CAFB 89

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 27TH COMBAT SUPPORT GROUP (TAC)
CANNON AIR FORCE BASE NM 88103

07 JUN 1989

New Mexico Environmental Improvement Div.
Hazardous Waste Section
P. O. Box 968
Santa Fe, New Mexico 87501

Attention: Mr. Gian Bacigalupa

Dear Mr. Bacigalupa,

Enclosed is the Part B, RCRA Permit Application for the DRMO facility, which incorporates the information you requested in your 17 March 89 letter. I hope the points covered will be of sufficient detail, fulfilling the technical requirements for the permit application and will allow the NMEID to approve the Cannon AFB permit.

Cannon's point of contact for this information is Mr. Jim Richards at (505) 784-4639 or Mrs. Vera Wood at (505) 784-2435.

Sincerely

David E Benson

DAVID E, BENSON, Colonel, USAF
Commander

1 Atch
Part B Permit

cc: HQ TAC/DEEV w/o Attach
AFRCE-CR w/o Attach
DRMS, Ogden UT w/o Attach

LIBRARY COPY

RECEIVED
JUN 9 1989
HAZARDOUS WASTE SECTION

RCRA PART B PERMIT APPLICATION

CANNON AIR FORCE BASE

31 May 1989

PREPARED BY

CANNON AIR FORCE BASE, NEW MEXICO 88103

TABLE OF CONTENTS

		Page
Section A.	PART A APPLICATION	A-1
Section B.	FACILITY DESCRIPTION	
B-1.	General Description	B-1
B-2.	Topographic Map	B-7
B-2a.	General Requirements	B-8
B-2a(1).	Land Uses	B-8
B-2a(2).	Hazardous Waste Management Facility Boundary	B-9
B-2a(3).	Wind Rose	B-10
B-2a(4).	Access Control	B-11
B-2a(5).	Injection and Withdrawal Wells	B-11
B-2a(6).	Buildings, Treatment, Storage, Disposal Areas, and Other Structures	B-12
B-2a(7).	Recreation Areas	B-12
B-2a(8).	Runoff Control Systems	B-13
B-2a(9).	Storm, Sanitary, and Process Sewers	B-13
B-2a(10).	Loading and Unloading Areas	B-13
B-2a(11).	Fire Control Facilities	B-14
B-2a(12).	Surface Waters	B-14
B-2a(13).	Flood Control/Drainage Barriers	B-14
B-3.	Location Information	B-14
B-3a.	Seismic Considerations	B-15
B-3b.	Floodplain Standard	B-15
B-4.	Traffic Information	B-15
B-4a.	Traffic Control	B-16
B-4b.	Access Road Surfacing	B-16
B-4c.	Load-Bearing Capacity	B-16
B-4d.	Traffic Control Signals	B-16
B-5.	Separation of Hazardous Material/Waste	B-17
Section C.	WASTE CHARACTERISTICS	
C-1.	Chemical and Physical Analyses	C-1
C-1a.	Containers [Guidance]	C-2
C-1b.	Tanks [Guidance]	.C-2
C-1c.	Wastes Piles [Guidance]	C-2
C-1d.	Surface Impoundments [Guidance]	C-3
C-1e.	Incinerators	C-3
C-1f.	Landfills [Guidance]	C-3
C-1g.	Land Treatment [Guidance]	C-3
C-1h.	Additional Requirements for Land Storage, Treatment and Disposal Facilities	C-3
C-2.	Waste Analysis Plan	C-3
C-2a	General Discusion Of Analysis	C-13
C-2b.	Additional Requirements For Waste Generated Off-Site	C-14
C-2c	Parameters and Rationale	C-15
C-2.c(1)	Analysis Parameters (Identity Unknown)	C-15
C-2.c(1)(a)	Frequency of Analysis	C-16
C-2.c(2)	Analysis Parameters (Known)	C-18
C-2d.	Test Methods	C-18
C-2e.	Sampling Methods	C-18

TABLE OF CONTENTS (continued)

Section		Page
C-2 f.	Sampling Frequency	C-19
C-2g.	Chain of Custody	C-19
C-2h.	Record Keeping	C-19
C-2i.	Additional Requirements for Facilities Handling Ignitable, Reactive or Incompatible Wastes	C-22
Section D.	PROCESS INFORMATION	
D-1.	Containers	D-1
D-1a.	Containers with Free Liquids, Description of the System	D-1
D-1a(1).	Basic Design Parameters, Dimensions, and Materials of Construction	D-14
D-1a(2).	Description of How Design Promotes Drainage or How Containers are Kept From Contact with Standing Liquids in Containment System	D-14
D-1a(3).	Capacity of the Containment System Relative to the Number and Volume of Containers to be Stored	D-15
D-1a(4).	Provisions for Preventing or Managing Run-on	D-15
D-1a(4).(a)	Load/Unload Area	D-15
D-1a(5).	How Accumulated Liquids Can be Analyzed and Removed to Prevent Overflow	D-16
D-1b.	Continers Without Free Liquid	D-16
D-1b(1).	Test for Free Liquids	D-16
D-1b(2).	Description of Storage Area Design and Operation to Drain and Remove Liquids or How Containers are Kept from Contact With Standing Liquids	D-17
D-1c.	Requirements for Ignitable or Reactive Wastes and Incompatible Wastes	D-17
D-1d.	Container Management	D-18
D-2	Tanks	D-19
D-3.	Waste Piles	D-19
D-4.	Surface Impoundments	D-19
D-5.	Incinerators	D-21
D-6.	Landfills	D-21
D-7.	Land Treatment	D-21
D-8.	Thermal Treatment	D-21

Section E. GROUNDWATER MONITORING

TABLE OF CONTENTS (continued)

Section F. PROCEDURES TO PREVENT HAZARDS

F-1.	Security	F-1
F-1a.	Security Procedures and Equipment	F-1
F-1a(1).	24-Hour Surveillance System	F-2
F-1a(2).	Barrier and Means to Control Entry	F-2
F-1a(2)(a).	Barrier	F-2
F-1a(2)(b).	Means to Control Entry	F-3
F-1a(3).	Warning Signs	F-3
F-1b.	Waiver	F-3
F-2.	Inspection Schedule	F-3
F-2a.	General Inspection Requirements	F-4
F-2a(1).	Types of Problems	F-4
F-2a(2).	Frequency of Inspection	F-4
F-2b.	Specific Process Inspection Requirements	F-8
F-2b(1).	Container Inspection	F-8
F-2b(2).	Tank Inspection	F-10
F-2b(3).	Waste Pile Inspection	F-10
F-2b(4).	Surface Impoundment Inspection	F-10
F 2b(5).	Incinerator Inspectlon	F-10
F-2b(6).	Landfill Inspection	F-10
F-2b(7).	Land Treatment Inspection	F-11
F-2b(8).	Thermal Treatment	F-11
F-2c.	Remedial Action	F-11
F-2d.	Inspection Log	F-12
F-3.	Waiver of Preparedness and Prevention Requirements	F-12
F-3a.	Equipment Requirements	F-12
F-3b.	Aisle Space Requirement	F-13
F-4.	Preventive Procedures, Structures, and Equipment	F-13
F-4a.	Unloading Operations	F-13
F-4b.	Runoff	F-14
F-4c.	Water Supplies	F-14
F-4d.	Equipment and Power Failure	F-15
F-4e.	Personnel Protection Equipment	F-15
F-5.	Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes	F-15
F-5a.	Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes	F-16
F-5b.	General Precautions for Handling Ignitable or Reactive Wastes and Mixing of Incompatible Wastes	F-16
F-5c.	Management of Ignitable or Reactive Wastes in Containers	F-17
F-5d.	Management of Incompatible Wastes in Containers	F-17
F-5e.	Management of Ignitable or Reactive Wastes in Tanks	F-18
F-5f.	Management of Incompatible Wastes in Tanks	F-18
F-5g.	Ignitable or Reactive Wastes ln Waste Piles	F-18
F-5h.	Incompatible Wastes in Waste Piles	F-18
F-5i.	Iqnitable or Reactive Wastes in Surface Impoundments	F-19
F-5j.	Incompatible Wastes in Surface Impoundments	F-19
F-5k.	Ignitable or Reactive Wastes in Landfills	F-19

TABLE OF CONTENTS (continued)

Section		PAGE
F-5l.	lncompatible Wastes ln Landfills	F-19
F-5m.	Liquid Wastes in Landfills	F-20
F-5n.	Special Requirements for Containers Disposed in Landfills	F-20
F-5o.	Ignitable or Reactive Wastes in Land Treatment	F-20
Section G.	CONTINGENCY PLAN	
G-1.	General Information	G-1
G-2.	Emergency Coordinators	G-2
G-3.	Implementation of the Contingency Plan	G-16
G-4.	Emergency Response Procedures	G-18
G-4a.	Notification	G-18
G-4b.	Identification. of Hazardous Materials	G-18
G-4c.	Hazard Assessment	G-19
G-4d.	Control Procedures	G-19
G-4e.	Prevention of Recurrence or Spread of Fires, Explosions, or Releases	G-30
G-4f.	Storage and Treatment of Released Material	G-30
G-4g.	Incompatible Waste	G-30
G-4h.	Post-Emergency Equipment Maintenance	G-31
G-4i.	Container Spills and Leakaqe	G-31
G-4j.	Tank Spills and Leakage	G-31
G-4k.	Waste Piles Spills and Leakaqe	G-31
G-4l.	Surface Impoundments Spills and Leakage and Sudden Drops	G-32
G-4m.	Landfill Leakage	G-32
G-5.	Emergency Equipment	G-32
G-6.	Coordination Agreements	G-36
G-7.	Evacuation Plan	G-37
G-8.	Required Reports	G-38
Section H.	PERSONNEL TRAINING	
H-1.	Outline of Training Program	H-1
H-1a.	Job Titles and Duties	H-2
H-1b.	Training Content, Frequency and Techniques	H-14
H-1c.	Training Director	H-16
H-1d.	Relevance of Training to Job Position	H-17
H-1e.	Training for Emergency Response	H-22
H-1e(1).	Procedures for Using, Inspecting, Repairing, and Replacing "Facility Emergency and Monitoring Equipment	H-22
H-1e(2).	Key Parameters for Automatic Waste Feed Cut-Off System	H-22
H-1e(3).	Communications or Alarm Systems	H-23

TABLE OF CONTENTS (continued)

Section		Page
H-1e(4)	Response to Fires or Explosions	H-23
H-1e(5)	Response to Groundwater Contamination Incidents	H-23
H-1e(6)	Shutdown of Operations	H-24
H-2	Implementation of Training Program	H-24
Section I.	CLOSURE PLAN, POST-CLOSURE PLAND AND FINANCIAL REQUIREMENTS	
I-1.	Closure Plans	I-1
I-1a	Closure Performance Standard	I-1
I-1b	Partial and Final Closure Activities	I-2
I-1c	Maximum Waste Inventory	I-2
I-1d	Schedule for Closure	I-3
I-1d(1)	Time Allowed for Closure	I-3
I-1d(2)	Extensions for Closure Time	I-3
I-1e(1)	Closure of Containers	I-7
I-1e(2)	Closure of Tanks	I-7
I-1e(3)	Closure of Waste Piles (Reserved)	I-7
I-1e(4)	Closure of Surface Impoundments	I-7
I-1e(5)	Closure of Incinerators	I-8
I-1e(6)	Closure of Landfills	I-8
I-1e(7)	Closure of Land Treatment	I-8
I-2	Post Closure Plans	I-8
I-3	Notices Required for Disposal Facilities	I-8
I-3a	Notice to Local Land Authority	I-8
I-3b	Notice in Deed to Property	I-8
I-4	Closure Cost Estimate	I-8
Section J.	OTHER FEDERAL LAWS	J-1
Section K.	CERTIFICATION	K-1
Appendices		
B-1	Cantonment Area	
B-2	Topographic and Utility Map	
B-3	Sanitary Sewerage System	

TABLE OF CONTENTS

Appendices (continued)

B-4.

B-5. Water Supply System

B-6. Construction Plans for Hazardous Waste Storage Facility

B-7. Flood Insurance Rate Map

C-1. Hazardous Material - Group I Items

C-2 Waste Streams Generated by Cannon AFB and Reese AFB's - Group II Items

C-3. Laboratory Analysis Reports for Group II Wastes

C-4. Example of a Material Safety Data Sheet

C-5. Parameters and Rational for Analysis of Known Operations

C-6. Sample Submission Form

C-7. Quality Assurance

D-1. Department of Transportation and Corresponding Military Container Specifications

D-2. Specifications for Chemical Sealant

D-3. Incompatible Wastes

Appendices (continued)

F-1. Inspection Log Sheets

F-2. Environmental Considerations in the DRMS Disposal Process=List of Chemical Substances

G-1. Coordination Agreements

H-1. Hazardous Waste Management Training Program Outline

I-1. Soil Classification

I-2. Land Management Plan

LIST OF FIGURES

Number		Page
B-1.	Location Map of Cannon AFB and Melrose Bombing Range	B-2
B-2.	Topography and Surface Drainage Map	B-7
B-3.	Annual Wind Roses	B-10
B-4	Storage Plan	B-12a
C-1.	Example of the Disposal Turn-in Document for Generators of Hazardous Wastes	C-7
C-2.	Hazardous Materials Information System Data for Acetone	C-11, 12
C-3	Identification Process Flow Chart	C-17
C-4	Chain of Custody Record	C-20
C-5	Sample Submission Form	C-21
D-1.	Typical Storage Plan	D-20
G-1.	Pollution Incident Report	G-40, through 41
G-2.	Reporting Form for Emergency Events	G-42
H-1.	Hazardous Materials/Hazardous Waste Handling Course, U.S. Army Logistics Management Command, Ft. Lee, Virginia	H-3
H-2	Topics Covered by the Course, Hazardous Chemical Safety, which is offered by the J.T. Baker Chemical Company	H-4
H-3.	Environmental Considerations in the DPDS Disposal Process DPDS-M# 6050.1, Section V.	H-5
H-4.	Hazardous Materials, Chemical and Waste Training and Compliance Course, Hazardous Materials & Waste Management Assoc., Inc.	H-18, through 19
H-5.	Hazardous Materials Incident Response Operations Course, U.S. Environmental Protection Agency	H-20
H-6.	Hazardous Materials Compliance and Enforcement Course, U.S. Department of Transportation	H-21

LIST OF TABLES

Number		Page
B-1.	Accumulation Points for Hazardous Waste on Cannon AFB	B-6
D-1.	Description of Containers to Store Hazardous Waste at DRMO - Cannon	D-2 through D-13
F-1a.	General Inspection Schedule	F-5 through F-7
F-1b.	Specific Process Inspection Schedule	F-9
G-1.	Emergency Coordinators	G-3
G-2.	Spill Response Team	G-4
G-3.	Local, State, and Federal Emergency Contacts	G-5
G-4.	Protective Equipment Available at DRMO - Cannon	G-33
G-5.	Emergency Response Equipment	G-34
G-6	Contents of Spill Kit	G-35
I-1.	Estimated Closure Schedule	I-5

(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: F N M 7 5 7 2 1 2 4 4 5 4 D

LABEL ITEMS

I. EPA I.D. NUMBER

II. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area*(s)* below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold—faced terms**.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)		X	
C. Is this a facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)		X	
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	X		
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP CANNON AIR FORCE BASE

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 EARLS GARRY LT COL USAF BCE	505 784 4358

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 27 CSG/DE

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 CANNON AIR FORCE BASE	NM	88103

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 US 60/84 7MI WEST OF CLOVIS NM

B. COUNTY NAME

CURRY

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE *(if known)*
6 CANNON AIR FORCE BASE	NM	88103	—

ONTINUED FROM THE FRONT

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

A. FIRST	B. SECOND
9711 (specify) NATIONAL DEFENSE	7532 (specify) To Air Transportation, APT, Flying Field, Fixed Facilities & Related Services
C. THIRD	**D. FOURTH**
(specify)	7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: DAVID E BENSON COL USAF CAFB LANDFILL

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

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

D. PHONE (area code & no.): A 505 784 2761

E. STREET OR P.O. BOX: 27CSG/CC

F. CITY OR TOWN: CANNON AIR FORCE BASE
G. STATE: NM
H. ZIP CODE: 88103

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): N	**D. PSD** (Air Emissions from Proposed Sources): 9 P
B. UIC (Underground Injection of Fluids): U	**E. OTHER** (specify): 9 (specify)
C. RCRA (Hazardous Wastes):	**E. OTHER** (specify): 9 (specify)

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.

XII. NATURE OF BUSINESS (provide a brief description)

This facility was used to dispose of some hazardous waste associated with aircraft maintenance and operations in FY 81 (Oct 80 to June 81).

XIII. CERTIFICATION (see instructions)

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
DAVID E. BENSON, Colonel, USAF Combat Support Group Commander	David E Benson	07 JUN 1989

COMMENTS FOR OFFICIAL USE ONLY

3 RCRA | EPA | U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER: F N M 7 5 7 2 1 2 4 4 5 4

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 a 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.)*

[ ] 2. NEW FACILITY *(Complete item below.)*

8 | YR. 65 | MO. 10 | DAY 01 — FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

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

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[X] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

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

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.1. AMOUNT (specify)	B.2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G	
X-2	T 0 3	20	E	
1	D 8 0	0.2	A*	
2				
3				
4				
5				
6				
7				
8				
9				
10				

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

* See explanation on reverse

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.

The Landfill was used to dispose of waste from the Corrosion Control Shop by spreading the liquid waste out on an absorbent material (sawdust) in the Landfill cell. We estimate about 9000 lbs. of F005 waste was disposed of in the cell designated as being in use during FY 81 (see attached Landfill plan). No Mogas Tanks have been cleaned since prior to 19 Nov 80. In the future when sludge is cleaned from the Mogas Tanks, it will be put in drums and turned in to the Defense Reutilization and Marketing Office (DRMO) for storage until disposed of through the manifest system.

