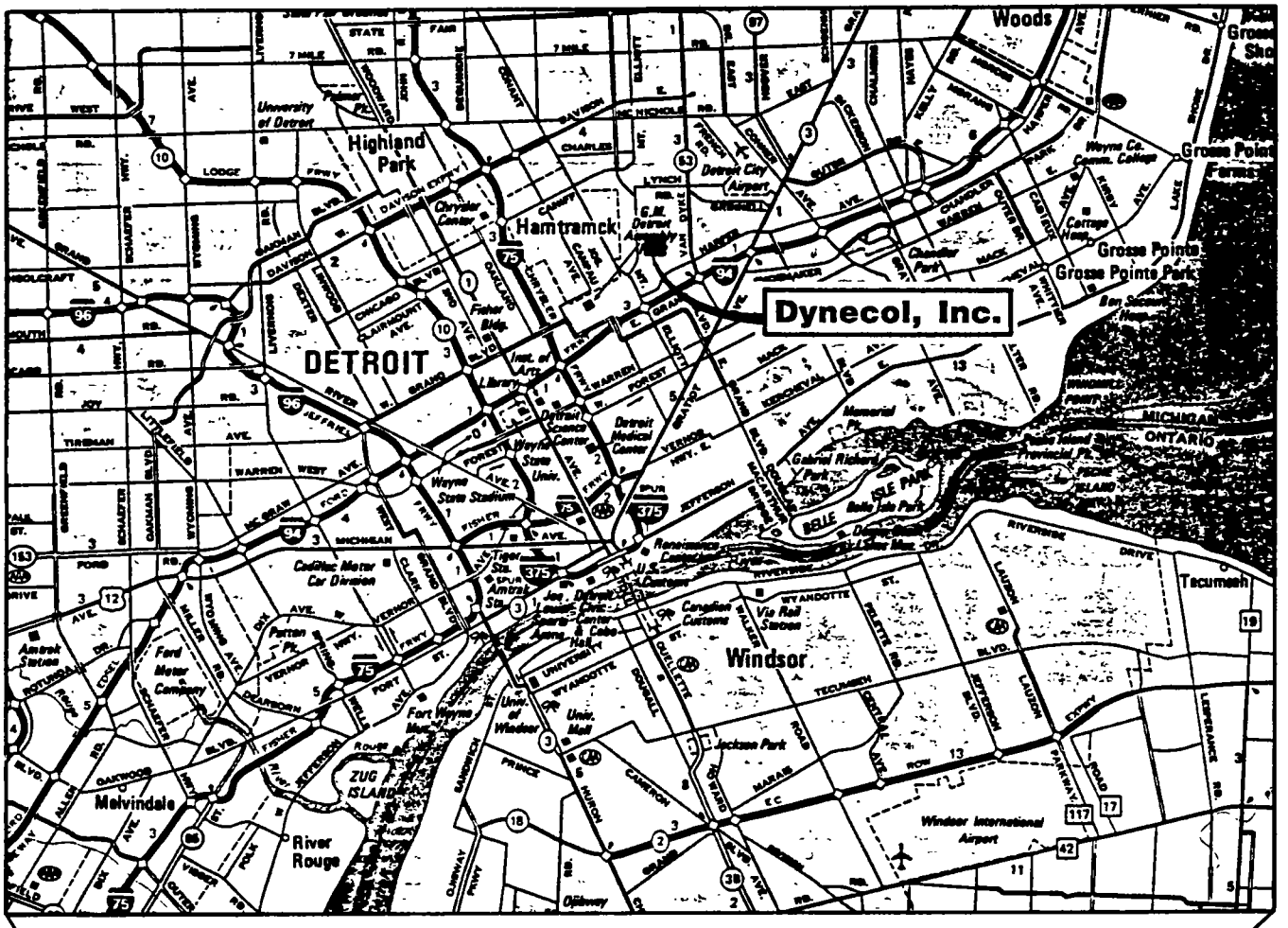
For a more detailed description of the geology of the site, see Ground Water Monitoring Systems (Section E).

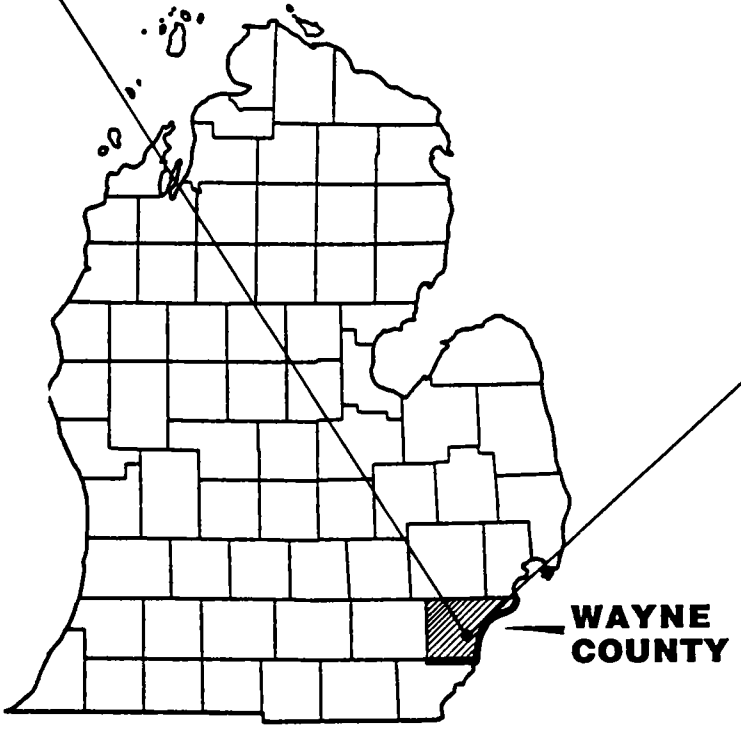
Bedrock Geology

The Paleozoic section present beneath northeastern Wayne County consists predominantly of Silurian and Devonian carbonates, evaporitic-carbonates, shales, and occasional sandstones. The bedrock surface beneath the site is comprised of carbonates and shales of the Devonian Traverse Group. These Paleozoic rocks dip gently toward the center of the basin (to the northwest) at an angle of generally less than one degree. The total thickness of these rocks is approximately 5,000 feet.

Glacial Geology

The glacial drift deposits present in the region range in thickness from 150-200 feet. The term "glacial drift" embraces all types of sediment deposited during the Pleistocene glacial epoch by ice, meltwater streams, glacial lakes, and wind. Dynecol's facility is underlain by predominantly lakebed (lacustrine) clay deposits and possibly some water reworked moraine material. Mazola (1969) shows mostly lacustrine clay for a one-mile radius around the Dynecol site, with occasional occurrences of (in descending order)





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0 1 2 3 4

Scale in Miles

Figures A.1, B.1, E.1, J.1

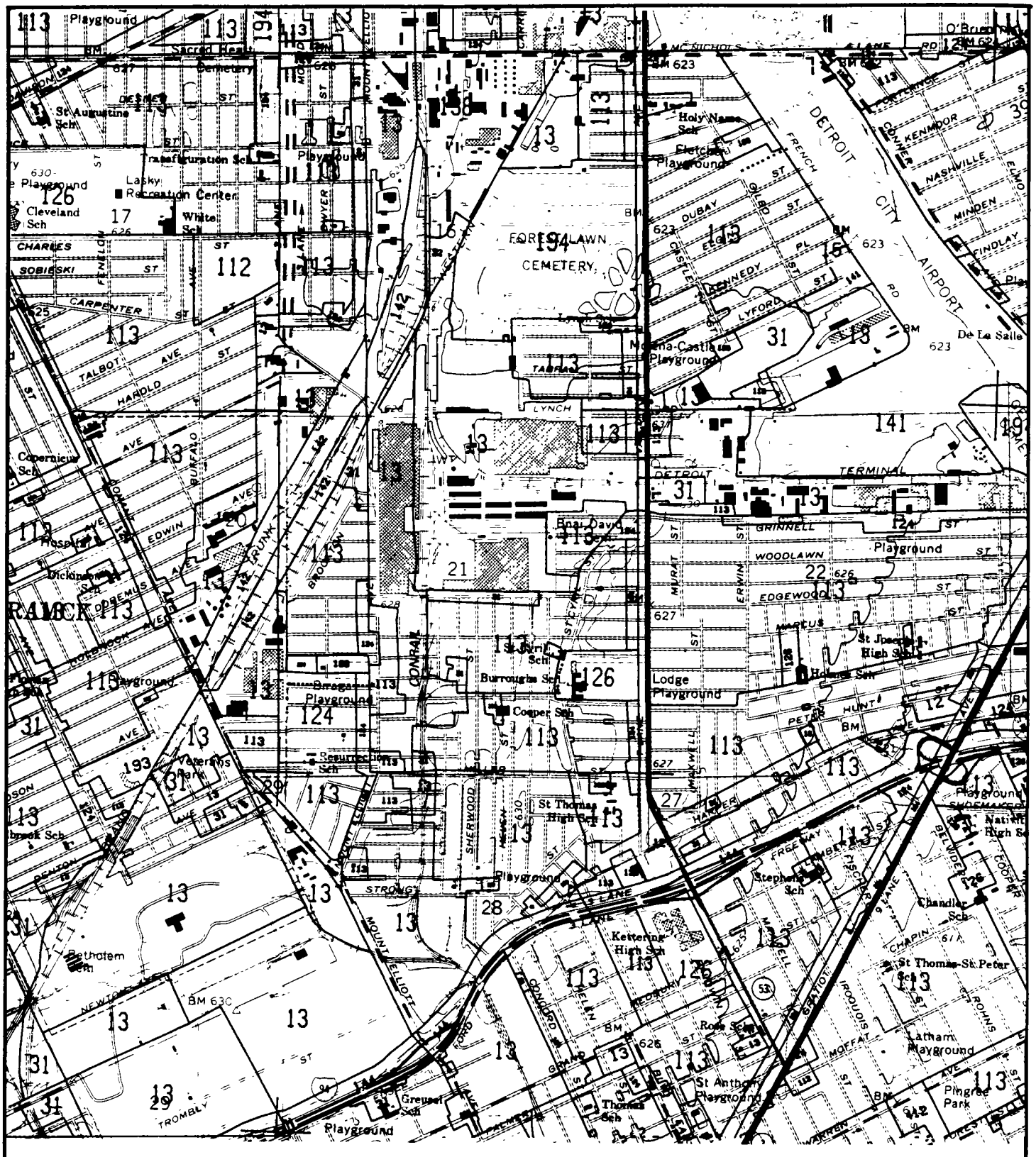
Site Location Map

Dynecol, Inc.
Detroit, Michigan

May, 1988

20878

EDI Engineering & Science



LEGEND

112	MULTI FAMILY, LOW-RISE RESIDENTIAL	142	RAILROAD
113	SINGLE FAMILY, DUPLEX RESIDENTIAL	144	ROAD
12	COMMERCIAL	193	PARK
124	SECONDARY NEIGHBORHOOD BUSINESS	194	CEMETERY
126	INSTITUTIONAL	21	CROPLAND
13	INDUSTRIAL	31	HERBACEOUS
141	AIRPORT	412	CENTRAL HARDWOODS

Figure J.2

Area and Land Use Map

Dynecol, INC.

May, 1988 20878

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muck and peat, beach ridge sands, and lacustrine sand. Drilling records from two nearby bedrock-penetrating wells indicate that nearly the entire thickness of the glacial sediment is comprised of clay. Locations of these wells are shown in Figure E.3 and drilling logs are provided in Appendix E.4.

Dynecol's property overlies glacial deposits that are consistent with regional depositional patterns. The sediments were evaluated using the eleven soil borings and five monitoring wells summarized in Tables E.1 and E.2 (see Section E, Hydrogeological Conditions). Detailed soil boring logs are included in Appendix E.3. Generally, the soil types encountered beneath the Dynecol facility can be divided into the following three units:

1) Mixed fill unit
2) Lacustrine clay unit
3) Lacustrine sand/silt unit

Mixed Fill Unit

The mixed fill unit is a thin veneer of sand, gravel, and clay on Dynecol's property. The composition of the fill material is variable, but locally appears to be comprised of texturally distinct layers. The thickness of this unit varies from 1 to 8 feet.

Lacustrine Clay Unit

The lacustrine clay unit lies immediately beneath the mixed fill unit. The lacustrine clay unit was deposited under near shore, shallow water environments within a glacial lake. Unabraded snail shells were recovered in split-spoon samples of the clay, indicating limited transport of the fossils, which is consistent with the lacustrine clay interpretation. The clay is commonly silty and occasionally contains gravel, suggesting that a portion of the sediment was derived from wave reworked morraine material.

The lacustrine clay unit extends from immediately beneath the fill to more than sixty (60) feet below the surface on Dynecol's property. The clay is virtually homogeneous to a depth of 20 feet (elevation of 610') at which point local, discontinuous intervals of lacustrine sand and silt are encountered (see Figures E.6, E.7, and E.8).

Lacustrine Sand/Silt Unit

The lacustrine sand/silt unit occurs as isolated stringers of silt and sand within the lacustrine clay unit. The factors controlling the deposition of these relatively coarser-grained sediments include a source of sand and silt, the relative energy level of the environment of deposition, and the bathymetric configuration of the glacial lake bed. Textural characteristics of the sediment indicate a unified soil classification (USC) of

predominantly ML (silt with low liquid limit) and SM (silty sand) with occasional occurrences of SM-SP (silty sand-poorly graded sand). The spatial distribution of the lacustrine sand/silt is subdivided in cross sections A-A', B-B', and C-C' (Figures E.6, E.7, and E.8) into the associated USC soil types. The existing data indicate that none of the intervals of the lacustrine sand/silt unit extend across Dynecol's property.

Mining

Mineral extraction, sand or gravel mining or hydrocarbon extraction have not occurred near the Dynecol site to any significant degree. There are extensive salt mines about 10 miles southwest of the Dynecol site (Great Lakes Basin Commission, 1974).

Earthquakes

Earthquakes are uncommon in Michigan, and no major quakes have occurred since the state was settled (Milstein, 1986). Three small earthquakes have been recorded in the Detroit area. The worst of these earthquakes occurred in 1938 and measured IV on the Mercalli Intensity scale (Bricker, 1977). This intensity of quake is felt indoors by many people and outdoors by some. Dishes and windows may rattle and cars may rock, but damage is very slight.

The entire State of Michigan is classified as Seismic Risk Zone 1 on the Uniform Building Code Seismic Risk Map of the United States. Zone 1 indicates that the State has had some record of seismic activity, but special construction measures are usually not required.

J-2a(iii) Soils

The soils of this urban area have been greatly disturbed and have not been mapped in detail. The site and nearby areas have soils of the Belleville-Selfridge-Tedrow (loamy substratum) association (Soil Conservation Service, 1977). These are nearly level to gently sloping, very poorly drained to somewhat poorly drained soils that have coarse textured to moderately fine textured subsoil over a coarse textured to moderately fine textured substratum. The site and nearby areas have been drained artificially.

J-2b Climate

Table J.1 presents annual and monthly mean temperatures and precipitation for Detroit, Michigan. In general, precipitation is fairly well distributed throughout the year. Winds are predominantly from the west to south, and rarely exceed 25 mph (MDNR, 1982) at Detroit City Airport (about 2 miles northeast of the site). One-hour rainfalls with return

Table J.1
Mean Temperatures and Precipitation for Detroit, Michigan

Month	Average Temperature (F)	Average Precipitation (inches)
January	25.5	1.93
February	26.9	1.80
March	35.4	2.33
April	48.1	3.08
May	58.4	3.43
June	69.1	3.04
July	73.3	2.99
August	71.9	3.04
September	64.5	2.30
October	54.3	2.52
November	41.1	2.31
December	29.6	2.19
Annual	***49.9***	***30.96***

Source: Michigan Department of Agriculture, 1974.

periods of 10, 25 and 100 years are 1.7, 2.05 and 2.5 inches, respectively (Hershfield, 1961).

The normal wintertime storm track is south of Detroit, and most passing storms bring periods of snow or rain. In summer most storms pass to the north, often bringing brief showers and occasionally heavy thunderstorms or damaging winds (Michigan Department of Agriculture, 1974).

J-2c Terrestrial Systems

Since the Dynecol site is almost completely paved or covered with buildings, no significant plants grow there. Plants in the area are those typical of older urban residential or industrial areas and include species such as American elm, tree-of-heaven, maples, and ornamental shrubs. Many houses have been removed, leaving vacant lots which support pioneer species characteristic of disturbed areas. None of the trees occur at high density, and most are fairly small in size. No rare, threatened, endangered, or a special plant species are known to occur in the area (Michigan Natural Features Inventory, 1988). The climax plant community for the area is beach-maple forest (U.S. Department of Agriculture, 1978).

Wildlife on the site and nearby is limited to species characteristic of urban areas such as English sparrows, rock doves, starlings, grackles, and fox squirrels. Some cottontail rabbits may live in the area, but predation by local cats and dogs probably limits their numbers. No rare, threatened, endangered or special wildlife species are known to occur in the area (Michigan Natural Features Inventory, 1988).

J-2d Aquatic Systems

There are no surface water features or wetlands near Dynecol. The area drains to the southeast toward the Detroit River via surface runoff. The Detroit River is about four miles southeast of Dynecol. Storm drains are combined with the city sewers and flow to Detroit's Wastewater Treatment Plant. Due to the flatness of the site, most surface flows are directed to storm sewers or infiltrate on-site.

J-2e Hydrology

J-2e(i) Ground Water Occurrence

Ground water in the Paleozoic bedrock generally occurs under artesian conditions. This water is variably mineralized, depending on the presence of hydrocarbons, local mineral composition of the rock, and the hydrodynamic relationship with the overlying glacial drift. Ground water is generally not available in glacial sediments near Dynecol. No

regional aquifer system has been defined in the area. A review of public records revealed no domestic ground water supply wells within two miles of Dynecol. The closest municipal well field is in Rochester, Michigan, 22 miles north-northwest of Dynecol. Therefore, no regional or local ground water quality data are available. The following is an analysis of the hydrologic characteristics and water-bearing potential of geologic units beneath Dynecol.

Mixed Fill Unit

Infiltration of precipitation forms a thin saturated to semi-saturated zone within the mixed fill unit. The quantity of water contained within the fill, as well as the ability of that water to flow, is dependent upon the textural nature of the fill. The sand and gravel zones within the fill are more likely to yield water than are the clayey intervals. The typically heterogeneous nature of fill material limits a hydrogeologic interpretation of ground water flow or water quality characteristics.

Four shallow wells are screened within and just below the mixed fill unit on Dynecol's property. Historical water level data from these wells are erratic, suggesting poor hydraulic connection within the mixed fill unit across the site. A summary of water level data is presented in Table E.3. Water level data for these isolated occurrences of ground water cannot accurately be used to calculate flow direction or flow volume.

The shallow ground water in the mixed fill unit is not capable of yielding ground water of sufficient quantity to serve as a source of water supply. No wells in the mixed fill unit are expected in the future due to the extremely low and inconsistent ground water yield of the fill.

Lacustrine Clay Unit

The lacustrine clay unit is typically unsaturated with occasional zones of partial saturation where it is in contact with isolated perched water intervals within the lacustrine sand/silt unit. The unit has a low permeability (1.25×10^{-8} to 1.60×10^{-8} cm/sec) and is not considered a usable aquifer because it will not yield a significant quantity of water. Recharge of the lacustrine clay unit is limited to very slow infiltration from low-lying zones within the mixed fill unit. The quantity of water entering the clay fill is considered very minimal as the clay serves as an effective barrier to any migration. Generally, the water content of the clay decreases with depth as observed through drilling activities and confirmed with laboratory analyses on samples for borings.

Lacustrine Sand/Silt Unit

The strata of lacustrine sand and silt within the lacustrine clay appear saturated through visual inspection of split-spoon core samples. Whether the water content is sufficient to overcome capillary forces within the silty soils to provide "free water" is uncertain. The potential for significant recharge to these isolated sands and silts is low due to their containment within the lacustrine clay unit. Therefore, intervals of the lacustrine sand/silt unit are not usable aquifers due to their inability to produce a significant quantity of water.

J-2e(ii) Ground Water Quality

The Dynecol facility is located in an old industrial area, and there are a number of sites where environmental contamination is known to have occurred. Eight of the sites closest to Dynecol are listed in Table J.2. None of these sites are known to have affected the environment in the immediate area of Dynecol. Ground water is known to be contaminated at only one of these sites; however, soils are contaminated at most of them. The sites listed in Table J.2 were identified by the Michigan Department of Natural Resources (1988). There are no sites on the National Priority List (Superfund sites) or sites proposed for addition to this list near Dynecol.

J-2e(iii) Drainage

~~Runoff from the Dynecol site enters combined~~ storm and sanitary ~~sewers and under normal~~ flow conditions would go to Detroit's wastewater treatment plant. ~~On-site infiltration of surface flow is also observed in the areas of the site that are not paved. Under high flow conditions, runoff from the Dynecol site could enter surface water (the Detroit River) by a combined sewer overflow.~~

There are several sewer lines near Dynecol. There is a 15-inch "crock" combined sewer that flows to the west along Georgia Street. This line has a manhole in front of Dynecol. This 15-inch line was constructed in about 1926. There is a deep (15 feet) 5 1/2-foot line of either brick or concrete construction along Georgia Street. This line was built in the 1930's and may leak, but the clay in which this line is located probably minimizes adverse impacts from leakage. The 5 1/2-foot line has several manholes near Dynecol. There is also a small sewer line in the alley behind Dynecol.

J-2e(iv) Surface Water Hydrology

The Detroit River is about four miles southeast of Dynecol and is the only significant surface water feature near the site. The Detroit River drains 228,000 square miles,

Table J.2

Sites of Environmental Contamination Near the Dynecol Facility

Common Site Name	Location (Township, Range, Section)	Point of Release	Pollutants	Resource Affected
Peloquin Enterprises	T.1S. R.12E. S.9	lagoon, barrel	oil	soil
Peloquin Enterprises	T.1S. R.12E. S.29	landfill	oil	soil
Berger Corporation	T.1S. R.12E. S.33	surface discharge	PCB	soil
Palmer at Brush St.	T.1S. R. 12E. S.31	barrel	heavy mfg.	-
Palmer at RR	T.1S. R.12E. S32	Surface discharge	heavy mfg.	-
Celanese Plastics	T.1S. R.12E. S.19	underground tank	xylene, toluene benzene	ground water
Troy Auto Parts	T.1S. R.12 E. S.10	surface discharge	light ind.	soil
Mt. Elliot Drum	T.1S. R.12E. S.9	barrel	toluene diisocyanate	-

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Source: Michigan Department of Natural Resources, 1988.

including all of the upper Great Lakes. The average 1986 (water year) discharge of the Detroit River was 226,500 cubic feet per second (Miller, et al, 1987).

J-2e(v) Surface Water Quality

Water quality in the Detroit River is good. River sediments in downstream areas south of Detroit are contaminated. Goudy (1986) summarized conditions in the river and its sediments:

> Water quality in the Detroit River is good, primarily due to the source and volume of water passing through it. This flushing effect, combined with reductions in point source loads, has resulted in steadily improving water quality since the 1960's. There have been dramatic decreases in the amount of oil, grease and heavy metals discharged to the river. Additionally, pollutant loads of phosphorus and chlorides have declined during recent years. Nitrate loads, however, appear to be increasing.
>
> Sediment contamination in the Detroit River is widespread with higher concentrations on the U.S. side downstream of the Rouge River and in the Trenton Channel....
>
> A 1982 Michigan Department of Natural Resources study found 43 U.S.EPA priority pollutants in the soft sediments of the Detroit River (Fallon and Horvath, 1985). The highest heavy metal concentrations were found in the Trenton Channel and immediately downstream of Grosse Ile. The highest levels of polynuclear aromatic hydrocarbons (PAHs) were also found near Grosse Ile. PAHs are products of incomplete combustion of organic materials such as coal. PAHs found in the study area were found at levels up to 50 times higher than that reported for other Great Lake sediments. The highest PCB concentrations were found in the Belle Isle-Peach Island vicinity. Organochlorine pesticides were not detected, except for a trace of heptachlor in one sample.

J-2e(vi) Great Lakes Water Levels

Water levels in the Great Lakes have been extremely high in recent years. Lake St. Clair is about 6 miles east of Dynecol. The present (March, 1988) water level in Lake St. Clair is 574.4 feet above sea level, down from an historic high level of 576.1 feet in March of 1986 (U.S. Army Corps of Engineers, 1988). Average annual levels of Lake St. Clair have been decreasing since 1986, and are now approaching the long term average lake level of 573.3 feet for March. Usually there is a seasonal variation of about 1.5 feet in Lake St. Clair (U.S. Army Corps of Engineers, 1988). The elevated lake levels in recent years have affected ground water near the Great Lakes, but the Dynecol site is far enough inland to isolate it from the influence of high lake levels.

J-2f Air Quality

All operations at Dynecol are controlled such that there is an absence of dust, odors, and other inconveniences to the local residents. Traffic areas are paved, except the parking area, in order to minimize dust. All treatment operations are controlled to eliminate unpleasant odors and air pollution. The container storage area will also include appropriate emission control features. All truck traffic is strictly controlled such that only Mt. Elliot Avenue and Georgia Street west of the Dynecol facility are travelled by trucks. This avoids any truck traffic past the schools and residences which are located east of the facility.

The following discussion of air quality in Wayne County is excerpted from the annual air quality report prepared by the MDNR (MDNR, 1985):

The Wayne County Air Pollution Control Division operates nineteen (19) suspended particulate samplers in Wayne County. Of these sites, three violated the primary annual geometric mean standard in 1985 - one in the City of Detroit (Site 82-005: Annual geometric mean 85 ug/m^3), one in Dearborn (Site 82-032: Annual geometric mean 107 ug/m^3), and a third site located in Detroit (82-091: Annual geometric mean of 89 ug/m^3). 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.

One site violated the primary 24-hour suspended particulate standard in Wayne County during 1985. The Dearborn site recorded three primary 24-hour excursions. One of the primary 24-hour excursions was the result of meteorological conditions. Three Wayne County monitors registered violations of the 24-hour secondary standard; all in the downtown Detroit area. This is an improvement over previous years monitored.

During 1985, the eleven sulfur dioxide monitors met primary and secondary standards, as in the previous year. Back in 1983, two excursions of the sulfur dioxide primary 24-hour standard were recorded at site near ICL Trucking in Detroit. These excursions were running 24-hour averages and are therefore not recorded as a violation of the standard. The other 18 sulfur dioxide sites which are monitored in Wayne County met all applicable standards. During the previous six years, the continuous sulfur dioxide monitors from 14 sites throughout Wayne County indicated compliance with the national standards.

The nitrogen dioxide annual standard was met at two sites monitored in the City of Detroit and has been for years.

No violations of the standards for carbon monoxide were recorded in 1985. During 1984, one site in downtown Detroit recorded a violation of the 8-hour secondary standard. No violations were recorded during 1983. During 1982, the two downtown Detroit monitors violated the 8-hour standard, as in 1981. 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 1985. All sites were in compliance with the 0.12 ppm ozone standard as in 1984. In 1983, the two Detroit sites exceeded the 0.12 ppm standard; one site once, and the other site three times. In the previous year, the Allen Park site exceeded the standard twice. In 1981, one Detroit site exceeded the 0.12 ppm standard.

The Wayne County Air Pollution Control Division operates eight calendar-quarter lead sites. All sites complied with the standard. During 1980, the site located near the Jeffries Freeway violated the standard; and in 1979, the same site showed violations for two consecutive quarters.

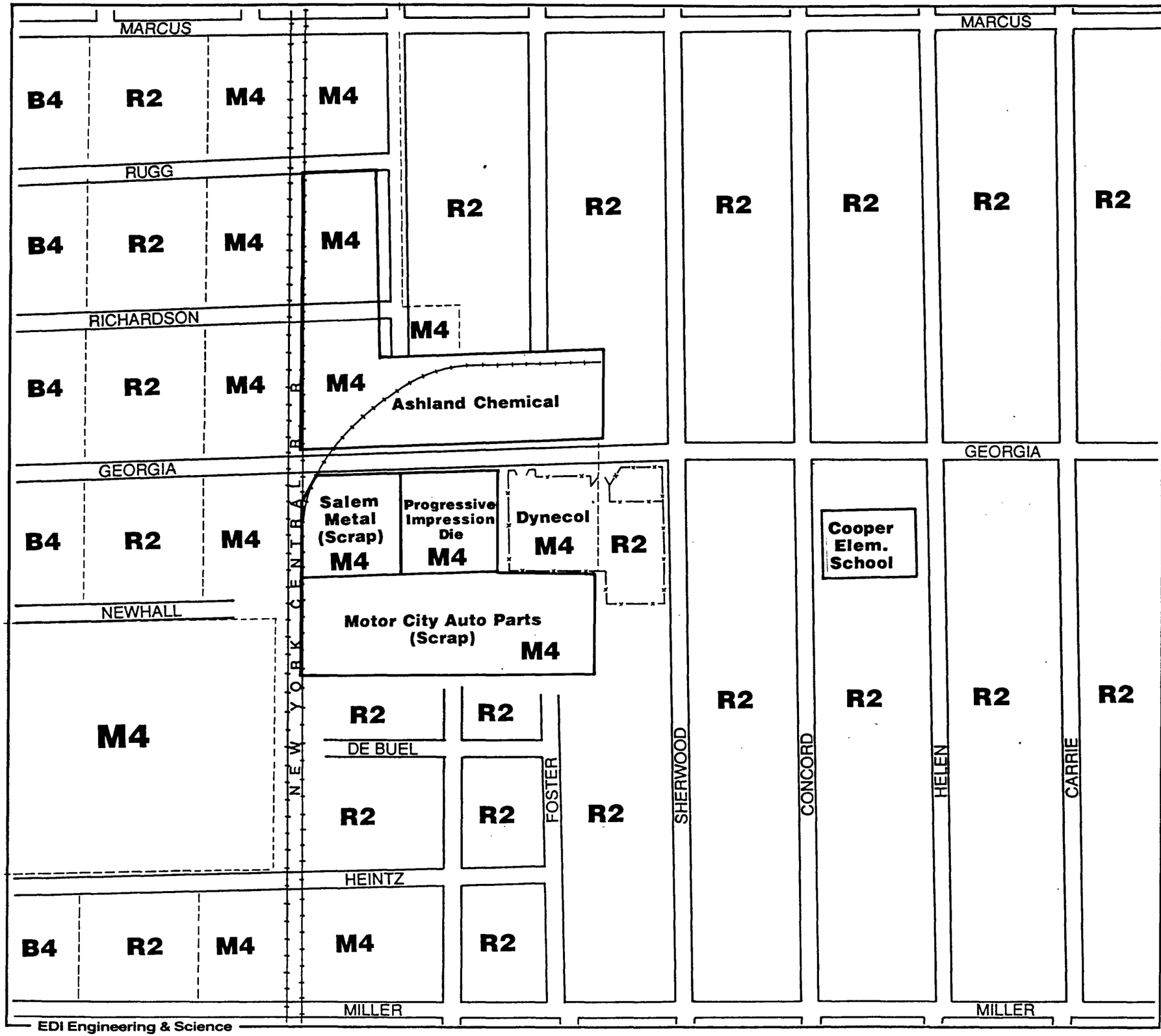
J-2g Aesthetics

The Dynecol site is in a residential and industrial area with no special aesthetic value. There are no panoramic views and no special landscapes except for yards around a few homes. Many homes in the area are abandoned and in poor condition, and some have been removed, leaving vacant lots where litter and refuse accumulate. A nearby railroad, junkyard, and other industries further detract from the aesthetics of the area. Cooper Elementary School and a few well-maintained homes are the most attractive features in the area. The Dynecol facility itself is kept neat and well maintained. The site is entirely fenced, and is bordered on two sides by other industry, and on the other two sides by streets. Parking areas for cars and trucks and buildings and tanks are visible through the fence, although much of the view from Georgia is blocked by the building on the site. All container storage areas are indoors, so neither drums nor other containers are visible from off the site.

The Dynecol facility generates relatively low levels of noise. Truck traffic is probably the noisiest aspect of this facility, and this traffic and noise is consistent with other industries nearby. All truck traffic is routed away from residential areas and Cooper Elementary School.

J-2h Land Use

Figure J.2 illustrates land use near to the Dynecol facility, and Figure J.3 details land use in the immediate surrounding area. Land adjacent to the Dynecol site on the east is



LEGEND

- R2 Two-Family Residential
- B4 General Buisness
- M4 Intensive Industrial

N

0 100 200 400
Scale in feet

Traced from Highland Park, Michigan
USGS 7.5 Minute Quadrangle Map
with Five Foot Contour Interval (1968)

Figure J.3

NEIGHBORHOOD ZONING AND LAND USE

Dynecol, Inc.
Detroit, Michigan

April, 1988 20878

occupied by Progressive Impression Die Company, and immediately to the south is an auto parts scrap yard. Across Georgia Street to the north of Dynecol is Ashland Chemical, a storage and distribution facility. The residential area near Dynecol has declined much in recent years. About half the homes appear empty, and many have been demolished. Across Sherwood Street east of Dynecol are a few houses, some empty houses, and some vacant lots. South of Dynecol along Sherwood Street are vacant lots, some homes, and empty houses. There may be people living in some houses that do not appear to be inhabited. Other nearby land is used for railroads, highways, playgrounds, schools, and neighborhood businesses. There are a number of "store front" churches in the business areas, and there is a small cemetery north of the site. Cooper Elementary School is one block east of Dynecol; St. Cyril School and Burroughs School are five blocks east of the site. St. Thomas High School is about 0.25 miles southeast of the site. There are no homes located along Georgia Street between Dynecol and Mt. Elliot Road.

Most of the Dynecol site is zoned for intensive industry (M4 Intensive Industrial District), and the nearby residential areas are zoned for two-family residences (R2 Two-Family Residential District). The east part of the site used for parking is zoned Residential (R2). Detroit's Planning Commission has prepared future land use plans which indicate the entire area is intended to be zoned for general industry and that in time the residential zoning will be eliminated in most of the area.

J-2i Archaeological and Historical Resources

The State Historic Preservation Officer (SHPO) was contacted regarding the presence of archaeological or historic resources at or near the Dynecol site. The opinion of the SHPO is that this project will affect no historic properties (Eckert, 1988).

J-2j Social Environment

The population of census tract 5108, where Dynecol is located, was 3,194 in 1980 (Bureau of the Census, 1980). This census tract is bounded by Mount Elliot Street on the west, Lynch Road on the north, Van Dyke on the east, and Miller on the south (see Figure J.2) Table J.3 presents census data for this area.

The population of Wayne County is expected to decline from 2,337,891 in 1980 to 2,069,700 in 2010 (Michigan Department of Management and Budget, 1985). The population of the Detroit Metropolitan area is expected to increase from 4,359,300 in 1985 to 4,588,100 in 2010.

Table J.3

Population Characteristics
Census Tract 5108, Detroit, Michigan

Age	Total Population	Female Population
<5	322	157
5-9	381	204
0-14	394	207
15-19	327	173
20-24	283	161
25-34	474	275
35-44	322	191
45-54	224	115
55-64	245	148
65-74	135	77
>75	87	55
Total:	3,194	1,763

Source: Bureau of the Census, 1980

J2j(i) Economic Levels

The average annual income in the tract is $12,388. About 42% of the families are below poverty level. Unemployment was about 25% in 1980. Major occupations are technical, sales, administrative support, clerical services, operators, fabricators, laborers, manufacturing, trade and professional services. Forty-five percent of persons 25 years of age or more are high school graduates (Bureau of the Census, 1980).

J-2j(ii) Support Systems

Support systems that may be affected by this facility are sewer and water service, police and fire protection, schools, roads, and solid waste disposal.

Detroit's Fire Department employs 1,850 paid fire fighters and the city's Police Department has over 5,000 employees. Electric Service is provided by Detroit Edison, gas service by Michigan Consolidated Gas, and telephone service by Michigan Bell. Municipal water is provided by the city of Detroit; Lake Huron is the source of the water. The capacity of the water supply system is 1500 million gallons per day, and maximum water use is 1300 million gallons per day. The city also provides sewer service. The capacity of the sewer system is 2100 million gallons per day and the present load is 1750 million gallons per day. This information on utilities in the city of Detroit was provided by the Michigan Department of Commerce (1988). The storm and sanitary sewers in the area near Dynecol are combined.

Major highways near Dynecol include I-94 a mile to the south, I-75 two miles to the west, and M-53 a mile to the east. Detroit City Airport is about 2 miles northeast of Dynecol, and Detroit Metropolitan Airport is about 22 miles west of Dynecol on I-94. Penn-Central Railroad tracks are one block west of Dynecol, but do not serve the facility.

Non-hazardous solid wastes from Dynecol are sent to solid waste landfills in southeast Michigan. The present capacity of the area's landfills is adequate for about the next five years. Wayne County is presently revising its solid waste management plan. A mass burn incinerator is being built, and the plan will probably require communities to initiate recycling programs. New landfills are also being planned in Wayne County. The increased recycling, planned landfills, and the incinerator should provide Wayne County with adequate solid waste disposal facilities for 20 years once these plans are implemented.

J-3 ALTERNATIVES CONSIDERED

The container storage facility has been specifically designed to safely store contained hazardous wastes. Alternative design features were reviewed, but the final selection of

design reflected several advantages, such as satisfying setback requirements and fire protection needs as well as providing optimum secondary containment structures and separate storage for potentially incompatible wastes.

The container storage facility is a modification of the existing treatment facility that used some of the storage capacity that was already present and did not require any additional land. For this reason alternative locations were not considered. The no-action alternative was considered, but was not consistent with Dynecol's objectives of helping to meet the increasing demand for the safe handling of a variety of wastes from small quantity generators of hazardous wastes. Those wastes that are accepted for storage are carefully screened to avoid highly reactive and incompatible wastes for storage.

Alternative treatment processes that were considered in addition to hexavalent chromium reduction and heavy metal precipitation were chromium (and other heavy metal) recovery by evaporative recovery, ion exchange, liquid ion exchange and reverse osmosis. Dynecol, Inc. will continue to evaluate the advantages of other treatment processes as the technology improves and the economies of these processes allow.

The existing treatment process has some advantages when highly variable waste concentrations are encountered: minimal operating and maintenance costs; the system has been proven to work in numerous applications; and some of the sludge generated may have high metal concentrations which may be recovered.

The disadvantages of ion exchange and evaporative recovery are their inflexibility to adapt to widely varying types and concentrations of cations and extreme maintenance requirements. Disadvantages of liquid ion exchange include those mentioned above along with solvent selection difficulties and high capital costs. Disadvantages of reverse osmosis include all those listed above in addition to expected difficulties with membrane selection and integrity, energy requirements, magnitude of equipment to treat the quantities and composition of waste materials to be treated.

J-4 ANTICIPATED ENVIRONMENTAL IMPACTS

J-4a Physiography

Existing operations along with the container storage facility will not affect the drainage, topography, streams, lakes, roads, bedrock, or glacial features of the area. There were some very minor impacts to soils on the site related to construction of the container storage facility. These soils had already been greatly altered and were paved or covered with gravel or buildings, so the impact was not significant.

J-4b Climate

Existing operations and the container facility will not affect the climate in any way.

J-4c Terrestrial Systems

Existing operations and the container facility will have no significant impact on terrestrial systems. The container facility was built on land that is not vegetated and was used for parking or as a roadway, so no plant species were adversely affected. This area had no value as wildlife habitat, so any modification associated with the Dynecol facility was not significant.

J-4d Aquatic Systems

Existing operations and the container facility will have no impact on any aquatic system. All waste management areas, including storage areas and loading areas, are covered, so runoff cannot come in contact with wastes. Dikes prevent runoff from entering any areas where wastes may be present. All storage and management areas have secondary containment, so that any leaked or spilled wastes are confined and cannot leave the site.

J-4e Hydrology

Existing operations and the container facility will have no effect on ground water hydrology or ground water quality as designed and routinely operated, except for the increased paved areas at the facility and the minimization of the opportunity for on-site infiltration. All process, storage, and loading areas are well contained and any spills are contained on-site. A ground water monitoring program has been implemented at the site to detect the presence of any hazardous waste constituents.

J-4f Air Quality

Existing operations in the Dynecol facility will have no significant impact on air quality. There may be a small increase in truck traffic to the facility and an associated small increase in exhaust from these trucks. There were minor dust emissions during the construction of the container storage facility. Air pollution controls are provided in the facility, and an ambient air monitoring program is conducted for the Dynecol facility.

J-4g Aesthetics

Existing operations in the Dynecol facility will not significantly change the aesthetics of the area. The conversion of a portion of the parking lot into a building did not result in any negative impacts on the aesthetics of the neighborhood.

J-4h Land Use

Existing operations in the Dynecol facility do not affect existing land use or the zoning of the site or nearby areas. The eastern portion of the site used for parking is zoned residential. A zoning change for this portion of the site has been sought for the container storage area. This zoning change is consistent with the City's plan for this area.

J-4i Archaeological and Historic Resources

There are not any known archaeological or historic resources on the site or in the area that would be impacted by existing activities at this site.

J-4j Social Environment

The changes at the Dynecol facility may have some positive effects on the social environment of the area. Dynecol may hire new personnel to handle increased volume and variety of wastes, and this will help to improve employment opportunities in the Detroit area.

Existing operations at the facility will not adversely affect fire or police protection or sewer services. The present treatment system does discharge treated wastewater to the city's sewage collection and treatment system; the magnitude of this discharge will not change and the capacity of the system is adequate. The increased variety of wastes stored at the facility require coordination with fire protection agencies, but this is not an adverse impact. Section G (Contingency Plan) details coordination with fire protection agencies. The changes in the facility should increase its value and the value of the facility to the community's tax base.

Truck traffic in the area has increased, which could be an annoyance to nearby residences and Cooper Elementary School. This adverse impact has been effectively mitigated by routing traffic through an established route only.

J-4k Energy Demand and Non-Renewable Resources

Safe handling of hazardous wastes does require use of fuels for transportation. Other non-renewable resources may be required for disposal (e.g., solidification additives or fuel for incineration) recycling, or recovery at the facilities that will receive wastes from the Dynecol facility. This demand for energy and non-renewable resources is an unavoidable impact of safe handling and disposal of hazardous wastes.

J-4l Solid Wastes

Treatment of some hazardous wastes at Dynecol may generate non-hazardous solid wastes, and these wastes will be sent to an appropriate landfill. This small waste stream will neither burden existing or proposed landfills in the county, nor will it significantly accelerate the landfills' expected life expectancy or capacity. The facility may receive and handle some wastes that subsequently will be sent to non-hazardous waste landfills if appropriate. Since these wastes would go to a landfill anyway, the Dynecol facility will have only minor impacts on solid waste loads.

J-4m Hazardous Wastes

Certain waste treatment processes may result in a sludge that must be classified as a hazardous waste. The purpose of the treatment process is to make the waste less hazardous and to reduce the quantity of hazardous waste to be disposed of. The Dynecol facility will not generate hazardous wastes from the storage of wastes but will provide safe storage that will improve the handling and management of hazardous wastes for various clients. This improved management of hazardous wastes will provide a better opportunity to recycle or recover certain wastes, which will reduce overall loads of hazardous wastes to disposal facilities. Those solvent waste streams that are accepted for treatment may be rendered non-hazardous by the various processes used at Dynecol. Additionally, the container storage facility helps to properly manage the hazardous wastes collected from small businesses that otherwise may not have been properly managed. These are beneficial impacts on hazardous wastes.

J-4n Summary of Environmental Impacts

Table J.4 summarizes the environmental impacts. The project had no significant impacts on physiography, climate, terrestrial systems, aquatic systems, hydrology, aesthetics, land use, and zoning. A zoning change for the eastern part of the Dynecol site, which has been planned by the City for this area, is necessary for the container storage facility. There may have been minor impacts on air quality (which have been mitigated) and on solid wastes. Truck traffic is routed to avoid adverse impacts on residential areas and nearby schools. Management and handling of these wastes requires use of some non-renewable resources.

Existing operations will have beneficial effects on the local economy, the tax base, and on the management of hazardous wastes. The facility provides a needed service to many generators of hazardous wastes.

Table J.4

Summary of Anticipated Environmental Impacts

Physiography	No significant impact
Topography	No significant impact
Geology	No significant impact
Soils	No significant impact
Climate	No significant impact
Terrestrial Systems	No significant impact
Flora	No significant impact
Fauna	No significant impact
Aquatic Systems	No significant impact
Hydrology	No significant impact
Air Quality	No significant impact
Aesthetics	No significant impact
Land Use	No significant impact
Zoning	Zoning change necessary
Archaeological and Historical Resources	No significant impact
Social Environment	Some minor impacts, mitigation possible
Economic Levels	Potentially beneficial
Support Services	No significant impact
Energy Demand and Non-Renewable Resources	Small negative impact
Solid Wastes	Small negative impact
Hazardous Wastes	Beneficial impact

The costs of the services provided by the Dynecol facility are paid for by the industries, schools, hospitals, and other waste generators that use the service. The beneficiary is the public, who benefits from improved handling of hazardous wastes.

J-5 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts includes:

- increased truck traffic near a residential area;
- use of some non-renewable resources to properly treat and handle hazardous wastes; and
- the generation of some non-hazardous solid wastes from hazardous waste treatment processes.

J-6 Mitigating Measures

The impact of increased truck traffic near a residential area has been mitigated by routing the traffic through the industrial areas between Dynecol and the major transportation networks and by requiring trucks to turn off their motors when the vehicles are not moving.

Safe and effective management of hazardous wastes requires the use of some energy and non-renewable resources. The use of these required resources are minimized by reducing the amounts of hazardous wastes generated, by recycling certain wastes, and by recovering some wastes. Reducing the amounts of wastes generated can only be done by generators of the wastes. Recycling and the recovery of hazardous waste is facilitated by the comprehensive management of hazardous wastes at the Dynecol facility.

Some wastes resulting from treatment processes are sent to solid waste landfills from the Dynecol facility. Since these wastes would have otherwise been sent to hazardous waste landfills, this represents a trade-off and is not an adverse effect.

J-7 FAILURE MODE ASSESSMENT

J-7a Description of System

Dynecol treats certain corrosive and metal-bearing wastes. The facility will also be used as a transfer facility for a variety of other wastes. These systems are described in detail in Section B (Facility Description) and Section D (Process Description) and are summarized below.

The treatment facility consists of the following components:

- unloading area with spill collection and containment structures;
- four primary treatment vessels (20,000 gal. each) with a concrete containment area which provides secondary containment for 100,159 gallons (five times the capacity of the largest vessel);
- four secondary treatment vessels (20,000 gal. each) located within a building having concrete secondary containment for 32,948 gallons (more than 1.5 times the capacity of the largest vessel);
- three storage tanks located within a building having concrete secondary containment for 98,032 gallons (more than five times the capacity of the largest vessel); and
- two filter presses located within a building which has a drainage system to a secondary containment area.

This facility is designed and licensed to process 144,000 gallons per day of hazardous waste. The hazardous waste received for treatment are inorganic aqueous solutions containing acids, alkalis, and heavy metals. The wastes are identified by EPA hazardous waste numbers K062, D002, D004, D005, D006, D007, D008, D009, D010, D011, F006 and F019, as well as Michigan hazardous waste numbers 001D and 003D.

These aqueous inorganic solutions are delivered to the facility in bulk tank trailers. Hazardous waste is stored and processed in above-ground, corrosion-resistant vessels. Four tanks are available for segregated storage of hazardous wastes prior to processing, having a total capacity of 61,000 gallons.

Hazardous waste may be processed at the facility using primary treatment, secondary treatment and solids dewatering. Primary treatment may be performed in any of four 20,000 gallon above-ground tanks by means of chemical oxidation, chemical reduction, and neutralization. Secondary treatment may be performed in any of four 20,000-gallon above-ground tanks by means of neutralization, chemical precipitation, flocculation, detoxification, clarification, sedimentation, chemical fixation, and lime stabilization. Solids generated from primary and secondary treatment may be dewatered by means of pressure filtration. Solids which may result in a hazardous waste sludge are segregated from those resulting in a non-hazardous sludge. Dewatered solids are discharged from the filters directly into a truck trailer or dump box situated beneath each filter.

The hazardous waste transfer and storage facility consists of two loading docks, eight isolation storage bays, and a bulking/transfer area in a single building. The loading docks have structures to contain any spills or leaks that may occur during loading or unloading. The loading areas are roofed but do not have side walls. The docks are equipped with hydraulic levelers and bumpers.

The storage and bulking areas are in a building heated to 40-50°F in the winter and are cooled by ventilation fans in the summer. The container storage area is designed to have a storage capacity of 46,000 gallons (equivalent to 836, 55-gallon drums) and consists of eight isolation bays to separate incompatible or reactive wastes. Fifty-five-gallon drums will be stacked on two levels with 18 inches between rows of drums. Five-hundred-gallon totes are on one level with 18 inches between the rows. The bays have containment for 700 gallons with acid-resistant concrete floors. Each bay has a blind sump to allow any spills or leaks to be collected. Material that collects in these sumps is pumped into a storage tank where it is tested so an appropriate disposal technique can be determined.

Wastes are received at the facility in drums, lab packs, or other containers and are unloaded at the loading dock. The wastes are sorted into compatible groups and are stored in the appropriate storage bay. The bulking and transfer area is equipped with a fume hood and an air emission control system consisting of a blower, wet scrubber, and a passive activated carbon system. Certain compatible wastes may be bulked in the bulking area if this is consistent with safety, the facility's permit, and disposal requirements. All wastes are temporarily stored until they are shipped to an appropriate disposal, recovery, or recycling facility.

J-7b Definition of Failure

While many precautions have been implemented within the existing system to prevent the release of hazardous wastes into the environment, such as the design of containment structures as well as the training of employees in handling these wastes, the potential for system failure does exist as it does for any system. A failure in the system is defined as a release of hazardous waste or hazardous waste constituents into the environment due to:

- leakage or spillage of wastes causing contamination of soil, water, or air;
- incompatible chemical reactions between wastes or wastes and their containers;
- power outages, failure of electrical equipment, or failure of mechanical equipment;
- inadequate storage space for wastes;
- inability to identify a facility that will accept wastes to be transferred; and
- acceptance of restricted wastes.

J-7c Possible Causes of Failure

The possible causes of system failure that could result in the release of hazardous waste or hazardous waste constituents into the environment for each of the failures defined above are summarized below:

- Leakage or spillage of waste could be caused by:

  - leaks from tank trailers or drums during unloading;
  - damage to drums during unloading;
  - leaks from transfer pumps, piping, or valves;
  - leaks from waste storage tanks, process tanks or process equipment;
  - leakage from drums in storage; or
  - overfilling of tanks or drums.

  Each of these failures could cause contamination of soil or water only if the secondary containment system also failed at the same time. Possible causes of failures of the secondary containment system are:

  - physical damage to the secondary containment structures;
  - contact of containment structure with wastes that affect the integrity of the structure;
  - inadequate capacity of the secondary containment to store the volume of wastes leaked or spilled; or
  - a loss of containment volume due to the presence of water, wastes, soil or other material in the containment area.

  A large spill or leak combined with a failure of secondary containment could result in wastes flowing from the site and into nearby storm sewers. This could contaminate the sewage and storm water. This combination of events is highly unlikely.

- Incompatible chemical reactions between wastes or wastes and their containers could be caused by:

  - mixing of incompatible wastes in a tank or drum;
  - mixing of incompatible wastes that have leaked or spilled;
  - addition of a waste to a container containing a residue of an incompatible waste; or
  - addition of a waste to a container that is incompatible with the waste.

- Power outages, failure of electrical equipment, or failure of mechanical equipment could be caused by:
  - damage to this equipment;
  - inadequate maintenance;
  - power failure outside of the Dynecol facility;
  - defective equipment supplied by the manufacturer; or
  - improper use or installation of equipment.

- Inadequate storage space for wastes could be caused by:

  - failure to transfer or treat wastes on schedule; or
  - acceptance of wastes for which adequate proper storage is not available.

- Inability to identify a facility that will accept wastes to be transferred could be caused by:

  - acceptance of a waste before a facility that will accept it has been identified;
  - rendering a waste unacceptable through mixing, treatment, improper containment, inadequate documentation, or inadequate testing; or
  - a facility which formerly agreed to accept a waste subsequently refusing to accept it.

- Acceptance of a restricted waste could be caused by:

  - inadequate waste evaluation;
  - inadequate screening and fingerprint analysis; or
  - incorrect identification of a waste by a generator.

J-7d Detection of Failure

Failures of treatment, storage, and management systems will readily be detected by careful observations of operations, inspection and testing of equipment, waste handling

procedures, communication with disposal facilities for wastes being transferred, and screening of shipments.

J-7d(i) Leaks and Spills

This failure mode will be obvious if it occurs and will be immediately detected by facility personnel. Incoming tank trucks are unloaded by trained personnel and will be continuously observed by facility personnel. Any leaks or spills from the tanker or hoses connected to receiving tanks will be immediately evident.

All waste storage areas, containment systems, loading and unloading areas, tanks and piping systems undergo regular and routine inspections by plant personnel. This inspection includes observation of container conditions, any structural deterioration, drum spacing and labeling, waste quantities, equipment operation, containment system integrity, and any potential problems that may lead to system failure. Facility personnel are also instructed to check for any leaks or spills of stored materials and to immediately initiate appropriate response procedures when such releases have been detected. All inspections are guided by an inspection schedule and are recorded on inspection logs. All tanks, piping, pumps, and other ancillary equipment are located above ground and in secondary containment areas. Tanks are provided with high level alarms that indicate when the tank is near capacity. There is no underground equipment which cannot be inspected or observed.

Ground water monitoring wells are in place to detect any abnormal conditions within the perched water at the site. These wells are sampled and analyzed quarterly.

J-7d(ii)Incompatible Reactions

The possibility of mixing incompatible wastes is minimized by the use of procedures for identifying and accepting wastes. Incompatible reactions will be easily observed by trained facility personnel who will take prompt action in accordance with Dynecol's contingency plan (Section G). Regular inspections will detect any leaks or spills.

J-7d(iii) Power Outages and Equipment Failure

Power outages at the plant will be detected immediately since all equipment and lights operate on electricity. All valves in the treatment system with automatic actuators are designed with spring closure in the event of loss of power. In this way, the transfer, overfilling or release of untreated or partially treated waste will be stopped with loss of power. Failure of mechanical or electrical equipment will also be detected immediately if the equipment stops working completely, delivers reduced supply or pressure of fluid, or emits false signals in the case of controls and meters. Regular inspection and testing of critical equipment will detect potential equipment failure.

J-7d(iv) Inadequate Storage

Inadequate storage will be detected by regular inspections and inventory of wastes.

J-7d(v) Inability to Transfer Wastes

Inability to transfer wastes will be detected by refusal of other facilities to accept wastes.

J-7d(vi) Potential Acceptance of Restricted Wastes

Acceptance of restricted wastes will be detected and prevented by proper waste evaluation and shipment screening as described in the Waste Analysis Plan (Section C-2).

J-7e Environmental Effects of Failure

J-7e(i) Existing Storage and Treatment System

The potential effects that the various types of failure of the existing waste handling and treatment system would have on the air, surface water, ground water and the health of both the employees and the general public are described below. Many of these potential effects presuppose a "worst case" scenario where the system experiences complete failure and large quantities of hazardous wastes will be involved. Under the most probable failure situation, any potential environmental effects would be confined on the site, easily managed, and would result in minimal effects to the environment.

Air

The environmental effects of a failure on air quality would depend upon the type of failure, the magnitude of the failure and the type of material lost to the environment in the failure. The waste materials processed at this facility are aqueous solutions of inorganic chemicals which have relatively low volatility, low vapor pressure in solution, and low concentration of components which render the solution hazardous. Solutions containing hydrochloric acid may adversely affect local air quality during the following worst-case scenario. A massive spill of 8,000 to 10,000 gallons (the maximum capacity of a tank trailer and of waste material contained in a primary treatment tank) of untreated 5% HCl solution at its maximum temperature of 40°C (104°F) could result in a concentration of HCl exceeding the ceiling limit value of 5.0 ppm in a thin layer of air, less than 1 cm. thick, immediately above the liquid surface of the spilled material. Calculations based upon the solution concentration, solution temperature, and vapor pressure at these conditions show that the concentration of HCl in the air *in equilibrium with the liquid surface* would be 5.7 ppm of HCl. Because tankers are unloaded outdoors and primary treatment tanks are also located out-of-doors, HCl vapors being released

from a massive spill as described above would be quickly diluted and dispersed in the atmosphere, resulting in an HCl concentration in air, even a short distance from the liquid surface of less than the ceiling level.

The scenario described above applies to the untreated, dilute HCl solutions received at this facility. Once processing of the material is begun, by adding an alkaline reagent to the solution, the free acid content rapidly decreases until, at a pH of 7.0, no free acid remains in solution. For this reason, the release of acid fumes is not possible from either secondary treatment tanks, filtration processes, or dewatered solids storage. A similar evaluation of both sulfuric acid and nitric acid at their maximum concentration and temperature indicates that the limitations on their vapor concentration in air would not be exceeded in the event of this worst-case scenario.

A massive spill of any liquid material could produce a spray of the material spilled which would be generated only when the material contacted the concrete unloading pad or concrete floor of the secondary containment area, and would last for only a short time. In either instance, there would be little or no impact on air quality beyond the immediate area of the spill or beyond the property line boundaries of the facility. The potential for the mixture of incompatible wastes which could result in the generation of toxic vapors is minimized by the procedures for identifying and accepting wastes for treatment at the facility.

Power outages or electrical equipment failure are not expected to pose an adverse impact upon air quality because the entire plant would automatically shut down and revert to a failsafe mode.

Surface Water

The environmental effects of any failures on surface water quality would depend upon the type of material lost during the failure, its quantity and whether or not the lost material escaped from the site through storm sewers which are directed to the wastewater treatment plant. Spills or leaks would normally have no adverse effects on surface water quality because secondary containment is provided for all tanks, for the unloading area, and for treatment areas. No loaded tank trailers are parked or left waiting outside of the facility boundaries when they arrive for unloading. Power outages, mechanical or electrical failures are not expected to pose an adverse impact upon surface water quality because the plant would automatically shut down and revert to a failsafe mode.

Ground Water

The environmental effects of spills or leakage of materials handled at this facility on ground water quality would be negligible and would be limited to this site. There is no

usable aquifer at this site, and beneath the pockets of perched water is a sandy clay layer extending from a depth of 21 to 36 feet below the surface. All active areas of the facility (entrance and exit roads, unloading, storage and process areas) are paved with concrete, 12 inches or more in thickness. In addition, curbs or spill containment structures are provided to prevent runoff from flowing to unpaved areas outside of the plant, and all wells are securely capped to prevent entrance to perched water pockets by this means. These pockets of perched water are sampled and the water is analyzed quarterly. Any deviations from the normal range of ground water quality would be detected at this time.

Power outages and mechanical or electrical equipment failure will have no impact on ground water quality because the plant will automatically shut down and revert to a failsafe mode.

Employee and Public Health

The effects of any failures on employee and public health will depend on the type of material lost during failure, the concentration of the material, the type of tissue contacted, and the duration of human contact. Losses of dilute acidic or alkaline solutions or more concentrated neutralization reagents could pose a threat to employee or public health upon direct contact. Leakage or spillage of corrosive materials, either acidic or alkaline, could cause acute symptoms ranging from tissue irritation to chemical burns on exposed skin or other tissue. Inhalation of acidic fumes or vapors could result in inflammation of the nose, throat or larynx.

Contact with sprays, which may be produced in the event of a massive spill, could cause those employees in the immediate vicinity of the spilled material to be exposed by both tissue contact and inhalation of small quantities of the material. There is no reason to believe that public health would be affected beyond the boundaries of this facility.

Power outages, mechanical or electrical equipment failure are not expected to cause adverse effects to employee or public health because the plant will automatically shut down and revert to a failsafe mode.

J-7e(ii) Container Storage System

Air

A failure mode for the container storage area that could affect air is the failure of one or more drums that could release vapors to the air. This failure could result from corrosion of the container, a puncture to the container, a spill of a container's contents, or not covering the container completely or properly during storage. The mixture of incompatible wastes could produce toxic vapors. The effects of such a failure on air

would depend on the waste, the rate of release, and the amount released. Such releases could cause concentrations of some wastes to exceed recommended concentrations in air within a small, localized area of the container storage area.

Surface Water

A combination of unlikely events could release wastes indirectly to either surface water or drinking water supplies. The consequences of such a release depend on the waste and the amount released, but under worst-case conditions drinking water could be rendered temporarily undrinkable, or wastes released to combined sewers could disrupt operations at Detroit's wastewater treatment plant. Such a release that could affect surface waters would be the result of a catastrophic event at the facility, such as a tornado or a major fire. These effects are extremely unlikely and would be temporary.

Ground Water

Wastes could be released to ground water if both the secondary and primary containment systems failed. The effects would be minimal and would be similar to the effects described for the existing tank storage and treatment system.

Employee and Public Health

Exposure to many of the wastes stored at the Dynecol facility could have a variety of effects on human health. The effects would depend on the waste, on the exposure duration and mode, and the concentration of the waste. Employees at the Dynecol facility are the most likely population that could be exposed to the wastes.

The variety of wastes that are stored at the facility would result in different reactions depending on the chemicals involved and the exposure route, such as eye or skin contact or inhalation. Consequently, the prediction of exposure reactions can be summarized as follows:

- for corrosive wastes, inhalation could result in respiratory irritation or damage and skin or eye contact could result in burning and possible tissue damage;
- for metal or carbide wastes, inhalation could result in respiratory irritation and skin or eye contact could result in burning or irritation; and
- for halogenated solvent wastes and solvent-based coatings and resins, inhalation could result in headache, dizziness, nausea, or unconsciousness and skin or eye contact could result in dry and cracked skin, rash, redness, itching, or burning.

All containerized wastes will be handled in a cautious manner by personnel who are trained to prevent exposure as well as to respond to exposure to these wastes.

J-7f Possible Corrective Actions in the Event of Failure

Possible corrective actions in the event of a failure are detailed in Section G, the Contingency Plan, and are summarized below. This plan describes the following procedures that will be followed in the event of an emergency situation such as fire, explosion, severe weather, or any unplanned sudden or non-sudden release of hazardous materials to the air, soil, or surface water at the facility:

- The discoverer of an emergency situation contacts the Emergency Coordinator. A determination is made whether the situation is an imminent or actual emergency. All facility personnel and appropriate federal, state, and local agencies (including police and fire departments) will also be notified.

- The character, source, amount, and extent of released materials will be identified. Any potential hazards to human health or the environment associated with this release will be assessed and evacuation will be initiated if necessary. Any materials that may be reactive with the released material will be removed from the area.

- For a fire and/or explosion, efforts will be made to prevent the fire from spreading to nearby areas. All feed lines will be shut down and possible sources of ignition will be eliminated. Spills of flammable materials will be contained through the use of chemical absorbants. Flushing the area with large quantities of water or the foaming of the spill will be performed if indicated.

- In the event of a leak or spill in the treatment system, all waste feed lines will be shut down and the leak or spill stopped. A contractor will be called to remove standing liquids within the containment system and transport the spilled materials to an approved facility. Small spills or leaks will be flushed to the sump, and a pump will be used to retrieve the diluted waste materials. Absorbent materials may also be used. Spills or leaks that are not contained will be isolated, appropriately recovered, and disposed of. If soils are involved, excavation of affected soils may be necessary.

- If the spill or leak results in the formation and release of a toxic vapor cloud, an assessment will be made of what areas may be impacted and should be evacuated.

- Actions will be undertaken to prevent the recurrence of fire, explosion, or releases, including the stopping of processes and operations, the collection and containment of released materials, and the recovery or isolation of containers. Valves, pipes, and other equipment will be monitored prior to start-up for leaks, pressure build-up, gas generation, or ruptures.

- Arrangements will be made for the treatment, storage, or disposal of recovered or contaminated materials. These materials will be properly stored at Dynecol until they can be removed.

All of these actions will be undertaken to correct any hazard that may result from the release of hazardous wastes or hazardous waste constituents.

7-7g Actions Taken to Minimize the Possibility of Failure and Adverse Impacts of Failure

The procedures, structures and equipment used at the facility to minimize failure and adverse impacts of failure are identified in the Prevention Plan (Section F), Contingency Plan (Section G), and elsewhere in this document. The following is a summary of these items. Table J.5 identifies corrective and preventative actions for each potential cause of failure identified in Section J-7c of this Failure Mode Assessment.

All waste treatment, waste storage, and unloading areas are provided with secondary containment. The secondary containment for the drum storage areas consists of concrete with an all-purpose sealant that maintains its integrity if it should be exposed to the wastes stored in the bay. Sand bags and neutralizing materials are available to provide for additional containment. The unloading area, treatment areas, tanks, and container storage areas are all under roofs to prevent precipitation or runoff from entering areas where hazardous wastes are stored or treated and to prevent secondary containment capacity from filling with water. Runoff from the roofs is piped directly to the municipal sewer system so that this runoff will not enter any part of the facility. Concrete and earthen curbs have been built around three sides of the facility, and the one exit road can be curbed with sand bags, if necessary, to prevent runoff from any uncovered areas from leaving the property. Secondary containment areas and the unloading area are equipped with in-ground sumps and pumps. Storage and treatment tanks are equipped with alarms to prevent overfilling.

Containers storing hazardous wastes are kept indoors in a heated and ventilated building. This eliminates exposure of the containers to harsh weather and prevents either the freezing or over-heating of the contents of the containers, either of which could cause the containers to leak.

The training of personnel is essential to prevent the mixing of incompatible wastes. Dynecol's training program is described in Section H (Personnel Training). A number of actions help prevent uncontrolled acid-base reactions. Acids and bases are transferred and stored in segregated piping and tanks which are clearly labelled. Also, the acid and base solutions treated at Dynecol are relatively low in concentration.

Table J.5
Corrective and Preventative Actions

Failure	Corrective and Preventative Actions
(i) Leaks and Spills	
(a) Leaks from tanks or drums during unloading	Secondary containment, cleanup, temperature control
(b) Damage to drums during unloading	Secondary containment, cleanup
(c) Leaks from pumps, pipes, valves	Secondary containment, cleanup
(d) Leaks from tanks and process equipment	Secondary containment, cleanup
(e) Leaks from stored drums	Secondary containment, cleanup
(f) Overfilling	Secondary containment, alarm system
(g) Failure of secondary containment	Inspection, maintenance, extra capacity, waste-compatible materials
(ii) Incompatible Reactions	
(a) Mixing incompatible wastes in tanks or drums	Training, testing
(b) Mixing of Leaks and Spills	Immediate cleanup, segregation of wastes
(c) Mixing with incompatible residues	Training
(d) Adding waste to incompatible container	Training, warning signs
(iii) Power Outages and Equipment Failure	
(a) Damage to equipment	Repair and replacement
(b) Inadequate maintenance	Regular maintenance, inspection, testing
(c) Power failure	Failsafe mode
(d) Defective equipment	Inspection, testing
(e) Improper use or installation	Inspection, testing
(iv) Inadequate Storage	
(a) Failure to transfer or treat wastes	Inspection
(b) Acceptance of wastes when storage is not available	Inspection, inventory
(v) Inability to Transfer Wastes	
(a) Acceptance of waste before disposal facility is identified	Prior arrangements required
(b) rendering a waste unacceptable	Prior arrangements required
(c) Change at disposal facility	Prior arrangements required, disposal options
(vi) Acceptance of Restricted Wastes	
(a) Inadequate evaluation	Waste analysis and screening
(b) Inadequate screening	Waste analysis and screening
(c) Misrepresentation by generator	Waste analysis and screening

Segregation of incompatible waste type into separate storage bays with separate secondary containment reduces the chance of incompatible wastes mixing. Any spills or leaks that occur are immediately cleaned up, so that there is little chance of incompatible wastes mixing due to spills or leaks. Certain wastes may be combined if the wastes are compatible. The mixing of wastes will occur in the bulking area, which is provided with a fume hood and secondary containment. If the compatibility of the wastes to be mixed is not certain, a small amount of the wastes will be combined as a test to see if the wastes are compatible.

Equipment failure and power outage can be partially prevented by regular inspection, testing and maintenance of critical equipment. In the event of a power failure, the plant reverts to a failsafe mode. Spare parts and replacement equipment for pumps, valves, pipes, and hoses are maintained at the facility. Local suppliers provide many items used at the facility and usually failed equipment can be repaired or replaced in 24 hours by suppliers, if necessary.

Inadequate storage for wastes will be detected by inspections and inventory, and no further wastes will be accepted if storage for the wastes is not available. Inability to transfer wastes will be prevented by making the appropriate arrangements with the disposal facilities before wastes are accepted at the Dynecol facility. Wastes will not be mixed or otherwise changed until a disposal facility has agreed to accept the waste. Dynecol will make arrangements with a variety of waste disposal, reclamation or recycling facilities so there are a number of options available for transferal. Acceptance of restricted wastes will be prevented by waste analysis and screening as described in the Waste Analysis Plan (Section C-2).

Water supply, provided by the City of Detroit pipelines, is protected from contamination by breaker valves and backflow prevention valves, as required by city code. There are no permanent water connections to the hazardous waste operations of the facility. Furthermore, the water supply main is segregated from the hazardous waste section of the facility.

To prevent undue exposure of personnel to hazardous materials, the following actions have been taken:

- All hazardous wastes are received, stored, and treated in enclosed tanks or containers; and
- Personnel have been issued, or have immediate access to, the personal protective equipment specified in the Prevention Plan and the Contingency Plan.

To protect employees who are responsible for unloading incoming tankers or trucks of hazardous materials, an enclosed building has been provided for them to observe the

unloading of tankers, while being protected from any sudden leak or spill from this operation. They are provided with personal protective equipment, such as safety glasses, rubber gloves, boots, mist respirator, portable and stationary eyewashes and safety showers. All personnel responsible for handling hazardous wastes in any way receive specialized safety training.

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SECTION K

SOLID WASTE MANAGEMENT UNIT INFORMATION

As required by the Hazardous and Solid Waste Amendments of 1984 (HSWA), Section 3004(a), this section contains a certification regarding potential releases from 3004(a), this section contains a certification regarding potential releases from solid waste management units at the Dynecol facility. All facilities seeking a permit under RCRA must provide for corrective action for all releases of hazardous waste or hazardous waste constituents from any solid waste management unit, regardless of the time at which waste was placed in the unit.

CERTIFICATION REGARDING POTENTIAL RELEASES FROM
SOLID WASTE MANAGEMENT UNITS

FACILITY NAME: Dynecol, inc.

EPA I.D. NUMBER: MID074259565

LOCATION CITY: Detroit

STATE: Michigan

1. Are there any of the following solid waste management units (existing or closed) at your facility? NOTE - DO NOT INCLUDE HAZARDOUS WASTES UNITS CURRENTLY SHOWN IN YOUR PART B APPLICATION

	YES	NO
° Landfill		x
° Surface Impoundment		x
° Land Farm		x
° Waste Pile		x
° Incinerator		x
° Storage Tank (Above Ground)		x
° Storage Tank (Underground)		x
° Container Storage Area	x	
° Injection Wells	x	
° Wastewater Treatment Units		x
° Transfer Stations		x
° Waste Recycling Operations		x
° Waste Treatment, Detoxification		x
° Other _____		x

2. If there are "Yes" answers to any of the items in Number 1 above, please provide a description of the wastes that were stored, treated or disposed of in each unit. In particular, please focus on whether or not the wastes would be considered as hazardous wastes or hazardous constituents under RCRA. Also include any available data on quantities or volume of wastes disposed on and the dates of disposal. Please also provide a description of each unit and include capacity, dimensions, location at facility, provide a site plan if avaliable.

Prior to the pruchase of this site by Waste Acid Services (name changed to Dynecol, Inc.), a paint and pigment repackager occupied this site. Twenty underground steel tanks (approximately 12,000 gallons each) were closed in place by vacuuming out any remaining paints or pigments and filling the tanks with sand. There was no underground piping associated

NOTE: Hazardous waste are those identified in 40 CFR 261. Hazardous constituents are those listed in Appendix VIII Of 40 CFR Part 261.

with these tanks and no visible contamination apparent during closure. Closure took place between 1975 and 1980. It is assumed that containers were also stored here.

3. For the units noted in Number 1 above and also those hazardous wasteunits in your Part B application, please describe for each unit any data available on any prior or current releases of hazardous wastes or constituents to the environment that may have occurred in the part or still be occurring.

   Please provide the following information

   a. Date of release
   b. Type of waste released .
   c. Quantity or volume of waste released
   d. Describe nature of release (i.e., spill, overflow, ruptured pipe or tank, etc.)

   No known releases of hazardous wastes or constituents have occurred or are occurring.

4. In regard to the prior releases described in Number 3 above, please provide (for each unit) any analytical data that may be available which would describe the nature and extent of environmental contamination that exists as a result of such releases, Please focus on concentrations of hazardous wastes or constituents present in contaminated soil or groundwater.

   N/A

1 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 submittal 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. (42 U.S.C. 6902 et seq. and 40 CFR 270.11(d))

Frank Biermann, President
Typed Name and Title

Frank Biermann
Signature

10/6/88
Date

CONTINUING RELEASES AT PERMITTED FACILITIES

SEC. 206. Section 3004 of the Solid Waste Disposal Act is amended by adding the following new subsection after subsection (t) thereof:

"(u) CONTINUING RELEASES AT PERMITTED FACILITIES.—Standards promulgated under this section shall require, and a permit issued after the date of enactment of the Hazardous and Solid Waste Amendments of 1984 by the Administrator or a State shall require, corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a permit under this subtitle, regardless of the time at which waste was placed in such unit. Permits issued under section 3005 shall contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to issuance of the permit) and assurances of financial responsibility for completing such corrective action.".

SECTION L

ENVIRONMENTAL MONITORING PROGRAMS

This section summarizes the environmental monitoring programs that will be implemented in accordance with the requirements of 40 CFR Subpart F and Michigan Act 64, Rule 299.9611.

L-1 ENVIRONMENTAL MONITORING PROGRAMS

The purpose of environmental monitoring programs is to detect failure of the facility's design or operational capabilities and to detect a release of hazardous waste or hazardous waste constituents. The following discussions describe the various environmental monitoring plans that have been developed for the Dynecol facility. The monitoring programs which are described on the following pages include:

- ground water monitoring;
- ambient air monitoring; and
- monitoring of the effluent discharge to the municipal sewage system.

Because there is no exposed soil within the hazardous waste management areas of the facility, due to extensive areas of pavement and the secondary containment structures and equipment, an annual soil monitoring program will not be undertaken because it would not be an effective method for detecting any releases of hazardous wastes or hazardous waste constituents from the facility.

L-1a Ground Water Monitoring

Hazardous waste constituents have not been detected in the ground water in statistical exceedance of background levels at Dynecol, Inc. However, in accordance with the requirements of Michigan Act 64 (Rule 299.9612) and 40 CFR 264 Subpart F, Dynecol will implement a detection monitoring program. The purpose of the ground water monitoring program is to provide analytical surveillance of ground water underlying the site and evaluate whether hazardous wastes or hazardous waste constituents from the regulated units have entered the ground water under the waste management facility. This program will employ a statistical comparison of measured concentrations of each of the primary monitoring parameters (hazardous constituents) with background values established for each well. Additionally, this detection monitoring program will continue building a data base on the composition of the ground water under the Dynecol facility which can be used to evaluate any future changes in the ground water chemistry.

L-1b Waste Description

The waste types received for treatment and storage in tanks are classified as hazardous due to their corrosivity, EP toxic metals content, or association with steel finishing, electroplating, and chemical conversion coating of aluminum operations. All treatment is performed within a closed system in above-ground vessels with complete secondary containment. Waste treatment processes include waste neutralization and metals/solids removal. A variety of wastes from small quantity generators are also stored at Dynecol in the container storage area prior to transport off-site for proper disposal or treatment. As discussed in Section L-1d below, groundwater monitoring for the container storage area is not required under Rule 299.9611(3)(a). Detailed descriptions of the wastes which are stored or treated at Dynecol are outlined in Section C, Waste Characteristics.

L-1c Ground Water Monitoring Sites

Due to the sporadic occurrence of saturated sediments beneath Dynecol's facility, primarily during periods of increased precipitation or snow melt, limited ground water monitoring alternatives exist. Results of hydrogeological investigations reveal no usable aquifer within the upper sixty(60) feet of sediment beneath Dynecol's facility (Section E, Ground Water Monitoring Systems). The uppermost water-bearing sediments (perched water) beneath the facility occur within the mixed fill unit (a thin veneer of sand, gravel, and clay covering the site which is described in Section E). Although this interval is limited horizontally and vertically and is an inconsistent source of perched ground water, the mixed fill unit is the only zone in which a leak detection system (in the form of ground water monitoring wells) can be instituted.