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	0 5 4	900	P	T 0 3 D 8 0	
X	0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

CONTINUE ON PAGE 3

Form Approved OMB No. 158-S80004

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

IV. 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	F005	-0-	P	D80	No hazardous waste has been disposed of in the Landfill since June 81. We have installed four (4) ground water monitoring wells. Also a closure/post closure plan and design specs for constructing a cap over this cell have been submitted to NMEID for approval.
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

(enter "A", "B", "C", etc. behind the "3" to identify photocopied pages)

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)*														
S												T/A	C	
F	N	M	7	5	7	2	1	2	4	4	5	4		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).*

VI. PHOTOGRAPHS

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

ACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
34 24 056	103 19 003

VIII. FACILITY OWNER

☐ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E Cannon Air Force Base	505-784-2761

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 27 CSG/CC	G Cannon Air Force Base	NM	88103

IX. OWNER CERTIFICATION

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

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
DAVID E. BENSON, Colonel, USAF Combat Support Group Commander	David E Benson	07 JUN 1989

X. OPERATOR CERTIFICATION

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

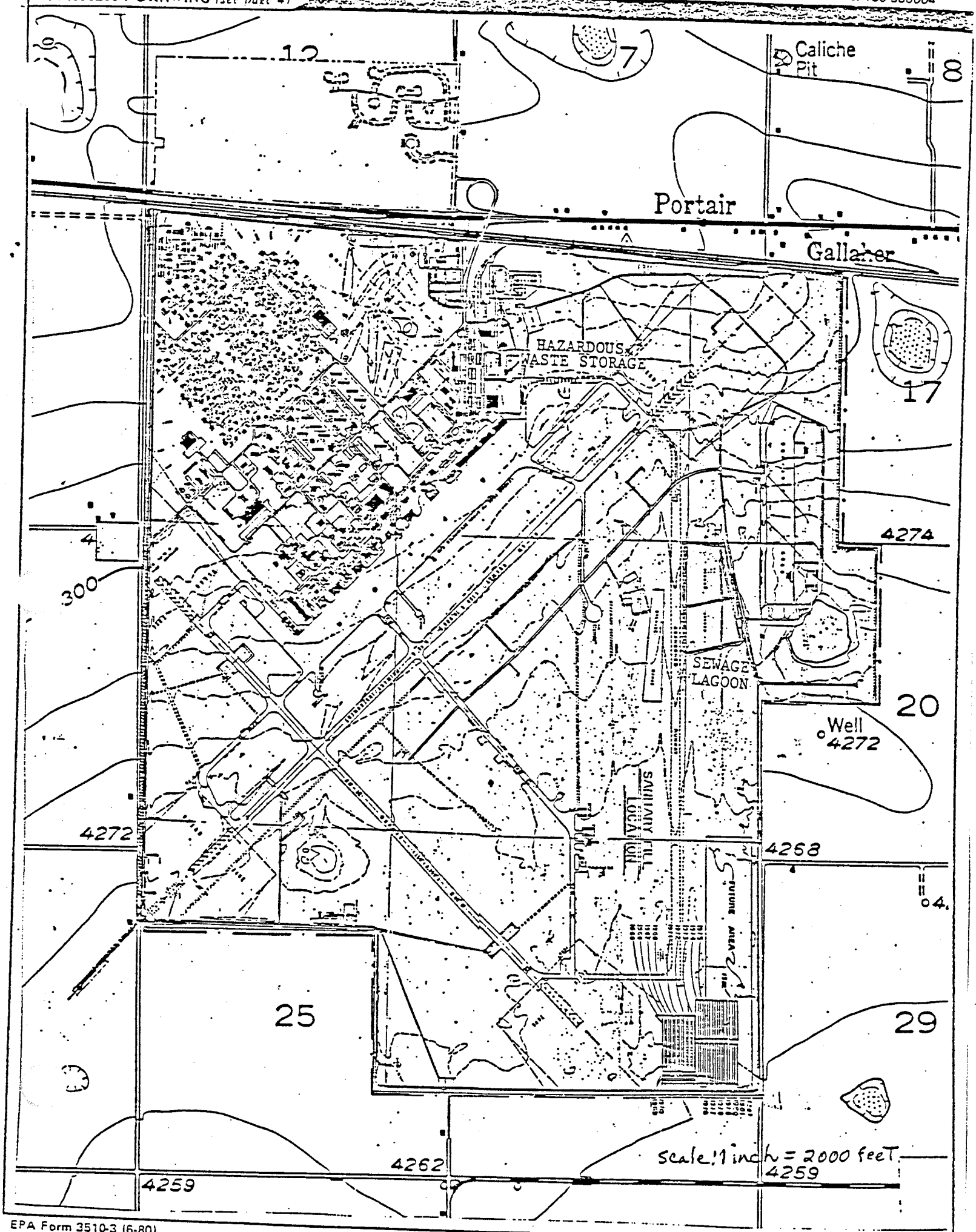
A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Walter E. Novak	Walter E. Novak	26 MAY 1989

CONTINUE ON PAGE 5

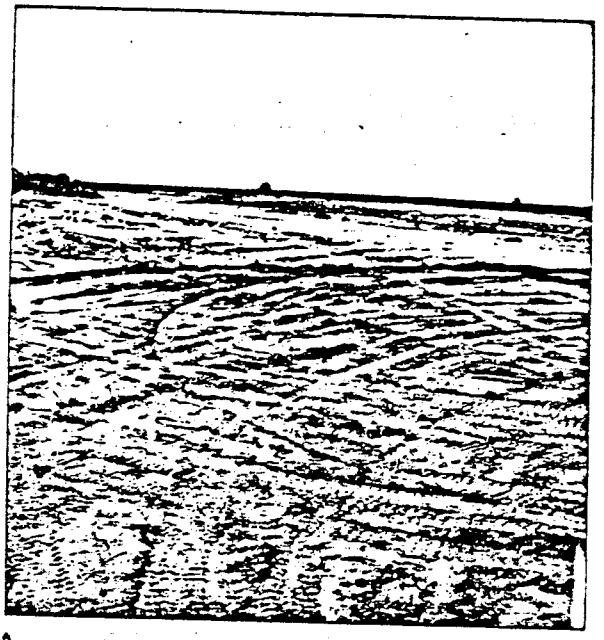
Continued from page 4.

V. FACILITY DRAWING (see page 4)

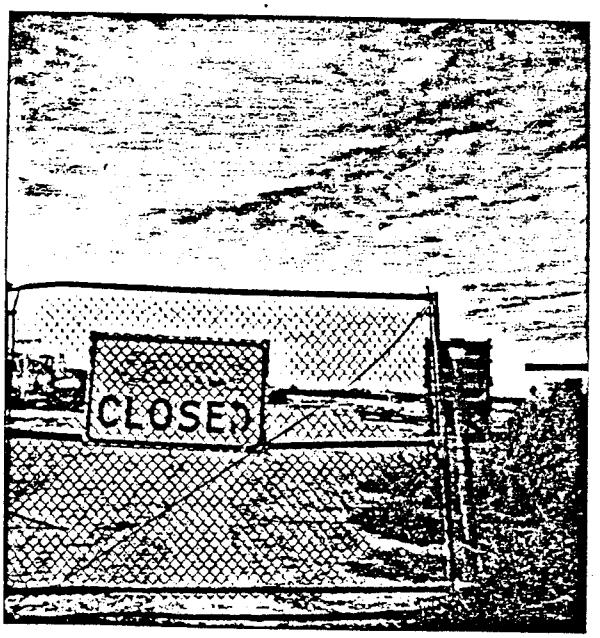
Form Approved OMB No. 158-S80004



Form Approved OMB No. 158-S80004



Cannon AFB Landfill area - 24 OCT 85



Cannon AFB Landfill area - 24 OCT 85

ONTINUED FROM THE FRONT

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

A. FIRST	B. SECOND
9711 (specify) NATIONAL DEFENSE	7532 (specify) To Air Transportation, APT, Flying Field, Fixed Facilities & Related Services

C. THIRD	D. FOURTH
(specify)	7 (specify)

VIII. OPERATOR INFORMATION

A. NAME: DAVID E BENSON COL USAF CAFB LANDFILL

B. Is the name listed in Item VIII-A also the owner? [X] YES [ ] NO

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

F (specify)

D. PHONE (area code & no.): A 505 784 2761

E. STREET OR P.O. BOX: 27 CSG/CC

F. CITY OR TOWN: CANNON AIR FORCE BASE

G. STATE: NM

H. ZIP CODE: 88103

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): N	D. PSD (Air Emissions from Proposed Sources): 9 P
B. UIC (Underground Injection of Fluids): U	E. OTHER (specify): 9 (specify)
C. RCRA (Hazardous Wastes)	E. OTHER (specify): 9 (specify)

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.

XII. NATURE OF BUSINESS (provide a brief description)

This facility was used to dispose of some hazardous waste associated with aircraft maintenance and operations in FY 81 (Oct 80 to June 81).

XIII. CERTIFICATION (see instructions)

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
DAVID E. BENSON, Colonel, USAF Combat Support Group Commander	David E Benson	07 JUN 1989

COMMENTS FOR OFFICIAL USE ONLY

RCRA

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER: F N M 7 5 7 2 1 2 4 4 5 4

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 a 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.)*

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

C	YR.	MO.	DAY
8	6 8	0 5	1 7

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

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

YR.	MO.	DAY
8 5	1 2	1 5

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

☒ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

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

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
X-1	S 0 2	600	G	
X-2	T 0 3	20	E	
1	0 1	11,000	G	
2				
3				
4				
5				
6				
7				
8				
9				
10				

CONTINUE ON REVERSE

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

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

cility 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 unt 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	
X-2	D002	400	P	T03 D80	
X-3	D001	100	P	T03 D80	
X-4	D002				included with above

CONTINUE ON PAGE 3

Continued from page 2.

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

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
W N M 7 5 7 2 1 2 4 4 5 4 T/A C 1	W DUP T/A 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	10,000 ✓	P	S01				
2	D007	3,000 ✓	P	S01				
3	F001	7,700 ✓	P	S01				
4	F002	5,500 ✓	P	S01				
5	F005	25,000 ✓	P	S01				
6	D001	5,000 ✓	P	S01				
7	D016	800 ✓	P	S01				
8	U002	10 ✓	P	S01				
9	U159	10 ✓	P	S01				
10	U220	10 ✓	P	S01				
11	U239	10 ✓	P	S01				
	U154	10 ✓	P	S01				
13	U228	10 ✓	P	S01				
14	U210	10 ✓	P	S01				
15	U151	100 ✓	P	S01				
16	U249	10 ✓	P	S01				
17	U226	10 ✓	P	S01				
18	D006	1,125 ✓	P	S01				
19	F003	1,125 ✓	P	S01				
20								
21								
22								
23								
25								
26								

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

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)*

S F N M 7 5 7 2 1 2 4 4 5 4 T/A C 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).*

VI. PHOTOGRAPHS

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

FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
3 4 2 4 0 5 6	1 0 3 1 9 0 0 3

VIII. FACILITY OWNER

☐ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E Cannon Air Force Base	5 0 5 - 7 8 4 - 2 7 6 1

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F 27 CSG/CC	G Cannon Air Force Base	N M	8 8 1 0 3

IX. OWNER CERTIFICATION

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

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
DAVID E. BENSON, Colonel, USAF Combat Support Group Commander	David E Benson	07 JUN 1989

X. OPERATOR CERTIFICATION

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

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
Walter E. Novak	Walter E. Novak	26 MAY 1989

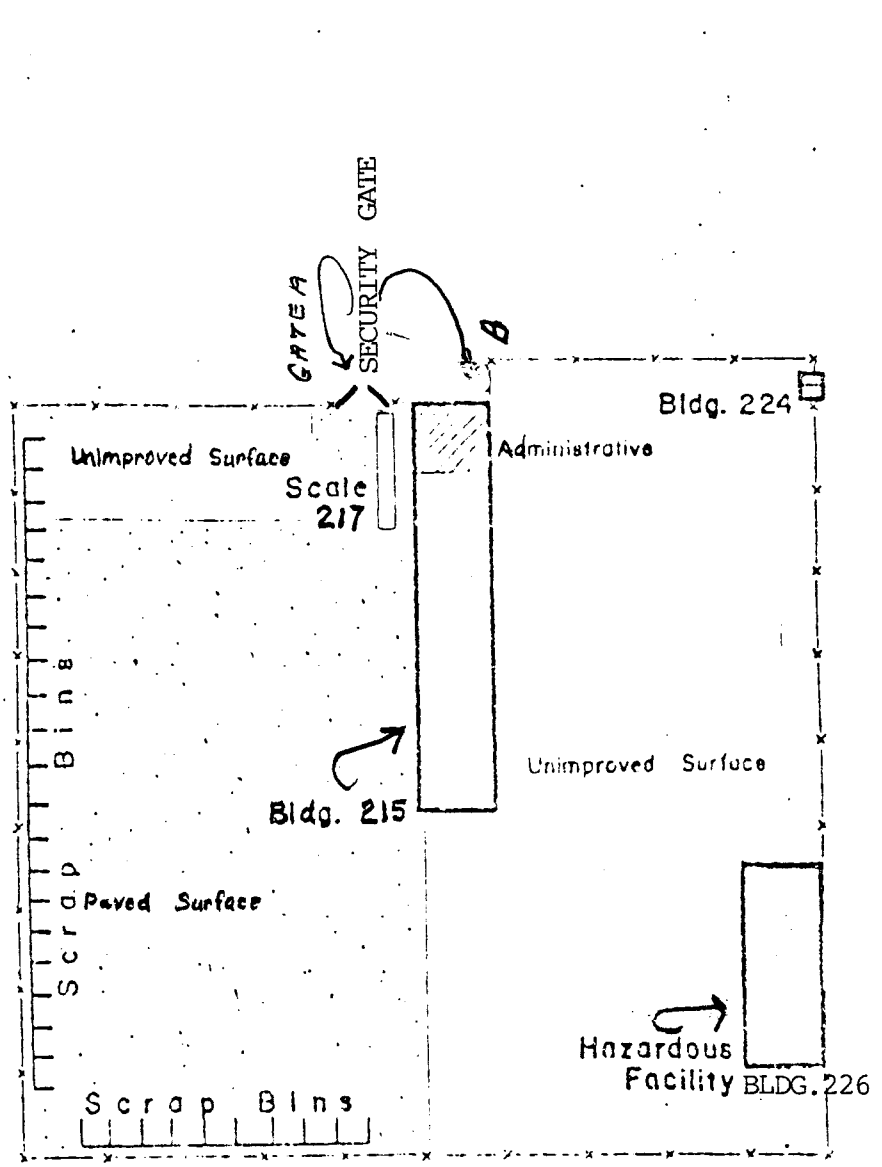
CONTINUE ON PAGE 5

V. FACILITY DRAWING (see page

INSTALLATION AND LOCATION
DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO)
BLDG: 215 (217, 224 and 226)
CANNON AFB, NM 88103-2606