L-1c(i) Monitoring Well Locations

The ground water monitoring system at Dynecol, Inc. is comprised of three wells screened within and just below the mixed fill unit (B-2-83, W-4-88, W-5-88) and one well (B-3-81) screened within an isolated shallow perched water interval from 16 to 19 feet below the ground surface. The locations of these wells are shown in Figure L.1. The water-bearing zone within the mixed fill unit is sandy in texture. The distribution of this sand is shown in the fence diagram (Figure E.9) in Section E, Ground Water Monitoring Systems. The shallow, perched water zone penetrated by well B-3-81 is representative of an isolated occurrence of the lacustrine sand/silt subunit (described in Section E) and is depicted in cross section A-A', Figure E.6.

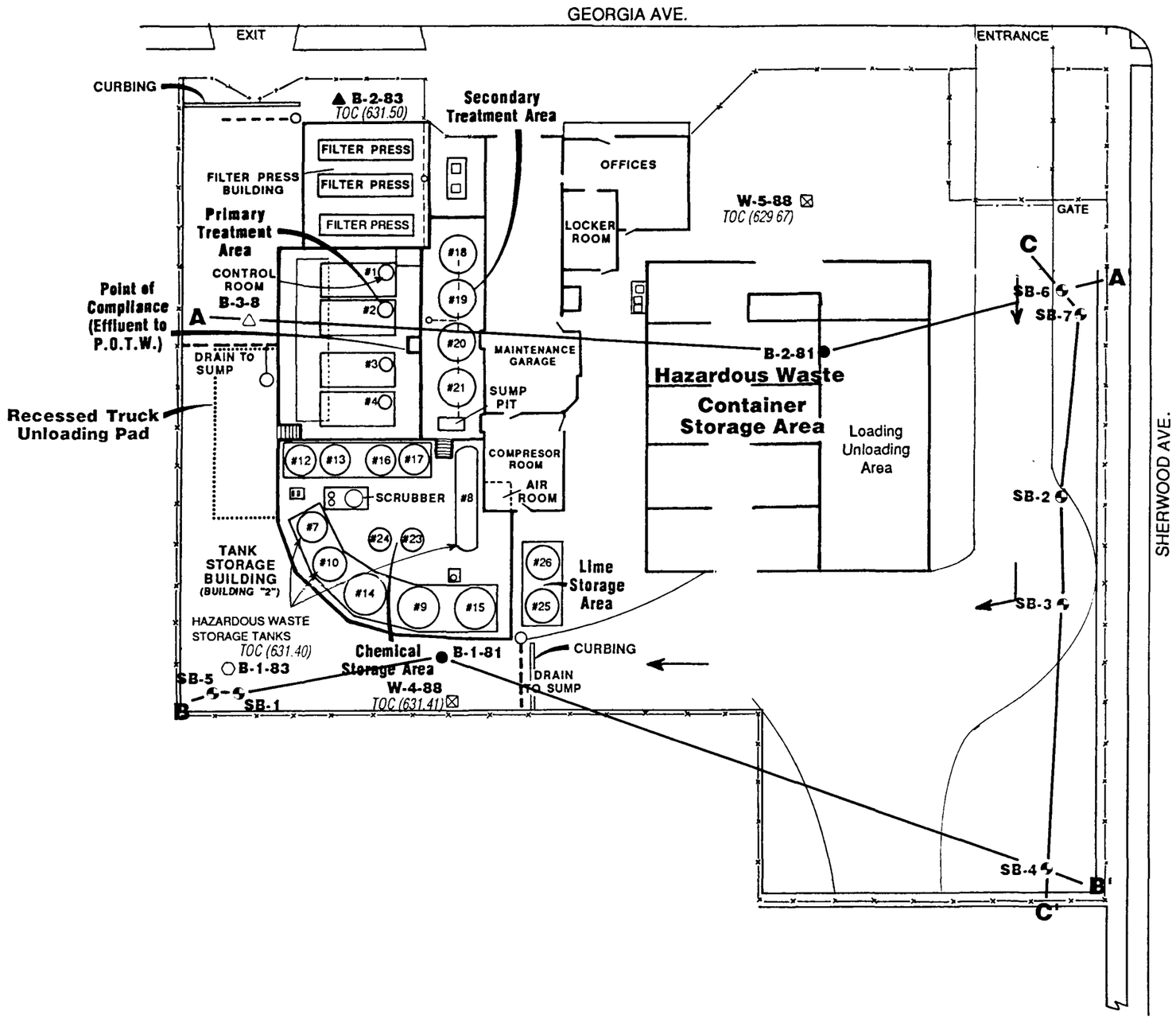
The sporadic occurrence and discontinuous nature of water-bearing sediments beneath Dynecol's facility prevent the determination of a ground water flow direction or gradient. Therefore, the positioning of the ground water monitoring system was designed to encompass the facility with monitoring wells.

L-1c(ii) Monitoring Well Construction

Monitoring wells have been constructed at Dynecol, Inc. during three separate field investigations. All wells were designed to monitor shallow, perched water intervals beneath the site. This section describes the monitoring well construction practices that were undertaken during each of the well installation periods.

L-1c(ii)(a) Monitoring Wells Constructed During Previous Investigations

Monitoring Well B-3-81 was converted to a monitoring well from soil boring B-3-81 in July, 1981. The well was constructed by a previous consultant, using two-inch diameter, PVC casing and a bronze well point with the screened interval set at a depth of 16-19 feet below grade. The well presently has a 4-inch galvanized steel surface casing (installed in



LEGEND

- ● Soil Boring (previous study)
- △ Soil Boring Converted to Monitoring Well (7/81)
- ▲ Monitoring Welll (previous study)
- ◐ Soil Boring
- ⊠ Monitoring Well
- TOC (631.40) Top of Casing Elevation in Feet (USGS)
- A—A' Cross Section Trace
- ○ Piezometer

N

0 20 40 80

Scale in Feet

Figure E.2 L.1

Site Map

Boring/ Monitoring Well Location

Dynecol, Inc.
Detroit, Michigan

November, 1989 20878

EDI Engineering & Science

the summer of 1984 to accommodate the pouring of concrete over the area) fitted with a flush mount cap. The concrete around the well head is sloped to direct surface run-off away from the well. The well is located within the existing, contained truck unloading pad (see Figure L.1).

Two additional monitoring wells (B-1-83 and B-2-83) were installed by a second consultant in May 1983. These wells were installed to an approximate depth of 8 to 9 feet below the surface. The wells consist of slotted PVC pipe encased in a protective casing and were designed to monitor the quality of the perched water zones in the fill material. A well construction sketch is located in Appendix L.1. Monitoring Well B-1-83 will be used exclusively as a piezometer to monitor the shallow ground water elevation due to contamination of this well by cement grout [Section E-4(b)(iii)].

L-1c(ii)(b) Supplemental Monitoring Wells Constructed During This Investigation

Two additional monitoring wells, W-4-88 and W-5-88, were installed in May 1988 by EDI Engineering and Science of Grand Rapids, Michigan. These wells were also designed to monitor the quality of the perched water zones in the fill material. The wells consist of two-inch diameter, 5-foot long, 7-slot, continuous wire-wound, stainless steel screens, set at a depth of 3 to 8 feet below grade. The screens are attached to PVC casing leading up to the surface where the wells are fitted with internally locking flush mount caps.

The wells were drilled with a 4-inch diameter hand auger to a depth of 8 feet below grade. This total depth is two feet below the base of the fill , slightly penetrating the lacustrine clay unit. The annular space associated with the well was backfilled with a silica sand pack around the screened interval and was sealed above the screen with granular bentonite grout. A detailed well construction sketch for Monitoring Wells W-4-88 and W-5-88 is presented in Appendix L.1.

L-1c(iii) Effective Ground Water Yield From Monitoring Wells

Monitoring wells set in the limited, inconsistent sources of shallow, perched ground water found beneath Dynecol's facility are not reliable producers of ground water samples. All of the wells are easily bailed dry and recover slowly. Well B-2-83 is seasonally dry, and no sample was obtainable from W-5-88 during well installation. These wells (B-2-83 and W-5-88) are set within sandy clay intervals which are capable of yielding only limited supplies of water during times of increased infiltration.

L-1d Waiver Of Ground Water Monitoring Requirements For Container Storage Area

All waste handling and storage activities at the container storage area at Dynecol, Inc. take place under a structure that provides protection from precipitation and run-off and the container storage facility is in compliance with Part 6 Rules of Michigan Act 64. Therefore, Dynecol requests a waiver for the ground water monitoring requirements under Rule 299.9611(3)(a) for the various hazardous wastes and hazardous waste constituents which are stored within the container storage area.

L-1e Chemical Constituents To Be Monitored

Statistical comparisons will be performed on each of the primary monitoring parameters listed in Table L.2 at each of the four monitoring wells. The primary monitoring parameters consist of the potentially hazardous constituents which are contained in concentrations in exceedance of EP toxic levels (see Table L.2), the metals in wastes generated by metal plating and steel finishing operations, and pH. These parameters will provide the most reliable and the earliest indication of a failure of the treatment and/or secondary containment systems.

In addition to the analytical evaluation of ground water beneath the site for the primary monitoring parameters, samples from the monitoring wells will be analyzed for the tracking parameters listed in Table L.2. These tracking parameters will supply a background data base to aid in the evaluation of any future change in ground water quality under the facility. The tracking parameters (major ions) are naturally occurring in ground water. Probable recharge areas to the shallow, perched ground water being monitored beneath Dynecol's facility are the unpaved areas around the site, which are the parking area to the east and the auto junkyard to the south. The surficial composition and topography of these probable recharge zones are subject to change. This may result in significant alteration of the shallow ground water chemistry by varying the rate, direction, and chemistry of infiltrating water. Additionally, any construction activity on Dynecol's property could affect the ionic composition of the shallow, perched ground water zones. Therefore, these tracking parameters (major ions) will be monitored, but not statistically evaluated.

The specific conductivity of the ground water will be analyzed as a general monitoring parameter. The specific capacity is an effective indicator parameter of the general ionic concentration of the ground water, but due to the potential variations in basic ground water chemistry is not a statistically appropriate indicator of the effects of the waste treatment facility on the shallow, perched ground water.

L-1f Sampling Frequency

Ground water samples will be collected quarterly from each of the four monitoring wells. Each of these ground water samples will be analyzed for the primary, tracking, and

TABLE L.2

CHEMICAL PARAMETERS TO BE MONITORED

Primary Monitoring Parameters	Expected Detection Limit (mg/L)*
Aluminum (Al)	0.25
Arsenic (As)	0.002
Barium (Ba)	0.10
Cadmium (Cd)	0.01
Chromium (Cr)	0.05
Lead (Pb)	0.05
Mercury (Hg)	0.0005
Nickel (Ni)	0.05
Selenium (Se)	0.002
Silver (Ag)	0.01
Zinc (Zn)	0.02
pH	0.05 s.u.
Tracking Parameters	
Calcium (Ca^{++})	0.01
Sodium (Na^{+})	0.1
Magnesium (Mg^{++})	0.1
Potassium (K^{+})	0.1
Sulfates ($SO_4^{=}$)	5.0
Bicarbonate alkalinity (HCO_3^{-})	2.0
Chloride (Cl^{-})	2.0
Nitrate (NO_3^{-})	0.1
General Parameters	
Specific conductivity	5 umhos/cm

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* Matrix interference or insufficient sample volume may cause the detection limit to increase.

general monitoring parameters listed in Table L.2. During the first year of the permit four replicate samples will be collected quarterly from each well and analyzed for each of the primary monitoring parameters. and individual samples will be collected from each well and analyzed for the tracking parameters and the general parameters. This monitoring will develop a background data set of 16 analyses on each of the primary monitoring parameters in each well. After the first year of the permit, individual samples will be collected quarterly from each well and analyzed for the primary, tracking, and general parameters.

L-1g Sample Collection

The procedures used to sample ground water can control the quality of the data produced by a monitoring program. The sample collection procedures described in this section are designed to generate samples and data which are representative of the actual conditions which exist beneath the site at the time of the sampling. These procedures are also designed to supply sufficient documentation of the sample collection procedures to allow future users of the data to re-evaluate the sample collection procedures. This section presents the methods which will be used to collect the water samples and the field data, and the methods which will be used to document the actual methods used in the field.

L-1g(i) Measurement of Static Water Level

Static water levels will be measured each time a well is sampled. The distance from the top of the well casing (a fixed, surveyed datum) to the static water level will be measured to within 0.01 foot with a conductivity sensor well probe or with a chalked steel tape. The elevation of the static water level will then be calculated by subtracting the distance from the top of the well casing to the static water level from the elevation of the fixed datum.

At each well, the top-of-casing elevations will be referenced to the National Geodetic Vertical Datum of 1929 (USGS datum). The elevations of the tops of the casings on the current monitoring wells are included in the well and soil boring summary in Table E.1 and on the field data entry forms in Appendix L.2.

Static water level measurements will be recorded immediately following a 2 to 3 minute venting period after opening the well. No purging activities shall be performed prior to venting of the well and the measurement of static water levels. The device used to measure the water levels will be washed with distilled water between wells. The static water level elevation, referenced to USGS datum, will be reported for each well for all of the quarterly sampling events.

L-1g(ii) Sampling Equipment

Ground water samples will be obtained from monitoring wells with either a stainless steel or Teflon bailer and a new length of polypropylene rope. Monitoring Wells B-2-83 and B-3-81 will accommodate a two-inch diameter bailer, and Monitoring Wells W-4-88 and

W-5-88 will require the use of a one-inch diameter bailer. It may be possible to utilize a peristaltic pump with Teflon tubing to purge and sample Monitoring Well W-4-88, if well recovery permits.

The stainless steel and Teflon sampling equipment described above are compatible with the ground water chemistry and are capable of supplying a representative sample of the ground water within the shallow, perched water zones at the site. The heavy metal or major ion composition of the ground water will not be altered by the sampling equipment, provided that the equipment is properly cleaned and utilized during sampling.

L-1g(iii) Well Evacuation

Monitoring wells will be purged utilizing the sampling equipment described above. The goal of the well purging activity is to remove existing stagnant water and replace it with representative formation water prior to sampling. The purge volume (typically three casing volumes) is calculated using the following equation:

$$V = 3\ r^2\ [(\text{well depth in feet}) - (\text{depth to water in feet})]\ 7.48\ \text{gal/ft}^3$$

where,

V = purge volume (gallons)
= 3.1416
r = radius of well (feet)

Past experience suggests none of the wells, with the possible exception of Monitoring Well W-4-88, are capable of yielding three casing volumes of ground water before becoming dry. Therefore, the monitoring wells will be bailed dry and allowed to recover until sufficient sample volume has reentered the well. Purge water will be collected in a bucket and discarded in one of the sump drains which discharges to the treatment system.

L-g1(iv) Sample Withdrawal and Handling

Samples will be withdrawn from each of the monitoring wells using the sampling equipment previously described. Ground water removed from a well will be placed directly into the sample bottle. The transfer to the sample bottle will be performed as gently as possible to reduce the introduction of air to the sample. Aeration introduced by sampling devices and sample handling can promote oxidation and subsequent precipitation of iron compounds which in turn can affect the concentration of the primary monitoring parameters zinc and arsenic (Stolzenburg and Nichols, 1986).

The collection of duplicate sample sets is not feasible due to insufficient yield of the required volume of ground water for duplicate analysis. The detection limit of the analysis increases whenever there is insufficient sample volume to analyze.

All ground water samples to be analyzed for dissolved metals will be field filtered at the time of sampling, and will then be preserved with dilute nitric acid. A peristaltic pump

with an in-line filter will be utilized, if possible, to reduce the exposure of the sample to air during filtration.

Additional ground water samples will be collected for the in-field analysis of unstable parameters, such as pH. These samples will be collected and analyzed after the samples for laboratory analyses have been procured. The probes used for in-field analyses will not be permitted to contact the ground water samples previously collected for laboratory analyses.

L-1g(v) Decontamination Procedures

Sampling equipment will be washed with soap and water, rinsed with tap water, and then rinsed with distilled water between each consecutive sampling event. A new length of polypropylene rope will be attached to the bailer before each sampling event to avoid cross contamination between wells.

L-1g(vi) Field Analyses

The pH and specific conductivity of the ground water samples will be measured in the field immediately after collection. Standard operating procedures for these field analyses are presented in Appendix L.3. A separate sample will be collected for these analyses to avoid possible contamination of the laboratory samples by the probes. The pH meter will be calibrated every four hours and will be checked with a pH 7.0 buffer before each measurement. The specific conductivity meter does not require calibration in the field. The temperature of each sample will be measured and recorded at the time of the specific conductivity measurement. This temperature is used to correct the specific conductivity to a standard temperature and only represents the temperature of the sample when the conductivity was measured. Since the temperature is not representative of the ground water at the well screen, it will not be included in summaries of the data.

L-1g(vii) Sample Blanks

During each monitoring event, one trip blank will be analyzed for the primary monitoring parameters to ensure that sample contamination from the sample bottles, shipping methods, or laboratory analyses has not occurred. When the sample bottles are prepared prior to shipment to the field, one complete set of sample bottles will be selected, filled with deionized water, and labeled "trip blank". The trip blank will be transported to the field and sent to the laboratory for analyses along with the other sample bottles. In the laboratory, the trip blank will be analyzed for the same parameters as the samples. The presence of any contaminant in the trip blank will be noted and attributed to sample contamination. This data will not be used to correct the concentrations in the other samples.

One field/equipment blank will be analyzed for each parameter to evaluate possible sample contamination from the sampling equipment. The blank will be obtained by pouring distilled water through the sampling equipment (bailer or possibly a peristaltic pump) prior to sampling or following a decontamination event.

L-1g(viii) Documentation of Sample Collection

The purpose of this detection monitoring program is to generate data on the ground water under Dynecol's facility. The data will be analyzed to evaluate whether the waste management area has impacted ground water quality. Therefore, the sampling equipment and procedures described in the previous sections are designed to generate data which are representative of the ground water under the waste management area.

To properly analyze this data to evaluate any possible effects from the regulated units, the actual procedures which were used in the field to collect the samples must be documented so that future users of the data can review and re-evaluate any possible bias introduced by the sampling procedures. This section describes the documentation procedures which will be used to allow data users to fully evaluate any bias in the sampling methods.

Customized field data entry forms will be used for each well to assure that the sampling procedures are thoroughly documented. The initial field data entry forms are included in Appendix L.2. These forms are designed to provide thorough documentation and to aid in the efficient performance of the sampling event. For instance, the proper equations and adequate space are provided on these forms to calculate purge volumes from the static water levels, providing both documentation and a convenient worksheet in the field.

No monitoring program design can foresee all of the modifications which are required by changing field conditions, and field samplers may be confronted with field conditions which make it impossible to follow the designed sample collection procedures. If this occurs, the field sampler will note these changes on the field data entry form so that the forms always represent the actual procedures used during the sample collection. When the field sampler completes a sampling event, all of the information on the field data entry forms will be filled in and any deviations from the designed sample collection procedures will be noted. The field sampler will then sign the forms, and the forms will be kept as documentation of the actual sampling procedures used.

L-1h Sample Preservation and Shipment

Complete and unequivocal preservation of samples is practically impossible. Preservation techniques are used to retard the chemical and biological changes that may occur after a sample is taken from its parent source. Samples collected in this detection

monitoring program will immediately be placed in coolers with Stay-Cold packs and then transported to the appropriate analytical laboratory, where they will be stored at a temperature of 4°C until analysis. Ground water samples will be preserved according to the Friday, October 26, 1984 Federal Register, Volume 49,Number 209, page 43260. These methods are summarized in Table L.3.

L-1i Chain-Of Custody Program

A chain-of-custody program will be established which documents the possession and handling of individual samples, from sample collection in the field through laboratory analysis of the sample. This program will include sample labels which identify the sample, the field data entry forms which record data about the collection of each sample (see previous discussion), a chain-of-custody record to track the possession of the sample after it has been collected, and laboratory logbooks which contain information about the analyses of the sample in the laboratory. The chain-of-custody program which is used at EDI Engineering & Science is presented in Appendix L.4. The chain-of-custody program used by the contract laboratory performing these analyses must be at least as thorough.

L-1j Analytical Procedures

The analytical procedures which will be used for this program are listed in Table L.3. These analytical procedures include the method detection limits which will be used in reporting the data. Expected detection limits are also listed in Table L.2.

The quality assurance/quality control program for the laboratory at EDI Engineering & Science is presented in Appendix L.4. The quality assurance/quality control program for the contract laboratory which performs these analyses must be at least as thorough.

TABLE L.3

SAMPLE PRESERVATION AND ANALYTICAL PROCEDURES

Measurement	Container[a]	Preservative[b]	Holding Time[c]	Sample Size (ml)	Reference
Mercury, arsenic selenium	P,G 0.05% $K_2Cr_2O_7$	HNO_3 to pH<2	28 days	100(for all 3)	303E; F(1)
Metals[d], except above	P,G	HNO_3 to pH<2	6 months	100 each 303 A-E (1)	200-289 (2)
Chloride	P,G	None required	28 days	50	407 A;B;D(1)
Nitrate	P,G	Cool, 4°C	48 hours	100	418 C; F (1)
Bicarbonate alkalinity	P,G	Cool, 4°C	14 days	250	403 (1)
Sulfate	P,G	Cool, 4°C	28 days	50	426 A; C
Specific conductance	P,G	Cool, 4°C	28 days	100	205 (1)
Hydrogen ion (pH)	P,G	Determine on site	2 hours	25	423 (1)

a Polyethylene (P) or glass (G).

b Sample preservation should be performed immediately upon sample collection. For composite samples, each aliquot should be preserved at the time of collection. When use of an automatic sampler makes it impossible to preserve each aliquot, then samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.

c Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods only if the permitted, or monitoring laboratory, has data on file to show that the specific types of samples under study are stable for the longer time. Some samples may not be stable for the maximum time period given in the table. A permitted, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.

d Samples should be filtered immediately on site before adding preservative for dissolved metals.

Source: Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. 40 CFR, Part 136, October 26, 1984.

Method References

) "Standard Methods for the Examination of Water and Wastewater", 15th edition; APHA, AWWA, QWPCF, 1980.
.) "Methods for Chemical Analysis of Water and Wastes", USEPA-600/4-79-020; revised March, 1982.

L-1k. Data Analysis and Statistical Evaluation

The concentrations of the tracking parameters in the ground water will be evaluated to determine if there is evidence of contamination [40 CFR 264.98(f)]. Since the monitoring wells are all screened in low-permeable sediments where the ground water flow direction cannot be consistently defined, the analyses from each monitoring well will be compared to historical, background data from that well. The background data will consist of the analyses of sixteen samples collected over the first year of the permit as described in Section L-1f. After the background data is collected, the data from each quarterly monitoring event will be evaluated as a part of the monitoring period.

A prediction interval will be used to screen the ground water data for potential evidence of contamination. Consistent with 40 CFR 264.97(h), the prediction interval procedure described below will be conducted separately for each hazardous constituent in each well. This procedure will develop an interval based upon the background data which has a defined probability that the next observation from the same population will fall within the interval. If an observation falls outside the interval, it is an indication that the concentration of the parameter in the well has changed or that the observation is a random occurrence outside the prediction interval which is from the original population. To determine whether statistically significant evidence of contamination exists, the well will be resampled as described in Section L-1k(ii).

L-1k(i) Prediction Interval Procedures

The background data on each parameter at each well will be used to determine a prediction interval with a 0.95 probability of containing the next measurement from the same population. Consistent with the preamble to the final rule for the "Statistical Methods for Evaluating Ground Water Monitoring Data from Hazardous Waste Facilities" (53 FR 39722; Tuesday, October 11, 1988), the data will be assumed to be normally distributed since there is insufficient data available to demonstrate that the data are inappropriate for a normal test. The prediction intervals will be calculated individually for each parameter at each well using a t-distribution as follows:

Dissolved Metals

Lower limit = 0
Upper limit = $x. + t\,(s/[n]^{0.5})$

pH

Lower limit = $x. - t\,(s/[n]^{0.5})$
Upper limit = $x. + t\,(s/[n]^{0.5})$

Where:

$x.$ = mean of background data
= $\text{sum}_i\ (x_i)/n$
x_i = background observations of one tracking parameter at one well
n = number of background observations
s = standard deviation of background data
= $[\text{sum}_i\ (x_i - x.)^2/(n-1)]^{0.5}$
t = t statistic with a 0.05 level of significance

The t values are listed in Table L.4. The t value for a one-sided prediction interval will be used for the trace metal prediction intervals, and the t value for a two-sided prediction interval will be used for pH prediction intervals.

If a parameter is analyzed to be not detectable at a given limit of detection in one or more of the samples, then numerical data must be substituted for that measurement to perform the statistical test. In this evaluation the non-detect analyses will be replaced by alternating values of zero and the detection value prior to performing the statistical analysis. This method is recommended by the Michigan Department of Natural Resources, Waste Management Division in the "Draft Guidance for Act 64/RCRA Clean Closure", dated April 30, 1987.

Individual prediction intervals will be constructed for each of the ten primary monitoring parameters at each of the four monitoring wells so that 40 individual prediction intervals will be used each quarter. Each individual prediction interval will be constructed at a 0.05 level of significance so that each interval will have a 95 percent probability of containing the next observation if the data is normally distributed and is from the same population. This is equivalent to a 13 percent probability that all 40 observations taken during a quarter will be inside their respective intervals:

$$P\ [40 \text{ observations in intervals}] = (0.95)^{40} = 0.13$$

This is also equivalent to a 0.03 percent probability that all 160 observations taken during a year will be inside their respective intervals:

$$P\ [160 \text{ observations in intervals}] = (0.95)^{160} = 0.0003$$

Since there is only a very small chance that all of the observations taken during a quarter or a year will lie within the prediction intervals, confirmational sampling will be used to determine if observations which are outside of the prediction intervals are actually different than the background population. This procedure will use the prediction

TABLE L.4

TABULATED T VALUES

DEGREES OF FREEDOM	0.05 SIGNIFICANCE ONE-SIDED	TWO-SIDED
1	6.314	12.706
2	2.920	4.303
3	2.353	3.182
4	2.132	2.776
5	2.015	2.571
6	1.943	2.447
7	1.895	2.365
8	1.860	2.306
9	1.833	2.262
10	1.812	2.228
11	1.796	2.201
12	1.782	2.179
13	1.771	2.160
14	1.761	2.145
15	1.753	2.131
16	1.746	2.120
17	1.740	2.110
18	1.734	2.101
19	1.729	2.093
20	1.725	2.086
21	1.721	2.080
22	1.717	2.074
23	1.714	2.069
24	1.711	2.064
25	1.708	2.060
26	1.706	2.056
27	1.703	2.052
28	1.701	2.048
29	1.699	2.045
30	1.697	2.042
40	1.684	2.021
60	1.671	2.000
120	1.658	1.980
00	1.645	1.960

intervals as a screening tool to determine if there is potential evidence of contamination. When an observation lies outside of its prediction interval, the well will be resampled for that parameter as described in Section L-1k(ii).

Though a 0.05 level of significance for each individual prediction interval leads to a significantly higher overall level of significance (a greater chance of unnecessary resampling), when the prediction interval is combined with the confirmational sampling in Section L-1k(ii) the overall protection against making a Type I error is reduced to an acceptable level. In addition, using the individual prediction intervals at 0.05 levels of significance decreases the chance of making a Type II error when actual differences exist. Even when all of the background observations are below the detection limit, the prediction interval (upper limit) will be just over 1.5 times the detection limit.

L-1h(ii) Confirmational Sampling

When the analysis of a primary monitoring parameter at a well lies outside the prediction interval described in L-1k(i), the well will be resampled in triplicate and each of the three samples will be analyzed for the specific primary monitoring parameter. The monitoring well will be purged of an additional one casing volume, or until dry, between each replicate sample. These three analyses will be combined with the original sample and statistically compared to the background sample using Cochrans Approximation to the Behrens-Fisher Student's t-Test (40 CFR 264 Appendix IV) at a 0.05 level of significance. Values for t_b and t_m will be taken from Table L.4, using the one-sided values for the trace metals and the two-sided values for pH.

If the t-test indicates that there is a significant difference between the current data and the background data, then the Regional Administrator will be notified, and all four monitoring wells will be sampled and analyzed for the parameters in 40 CFR 264 Appendix IX as specified in 40 CFR 264.98(g).

If a parameter is analyzed to be not detectable at a given limit of detection in one or more of the samples, then numerical data must be substituted for that measurement to perform the statistical test. In this evaluation the non-detect analyses will be replaced by alternating values of zero and the detection value prior to performing the statistical analysis. This method is recommended by the Michigan Department of Natural Resources, Waste Management Division in the "Draft Guidance for Act 64/RCRA Clean Closure", dated April 30, 1987.

L-1l. Regulatory Considerations

This ground water monitoring plan is submitted to satisfy the requirements of Michigan Act 64, Rule 299.9612, and 40 CFR 264 Subpart F. In light of the lack of a usable aquifer beneath the facility and the difficulty in obtaining routine samples from the

uppermost "aquifer", Dynecol reserves the option of applying for a waiver of ground water monitoring requirements after two years of monitoring without an exceedance. This waiver would be contingent upon constructing a roof over the truck unloading pad (Figure L.1), thus protecting the area from precipitation and run-off in accordance with Michigan Act 64 [Rule 299.9611(3)(a)].

L-1m. Reference For Section L-1

Federal Register, October 25,;1985. Vol 49,#209,p. 43260.

Stolzenburg, T.R., and D.G. Nichols, 1986 "Effects of Filtration Method and Sampling Devices on Inorganic Chemistry of Sampled Well Water" in: Proceedings of the Sixth National Symposium and Exposition on Aquifer Restoration and Ground Water Monitoring. National Water Well Association, Dublin, Ohio, p. 216-234.

L-2 SOIL MONITORING

All areas of the Dynecol facility where hazardous wastes are stored, treated, or transported are paved, thus protecting the surface soils from contamination in the event of a release. Additionally, the Ground Water Monitoring Plan described in Section L-1 monitors the shallow perched ground water quality. Any hazardous waste that may be released (and any subsequent failure of the secondary containment system) would be readily detected by the ground water monitoring system. Therefore, Dynecol requests a waiver for soil monitoring as referenced by Act 64, Rule 611 (2)(c).

A program for soil sampling to be implemented at the time of closure is outlined in Section I. No additional soil sampling will take place providing there are no visible cracks in the containment areas in the interim.

L-3 AMBIENT AIR MONITORING PROGRAM

l-3a Introduction

The following ambient air monitoring program has been developed for the Dynecol facility to detect the presence of any air contamination by components which may originate from the activities at the site. The purpose of the ambient air monitoring program is to determine the facility's contribution to atmospheric concentrations of particulates, heavy metals, and organics.

Dynecol, Inc. is currently designed and licensed to store and treat hazardous wastes in tanks. The waste treatment process undertaken at the Dynecol facility includes primary treatment, secondary treatment, and solids dewatering. The type of wastes received for treatment are classified as hazardous due to their corrosivity, EP-toxic metals content, or

association with steel finishing, electroplating, and chemical conversion coating of aluminum operations.

A proposed facility expansion also includes a hazardous waste container storage facility located adjacent to the treatment building (east of the current treatment facility). This building meets the minimum setback requirement of 50 feet from the property lines (see Drawing C.2). The storage container facility will receive, store, bulk and transfer containers of hazardous waste.

L-3b Monitoring Parameters

L-3b(i) Existing Facility

Currently Dynecol, Inc. is conducting a quarterly ambient monitoring program at two sites (upwind and downwind) for total suspended particulates, chlorides, nitrates, and sulfates.

The baseline monitoring program for the existing facility consists of monitoring for total suspended particulate and the metals listed in Table L.5.

L-3b(ii) Proposed Container Storage Facility

The proposed container storage facility will be capable of handling many different waste types including characteristic or list wastes. These wastes may be organic and/or inorganic in nature. The monitoring program for the proposed facility, when built and operated, will consist of monitoring for the organic compounds listed in Table L.6.

L-3c Samplers and Locations

L-3c(i) Existing Facility

The current monitoring program uses two high-volume samplers (northeast corner and southwest corner of property). A third sampling station would be placed in the vicinity of the northeast corner and act as a second downwind station. The final site selection will be determined by mutual agreement with Dynecol, Michigan Department of Natural Resources (MDNR), and Wayne County Health Department, Air Quality Division (WCHD, AQD). All sampling sites will be located within the Dynecol property limits, and the data obtained will be considered to be representative of the ambient air quality within the vicinity of the Dynecol facility.

L-3c(ii) Proposed Facility

The monitoring stations for the storage container facility will be consistent with those being used for the existing facility ambient monitoring.

TABLE L.5

MONITORING PARAMETERS FOR THE EXISTING FACILITY

PARAMETERS	EXPECTED DETECTION LIMIT (UG/M^3)
Arsenic (As)	0.30
Cadmium (Cd)	0.30
Chromium (Cr)	1.0
Copper (cu)	0.42
Lead (Pb)	1.0
Nickel (Ni)	3.03
Zinc (Zn)	1.00
Particulate	1.0

TABLE L.6

MONITORING PARAMETERS FOR THE PROPOSED FACILITY

MONITORING PARAMETERS	EXPECTED DETECTION LIMIT (UG/LM^3)
Benzene	0.01
Carbon Tetrachloride	0.01
Chlorobenzene	1.00
Chloroform	0.01
Ethylbenzene	1.00
Methylene Chloride	0.01
Tetrachloroethane	1.00
1,1,1-Trichloroethane	1.00
1,1,2-Trichloroethane	1.00
Trichloroethylene	0.01
Toluene	1.0
Xylene	1.0
1,1,2,2 Tetrachloroethane	0.01
1,1,1,2 Tetrachloroethane	0.01

L-3c(iii) General

The location of the samplers will be placed in an area that has an unobstructed air flow from the direction of the source. The distance from the nearest obstruction and the sampler will be no closer than two times the height of the obstruction, where possible. All samplers will be located at least 20 meters from trees, if possible. The intake probe of the individual samplers will be placed 3 to 5 meters above ground level.

Site and sensor information will be completed for each site and submitted to the proper agencies prior to the start of the sampling program. Upon changes to the site or sensor information, updated forms will be submitted within 30 days of the change.

L-3d Sampling Schedule

L-3d(i) Existing Facility

The sampling schedule for the high volume sampling around the existing facility will be every 6th day to coincide with the U.S. EPA national sampling schedule.

L-3d(ii) Proposed Facility

The sampling schedule for the organic sampling around the proposed container storage facility will consist of every 6th day, as above, during all months except June, July, and August. During these three months the organic sampling will increase to every third day.

L-3d(iii) General

Upon completion of the first year of monitoring, Dynecol may ask that the three-day frequency for the organics during the summer months be deleted, based on the results of the previous year's data. This request will be directed to both the MDNR and Wayne County.

L-3e Sampling Methods

L-3e(i) Total Suspended Particulates and Metals

Each sampling site will contain one General Metal Works high-volume sampling system (Model 2000 H). These samplers meet the requirements specified in 40 CFR, Part 50. All samplers will be equipped with continuous flow recorders as a measure of sampling documentation. Each sampler will be placed on an elevated platform at least two meters above the ground level.

The high-volume samplers will be operated according to the procedures outlined in 40 CFR Part 50 and Part 58, and the "Quality Assurance Handbook for Air Pollution

Measurement Systems", Volumes I and II. The samplers will operate on a 24-hour sampling period each sampling day (midnight to midnight).

Calibrations will be performed on each sampler before the sampling program begins and after every 500 hours of sampling operation or at least three times per year.

L-3e(ii) Organics

Each sampling site will contain one organic vapor sampling system consisting of a low-flow personal sampling pump and combination carbo trap/carbo sieve tube as collection media. One of the downwind sites will have two organic sampling systems for the purpose of precision. The organic sampling systems will be placed on the high-volume platforms.

The sampling pumps will operate on the same sampling schedule as the high-volume samplers except during the months of June, July, and August, in which they will operate every third day. The samplers will operate for a 24-hour plus 30-minute time period during each sampling episode.

L-3f Analytical Methods

L-3f(i) Total Suspended Particulates

The total weight gain of each filter will be determined using a laboratory analytical balance accurate to 0.1 milligrams. The filters will be desiccated and weighed to a constant weight.

L-3f(ii) Metals

Upon completion of measurements for weight gain each exposed filter will be analyzed for the metals listed in Section 2.1. The analysis will be in accordance with the guidelines of 40 CFR, Part 50, Appendix G. The analysis will be performed using Inductively Coupled Plasma Atomic Emission Spectroscopy.

L-3f(iii) Organics

The collected carbo trap/carbo sieve tubes will be capped and placed on ice until analysis. Analysis will take place within 1-2 weeks after the samples are collected.

The carbo trap/carbo sieve media will be thermal desorped and analyzed using a gas chromatograph (GC-FIC).

L-3g QC/QA Procedures

L-3g(i) Calibrations

The high-volume samplers will be calibrated after every 500 hours of operation or at least three times per year.

The organic sampling pumps will be calibrated for flow rate before and after every sampling episode.

L-3g(ii) Audits

The high-volume samplers will be audited once per year in accordance with 40 CFR, Part 58, Appendix B. The device used to audit the samplers will be different from that used to calibrate the samplers.

L-3g(iii) Precision

Precision checks will be in accordance with 40 CFR, Part 58, Appendix B. One of the downwind sites will be designated as the precision site. The high-volume filter from this site will be split each sampling episode to obtain the precision sample for the metal analysis.

A second organic sampling system will be placed at this site also and will be operated according to the same schedule and procedures as the designated site sampler.

L-3g(iv) Accuracy

Accuracy checks for the metals will be conducted by depositing a known amount of the metal solution on an unexposed filter strip and analyzing it using the same procedures as for the field samples.

Accuracy checks for the organics will be accomplished by spiking blank carbo trap/carbo sieve tubes with known quantities of organic solutions and determining the desorption efficiency.

L-3h Meteorological Conditions

The wind speed and wind direction conditions during each sampling period will be collected from the meteorological station at Detroit City Airport.

L-3i Reporting Requirements

L-3i(i) Monitoring Data

All monitoring data (including meteorological data) will be reported to the MDNR and Wayne County within 30 days after the end of the month that the data were collected. The precision and accuracy data will be submitted in the AIRS format.