PROJECT TITLE

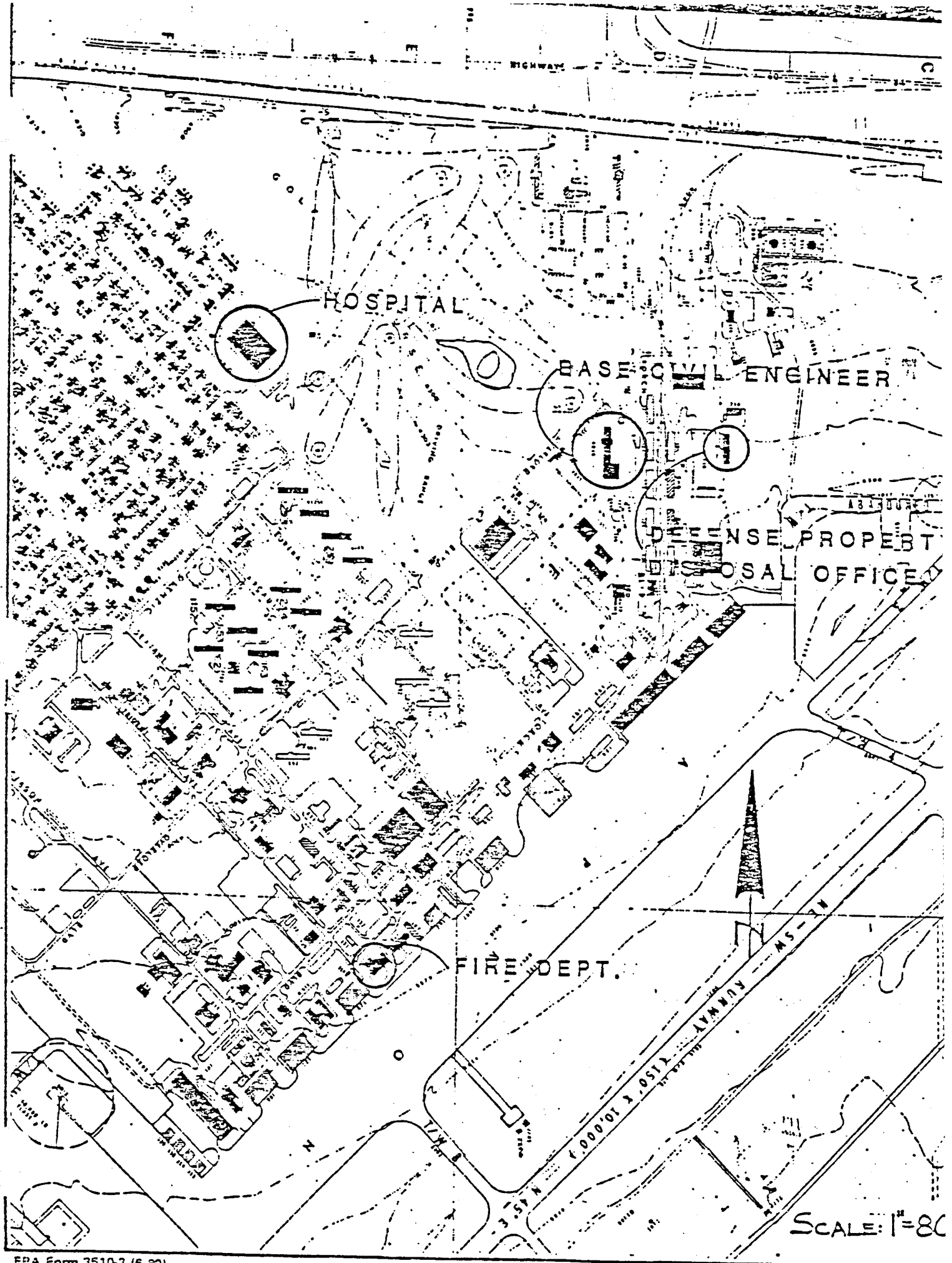
TSDF STORAGE



GENERAL SITE PLAN

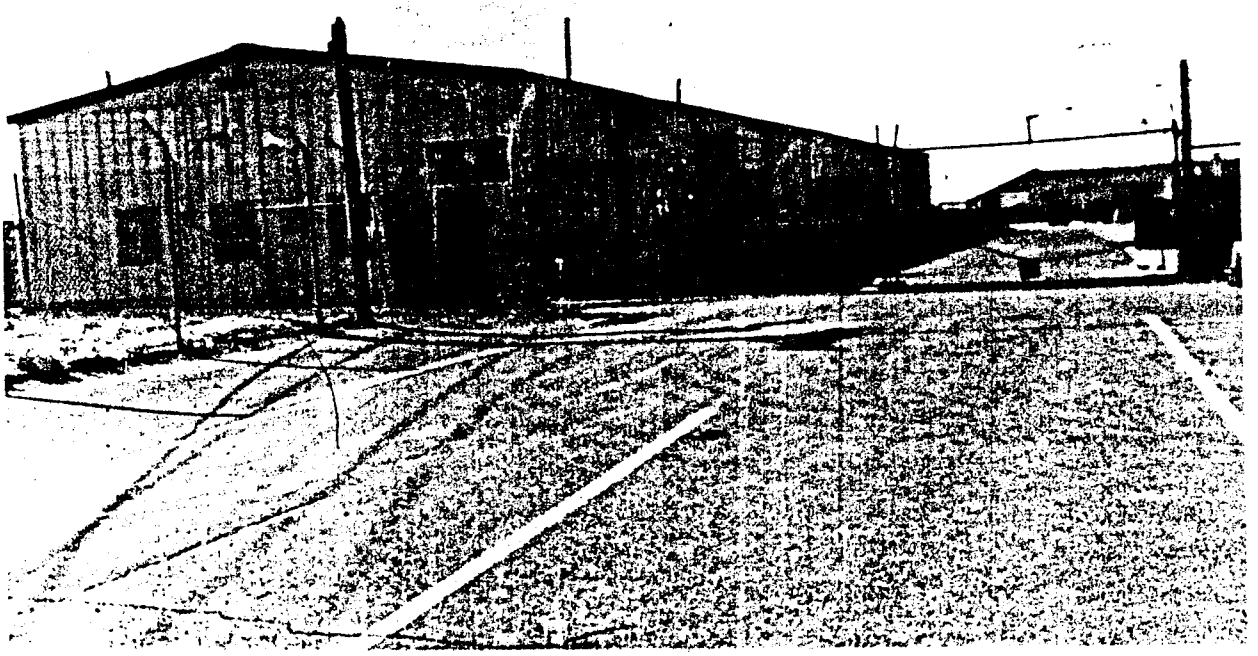
100 50 0 100

SCALE IN FEET

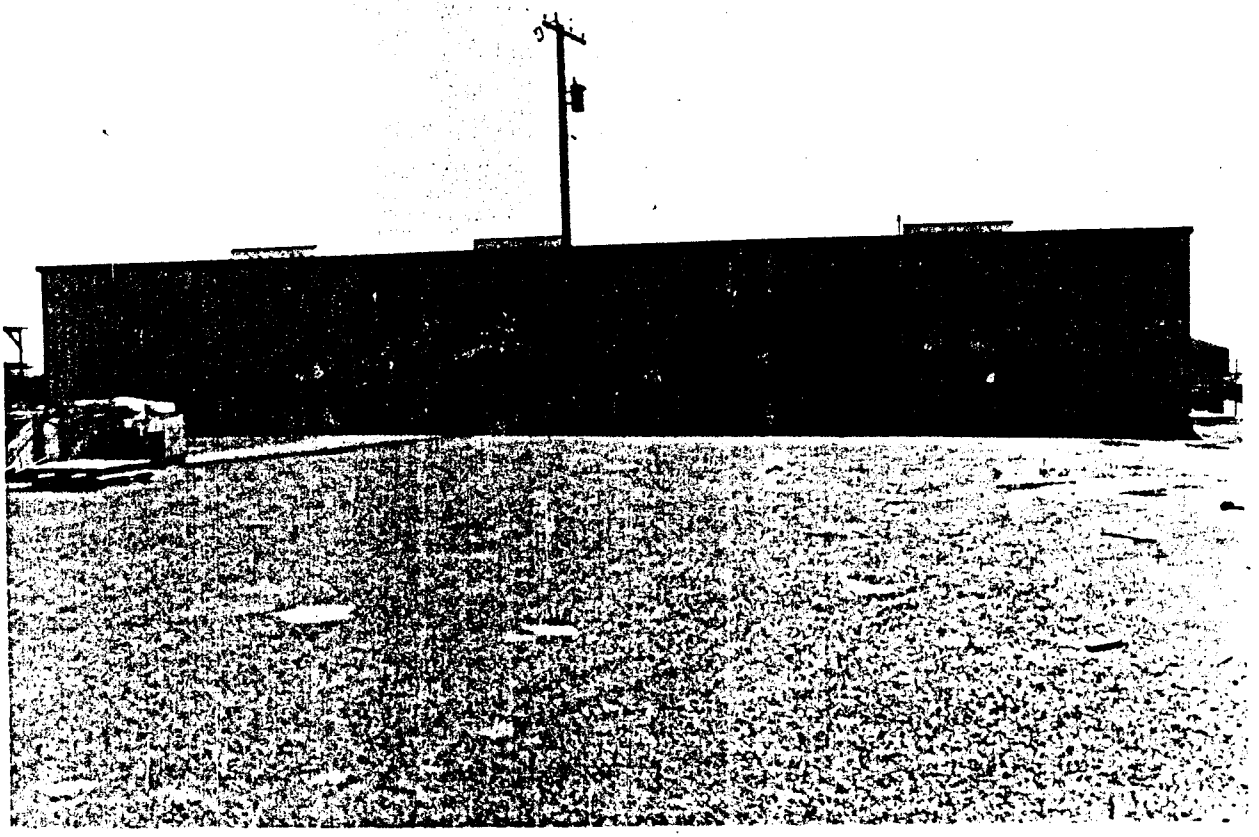

HIGHWAY
HOSPITAL
BASE CIVIL ENGINEER
DEFENSE PROPERT
DISPOSAL OFFICE
FIRE DEPT.
RUNWAY
N 45° W
SCALE: 1"=80

ATTACHMENTS

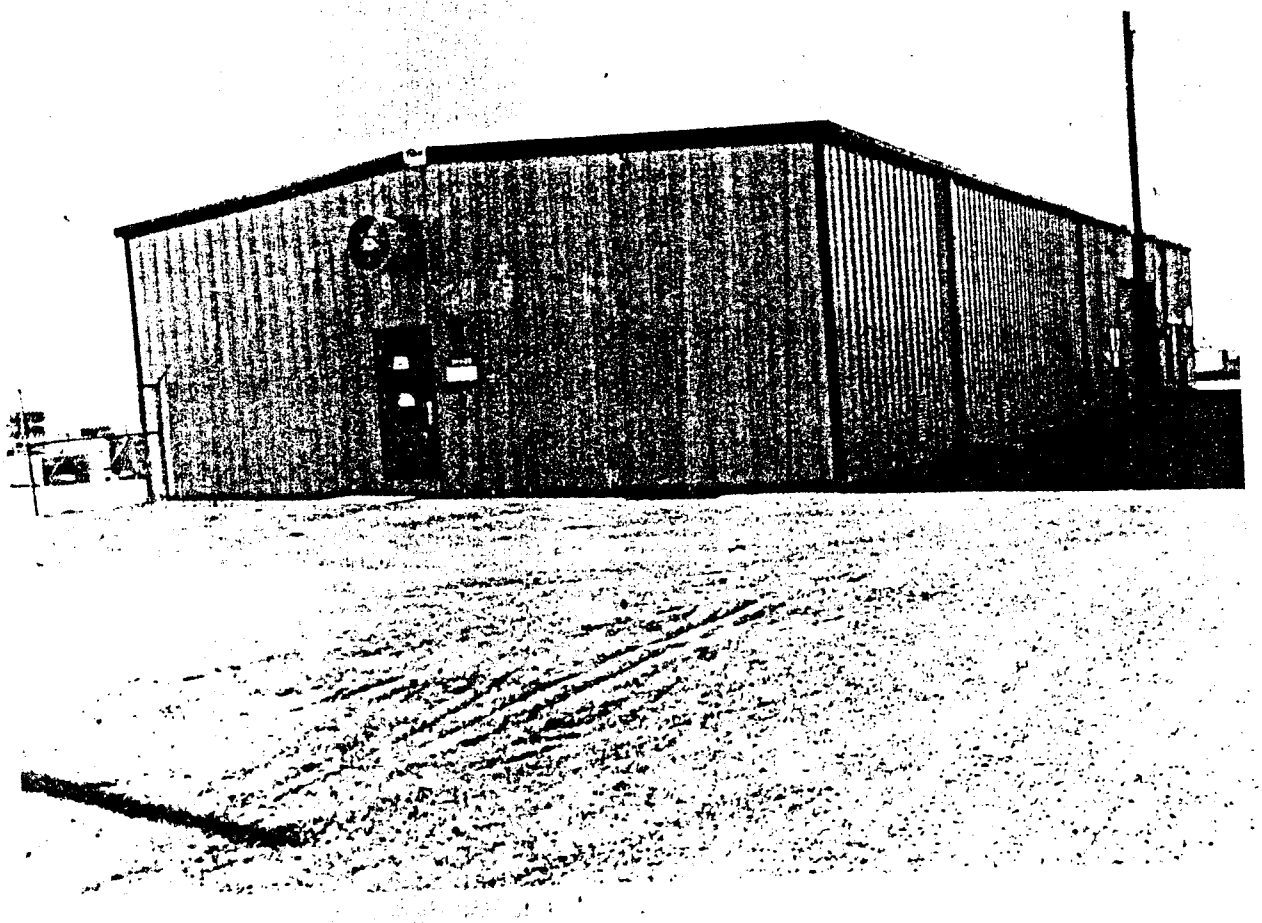
PICTURES



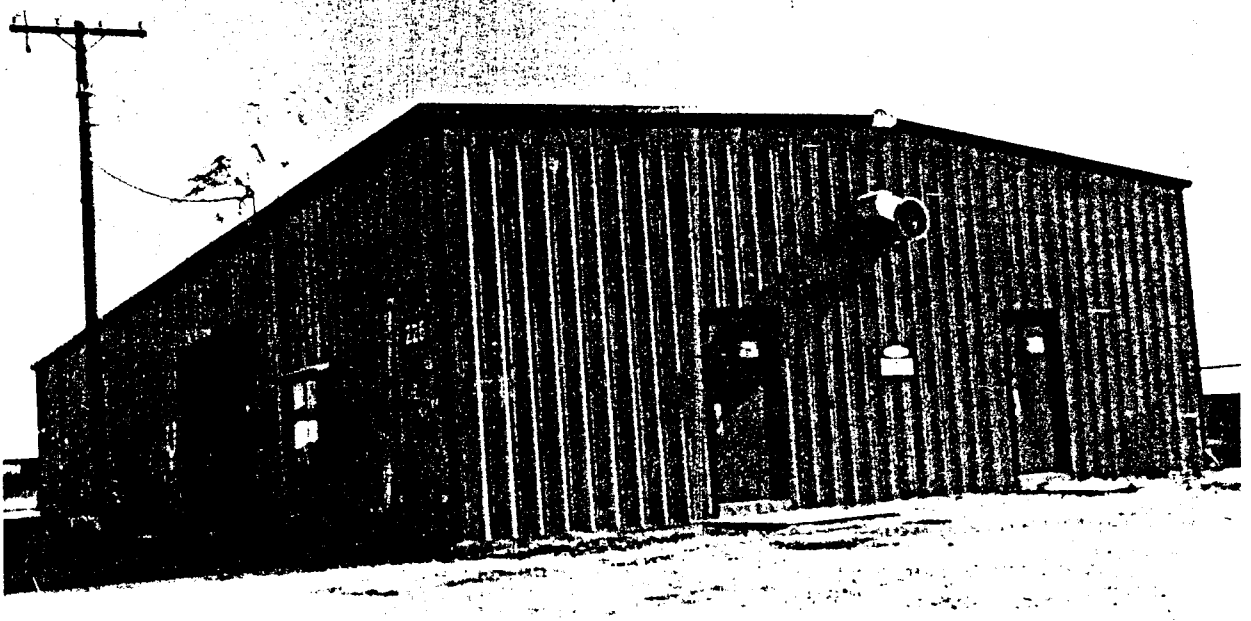
DRMO-Cannon AFB, NM
Entrance to DRMO and DRMO yard,
Building Faces North
(May 1989)



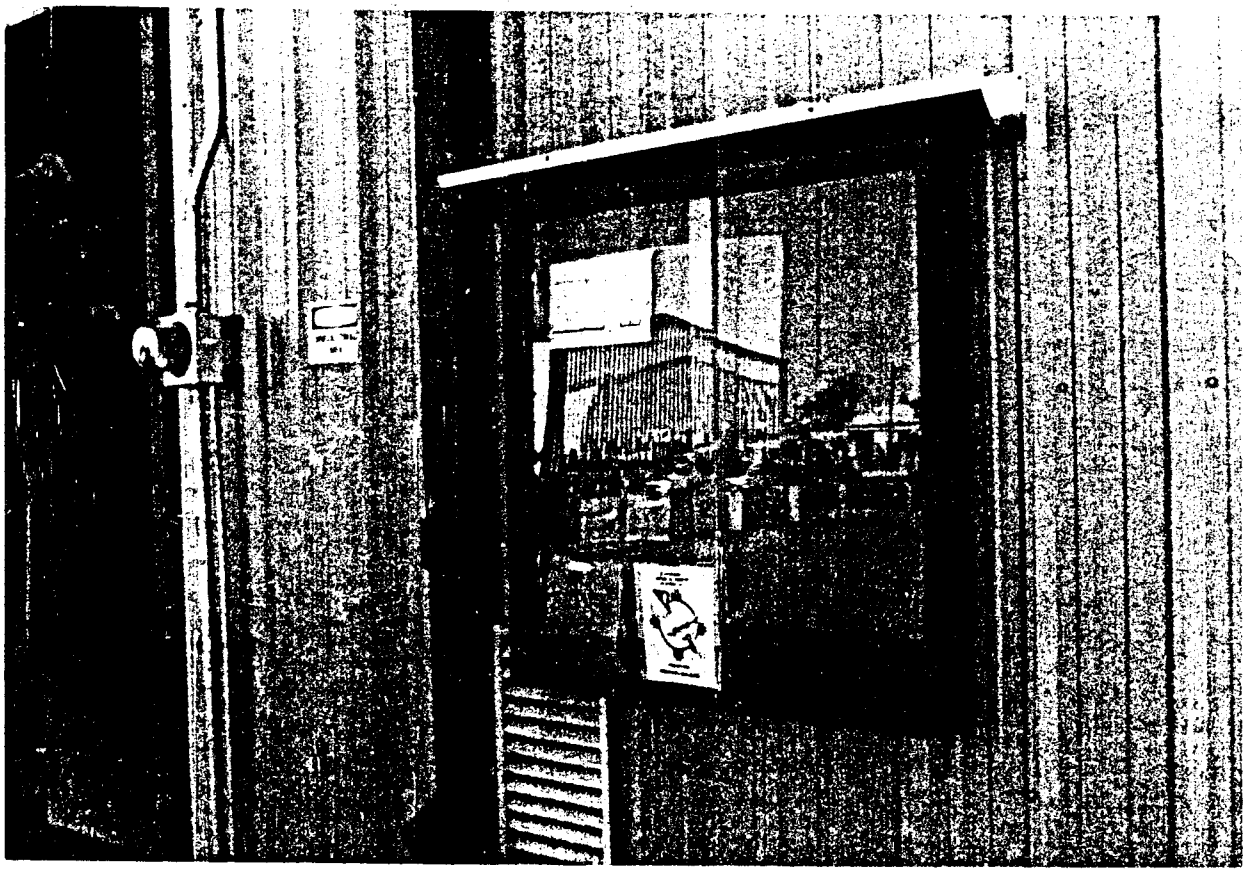
BLDG. 226 Cannon AFB, NM. TSDF
West Side of TSDF, Receiving area
Inside DRMO-Cannon's fenced compound
TSDF
Treatment, Storage
Disposal Facility



DRMO-Cannon AFB, NM. TSDF
North & West Side of Exterior TSDF



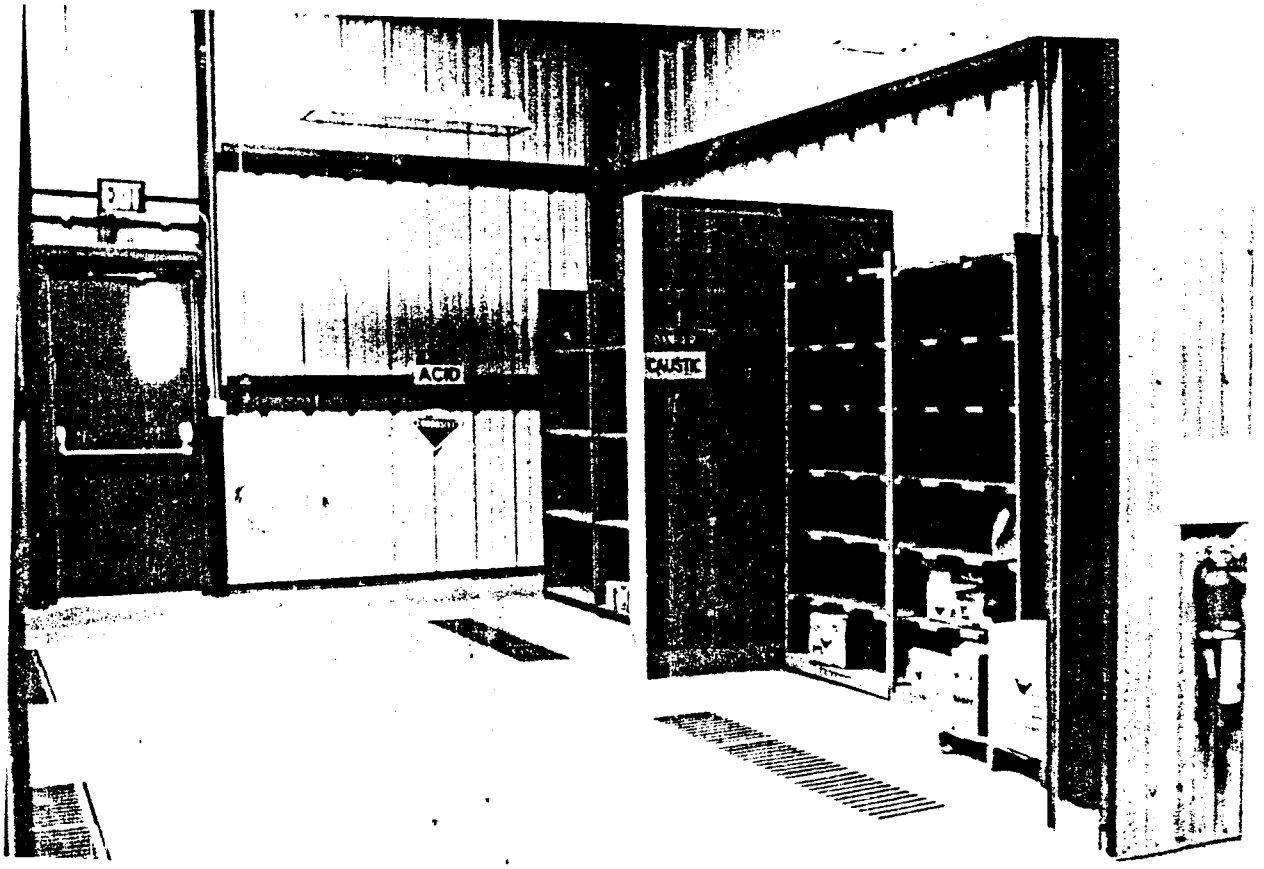
BLDG. 226 Cannon AFB, NM TSDF
WEST and SOUTH SIDE of TSDF



DRMO-Cannon AFB, NM. West Exterior Wall by receiving overhead door. Display Case containing "Planograph" of facility, Spill Response Plan & HM/HW Inventory

DRMO-Cannon AFB, NM TSDF
Receiving Area
West Wall - Spill Recovery Items
Right: Storage to 026-02 & 04 Units
Storage 226-02
Base
Acids
Posions
Reactives
Storage 226-04
ORM-Material
Oxidizers
and Low Hazard Class
Materials

DRMO-Cannon AFB, NM TSDF
Receiving Area
LEFT: Flammable, Combustible, EP TOXIC
Waste & Materials Storage units 226-01



DRMO-Cannon AFB, NM TSDF
Corrosive Materials Storage
Acids & Bases

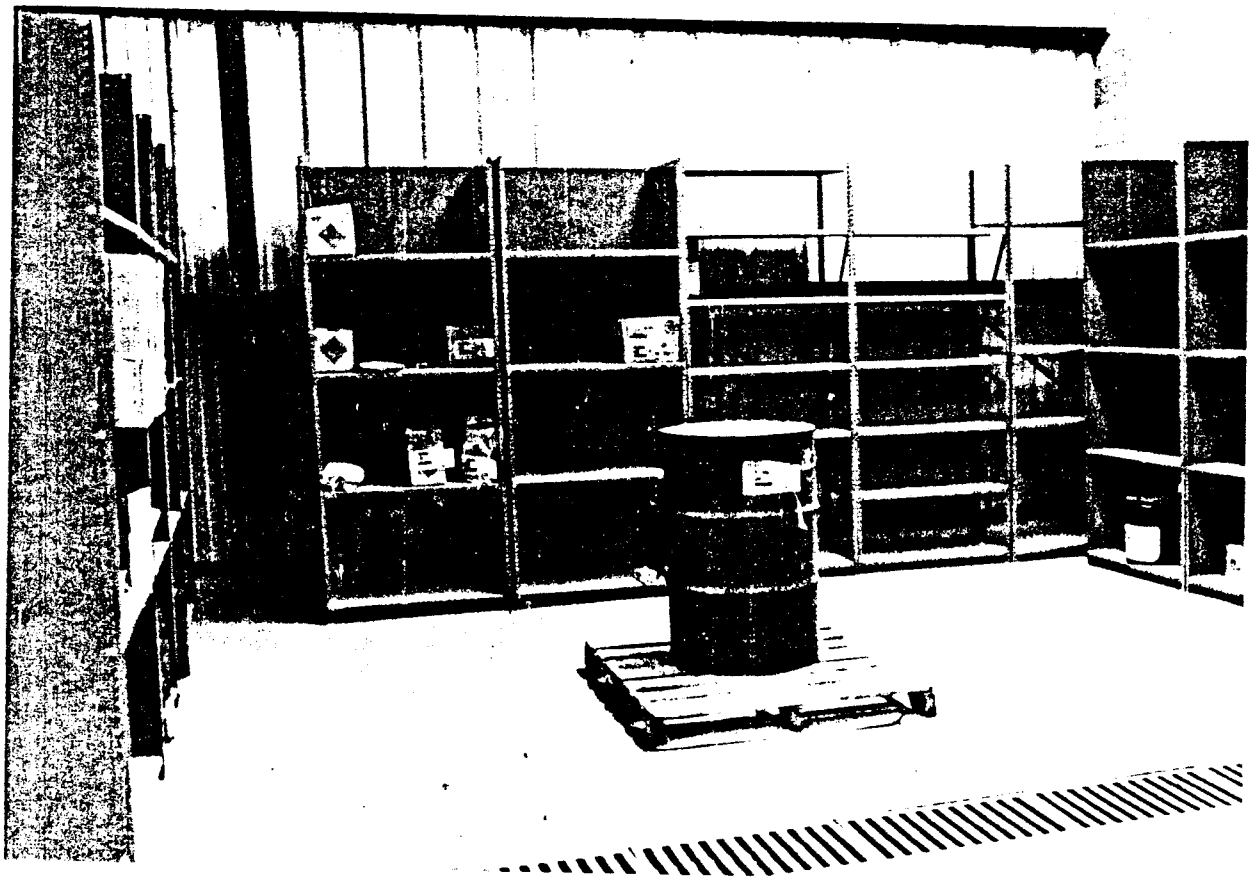
Storage 226-02-02--
Base
226-02-04--
Acids

DRMO-Cannon AFB, NM TSDF
Poison to left
Reactive to Right
Storage 226-02-01--
Posions
226-02-03--
Reactives

DRMO-Cannon AFB, NM TSDF
Left: Storage of Low Hazardous Materials
Right: Storage of Oxidizers
South Bay

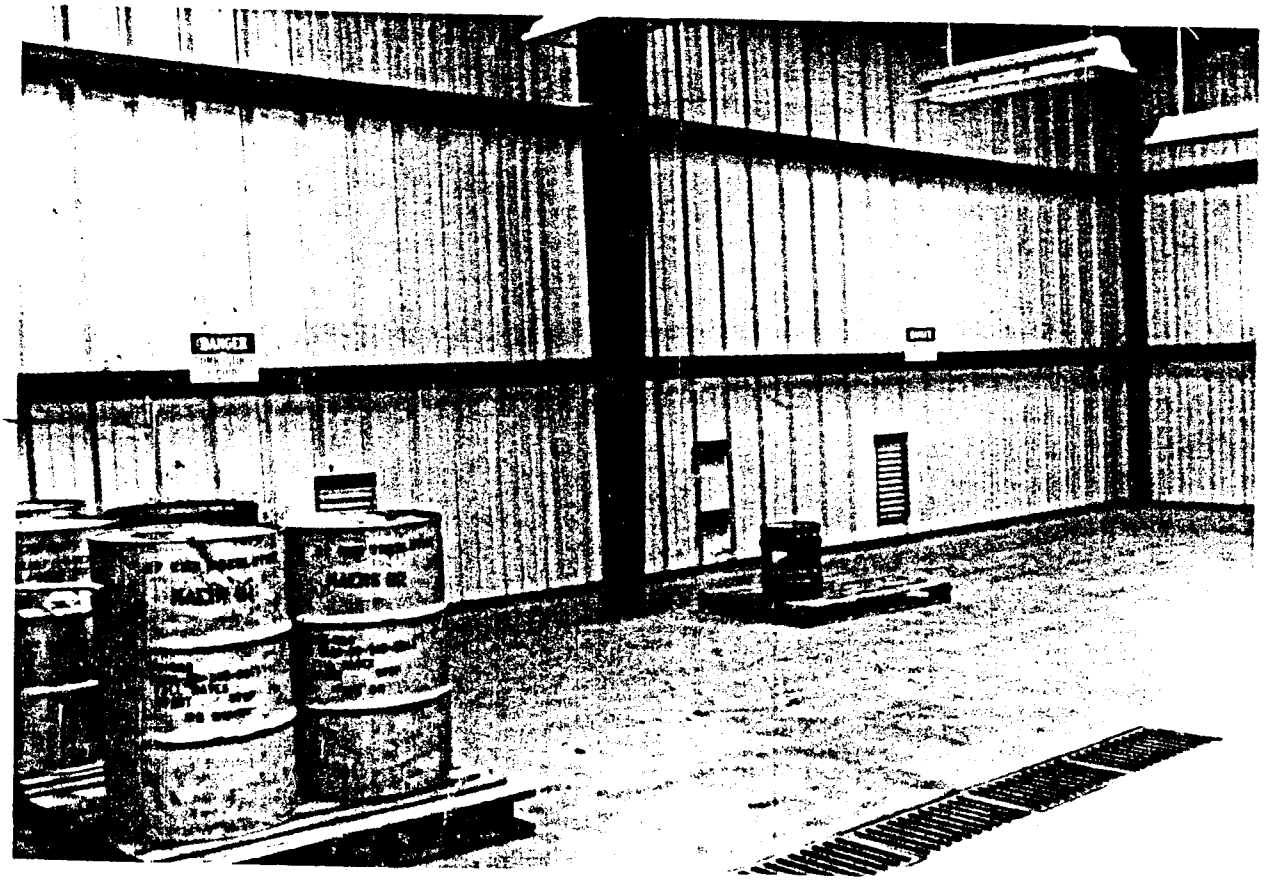
BLDG. 226 Cannon AFB, TSDF
Right of Photograph: ORM-storage
South Bay
Storage 2260402--
and 2260404--

DRMO-Cannon AFB, NM TSDF
Flammable Storage Area HM/HW
Storage 226-01-04-A1
Spent Flammable
Materials for
RTD & Sale
226-01-06-A1
Flammable Hazardous Waste



DRMO-Cannon AFB, NM TSDF
FLAMMABLE MATERIALS FOR RTD/SALES
STORAGE 226-01-02-A1, B1, etc.
Flammable
Expired shelf life items
for RTD and Sales

DRMO-Cannon AFB, NM. TSDF
Combustible Materials for RTD/Sales
Absorbent lower shelf for spill
response
Storage 226-01-01-A1, B1, C1, etc.
Combustible, expired
Shelf life items for
RTD and Sales



DRMO-Cannon AFB, NM TSDF
Interior Combustible & EP Toxic
Hazardous Materials Left (Drums Only)
Hazardous Waste stored to the right
Storage 226-01-03-A1
Spent Combustible/EP Toxic
Materials/for RTD and Sales
Storage 226-01-05-A1
Combustible, EP
Toxic Hazardous
Waste

SECTION B

FACILITY DESCRIPTION

This section provides a general description of the hazardous waste management facilities located on Cannon Air Force Base as required by 40 CFR 270.14(b) and NM HWMR 302.A.4.b(1). The following description is intended to acquaint the permit application reviewer and permit writer with an overview of the facilities. More complete details can be found in other parts of this permit application.

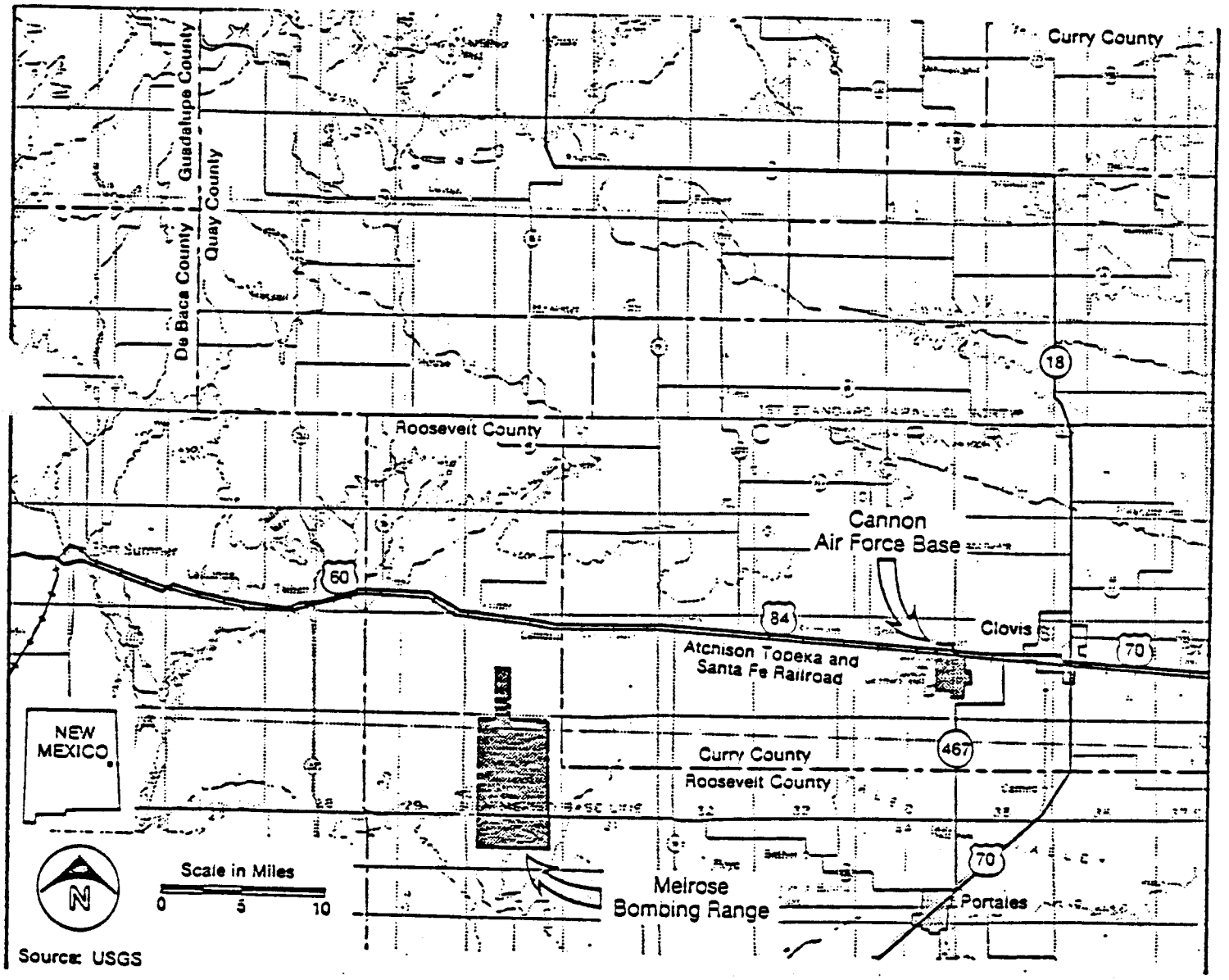
B.1 General Description [10 CFR 270.14(b)(1) Guidance; NM HWMR 302.A.1.b(1)(a)]

Cannon AFB is located in Curry County, New Mexico, approximately 7 miles west of the city of Clovis. The base is situated on approximately 4,320 acres of land. The location of Cannon AFB is shown in Figure B-1.

The primary mission of Cannon AFB has remained relatively unchanged since 1965, i.e., to develop and maintain an F-111 tactical flghter wing capable of day, night and all-weather combat operations, and to provide replacement training of combat aircrews for tactical organizations worldwide. Aircraft stationed at Cannon AFB since 1965 include the F-100 "Super Sabre" fighter jet (1957-1969), the F-111A (1969), the F-111E (1969-1971), and the F-111D (1971-present).

Figure B-1

Location Map of Cannon AFB and
Melrose Bombing Range



There are approximately 70 F-111D aircraft assigned to Cannon AFB. The total force on Cannon AFB numbers approximately 4,780, which includes 4,090 military, 425 civil service and 265 non-appropriated fund employees.

The major organizations at Cannon AFB are as follows:

Host

27th Combat Support Group

27th Tactical Fighter Wing

USAF Hospital, Cannon

Tenant

Army and Air Force Exchange Service

Detachment 2, 4400 Management Engineering Squadron

Defense Reutilization and Marketing Office

Detachment 2, AF Commissary Service

Detachment 11, 25th Weather Squadron

Detachment 408, AFAA Area Audit Office

Detachment 526, 3751 Field Training Squadron

Detachment 1702, AF Office of Special Investigation

USAF Trial Judiciary Office

2040th Communications Squadron

This permit application will address the hazardous waste storage facility at the Defense Reutilization and Marketing Office on Cannon AFB.

DRMO Cannon

In 1980, the Department of Defense (DOD) designated the Defense Logistics Agency (DLA) as the responsible organization for the disposal of hazardous materials/hazardous wastes with the exception of eight specific types of hazardous materials/hazardous wastes. DLA then delegated this mission to the Defense Reutilization and Marketing Service (DRMS). DRMS is organized into 5 Defense Reutilization and Marketing Regions (DRMRs) and 228 Defense Reutilization and Marketing Offices (DRMOs) and Off Site Branches (OSBs). The DRMOs and the OSBs are the field level activity responsible for accepting hazardous materials/waste from DOD generators, and for disposing of these items in an approved manner. The DRMO on Cannon AFB is one of these designated collection sites. DRMO-Cannon accepts waste from accumulation points on Cannon AFB (Table B-1) and from Reese AFB in Lubbock, Texas.

The mailing address for DRMO-Cannon is:

DRMO-Cannon

BLDG. 215

Cannon AFB, New Mexico 88103-2606

The location of the hazardous waste storage facility at the DRMO is indicated on the map of the Air Force base included as Appendix B-1. Accumulation points for waste stream items are listed in Table B-1. The DRMO will also accept for disposal, materials with an expired shelf-life.

Table B-1

Accumulation Points for Hazardous Waste
on Cannon AFB

Building Number	Organization	Duty Section
196	27 TFW/MAEEC	Corrosion Control
680	27 TFW/MACP	Jet Propulsion
219	27 CSG/DEMM	Liquid Fuels

The point of contact for the hazardous waste management activities at DRMO-Cannon is:

Ralph Flory
Chief, DRMO
Cannon AFB
Clovis, New Mexico 88103
(505) 784-2437

The point of contact for the hazardous waste management activities at Cannon AFB is:

Jim Richards
Environmental Coordinator
Cannon AFB
New Mexico 88103
(505) 784-4639

B.2 Topographic Map [40 CFR 270.14 (b)(19): NM HWMR 302.A.4.b.(1)(r)]

Appendix B-2 is a topographic map showing the area around the HWSF, at a scale of 1 inch equal to 50 feet. The 1-foot contour intervals are indicated.

Figure B-2 is a topographic map which shows Cannon Air Force Base and 1000 feet beyond the property boundary.

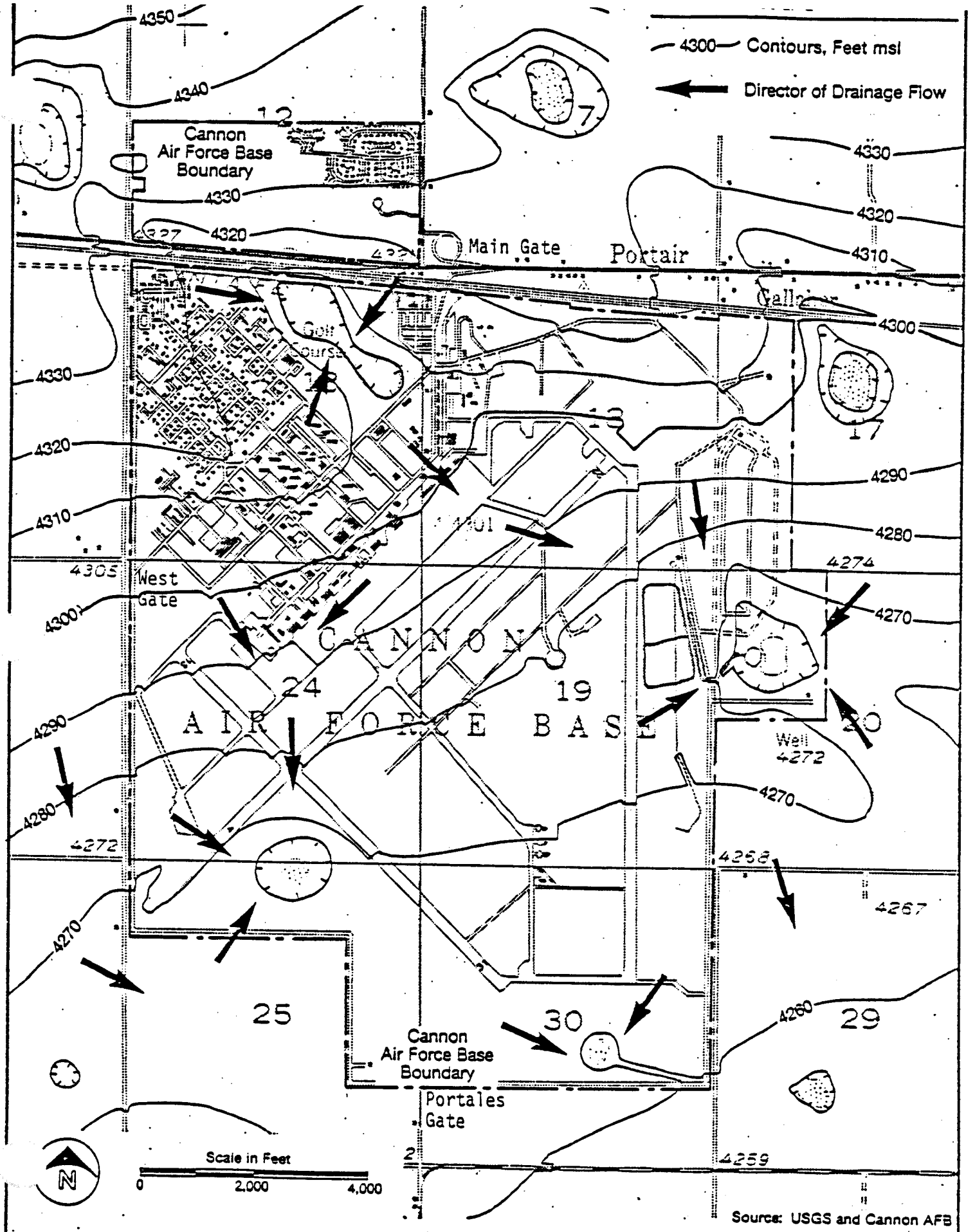


FIGURE B-2
Topography and Surface Drainage Map.

B.2.a. General Requirements 40 CFR 270.14(B)(19)(iv)

B.2.a(1) Land Uses NM HWMR 302. A.4.b.(1)(r)(iv)

Appendix B-1, Cantonment Area Map, indicates land use surrounding DRMO-Cannon. No residential area is located within 1000 feet of the facility. The majority of the land around Cannon AFB is used for agricultural purposes. A railroad track and a highway are located on the north side of the base. Some businesses and a few residential trailers are located in this area.