L-3i(ii) Precision and Accuracy Data

All precision and accuracy results will be reported to the MDNR and Wayne County within 30 days after the end of the quarter that the data were collected. The precision and accuracy data will be submitted in the AIRS format.

L-3j Program Review and Update

Upon completion of one year of sampling, Dynecol may prepare a summary of the results and request a relaxation of the analytical testing program. The relaxation of test parameters will be based in part upon non-detection of monitored pollutants. This determination will be made by Wayne County Air Pollution Control Officials and the MDNR.

L-4 EFFLUENT MONITORING PLAN

An effluent monitoring program has been developed that consists of the following elements:

- effluent sample collection procedures (machine collected composite samples); and
- effluent sample analytical procedures.

L-4a Effluent Sample Collection Procedures (Machine Collected Composite Samples)

Twenty-four hour composite samples will be collected using automatic sampling equipment installed in a "control manhole". This manhole provides access to all effluent discharged to the public sewer system from the waste processing operations at the facility.

Composite samples will be collected using ISCO (or equivalent) automatic sampling equipment. The sampling equipment consists of:

- peristaltic pump;
- pump controller, as necessary to control the frequency of pump operation and the volume of sample delivered with each pumping cycle;

- polyethylene tubing from the point of sample intake to the pump suction port, and from the pump discharge to the composite sample container; and
- polyethylene composite sample container with a five-gallon capacity.

During the 24-hour composite sampling period, four discrete grab samples will be collected per hour, for a total of 96 discrete grab samples per day. Each hourly composite sample, consisting of four discrete grab samples, is 150 milliliters in volume. At the end of each 24-hour sampling period, the composite sample will be thoroughly and completely mixed in order to suspend any solids which may have settled in the container. One thousand (1,000) milliliters of the homogenized composite sample will be transferred into a glass or polyethylene container for analyses of heavy metals (As, Dd, Cu, Pb, Hg, Ni, Ag, and Zn) and pH. Sampling equipment, tubing, and any sample container will be thoroughly washed with 1 + 1 nitric acid and rinsed with distilled water prior to reuse.

L-4b Analytical Procedures - Effluent Analyses

Composite samples of effluent wastewater, as discharged to the Detroit Water and Sewerage Department sewage system, and at a frequency equal to or greater than required by the discharge permit, will be analyzed by (or another equivalent laboratory):

Analytic and Biological Laboratories, Inc.
29079 Ford Road
Garden City, MI 48135
313-422-7474
Francis B. McLaughlin, Director

The analytical methods used by A & B Labs include:

- for heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Ag, and Zn), Inductively Coupled Plasma Atomic Emission Spectrophotometery per "Methods for Trace Elements Analyses" October, 1979; Environmental Monitoring and Support Laboratory; Cincinnati, Ohio 45628; and
- for pH, Method #150.2 per "Methods of Analyses of Waste and Wastewater", E.P.A. Publication #600/4-79-020

SECTION M

OTHER FEDERAL LAWS

At this time we believe this facility is in compliance with the following Federal laws: the Wild and Scenic Rivers Act (16 U.S.C 1273 et seq. Section 7); National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq. Section 106 and 36 CFR Part 800); Endangered Species Act (16 U.S.C. 1531 et seq. Section 7 and 50 CFR Part 402); Coastal Zone Management Act (16 U.S.C. 1451 et seq. Section 307(c) and 15 CFR Part 930); and Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.). Information will be provided in accordance with the requirements of 40 CFR Part 270.14(b)(20) at the request of the EPA Region V Office or the Michigan Department of Natural Resources.

SECTION N

RECORDKEEPING PROCEDURES

This section summarizes the recordkeeping procedures that are implemented by Dynecol, Inc. as required under 40 CFR 264.73 and Michigan Act 64 Rule 299.9609. All records are maintained by Dynecol for a minimum of three years as specified by the regulations.

N-1 INTRODUCTION

All records and plans required by 40 CFR 264.73 and Michigan Act 64, Rule 299.9609, as well as any other records required under the facility's permit or license are retained at the facility and are available, at reasonable times, for inspection by designated representatives of the U.S.EPA and MDNR. All records are retained for a period of at least three years or longer as specified by the regulations. The following records are retained at the facility.

N-2 GENERAL FACILITY RECORDS

- Daily operating record which includes, for each waste received by Dynecol, a description, the quantity, the method and date of treatment or storage, and the location of the waste in the facility cross-referenced to specific manifest document numbers. (See Appendix N-1 for copies of various reporting forms.)
- Records and results of analyses of wastes from each generator, including initial analyses and any follow-up analyses.
- RCRA Part A application, plus any modifications.
- Notice of EPA ID number
- Inspection reports and any results of inspections including all inspection reports prepared routinely by plant employees (see Section F, Procedures to Prevent Hazards) and all inspection reports performed by outside inspection or testing services.
- Results of any trial tests performed.
- Analytical results of daily effluent monitoring.
- Analytical results of quarterly ambient air monitoring.
- Analytical results of quarterly ground water monitoring
- Copies of the Procedures to Prevent Hazards (Section F)
- Copies of the Contingency Plan (Section G) plus a summary of all incidents that required the implementation of the contingency plan.
- Copy of arrangements and coordination agreements with local authorities regarding the Contingency Plan.

- Copies of the written training program required of the Contingency Plan
- Personnel training records including the job titles for each position having hazardous waste management responsibilities; the name of each employee filling each job title; and the written job description for each hazardous waste management position listed, as outlined in Section H.
- Documentation that the required training has been successfully completed by each employee with hazardous waste management responsibilities.
- Copies of any written reports required to be submitted to the EPA or the MDNR after incidents occur at the facility which require implementation of the Contingency plan per 40 CFR 265.56(j).
- The facility copy of the manifests for each hazardous waste that has been received by Dynecol.
- Notices to the U.S.EPA and MDNR of arrangements to receive waste from foreign sources per 40 CFR 265.12.
- Copies of the Closure Plan (Section I).
- Closure cost estimates and any annual adjustments.
- Any revisions to the Closure Plan and closure cost estimates.
- Certificate of liability insurance as required by the U.S.EPA and MDNR.
- Copy of each biennial report as submitted to the U.S.EPA.
- The Hazardous Waste Facility Operating License as issued by the MDNR and any modifications to the permit.
- Permits which may be required.
- Copies of any reports, data, information, etc., requested by and submitted to, any federal, state, county, city agency having authority.
- Un-manifested waste reports.
- The detection of ground water contaminants.
- Records of waste shipments rejected.

- Land disposal records.
- Generator Records (regarding waste material shipped from this facility):
  - Copy of test results, analyses and any other determinations made on the waste shipped off-site.
  - Generator manifest copy signed by the initial transporter.
  - Generator manifest copy signed by and returned by the disposal facility.
  - Exception reports, as necessary, per 40 CFR 262.42.
- Transporter records:
  - Transporter copy of the manifest signed by the generator, the transporter, and the receiving facility.
  - Transporter copy of the manifest for hazardous waste shipped out of the U.S.A. which indicates such.

N-3 LAND DISPOSAL RESTRICTION RECORDKEEPING REQUIREMENTS

All facilities which receive or generate restricted wastes, including transfer stations, are subject to land disposal restriction recordkeeping requirements. Generators are required to provide Dynecol with a written notice that describes the appropriate treatment standards set forth in 40 CFR 268 Subpart D, a certification stating that the applicable soft hammer provisions in 40 CFR 268.33, or a waste meets the applicable treatment standards, or prohibition levels in 40 CFR 260 Subpart D or 40 CFR 268.32 and RCRA 3004(d), respectively. These recordkeeping requirements are discussed further in Section C.

For wastes or treatment residues which will be further managed at a different treatment, storage, or disposal facility, Dynecol will comply with the same generator notice and certification requirements.

Dynecol will maintain copies of all generator notices and certification and copies of notices and certication sent by Dynecol to other facilities for a minimum of five years.

SECTION O

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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature Frank J. Biermann

Name Frank J. Biermann

Title President

Date 12-5-89

CERTIFICATION OF CAPABILITY

I certify to the best of my knowledge and belief that the treatment and storage facilities at Dynecol, Inc. in Detroit, Michigan, are capable of storing hazardous waste materials as specified in this application in the manner described within this application. The facilities included within this certification are:

1) Treatment System and Storage Tanks
2) Container Storage Facility -Engineering Design

This certification is based upon my knowledge of these facilities and my understanding of Act 64 requirements. This certification does not include certification of construction standards for the Container Storage Facility as per the design plans and specifications.

Signature: Frank E. Remsburg

Name: Frank E. Remsburg, III

Firm: WW Engineering and Science

Date: 12/5/89

Registration # 28157

State: Michigan

APPENDIX A.1

OTHER ENVIRONMENTAL PERMITS

APPENDIX A.1a

INSTALLATION PERMITS FOR CAUSTIC RECYCLE SCRUBBER AND ACID STORAGE TANKS

WAYNE COUNTY HEALTH DEPARTMENT
AIR POLLUTION CONTROL DIVISION
MAIN OFFICE: (313) 567-4100
2211 EAST JEFFERSON, DETROIT, MICHIGAN 48207
DOWNRIVER OFFICE: (313) 281-8395
152 ELM STREET, WYANDOTTE, MICHIGAN 48192

May 9, 1986

CONFIRMATION COPY

Mr. Robert Mackinder
Plant Manager
Waste Acid Services
6520 Georgia Street
Detroit, Michigan 48211

SUBJECT: APPROVAL OF INSTALLATION PERMIT NO. C-6917 FOR INSTALLATION OF A CAUSTIC RECYCLE SCRUBBER AND PERMIT NOS. C-6977 THRU C-7980 FOR INSTALLATION OF FOUR ACID STORAGE TANKS AT 6520 GEORGIA STREET, DETROIT; APPROVAL WITH CONDITIONS

Dear Mr. Mackinder:

We have completed our review of the installation permit applications for compliance with all applicable Federal, State and Wayne County air pollution control regulations, rules and ordinances. We shall approve these permits subject to the following general conditions and with written concurrence by your organization with the following special conditions. Your written concurrence signifies your acknowledgement of and agreement to the special conditions.

GENERAL CONDITIONS

1. Not more than 30 days after completion of the installation, the applicant shall apply, in writing, for a Certificate of Operation. Written application should be sent to: Mr. Michael Maillard, Director, Enforcement Services, Wayne County Department of Health, Air Pollution Control Division, 2211 East Jefferson, Detroit, Michigan 48207.

2. Trial operation of this emission source shall be allowed for 90 days, provided such operation is in compliance with all of the terms and conditions contained in the installation permit. If a Certificate of Operation has not been issued for an emission source prior to the expiration of the trial operation period, an extension of trial operation may be requested of the Division Director.

3. Operation of the emission source shall permanently cease upon denial of the Certificate of Operation by this Division.

4. The applicant shall demonstrate compliance with all Division regulation requirements and other applicable state and federal regulation requirements and with all general and special conditions of this permit prior to the issuance of the Certificate of Operation.

5. The applicant shall not reconstruct, alter, modify, expand or relocate this emission source unless plans, specifications and an application for an installation permit are submitted to and approved by this Division.

6. No emission source shall be operated for any other purpose or in any other manner than that for which the installation permit was approved and for which a Certificate of Operation has been issued unless otherwise authorized in writing by the Division. Such emission source shall also be maintained in a state of good repair.

7. Operation of this emission source shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant value or property, or which causes unreasonable interference with the comfortable enjoyment of life and property.

8. Operation of this emission source shall not interfere with the attainment or maintenance of the air quality standard for any air contaminant.

9. Operation of this emission source shall not result in significant deterioration of air quality.

10. The applicant shall provide notification of any abnormal conditions or malfunction of process or control equipment covered by this application, resulting in emissions in violation of Division requirements or of any permit conditions for more than two hours, to the Enforcement Section of this Division. Such notice shall be made as soon as reasonably possible, but not later than 9:00 a.m. of the next working day. The applicant shall also, within 10 days, submit to the Enforcement Section of this Division a written detailed report, including probable causes, duration of violation, remedial action taken and the steps which are being undertaken to prevent a reoccurrence.

11. Approval of this application does not preclude the applicant from complying with any future regulations which may be promulgated.

12. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.

13. Act No. 53 - Applicant shall notify any public utility of any excavation, tunneling and discharging of explosives or demolition of buildings which may affect said utility's facilities in accordance with Act 53 of the Public Acts of 1974, being sections 460.701 to 460.718 of the Michigan Compiled Laws and comply with each of the requirements of that Act.

14. The restrictions and conditions of this installation permit shall apply to any person or legal entity which now or shall hereafter own or operate the emission source for which this installation permit is issued. Any new owner or operator shall immediately notify the Director of the Enforcement Section, in writing, of such change in ownership or principal operator status of this emission source.

15. If the installation, reconstruction, relocation or alteration of the emission source for which this permit has been approved has not commenced within, or has been interrupted for, 18 months, this permit shall become void unless otherwise authorized by this Division.

SPECIAL CONDITIONS

16. The facility shall comply with all the general and specific conditions of the Hazardous Waste Disposal Facility operating license issued to you on March 17, 1982 by the Michigan Department of Natural Resources, Hazardous Waste Division under 1979 P.A.:64.

17. The facility shall accept for disposal only the hazardous waste types: k062 - spent pickle liquor from steel finishing operations; and D002 - corrosive.

18. Impacts of the non-criteria pollutant hydrochloric acid emissions from the caustic recycle scrubber stack, at the property line shall not exceed the acceptable ambient concentrations of 70 $\mu g/m^3$ for hydrochloric acid.

19. The facility must comply with MDNR R336.1373 to control fugitive dust.

20. The Division reserves the authority to conduct or require any odor testing or other pollutant testing at applicant's

facility and at the applicant's expense. Any required tests shall be performed utilizing methods acceptable to this Division and with prior Division approval.

21. After a determination by and written notification from the Division Director that emissions from the applicant's operation(s) are causing unreasonable interference with the common public right to live free from foul or noxious odors, the applicant shall immediately cease the operation(s) until the cause of the odors can be corrected to the satisfaction of the Division. The applicant shall not restart the operation(s) until the Director of this Division has approved the restart in writing. Information submitted by the applicant indicating the odors have been eliminated shall be evaluated by the Division as expeditiously as possible. The applicant may request the Health Officer to schedule a special meeting to consider a cessation order issued by the Director. This meeting will be held within 48 hours of the applicant's request. At that meeting the Health Officer may continue, modify or rescind the cessation order.

22. Applicant shall not accept and process the hazardous wastes with pH values less than or equal to 2 and equal to or greater than 12.5.

23. Applicant shall not process hazardous wastes in the neutralization tanks unless the caustic recycle scrubber system is installed and operating properly.

24. Applicant shall maintain the pH value of the caustic recycle scrubber solution between 10 and 13.

25. Applicant shall not operate the neutralization process for more than 24 hours per day and 312 days per year, or 7488 hours per year.

26. Applicant shall exhaust the emissions from tank Nos. 12, 13, 16, 17 through the caustic recycle scrubber system.

27. The exhaust emissions from the caustic recycle scrubber shall be discharged unobstructed vertically upwards to the ambient air from a stack with a maximum diameter of 20 inches at an exit point not less than 70 feet above grade level.

28. There shall be no visible emissions from the caustic recycle scrubber stack.

Please indicate written concurrence to these special conditions by signing and dating the confirmation copies of this letter by an authorized representative of your organization and returning one copy to this Division by June 9, 1986, retaining the original and other confirmation copy for your files. We shall approve these permits upon receipt of the signed and dated confirmation copy of this letter.

Thank you for your cooperation in this matter.

Very truly yours,

Alan M. Greenberg
Director

SIGNATURE _____

NAME _____

TITLE _____

DATE _____

AMG:RKS/jrb RWS ack

Enclosures

CONFIRMATION COPY

WAYNE COUNTY DEPARTMENT OF HEALTH
AIR POLLUTION CONTROL DIVISION
2211 E. JEFFERSON, DETROIT, MICHIGAN 48207
TELEPHONE NO. 567-1180

ATION	AREA/GRID SQUARE	CERTIFICATE OF OPERATION
6520 GEORGIA DETROIT 48211 DYNECOL, INC.	22/1543	APC 5-21376
	ESTABLISHMENT NO. M4008	WITH CONDITIONS

CERTIFICATE OF OPERATION

ER/AGENT

DYNECOL, INC.
6520 GEORGIA
DETROIT, MI 48211

Permits: C-6977 C-6978 C-6979 C-6980
C-6917

IPMENT

GENERAL PROCESS: 9999 PRODUCT STORAGE ($FeCL_2$ $FeSO_4$) (WASTE ACIDS)
CONTROL EQUIP: SCRUBBER /CAUSTIC SOLUTION (5,000 CFM)
SOURCE ID: QUANTITY: 4 TANKS (25,800 GALS. EACH)

The possession of this certificate of operation shall not exempt any person from citation for operating the above described equipment in violation of the Wayne County Air Pollution Control Ordinance. This certificate of operation shall be posted on or near the installation described. This certification of operation may be revoked for cause.

THIS CERTIFICATE ISSUED BY
DIVISION OF AIR POLLUTION CONTROL
ALAN M. GREENBERG, *Director*

T. Muldoon 9-29-87
Air Pollution Inspector Date

THIS CERTIFICATE IS SUBJECT TO SPECIAL OPERATING CONDITIONS IF NOTED ON THE REVERSE SIDE OF THIS FORM AND/OR AS STATED ON THE INSTALLATION PERMIT ISSUED BY THE DIVISION FOR THIS EQUIPMENT.

APC-23 (REV 3-84)

APPENDIX A.1b

DETROIT WATER AND SEWERAGE WASTEWATER DISCHARGE PERMIT

APPENDIX A.1b

DETROIT WATER AND SEWERAGE WASTEWATER DISCHARGE PERMIT

Detroit Water and Sewerage Department
Water Board Building
Detroit, Michigan 48226
(313) 224-4800

DETROIT

WATER AND SEWERAGE DEPARTMENT

Coleman A. Young, Mayor
City of Detroit

WASTEWATER DISCHARGE PERMIT - TYPE 3

Section A: General Information Permit No. 003-039

Company Name: Dynecol, Inc.

Premise Address: 6520 Georgia

City Detroit, MI Zip Code 48211

Mailing Address SAME

City _____, MI Zip Code _____

Primary Standard Industrial Classification (SIC) Code 5093

Other SIC Codes _____

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

This permit is granted in accordance with the application filed in the office of Director of DWSD, and in conformity with plans, specifications and other data submitted to the City in support of the above application.

Effective Date: January 18, 1988

Expiration Date: September 1, 1992

Charlie J. Williams
Director

Section B: Discharge Limitations and Monitoring Requirements

Representative Sampling Location: Control manhole in front of building near fence

( ) (See attached schematic) and South of Georgia St.

The following pretreatment standards shall be applied to this location.

Parameter	Daily Maximum (mg/l) A*	Self-Monitoring Required (Y/N)
Total Arsenic (AS)	1.0	Y
Total Cadmium (Cd)	2.0	Y
Total Copper (Cu)	4.5	Y
Total Cyanide (CN)	2.0	N
Total Lead (Pb)	1.0	Y
Total Mercury	0.005	N
Total Nickel (Ni)	5.0	Y
Total Silver (Ag)	2.0	Y
Total Chromium (Cr)	25.0	Y
Total Zinc (Zn)	15.0	Y
PCB - Acolor 1260	0.0005	N
Total PCB	0.001	N
Fats, Oils, Grease (FOG)	2000	Y
Total Suspended Solids (TSS)	10000	Y
Biochemical Oxygen Demand (BOD)	10000	Y
Phosphorus (P)	500	Y

Other Requirements:

(1) Compliance with the General Pollutant Prohibitions

(2) pH between 5.0 - 10.0 (10.5 if alkalinity is less than 300 ppm)

* A - All limitations based on composite samples.

Permit No. 003-039

Section C: Compliance Requirements

The permittee shall achieve compliance with the applicable pretreatment standards through the following compliance schedule:

( ) See Attachment
(X) Not Applicable

Section D: Spill Prevention Requirements

The permittee shall submit to the Detroit Water and Sewerage Department a spill prevention plan to provide protection against accidental discharges. This plan shall be submitted by JUN 1 1987

Section E: Monitoring Requirements

1) Sample Location

Control manhole in front of building near fence and South of Georgia St.

2) Self Monitoring Sampling Frequency
(X) Six Month

( )

Permit No. 003-039

Section F: Reporting Requirements

1) ( ) For Categorical Industrial Users

The permittee shall submit the following reports:

a) Baseline Monitoring Report (BMR): As specified in the Federal regulation for your category.

b) Progress Reports: If applicable, not later than (14) days following each date in the compliance schedule and the final date of compliance.

c) Compliance Reports: No later than (90) days following the final compliance date for the Federal categorical pretreatment standard.

d) Six month self-monitoring reports: June 30 and December 31 each year.

2) (X) For Non-Categorical Industrial Users

The permittee shall submit a status compliance report on June 30 and December 31 of each year.

GENERAL TERMS AND CONDITIONS

The permittee shall apply the discharge limits specified in Section B of this permit and shall comply with all provisions of the City of Detroit Wastewater Discharge Control Ordinance, other applicable laws, rules, regulations, user charges and fees established by the City of Detroit without repetition herein.

1) Right of Entry

The City of Detroit Water and Sewerage Department employees or authorized representatives shall have ready access to the permittee's premises to engage in inspection, sampling, compliance monitoring and/or metering acitivity. The duly authorized employees or representatives of the Department shall bear proper credentials and identification and shall be accompanied by a representative of the permittee at the permittee's option.

2) Record Retention

The permittee shall maintain records of all information from monitoring activities for no less than (3) years. Such records shall include for all samples:

1) The date, exact place, time and method of sampling

2) The names of persons taking the sample

3) The technique or method of analysis, the date of analysis and results of analysis

4) The names of persons performing the analysis

This period of record retention shall be extended during the course of any unresolved litigation.

3) Notifications

a. Accidental Discharge

Within one (1) hour of becoming aware of an accidental discharge into the sewer system which exceeds or does not conform with Federal, State or Detroit laws, rules, regulations or permit requirements and the degree of the exceedance appears to be more than twice the allowable concentration, the permittee shall telephone the Department at its control centers as shown on the following page. Within five (5) calendar days after the discharge, the permittee shall submit a detailed written report describing the cause of the discharge and the measures to be taken by the permittee to prevent similar future occurrences.

Cont'd.

b. Upsets

The permittee shall submit information on the upset orally or in writing, within (24) hours of becoming aware of the upset. If the information is provided orally, a written submission must be provided within (5) days.

Control Centers

- Systems Control Center	224-4775
- Wastewater Treatment Plant	297-9000
- Industrial Waste Control Office	935-4444

4) Monitoring Facilities

The permittee shall provide, operate and maintain at his own expense a sampling manhole or special structure to facilitate monitoring, inspection, sampling and flow measurement. The sampling manhole should be situated on the permittee's premises in a location accessible to the Detroit Water and Sewerage Department's authorized employees.

5) Limitations on Permit Transfer

The wastewater discharge permit shall not be reassigned or transferred, or sold, to a different person, new owner, new industrial user, different premises or a new or changed operation without the written approval of the City of Detroit Water and Sewerage Department. The permittee shall notify the City of Detroit Water and Sewerage Department of any such changes (30) days prior to the change.

6) Modifications or Revisions of the Permit

a) The terms and conditions of the permit may be subject to modification by the City of Detroit Water and Sewerage Department during the term of the permit, as limitations or requirements of the city ordinance are amended, or other just cause exists.

b) The categorical industrial user permittee shall request an application form and apply to the City of Detroit Water and Sewerage Department for a modified permit within (90) days after the promulgation of new or revised National Categorical Pretreatment Standards.

c) The permittee shall be informed at least (60) days prior to the proposed effective date of any change initiated by the City of Detroit Water and Sewerage Department, unless such change is the result of any enforcement action.

7) Falsifying Information or Tampering with Monitoring Equipment

The permittee who makes any false statements, representations, or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to this permit or who tampers with or knowingly renders inaccurate any monitoring device required under the regulation, is guilty of a misdemeanor and shall, upon conviction, be punished by a fine, or by imprisonment, or by both.

Cont'd.

8) Revocation of the Permits

Violations of this permit shall be eliminated or remedied through conferences, notices, or cooperation between the user and the Department. Failure to resolve these violations may result in other actions including but not limited to permit revocation.

9) Emergency Suspension of the Permit

The City of Detroit Water and Sewerage Department may order suspension of the sewer or wastewater treatment service and/or a wastewater discharge permit. The permittee shall be notified in writing and shall be provided with an opportunity for hearing before the Director within (10) days of such discharge. The permittee shall submit a detailed written statement to the Department within (15) days of the occurrence describing the causes of the harmful contribution and the measures taken to prevent any future occurrences.

10) Confidential Information:

Information and data on an industrial user obtained from written reports, questionnaires, permit applications, permits and monitoring programs and from inspections shall be available to any other governmental agency without restriction unless the industrial user specifically requests and is able to demonstrate to the satisfaction of the city that the release of such information would divulge information, processes or methods of production entitled to protection as trade secrets of the industrial user.

Except for data determined to be confidental under the City's ordinance, all information and data on the permittee obtained from written reports, questionnaires, permit applications, permits, monitoring programs and inspections shall not be transmitted to any governmental agency until a (10) day notification of intent to transmit is first given to the permittee.

11) Dilution

The permittee shall not increase the use of process water, or in any way dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the applicable pretreatment standards.

12) Permit Renewal

The permittee shall apply for permit reissuance a minimum of (90) days prior to the expiration of the existing permit on a form prescribed by the City of Detroit Water and Sewerage Department. Upon timely application, the expired permit shall be automatically extended until modified or reissued by the department.

13) Severability

If any provision, paragraph, word, section or article of this permit is invalidated by any court of competent jurisdiction, the remaining provisions, paragraphs, words, sections and articles shall not be affected and shall continue in full force and effect.

Cont'd.

14) All reports shall be addressed to:

Director
Detroit Water and Sewerage Department
735 Randolph Street
Detroit, Michigan 48226

Attention: Industrial Waste Control Division

Detroit Water and Sewerage Department
Water Board Building
Detroit, Michigan 48226
(313) 224-4800

Coleman A. Young, Mayor
City of Detroit

November 6, 1987

Mr. Tien H. Pham
Dynecol, Inc.
6520 Georgia
Detroit, Michigan 48211

Dear Mr. Pham:

Re: Notice of Acceptance - Spill Prevention Plan

The Detroit Water and Sewerage Department has reviewed your submittal for the Spill Prevention Plan and found it to comply with the stated requirements.

Periodic inspections by our field investigators may involve a review of these measures and procedures at your facility. Please attach this letter to your permit. Future permits shall indicate your compliance with this requirement.

Sincerely yours,

Richard D. Connors, P.E.

Richard D. Connors, P.E.
Manager, Industrial Waste Control

SJK/er

APPENDIX A.1c

Air Discharge Permit Applications

Container Storage Facility

LOCATION OF INSTALLATION (Street address and city) (Please Print)

AREA/GRID

PERMIT NO.

For Office use only

Establishment

Source Id. No.

Equip. Code No.

Cashier

WAYNE COUNTY HEALTH DEPARTMENT
Air Pollution Control Division
2211 E. Jefferson Avenue
Detroit, Michigan 48207
Telephone No. (313) 567-0710

INSTALLATION PERMIT

Owner Dynecol, Inc. Telephone No. 313-571-7140

Mailing Address 6520 Georgia, Detroit, MI 48211

Installer by owner Telephone No. _____

Address _____

(Circle One) To (Install)[Construct][Reconstruct][Relocate][Alter][Modify the Use of A Process]

Designate whether this application is for process equipment or emission control equipment by circling (1) or (2) below.

(1.) Description of Process Equipment Two-speed exhaust fan (e.g. Boiler, Incinerator, Other)

Name of Manufacturer Industrial Air or equal Model No. 161030 Rating 5000cfm/8500cfm

2. Description of Emission Control Equipment _____

Name of Manufacturer _____ Model No. _____ Rating _____

3. (New) Existing) Stack or Vent: I.D. or Size 30-inch dia. Height (ground to top) 18 feet

4. Signature of Owner or Agent _____ Title President

5. Print Name of Owner or Agent Frank Biermann

DO NOT WRITE BELOW THIS LINE

Approval by _____ / _____ with conditions in letter dated _____
Director Date

FEE BASED ON _____ EXAMINATION FEE: $_____ INSPECTION FEE: $_____

THIS IS NOT A CERTIFICATE OF OPERATION

APC-22A SEE REVERSE OF GREEN COPY FOR APPLICATION REQUIREMENTS Revised 1987

APPLICANT'S APPROVED I.P.

MARTEL Business Forms Inc 313/889-8943

LOCATION OF INSTALLATION (Street address and city) (Please Print)

AREA/GRID

PERMIT NO.

For Office use only

Establishment

Source Id. No.

Equip. Code No.

Cashier

WAYNE COUNTY HEALTH DEPARTMENT
Air Pollution Control Division
2211 E. Jefferson Avenue
Detroit, Michigan 48207
Telephone No. (313) 567-0710

INSTALLATION PERMIT

Owner Dynecol, Inc. Telephone No. 313-571-7140

Mailing Address 6520 Georgia, Detroit, MI 48211

Installer By owner Telephone No. _____

Address _____

(Circle One) To (Install) [Construct] [Reconstruct] [Relocate] [Alter] [Modify the Use of A Process]

Designate whether this application is for process equipment or emission control equipment by circling (1) or (2) below.

(1.) Description of Process Equipment Transfer/Bulking Ventilation (e.g. Boiler, Incinerator, Other)

Name of Manufacturer Not Applicable Model No. Not Applicable Rating 1000 cfm

2. Description of Emission Control Equipment _____

Name of Manufacturer _____ Model No. _____ Rating _____

3. (New, Existing) Stack or Vent: I.D. or Size to adsorption unit Height (ground to top) N.A.

4. Signature of Owner or Agent _____ Title President

5. Print Name of Owner or Agent Frank Biermann

DO NOT WRITE BELOW THIS LINE

Approval by _____ / _____ with conditions in letter dated _____
Director Date

FEE BASED ON _____ EXAMINATION FEE: $_____ INSPECTION FEE: $_____

THIS IS NOT A CERTIFICATE OF OPERATION

APC-22A SEE REVERSE OF GREEN COPY FOR APPLICATION REQUIREMENTS Revised 1987

APPLICANT'S APPROVAL

MARTEL Business Forms Inc 313/689 8843

LOCATION OF INSTALLATION (Street address and city) (Please Print)

AREA/GRID

PERMIT NO.

For Office use only

Establishment

Source Id. No.

Equip. Code No.

Cashier

WAYNE COUNTY HEALTH DEPARTMENT
Air Pollution Control Division
2211 E. Jefferson Avenue
Detroit, Michigan 48207
Telephone No. (313) 567-0710

INSTALLATION PERMIT

Owner Dynecol, Inc. Telephone No. 313-571-7140

Mailing Address 6520 Georgia, Detroit, MI 48211

Installer By owner Telephone No. _____

Address _____

(Circle One) To [Install][Construct][Reconstruct][Relocate][Alter][Modify the Use of A Process]

Designate whether this application is for process equipment or emission control equipment by circling (1) or (2) below.

1. Description of Process Equipment _____ (e.g. Boiler, Incinerator, Other)
   Name of Manufacturer _____ Model No. _____ Rating _____
2. Description of Emission Control Equipment Activated Carbon Adsorption Unit
   Name of Manufacturer Calgon or equal Model No. Vapor Pac Rating 1000 cfm
3. (New, Existing) Stack or Vent: I.D. or Size New 9" Height (ground to top) 20 feet
4. Signature of Owner or Agent _____ Title President
5. Print Name of Owner or Agent Frank Biermann

DO NOT WRITE BELOW THIS LINE

Approval by _____ / _____ with conditions in letter dated _____
Director Date

FEE BASED ON _____ EXAMINATION FEE: $_____ INSPECTION FEE: $_____

THIS IS NOT A CERTIFICATE OF OPERATION

APC-22A SEE REVERSE OF GREEN COPY FOR APPLICATION REQUIREMENTS Revised 1987

APPLICANT'S APPROVED FP

MARTEL Business Forms Inc 313/669 8843

SUPPLEMENT TO DYNECOL, INC.
APPLICATION FOR INSTALLATION PERMITS

1.0 INTRODUCTION

This document provides supplemental information relating to three installation permit application for Dynecol, Inc.

These applications are for installation of the following equipment:

Two speed exhaust fan
Transfer/bulking ventilation system
Activated carbon adsorption canisters

These applications are submitted to the Wayne County Health Department Air Pollution Control Division per the requirements of the Wayne County Air Pollution Control Ordinance.

2.0 GENERAL FACILITY DESCRIPTION

2.1 Dynecol, Inc., formerly Waste Acid Services, Inc., is a commercial hazardous waste treatment and storage facility located in the City of Detroit in Wayne County, Michigan. The street and mailing address is 6520 Georgia Street, Detroit, Michigan, 48211. Drawing cover sheet includes a location map and Drawing C2 shows the proposed site plan of the facility showing facility boundaries and major buildings. A vicinity plan is attached.

2.2 Dynecol is proposing to transfer a part of their storage capacity from the existing tank storage facility to a new container storage facility. The hazardous waste container storage facility will be constructed at Dynecol to receive and store hazardous wastes in drums. The facility has been designed to contain flammable liquids, in accordance with applicable BOCA, NFPA, and NEC codes for Class I, II, and III liquids. The facility consists of two loading docks, eight isolation storage bays, and a waste transfer/bulking room. A flow diagram of Dynecol's proposed container storage operation is attached.

2.2.1 A two-bay loading/unloading area will be located in the southeast corner of the facility and will be roofed but without side walls. Wall skirting will be provided as a barrier against precipitation infiltration. In addition, the loading and unloading area will be located outside of the predominant wind direction. Spill containment structures will be provided in this area to capture any spills or leaks. A tank truck vapor recovery vent will be provided and vented to an air emission control system.

2.2.2 The container storage area will consist of eight isolation bays constructed of continuously poured concrete to provide for the separate storage of incompatible or reactive wastes (see Drawings A1 and A2). Each bay holds up to 120 drums (6,600 gallons) on a maximum of two levels of pallets with eighteen to twenty-four inches of aisle space provided between each row of drums and walls, total area capacity, 960 drums. In bays storing flammable liquids, drums will be stored no greater than 12 feet from the main aisle.

The storage area will be heated between 40 and 60 degrees Fahrenheit in the winter with 5000 cfm of ventilation air flow and cooled by the ventilation fan in the summer with a high speed fan rating of 8500 cfm.

2.2.3 The transfer/bulking room will be used to transfer drum quantities of waste to tank trucks and to consolidate small quantities of certain compatible lab pack wastes into 55-gallon drums. This area will be equipped with local drum exhaust hoods, a floor exhaust and an air emission control system consisting of a blower and an activated carbon adsorption system.

All transfer piping within the bulking area will be two-inch Teflon-lined pipe with a ductile iron outer shell. The sizing of this pipe is based on the pumping of 50 gpm of waste liquid. The exterior of the pipe will be labeled according to its use designation. Three pipe lines will be provided from the transfer area to the loading area; one each for acids, caustics, and organics.

Ventilation air within the transfer/bulking room will be supplied at a rate of 1,000 cfm and will be withdrawn through the three drum transfer/bulking ventilation hoods. A side stream from the heating unit will supply the required heated air during the winter months.

3.0 PROCESS EQUIPMENT DESCRIPTIONS

3.1 Two-Speed Exhaust Fan

3.1.1 A two-speed exhaust fan will be provided on the south side of the drum storage area per drawing HV1. The purpose of this fan is to maintain adequate air changes during cold weather and minimize heat build-up during warm weather. Expected operation is shown below:

	Winter	Summer
Flow, ACFM	5,000	8,500
Temp., degrees F	55 degrees	80 degrees
Pressure	ambient	ambient
Operating Schedule	continuous	continuous

3.1.2 It is expected that if there is any drum spillage within the storage area, this exhaust fan would maintain building airborne contaminant levels within OSHA standards. The ventilation fan would provide 3.9 air changes per hour during winter operation and 6.6 air changes per hour during summer operation.

3.1.3 Emissions with contaminants above ambient levels are only expected to occur if a drum were to spill because all drums are sealed. Per the Act 64 permit for this facility, spills must be addressed promptly. Spills are unlikely, but if a drum were to leak, the contaminant would pool in the containment bay. Expected spill frequency is zero to one spilled 55 gallon drum per year. As a worst case example, if the material was volatile, it could evaporate and be emitted through the exhaust prior to initiation of cleanup, resulting in an emission of up to 500 lbs. depending on the specific gravity of the material leaked from the drum. This relates to the following emission rates:

Pounds per hour (24 hr. avg.)	20.8
Tons per year	0.25
Parts per million (24 hr. avg.) (assume molecular weight of 100 and low fan speed)	270
Parts per million (yearly average above ambient)	3

3.1.4 Typical volatile materials to be stored in this area include paint solvents, printing solvents, and cleaning solvents. They could include toluene, acetone, trichloroethane, perchloroethylene, methylene chloride and other organics. In addition, acids, caustics and plating wastes could be handled, however, these materials are not as volatile as the organics and as such would not contribute significantly to air emissions.

3.2 Transfer/Bulking Ventilation

3.2.1 The transfer/bulking ventilation system consists of five pickup points: three drum exhaust hoods, a floor level exhaust hood and a transport truck tank exhaust. Details of this system are shown on drawings M1 and HV1. A schematic and calculation sheet for this system is attached.

3.2.2 The drum transfer/bulking ventilation hoods have been designed according to the guidelines presented in the Industrial Ventilation Manual of the American Conference of Governmental Industrial Hygienists. Each station will withdraw 300 cfm of air which provides adequate velocity across the drum opening to capture any fugitive emissions from the top of the drums.

3.2.3 The floor exhaust would be used in the event of a spill in the transfer/bulking room which could produce vapors that would settle to the floor. It is designed to exhaust 1,000 cfm from near the floor. This system has been designed to be remote manually activated from the transfer/bulking room.

3.2.4 The transport truck tank exhaust is rated at approximately 68 cfm. This is sufficient volume to assure that organic vapors in the transport truck tank are not released to the atmosphere during the filling operation as the filling pumps are rated at 50 gpm (6.7 cfm).

3.2.5 It is expected that this ventilation system would be in operation for eight hours per day, six days per week. Generally, only the drum exhaust hoods and transport truck tank exhaust would be operating.