B.2.a(2) Hazardous Waste Management Facility Boundary 40 CFR270.14(b)(19)vii; NMHWMR 302, A,4(b)1(r)(vii) See page B-9

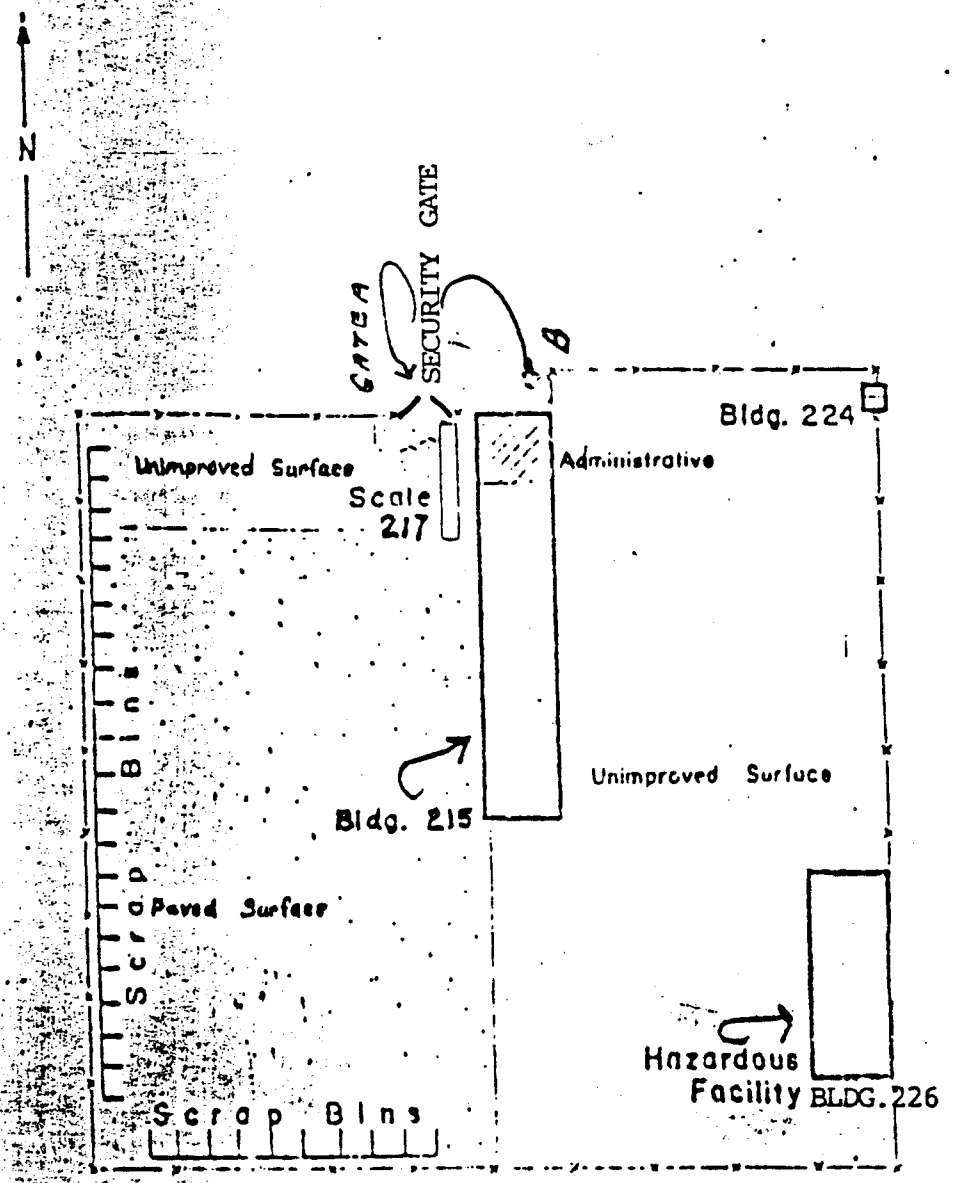
The HWSF is located 2000 feet from the closest boundary of Cannon AFB. The legal boundaries of the hazardous waste management facility site are the boundaries of Cannon AFB.

The DRMO is completely fenced and has two entrance/exit gates. Gate A is the primary entrance/exit to/from DRMO. During normal duty hours Gate A is unlocked for receiving/removing all property; a chain stretches across the opening to secure the area from entrance with a sign bearing the message 'CLEAR THRU OFFICE'. Gate B is locked at all times and accessed only when heavy equipment is turned in or removed from the DRMO, the key control monitor is in charge of opening/locking the Gates during turn-in and/or removal of property. The facility is posted with hours of operation, building custodians off duty phone numbers, and warning signs which read 'WARNING-THIS AREA IS OFF LIMITS TO UNAUTHORIZED PERSONNEL'. Security Police patrol the DRMO during off duty hours.

INSTALLATION AND LOCATION:
DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO)
BLDG. 215 (217, 224 and 226)
CANNON AFB, NM 88103-2606

PROJECT TITLE:

TSDF STORAGE



GENERAL SITE PLAN

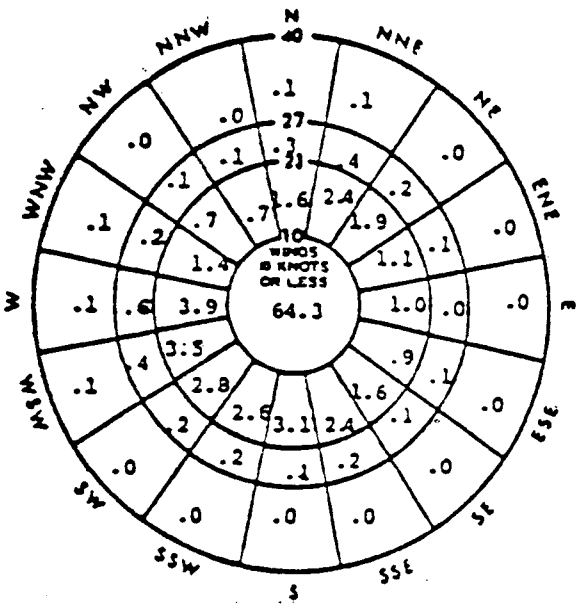
100 50 0 100

SCALE IN FEET

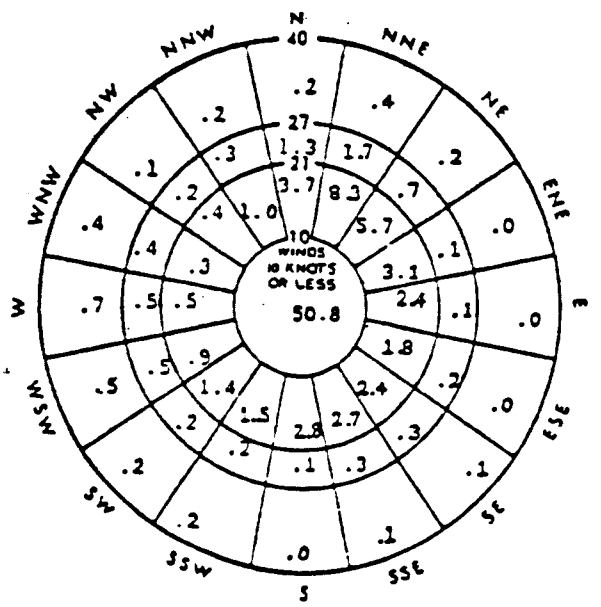
EPA Form 3510-3 (6-80)

Figure B-3

Annual Wind Roses



ALL WEATHER



INSTRUMENT

These wind roses show the total percent of winds by speed group and direction based on true bearing.

B.2.a(3) Wind Rose 40 CFR 270.14(b)(19)(v);
NM HWMR 302.A.4.b(1)(r)(v)

Figure B-3 illustrates the annual wind rose of meteorological data collected during the period of January, 1943 to February, 1981 at Cannon AFB.

B.2.a(4) Access Control 40 CFR 270.14(b)(19)(viii);
NM HWMR 302.A.4.b.(1)(r)(viii)

All entrances to Cannon AFB are manned 24 hours per day or are locked. Proper identification is required for entry to the base. Access points are identified in Figure B-2.

DRMO-Cannon is surrounded by a six-foot-high chain-link fence topped with three strands of barbed wire. The HWSF is a part of this fence, with the rear of the building completely enclosed. The DRMO complex has two gates which are indicated on Appendix B-2. These are locked during the hours of 1600-0730.

B.2.a(5) Injection and Withdrawal Wells 40 CFR 270.14(b)(19)(ix);
NM HWMR 302.A.4.b.(1)(r)(ix)

The location of wells on Cannon AFB is shown in Appendix B-5, Water Supply System. The base water supply is taken from these wells. Three potable water wells are located within 1000 feet of the HWSF: one 600 feet east, one 800 feet southwest, and one 800 feet northwest.

B.2.a(6) Buildings, Treatment, Storage, Disposal Areas, and other Structures 40 CFR 270.14(b)(19)(x); NM HWMR 302.A.4.b.(1)(r)(x)

The DRMO complex is located near the northern boundary of Cannon AFB. Appendix B-1 identifies all buildings and structures on the DRMO property, including the site of hazardous waste storage facility. The HWSF, including the loading/unloading area, is approximately 4000 square feet in size. Phone number 4144.

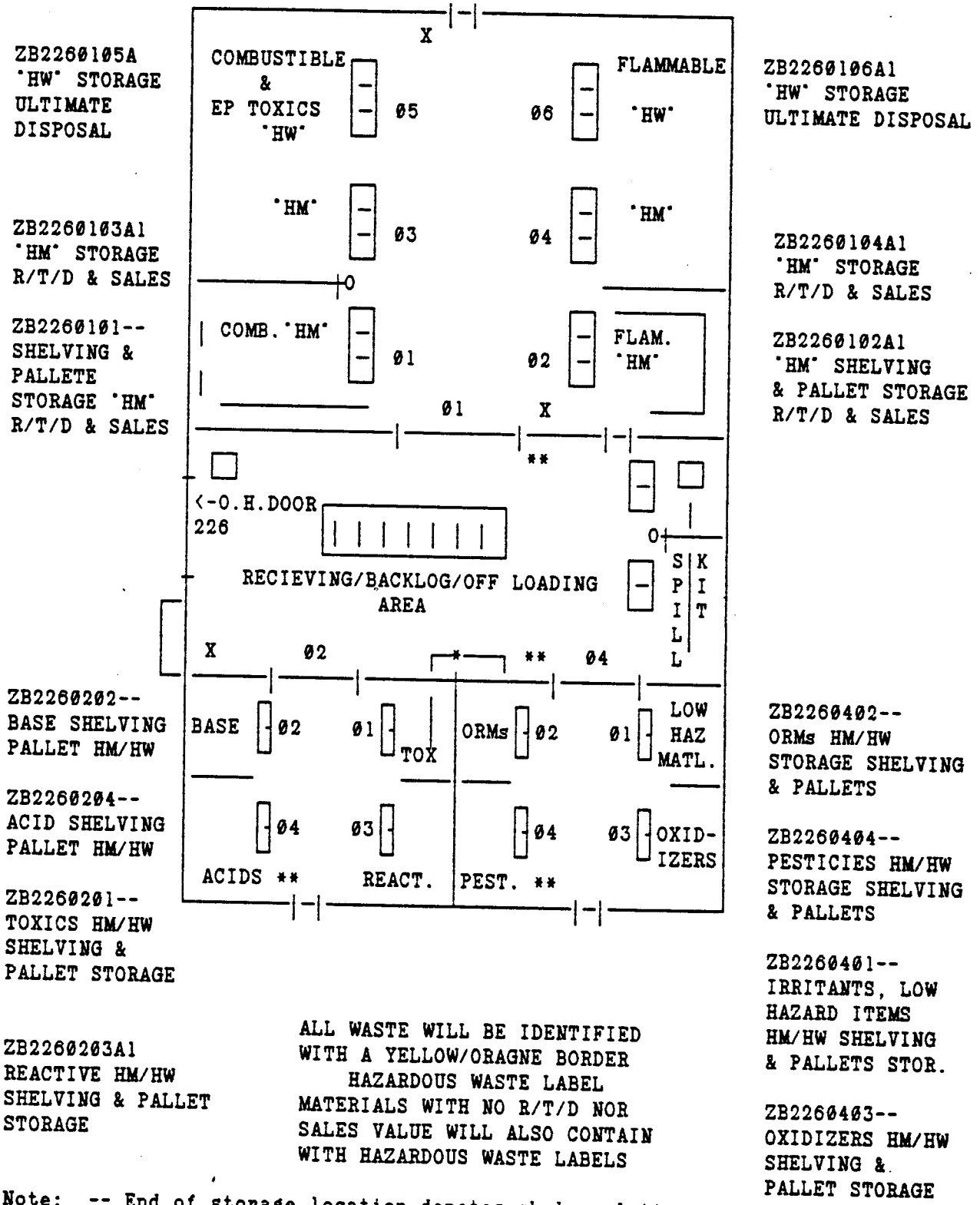
The flammable/combustible storage area is 2400 square feet, and contains six storage bays 13 feet by 20 feet with a 10.5-foot aisle space. The storage area for toxic, corrosive, and reactive waste is 800 square feet in size and contains eight bays 6 feet by 9 feet with a 4-foot aisle space. See figure B-4. Building plans are included as Appendix B-6.

B.2.a(7) Recreation Areas 40 CFR 270.14(b)(19)(x); NM HWMR 302.A.4.b.(1)(r)(x)

No recreation areas are located within 1000 feet of these three TSD facilities.

FIGURE B-4

CANNON AFB, NM (NM7572124454) TSDF, DRMO-CANNON BLDG. 226
STORAGE PLAN HM/HW



Note: -- End of storage location denotes shelves letter and number; A1, A2, B1, B2, C1, C2, Etc.; Reutilization, Transfer, Donation (R/T/D).

B.2.a(8) Run-off Control Systems [40 CFR 270.14(b)(19)(x); NM HWMR 302.A.4.b.(1)(r)(x)]

Storage bays are separated by an 8-inch-high containment curb, and a drainage trench is located at the front of each bay. The loading/unloading area is sloped to the drain trench (150-gallon capacity) in the center. This design provides containment and eliminates the possibility of run-off from the storage facility.

B.2.a(9) Storm, Sanitary and Process Sewers [40 CFR 270.14(b)(19)(x); NM HWMR 302.A 4:b.(1)(r)(x)]

The storm and sanitary sewer systems are shown in Appendix B-2. A sanitary sewer service line runs to Building 215. A storm sewer runs in front of the HWSF. The headwall is located near the building, and a catch basin is located 225 feet northwest of the facility.

There are no process sewers located at either facility.

B.2.a(10) Loading and Unloading Areas [40 CFR 270.14(b)(19)(x); NM HWMR 302.A.4.b.(1)(r)(x)]

A loading/unloading area of approximately 600 square feet is located inside the storage facility. The area slopes to a drainage trench in the center.

B.2.a(11) Fire Control Facilities [40 CFR 270.14(b)(19)(x); NM HWMR 302.A.4.b.(1)(r)(x)]

A freeze-proof water hydrant is located 300 feet southeast of the HWSF. Other fire hydrants are located 350 feet southwest and 400 feet northwest of the facility. The location of all fire hydrants is shown in Appendix B-2.

B.2.a.(12) Surface Waters [40 CFR 270.14(b)(19)(iii); NM HWMR 302.A.4.b.(1)(r)(iii)

The only surface water on Cannon AFB consists of shallow depressions, or playas. The largest of these is Playa Lake. They are not located within 1000 feet of the HWSF. The largest Playa Lake receives the effluent from sewage lagoons. Samples are collected and analyzed periodically as shown in Appendix C-8.

B.2.a(13) Flood Control/Drainage Barriers [40 CFR 270.14(b)(19)(xi); NM HWMR 302.A.4.b.(1)(r)(xi).

Facilities are not located in a floodplain. Drainage from the area around the DRMO generally flows south and east. The storage areas of the facility are completely enclosed when doors are secured. The loading area has a 4-foot section that slopes outwardly. This design eliminates drainage into the facility.

B.3 Location Information [40 CFR 270.14(b)(11); NM HWMR 302.A.4.b.(1)(k)

B.3.a. Seismic Considerations [40 CFR 270.14(b)(11)(i) and (ii), 264.18(a) and 264 Appendix VI; NM HWMR 302.A.4.b.(1)(k)(i) and (ii) and 206.B.8.a]

Cannon AFB is located in Curry County. This county is not listed as a site that requires seismic data.

B.3.b Floodplain Standard [40 CFR 270.14 (b)(11)(iii) and 264.18 (b); NM HWMR 302.A.4.b.(1)(k)(iii) and 206.B.8.b.

The Flood Insurance Rate Map included as Appendix B-7 indicates that Cannon AFB is not located in the 100-year floodplain.

B.4 Traffic Information [40 CFR 270.14(b)(10); NM HWMR 302.A.4.b.(1)(j).

Hazardous waste will be transported from accumulation points on Cannon AFB and from Reese AFB in Lubbock, Texas. Shipments from Reese are transported on an Air Force flat bed truck. Reese AFB shipments are accepted on written request only. We have received only three drums to date. Two to eight drums per month are generated on-base. These drums are transported by forklift, one-ton, or two and one-half ton trucks.

B.4.a Traffic Control [40 CFR 270.14(b)(10); NM HWMR 302.A.4.b.(1)(1)]

The speed limit on Cannon AFB varies from 5 to 30 miles per hour. Accumulation Points use either Torch Boulevard. or perimeter Road to W Street where the DRMO is located.

Trucks bringing shipments from off-base turn off Route 84, come through the main gate and make a left turn onto Perimeter Road and a right onto W Street. Contractors removing waste from the facility also use this route.

B.4.b Access Road Surfacing [40 CFR 270.14(b)(10); NM HWMR 302.A.4.b.(1)(j)]

All access roads on Cannon AFB are asphalt surfaced, generally with 1 1/2 - 2 inches of hot mix asphaltic concrete.

B.4.c Load-Bearing Capacity [40 CFR 270.14(b)(10); NM HWMR 302.A.4.b.(1)(j)]

All access routes for moving hazardous waste on Cannon AFB are capable of handling H-20 loaded vehicles.

B.4.d Traffic Control Signals 40 CFR 270.14(b)(10); NM HWMR 302.A.4.b(1)(j)

Stop signs are the only traffic control signals in the area of the DRMO. Trucks from Corrosion Control (Building 196) encounter a stop sign at W Street, and those from Avionics (Building 620) encounter a stop sign at Torch Boulevard.

There are no traffic control signals on the route from the main gate to the DRMO. When this route is reversed, a stop sign is located at the intersection of W Street and Perimeter Road, and also at the intersection of Torch Boulevard and perimeter Road (See Appendix B-1).

B.5 Separation of Hazardous Material and Hazardous Waste

The DRMO receives both hazardous material and hazardous waste at this facility. Reuse of the hazardous material is sought within the DOD community. Failing any reuse the property is then available for sale to the general public. Failing any sale, the property is then deemed a hazardous waste and is labelled and handled as such by DRMO personnel.

All hazardous materials undergoing review for reuse or sale will be identified in the storage facility as items without the yellow and orange hazardous waste labels.

Hazardous waste items will have a yellow and orange hazardous waste label.

Physical separation of waste and material by space will be provided when room permits. Should the volume in storage not allow physical separation then the waste label will allow for proper identification.