3.2.6 Not all waste stored at the facility will be transferred/bulked in this area. The criteria for bulking are based on economic and compatibility concerns. It is expected that up to 10,000 gallons per day and 50,000 gallons per month of hazardous waste will be transferred from drums to tanker trucks in this operation. Generally, the hazardous waste will be organic solvents with some acidic and some caustic waste contributing to the total.

3.3 Activated Carbon Adsorption System

3.3.1 Design Flow: 1,000 cfm, to treat the exhaust from the transfer/bulking area.

3.3.2 System Components:

Blower - 1,000 cfm at 32" W.C.

Activated Carbon Units - each unit contains 1,800 pounds of activated carbon. One canister will be in operation with another on stand-by. The second unit will be put into operation when first canister has reached break-through; i.e. is saturated with organic constituents. An equipment specification sheet is enclosed.

Break-through will be detected by an organic vapor analyzer located in the top 1/4 of the carbon bed. When organic vapors are detected, the carbon unit will be taken off line and replaced with a fresh unit.

Contact time in the carbon bed is three to four seconds. This will allow sufficient time for a majority of the organic solvents to be adsorbed. Approximately 85% - 90% removal is expected. (Note that all common organic solvent vapors are adsorbed on activated carbon. The concentration and type of contaminant will determine the carbon use rate.)

3.3.3 Emissions from this system can be calculated as follows:

Major pollutant input during normal operation is from displacement of vapor from tank truck during filling. Pollutants from drum transfer/bulking hoods would be minor. The purpose for these hoods is for operator safety if a spill were to occur.

Assume 10,000 gallons (1,300 cubic feet) of tank area is displaced and this tank was filled with a volatile organic vapor with a vapor pressure of 3 psia and a molecular weight of 100.

Moles of vapor in 10,000-gallon empty tank:

1,300 cu. ft. x 3 psia/14.7 psia x 1 mole/385 scf = 0.69 moles

Pounds of vapor:

0.69 x 100 = 69 lbs.

Pounds collected by activated carbon:

69 lbs x 85% = 58 lbs.

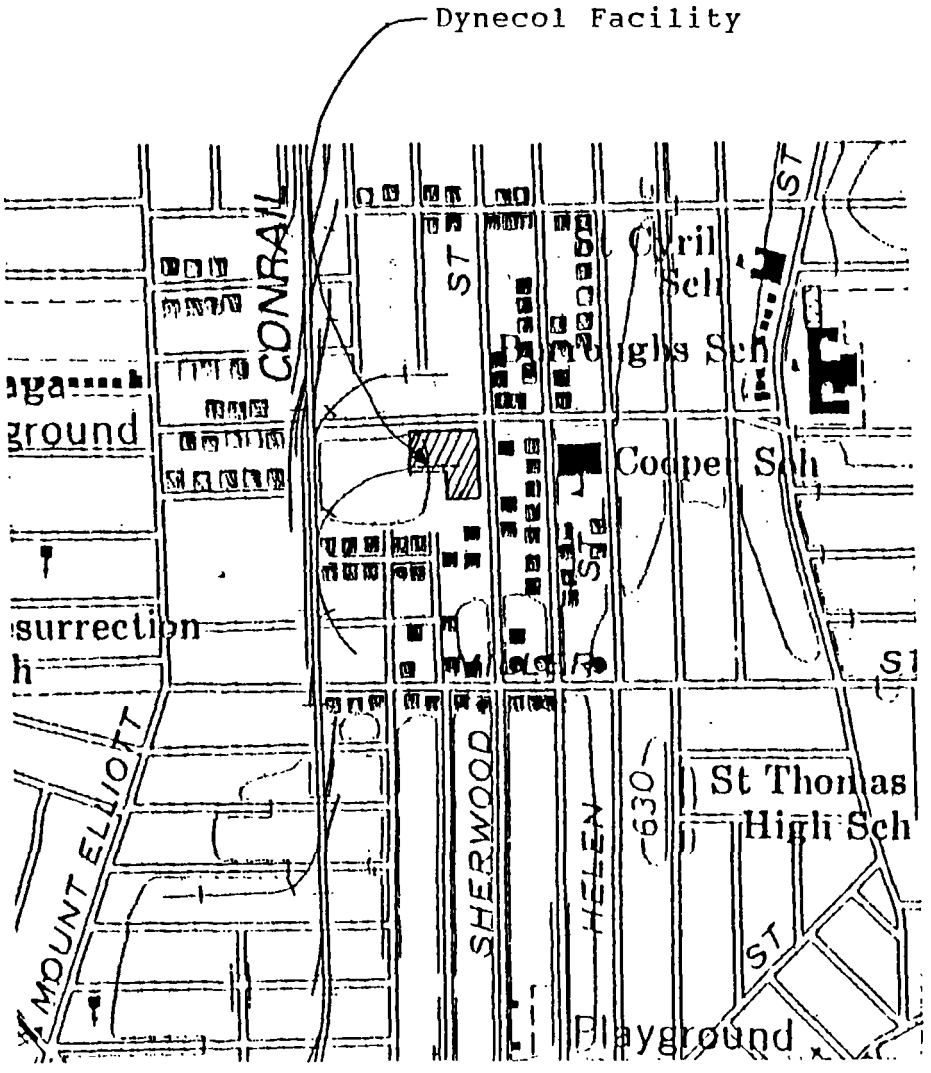
Pounds discharged:

69 - 58 = 11 lbs

Pounds per hour volatile organic vapor discharged over 8 hour shift:

11/8 = 1.4 lbs/hr.

3.3.4 Each canister is expected to have an operating life of approximately two to six weeks or longer depending on the concentration and type of contaminants. Canisters will be regenerated off site.



North

1000 feet
Scale

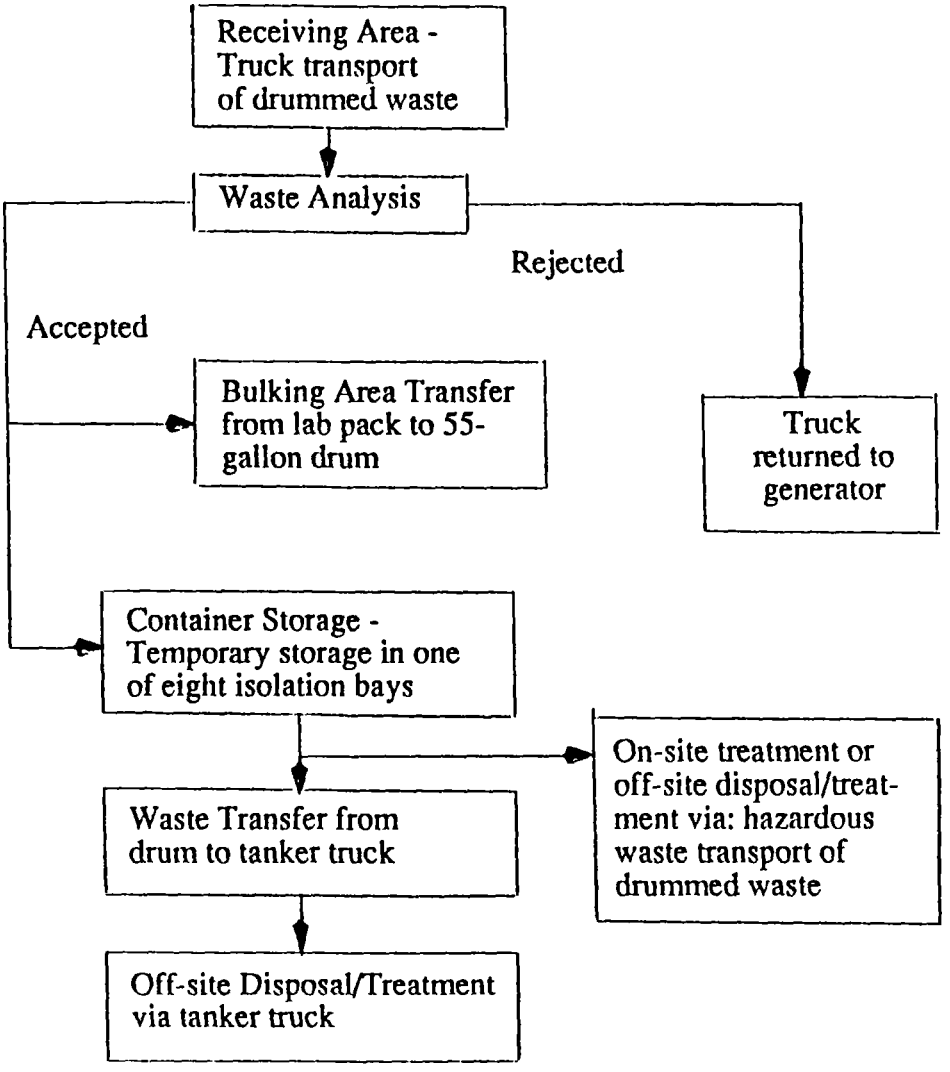
■ Residential areas adjacent to Dynecol

● Commercial establishments adjacent to Dynecol

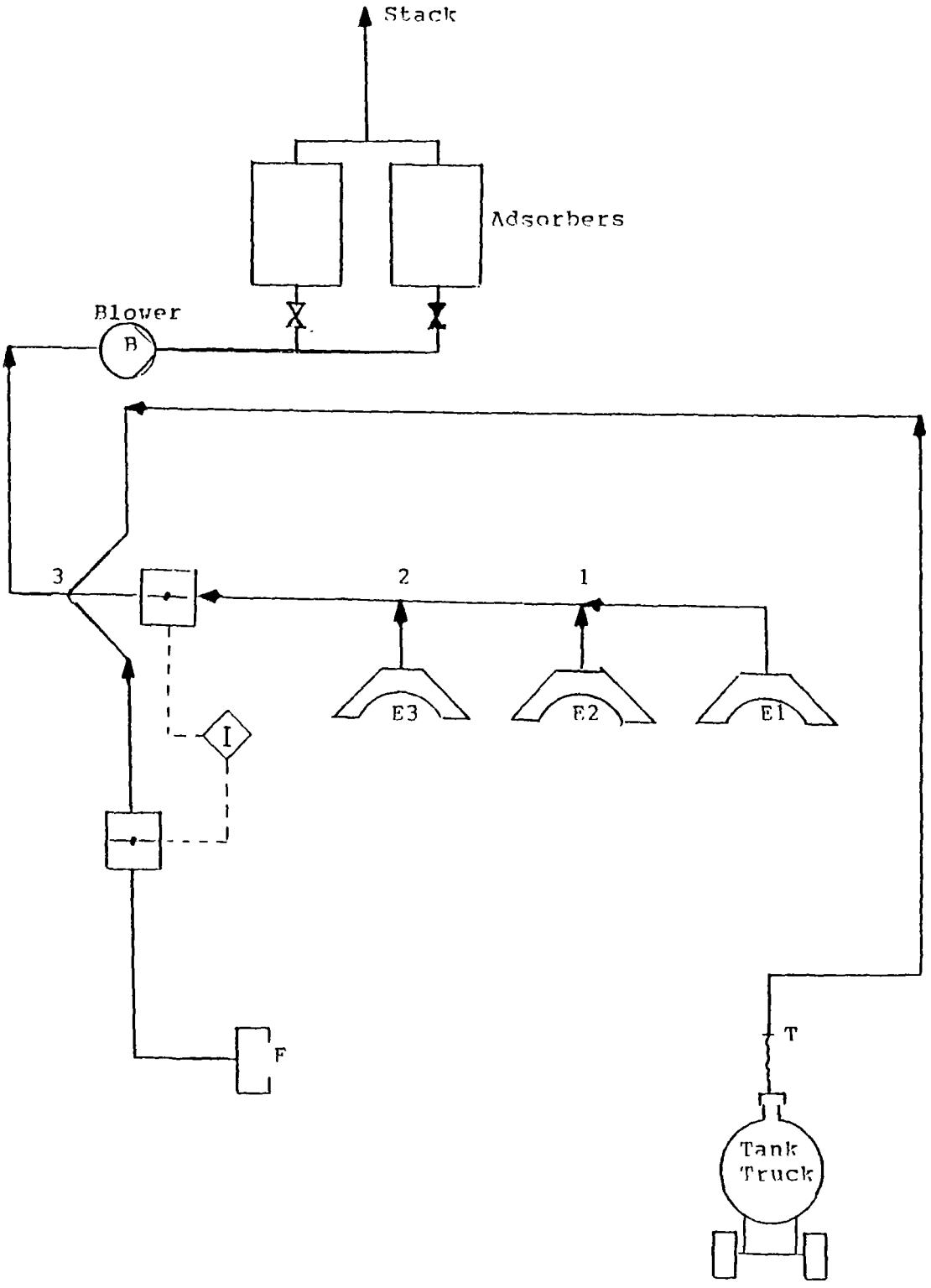
Vicinity Plan
Dynecol Facility

EDI ENGINEERING AND SCIENCE

DYNECOL, INC.
PROCESS FLOW SCHEMATIC
CONTAINER STORAGE AREA



DYNECOL, INC.
TRANSFER/BULKING VENTILATION
SCHEMATIC



DYNECOL CONTAINER STORAGE FACILITY

EQUIVALENT FOOT METHOD CALCULATION SHEET
FOR EXHAUST DUCTS

SYSTEM: DYNECOL DATE: 19 JUN 89

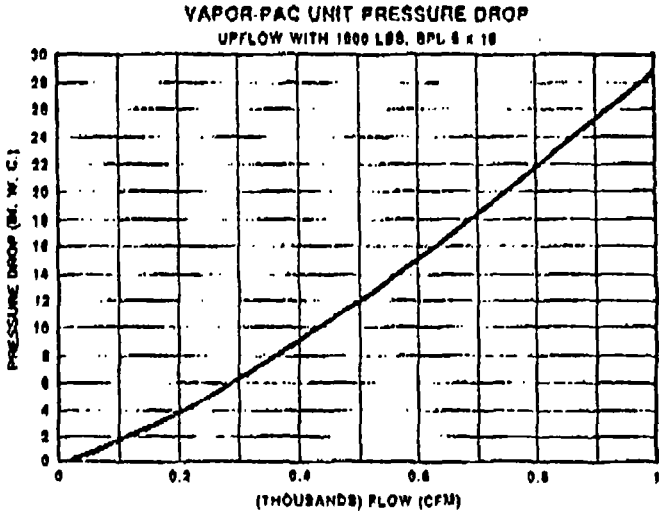
SECTION ID	DUCT DIA INCHES	DUCT AREA SQ FT	AIR VOLUME CFM IN SEGMENT	VELOCITY FPM	STRAIGHT RUN FT	1.5 RAD ELBOW NO.	1.5 RAD ELBOW FT	1 RAD ELBOW NO.	1 RAD ELBOW FT	TEE NO	TEE FT	TOTAL LENGTH FT	RESISTANCE PER 100 FT	PER RUN	ADDED VP	ONE VP	ENTRY LOSS	HOOD SUCTION	HOOD SUCTION	SEGMENT STATIC PRESSURE	TOTAL GOV. SP
E1-1	5	0.1364	300	2200	4	1.5	9	0	15	0	6	17.5	1.722	0.30		0.302	0.5	1.5	0.45	0.75	
E2-1	5	0.1364	300	2200	4	0.5	9	0	15	1	6	14.5	1.722	0.25		0.302	0.5	1.5	0.45	0.70	
1-2	9	0.4418	600	1358	4	0	18	0	29	0	13	4.0	0.336	0.01	0.00	0.115	0	0	0.00	0.01	0.72
E3-2	5	0.1364	300	2200	4	0.5	9	0	15	1	6	14.5	1.722	0.25		0.302	0.5	1.5	0.45	0.70	
2-3	9	0.4418	900	2037	3	2	18	0	29	0	13	39.0	0.714	0.28	0.11	0.259	0	0	0.00	0.39	1.09
F-3	9	0.4418	1000	2264	12	2.5	18	0	29	1	13	70.0	0.868	0.61		0.319	0.5	1.5	0.48	1.09	
T-3	3	0.0491	68	1385	100	4	5	0	11	1	5	125.0	0.688	0.86		0.120	0.5	1.5	0.18	1.04	
3-B	9	0.4418	1000	2264	1	0	18	0	29	0	13	1.0	0.868	0.01	0.00	0.319	0	0	0.00	0.01	1.10
B-AD	9	0.4418	1000	2264	12	4	18	0	29	0	13	84.0	0.868	0.73	0.00	0.319	0	0	0.00	0.73	1.83
ADS	NA	0.0000	1000	NA	0	0	NA	0	NA	0	NA	0.0	NA	29.00		NA	NA	NA	NA	29.00	30.83
ADS-S	9	0.4418	1000	2264	25	3	18	0	29	0	13	79.0	0.868	0.69	0.00	0.319	0	0	0.00	0.69	31.51

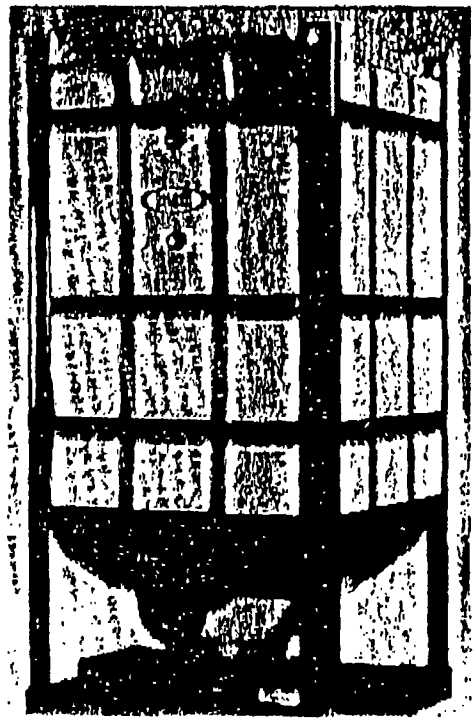
VAPOR-PAC SERVICE UNIT

Calgon Carbon Vapor-Pac Service Units are designed to remove volatile organic compounds from various vapor streams using granular activated carbon adsorption. The units are particularly suited for short term projects, or for low volume applications where VOC concentrations are relatively high. Common applications include control of industrial process vents, air stripper off-gases, or emissions of organic compounds from in-situ treatment of contaminated soils.

A unique feature of the Vapor-Pac unit is that it serves as both a shipping container and an adsorber, which is easily transported and installed. When the carbon is spent, the unit is simply disconnected and returned to Calgon Carbon for carbon reactivation — provided the spent carbon meets Calgon Carbon's acceptance criteria.

Each Vapor-Pac Service Unit contains 1800 lbs. of vapor phase granular activated carbon and is capable of handling flows up to 1000 cfm. Vapor-Pacs may be operated in series or parallel mode. Your Calgon Carbon representative is available to assist you in evaluating the suitability of the Vapor-Pac Service for your particular application.





FEATURES

- Allows for ease of installation
- Constructed of corrosion resistant materials
- Designed for upflow operation in series or parallel mode
- Eliminates on-site carbon handling
- Minimizes spent carbon disposal problems
- Provides convenient carbon sampling device

SPECIFICATIONS

Vessel Dimensions:	44¼" x 44¼" x 89⅞"
Inlet & Discharge Connections:	6" Ø PS 15-69 Duct Flanges
Carbon Volume:	60 cu. ft. (1800 lbs.)
Shipping Weight:	Virgin - 2200 lbs. Spent - 4000 lbs.
Temperature Rating:	150°F max.
Static Pressure rating above carbon level:	20" W.C. max.
Vacuum Pressure rating above carbon level	2" W.C. max.

All units shipped F.O.B., Pittsburgh, Pennsylvania

MATERIALS OF CONSTRUCTION

Vessel:	Polyethylene
Frame:	Carbon Steel coated with Sherwin Williams Tile Clad II
Inlet Flanges, Elbow, Septa:	PVC
Discharge Flange:	Polyethylene
Fasteners & Bottom Valve Support Plate:	316 Stainless Steel
Sample Fittings &	

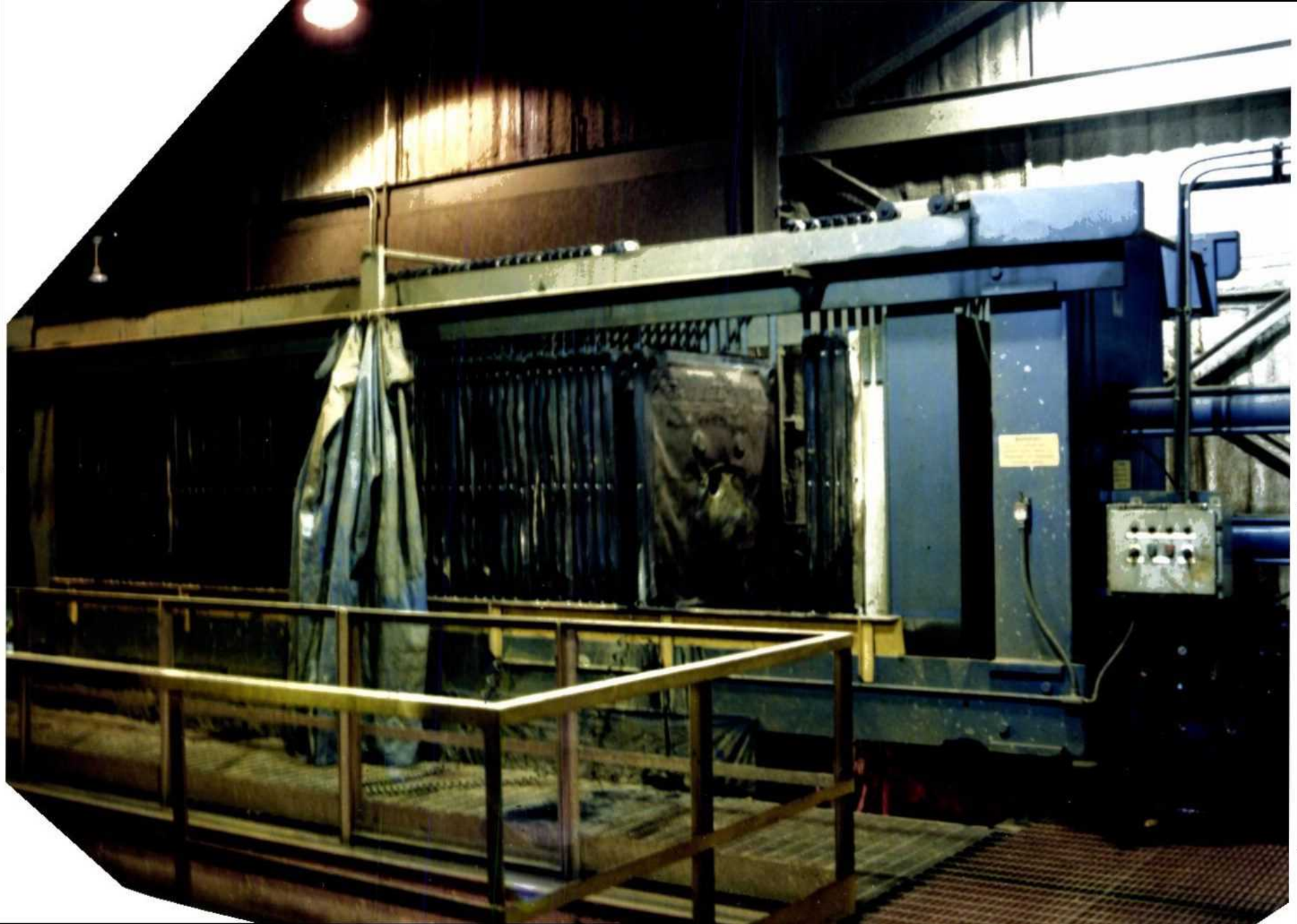
CAUTION

Wet activated carbon preferentially removes oxygen from the air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate sampling and work procedures for potentially low-oxygen spaces should be followed, including all applicable Federal and State requirements.

For information regarding human and environmental exposure, call (412) 787-6700 and request to speak to Regulatory and Safety

APPENDIX A.2

FACILITY PHOTOGRAPHS



COR
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WASTE

LICENSED INDUSTRIAL
& HAZARDOUS WASTE
HAULING VEHICLE
Dynecol, Inc.
6520 Georgia Street
Detroit, Michigan 48211
(313) 571-7140
251
5-18-87
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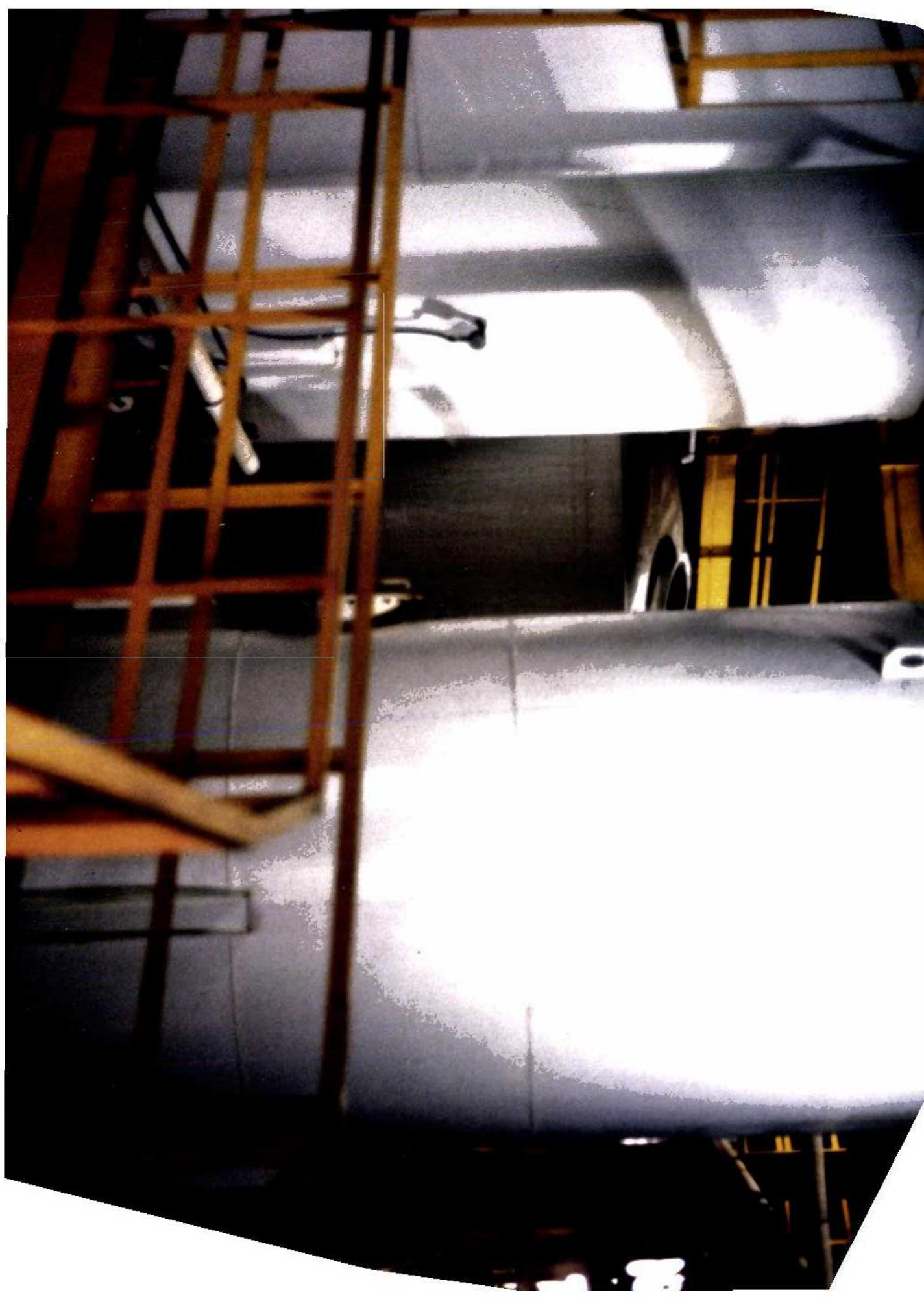
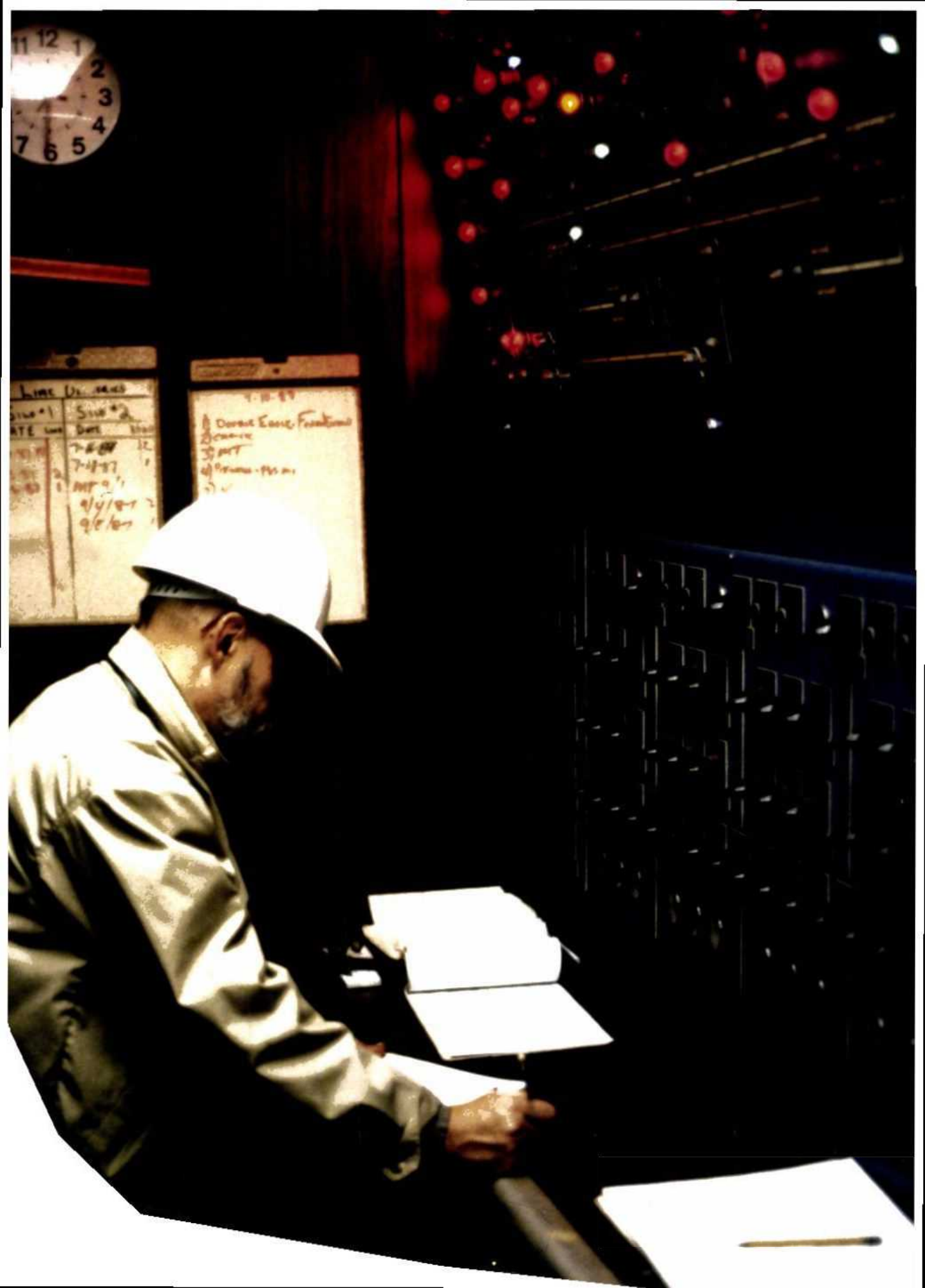
CHEMICAL
TRANSPORT
SERVICES, INC.
DIVISION OF
DYNECOL
INC.
DETROIT, MI
L-23
343171





APPENDIX B

This appendix is reserved for future use.

APPENDIX C.1

HAZARDOUS WASTE STREAMS

SECTION C

APPENDICES

Appendix C.1	Acceptable Hazardous Waste Types - Container Storage Facility
Appendix C.1a	Characteristically Hazardous Wastes and Hazardous Wastes From Non-Specific Sources
Appendix C.1b	Hazardous Wastes From Specific Sources
Appendix C.1c	Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues
Appendix C.1d	MDNR Listed Wastes
Appendix C.2	Characterizations for Containerized Wastes Accepted for Storage
Appendix C.3	Characterizations of Wastes Accepted for Treatment and Storge in Tanks

APPENDIX C.1

Acceptable Hazardous Waste Types - Container Storage Facility

APPENDIX C.1a
CHARACTERISTICALLY HAZARDOUS WASTES AND HAZARDOUS WASTES FROM NON-SPECIFIC SOURCES

Generic Waste Codes Acceptable for Bulking

F001	F005
F002	F006
F003	F019
F004	F024

Generic Waste Codes Acceptable for Storage Only

F007	F010
F008	F011
F009	F012

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Acceptable for Bulking	Waste Description
D001	Y	Characteristic of ignitability with flashpoint $\geq 90^{o}F$
D002	Y	Inorganic solutions, pH $\leq$ 2.0 or pH $\geq$ 12.5
D004	Y	Inorganic solution & sludges, arsenic
D005	Y	Inorganic solution & sludges, barium
D006	Y	Inorganic solution & sludges, cadmium
D007	Y	Inorganic solution & sludges, chromium
D008	Y	Inorganic solution & sludges, lead
D009	Y	Inorganic solution & sludges, mercury
D010	Y	Inorganic solution & sludges, selenium
D011	Y	Inorganic solution & sludges, silver
D012	Y	Characteristic of EP toxicity, Endrin
D013	Y	Characteristic of EP toxicity, Lindane
D014	Y	Characteristic of EP toxicity, Methoxychlor
D015	Y	Characteristic of EP toxicity, Toxaphene
D016	Y	Characteristic of EP toxicity, 2,4-D
D017	Y	Characteristic of EP toxicity, 2.4.5-TP
001D	Y	Inorganic solution & sludges, copper
003D	Y	Inorganic solution & sludges, zinc

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Waste Description
D001	Characteristic of ignitability with flashpoint $<90^{o}F$
D003	Characteristic of reactivity

APPENDIX C.1B
HAZARDOUS WASTE CODES FROM SPECIFIC SOURCES

Hazardous Waste Codes from Specific Sources

K Waste Codes Acceptable for Bulking

K001	K017	K029	K116	K037	K049
K002	K018	K095	K117	K038	K050
K003	K019	K096	K118	K039	K051
K004	K020	K030	K136	K040	K052
K005	K021	K083	K071	K041	K062
K006	K022	K103	K073	K098	K100
K008	K023	K104	K106	K042	K084
K009	K024	K085	K031	K043	K101
K010	K093	K105	K032	K099	K102
K011	K094	K111	K033	K123	K086
K013	K025	K112	K034	K124	K087
K014	K026	K113	K097	K125	
K015	K027	K114	K035	K126	
K016	K028	K115	K036	K048	

K Waste Codes Acceptable for Storage Only

K007
K060
K061
K069

APPENDIX C.1c
DISCARDED COMMERCIAL CHEMICAL PRODUCTS, OFF-SPECIFICATION SPECIES, CONTAINER RESIDUES, AND SPILL RESIDUES

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Chemical Abstract Number	Acceptable For Bulking	Description
P001	81-81-2	Y	Warfarin & salts,
P005	107-18-6	Y	Allyl alcohol
P022	75-15-0	Y	Carbon disulfide
P028	100-44-7	Y	Benzene, (chloromethyl)
P037	60-57-1	Y	Dieldrin
P047	534-52-1	Y	4,6-Dinitro-o-cresol, & salts
P051	72-20-8	Y	Endrin
P059	76-44-8	Y	Heptachlor
P077	100-01-6	Y	p-Nitroaniline

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
P002	591-08-2	Acetamide, n-(aminothioxomethyl)-
P004	309-00-2	Aldrin
P008	504-24-5	4-Aminophyridine
P010	7778-39-4	Arsenic acid H_3AsO_4
P013	542-62-1	Barium cyanide
P016	542-88-1	Methane, oxybis(chloro-
P017	598-31-2	Bromoacetone
P021	592-01-8	Calcium cyanide
P024	106-47-8	p-Chloroaniline
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide Cu(CN)
P030		Cyanides (soluble cyanide salts)
P031	460-19-5	Cyanogen
P033	507-77-4	Cyanogen chloride
P034	131-89-5	Phenol, 2 cyclohexyl-4,6-dinitro
P036	696-28-6	Dichlorophenylarsine
P038	692-42-2	Diethylarsine
P039	298-04-0	Disulfoton
P040	297-97-2	O,O-Diethyl O-pyrazinyl
P041	311-45-5	Diethyl p-nitrophenyl phosphate
P042	51-43-4	Epinephrine
P043	55-91-4	Diisopropylfluorophosphate (DFP)
P044	60-51-5	Dimethoate
P045	39196-18-4	2-Butanone, 3,3-dimenthyl
P046	122-09-8	alpha, alpha-Dimethylphenethylamine
P048	51-28-5	Phenol, 2,4-dinitro
P049	514-53-7	Dithiobiuret
P054	151-56-4	Aziridine
P057	640-19-7	Fluoroacetamide
P058	62-74-8	Fluoroacetic acid, sodium salt
P062	757-58-4	Hexaethyl tetraphosphate
P066	16752-77-5	Methomyl
P068	60-34-4	Hydrazine, methyl
P069	75-86-5	2-Methyllactonitrile
P071	298-00-0	Methyl parathion
P072	86-88-4	Alpha-Naphthylthiourea
P074	557-19-7	Nickel cyanide
P082	62-75-9	N-Nitrosodimethylamine
P084	4549-40-0	N-Nitrosomethylvinylamine
P088	145-73-3	Endothall
P092	62-38-4	Mercury (acetato-O)phenyl
P097	52-85-7	Famphur
P098	151-50-8	Potassium cyanide
P099	506-61-6	Potassium silver cyanide
P101	107-12-0	Ethyl cyanide
P102	107-19-7	Propargyl alcohol
P103	630-10-4	Selenourea
P104	506-64-9	Silver cyanide
P105	26628-22-8	Sodium azide
P106	143-33-9	Sodium cyanide
P109	3689-24-5	Tetraethyldithiopyrophosphate
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P118	75-70-7	Trichloromethanethiol
P119	7803-55-6	Ammonium vanadate
P121	557-21-1	Zinc cyanide
P122	1314-84-7	Zinc phosphide Zn_3P_2