APPENDIX B

APPENDIX B-1 thru B-7

MAPS FILED SEPARATE IN VOL.2

Section C

WASTE CHARACTERISTICS

The hazardous wastes stored at DRMO-Cannon and described in this section are group two items. The first group (Group I) includes unopened, original, labeled manufacturers containers. Group II items includes all wastes generated on Cannon AFB and Reese AFB.

The chemical and physical nature of hazardous wastes and the Waste Analysis Plan for sampling, testing, and evaluating these wastes are described in detail below.

C.1 Chemical and Physical Analyses [40 CFR 270.14(b)(2), 264.13(a,) 270.62(b)(2)(i); NM HWMR 302.A.4.b.(1)(b)]

Appendix C-1 lists the Group I items used on Cannon AFB and their respective hazards. Appendix C-2 lists wastes which will normally be components of a Group II item stream. In most cases, the hazardous designation are based upon the known characteristics of the waste, such as ignitability, reactivity, corrosivity, or EP toxicity. For listed wastes, the hazardous designation is based upon the EPA listing.

Laboratory analyses which have been performed for Group II items are included as Appendix C-3.

C.1.a Containers (Guidance) [40 CFR 270.15(a), 264.175(a); NM HWMR 302.A.4.b.(2)(a), 206.D.4.f..

No wastes, regardless of whether they are solid or liquid, will be stored in an area that is not equipped with secondary containment systems as described in Section D-1a(3); therefore, no documentation or information is provided to show that the wastes do not contain free liquids.

C.1.b Tanks (Guidance) [40CFR 270.16, 264.190(a); NM HWMR 302.A.4.b.(2)(b), 206.D.5.a.(1).

This facility will not utilize storage tanks.

C.1.c Wastes Piles (Guidance) [40 CFR 270.18, 264.250(a); NM HWMR 302.A.4.b.(2)(d), 206.D.7.a.(1)]

No wastes piles will be maintained at this facility.

C.1.d Surface Impoundments (Guidance) [40 CFR 270.17(a), NM HWMR 302.A.4.b.(2)(c)(i)]

No surface impoundment will be maintained at this facility.

c.1.e Incinerators [40 CFR 270.62(b)(2)(i); NM HWMR 302.E.2.b(2)(a)]

No wastes will be incinerated at this facility; therefore, Sections C-1e (1) and (2) are not applicable.

C.1.f Landfills (Guidance) [40 CFR 270.21, 264.300; NM HWMR 302.A.4.b.(2)(g), 206.D.10.a.]

No landfill will be maintained at this facility.

C.1.g Land Treatment (Guidance) [40 CFR 270.20, 264.270; NM HWMR 302.A.4.b.(2)(i), 206.D.9.a.]

No land treatment units will exist at this facility.

C.1.h Additional Requirements for Land Storage, Treatment and Disposal Facilities [40 CFR 270.14(c); NM HWMR 302.A.4.b.(3)]

NONE

C.2 Waste Analysis Plan [40 CFR 264.13(b) and (c) and 264.341; NM HWMR 206.B.3.b. and c. and 206.D.8.b.]

Cannon Air Force Base generates, stores and treats hazardous wastes in the course of routine aircraft maintenance operations. The intent of this waste analysis plan is to summarize the manner in which hazardous materials

will be tracked, once they are purchased for use, and how they will be analyzed for chemical/physical characteristics to insure proper handling, storage and treatment in accordance with New Mexico Hazardous Waste Management Regulations.

Corrosion Control is a aircraft spray painting operation that uses several types of paints and solvents in the process of maintaining the exterior finish of aircraft and some aircraft ground equipment. The facility consists of a hangar area where painting is accomplished, an administrative area and an outdoor accumulation point.They generate slop paint and a wipe down material consisting of methyl ethyl ketone and toluene. The Munitions Maintenance area uses small amounts of paint and thinner to paint the exterior of practice bombs. A paint booth is installed in a building in the Munitions area for painting. Wastes are collected and taken to the Corrosion Control Accumulation Point.

The Transportation Paint Shop uses materials similar to Corrosion Control to paint Air Force vehicles. Vehicles are painted inside a paint booth. Wastes are collected and taken to Corrosion Control for accumulation.

The Jet Engine Shop performs maintenance on the F-111D jet engines. They use Carbon Remover and B & B 3100 for part cleaning of assorted engine parts.

Corrosion Control accumulates their wastes (slop paint and wipe down material) in an outdoor storage area. They also accumulate minute amounts of paint and thinner (MEK and/or toluene) from the Munitions Maintenance area and from the Transportation Squadron Paint Shop.

The Jet Engine Shop (Bldg 680) also accumulates wastes in an outdoor storage area. They segregate and accumulate waste Freon 113, Carbon Remover and B & B 3100. See page C-5a thru C-5d for waste analysis concentrations generated by the above hazardous waste generators.

The DRMO on Cannon AFB disposes of the waste accumulated at Corrosion Control and any other wastes generated on Cannon AFB. The DRMO may accept, upon written request, hazardous waste from Reese AFB, near Lubbock, Texas. Waste streams and processes are identified in Appendix C-2.

DRMO-Cannon will only accept hazardous wastes for which it is permitted. Periodically, DRMO-Cannon will inform each generating activity of the hazardous wastes it is permitted to receive and store. DOD has issued specific regulations that govern the transfer of hazardous wastes and are applicable to all generators of hazardous wastes that transfer such wastes to DRMOs. These

WASTE ANALYSIS

27EMS CORROSION CONTROL BLDO. 196. AND 27 TRANSPORTATION PAINT SHOP CANNON AFB. NEW MEXICO WASTE STREAM-RESTRICTED LAND BAN SOLVENT

Generation of Slop paint and wipe down material consisting of methyl ethyl ketone. toluene. paint thinner. and paint resins. EPA WASTE CODE: D001. D007. D006. D008. F003 AND F005; NON-HALOGENATED

BULK CONCENTRATION	% BULK CONCENTRATION	COMMENTS	EPA
EPA IGNITABLE		27C	D001
PETROLEUM HYDROCARBONS	7	PH	
METHYL ETHYL KETONE	20		F005
ISOBUTYL ACETATE	4		
TOLUENE	2		F005
ISOBUTANOL	3		F005
XYLENES	3		F003
CELLOSOLVE ACETATE	1		
BENZENE. TOLUENE. XYLENES	<1	PH --	
WATER	60	PH 6.9	
EP TOXICITY-METALS:			
ARSENIC	0.5 mg/1		
BARRUM	10.0 mg/1		
CADMIUM	5.0 mg/1		D006
CHROMIUM	193.0 mg/1		D007
LEAD	11.5 mg/1		D008
MERCURY	0.02 mg/1		
SELENIUM	0.1 mg/1		
SILVER	0.5 mg/1		

WASTE ANALYSIS

27EMS/MAEBW JET ENGINES MAINTENANCE. BLDO. 680. CANNON AFB. NM
WASTE STREAM

Generation of B & B 3100 Cleaning Solvent to perform maintenance on the F-111D jet engines. EP Toxicity Test - Metals; EPA WASTE CODES D006 and D008 (NSN: 6850-00-181-7597)

BULK CONCENTRATION	% BULK CONCENTRATION	COMMENTS	EPA CODE:
EPA IGNITABLE		> 140	
PARAMETERS:			
ARSENIC	< 0.5 mg/l		
BARIUM	<10 . mg/l		
CADMIUM	4.0 mg/l		D006
CHROMIUM	2.3 mg/l		
LEAD	20 mg/l		D008
MERCURY	< 0.02mg/l		
SELENIUM	< 0.1 mg/l		
SILVER	< 0.5 mg/l		
PH, UNITS		8.3	

SAMPLE TYPE: AQUEOUS

WASTE ANALYSIS

27EMS/MAEBW JET ENGINE MAINTENANCE. BLDG. 680. CANNON AFB. NEW MEXICO
WASTE STREAM - RESTRICTED LAND BAN SOLVENT

Generation of Freon 113 (1,1,2, Trichloro-1,2,2 Trifluoroethane Halogenated Hydrocarbon) Cleaner, also known as Trichlorotrifluoroethane. Mixture of 98% silicone fluid. freon 113 solvent and 2% water. NSN: 6850-00-033-8851; EPA WASTE CODE F002

BULK CONCENTRATION	% BULK CONCENTRATIOM	COMMENTS	EPA CODE:
EPA IGNITABLE		NO	
CORROSIVITY		NO	
HALIDES		YES	F002
EP TOXICITY		N/A	

Tested for: Infrared Spectrograph; pH measurement and closed cup flash point.

WASTE ANALYSIS

27EMS/MAEBW JET ENGINE MAINTENANCE. BLDG. 680. CANNON AFB. NM
WASTE STREAM - RESTRICTED LAND BAN SOLVENT

Generation of Carbon Remover containing perchloroethylene (Tetrachloroethylene); Major compounds consist of 95% paint remover

(NSN: 8010-01-040-1059) and 5% Mineral Oil. EPA WASTE CODE F001

BULK CONCENTRATION	% BULK CONCEMTRATION	COMMEMTS	EPA CODE:
EPA IGNITABILITY		NOT < 140 F	N/A
CORROSIVE		NO	N/A
REACTIVE		NO	
HALIDES (TOX)	1,000 ppm	0.1	

Tested for: Infrared Spectro.graph: pH measurement and closed cup flash point.

regulations require that activities transferring hazardous wastes to a DRMO must properly identify the property so that the hazardous characteristics of the waste are immediately apparent to the receiving personnel. Each different waste must be accompanied by a completed Disposal Turn-In Document (DD Form 1348-1, Figure C-1) that includes a proper item identification. The DOD regulation state that proper identification of a hazardous waste identified by a National Stock Number (NSN), a unique 13 digit code assigned to each item in the Federal Supply System, will include the following:

Figure C-1

Example of the Disposal Turn-in Document for Generators of Hazardous Materials and Hazardous wastes

DOC IDENT | RI FROM | MI & S | STOCK NUMBER: FSC, NIIN, AGO | UNIT OF ISSUE | QUANTITY | DOCUMENT NUMBER: SERV, REQUISITIONER, DATE, SERIAL | SUFFIX | SUPPLEMENTARY ADDRESS: SERV | SIGNAL | FUND | DISTRIBUTION | PROJECT | PRI | UNIT | REQ DEL DATE | ADVICE | RI | UNIT PRICE: DOLLARS | CT

SHIPPED FROM (A) | SHIP TO (B) | MARK FOR (C) | PROJECT (D) | TOTAL PRICE: DOLLARS | CT (E, F)

WAREHOUSE LOCATION | TYPE OF CARGO (G) | UNIT PACK (H) | UNIT WEIGHT (I) | UNIT CUBE (J) | U F C (K) | N M F C (L) | FREIGHT RATE (M) | (N) | DOCUMENT DATE (O) | MAT COND (P) | QUANTITY (Q) | (R) | (S)

UTE DATA | ITEM ORIGINALLY REQUESTED | FREIGHT CLASSIFICATION NOMENCLATURE (U) | (V)

(W) | ITEM NOMENCLATURE (X) | (Y)

SHIPPERS USE:
SELECTED BY AND DATE (1) | TYPE OF CONTAINER(S) (2) | TOTAL WEIGHT (3)
PACKED BY AND DATE (4) | NO OF CONTAINERS (5) | TOTAL CUBE (6)

RECEIVERS USE:
RECEIVED BY AND DATE (7) | INSPECTED BY AND DATE (8)
WAREHOUSED BY AND DATE (9) | WAREHOUSE LOCATION (10)

REMARKS (AA, BB, CC, DD, EE)

FIRST DESTINATION ADDRESS (11) | DATE SHIPPED (12) | (FF) | (GG)

13 TRANSPORTATION CHARGEABLE TO | 14 B/LADING, AWB OR RECEIVER'S SIGNATURE (AND DATE) | 15 RECEIVER'S DOCUMENT NUMBER

DD FORM 1348—1 1 MAR 74 EDITION OF 1 JAN 64 MAY BE USED UNTIL EXHAUSTED

DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT

(i) the noun name; as catalogued in the Federal Supply System.

(ii) the chemical name of the hazardous contaminants and the noun name of nonhazardous contaminants.

Proper identification of hazardous waste without an NSN will include:

(i) the chemical name of the hazardous components.

(ii) the chemical names of hazardous contaminants and noun name of nonhazardous contaminants.

This information allows DRMO-Cannon personnel to utilize standard references in order to determine the chemical characteristics and proper Storage procedures for the hazardous wastes. Additionally, many Group I waste containers will have the original manufacturer's label affixed. Often information supplied on the label can assist in determining hazardous characteristics and proper storage for the item.

For items with an NSN, DRMO-Cannon will then determine the hazardous characteristics by accessing DOD's Hazardous Materials Information System (HMIS). The HMIS is a computerized source of information which can cross-reference many NSNs to their particular chemical characteristics such as flash point, specific gravity, special handling precautions, and the hazardous ingredients contained within the NSN item.

For locally purchased items a Material Safety Data sheet (MSDS) (See Appendix C-6) will be obtained from the manufacturer in accordance with Federal Standard 313B, dated 14 April 1983. A copy will be maintained at Bioenvironmental Engineering (SGPB) and record keeping practices will be employed in the shop using the material linking the MSDS to the material.

For other items, DRMO personnel have the following references to determine the hazardous characteristics:

(i) NFPA Books (Fire protection Guide on Hazardous Materials).

(ii) Chemical Dictionary.

(iii) Navy "CHIL" Manual.

(iv) DOT Guide (Emergency Response Guide Mo. DOT P. 5800.2).

(v) NIOSH/OSHA: (1) pocket Guide to Chemical Hazards; (2) Occupational Health Guidelines for Chemical Hazards.

(vi) Industrial Chart for Toxic and Hazardous Chemicals in Industry.

(vii) EPA Document: "A Method for Determining the Compatibility of Hazardous Wastes."

(viii) Environmental Considerations in the DPDS Disposal Process, DPDS-M 6050.1.

(1X) Regional Environmental Specialist (Who has more reference documents on hand).

Figure C-2 is an example of the data output obtained from the HazardouS Materials Information System for acetone, a Group I item listed in Appendix C-1. It provides an example of the detail of information which can be obtained through HMIS. without requiring a sample of the item to undergo laboratory analysis. The NSN for this item is 6810-00-184-4796, and it consists of 100 percent acetone. DRMO-Cannon can identify this compound as ignitable. The handling and storage information indicates that acetone should be stored in an area away from heat, sparks, and open flames, and separated from strong oxidizers, nitric/sulfuric acid mixtures, and chloroform. To fight fires involving this chemical, a type of dry chemical extinguisher should be used. Small spills can be removed with absorbent materials, while large spills should be contained and pumped into appropriate containers.

The above discussion of Group I waste items is intended to meet the requirements of paragraph 40 CFR 264.13(a)(2), which indicates that existing published or documented data on the hazardous waste may be used to meet the general waste analysis requirements.

Hazardous material/waste generators will segregate all materials/wastes as much as possible so as to maintain identity of the materials. Corrosion Control, for instance, will segregate wipe down material (50% toluene and 50% MEK) from unused and slop paint.

Any material that is not mixed with other materials (solvents used to clean Parts, for example) will be returned to its original container

FIGURE C-2

Hazardous Materials Information

System Data for Acetone

```
GLC016                 013                    * * * HAZARDOUS ITEM   BASIC PUBLICATION * * *
      N I N            FECN     NGR    F P INB  PM INB              PART NUMBER/TRADE NAME              ACT CD  DATE   PAGE NR
 6810-00-184-4796      54527    CX       D       A     31125                                                     87082        1
                                                    * * * * GENERAL INFORMATION * * * *
PROPRIETARY                          MANUFACTURER                                EMERGENCY TELE NO
   NO        SHELL OIL CO.(NICKEL & PELTON COMPANY)                              713-473-9461
                   ITEM NAME                                UI   UI CONTAINER QTY   TYPE OF CONT    NET UNIT WT   MAG/MILGAUS   EXEMPTION NO
ACETONE,TECHNICAL                                           CN    3 GAL
                                                  AEROSOL PROPELLANT                                          SPECIFICATION
                                                                                                                 B-A-51
RADIOACTIVITY      FORM     TR GP    MAC LIC NUMBER        CHEMICAL NAME              CHEMICAL FAMILY              FORMULA
                                                           DMK,DIMETHYL KETONE        KETONE
                                                  * * * * * HAZARDOUS COMPONENTS * * * * *
 NIOSH NO                                                  CHEMICAL NAME                                          PCT          T L V
 AL3150000     ACETONE(C.A.S.NO. 67-64-1).                                                                        100      1000 PPM

                                                  * * * * * * TRANSPORTATION DATA * * * * * *
    DOT SHIPPING NAME: ACETONE
CLASS: FLAMMABLE LIQUID          LABEL: FLAMMABLE LIQUID              NOSE:        ID NO: UN1090    RQ:
   WATER SHIPPING NAME: ACETONE
CLASS: FLAMMABLE LIQUID          LABEL: FLAMMABLE LIQUID          UN NO: 1090  UN CLASS: 3.:  CON GP:       DOT: YES  INCO  YES
   TARIFF 6-D SHIPPING: N/A, REFER TO 49 CFR
CLASS:                           LABEL:
    IATA SHIPPING NAME: ACETONE
CLASS: FLAMMABLE LIQUID          LABEL: FLAMMABLE LIQUID          IATA ARTICLE NO: 1090
AFR 71-4 SHIPPING NAME: ACETONE
CLASS: FLAMMABLE LIQUID          LABEL: FLAMMABLE LIQUID          RMACI
                                                  * * * * * * ADDITIONAL DATA * * * * * *
```

FIGURE C-2 (Continued)

Hazardous Materials Information

System Data for Acetone

```
                    A14
      N S N                                                                                    ACT CD  DATE    PAGE NR
6810-00-184-4796                  * * * * HEALTH AND PHYSICAL PROPERTY DATA * * * *                          83032       2

          BOILING POINT   VAP DEN/AIR=1/   SOL IN H2O      FLASH POINT     VAP PRESS/MM HG/70 F/      TLV-MIXTURE      STORAGE CODE
            133F              2.0          COMPLETE       -18C TCC(OF)          18                    1000 PPM            F2

            APPEARANCE AND ODOR                                LEL/PCT/   UEL/PCT/   SP GR    PCT VOLT BY VOL    EVAP RATE PER REFERENCE
COLORLESS,MOBILE LIQUID.MILD ODOR                                 2.6        12.8     0.80        100              5.4,BUTYL ACETATE

                                      EFFECTS OF OVEREXPOSURE                                                  NET PROP WT-AMMO      NEW LB
IRRITATING TO THE EYES,DRYNESS & IRRITATION TO SKIN,SORE THROAT,HEADACHE,DIZZINESS,DULLNESS.

STABLE                        CONDITIONS TO AVOID                                          MATERIALS TO AVOID
 YES    HEAT,SPARKS & OPEN FLAMES.                                   STRONG OXIDIZERS,CONC.HNO*3 & SULFURIC ACID MIXTURES,CHCL*3

HAZ POLYMERIZATION OCCUR                      CONDITIONS TO AVOID                          AUTO IGN TEMP     VISCOSITY    CE AMMO CD
      NO

            HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE CAN FORM UPON INCOMPLETE COMBUSTION.

                                  * * * * SAFETY STORAGE HANDLING AND FIRE FIGHTING PROCEDURES * * * *

                    EXTINGUISHING MEDIA                                          SPECIAL FIRE FIGHTING PROCEDURES
DRY CHEMICAL,ALCOHOL FOAM,CO*2,H*2O SPRAY OR FOG.HALONS,CO*2    USE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS.

                                  UNUSUAL FIRE / EXPLOSION HAZARDS                                   PROTECTIVE GLOVES
REACTION WITH CHLOROFORM CAUSES FIRE & EXPLOSION.DIST.IGNITION POSSIBLE;VAPOR MAY FLASH BACK.          IMPERVIOUS

                                  EMERGENCY FIRST AID PROCEDURES
INHALATION:REMOVE VICTIM TO FRESH AIR.GIVE CPR IF NOT BREATHING.GET MEDICAL ATTENTION.SKIN:WASH WITH SOAP & WATER.REMOVE CONT
AMINATED CLOTHING & DO NOT REUSE UNTIL THEY ARE DRY.INGESTION:GIVE LARGE AMOUNTS OF WATER.THEN INDUCE VOMITING.SEE DOCTOR.

                    TYPE OF RESPIRATORY PROTECTION                                                VENTILATION
USE NIOSH APPROVED RESPIRATORY PROTECTION EQUIP TO STOP OVEREXPOSURE  LOCAL EXHAUST IS PREFERRED

      EYE PROTECTION                                OTHER PROTECTIVE EQUIPMENT                          HANDLING / STORAGE PRECAUTIONS
SAFETY GOGGLES                  PROTECTIVE CLOTHING.                                          PROTECT AGAINST PHYSICAL DAMAGE TO CON
TAINERS.USE SPARK-RESISTANT ELECTRIC APPLIANCES.KEEP AWAY FROM OXIDIZING SUBSTANCES.KEEP AWAY FROM IGN.SOURCES.

                                  * * * * SPILL AND LEAK PROCEDURES * * * *

            SPILL AND LEAK CONTROL
ELIMINATE ALL SOURCES OF IGNITION IMMEDIATELY & EVACUATE THE AREA.BE PREPARED FOR FIRE.WEAR APPROPRIATE PROTECTIVE CLOTHING &
 RESPIRATORY PROTECTION EQUIPMENT WHEN ENTERING SPILL AREA.SHUT OFF LK.VENTILATE.DIKE & PUMP INTO SALVAGE CANS.ABSORB SM SPLS

            WASTE ELIMINATION
DISPOSE IAW STATE,FEDERAL & LOCAL REGULATIONS.HANDLE WASTE MATERIAL IAW RCRA REQUIREMENTS.OR WHEN IN HIGH CONCENTRATION,SPRAY
 AS SUCH OR AFTER MIXING WITH A SOLVENT & BURN IN AN INCINERATOR.WHEN IN LOW CONC.,TREAT W/ACTIVATED SLUDGE IN PUBLIC SWG PLT

                    OTHER PRECAUTIONS                                                   SUPPLEMENTAL DATA

GROUND ALL CONTAINERS WHEN POURING OR TRANSFERRING LIQUID.STORE   EMERGENCY & FIRST AID PROCEDURES(CONTD):EYES:FLUSH EYES IMMEDIAT
IN TIGHTLY CLOSED CONTAINERS IN A COOL,WELL VENTILATED AREA.DO N  ELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINS.GET MEDICAL
OT EAT OR SMOKE IN STR AREA.USE GOOD PERSONAL HYGIENE.             ATTENTION.
```

C.2.(a) General Discussion of Analysis

1. Identity known. Percentages of constituents will be calculated based on MSDS/HMIS information and a knowledge of the process.

(a) Material Safety Data Sheets. Identity of the material will be maintained by employing one of the following procedures:

(1) Locally Purchased Items. A Material Safety Data sheet (MSDS) (see appendix C-6) will be obtained from the manufacturer IAW Federal Standard 313B, dated 14 April 1983. A copy will be maintained at Bioenvironmental Engineering (SGPB) and by the Environmental Coordinator (DEEV) and record keeping practices will be employed in the shop using the material linking the MSDS to the material.

(2) Federally Stock Listed Items. The latest version of DOD 6050.5-LR - Hazardous Materials Information System (HMIS) will be maintained by SGPB (see figure C-2). A copy will be made of each HMIS sheet containing information used in a quantitative analysis and sent to DEEV for inclusion in their records.

Any material that is not mixed with other materials (solvents used to clean parts, for example) will be returned to its original container if the container meets DOT specifications. Federal Stock Number and nomenclature will be visible and legible on the container.

(b) Material/Waste Segregation. Hazardous material/waste generators will segregate all materials/wastes as much as possible so as to maintain any possible recycle value of the materials. Corrosion Control, for instance, will segregate wipe down material (50% Toluene and 50% MEK) for unused and slop paint.

Copies of the current quantitative analysis will be maintained at SGPB and copies will be kept by the Environmental Coordinator (DEEV), the Defense Reutilization Marketing Office (DRMO) and by the waste generator in accordance with Section XIII (Record Keeping Requirements) of the base Hazardous Waste Management Plan.

2. Identity Unknown. If the identity of a material/waste is unknown, the material will be tested for the parameters listed in Section C.2.c.(1). Sampling procedures outlined in Section C.2.e. will be followed.

(a) SGPB will verify the chemical composition of the materials by obtaining a sample of the material and request qualitative analysis by USAF Occupational and Environmental Health Laboratory (OEHL), Brooks AFB, Texas. Unused unopened materials will not require analysis as long as the container has not been opened and the identity is visible and legible on the container label.

(b) Samples will be preserved and packaged according to instructions in the USAF OEHL Recommended Sampling Procedures manual. Reusable cold packs will be used for temperature control. The containers will be made of insulated material and sealed.

C.2.b. <u>Additional Requirements for Wastes Generated Off-Site [40 CFR 264.13(c); NM HWMR 206.B.3.c]</u>

DRMO-Cannon may, on written request, accept waste from Reese AFB in Lubbock, Texas. These shipments and any other waste received at the facility through a Memorandum of Understanding will be inspected by DRMO-Cannon in order to assure proper identification by the generator.

The off-site facility will provide sampling results in accordance with this waste analysis plan. If DRMO-Cannon finds discrepancies between manifests and containers shipped, DRMO will verify waste shipped off site IAW 40 CFR 264.13(c). DRMS has contracted with the Defense Industrial Supply Center (DISC) to perform testing of waste turned into DRMOs/OSBs from off site generators. If DRMO-Cannon finds discrepancies between manifests and containers shipped, the waste will be rejected back to the generator and not received into the HWSF. The sampling parameters outlined below will be used.

C.2.c Parameters and Rationale [40 CFR 264.13(b)(1); NM HWMR 106.B.3.b(1)]

C.2.c.(1) Analysis Parameters (Identity Unknown)

All samples submitted will first be screened using infrared identification. This test will give major components and classify the waste as solvent or non-solvent. If the substance is identified as a solvent, one of two methods will be used. Gas Chromatograph/infrared separation analysis will be used for mixtures IAW Section 8.1 of EPA Publication SW 846 "Test Methods for evaluating Solid Waste, Physical/Chemical Methods" followed by infrared confirmation. Section 8.2 (Gas Chromatograph/Mass Spectrometry) methods will be used on other solvents.

Ignitability will also be performed on all wastes (solvent and non-solvent) using a Fisher tag closed cup tester (Pensky- Martens type) according to method 1010 listed in SW 846, Section 2.1.1.

If the infrared screen indicates that the waste material is acid or base, Corrosivity (ph) tests will be performed on the substance in accordance with Section 2.1.1. of SW 846.

Tests for reactivity will be performed on all wastes IAW SW 846 Section 2.1.3.

An EP Toxicity Test (metals only) will be performed on all wastes IAW SW B46 Section 2.1.4.

If the infrared identification test does not adequately quantify the Waste constituents a sample will be resubmitted. An EPA approved method for further quantification will then be performed. Refer to Figure C-3 for flow chart description of the identification process.

C.2c(1)(a) Frequency of. Analysis (40 CFR 264.13(b)(4)]

Frequency of analysis will be as follows:

1) For offbase turn-in activities transferring property to the DRMO once or more per month sampling will be performed once per month. Number of samples are determined by number of containers received from a generator (each generator has a separate EPA Id number). (See Table C-6)

2) For offbase turn-in activities transferring property to the DRMO less than once per month, sampling will be performed at each turn-in.

Table C-6 will be used to determine the number of samples to be taken. Shipment size is the number of containers (whatever size) which hold Group II wastes. Containers to be sampled and selected at the discretion of the environmental specialist or other person designated by the DRMO Chief.

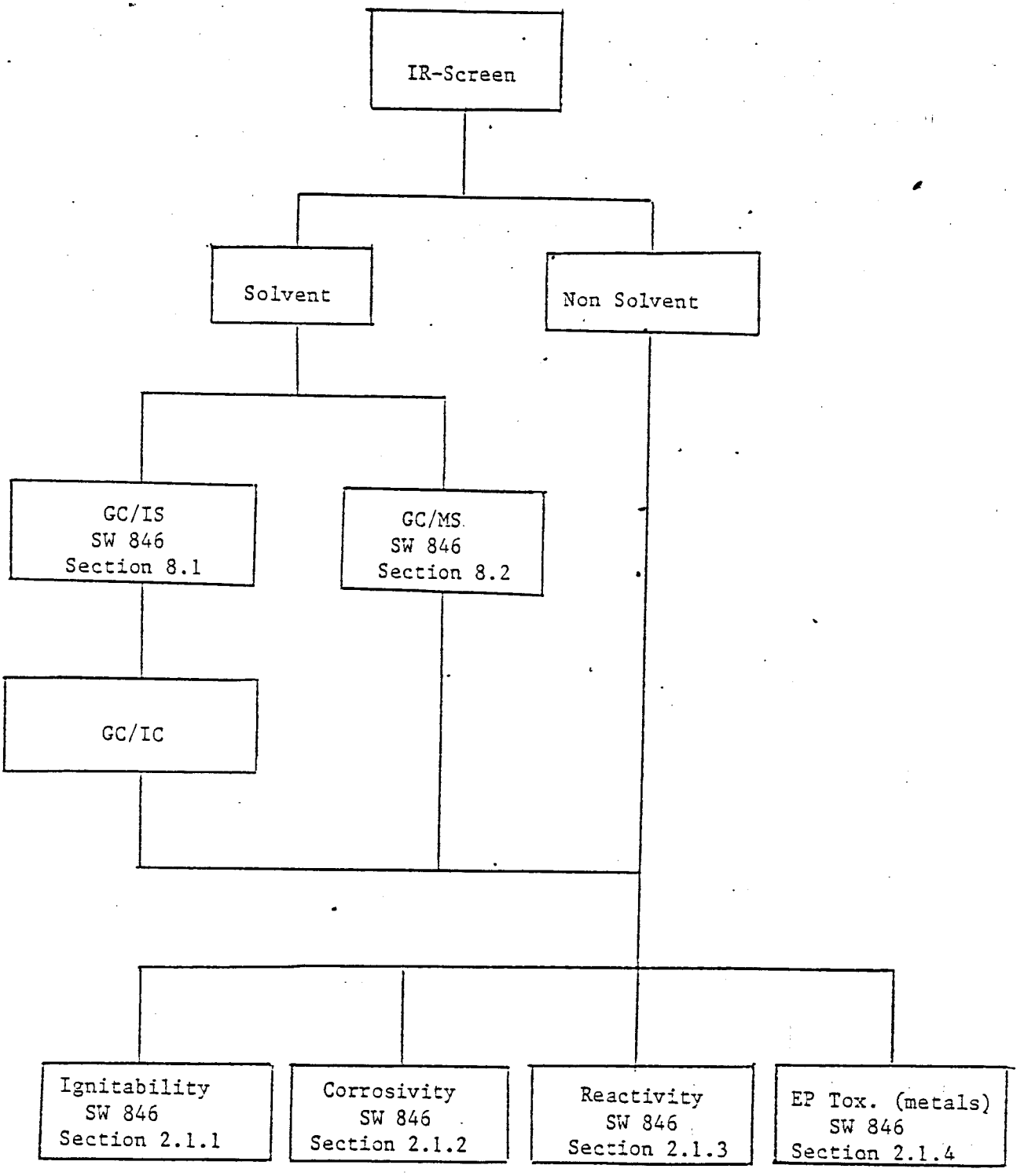
Table C-6. Number of Samples To be Collected As a Function of the Number of. Items in the Shipments.

SCHEDULE A - Military Standard 105D Normal Inspection

Shipment Size	Number of Samples To Be Collected
2 to 8	2
9 to 15	3
16 to 25	5
26 to 50	8
51 to 90	13
91 to 150	20

FIGURE C-3

IDENTIFICATION PROCESS FLOW CHART



C.2.c.(2) Analysis Parameters (Known). The analysis parameters will be determined based upon the quantitative analysis outlined in Section A above. Appendix C-5 shows the sampling parameters and the rationale for those parameters for specific operations which generate wastes that require analysis. Results of samples analyzed according to the selected parameters are contained in Appendix C-3.

C.2.d. Test Methods. Specific methods for analysis of wastes generated by base organizations are listed in Appendix C-5.

C.2.e. Sampling Methods.

C.2.e.(1) Drums - SGPB has obtained a Coliwasa (PVC type) and has ordered another one (glass type) to collect all drum samples. The sampling procedure listed in SW 846 Section 1.2.1.1. will be followed. The following decontamination procedure will be used:

C.2.e.(1)(a) Rinse with mild lab soap.

C.2.e.(1)(b) Rinse with water.

C.2.e.(1)(c) Rinse with a 3% HCL or HNO3 solution.

C.2.e.(1)(d) Rinse with distilled water.

This is the decontamination method recommended by California Department of Health who developed the Coliwasa.

C.2.e(2) Small Containers. Because there is a possible explosive hazard when dealing with an unknown chemical, the container will not be shaken to ensure constituents are evenly mixed. Instead, the container will be inverted one time then a sample will be poured into a clean glass container with teflon

lined lid. Although this will not ensure a representative sample, it will identify all possible constituents.

C.2.f. Sampling Frequency.

C.2.f.(1) Continuous processes will be sampled annually. C.2.f.(2) Intermitent processes will be sampled upon request for turn-in to DRMO.

C.2.f.(3) Process Changes requiring a change in chemical useage will be reported to SGPB by all organization on Cannon Air Force Base whereupon SGPB will determine new sampling requirements.

C.2.g. Chain of Custody. Samples will be sent to USAF OEHL in a sealed container. A Chain-of-custody record (figure C-4) will be filled out, signed and placed in a plastic bag along with the usual sample submission form (see figure C-5) and sealed in the shipping container. A duplicate will be kept by SGPB with the duplicates of the sample submission forms. OEHL personnel will acknowledge receipt of the samples in good condition by signing the Chain-of-Custody form and returning it to Cannon AFB. If the container is damaged in any way or not sealed when the lab receives the package, the technician will so annotate on the form.

C. 2.h Record Keeping. Sample results (along with Chain-of-Custody forms) will be maintained at SGPB and copies will be kept by the generator, Environmental Coordinator (DEEV), and by the Defense Reutilization and Marketing Office (DRMO) in accordance with Section XIII (Record Keeping Requirements) of the base Hazardous Waste Management Plan.

Figure C-4

Chain-of-Custody Record

Figure A-2 Chain-of-Custody Record

Survey | **Samplers:** *Signature*

Station Number	Station Location	Date	Time	Sample Type Water Comp	Sample Type Water Grab	Sample Type Air	Seq. No	No. of Containers	Analyses Required

Relinquished by: *Signature*	Received by: *Signature*	Date/Time
Relinquished by: *Signature*	Received by: *Signature*	Date/Time
Relinquished by: *Signature*	Received by: *Signature*	Date/Time
Relinquished by: *Signature*	Received by Mobile Laboratory for Field analysis: *Signature*	Date/Time
Dispatched by: *Signature* — Date/Time	Received for Laboratory by:	Date/Time

Method of Shipment:

Distribution: Orig.—Accompany Shipment
1 Copy—Survey Coordinator Field Files

Figure C- 5

Sample Submission Form

BULK MATERIAL SAMPLING DATA

(Use this space for additional comments)

OEHL USE ONLY

WORKPLACE OR SITE IDENTIFIER

BASE

ORGANIZATION

WORKPLACE OR SITE

DATE COLLECTED (YYMMDD)

BLDG NO/LOCATION

ROOM/AREA

MAIL REPORTS TO (circle if change)

ORIGINAL

COPY 1

COPY 2

SAMPLE COLLECTED BY (Name, Grade, AFSC)

SIGNATURE

AUTOVON

REASON FOR SUBMISSION

A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP
R-ROUTINE BACKGROUND/PERIODIC SURVEY O-OTHER

OEHL PRIORITY

SOURCE BEING SAMPLED

EXISTING CONTROLS (Personal protective equipment, Engineering, Administrative)

SAMPLE COLLECTION DATA

OEHL SAMPLE NUMBER			
BASE SAMPLE NUMBER			
ANALYSES REQUESTED	A	CHECK FOR	☐ MAJOR COMPONENTS ☐ MAJOR COMPONENTS
	B	NAME	
		NIOSH NO	
	C	NAME	
		NIOSH NO	
	D	NAME	
		NIOSH NO	
	E	CHECK FOR	☐ HAZARDOUS/TOXIC WASTE ☐ HAZARDOUS/TOXIC WASTE
MATERIAL NAME			
LOT NUMBER			
NSN (FSN)			
SPECIFICATION (MIL or FED)			
MANUFACTURER'S NAME			
DESCRIPTION OF MATERIAL USAGE (Poured, Brushed, Removed, etc)			
SUPPORTING SAMPLES		OEHL SAMPLE NO	
		BASE SAMPLE NO	
		SAMPLE TYPE	

COMMENTS

AF FORM JAN 81 2751

C.2. i. Additional Requirements for Facilities Handling Ignitables, Reactive, or Incompatible Waste [40 CFR 264.13(b)(6) and 264.17; NM HWMR 206.B.3b.(6) and 206.B.7.]

No additional testing of ignitable, reactive, or incompatible hazardous waste is necessary because DOD turn-in requirements and the Waste Analysis Plan (as described in Section C-2) provide the necessary information to properly store ignitable and reactive wastes and prevent the mixing of incompatible wastes. Precautions to prevent the accidental ignition or reaction of ignitable, reactive, or incompatible wastes are described in Section F-5 of this permit application.