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Chemical Abstract Number	Acceptable for Bulking	Description
U002	67-64-1	Y	Acetone (I)
U003	75-05-8	Y	Acetonitrile (I,T)
U007	79-06-1	Y	Acrylamide
U008	79-10-7	Y	Acrylic Acid (I)
U009	107-13-1	Y	Acrylonitrile
U012	62-53-3	Y	Aniline (I,T)
U019	71-43-2	Y	Benzene (I,T)
U025	111-44-4	Y	Dichloroethyl ether
U029	74-83-9	Y	Methyl bromide
U031	71-36-3	Y	n-Butyl alcohol (I)
U036	57-74-9	Y	Chlordane, alpha & Gamma isomers
U037	108-90-7	Y	Chlorobenzene
U041	106-89-8	Y	Epichlorohydrin
U044	67-66-3	Y	Chloroform
U045	74-87-3	Y	Methyl chloride (I,T)
U052	1319-77-3	Y	Cresol (Cresylic acid)
U055	98-82-8	Y	Cumene (I)
U056	110-82-7	Y	Cyclohexane (I)
U057	108-94-1	Y	Cyclohexanone (I)
U067	106-93-4	Y	Ethylene dibromide
U070	95-50-1	Y	o-Dichlorobenzene
U071	541-73-1	Y	m-Dichlorobenzene
U072	106-46-7	Y	p-Dichlorobenzene
U076	75-34-3	Y	Ethane, 1,1-dichloro-
U077	107-06-2	Y	Ethane, 1,2-dichloro-
U078	75-35-4	Y	1,1-Dichloroethylene
U079	156-60-5	Y	1,2-Dichloroethylene
U080	75-09-2	Y	Methylene chloride
U083	78-87-5	Y	Propylene dichloride
U093	60-11-7	Y	p-Dimethylaminoazobenzene
U102	131-11-3	Y	Dimethyl Phthalate
U103	77-78-1	Y	Dimethyl sulfate
U105	121-14-2	Y	2,4-Dinitrotoluene
U106	606-20-2	Y	2,6-Dinitrotoluene
U107	117-84-0	Y	Di-n-octyl phthalate
U108	123-91-1	Y	1,4-Dioxane
U112	141-78-6	Y	Ethyl acetate (I)
U113	140-88-5	Y	Ethyl acrylate (I)
U117	60-29-7	Y	Ethyl ether (I)
U122	50-00-0	Y	Formaldehyde
U123	64-18-6	Y	Formic acid (C,T)
U125	98-01-1	Y	Furfural (I)
U129	58-89-9	Y	Lindane
U131	67-72-1	Y	Hexachloroethane
U134	7664-39-3	Y	Hydrofluoric acid (C,T)
U138	74-88-4	Y	Methyl iodide
U140	78-83-1	Y	Isobutyl alcohol (I,T)
U144	301-04-2	Y	Lead acetate
U147	108-31-6	Y	Maleic anhydride
U151	7439-97-6	Y	Mercury
U154	67-56-1	Y	Methanol (I)

Waste Codes Acceptable for Bulking

Hazardous Waste Code	Chemical Abstract Number	Acceptable for Bulking	Description
U159	78-93-3	Y	Methyl ethyl ketone (MEK)(I,T)
U161	108-10-1	Y	Methyl isobutyl ketone (I)
U165	91-20-3	Y	Naphthalene
U167	134-32-7	Y	1-Naphthalenamine
U168	91-59-8	Y	2-Naphthalenamine
U169	98-95-3	Y	Nitrobenzene (I,T)
U171	79-46-9	Y	Nitropropane
U183	608-93-5	Y	Pentachlorobenzene
U188	108-95-2	Y	Phenol
U190	85-44-9	Y	Phthalic Anhydride
U191	109-06-8	Y	Pyridine, 2-methyl-
U201	108-46-3	Y	Resorcinol
U202	81-06-2	Y	Saccharin & salts
U204	7783-00-8	Y	Selenious acid
U205	7488-56-4	Y	Selenium sulfide
U207	95-94-3	Y	1,2,4,5-Tetrachlorobenzene
U208	630-20-6	Y	1,1,1-2-Tetrachloroethane
U209	79-34-5	Y	1,1,2,2-Tetrachlorethane
U210	127-18-4	Y	Tetrachloroethylene
U211	56-23-5	Y	Carbon tetrachloride
U213	109-99-9	Y	Tetrahydrofuran (I)
U214	563-68-8	Y	Thallium(I) acetate
U215	6533-73-9	Y	Thallium(I) carbonate
U220	108-88-3	Y	Toluene
U221	25376-45-8	Y	Toluenediamine
U225	75-25-2	Y	Bromoform
U226	71-55-6	Y	Methyl chloroform
U227	79-00-5	Y	1,1,2-Trichloroethane
U228	79-01-6	Y	Trichloroethylene
U239	1330-20-7	Y	Xylene (I)
U244	137-26-8	Y	Thiram
U248	81-81-2	Y	Warfarin & salts, when present at concentrationsof 3% or less
U328	95-53-4	Y	o-Toluidine
U353	106-49-0	Y	p-Toluidine
U359	110-80-5	Y	Ethylene glycol monoethyl ether

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
U001	75-07-0	Acetaldehyde (1)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U010	50-07-7	Mitomycin C
U011	61-82-8	Amitrole
U014	492-80-8	Auramine
U015	115-02-6	Azaserine
U016	225-51-4	Benz(c)acridine
U017	98-87-3	Benzal chloride
U018	56-55-3	Benz(a)anthracene
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U021	92-87-5	Benzidine
U022	50-32-8	Benzo(a)pyrene
U024	111-91-1	Dichloromethoxy ethane
U026	494-03-1	Chlornaphazin
U027	108-60-1	Dichloroisoprophy ether
U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U032	13765-19-0	Calcium chromate
U033	353-50-4	Carbonic oxyfluoride
U034	75-87-6	Acetaldehyde, Trichloro-
U035	305-03-3	Chlorambucil
U038	510-15-6	Chlorobenzilate
U039	59-50-7	Phenol, 4-chloro-3-methyl-
U042	110-75-8	2-Chloroethyl vinyl ether
U043	75-01-4	Vinyl chloride
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	Phenol, 2-chloro-
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U050	218-01-9	Chrysene
U051		Cresote
U058	50-18-0	Cyclophosphamide
U059	20830-81-3	Daunomycin
U060	72-54-8	DDD
U061	50-29-3	DDT
U062	2303-16-4	Diallate
U063	53-70-3	Dibenz(a,h)anthracene
U064	189-55-9	Dibenzo(a,i)pyrene
U068	74-95-3	Methane, dibromo-
U069	84-74-2	dibutyl phthalate
U074	764-41-0	1,4-Dichloro-2 butene (I,T)
U075	75-71-8	Dichlorodifluoromethane
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U084	542-75-6	1,3-Dichloropropene
U085	1464-53-5	2,2'-Bioxirane

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
U086	1615-80-1	Hydrazine, 1,2-dimethyl-
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl
U088	84-66-2	Diethyl phthalate
U089	56-53-1	Diethylstibesterol
U090	94-58-6	Dihydrosafrole
U091	119-90-4	3,3'-Dimethoxybenzidine
U092	134-40-3	Dimethylamine (I)
U094	57-97-6	7,12-Dimethylbenz(a)anthracene
U095	119-93-7	3,3'-Dimethylbenzidine
U096	80-15-9	Hydroperoxide, 1-methyl-1-phenylethy
U097	79-44-7	Dimethylcarbamoyl chloride
U099	540-73-8	Hydrazine, 1,2-dimethyl-
U101	105-67-9	2,4-Dimethylphenol
U109	122-66-7	Hydrazine, 1,2-dimethyl-
U110	142-84-7	Dipropylamine (I)
U111	621-64-7	Di-n propylnitrosamine
U114	111-54-6	Carbamodithioic acid, 1,2-ethanediyl
U116	96-45-7	Ethylenethiourea .
U118	97-63-2	Ethyl methacrylate
U119	62-50-0	Ethyl methanesulfonate
U120	206-44-0	Fluoranthene
U121	75-69-4	Methane, trichlorofluoro-
U124	110-00-9	Furfuran (I)
U126	765-34-4	Glycidylaldehyde
U127	118-74-1	Hexachlorobenzene
U128	87-68-3	Hexachlorobutadiene
U132	70-30-4	Phenol, 1,1'-methylenebis(3,4,6-tric
U133	302-01-2	Hydrazine (R,T)
U135	7783-06-4	Hydrogen sulfide
U136	75-60-5	Cacodylic acid
U137	193-39-5	Indeno (1,2,3-cd)pyrene
U139	9004-66-4	Iron dextran
U141	120-58-1	Isosafrole
U143	303-34-4	Lasiocarpine
U145	7446-27-7	Lead phosphate
U146	1335-32-6	Lad subacetate
U148	123-33-1	Maleic hydrazide
U149	109-77-3	Malononitrile
U150	148-82-3	Melphalan
U152	126-98-7	Methacrylonitrile (I,T)
U153	74-93-1	Methanethiol (I,T)
U155	91-80-5	Methapyrilene
U156	79-22-1	Methyl chlorocarbonate (I,T)
U157	56-49-5	3-Methylcholanthrene
U158	101-14-4	4,4-Methylenebis(2-chloroaniline)
U162	80-62-6	Methyl methacrylate (I,T)
U163	70-25-7	MNNG
U164	56-04-2	Methylthiouracil
U166	130-15-4	1,4-Naphthalenedione
U170	100-02-7	Phenol, 4-nitro-

Waste Codes Acceptable for Storage Only

Hazardous Waste Code	Chemical Abstract Number	Description
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	Urea, N-ethyl-N-nitroso-
U177	684-93-5	Urea, N-methyl-N-nitroso-
U178	615-53-2	N-Nitroso-N-methylurethane
U179	100-75-4	Nitrosopiperidine
U180	930-55-2	Pyrrolidine, 1-nitroso-
U181	99-55-8	5-Nitro-o-toluidine
U182	123-63-7	Paraldehyde
U184	76-01-7	Pentachlorothane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
U186	504-60-9	1-Methylbutadiene (I)
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
U189	1314-80-3	Phosphorus sulfide (R)
U192	23950-58-5	Pronamide
U193	1120-71-4	1,3-Propane sultone
U194	107-10-8	1-Propanamine (I,T)
U197	1-7-51-4	p-Benzoquinone
U200	50-55-5	Reserpine
U203	94-59-7	Safrole
U206	18883-66-4	Streptozotocin
U216	7791-12-0	Thallium(I) chloride
U217	10102-45-1	Thallium(I) nitrate
U218	62-55-5	Thioacetamide
U219	62-56-5	Thiourea
U222	636-21-5	o-Toluidine hydrochloride
U234	99-35-4	1,3,5-Trinitrobenzene (R,T)
U235	126-72-7	Trist (2,3-dibromopropyl) phosphate
U236	72-57-1	Trypan blue
U238	51-79=6	Ethyl carbamate (urethane)
U240	94-75-7	2,4D, salts & esters
U243	1888-71-7	Hexachloroprop[illegible]
U246	506-68-3	Cyanogen brom[illegible]N) Br
U249	1314-84-7	Zinc phosphid[illegible] hen present at concentratior

Appendix C-16
Removed Intentionally

Appendix C-17
Removed Intentionally

APPENDIX C.1d
MDNR LISTED WASTES

Waste Codes Acceptable for Bulking

Michigan Hazardous Waste Number	Acceptable for Bulking	Description
011U	Y	o-Anisidine
033U	Y	2-Chloroethanol
054U	Y	Dichlorvos
059U	Y	EPN
070U	Y	Hydroquinone
072U	Y	Hypochlorite
101U	Y	Nitrobiphenyl
131U	Y	Styrene
139U	Y	o-Toluidine
150U	Y	p-chlorophenol
155U	Y	Vinylidene chloride
161U	Y	Butylbenzlphthalate
163U	Y	1-chloropropene
172U	Y	1,2,3-Trichlorobenzene
173U	Y	1,2,4-Trichlorobenzene
174U	Y	Urethane

Michigan Hazardous Waste Number	Acceptable for Bulking	Description
001K	Y	Residues, including emission control sludges, from the production process and packaging of 4,4'-methylenebis (2-chloroaniline)
002K	Y	Wash acids generated after the effective date of these rules from the production of 3,3'-Dichlorobenzidine, excluding wash acids that are recycled or any materials that are reclaimed from the wash acids and used feneficially

Waste Codes Acceptable for Storage Only

Michigan Hazardous Waste Number	Description
001U	Actinomycin D
002U	Allyl chloride
003U	2-aminoanthraquinone
004U	Aminoazobenzene
005U	0-aminoazotoluene
006U	4-aminobiphenyl
007U	3-amino-9-ethyl carbazole hydrchloride
008U	1-amino-2-methyl anthraquinone
009U	Anilazine
012U	0-Anisidine hydrochloride
013U	Antimony (when in the form of particles 100
014U	Antimycin A
015U	Barban
016U	Bendiocarb
017U	Benomyl
020U	Bromoxynil
021U	2(p-tert-Buitylphenoxy)-Isopropyl-2-chloroe
022U	Captafol
023U	Captan
024U	Carbaryl
027U	Carbophenothion
028U	Chloramines
029U	Chloropyrifos
034U	3-(Chloromethyl)pyridine hydrochloride
036U	4-chloro-m-phenylenediamine
037U	4-chloro-o-phenylenediamine
038U	Chloroprene
041U	Clonitralid
041U	Cobalt(when in the form of particles 100 microns or less)
042U	Coumaphos
043U	p-Cresidine
044U	Crotoxyphos
046U	Cycloheximide
047U	Demeton
048U	2,4-Diaminoanisole sulfate
049U	4,4'-Diaminodiphenyl ether
050U	2,4-Diaminotoluene
051U	Diazinon
052U	Dichlone
056U	Diethylsulfate
057U	Dinocap
058U	Dioxathion
061U	Ethion
063U	Fensulfothion
064U	Fenthion
065U	Fluchloralin

068U	Hexamethylphosphoramide
071U	N-(2-Hydroxyethyl) ethylenelmine

Waste Codes Acceptable for Storage Only

Michigan Hazardous Waste Number	Description
073U	Isonicotinic acid hydrazine
075U	Lactonitril
076U	Leptophos
078U	Malachite green
079U	Malathion
080U	Mestranol
082U	4,4'-Methylenebis (2-methylaniline)
083U	4,4'-Methylenebis (N,N-dimethylaniline)
086U	1-Methylnaphthalene
088U	Mevinphos
089U	Mexacarbate
090U	Mirex
094U	Naled
095U	1,5-Napthalenediamine
096U	Nickel (when inthe form of particles 100 micr
097U	Niridazole
098U	Nithiazide
099U	5-Nitroacenaphthene
100U	Nitro-o-anisidine
102U	Nitrofen
103U	N-(4-(5-nitro-2-furanyl)-2-thiazolyl)-acetami
106U	p-Nitrosodiphenylamine
108U	N-nitroso-N-phenylhydroxylamine,ammonium salt
110U	Oxydemeton-methyl
113U	Phenazopyridine Hydrochloride
114U	Phenesterin
115U	Phenobarbitol
116U	Phenytoin
117U	Phenytoin sodium
118U	Phosazetim
120U	Phosphamidon
121U	Piperonyl sulfoxide
122U	Polybrominated biphenyls (PBB)
124U	Propiolaclone
127U	Propylthiouracll
128U	Rotenone
129U	Semicarbazide
132U	Sulfallate
134U	TDE
137U	Tetrachlorvinphos
138U	4,4'-Thiodianiline
140U	Triaryl phosphate esters
141U	Trichlorion
142U	Trifluralin
143U	2,4,5-Trimethylaniline
144U	Triamethylphosphate

146U	Ziram
147U	Azinphos-ethyl

Waste Codes Acceptable for Storage Only

Michigan Hazardous Waste Number	Description
148U	Azinphos-methyl
151U	5-chloro-o-toluidene
152U	Methacrylonitrile
154U	Bis (tri-n-butyl tin) oxide
157U	3-amino-9-ethyl carbazole
158U	Aniline hydrochloride
159U	Azobenzene
162U	1-chloro-4-phenoxybenzene
164U	P,P'DDE
165U	N,N'-Diethylhiourea
166U	1,2-Epoxybutane
167U	Kanechlor C
168U	N-Nitrosomethylvinylamine
169U	Octachlorostyrene
170U	Semicarbazide hydrochloride
171U	Tributyltin (and other salts & esters
175U	Vinylbromide

APPENDIX C.2

CHARACTERIZATIONS FOR WASTES ACCEPTED FOR STORAGE -CONTAINER STORAGE FACILITY

Waste characterization information will be added to this section at the time of acceptance of the waste for storage in the Container Storage Facility.

APPENDIX C.3

CHARACTERIZATIONS FOr WASTES

ACCEPTED FOR TREATMENT AND STORAGE IN TANKS

Waste characterization information will be added to this section at the time of acceptance of the waste for treatment and/or storage in tanks.

DYNECOL

DYNECOL, INC.

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: June 8, 1989

Sample I.D. No.: 11433

GENERATOR

Company Name: CHEMICAL MILLING INC. Phone: (313)771-8040

Generator Identification Number: MID091951434

Address: 16082 COMMON RD. City: ROSEVILLE State: MI Zip: 48066

Contact and Title: FRANK HARRISON - PRESIDENT

SUBMITTER OF SAMPLE (if different from GENERATOR)

Company Name: _____ Phone: _____

Address: _____ City: _____ State: _____ Zip: _____

Contact and Title: _____

WASTE DESCRIPTION

Common Name: WASTE ACID Volume Generated (gal./mo.): 500/mo.

DOT Shipping Name: WASTE ACID

DOT Hazard Class: CORROSIVE DOT Shipping Code (UN/NA): 1790

EPA Hazardous Waste No.: D002

Description of Process Generating Waste: ETCHING OF METAL

Handling Precautions: AVOID CONTACT WITH SKIN & EYES

WASTE CHARACTERIZATION

Physical State @ 70°F (circle one): Solid Slurry (Liquid) Powder

Specific Gravity @ 70°F: _____ BOD: _____ COD: _____ TOC: _____

Flash Point and Method: NONE pH: _____ % Acid or Alkali: _____

Odor (describe): STRONG

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	Y (N)	Poison	Y (N)	Asbestos	Y (N)
Corrosive	(Y) N	Radioactive	Y (N)	Cyanide	Y (N)
Explosive	Y (N)	Reactive	Y (N)	Organics	Y (N)
Flammable	Y (N)	Water Dispersion	(Y) N	PCB's	Y (N)
Oxidizer	Y (N)	Water Solution	(Y) N	Pesticides	Y (N)
Reducer	Y (N)			Sulfides	Y (N)

WASTE COMPOSITION (concentration in ppm or mg/l)

California List Wastes (please fill out completely)		California List Wastes (con't)			
Arsenic	38.75	Mercury	<10.0	Chromium (total)	3.254
Cadmium	<1.0	Nickel	<2.5	FOG	none
Chromium (+6)		Selenium	<10.0	Iron	249.2
Cyanides		Thallium	1,950 ppm	Phenols	
HOC	none	Cobalt		Phosphorus	
Lead	<10.0	Copper	<1.0	Silver	<3.0
				Sulfides	
				Zinc	<1.0

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

Please call [illegible]

6.12.1989 16:15 P. 4

SYNECOL

6520 Georgia St
Detroit, MI 48211
313-571-7140

Date: July 15, 1

Sample I.D. No.:

GENERATOR

Company Name: Braun Engineering Company Phone: (313) 270-17

Generator Identification Number: MID 085 031 599

Address: 19001 Glendale City: Detroit State: MI Zip: 4822

Contact and Title: Marc Dixon, Plant Engineer

SUBMITTER OF SAMPLE (if different from GENERATOR)

Company Name: SAME Phone:

Address: City: State: Zip:

Contact and Title:

WASTE DESCRIPTION

Common Name: Spent Acid-Slug Line Volume Generated (gal./mo.): 45,000 Gal/MO

DOT Shipping Name: Sulfuric Acid, Spent-RQ 1000/454

DOT Hazard Class: Corrosive Material DOT Shipping Code (UN/NA): UN1832

EPA Hazardous Waste No.: K062 (D002, D007, D008)

Description of Process Generating Waste: Slug Phosphate Coating Line

Handling Precautions: Adequate ventillation, wear acid resistant eye and skin protective equipment.

WASTE CHARACTERIZATION

Physical State @ 70°F (circle one): Solid Slurry **Liquid** Powder

Specific Gravity @ 70°F: 1.2323 BOD: - COD: 2,800 TOC: -

Flash Point and Method: N.A. pH: 0.43 % Acid or Alkali: 3.0%

Odor (describe): Slight acidic odor at ambient temperatures

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	Y (N)	Poison	Y (N)	Asbestos	Y (N)
Corrosive	(Y) N	Radioactive	Y (N)	Cyanide	Y (N)
Explosive	Y (N)	Reactive	Y (N)	Organics	Y (N)
Flammable	Y (N)	Water Dispersion	Y (N)	PCB's	Y (N)
Oxidizer	(Y) N	Water Solution	(Y) N	Pesticides	Y (N)
Reducer	Y (N)			Sulfides	Y (N)

WASTE COMPOSITION (concentration in ppm or mg/l)

L.T.=Less Than

California List Wastes (please fill out completely)		California List Wastes (con't)			
Arsenic	L.T. 0.01	Mercury	L.T. 0.005	Chromium (total)	36
Cadmium	0.36	Nickel	32	POG	L.T. 10
Chromium (+6)	L.T. 1.0	Selenium	L.T. 0.01	Iron	85,000
Cyanides	L.T. 0.05	Thallium	2.1	Phenols	0.
HOC	0.300	Cobalt	3.8	Phosphorus	1,300
Lead	7.4	Copper	0.68	Silver	0.
				Sulfides	L.T. 0.
				Zinc	1,000

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 10 oz. sample in DOT approved container.

☐ Report completed by: (Name, Title, Phone No.) Raymond J. Barker, P.E. (313) 494-0606

DYNECOL

DYNECOL, INC.

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: 2-13-89

Sample I.D. No.: 1

GENERATOR

Company Name: Commonwealth Industries Phone: (313) 872-7900
Generator Identification Number: MID 072782857
Address: 5900 Commonwealth Ave City: Detroit State: MI Zip: 48208
Contact and Title: David Muck Plating Dept Plant Manager

SUBMITTER OF SAMPLE *(If different from GENERATOR)*

Company Name: _____ Phone: _____
Address: _____ City: _____ State: _____ Zip: _____
Contact and Title: _____

WASTE DESCRIPTION

Common Name: Hydrochloric acid Volume Generated (gal./mo.): 8000
DOT Shipping Name: _____
DOT Hazard Class: _____ DOT Shipping Code (UN/NA): 1789
EPA Hazardous Waste No.: K062
Description of Process Generating Waste: Pickling of steel parts
Handling Precautions: _____

WASTE CHARACTERIZATION

Physical State @ 70°F *(circle one)*: Solid Slurry (Liquid) Powder
Specific Gravity @ 70°F: _____ BOD: _____ COD: _____ TOC: _____
Flash Point and Method: >200 pH: <1 % Acid or Alkali: _____
Odor *(describe)*: _____

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	Y (N)	Poison	Y (N)	Asbestos	Y (N)
Corrosive	(Y) N	Radioactive	Y (N)	Cyanide	Y (N)
Explosive	Y (N)	Reactive	(Y) N	Organics	Y (N)
Flammable	Y (N)	Water Dispersion	Y (N)	PCB's	Y (N)
Oxidizer	Y (N)	Water Solution	(Y) N	Pesticides	Y (N)
Reducer	Y (N)			Sulfides	Y (N)

WASTE COMPOSITION *(concentration in ppm or mg/l)*

California List Wastes *(please fill out completely)*		California List Wastes *(con't)*			
Arsenic	0.094	Mercury	<0.005	Chromium (total)	54.4
Cadmium	<0.1	Nickel	25.8	FOG	
Chromium (+6)		Selenium	<0.001	Iron	20,200
Cyanides	<0.1	Thallium		Phenols	8.86
HOC		+ + + + + + + + + + + + + + + +		Phosphorus	
Lead	2.28	Cobalt	2.17	Silver	.0007
		Copper	7.48	Sulfides	<0.01
				Zinc	3950

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 16 oz. sample in DOT approved container.
☐ Report completed by: (Name, Title, Phone No.) [illegible]

~~WASTE ACID SERVICES, INC.~~

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: May 31, 1985

Sample I.D. No.: 3

GENERATOR

Company Name American Steel Phone 365-7000
Address 7170 East McNichols City Detroit State MI Zip 48212
Contact and Title John Cavalier - Envir. Mgr.

SUBMITTER OF SAMPLE *(if different from GENERATOR)*

Company Name _____ Phone _____
Address _____ City _____ State _____ Zip _____
Contact and Title _____

WASTE DESCRIPTION

Common Name Hydrochloric Acid Volume Generated (gal./mo.) 160,000 gpm
DOT Shipping Name Hydrochloric Acid, Spent (Ferrous Chloride)
DOT Hazard Class Corrosive DOT Shipping Code (UN/NA) UN-1789 (UN-1760
EPA Hazardous Waste No. K062 Spent Pickle Liquor
Description of Process Generating Waste Steel Pickling
Handling Precautions _____

WASTE CHARACTERIZATION

Physical State @ 70°F *(circle one)*: Solid Slurry (Liquid) Powder
Specific Gravity @ 70°F 11#/g BOD _____ COD _____ TOC _____
Flash Point and Method N/A pH <1.0 % Acid or Alkali ~6% HCl
Odor *(describe)* _____

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	Y	N	Poison	Y	N	Asbestos	Y	N
Corrosive	(Y)	N	Radioactive	Y	N	Cyanide	Y	N
Explosive	Y	N	Reactive	Y	N	Organics	Y	N
Flammable	Y	N	Water Dispersion	Y	N	PCB's	Y	N
Oxidizer	Y	N	Water Solution	(Y)	N	Pesticides	Y	N
Reducer	Y	N				Sulfides	Y	N

WASTE COMPOSITION *(concentration in ppm or mg/l)*

Arsenic	<1.0	Cyanides	-	Phenols	-
Barium	-	Fats, Oil, Grease	-	Selenium	<1.0
Cadmium	7.1	Iron	-	Silver	0.6
Cobalt	-	Lead	152.3	Sulfides	-
Copper	31.9	Mercury	<0.5	Zinc	133.0
Chromium (+6)	-	Molybdenum	-		
Chromium (total)	71.2	Nickel	40.1		

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 16 oz. sample in DOT approved container.
☐ Report completed by: *(Name, Title, Phone No.)* _____

~~WASTE ACID SERVICES, INC.~~

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: Aug. 30, 1985

Sample I.D. No.: _____

GENERATOR

Company Name: Voss Steel Phone: 295-1500
Address: 7925 Beech Daly City: Taylor State: MI Zip: _____
Contact and Title: Ted Szynal - Plt. Mgr.

SUBMITTER OF SAMPLE *(if different from GENERATOR)*

Company Name: _____ Phone: _____
Address: _____ City: _____ State: _____ Zip: _____
Contact and Title: _____

WASTE DESCRIPTION

Common Name: Hydrochloric Acid Volume Generated (gal./mo.): 210,000 gpm
DOT Shipping Name: Hydrochloric Acid, Spent (Ferrous Chloride)
DOT Hazard Class: Corrosive DOT Shipping Code (UN/NA): UN 1789 (UN 17
EPA Hazardous Waste No.: K062 Spent Pickle Liquor
Description of Process Generating Waste: Steel Pickling
Handling Precautions: _____

WASTE CHARACTERIZATION

Physical State @ 70°F *(circle one)*: Solid Slurry (Liquid) Powder
Specific Gravity @ 70°F: ~12#/g BOD: _____ COD: _____ TOC: _____
Flash Point and Method: N/A pH: <1 % Acid or Alkali: ~6.5% HCl
Odor *(describe)*: _____

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	~~Y~~ N	Poison	~~Y~~ N	Asbestos	~~Y~~ N
Corrosive	(Y) N	Radioactive	~~Y~~ N	Cyanide	~~Y~~ N
Explosive	~~Y~~ N	Reactive	~~Y~~ N	Organics	~~Y~~ N
Flammable	~~Y~~ N	Water Dispersion	~~Y~~ N	PCB's	~~Y~~ N
Oxidizer	~~Y~~ N	Water Solution	(Y) N	Pesticides	~~Y~~ N
Reducer	~~Y~~ N			Sulfides	~~Y~~ N

WASTE COMPOSITION *(concentration in ppm or mg/l)*

Arsenic	<1.0	Cyanides	-	Phenols	-
Barium	-	Fats, Oil, Grease	-	Selenium	<1.0
Cadmium	<0.1	Iron	-	Silver	<0.5
Cobalt	-	Lead	<0.5	Sulfides	-
Copper	31.6	Mercury	<1.0	Zinc	172.3
Chromium (+6)	-	Molybdenum	-		
Chromium (total)	135.0	Nickel	80.0		

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 16 oz. sample in DOT approved container.
☐ Report completed by: *(Name, Title, Phone No.)* _____

5.33c

~~WASTE ACID SERVICES, INC.~~

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: May 31 1985

Sample I.D. No.: _____

GENERATOR

Company Name: Bedford Steel Phone: 848-2915
Address: 640 Lavoy Road City: Erie State: MI Zip: 48133
Contact and Title: Dick Garrett - Oper. Mgr.

SUBMITTER OF SAMPLE *(if different from GENERATOR)*

Company Name: _____ Phone: _____
Address: _____ City: _____ State: _____ Zip: _____
Contact and Title: _____

WASTE DESCRIPTION

Common Name: Hydrochloric Acid Volume Generated (gal./mo.): 140,000 gal
DOT Shipping Name: Hydrochloric Acid, Spent (Ferrous Chloride)
DOT Hazard Class: Corrosive DOT Shipping Code (UN/NA): UN-1789 (UN-1760)
EPA Hazardous Waste No.: K062 Spent Pickle Liquor
Description of Process Generating Waste: Steel Pickling
Handling Precautions: _____

WASTE CHARACTERIZATION

Physical State @ 70°F *(circle one)*: Solid Slurry (Liquid) Powder
Specific Gravity @ 70°F: 11#/g BOD: _____ COD: _____ TOC: _____
Flash Point and Method: N/A pH: _____ % Acid or Alkali: _____
Odor *(describe)*: _____

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	Y N	Poison	Y N	Asbestos	Y N
Corrosive	(Y) N	Radioactive	Y N	Cyanide	Y N
Explosive	Y N	Reactive	Y N	Organics	Y N
Flammable	Y N	Water Dispersion	Y N	PCB's	Y N
Oxidizer	Y N	Water Solution	(Y) N	Pesticides	Y N
Reducer	Y N			Sulfides	Y N

WASTE COMPOSITION *(concentration in ppm or mg/l)*

Arsenic	<1.0	Cyanides	-	Phenols	-
Barium	-	Fats, Oil, Grease	-	Selenium	<1.0
Cadmium	0.3	Iron	-	Silver	1.2
Cobalt	-	Lead	<0.5	Sulfides	-
Copper	20.8	Mercury	<0.5	Zinc	11.1
Chromium (+6)	-	Molybdenum	-		
Chromium (total)	53.5	Nickel	28.4		

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 16 oz. sample in DOT approved container.
☐ Report completed by: *(Name, Title, Phone No.)* _____

5.33a

~~WASTE ACID SERVICES, INC.~~

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: Aug. 30, 1985

Sample I.D. No.: _____

GENERATOR

Company Name: Midwest Steel Phone: 756-0460
Address: 23860 Sherwood City: Centerline State: MI Zip: 48015
Contact and Title: Tom Buhler - V.P.

SUBMITTER OF SAMPLE *(if different from GENERATOR)*

Company Name: _____ Phone: _____
Address: _____ City: _____ State: _____ Zip: _____
Contact and Title: _____

WASTE DESCRIPTION

Common Name: Sulfuric Acid Volume Generated (gal./mo.): 40,000 g.
DOT Shipping Name: Sulfuric Acid, Spent
DOT Hazard Class: Corrosive DOT Shipping Code (UN/NA): UN-1832
EPA Hazardous Waste No.: K062 Spent Pickle Liquor
Description of Process Generating Waste: Steel Pickling
Handling Precautions: _____

WASTE CHARACTERIZATION

Physical State @ 70°F *(circle one)*: Solid Slurry (Liquid) Powder
Specific Gravity @ 70°F: 11#/g BOD: _____ COD: _____ TOC: _____
Flash Point and Method: N/A pH: <1.0 % Acid or Alkali: ~10% H_2SO_4
Odor *(describe)*: _____

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	~~Y~~ N	Poison	~~Y~~ N	Asbestos	~~Y~~ N
Corrosive	(Y) N	Radioactive	~~Y~~ N	Cyanide	~~Y~~ N
Explosive	~~Y~~ N	Reactive	Y N	Organics	~~Y~~ N
Flammable	~~Y~~ N	Water Dispersion	~~Y~~ N	PCB's	~~Y~~ N
Oxidizer	~~Y~~ N	Water Solution	(Y) N	Pesticides	~~Y~~ N
Reducer	~~Y~~ N			Sulfides	~~Y~~ N

WASTE COMPOSITION *(concentration in ppm or mg/l)*

Arsenic	<1.0	Cyanides	-	Phenols	-
Barium	-	Fats, Oil, Grease	-	Selenium	<1.0
Cadmium	<0.1	Iron	-	Silver	<0.5
Cobalt	-	Lead	<0.5	Sulfides	-
Copper	<0.1	Mercury	<0.1	Zinc	36.9
Chromium (+6)	-	Molybdenum	-		
Chromium (total)	900	Nickel	<0.5		

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 16 oz. sample in DOT approved container.
☐ Report completed by: *(Name, Title, Phone No.)* _____

4002

DYNECOL, INC.
~~WASTE ACID SERVICES, INC.~~

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: Aug. 30, 1985

Sample I.D. No.: _____

GENERATOR

Company Name: Howmet Phone: 616-894-5686
Address: 1600 S. Warner Rd City: Whitehall State: MI Zip: 49461
Contact and Title: Keith Shell - Env. Eng.

SUBMITTER OF SAMPLE *(if different from GENERATOR)*

Company Name: _____ Phone: _____
Address: _____ City: _____ State: _____ Zip: _____
Contact and Title: _____

WASTE DESCRIPTION

Common Name: Nitric Acid Volume Generated (gal./mo.): 5,000 gpm
DOT Shipping Name: Nitric Acid, Spent
DOT Hazard Class: Corrosive DOT Shipping Code (UN/NA): UN-1760
EPA Hazardous Waste No.: D002 Corrosive
Description of Process Generating Waste: Metal Etching
Handling Precautions: _____

WASTE CHARACTERIZATION

Physical State @ 70°F *(circle one)*: Solid Slurry (Liquid) Powder
Specific Gravity @ 70°F: _____ BOD: _____ COD: _____ TOC: _____
Flash Point and Method: N/A pH: <1.0 % Acid or Alkali: 15-25% HNO_3
Odor *(describe)*: _____

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	Y N	Poison	Y N	Asbestos	Y N
Corrosive	(Y) N	Radioactive	Y N	Cyanide	Y N
Explosive	Y N	Reactive	Y N	Organics	Y N
Flammable	Y N	Water Dispersion	Y N	PCB's	Y N
Oxidizer	(Y) N	Water Solution	(Y) N	Pesticides	Y N
Reducer	Y N			Sulfides	Y N

WASTE COMPOSITION *(concentration in ppm or mg/l)*

Arsenic	<1.0	Cyanides	-	Phenols	-
Barium	-	Fats, Oil, Grease	-	Selenium	<1.0
Cadmium	0.7	Iron	-	Silver	<0.5
Cobalt	-	Lead	11.3	Sulfides	-
Copper	<0.1	Mercury	<1.0	Zinc	2.5
Chromium (+6)	-	Molybdenum	-		
Chromium (total)	1.8	Nickel	16.5		

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 16 oz. sample in DOT approved container.
☐ Report completed by: *(Name, Title, Phone No.)* _____

F006 H_2SO_4

5.35a

WASTE ACID SERVICES, INC.

6520 Georgia St.
Detroit, MI 48211
313-571-7140

Date: Oct 16, 1985

Sample I.D. No.: _____

GENERATOR

Company Name: GM Hydramatic Phone: 575-1817
Address: 23500 Mound Rd City: Warren State: MI. Zip: 48091
Contact and Title: Frank Hickey - Chief Oper.

SUBMITTER OF SAMPLE *(if different from GENERATOR)*

Company Name: _____ Phone: _____
Address: _____ City: _____ State: _____ Zip: _____
Contact and Title: _____

WASTE DESCRIPTION

Common Name: Sulfuric Acid Wash Volume Generated (gal./mo.): 120,000 gpm
DOT Shipping Name: Sulfuric Acid, Spent
DOT Hazard Class: Corrosive DOT Shipping Code (UN/NA): UN-1782
EPA Hazardous Waste No.: F006
Description of Process Generating Waste: Oil Reclamation
Handling Precautions: _____

WASTE CHARACTERIZATION

Physical State @ 70°F *(circle one)*: Solid Slurry (Liquid) Powder
Specific Gravity @ 70°F: ~10#/g BOD: _____ COD: _____ TOC: _____
Flash Point and Method: N/A pH: <1.0 % Acid or Alkali: ~3.0% H_2SO
Odor *(describe)*: _____

Circle yes (Y) or no (N) to the presence of the following characteristics or contaminants:

Carcinogen	Y N	Poison	Y N	Asbestos	Y N
Corrosive	(Y) N	Radioactive	Y N	Cyanide	Y N
Explosive	Y N	Reactive	Y N	Organics	(Y) N Trace
Flammable	Y N	Water Dispersion	Y N	PCB's	Y N
Oxidizer	Y N	Water Solution	(Y) N	Pesticides	Y N
Reducer	Y N			Sulfides	Y N

WASTE COMPOSITION *(concentration in ppm or mg/l)*

Arsenic	<1.0	Cyanides	-	Phenols	-
Barium	-	Fats, Oil, Grease	56	Selenium	<1.0
Cadmium	0.5	Iron	1435	Silver	<0.5
Cobalt	-	Lead	28.2	Sulfides	-
Copper	-	Mercury	<1.0	Zinc	153.6
Chromium (+6)	-	Molybdenum			
Chromium (total)	51.1	Nickel	10.2		

Other Components	EPA Haz. Waste No.	Concentration (%)
1.		
2.		
3.		
4.		

ACTION

☐ Please send a 16 oz. sample in DOT approved container.
☐ Report completed by: *(Name, Title, Phone No.)* _____

APPENDIX C.4

ANALYTICAL PARAMETERS AND RATIONALE FOR WASTES STORED AT THE CONTAINER STORAGE FACILITY

APPENDIX C-4

TABLE 1

PARAMETERS, RATIONALE FOR THEIR SELECTION AND TEST METHODS DYNECOL HAZARDOUS WASTE CONTAINER STORAGE FACILITY

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
Generic:				
F001	Spent halogenated solvents	(T)	Tetrachloroethylene, methylene chloride trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, chlorinated fluorocarbons	8240
F002	Spent halogenated solvents	(T)	Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trichfluoroethane, ortho-dichlorobenzene, trichlorofluoromethane	8240
F003	Spent non-halogenated solvents	(I)	N.A.	
F004	Spent non-halogenated solvents	(T)	Cresols and cresylic acid, nitrobenzene	8270
F005	Spent non-halogenated solvents	(I, T)	Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, 2-ethoxyethanol, benzene, 2-nitropropane	8240
F006	Wastewater treatment sludges	(T)	Cadmium(Cd), hexavalent chromium(Cr^{+6}), nickel(Ni), cyanide (complexed)(CN)	Cd -3010/7130, Cr^{+6} -7196 Ni - 7520 CN - 9010
F007	Spent cyanide plating bath solutions	(R, T)	Cyanide (salts)	9010
F008	Plating sludges	(R, T)	Cyanide (salts)	9010
F009	Spent stipping and cleaning bath solutions	(R, T)	Cyanide (salts)	9010
F010	Quenching bath residues	(R, T)	Cyanide (salts)	9010
F011	Spent cyanide solutions	(R, T)	Cyanide (salts)	9010
F012	Quenching wastewater treatment sludges	(T)	Cyanide (complexed)	9010

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
F019	Wastewater treatment sludges	(T)	Hexavalent chromium(Cr^{+6}), cyanide (complexed)(CN)	Cr^{+6} - 7196 CN -9010
F024	Wastes	(T)	Chloromethane, dichloromethane, tri-chloromethane, carbon tetrachloride, chloroethylene, 1,1-dichloroethane, 1,2-dichloroethane, trans-1-2-dichloroethylene, 1,1-dichloroethylene 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene, 1,1,1,2-tetra-chloroethane 1,1,2,2 -tetrachloroethane, tetrachloroethylene, pentachloroethane, hexachloroethane, allyl chloride, (3-chloropropene), dichloropropane, dichloropropene 2-chloro-1,3-butadiene, hexachloro-1,3-butadene, hexachloro-cyclopentadene, hexachlorocyclohexane, benzene, chlorobenzene, dichloro-benzenes, 1,2,4-trichloro-benzene, tetrachlorobenzene, pentachlorobenzene, hexachlorobenzene, toluene, naphthalene	8240 & 8270
Wood Preservation				
K001	Bottom sediment sludge	(T)	Pentachlorophenol, phenol, 2-chlorophenol, p-chloro-m-cresol, 2,4-dimethylphenyl, 2,4-dinitrophenol, trichlorophenols, tetrachlorophenols, 2,4-dinitrophenol cresosote, chrysene, naphthalene, fluoranthene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, benz(a)-anthracene, dibenz(a)anthracene, acen-aphthalene	8270
Inorganic Pigments				
K002	Wastewater treatment sludge	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb)	Cr^{+6} - 7196 Pb - 3010/7420
K003	Wastewater treatment sludge	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb)	Cr^{+6} - 7196 Pb - 3010/7420
K004	Wastewater treatment sludge	(T)	Hexavalent chromium(Cr^{+6})	Cr^{+6} - 7196
K005	Wastewater treatment sludge	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb)	Cr^{+6} - 7196 Pb - 3010/7420
K006	Wastewater treatment sludge	(T)	Hexavalent chromium(Cr^{+6})	Cr^{+6} - 7196

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
K007	Wastewater treatment sludge	(T)	Cyanide (complexed)(CN), hexavalent chromium(Cr^{+6})	CN - 9010 Cr^{+6} -7196
K008	Oven residue	(T)	Hexavalent chromium(Cr^{+6})	Cr^{+6} - 7196
Organic chemicals:				
K009	Distillation bottoms	(T)	Chloroform, formaldehyde, methylene chloride, methyl chloride, paraldehyde, formic acid*	8240, 8411
K010	Distillation side cuts	(T)	Chloroform, formaldehyde, Methylene chloride, methyl chloride, paraldehyde, formic acid*, chloroacetaldehyde*	8240, 8411
K011	Bottom stream	(R, T)	Acrylonitrile, acetonitrile*, hydrocyanic acid*	8240
K013	Bottom stream	(R, T)	Hydrocyanic acid*, acrylonitrile, acetonitrile*	8240
K014	Bottoms	(T)	Acetonitrile*, acrylamide*	8240
K015	Still bottoms	(T)	Benzyl chloride*, chlorobenzene, toluene benzotrichloride*	8240
K016	Heavy ends or distillation residues	(T)	Hexachlorobenzene, hexachlorobutadiene, carbon tetrachloride, hexachloroethane, perchloroethylene	8240, 8270
K017	Heavy ends (still bottoms	(T)	Epichlorohydrin*, chloroethers [bis-(chloromethyl) ether* and bis (2-chloro ethyl) ethers], trichloropropane*, dichloropropanols*	8270
K018	Heavy ends	(T)	1,2-dichloroethane, trichloroethylene, hexachlorobutadiene, hexachlorobenzene	8240, 8270
K019	Heavy ends	(T)	Ethylene dichloride, 1,1,1-trichloroethane, 1,1,2-trichloroethane, tetrachloroethanes (1,1,2,2-tetrachloroethane and 1,1,1,2-tetrachloroethane), trichloroethylene, tetrachloroethylene, carbon tetrachloride, chloroform, vinyl chloride, vinylidene chloride	8240

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
K020	Heavy ends	(T)	Ethylene dichloride, 1,1,1-trichloroethane, 1,1,2-trichloroethane, tetrachloroethanes (1,1,2,2-tetrachloroethane, 1,1,1,2-tetrachloroethane), trichloroethylene, tetrachloroethylene, carbon tetrachloride, chloroform, vinyl chloride, vinylidene chloride	8240
K021	Aqueous spent antimony catalyst waste	(T)	Antimony, carbon tetrachloride, chloroform	8240 Antimony - 3010/7040
K022	Distillation bottom tars	(T)	Phenol, tars (polycyclic aromatic hydrocarbons)	8270 phenol - 9066
K023	Distillation light ends	(T)	Phthalic anhydride, maleic anhydride	*
K024	Distillation bottoms	(T)	Phthalic anydride, 1,4-naphthoquinone	*
K093	Distillation light ends	(T)	Phthalic anhydride, maleic anhydride	*
K094	Distillation bottoms	(T)	Phthalic anhydride	*
K025	Distillation bottoms	(T)	Meta-dinitrobenzene, 2,4-dinitrotoluene	8270
K026	Stripping still tails	(T)	Paraldehyde, pyridines, 2-picoline	*
K027	Centrifuge and distillation residues	(R, T)	Toluene diisocyanaate, toluene-2, 4-diamine	*
K028	Spent catalyst	(T)	1,1,1-trichloroethane, vinyl chloride	8240
K029	Waste	(T)	1,2-dichloroethane, 1,1,1-trichloroethane, vinyl chloride, vinylidene chloride, chloroform	8240
K095	Distillation bottoms	(T)	1,1,2-trichloroethane, 1,1,1,2-tetra chloroethane, 1,1,2,2-tetrachloroethane	8240
K096	Heavy ends	(T)	1,2-dichloroethane, 1,1,1-trichloroethane, 1,1,2-trichloroethane	8240

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
K030	Column bottoms or heavy ends	(T)	Hexachlorobenzene, hexachlorobutadiene, hexachloroethane, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, ethylene dichloride	8240, 8270
K083	Distillation bottoms	(T)	Aniline, diphenylamine*, nitrobenzene, phenylenediamine*	8270
K103	Process residues	(T)	Aniline, nitrobenzene, phenylenediamine*	8270
K104	Combined wastewater streams generated	(T)	Aniline, benzene, diphenylamine*, nitrobenzene, phenylenediamine*	8240, 8270
K085	Distillation or fractionation coloum bottoms	(T)	Bezene, dichlorobenzenes, trichlorobenzenes, tetrachlorobenzenes, pentachlorobenzene, hexachlorobenzene, benzyl chloride	8240, 8270
K105	Separated aqueous stream	(T)	Benzene, monochlorobenzene, dichlorobenzenes, 2,4,6-trichlorophenol	8240, 8270
K111	Product washwaters	(C,T)	2,4-Dinitrotoluene	8270
K112	Reaction by-product	(T)	2,4-Toluenediamine, o-toluidine, p-toluidine, aniline	*
K113	Condensed liquid light ends	(T)	2,4-Toluenediamine, o-toluidine, p-toluidine, aniline	*
K114	Vicinals	(T)	2,4-Toluenediamine, o-toluidine, p-toluidine	*
K115	Heavy ends	(T)	2,4-Toluenediamine	*
K116	Organic condensate	(T)	Carbon tetrachloride, tetrachloroethylene, chloroform, phosgene*	8240
K117	Wastewater	(T)	Ethylene dibromide	8240
K118	Spent adsorbent solids	(T)	Ethylene dibromide	8240
K136	Still bottoms	(T)	Ethylene dibromide	8240

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
Pesticides				
K031	By-product salts	(T)	Arsenic	7060
K032	Wastewater treatment sludge	(T)	Hexachlorocyclopentadiene	8270
K033	Wastewater and scrub water	(T)	Hexachlorocyclopentadiene	8270
K034	Filter solids	(T)	Hexachlorocyclopentadiene	8270
K097	Vacuum stripper discharge	(T)	Chlordane, heptachlor	8080
K035	Wastewater treatment sludge	(T)	Creosote, chrysene, naphthalene, fluoranthene, benzo(b) fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd) pyrene, benzo(a)anthracene, dibenzo-(a)anthracene, acenaphthalene	8270
K036	Still bottoms	(T)	Toluene, phosphorodithioic* and phosphorothioic acid esters*	8240
K037	Wastewater treatment sludge	(T)	Toluene, phosphorodithioic* and phosphorothioic acid esters*	8240
K038	Wastewater	(T)	Phorate*, formaldehyde, phos-phorodithioic and phosphorothioic acid esters*	8411
K039	Filter cake	(T)	Phosphorodithioic and phosphorothioic acid esters	*
K040	Wastewater treatment sludge	(T)	Phorate*, formaldehyde, phosphoro-dithioic* and phosphorothioic acid esters*	8411
K041	Wastewater treatment sludge	(T)	Toxaphene	8080
K042	Heavy ends or distillation residues	(T)	Hexachlorobenzene, ortho-dichlorobenzene	8270
K098	Untreated process wastewater	(T)	Toxaphene	8080

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
K043	2,6-Dichlorophenol waste	(T)	2,4-dichlorophenol, 2,6-dichlorophenol, 2,4,6-trichlorophenol	8270
K099	Untreated wastewater	(T)	2,4-dichlorophenol, 2,4,6-tri-chlorophenol	8270
K123	Process wastewater (including supernates, filtrates, and washwaters	(T)	Ethylene thiourea	*
K124	Reactor vent scrubber water	(C, T)	Ethylene thiourea	*
K125	Filtration, evaporation, and centrifugation solids	(T)	Ethylene thiourea	*
K126	Baghouse dust and floor sweepings	(T)	Ethylene thiourea	*
Petroleum refining:				
K048	Dissolved air flotation (DAF) float	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb)	Cr^{+6} - 7196 Pb 3010/7420
K049	Slop oil emulsion solids Cr^{+6} - 7196	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb)	Pb - 3010/7420
K050	Heat exchanger bundle cleaning sludge	(T)	Hexavalent chromium(Cr^{+6})	Cr^{+6} - 7196
K051	API separator sludge	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb)	Cr^{+6} - 7196 Pb 3010/7420
K052	Tank bottoms (leaded)	(T)	Lead(Pb)	Pb - 3010/7420
Iron and steel				
K061	Emission control dust/sludge	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb),cadmium(Cd)	Cr^{+6} -7196 Pb - 3010/7420 Cd - 3010/7130
K062	Spent pickle liquor	(C, T)	Hexavalent chromium(Cr^{+6}), lead(Pb)	Cr^{+6} -7196 Pb - 3010/7420
Primary Copper				
K064	Acid plant blowdown slurry/sludge	(T)	Lead (Pb), cadmium(Cd)	Pb - 3010/7420 Cd - 3010/7130

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
Primary Lead				
K065	Surface impoundment solids	(T)	Do	*
Primary Zinc				
K066	Sludge	(T)	Do	*
Secondary Lead				
K069	Emission control dust/ sludge	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb) cadmium(Cd)	Cr^{+6} - 7196 Pb - 3010/7420 Cd - 3010/7130
K100	Waste leaching solution	(T)	Hexavalent chromium(Cr^{+6}), lead(Pb) cadmium(Cd)	Cr^{+6} - 7196 Pb - 3010/7420 Cd - 3010/7130
Inorganic Chemicals				
K071	Brine purification muds	(T)	Mercury	7470 or 7471
K073	Chlorinated hydrocarbon waste	(T)	Chloroform, carbon tetrachloride, hexacholoroethane, trichloro-ethane, tetrachloroethylene, dichloroethylene, 1,1,2,2-tetrachloroethane	8240, 8270
K106	Wastewater treatment sludge	(T)	Mercury	7470 or 7471
Veterinary Pharmaceuticals:				
K084	Wastewater treatment sludge	(T)	Arsenic	7060
K101	Distillation tar residues	(T)	Arsenic	7060
K102	Residue	(T)	Arsenic	7060
K085	Distillation or fractionation coloum bottoms	(T)	Bezene, dichlorobenzenes, trichlorobenzenes, tetrachlorobenzenes, pentachlorobenzene, hexachloro-benzene, benzyl chloride*	8240, 8270
Ink formulation				
K086	Solvent washes and sludges, caustic washes and sludges, or water washes and sludges	(T)	Lead(Pb), hexavalent chromium(Cr^{+6})	Pb - 3010/7420 Cr^{+6} - 7196

Hazardous Waste	Parameter	Hazard Code	Rationale	Test Method
Coking				
K060	Ammonia still lime sludge	(T)	Cyanide*, napthalene, phenolic* compounds, arsenic	8270
K087	Decanter tank far sludge	(T)	Phenol, naphthalene	8270 Phenol - 9066
Primary aluminum				
K088	Spent potliners	(T)	Cyanide (complexes)	9010
Ferroalloys				
K090	Emission control dust or sludge	(T)	Chromium	3010/7190
K091	Emission control dust or sludge	(T)	Do	*

ORGANIC P & U WASTES

Hazardous Waste Number	Test Method
P003, P028 U112(I), U002 (I), U009, U019(I,T), U037, U070, U071, U072, U239(I, T), U220, U225, U031(I), U159(I, T), U211, U037, U042 U044, U075, U078, U079, U084, U067, U076, U077, U208, U209, U226 U227, U043, U210, U228, U117(I), U118, U213(I), U131,U140(I,T) U045(I, T), U080, U138, U211, U121, U029, U045(I T), U161(I), U196 U228, U121, U043 002U, 131U, 155U	8240
P004, P037, P050, P051, P059, P071, P089, P123 U036, U060, U061, U129, U247 029U, 164U, 079U, 090U, 122U	8080
P024, P077, P047, P048, P077, P092 U012(I, T), U018, U028, U069, U088, U102, U107, U127, U105, U055 U169(I, T), U183, U185, U207, U021, U022, U073, U030, U128, U039 U047, U048, U050, U052, U063, U069, U070, U071, U072, U073, U025 U027, U081, U082, U028, U088, U101, U102, U105, U106, U107, U109 U131, U120, U130, U109, U137, U158, U165, U170, U184, U188 159U, 161U, 150U, 086U, 106U, 172U, 173U	8270

Hazardous Waste Number	Test Method
P082	607
U001(I), U122	8411
4240	8150
P023, P002, P057, P058, P070, P005, P007, P008, P009, P119, P036 P054, P067, P042, P046, P014, P001, P028, P017, P018, P045, P022 P095, P023, P026, P027, P031, P033, P034, P016, P038, P041, P040 P043, P004, P060, P037, P051, P044, P046, P020, P085, P111, P039 P049, P088, P042, P031, P066, P054, P056, P057, P058, P065, P062 P116, P068, P063, P096, P060, P082, P064, P112, P118, P050, P059 P069, P072, P075, P076, P078, P081, P084, P085, P087, P009(R), P093 P094, P095, P096, P089, P097, P071, P110, P070, P101, P027, P069 P081(R), P017, P102, P003, P005, P067, P102, P008, P075, P114, P103 P105, P107, P108, P018, P115, P109, P111, P112, P062, P049, P014 P026, P001 U034, U187, U005, U003, U004, U006, U007, U008, U011, U136, U014 U015, U010, U157, U016, U017, U192, U094, U012, U049, U093, U328 U353, U158, U222, U181, U038, U030, U035, U221, U060, U223, U201 U056, U106, U020, U061, U247, U023, U234, U202, U203, U141, U090 U064, U248, U197, U023, U085, U091, U095, U172, U160, U053, U074 U143, U136, U238, U178, U097, U114, U062, U215, U033, U156, U033 U034, U035, U026, U038, U046, U049, U032, U051, U053, U055, U246 U197, U056, U129, U057, U130, U058, U059, U062, U064, U066, U074 U024, U065, U108, U086, U087, U089, U090, U091, U092, U093, U094 U095, U096, U097, U098, U099, U103, U108, U110, U111, U041, U001 U174, U155, U024, U117, U025, U184, U218, U359, U173, U004, U042 U113, U238, U114, U359, U115, U116, U076, U119, U124(I), U125(I) U147, U206, U126, U163, U132, U243, U133(R, T), U086, U098, U099, U134(C,T), U135, U096(R), U116, U139, U190, U141, U142, U143, U163, U147, U149, U150, U152(I,T), U092(I), U029, U046, U068, U119, U153(I, T), U225, U036, U154, U155, U142, U154(I), U186(I), U156(I, T) U157, U068, U160(R, T), U162((I, T), U164, U010, U059, U167, U174 U176, U177, U168, U026, U236, U166, U171(I, T), U172, U173, U178, U179, U180, U181, U193, U058, U115(I, T), U126, U041, U182 U161, U186, U187, U150, U145, U189(R), U190, U191, U179, U192 U194(I, T), U111, U110 (I), U083, U149, U171(I, T), U027, U193 U235, U140 (I, T), U007, U243, U009, U152(I, T), U008 (I), U113(I) U118, U162, U194(I,T), U083, U148, U191, U237, U164, U180, U200 U201, U202, U015, U206, U103, U207, U218, U153(I, T), U244, U219 U221, U223(R, T), U328, U353, U222, U011, U234(R, T), U182, U235 U176, U177	*
001U, 003U,004U, 005U, 006U, 007U, 157U, 008U, 009U, 158U, 011U, 012U, 013U, 014U, 147U, 148U, 015U, 016U, 017U, 020U, 160U, 021U 022U, 023U, 024U, 025U, 027U, 028U, 152U, O30U, 031U, 033U, 034U 162U, 163U, 036U, 037U, 038U, 173U, 151U, 040U, 042U, 043U, 044U 046U, 047U, 048U, 049U, 050U, 051U, 052U, 054U, 055U, 056U, 165U O57U, 058U, 166U, 061U, 063U, 064U, 065U, 068U, 070U, 071U, 073U	

Hazardous Waste Number	Test Method
167U, 074U, 075U, 076U, 077U, 078U, 080U, 152U, 082U, 083U, 088U 089U, 092U, 095U, 097U, 098U, 099U, 100U, 101U, 102U, 103U, 168U 108U, 120U, 169U, 110U, 111U, 112U, 113U, 114U, 115U, 129U, 124U 127U, 128U, 132U, 134U, 135U, 136U, 137U, 138U, 139U, 140U, 154U 171U, 141U, 142U, 143U, 144U, 174U, 175U, 146U	

INORGANIC P & U WASTES

Hazardous Waste Number	Test Method
P006(R, T)	3010/7020
P015	3010/7090
P119, P120	3010/7911
U032	3010/7140
U144, U146, U145	3010/7420
U217	3010/7841
U214(I), U215(I), U216(I), U216, U217(I)	3010/7840
U041	3010/7200
U096	3010/7520
153U	3010/7770
P010, P012, P011	3020/7060
U204, U205, U205(R,T)	3020/7740
P013	9010/7080
P021	9010/7140
P029	9010/7210
P101	9010

Hazardous Waste Number	Test Method
P074	9010/7520
P098, P099	9010/7610
P104	9010/7760
P106	9010/7770
P121	9010/7950
P092, P065, U151	7471
P073	7520
P099, P097, P110, P113, P114, P115, P109, P045, P049, P122 U240, U144, U214, U123, U148, U203, U189, U236, U237, U248, U249 032U, 059U, 093U, 094U, 104U, 116U, 117U, 118U, 119U, 121U, 129U, 170U	*

NOTE: All method numbers reference EPA SW-846, 3rd edition, 1986, "Test Methods for Evaluating Solid Waste."

* Undeterminable at this time, not an applicable standard EPA method; Test methods refer only to those Rationale compounds without an asterisk.

( )= Additional Hazard Code

APPENDIX C

TABLE 2

PARAMETERS, RATIONALE FOR THEIR SELECTION AND TEST METHODS DYNECOL HAZARDOUS WASTE TREATMENT FACILITY

Hazardous Waste	Parameter	Rationale	Test Method
Spent pickle liquor from Steel Finishing Operations	Hexavalent Chromium, Lead	Listed waste (K062)	Total -SH-846 Method 7190 Standard Methods No. 303A Hexavalent SH-846 Method 7196 Standard Methods No. 312B
Wastewater treatment sludges from electroplating operations	Cadmium, Hexavalent Chromium, Nickel, Cyanide (complexed)	Listed waste (F006)	Colorimetric -SH-846
Wastewater treatment sludges from the chemical conversion coating of aluminum	Hexavalent Chromium, Cyanide (complexed)	Listed waste (F019)	Total -SH-846 Method 7190 Standard Methods No. 303A Hexavalent SH-846 Method 7196 Standard Methods No. 312B
Liquid inorganic solutions	acidic ph$\leq$2.0 alkaline ph$\geq$12.5	Corrosive (D002)	
Inorganic solutions and sludges	Arsenic	E.P. Toxic (D004)	SW-846 Method 7061 Standard Methods No. 303E
Inorganic solutions and sludges	Barium	E.P. Toxic (D005)	SW-846 Method 7080 Standard Methods No. 303C
Inorganic solutions and sludges	Cadmium	E.P. Toxic (D006)	SW-846 Method 7130 Standard Methods No. 303A
Inorganic solutions and sludges	Chromium	E.P. Toxic (D007)	Total -SH-846 Method 7190 Standard Methods No. 303A Hexavalent SH-846 Method 7196 Standard Methods No. 312B
Inorganic solutions and sludges	Lead	E.P. Toxic (D008)	
Inorganic solutions and sludges	Mercury	E.P. Toxic (D009)	SW-846 Method 7470 Standard Methods No. 303F

Hazardous Waste	Parameter	Rationale	Test Method
Inorganic solutions and sludges	Selenium	E.P. Toxic (D010)	SW-846 Method 7741 Standard Methods No. 303E
Inorganic solutions and sludges	Silver	E.P. Toxic (D011)	SW-846 Method 7660 Standard Methods No. 303A
Inorganic solutions and sludges	Copper	E.P. Toxic (001D)	
Inorganic solutions and sludges	Zinc	E.P. Toxic (003D)	

APPENDIX C

TABLE 3

ANALYTICAL METHODS

Waste Name/ EPA ID Number	Test Parameter	Analytical Method
All aqueous wastes	pH	SW-846 Method 9040 Standard Methods No. 423
All aqueous wastes	Neutralization equivalent	No standard method
All aqueous wastes	Miscibility	No standard method
D004, K084, K101, K102	Arsenic	SW-846 Method 7060 Standard Methods No. 303E
D005	Barium	SW-846 Method 7080 Standard Methods No. 303C
D006, F006, K061, K069 K100	Cadium	SW-846 Method 7130 Standard Methods No. 303A
D007, F006, F019, K002 K003, K004, K005, K006 K007, K008, K048, K050 K051, K049, K050, K061 K062, K069, K086, K100, U146	Chromium (total) and Chromium (hexavalent)	Total - SH-846 Method 7190, Standard Methods No. 303A Hexavalent 0 SH-846 Method 7196 Standard Methods No. 312B
D009, K071, K106	Mercury	SW-846 Method 7470, Standard Methods No. 303F
D010	Selenium	SW-846 Method 7740, Standard Methods No. 303E
D011	Silver	SW-846 Method 7760, Standard Methods No. 303A
F006	Nickel	SW-846 Method 7520, Standard Methods No. 303A
U246	Zinc	Standard Methods No. 303A
D003, F006, F007, F008 F009, F010, F011, P013 P030, P098, P099, D106	Cyanide (total)	Colorimetric-SH-846 Method 9010 Standard Methods No. 4120 Titrimetic Standard Methods No. 412C Selective Ion Probe Standard Methods No. 412E

Waste Name/ EPA ID Number	Test Parameter	Analytical Method
F001, F0092, F003, F005 F024, all "U" wastes U146, U246	Volatile organic compounds	SW-0846-Methods 8010, 8015, 8020, 3030
F004, F024, U028, U039 U048, U049, U073, U081, U082, U088, U101, U102, U105, U107, U109, U111, U130, U131, U165, U169, U170, U196, U213	Various BN/A Compounds Method 8060; Nitro-aromatics & cyclic ketones SW-846 Method 8090;	Phenols-SH-846 Method 8040, Phthalate Esters-SH-846 Chlorinated hydrocarbons SW-846 Method 8150
All aqueous wastes	Ammonia	Qualitative
All aqueous wastes to be stabilized	Compatibility	Screening test-"Hazardous Waste Compatibility Protocol", Hatayama, et al., State of California DHS
All aqueous wastes	Copper	Standard Methods No. 303A
All aqueous wastes	Phenol	Clean Up- Standard Methods No. 510A Chloroform Extraction No. 5108 GC-SW-846 Method 8040
All aqueous wastes	Suspended solids (after bench treatment)	Standard Methods No. 209C
All aqueous wastes	Fluorides	Distillation Preparation - Standard Methods No. 413A
All aqueous wastes	Fluorides (Con't)	Colorimetric - Standard Methods No. 413C Specific Ion Electrode - Standard Methods No. 413B
All aqueous wastes	Settleable Solids	Standard Methods No. 209E
All aqueous wastes	Specific Gravity	Standard Methods No. 213E Hydrometer Method

Waste Name/ EPA ID Number	Test Parameter	Analytical Method
All aqueous wastes	Sulfides - Total	Titrimetric - SW-846 Method 9030, Standard Methods No. 427D Colorimetric - Standard Methods No. 427D
All aqueous wastes	COD	Standard Methods No. 508A
All aqueous wastes	Suspended Solids	Standard Methods No. 209C
All aqueous wastes	Total Solids	Standard Methods No. 209A
All appropriate wastes	Flash point	ASTM Method D-93
All aqueous wastes	Oil and Grease	Extraction - Standard Methods No. 503C Partition Gravimetric - Standard Methods No. 503A Partition Infrared - Standard Methods No. 503B Hydrocarbon Fraction - Standard Methods No. 503E

APPENDIX C.5

LAND DISPOSAL RESTRICTION

NOTICE FOR F006 WASTES

APPENDIX C-5

LAND DISPOSAL RESTRICTIONS INFORMATION - F006 WASTE

Facility Name:_____ EPA ID Number_____

Address:_____

_____

_____

Under manifest number _____ we are shipping to you for incineration, a waste stream classified by EPA Hazardous Waste Number _____.

This stream contains the following constituents identified in Table CCWE of 40 CFR 268.41 (copy below) and must be treated at least to the level specified below:

Constituent	Treatment Standard

The above constituent composition is based upon, [ ] an attached waste analysis or [ ] my thorough knowledge of the waste stream.

BDAT Treatment Standards for F006

[Nonwastewaters]

Constituent	(mg/kg)	Total Composition TCLP (mg/l)
Cadmium	N/A	0.066
Chromium (total)	N/A	5.2
Lead	N/A	0.51
Nickel	N/A	0.32
Silver	N/A	0.072
Cyanides (total)	Reserved	Reserved

APPENDIX C-5

LAND DISPOSAL RESTRICTIONS INFORMATION

Facility Name:_____ EPA ID Number_____

Address:_____

_____

_____

Under manifest number _____ we are shipping to you for incineration, a waste stream classified by EPA Hazardous Waste Number _____.

This stream contains the following constituents identified in Table CCWE of 40 CFR 268.41 (copy below) and must be treated at least to the level specified below:

Constituent	Treatment Standard

The above constituent composition is based upon, [ ] an attached waste analysis or [ ] my thorough knowledge of the waste stream.

BDAT Treatment Standards

[Nonwastewaters]

APPENDIX C.6

SOLVENT AND CALIFORNIA LIST WASTES

ATTACHMENT I

Halogenated Organic Compounds regulated under 40 CFR 268.32

In determining the concentration of HOCs in a hazardous waste for purposes of the paragraph 268.32 land disposal prohibition, EPA has defined the HOCs that must be included in the calculation as any compounds having a carbon-halogen bond which are listed in this Appendix (see paragraph 268.2). Appendix III to Part 268 consists of the following compounds:

VOLATILES

Bromodichloromethane
Bromomethane
Carbon Tetrachloride
Chlorobenzene
2-Chloro-1, 3-butadiene
Chlorodibromomethane
Chloroethane
2-Chloroethyl vinyl ether
Chloroform
Chloropropene
1, 2-Dibromo-3-chloropropane
1, 2-Dibromomethane
Dibromomethane
Trans-1, 4-Dichloro-2-butene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
Trans-1,2-Dichloroethene
1,2-Dichloropropane
Trans-1,3-Dichloropropene
cis-1,3-Dichloropropene
Iodomethane
Methylene chloride
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethene
Tribromomethane
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichloromonofluoromethane
1,2,3-Trichloropropane
Vinyl chloride

SEMIVOLATILES

Bis(2-chloroethoxy)ethane
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol
2-Chloronaphthalene
2-Chlorophenol
3-Chloropropionitrile
m-Dichlorobenzene
o-Dichlorobenzene
p-Dichlorobenzene
3,3-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloroprophene
Hexachloropropene
4,4-Methylenebis(2-chloroaniline)
Pentachlorobenzene
Pentachloroethane
Pentachloronitrobenzene
Pentachlorophenol
Pronamide
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
1,2,4-Trichlorobenzene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Tris(2,3-dibromoprophy)phosphate

ATTACHMENT I
(cont)

ORGANOCHLORINE PESTICIDES

Aldrin
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC
Chlordane
DDD
DDE
DDT
Dieldrin
Endosulfan I
Endosulfan II
Endrin
Endrina aldehyde
Heptachlor
Heptachlor epoxide
Isodrin
Kepone
Methoxyclor
Toxaphene

PHENOXYACETIC ACID HERBICIDES

2,4-Dichlorophenoxyacetic acid
Silvex
2,4,5-T

PCBs

Aroclor 1016
Aroclor 1221
Aroclor 1232
Aroclor 1242
Aroclor 1248
Aroclor 1254
Aroclor 1260
PCBs not otherwise specified

DIOXINS AND FURANS

Hexachlorodibenzo-p-dioxins
Hexachlorodibenzofuran
Pentachlorodibenzo-p-dioxins
Pentachlorodibenzofuran
Tetrachlorodibenzo-p-dioxins
Tetrachlorodibenzofuran
2,3,7,8-Tetrachlorodibenzo-p-dioxin

Dynecol does not accept dioxin wastes or wastes with PCB concentrations greater than 50 ppm

APPENDIX C.7

FIRST THIRD SCHEDULED WASTES

FIRST THIRD SCHEDULED WASTES

261.31 Wastes

F006-Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.

F007-Spent cyanide plating bath solutions from electroplating operations.

F008-Plating bath sludges from the bottom of plating baths from electroplating operations where cyanides are used in the process.

F009-Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.

F019-Wastewater treatment sludges from the chemical conversion coating of aluminum.

261.32 Wastes

K001-Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.

K004-Wastewater treatment sludge from the production of zinc yellow pigments.

K008-Over residue from the production of chrome oxide green pigments.

K011-Bottom stream from the wastewater stripper in the production of acrylonitrile.

K013-Bottom stream from the acetonitrile column in the production of acrylonitrile.

K014-Bottoms from the acetonitrile purification column in the production of acrylonitrile.

K015-Still bottoms from the distillation of benzyl chloride.

K016-Heavy ends or distillation residues from the production of carbon tetrachloride.

K017-Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.

K018-Heavy ends from the fractionation column in ethyl chloride production.

K020-Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.

K021-Aqueous spent antimony catalyst waste from fluoromethanes production.

K022-Distillation bottom tars from the production of phenol/acetone from cumane.

K024-Distillation bottoms from the production of phthalic anhydride from naphthalene.

K030-Column bottom or heavy ends from the combined production of trichloroethylene and perchloroethylene.

K031-By-products salts generated in the production of MSMA and cacodylic acid.

K035-Wastewater treatment sludges generated in the production of creosote.

K036-Still bottoms from toluene reclamation distillation in the production of disulfoton.

K037-Wastewater treatment sludge from the production of disulfoton.

K044-Wastewater treatment sludges from the manufacturing and processing of explosives.

K045-Spent carbon from the treatment of wastewater containing explosives.

K046-Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.

K047-Pink/red water from TNT operations.

K048-Dissolved air flotation (DAF) float from the petroleum refining industry.

K049-Stop oil emulsion solids from the petroleum refining industry.

K050-Heat exchange bundle cleaning sludge from the petroleum refining industry.

K051-API separator sludge from the petroleum refining industry.

K052-Tank bottoms (leaded) from the petroleum refining industry.

K060-Ammonia still lime sludge from coking operations.

K061-Emission control dust/sludge from the primary production of steel in electric furnaces.

K062-Spent pickle liquor from steel finishing operations in chlorine production.

K069-Emission control dust/sludge from secondary lead smelting.

K071-Brine purification muds from the mercury cells process in chlorine production, where separately prepurified brine is not used.

K073-Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes

K083-Distillation bottoms from aniline production.

K084-Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.

K085-Distillation of fractionation column bottoms from the production of chlorobenzenes.

K086-Solvent washes and sludges; caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.

K087-Decanter tank tar sludge from coking operations.

K099-Untreated wastewater from the production of 2,4-D.

K101-Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.

K102-Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.

K103-Process residues from aniline extraction from the production of aniline.

K104-Combined wastewater streams generated from nitrobenzene/aniline production.

K106-Waste water treatment sludge from the mercury cell process in chlorine production.

261.33(e) Wastes

P001-Warfarin, when present at concentration greater than 0.3%

P004-Aldrin

P005-Allyl alcohol

P010-Arsenic acid

P011-Arsenic (V) oxide

P012-Arsenic (III) oxide

P015-Beryllium dust

P016-Bis-(chloromethyl) ether

P018-Brucine

P020-Dinoseb

P030-Soluble cyanide salts not elsewhere specified

P036-Dichlorophenylarsine

P037-Dieldrin

P039-Disulfoton

P041-Diethyl-p-nitrophenyl phosphate

P048-2,4-Dinitrophenol

P050-Endosulfan

P058-Fluoracetic acid, sodium salt

P059-Heptachlor

P063-Hydrogen cyanide

P068-Methyl Hydrazine

P069-Methyllactonitrile

P070-Aldicarb

P071-Methyl parathion

P081-Nitroglycerine

P082-N-Nitrosodimethylamine

P084-N-Nitrosomethylvinylamine

P087-Osmium tetraoxide

P089-Parathion

P092-Phenylmercuric acetate

P094-Phorate

P097-Famphur

P102-Propargyl alcohol

P105-Sodium azide

P108-Strychnine and salts

P110-Tetraethyl lead

P115-Thallium (I) sulfate

P120-Vanadium pentoxide

P122-Zinc phosphide, when present at concentrations greater than 10%

P123-Toxaphene

261.33(f) Wastes

U007-Acrylamide

U009-Acrylonitrile

U010-Mitomycin C

U012-Aniline

U016-Benz(c)acridine

U018-Benz(a)anthracene

U019-Benzene

U022-Benzo(a)pyrene

U029-Methyl bromide

U031-n-Butanol

U036-Chlordane, technical

U037-Chlorobenzene

U041-n-Chloro-2,3-epoxypropane

U043-Vinyl chloride

U044-Chloroform

U046-Chloromethyl methyl ether

U050-Chrysene

U051-Creosote

U053-Crotonaldehyde

U061-DDT

U063-Dibenz o (a, h) anthracene

U064-2,2,7,8 Dibenzopyrene

U066-Dibromo-3-chloropropane 1,2-

U067-Ethylene dibromide

U074-1,4-Dichloro-2-butene

U077-Ethane, 1,2-dichloro-

U078-Dichloroethylene, 1,1-

U086-N,N Diethylhydrazine

U089-Diethylstilbestrol

U103-Dimethyl sulfate

U105-2,4-Dinitrotoluene

U108-Dioxane, 1,4-

U115-Ethylene oxide

U122-Formaldehyde

U124-Furan

U129-Lindane

U130-Hexachlorocyclopentadiene

U133-Hydrazine

U134-Hydrofluoric acid

U137-Indeno(1,2,3-cd)pyrene

U151-Mecury

U154-Methanol

U155-Methapyrilene

U157-3-Methylcholanthrene

U158-4,4-Methylene-bis-(2-chloroaniline)

U159-Methyl ethyl ketone

U171-Nitropropane, 2-

U177-N-Nitroso-N-methylurea

U180-N-Nitrosopyrrolidine

U185-Pentachloronitrobenzene

U188-Phenol

U192-Pronamide

U200-Reserpine

U209-Tetrachloroethane, 1,1,2,2-

U210-Tetrachloroethylene

U211-Carbon tetrachloride

U219-Thiourea

U220-Toluene

U221-Toluenediamine

U223-Toluene diisocyanate

U226-Methylchloroform

U227-Trichloroethane, 1,1,2-

U228-Trichloroethylene

U237-Uracil mustard

U238-Ethyl carbamate

U248-Warfarin, when present at concentrations of 0.3% or less

U249-Zinc phosphide, when present at concentrations of 10% or less

APPENDIX C.8

SECOND THIRD SCHEDULED WASTES

SECOND THIRD SCHEDULED WASTES

261.31 Wastes

F010-Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process.

F011-Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.

F012-Quenching wastewater treatment sludges from metal heat operations where cyanides are used in the process.

F024-Wastes including but not limited to, distillation residues, heavy ends, tars and reactor clean-out wastes from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. [This listing does not include light ends, spent filters and filter aids, spend desiccants, wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in 261.32.].

261.32 Wastes

K009-Distillation bottoms from the production of acetaldehyde from ethylene.

K010-Distillation side cuts from the productions of acetaldehyde from ethylene.

K019-Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.

K025-Distillation bottoms from the production of nitrobenzene by the nitration of benzene.

K027-Centrifuge and distillation residues from toluene diisocyanate production.

K028-Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.

K029-Waste from the product steam stripper in the production of 1,1,1-trichloroethane.

K038-Wastewater from the washing and stripping of phorate production.

K039-Filter cake from the filtration of diethylphosphoro-dithioic acid in the production of phorate.

K040-Wastewater treatment sludge from the production of phorate.

K041-Wastewater treatment sludge from the production of toxaphene.

K042-Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.

K043-2,6-Dichlorophenol waste from the production of 2,4-D.

K095-Distillation bottoms from the production of 1,1,1-trichloroethane.

K096-Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.

K097-Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.

K098-Untreated process wastewater from the production of toxaphene.

K105-Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.

261.33(e) Wastes

P002-1-Acetyl-2-thiourea

P003-Acrolein

P007-5-(Aminoethyl)-3-isoxazolol

P008-4-Aminopyridine

P014-Thiophenol

P026-1-(o-Chlorophenyl)thiourea

P027-Propanenitrile, 3-chloro

P029-Copper cyanides

P040-O,O-Diethyl o-pyrazinyl phosphorothioate

P043-Diisopropyl fluorophosphate

P044-Dimethoate

P049-2,4-Dithiobiuret

P054-Aziridine

P057-Fluoracetamide

P060-Isodrin

P062-Hexaethyltetraphosphate

P066-Methomyl

P067-2-Methylaziridine

P072-Alpha-naphthylthiourea (ANTU)

P074-Nickel cyanide

P085-Octamethylpyrophosphoramide

P098-Potassium cyanide

P104-Silver cyanide

P106-Sodium cyanide

P107-Strontium sulfide

P111-Tetraethylpyrophosphate

P112-Tetranitromethane

P113-Thallic oxide

P114-Thallium (I) selenite

261.33(f) Wastes

U002-Acetone

U003-Acetonitrile

U005-o-Acetylaminofluorene

U008-Acrylic acid

U011-Amitrole

U014-Auramine

U015-Azaserine

U020-Benzenesulfonyl chloride

U021-Benzidine

U023-Benzotrichloride

U025-Dichloroethyl ether

U026-Chlornaphazine

U028-Bis-(2-ethylhexyl)phthalate

U032-Calcium chromate

U035-Chlorambucil

U047-Beta-chloronaphthalene

U049-4-Chloro-o-toluidine, hydrochloride

U057-Cyclohexanone

U058-Cyclophosphamide

U059-Daunomycin

U060-DDD

U062-Diallate

U070-o-Dichlorobenzene

U073-Dichlorobenzidene, 3,3-

U080-Methylene chloride

U083-Dichloropropane, 1,2-

U092-Dimethylamine

U093-Dimethylaminoazobenzene

U094-Dimethylbenz(a)anthracene,7,12-

U095-Dimethylbenzidine,3,3-

U097-Dimethylcarbamoyl chloride

U098-Dimethylhydrazine, 1,1-

U099-Dimethylhydrazine, 1,2-

U101-Dimethylphenol, 2,4-

U106-Dinitrotoluene, 2,6-

U107-Di-n-octyl phthalate

U109-1,2,-Diphenylhydrazine

U110-Dipropylamine

U111-Di-N-Propylnitrosamine

U114-Ethylenebis-(dithiocarbamic acid)

U116-Ethylene thiourea

U119-Ethyl methanesulfonate

U127-Hexachlorobenzene

U128-Hexachlorobutadiene

U131-Hexachloroethane

U135-Hydrogen sulfide

U138-Methyl iodide

U140-Isobutyl alcohol

U142-Kepone

U143-Lasiocarpine

U144-Lead acetate

U146-Lead subacetate

U147-Maleic anhydride

U149-Malononitrile

U150-Melphalan

U161-Methyl isobutyl ketone

U162-Methyl methacrylate

U163-N-Methyl-N-nitro-N-nitrosoguanidine

U164-Methylthiouracil

U165-Naphthalene

U168-Napthylamine, 2-

U169-Nitrobenzene

U170-p-Nitrophenol

U172-N-Nitroso-di-n-butylamine

U173-N-Nitroso-diethanolamine

U174-N-Nitroso-diethylamine

U176-N-Nitroso-N-ethylurea

U178-N-Nitroso-N-methylurethane

U179-N-Nitrosopiperidine

U189-Phosphorus sulfide

U193-1,3-Propane sultone

U196-Pyridine

U203-Safrole

U205-Selenium disulfide

U206-Streptozotocin

U208-Terachloroethane, 1,1,1,2-

U213-Tetrahydrofuran

U214-Thallium (I) acetate

U215-Thallium (I) carbonate

U216-Thallium (I) chloride

U217-Thallium (I) nitrate

U218-Thioacetamide

U235-Tris (2,3-Dibromopropyl) phosphate

U239-Xylene

U244-Thiram

APPENDIX C.9

THIRD THIRD SCHEDULED WASTES

THIRD THIRD SCHEDULED WASTES

261.32 Wastes

K002-Wastewater treatment sludge from the production of chrome yellow and orange pigments.

K003-Wastewater treatment sludge from the production of molybdate orange pigments.

K005-Wastewater treatment sludge from the production of chrome green pigments.

K006-Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).

K007-Wastewater treatment sludge from the production of iron blue pigments.

K023-Distillation light ends from the production of phthalic anhydride from naphthalene.

K026-Stripping still tails from the production of methyl ethyl pyridines.

K032-Wastewater treatment sludge from the production of chlordane.

K033-Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.

K034-Filter solids from the hexachlorocyclopentadiene in the production of chlordane.

K093-Distillation light ends from the production of phthalic anhydride from ortho-xylene.

K094-Distillation bottoms from the production of phthalic anhydride from ortho-xylene.

K100-Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.

261.33(e) Wastes

P006-Aluminum phosphide

P009-Ammonium picrate

P013-Barium cyanide

P017-Bromoacetone

P021-Calcium cyanide

P022-Carbon disulfide

P023-Chloroacetaldehyde

P024-p-Chloroaniline

P028-Benzyl chloride

P031-Cyanogen

P033-Cyanogen chloride

P034-4,6-Dinitro-o-cyclohexylphenol

P038-Diethylarsine

P042-Epinephrine

P045-Thiofanox

P046-Alpha, alpha-Dimethylphenethylamine

P047-4,6-Dinitro-o-cresol and salts

P051-Endrin

P056-Fluorine

P064-Methyl isocyanate

P065-Mercury fulminate

P073-Nickel carbonyl

P075-Nicotine and salts

P076-Nitric oxide

P077-p-Nitroaniline

P078-Nitrogen dioxide

P088-Endothall

P093-N-Phenylthiourea

P095-Phosgene

P096-Phosphine

P099-Potassium silver cyanide

P101-Propanenitrile

P103-Selenourea

P109-Tetraethyldithiopyrophosphate

P116-Thiosemicarbazide

P118-Trichloromethanethiol

P119-Ammonium vanadate

P121-Zinc cyanide

261.33(f) Wastes

U001-Acetaldehyde

U004-Acetophenone

U006-Acetyl chloride

U017-Benzal chloride

U024-Bis(2-chloroethoxy)methane

U027-Bis(2-chloroisopropyl)ether

U030-Benzene, 1-bromo-4-phenoxy

U033-Carbonyl fluoride

U034-Chloral

U038-Ethyl-4-4 -dichlorobenzilate

U039-4-Chloro-m-cresol

U042-Vinyl ether, 2-chloroethyl

U045-Methyl chloride

U048-o-Chlorophenol

U052--Cresols

U055-Cumene

U056-Cyclohexane

U068-Methane, dibromo

U069-Dibutyl phthalate

U071-m-Dichlorobenzene

U072-p-Dichlorobenzene

U075-Dichlorodifluoromethane

U076-Ethane, 1,1-dichloro-

U079-1,2-Dichlorethylene

U081-2,4-Dichlorophenol

U082-2,6-Dichlorophenol

U084-1,3-Dichloropropene

U085-2,2 -Bioxirane

U087-0,0,-Diethyl-S-methyl-dithiophosphate

U088-Diethyl phthalate

U090-Dihydrosafrole

U091-3,3 -Dimethoxybenzidine

U096-alpha,alpha-Dimethylbenzylhydroxyperoxide

U102-Dimethyl phthalate

U112-Ethyl acetate

U113-Ethyl acrylate

U117-Ethyl ether

U118-Ethylmethacrylate

U120-Fluoranthene

U121-Trichloromonofluoromethane

U123-Formic acid

U125-Furfural

U126-Glycidylaldehyde

U132-Hexachlorophene

U136-Cacodylic acid

U139-Iron dextran

U141-Isosafrole

U145-Lead phosphate

U148-Maleic hydrazide

U152-Methacrylonitrile

U153-Methanethiol

U156-Methyl chlorocarbonate

U160-Methyl ethyl ketone peroxide

U166-1,4-Naphthaquinone

U167-1-Naphthylamine

U181-5-Nitro-o-toluidine

U182-Paraldehyde

U183-Pentachlorobenzene

U184-Pentachloroethane

U186-1,3-Pentadiene

U187-Phenacetin

U190-Phthalic anhydride

U191-2-Picoline

U194-1-Propanamine

U197-p-Benzoquinone

U201-Resorcinol

U202-Saccharin and salts

U204-Selenious acid

U207-1,2,4,5-tetrachlorobenzene

U222-o-Toluidine hydrochloride

U225-Bromoform

U234-Sym-Trinitrobenzene

U236-Trypan blue

U240-2,4-D, salts and esters

U243-Hexachloropropene

U246-Cyanogen bromide

U247-Methoxychlor

F001 - F005 SPENT SOLVENTS

Acetone
n-Butyl alcohol
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Cresols (and cresylic acid)
Cyclohexanone
1,2-dichlorobenzene
Ethyl acetate
Ethyl benzene
Ethyl ether
Isobutanol
Methanol
Methylene chloride
Methylene chloride (from the pharmaceutical industry)
Methyl ethyl ketone
Methyl isobutyl ketone
Nitrobenzene
Pyridine
Tetrachloroethylene
Toluene
1,1,1-Trichloroethane
1,2,2-Trichloro-1,2,2-trifluroethane
Trichloroethylene
Trichlorofluoromethane
Xylene

CALIFORNIA LIST WASTES

Liquid hazardous wastes having a pH less than or equal to two (2.0);

Liquid hazardous wastes containing polychlorinated biphenyls (PCBs) at concentrations greater than or equal to 50 ppm;

Liquid hazardous wastes that are primarily water and contain halogenated organic compounds (HOCs) in total concentration greater than or equal to 1,000 mg/l and less than 10,000 mg/l HOC's. (See Attachment I)

Liquid hazardous wastes including free liquids asociated with any solid or sludge, containing the following metals (or elements) or compounds or these metals (or elements) at concentrations greatern than or equal to those specified below:

(i) Arsenic and/or compounds (as As) 500 mg/l;
(ii) Cadmium and/or compounds (as Cd) 100 mg/l;
(iii) Chromium (VI/and/or compounds (as Cr VI) 500 mg/l;
(iv) Lead and/or compounds (as Pb) 500 mg/l;
(v) Mercury and/or compounds (as Hg) 20 mg/l;
(vi) Nickel and/or compounds (as Ni) 134 mg/l;
(vii) Selenium and/or compounds (as Se) 100 mg/l;
(viii) Thallium and/or compounds (as Tl) 130 mg/l.

Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing free cyanides at concentrations greater than or equal to 1,000 mg/l.

APPENDIX D.1

PROPOSED CONTAINER STORAGE FACILITY

APPENDIX D.1a

BASIS OF DESIGN AND DESIGN CAPACITY

APPENDIX D.1a

BASIS OF DESIGN AND DESIGN CAPACITY

DYNECOL CONTAINER STORAGE/TRANSFER FACILITY
BASIS OF DESIGN

I. General Building Configuration

The building was designed on the basis that it will contain flammable liquids. The building was designed to meet all applicable BOCA, NFPA ,and NEC codes for Class I, II and III liquids. The general design of the building is as follows:

- two loading docks
- eight isolated container storage bays for drum storage
- blind sumps for each bay
- inside clearance of 15'
- concrete floor with continuous chemical resistant coating
- 12" concrete block walls for 4 hour fire protection
- Entrance Doors: Service entrance doors will be 2 hour fire rated. Garage doors will be 2 hour fire rated. Door operators will be located in non-explosive area.

II. Loading Docks

- Overall Size: 32' x 80'
- Containment: 7,000 gallons in coated area, 30,000 gallons total in loading dock
- Dock Accessories: truck bumpers, hydraulic leveler, access ladder
- Ventilation: No mechanical ventilation is provided. Natural ventilation will be provided by open space in the exterior building wall (a portion of the wall is covered to reduce the amount of precipitation infiltration).
- Floor coating: acid, caustic and organic resistant. Containment area as well as dock area floors will be coated to a level exceeding 7,000 gallons of liquid accumulation

III. Container Storage and Transfer/Bulking Area

- Maximum permitted volume: 46,000 gallons (836-55 gallon drums)
- Eight isolated storage bays: 20' x 19' nominal, for isolation of all non-compatible wastes.
- Drum storage: two levels maximum, second level on pallet or plywood. 24" aisle between each double row of drums and wall for leak inspection. In bays containing flammable liquids, drums will be stored such that no drum is greater than 12' from the main aisle.

- Maximum Capacity of Container Storage area: 60 drums per level per bay, 120 drums total (6,600 gallons per bay).
- Containment: Each bay is capable of containing 700 gallons (10% of maximum stored volume). Each bay also contains a blind sump that will be used to remove spilled waste from the bay. A sump will also be provided for in transfer/bulking area to collect spills, leaks, etc.
- Floor coating: acid, caustic and organic resistant. Total floor surface area will be coated, as well as the bottom 8" of the isolation walls separating the container storage bays.

IV. Site Conditions

- Minimum of 50' setback from all property lines
- Relocation of 9 electric lines, 1 telephone cable, 4 power poles and 1 pole-mounted transformer to allow installation of building. A portion of the existing 12" storm sewer line located under proposed building location to be abandoned and plugged.
- Site drainage: all roof drains and site run-off to be piped to storm sewer. Building floor elevation to be set 6" above existing grade to prevent infiltration of storm water into the building.
- Parking area: bituminous pavement, gravel, crushed stone.

V. General Building Mechanical Provisions

- Three overhead doors: 8' x 10'
- Water supply: potable water (for washing, rinsing, etc.) will be supplies by a 1" service main. Service main will be metered per City of Detroit standard metering requirements. All interior piping to be schedule 40 galvanized.
- Transfer piping: All transfer piping will be 2" teflon lined pipe, with schedule 10 ductile iron outer shell. Sizing of piping based on pumping 50 gpm of waste liquid with a specific gravity of 1. Exterior of pipe will be painted with an epoxy based, chemical resistant paint and labelled for use designation. Three lines will be provided form the transfer area to the loading area; one for acids, one for caustics, and one for organics. Joints to be flanged.
- Compressed air piping: schedule 40 galvanized with threaded joints. Compressed air will be supplied by existing compressor in another on-site building. A 1/2" compressed air drop line will be provided at all blind sumps to allow a portable air diaphragm pump to pump out sumps as required.
- Pumps: All pumps will be positive displacement, air diaphragm type. Pumps designed to pump 50 gpm.

VI. Building Heating and Ventilation

- Containment Area: 4800 cfm of heated ventilation air will be supplied (per NFPA regulations of 1 cf/sf of floor surface) during winter months when heating is required. Temperature in the containment storage area during winter months will be maintained at 50-60°F. During the summer months, air flow will be increased to 8600 cfm.
- Transfer/Bulking Area: 1000 cfm of ventilation air will be supplied which will be withdrawn through the three barrel transfer stations ventilators. A side stream from the heating unit will supply the required heated air during the winter months.
- Barrel Transfer Stations: designed per guidelines presented in the Industrial Ventilation manual on the American Conference of Industrial Hygienists. Each station will withdraw 300 cfm of air which will provide adequate velocity across the barrel opening to capture any fugitive vapors from the ***top*** of the barrels.
- Vapor recovery system: for capture of approximately 68 cfm of exhaust vapors from tanker trucks during loading operations. Collection via a 3-inch pipe and connected to the air control system.
- Spill Measures: In the event of a spill in the transfer/bulking area (which could produce vapors that would settle to the floor), a low level exhaust system will be installed which will exhaust 1000 cfm from near the floor, in lieu of at the top of the barrels. The low level exhaust system will be started by a "panic" button by the operator.

VII. Air Emission Controls

- Design Flow: 1000 cfm, to treat the exhaust from the barrel/transfer area and vapor recovery from tanker truck loading operations.
- System Components:
  - Blower - 1000 cfm at 25" W.C.
  - Activated Carbon Canisters - each canister containing 1800 pounds of activated carbon. One canister will be in operation with another on stand-by. The second unit will be put into operation when the first canister has reached break-through; i.e. is saturated with organic constituents.

    Break-through will be detected by an organic vapor analyzer located in the top 1/4 of the carbon bed. When organic vapors are detected, the carbon unit will be taken off line and replaced with a fresh unit.

Contact time in the carbon bed is 3 to 4 seconds. This will allow sufficient time for a majority of the organic solvents to be adsorbed. Approximately 85% - 90% removal is expected. (Note that all common organic solvent vapors are adsorbed on activated carbon. The concentration and type of contaminant will determine the carbon use rate).

VIII. Electrical

- Electrical: All electrical components located within the container storage area or transfer/bulking area (which are hazardous areas as defined by the National Electric Code) will be explosion proof. A grounding system will be installed in the bulking/transfer area to allow drums to be grounded during transfer/bulking operations.
- All electrical service lines, conduits, etc., will be routed overhead; no conduits or wiring will penetrate bay containment/separation walls.
- The mechanical room will be isolated from hazardous areas. All electrical equipment in this room will be rated non-hazardous.

IX. Fire Protection

- Service Main to Building: 8" water main. Based on water pressure of less than 50 psig.
- Piping: Below grade; ductile iron. Above grade; scheduled 40 galvanized for 4" and smaller, painter, standard weight steel pipe for larger than 4".
- Sprinkler system: wet type, closed head, automatic operation with flow switch and electric alarm bell on building exterior. Capacity is 0.30 gpm/sf plus an allowance of 750 gpm for fire department streams.
- Control: Outside post indicator valve (PIV) with electric monitor switch.

APPENDIX D.1b

FACILITY DRAWINGS FOR CONTAINER STORAGE AREA

i.	Location/Vicinity Maps - Sheet Index	
ii.	Demolition	C-1
iii.	Proposed Site Plan	C-2
iv.	Floor Plan	A-1
v.	Building Sections	A-2
vi.	Mechanical	M-1
vii.	Fire Protection	FP-1
viii.	HVAC	HV-1
ix.	Process Flow Schematics	PS-1

APPENDIX D.1c

MATERIAL SPECIFICATIONS; INSTALLATION METHODS FOR CONTAINER STORAGE FACILITY

APPENDIX D.2a

BASIS OF DESIGN AND DESIGN CAPACITY FOR REGULATED TANKS

D.2A BASIS OF DESIGN AND DESIGN CAPACITY

EXISTING REGULATED TANKS (TREATMENT AND STORAGE)

I. GENERAL

A. Treatment of hazardous and non-hazardous wastes, sludges and other wastes generated off-site.

B. Design capacity: 144,000 gallons per day in a 24-hour per day operation (average flow rate: 100 gpm)

C. Primary treatment: Four (4) 20,000-gallon rubber-lined steel tanks

D. Secondary Treatment: Four (4) 20,000-gallon fiberglass reinforced plastic tanks

E. Sludge dewatering: Three (3) 167-cubic-foot recessed chamber filter presses

II. PRIMARY TREATMENT SYSTEM

A. General Equipment

1. Tanks: Four (4) 20,000-gallon rubber-lined steel tanks

2. Containment System: concrete with Ceilcote Flakeline #252 acid-alkaline resistant coating and Ceilcrete 2500S

3. Mixing: compressed air system and sparge ring

4. pH Control System: Lakewood Model 520 and 900 Controller

5. Chemical Feed System: lime slurry feed system

6. High level float with alarm-overfill protection

7. Vent: discharge to air emissions control scrubber

B. Treatment Sequence: Oxidation, Neutralization on Batch Basis

1. Liquid transfer from bulk tanker truck to primary tanks via hose and piping system: Q = 200 gpm avg.

2. Control: manual with continuous supervision from control room

3. Treatment Volume: 12,000 gallons

4. Mixing: continuous via air sparge system

5. Chemical Addition: 120 gpm pump system feeding approximately 10% lime slurry for 30 minutes

6. Neutralization to pH 5.0-6.0 (volume increase: approximately 30%)

7. Treatment Time: 1-3 hours (average: 2 hours)

8. Transfer to secondary treatment system via one of two 320 gpm pumps and CPVC piping

C. Primary Treatment System: Reduction, Neutralization on Batch Basis

1. Liquid transfer from bulk tanker truck to primary tanks via hose and piping system at 200 gpm average

2. Control: manual with continuous supervision from control room

3. Chemical Addition: sodium meta bisulfite addition through chemical feed system

4. Treatment Time: variable, depending on initial pH

5. Neutralization: following complete chrome reduction, sequence as outlined in #2 above.

III. SECONDARY TREATMENT SYSTEM

A. General Equipment

1. Tanks: Four (4) 20,000-gallon FRP tanks in vertical position with cone bottom

2. Containment System: concrete with Ceilcote Flakeline 600 acid-alkaline resistant coating

3. Transfer Pumps: Two (2) centrifugal type rated at 320 gpm

4. Mixing: Two (2) mechanical mixers, 25 HP side-mount and 5 HP bottom mount agitators by Process Equipment Company

5. pH Control System: Lakewood Model 520 probe and 900 Controller

6. Chemical Feed System: lime slurry feed system

7. Process Piping: CPVC

8. Vent: discharge to air emissions control scrubber

9. High-level float with alarm-overfill protection

B. Treatment Sequence: Neutralization, Precipitation, Detoxification vis Batch Treatment

1. Liquid transfer from primary to secondary tank via process piping, valves and transfer pumps

2. Valves: air actuated, spring to close remote operation from the main control panel

3. Treatment Volume: 8,250 gallons

4. Mixing: continuous via two mechanical mixers per tank

5. Chemical Addition: 300 gpm lime slurry transfer pumps feeding approximately 10% lime slurry for 3-10 minutes

6. Neutralization to desired pH ranging from 7.5 to 10.5 depending on the type of waste being treated

7. Treatment Time: 45 to 90 minutes (average: 60 minutes)

8. Transfer to filtration process via one of two 120 gpm positive displacement pumps

9. Average Flushing Time: 5 minutes

IV. FILTRATION (DEWATERING) PROCESS

A. General Equipment

1. Filter presses (3) 167 cubic foot recessed chamber filter presses by Durco

2. Operating Pressure: 100 psig

3. Plate Material: polypropylene

4. Cloth Material: polypropylene cros-ible POW/1402K

5. Hydraulic Closing Mechanism, Semi-Automatic (maximum pressure): 3600 psi)

6. Feed Pump: dual air operated diaphragm pumps (neoprene diaphragm)

B. Operating Discussion

1. Filtrate Volume: 8,500 gallons average

2. Feed Rate: variable average 120 gpm

3. Average Filtration Period: 75 minutes

4. Average Cake Dumping Time: 45 minutes

5. Average Clean-up Time: 2 hours

6. Cycle Time: 4 hours

7. Sludge Volume: 167 cubic feet per cycle

195 cubic yards per day (average at 144,000 gallons per day treatment rate)

V. LIME FEED SYSTEM

A. General Equipment

1. Storage Silos: (2), 12-feet diameter by 60-feet high (5000 cu. ft. each)

2. Slurry System: 750 gallon tank with mixer, volumetric feeder, level control, etc.

3. Dust Filter: 180 sq. ft. Whirl-Air-Flow

B. System Capacity

1. Usage: peak 66,800 lbs/day of hydrated lime over 24 hours

2. Slurry System: 20% lime (maximum)

3. Water Requirement: 22-60 gpm

4. Feed Rate: 300 gpm, (peak) 60 gpm (average)

VI. AIR EMISSIONS CONTROL SCRUBBER

A. General Equipment

1. Model 734-XL Heil Fume Alkaline Scrubber with a capacity of 5000 CFM, 200°F (maximum) at 4-inch water pressure.

2. Recirculation Pump: Vanton Model CG-PY 800, 3 HP, 1750 RPM, rated at 75 gpm, 40-foot head.

3. pH system: Great Lakes Instrument, Model #A72-1-1-2-3, and probe #6030PO

4. Chemical Pump: Chem-Tech Model #2-120, PVC and Teflon fittings, rated for 0-120 gpd.

5. Centrifugal Fan: HCL-20 Heil blower; 10 HP, 1800 RPM, 5000 CFM

B. Design Capacity

1. Controls vapors and off gases from four primary tanks, four secondary tanks, and all storage tanks within the tank farm building.

2. Alkaline wet scrubber is capable of removing nearly all acid vapors, ammonia and sulfate compounds, and other process odors expected from this facility.

VII. CONTROL SYSTEM

A. General Equipment

1. Main control board and graphics panel

2. Pump and motor, start-stop controls

3. Valve actuator controls

4. Level, pH and ORP indicators and recorders

5. Flow meters

6. Running and alarm lights

B. Operations

1. The control system is designed to provide full treatment system feedback and control from the main control room.

VIII. OPERATION PROCEDURE SUMMARY

Treatment system control procedures are outlined below. Three sections are provided covering:

- Pre-startup Checks
- Instrument Calibration
- Console Operating Sequence

A. Typical Operations Sequence

The Batch Treatment Tables (Exhibits A, B, C & D) provide a typical treatment sequence including start and stop times, volumes, etc. The number at the top of the double columns indicates the batch treatment number. Tank numbers correspond with actual tank labels at Dynecol.

B. Pre-Startup Checks

1. See that all valves open and close in manual mode from selector switches. Note: The color code for light is as follows:

   a. RED = STOP and CLOSED

   b. GREEN = GO and OPEN

2. Flush all water lines to keep grit and scale from getting into pump seals and valves.

3. Blow out all air lines to keep grit and scale from getting into solenoids and other valves.

4. Check pump and motor rotations.

5. Align all motors and shafts to comply with manufacturer's specifications.

6. Install bags on filter presses.

7. Process wise, see that all valves and pumps are installed per Process Flow Diagram.

8. Water test all pipes for leakage.

C. Instrument Calibration

1. pH Instruments: All preliminary settings have already been made. Final calibration is now required. Follow the directions in Section 9.1 of GLI Operating Instruction Manual 164 for this operation. See Vendor literature section.

2. Level Transmitters: Calibration is required. Follow instructions in Section 4.3.1 of Drexelbrook Installation and Operating Instructions for RF level and flow controls. Note: Tanks will have to be filled for final calibration. See Vendor literature section.

D. Console Operating Sequence

1. Turn Control Power Selector Switch to ON. The Power On light will come on. The audio alarm will usually sound because the batch treatment tanks are empty. The Low Alarm lights will be flashing. Press the Silence pushbutton. The audio alarm will silence and the flashing alarm lights will go to steady ON.

2. All valves should be closed and their associated selector switches on their auto position. The auto position allows valves and pumps to open and close on demand from the programmable controller computer.

3. Determine which acid storage tank has been manually treated to a pH of 5-6 and manually connect that tank via hose to the desired transfer pump, P1 and P2. Open the manual valves associated with that tank and pump.

4. Pick the batch treatment tank to be filled from that pump and turn the selector switch to the correct tank number.

   EXAMPLE: If acid storage tank #1 was connected to acid transfer pump #1 and we wanted to treat it in batch tank #18, we would turn the selector switch for pump #1 to the T18 position. This switch is located at the bottom corner of the selector switch deck.

5. Press the Start pushbotton for Pump #1; several functions will occur:

   a. The step sequence lights for batch tank T18 will go from Off to the Filling step.

   b. Only the appropriate valves will open. In this example, only V1 and V3 will open.

   c. Pump P1 will start and transfer from acid tank #1 to tank T18. As the level in T18 rises, the Low Alarm light will go out. The level can be observed by the meter in the graphic display associated with T18.

   d. As the level gets above the propeller of the bottom mounted agitator, A18B will start.

   e. When the level gets up to 45% full, the acid transfer pump will stop and the inlet valves will close. The next step light treating will flash. This indicates that all conditions are ready to go to the treating step. The process will hold this way until the Start Treatment 18 pushbutton is pushed.

6. Press the Start Treatment T18 pushbutton; several functions will occur:

   a. The filling step light will go out and the treating light will go on steady.

   b. Valves 22 and 23 will open.

c. The side mounted agitator A18S will start.

d. P18, the recirculation pH pump, will start.

e. P18 will circulate liquid from T18 past the pH sensor and back to T18.

f. If the solution being pumped past the pH sensor gets below 5 pH, the pH Low Alarm will sound and the light will flash until the Silence pushbutton is pushed.

g. After a preset time of three minutes, the lime feed system will start adding lime to the treatment tank.

h. Valves V172, V173, and V10 will open and the lime feed pump will start and continue until the pH is above the desired pH of 8.5.

i. After a preset time of ten minutes, the Instrument Flush step light will start flashing. This indicates that all conditions are ready to go to the Instrument Flush step.

7. Press the Start Instrument Flush T18 pushbutton. Two flushes occur at the same time.

a. Flushing of the pH control loop occurs.

1) P18 stops and V23 closes.

2) V24 water flush valve opens and flushes water into T18 for ninety seconds to clean that section of the piping.

3) V24 closes, V23 opens, and P18 starts for another ninety seconds. The pump, pH sensor, and pipes are flushed.

b. Flushing of the Lime Feed System.

1) Pump P25 is already off and the valves are closed.

2) Valve V14 water flush and V172 open for ninety seconds flushing the lime back into the day tank T25.

3) V172 closes, V173 and V10 open, and P25 starts. For ninety seconds we flush the pump and the pipes all the way to T18.

c. After flushing all valves and pumps, stop and the filtering step light will flash. This indicates that all conditions are ready to go to the filtering step.

d. The agitators continue to run to keep the solids from settling.

8. The operator must decide which filter press is clean and ready to accept sludge. Open all manual valves on that press. See that the hydraulic pressure light on that press is on. Sludge feed pumps will not start without adequate hydraulic pressure on the press.

a. Select the treatment tank to press by placing the selector switch for Press A to the T18 position.

b. Press the Start Feed to Press A pushbutton and V15 will open and AP3 and AP4 will start and fill the Filter Press A.

c. When the press is full, the High Inlet Pressure Alarm will sound and the light will flash until silenced. If the batch tank is not yet empty, do not push the Stop Feed to Press B pushbutton. To clean the press and continue filtering, the manual inlet valve to the press must be closed, the press emptied and the valve reopened, thus allowing more of the sludge from T18 to be filtered.

d. If the tank becomes empty before the press is full, press the Stop Feed to Press A pushbutton.

1) AP3 and AP4 will stop.

2) V15 will close.

3) The OFF sequence light will come on.

9. Notes of Clarification

a. Acid Transfer Pump 1 can pump to T18, T19, T20 or T21. Pump 2 can also pump to any of the treatment tanks. However, due to the fact that they share some common valves and pipes, it is set up so that they cannot crossover.

EXAMPLE: If P1 is pumping to T20, we cannot allow P2 to pump to T19 or T18. Any time the pump to treatment tank selectors get into a crossover not allowed condition, the Sequence Not Allowed alarm will sound, and it cannot be silenced. Any pump that is running, when this alarm sounds, will stop and will have to be restarted.

b. It is, however, permissible for both P1 and P2 to fill the same tank.

c. The lime feed system is large enough for several tanks to be in the treatment step at the same time.

d. Filter Press A or B can receive sludge from T18, T19, T20, or T21. Due to the fact that they share some pipes and valves, it is set up so that they cannot crossover.

EXAMPLE: Batch tank T19 is being filtered through Press B. Tank T20 or T21 cannot go to Press A. Any time the treatment tank selectors get put into a crossover not allowed position, the Sequence Not Allowed alarm will sound and it cannot be silenced. Any air pumps running, when this alarm happens, will stop and will have to be restarted.

e. It is allowable, but not recommended, to let one press filter two tanks at the same time.

10. The effluent from each press goes into clear water hold tank T22. Under normal conditions, this tank overflows to the city sewer.

a. If the line make-up system (supplied by others) requires make-up water, P22 will start and pump water to T24 until T24 no longer needs water. If P22 should fail or is turned off, city water valve SV171 will open and fill T24.

b. If T22 is pumped all the way down, the Low Level alarm will sound and P22 will shut down. This alarm can be silenced and the flashing light will go to steady ON.

11. Any spills or overflows in the area will gravity flow into T23 spill sump. AP23 must be connected via hoses to the desired tank. AP 23 will start any time the tank is not at low level. If the tank gets to high level, the High Level alarm will sound. This alarm can be silenced and the flashing light will go to steady ON.

EXHIBIT A

TANK 4	BATCH #1	BATCH #5	BATCH #9
Starting Volume	12,000	12,000	12,000
Ending Volume	15,600	15,600	15,600
Start Treatment	4 a.m.	8:05 a.m.	4:05 p.m.
Stop Treatment	4:30 a.m.	8:35 a.m.	4:35p.m.

TANK 18	BATCH #1		BATCH #5		BATCH #9	
Starting Volume	8250	7350	8250	7350	8250	7350
Ending Volume	9900	8820	9900	8820	9900	8820
Start Filling	4:30 a.m.	6:35 a.m.	8:33 a.m.	2:35 p.m.	4:35 p.m.	12:40 a.m.
Stop Filling	5:00 a.m.	7:05 a.m.	9:05 a.m.	3:05 p.m.	5:05 p.m.	1:10 a.m.
Start Treatment	5:00 a.m.	7:05 a.m.	9:05 a.m.	3:05 p.m.	5:05 p.m.	1:10 a.m.
Stop Treatment	5:15 a.m.	7:20 a.m.	9:05 a.m.	3:20 p.m.	5:20 p.m.	1:25 a.m.

PRESS A	BATCH #1		BATCH #5		BATCH #9	
Start Filtering	5:15 a.m.	7:20 a.m.	1:15 p.m.	3:20 p.m.	11:20 p.m.	1:25 a.m.
Stop Filtering	6:35 a.m.	8:30 a.m.	2:35 p.m.	4:30 p.m.	12:40 a.m.	2:35 a.m.
Net Volume	9900	8820	9900	8820	9900	8820
Start Dumping	6:35 a.m.	8:30 a.m.	2:35 p.m.	4:30 p.m.	12:40 a.m.	2:35 a.m.
Stop Dumping	7:15 a.m.	9:15 a.m.	3:20 p.m.	5:15 p.m.	1:25 a.m.	3:20 a.m.
Ready	7:15 a.m.	9:15 a.m.	3:20 p.m.	7:20 p.m.*	1:25 a.m.	3:20 a.m.

*Wash edge of filter trays (2 hours, 5:20 p.m. - 7:20 p.m.).

EXHIBIT B

TANK 2	BATCH #2		BATCH #6		BATCH #10		BATCH #12	
Starting Volume	12,000		12,000		12,000		12,000	
Ending Volume	15,600		15,600		15,600		15,600	
Start Treatment	4:30 a.m.		8:35 a.m.		12:40 p.m.		8:10 p.m.	
Stop Treatment	5:00 a.m.		9:05 a.m.		1:10 p.m.		8:40 p.m.	
TANK 19								
Starting Volume	8250	7350	8250	7350	8250	7350	8250	7350
Ending Volume	9900	8820	9900	8820	9900	8820	9900	8820
Start Filling	5:00 a.m.	7:05 a.m.	9:05 a.m.	11:10 a.m.	1:10 p.m.	6:40 p.m.	8:45p.m.	10:50 p.m.
Stop Filling	5:30 a.m.	7:35 a.m.	9:35 a.m.	11:40 a.m.	1:40 p.m.	7:10 p.m.	9:15 p.m.	11:20 p.m.
Start Treatment	5:30 a.m.	7:35 a.m.	9:35 a.m.	11:40 a.m.	1:40 p.m.	7:10 p.m.	9:15 p.m.	11:20 p.m.
Stop Treatment	5:45 a.m.	7:50 a.m.	9:50 a.m.	11:55 a.m.	1:55 p.m.	7:25 p.m.	9:30 p.m.	11:35 p.m.
PRESS B								
Start Filtering	5:45 a.m.	7:50 a.m.	9:50 a.m.	11:55 a.m.	5:20 p.m.	7:25 p.m.	9:30 p.m.	11:35 p.m.
Stop Filtering	7:05 a.m.	9:00 a.m.	11:10 a.m.	1:05 p.m.	6:40 p.m.	8:45 p.m.	10:50 p.m.	12:45 a.m.
Net Volume	9900	8820	9900	8820	9900	8820	9900	8820
Start dumping	7:05 a.m.	9:00 a.m.	11:10 a.m.	1:05 p.m.	6:40 p.m.	8:45 p.m.	10:50 p.m.	12:45 a.m.
Stop dumping	7:50 a.m.	9:45 a.m.	11:55 a.m.	1:50 p.m.	7:25 p.m.	9:30 a.m.	11:35 p.m.	1:30 a.m.
Ready	7:50 a.m.	9:45 a.m.	11:55 a.m.	5:20 p.m.*	7:25 p.m.	9:30 p.m.	11:35 p.m.	1:30 a.m.

*2 hours for clearing edges of filter bags (3:20 p.m. - 5:20 p.m.).

APPENDIX D.1b

FACILITY DRAWINGS FOR PROPOSED CONTAINER STORAGE AREA

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