APPENDIX C-1

Hazardous Materials - Group I Items

APPENDIX C-1

Hazardous Materials - Group I Items

Chemical	Hazard
2,4 - Dichloropheoxy acetic acid	EP Toxic
Insecticide, DDT	Toxic
Acrylic lacquer	Ignitable
Adhesive, liquid	Ignitable
Adhesive, epoxy	Ignitable
Adhesive, primer	Ignitable
Cleaning compound	Ignitable
Cleaning compound	Reactive
Cleaning compound solvent	Ignitable
Chromic acid	Corrosive, EP Toxic
Calcium hypochlorite	Reactive
Toluene	Toxic
Dimethylformamide	Reactive
Polyurethane Paint	Ignitable
Primer	Ignitable, EP Toxic
Thinner	Ignitable
Primer sealant	Ignitable

Hazardous Materials - Group I Items

Chemical	Hazard
Acetone	Ignitable
934 structural sealant	Ignitable
Sulfuric acid	Corrosive
Enamel thinner	Ignitable
Lacquer thinner	Ignitable
Methyl ethyl ketone	Ignitable, Toxic
Toluene thinner	Ignitable
Naphtha thinner	Ignitable
Epoxy primer	Ignitable
Polyurethane coating	Ignitable
Lacquer	Ignitable
Epoxy paint remover	Corrosive
Xylene	Ignitable, Toxic
Potassium hydroxide	Corrosive
Ethyl alcohol	Ignitable
Trichloroethylene	Toxic
Tetrachloroethylene	Toxic
Batteries (mercury)	Corrosive

APPENDIX C-1 (Continued)

Hazardous Materials - Group I Items

Chemical	Hazard
Methyl alcohol	Ignitable, Toxic
Carbon remover	Corrosive
Enamel	Ignitable
Enamel	Ignitable, EP Toxic
Bromochloromethane	Corrosive
Aqueous film forming foam	Corrosive
1,1,1 Trichloroethane	Toxic
Naphtha	Ignitable
Potassium dichromate	EP Toxic
Hydrochloric Acid	Corrosive
Mercury	Toxic
Zinc phosphide	Reactive, Toxic
Paint, heat resistant	Ignitable
Paint, latex	Ignitable
Paint, oil	Ignitable
Petroleum ether	Ignitable
Primer coating, epoxy polyamide	Ignitable

APPENDIX C-2

Waste Streams Generated by Cannon and Reese AFBs

- Group II Items

APPENDIX C-2

Waste Streams Generated By Cannon AFB

- Group II Items

Hazardous Waste	Hazard	EPA Hazard Class	Source
Methyl ethyl ketone Toluene Xylene Methyl isobutyl ketone Cyclohexanone	Ignitable, Toxic	Listed Waste F005	Corrosion Control Slop paint waste
Lead	EP Toxic	Characteristic Waste D008	
Methyl ethyl ketone Toluene	Ignitable, Toxic	Listed Waste F005	Corrosion Control Wipe-down material
Carbon Remover	Corrosive	Characteristic Waste D002	Wash Rack, Bldg 680
Turco 6542 (contains dichloromethane and tetrachloroethylene)	Toxic	Listed Waste F001	Cold Stripper, Wheel and Tire Shop

APPENDIX C-2

Waste Streams Generated By Cannon AFB
- Group II Items

Additional materials which may be disposed of through the DRMO include:

Hazardous Waste	Hazard	EPA Hazard Class	Source
Developer System Cleaner (35% potassium dichromate)	Corrosive EP Toxic	Characteristic Waste D002, D007	Bldg. 163 Photographic Materials
Photographic Intensifier (100% chlorochromate)	EP Toxic	Characteristic Waste D007	

APPENDIX C-2

Waste Streams Generated By Reese AFB

- Group II Items

Hazardous Waste	Hazard	EPA Hazard Class	Source	Quantity
Waste Print Stripper 77% MEK 10% Toluene 5% Water 3% Isopropanol 1% Butyl Acetate	Ignitable, Toxic	Listed Waste F005	Cleaning, stripping Priming, repainting and stenciling aircraft and ground support equipment.	150 GL/MO
Hot Paint Stripper-TURCO 6148-A Paint Remover (MIL-R-83936B, NSN 8010-01-040-1059) Ortho Dichlorobenzene contaminated with 200 MG/L Chromium	Ignitable, Toxic	Listed Waste F002 Characteristic Waste D007	Landing gear cleaned for inspection, repair and repainting, chemicals used in 220 GL vats.	200 GL/ 6 Months
Carbon remover (NSN 6850-00-281-3042)	Corrosive	Characteristic	Landing gear cleaned for inspection, repair and repainting, chemicals used in 300 GL vats.	300 GL/ 5 years

Appendix C-2
WASTE STREAMS GENERATED BY REESE AFB (continued)
- Group II Items

	HAZARDOUS WASTE	HAZARD	EPA HAZARD CLASS	SOURCE	QUANTI
*	Descaler (NSN 6850-00-597-1528) Sodium Hydroxide	Corrosive	Characteristic Waste D002	Landing gear cleaned for inspection, repair and repainting, chemicals used in 300 GL vats.	300 Gl 5 Year
*	Potassium Permanganate Solution (NSN 6810-00 264-6620) Sodium Hydroxide Sodium Carbonate Potassium Permanganate	Corrosive	Characteristic Waste D002	Landing gear cleaned for inspection, repair and repainting, chemicals used in 300 GL vats.	300 Gl 5 Year
*	Phosphoric Acid Solution (NSN 6810-00-551-9577)	Corrosive	Characteristic Waste D002	Landing gear cleaned for inspection, repair and repainting, chemicals used in 300 GL vats.	300 Gl 5 Year

* These chemicals are used in 220 gallon and 300 gallon vats within the chemical cleaning facility. Chemicals are used up in the cleaning process, therefore no waste is generated from use. Waste is generated when the vats are cleaned (approximately once every 5 years) or replaced. Note that a new chemical cleaning facility is under construction and that these wastes will be disposed of in the November-December, 1985 time frame.

APPENDIX C-3

Laboratory Analysis Reports for Group II Wastes

1. Analysis 1 is from the Corrosion Control Shop at Reese AFB.
2. Analysis 2 is from the Corrosion Control Shop at Cannon AFB.
3. The rational and methods used in these analysis are described in Section C-2.

TO: Brooks Air Force Base

FROM:

SAMPLE IDENTITY: Waste Solvents

DATE RECEIVED: March 24, 1983

SAMPLE FROM: Reese AFB, Texas

XX RECD

LAB CONTROL NR: 10905-10907, 10907

TEST FOR: Bulk Identification

Sample Identification Base # (OHEL #)	Ignitability at 60°C	pH	Bulk Components	Bulk Concentration (%
GM830036 - BBL #51 10905	Yes	-	Acetone	35
			MEK	34
			MIBK/Isobutyl acetate	8
			Toluene	13
			Xylenes	1
			Butyl cellosolve	3
			Solids/Paint resins	6
GM83007 - BBL #52 10906	Yes	-	Aliphatic Hydrocarbons >C_{12}	3
			Acetone	39
			MEK	34
			MIBK/Isobutyl acetate	6
			Toluene	10
			Isobutanol/n-butyl acetate	4
			Solids/Paint resins	4
GM830038 - BBL #53 10907	Yes	-	Acetone	16
			MEK	8
			MIBK/Isobutyl acetate	13
			Toluene	20
			Xylenes	2
			Cellosolve acetate	11
			Solids/Paint resins	16

Chief, Environmental Chemistry Branch

BBLs 51, 52, & 53 FROM [redacted], DLOS 59.

m29 ocr 83

OEHL FORM # DEC 78 * PREVIOUS EDITION WILL BE USED

LABORATORY ANALYSIS REPORT AND RECORD (General)

DATE: 19 Jan 84

FROM: USAF OEHL/SA
Brooks AFB TX 78235

SAMPLE IDENTITY: GM830389-411 waste chemicals

DATE RECEIVED: 27 Dec 83

SAMPLE FROM: B 196 Drum Storage

LAB CONTROL NO: 65957-979

TEST FOR: Analysis

Lab #	Sample #	Ignitability at 140°F	Identification
65957	830389	yes	Toluene and Methyl Ethyl Ketone
65958	830390	yes	Toluene and Methyl Ethyl Ketone
65959	830391	yes	Toluene and Methyl Ethyl Ketone
65960	830392	yes	Toluene and Methyl Ethyl Ketone
65961	830393	yes	Toluene and Methyl Ethyl Ketone
65962	830394	yes	Toluene and Methyl Ethyl Ketone
65963	830395	yes	Toluene and Methyl Ethyl Ketone
65964	830396	yes	Toluene and Methyl Ethyl Ketone
65965	830397	yes	Toluene and Methyl Ethyl Ketone
65966	830398	yes	Toluene and Methyl Ethyl Ketone
65967	830399	yes	Toluene and Methyl Ethyl Ketone
65968	830400	yes	Toluene and Methyl Ethyl Ketone
65969	830401	yes	Toluene and Methyl Ethyl Ketone
65970	830402	yes	Toluene and Methyl Ethyl Ketone
65971	830403	yes	Toluene and Methyl Ethyl Ketone
65972	830404	yes	Toluene and Methyl Ethyl Ketone
65973	830405	yes	Toluene and Methyl Ethyl Ketone
65974	830406	yes	Toluene and Methyl Ethyl Ketone
65975	830407	yes	Toluene and Methyl Ethyl Ketone
65976	830408	yes	Toluene and Methyl Ethyl Ketone
65977	830409	yes	Toluene and Methyl Ethyl Ketone
65978	830410	yes	Toluene and Methyl Ethyl Ketone
65979	830411	yes	Toluene and Methyl Ethyl Ketone

Note: The above are the major components as determined by a general qualitative infrared analysis. Cyclohexanone, Xylenes and MIBK are present as minor components in some samples. No halogenated solvents are present.

J.D. HILLSBERRY, GS-12
Industrial Hygiene Analysis Function
Occupational Chemistry Branch

REQUESTING AGENCY (Mailing Address)

USAF Hosp/SGPB
Cannon AFB NM 88103

APPENDIX C-4

Example of a Material Safety Data Sheet

Fed. Std. No. 313A

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: Oklahoma Refining Company	EMERGENCY TELEPHONE NO.: 405-424-0661
ADDRESS (Number, Street, City, State, and ZIP Code): P. O. Box 26386 Oklahoma City, Okla 73126	PD-680
[redacted]	TRADE NAME AND SYNONYMS: Apco 140, [redacted] Amm 2 Type 2
CHEMICAL FAMILY	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	362	SPECIFIC GRAVITY (H_2O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER			
APPEARANCE AND ODOR	clear- sweet		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) TCC-o/F 139	FLAMMABLE LIMITS	LEL	UEL
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
NO EXPLOSION HAZARDS			

(Continued on reverse side)

Form OSHA-20
Rev. May 72

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
100 parts of vapor per million in air. This value is maximum adverage

EFFECTS OF OVEREXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Skin: Wash with soap and water
Breathing: Remove patient to fresh air
Eyes: Flush with water for at least 15 minutes
Swallowing: Call physician immediately. Do not induce vomiting.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE		

INCOMPATABILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR		

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES	EYE PROTECTION

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
OSHA Class 111 A
Must be kept away from heat and open flame. Containers should be kept closed when not in use. (somewhat less hazardous than Kerosene

OTHER PRECAUTIONS

PAGE (2)
GPO 1 23-040

Form OSHA-20
Rev. May 73

APPENDIX C-5

Parameters and Rational for Analysis of Known Operations

ANALYSIS PARAMETERS (Corrosion Control)

SLOP PAINT WASTE

Constituent	RCRA No.	EPA Test No.*
Methyl Ethyl ketone	F005	8015
Toluene	F005	8020
Xylene	F003	8020
Methyl Isobutyl Ketone	F003	8015
Cyclohexanone	F003	8015
Lead	D008	7420
Chromate	D007	7195

* EPA TEST NO. refers to the analytical method outlined in "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods."

RATIONALE FOR SAMPLING PARAMETERS (Corrosion Control)

Calculations are based on estimates of materials used per aircraft paint job. Quantities are then extrapolated to the amount that would fill a 55 gallon drum, i.e. 50 gallons and converted to a weight for calculation of specific weight.

1. Paint slop is made of several paints with the following constituents:

Equipment cleaning: 0.25 gal of MEK
Unused paint (70% laquer, 30% enamel): 1.5 gal

Chemical breakdown follows:

Chemical	Percentage	Liquid Amt (gal)
Equipment Cleaning		
Methyl Ethyl Ketone	100	0.25
Laquer paint (1.05 gal)		
Ethylene Glycol Monobutyl Ether	5	0.0525
Xylene	5	0.0525
Methyl Isobutyl Ketone	45	0.4725
Toluene	45	0.4725
Enamel paint (0.45 gal)		
Cyclohexanone	20	0.0900
Methyl Ethyl Ketone	25	0.1125
Isopropyl Alcohol	5	0.0225
Toluene	15	0.0675
Lead	2.4	0.0108
Chromate	1.1	0.00495
Water	31.5	0.14175
TOTAL		1.75 gal

TOTAL VOLUME BY CHEMICAL

MEK = 0.25 + 0.1125 = 0.3625 gal

$$0.3625 \text{ gal} \times \frac{50 \text{ gal}}{1.75 \text{ gal}} \times \frac{0.806 \text{ lb MEK}}{1 \text{ lb H2O}} \times \frac{8.33 \text{ lb H2O}}{1 \text{ gal H2O}} = 69.54 \text{ lb}$$

Ethylene Glycol Monobutyl Ether

$$0.0525 \times \frac{50}{1.75} \times 0.902 \times 8.33 = 11.27 \text{ lb}$$

Methyl Isobutyl Ketone

$$0.4725 \times \frac{50}{1.75} \times 0.802 \times 8.33 \quad +90.19$$

Xylene

$$0.0525 \times \frac{50}{1.75} \times 0.865 \times 8.33 = 10.81 \text{ lb}$$

Toluene

0.4725 gal + 0.0675 gal = 0.5400 gal

$$0.54 \times \frac{50}{1.75} \times 0.945 \times 8.33 = 111.43 \text{ lb}$$

Cyclohexanone

$$0.09 \times \frac{50}{1.75} \times 0.785 \times 8.33 = 20.24 \text{ lb}$$

Isopropyl Alcohol

$$0.0225 \times \frac{50}{1.75} \times 0.785 \times 8.33 = 4.20 \text{ lb}$$

Lead

$$0.0108 \times \frac{50}{1.75} \times 11.35 \times 8.33 = 29.17 \text{ lb}$$

Chromate

$$0\ 00495 \times \frac{50}{1.75} \times 5.2 \times 8.33 = 6.13 \text{ lb}$$

Water

$$0.14175 \times \frac{50}{1.75} \times \times 8.33 = 33.74 \text{ lb}$$

386.72 lb

$$\frac{386.72 \text{ lb}}{50 \text{ gal}} = 7.73 \text{ lb/gal}$$

SUMMARY

PAINT SLOP

CONSTITUENT	VOLUME (gal)	% Vol	REPORTED %
Methyl Ethyl Ketone	0.3265	20.71	19-23
Ethylene Clycol Monobutyl Ether	0.0525	3.00	0-3
Xylene	0.0525	3.00	0-3
Methyl Isobutyl Ketone	0.4725	27.00	24-30
Toluene	0.5400	30.86	28-34
Cyclohexanone	0.0900	5.14	0-5
Isopropyl Alcohol	0.0225	1.29	0-1
Lead	0.0108	0.62	< 1
Chromate	0.00495	0.28	< 1
Water	0.14175	8.10	7-9

The Corrosion Control operation is considered a continuous process. Qualitative analysis will be performed annually.

ANALYSIS PARAMETERS (Jet Engine Shop)

a) FREON 113

Analysis	EPA Test No.
Major Componets	IR Identification Screen
Volatile Halocarbons	E 601
EP Toxicity - metals	SW 846 Section 2.1.4.
Ignitability	SW 846 Section 2.1.1.
Corrosivity	SW 846 Section 2.1.2.

RATIONALE FOR SAMPLING PARAMETERS

The waste Freon 113 generated is kept segregated by shop personnel. It is a volatile halogenated compound with possible unknown contaminants which warrents initiating the Infrared Identification Process with further quantification for volatile halocarbons.

b) B & B 3100

Analysis	EPA Test No.
Major Componets	IR Identification Screen
Volatile Aromatics	E 602
EP Toxicity - metals	SW 846 Section 2.1.4.
Ignitability	SW 846 Section 2.1.1.
Corrosivity	SW 846 Section 2.1.2.

RATIONALE FOR SAMPLING PARAMETERS

The waste B & B 3100 generated is kept segregated by shop personnel. It is a volatile halogenated compound with possible unknown contaminants which warrents initiating the Infrared Identification Process with further quantification for volatile Aromatics.

c) CARBON REMOVER

Analysis	EPA Test No.
Major Componets	IR Identification Screen
EP Toxicity - metals	SW 846 Section 2.1.4.
Ignitibility	SW 846 Section 2.1.1.
Corrosivity	SW 846 Section 2.1.2.

RATIONALE FOR SAMPLING PARAMETERS

The waste Carbon Remover generated is kept segregated by shop personnel. There is no HMIS data avialable and the Infrared Identification Screen must be used to find out what the possible constituents are.

APPENDIX C-6

EXAMPLE SAMPLE SUBMISSION FORMS

ENVIRONMENTAL SAMPLING DATA

(Use this space for mechanical imprint)

OEHL USE ONLY

SAMPLING SITE IDENTIFIER (AFR 14-7)

BASE WHERE SAMPLE COLLECTED

SAMPLING SITE DESCRIPTION

DATE COLLECTION BEGAN (YYMMDD)

TIME COLLECTION BEGAN (24 hour clock)

COLLECTION METHOD: [ ] GRAB [ ] COMPOSITE _____ HOURS

MAIL REPORTS TO (circle if changed): ORIGINAL / COPY 1 / COPY 2

SAMPLE COLLECTED BY (Name, Grade, AFSC)

SIGNATURE

AUTOVON

REASON FOR SUBMISSION: A-ACCIDENT/INCIDENT, R-ROUTINE/PERIODIC, C-COMPLAINT, N-NPDES, F-FOLLOWUP/CLEANUP, O-OTHER (specify)

BASE SAMPLE NUMBER

OEHL PID

ANALYSES REQUESTED (check appropriate blocks)

GROUP A						GROUP T	
Ammonia	00610	Hardness	00900	Residue, Settleable	50086	Bromoform	32104
Chemical Oxygen Demand	00340	Iron	01045	Residue, Volatile	00505	Bromodichloromethane	32101
Kjeldahl Nitrogen	00625	Lead	01051	Silica	00955	Carbon Tetrachloride	32102
Nitrate	00620	Magnesium	00927	Specific Conductance	00095	Chloroform	32106
Nitrite	00615	Manganese	01055	Sulfate	00945	Chloromethane	34418
Oil & Grease	00560	Mercury	71900	Sulfite	00740	Dibromochloromethane	32105
Organic Carbon	00680	Nickel	01067	Surfactants -MBAS	38260	Methylene Chloride	34423
Orthophosphate	00671	Potassium	00937	Turbidity	00076	Tetrachloroethylene	34475
Phosphorus, Total	00665	Selenium	01147			1,1,1-Trichloroethane	34506
		Silver	01077			Trichloroethylene	39180
GROUP D		Sodium	00929	GROUP H		Trihalomethanes	82080
Cyanide, Total	00720	Thallium	01059	BHC Isomers	39340	PCBs	39516
Cyanide, Free	00722	Zinc	01092	Chlordane	39350		
				DDT Isomers	39370		
				Dieldrin	39380		
GROUP E		GROUP G		Endrin	39390		
Phenols	32730	Acidity, Total	70508	Heptachlor	39410		
		Alkalinity, Total	00410	Heptachlor Epoxide	39420		
GROUP F		Alkalinity, Bicarbonate	00425	Lindane	39782		
Antimony	01097	Bromide	71870	Methoxychlor	39480		
Arsenic	01002	Carbon Dioxide	00405	Toxaphene	39400		
Barium	01007	Chloride	00940	2,4-D	39730	ON SITE ANALYSES	
Beryllium	01012	Color	00080	2,4,5-TP-Silvex	39760	Parameter	Value
Boron	01022	Fluoride	00951	2,4,5-T	39740	Flow 50050	mgd
Cadmium	01027	Iodide	71865			Chlorine, Total 50060	mg/l
Calcium	00916	Odor	00086			Dissolved Oxygen 00300	mg/l
Chromium, Total	01034	Residue, Total	00500			pH 00400	units
Chromium VI	01032	Residue, Filterable (TDS)	70300	GROUP J		Temperature 00010	°C
Copper	01042	Residue, Nonfilterable	00530	Sulfides	00745		

COMMENTS

C-6a

AF FORM JAN 81 2752

Station Number	Station Location	Date	Time	Sample Type Water Comp	Sample Type Water Grab	Sample Type Air	Seq No	No of Containers	Analysis Required

Relinquished by: *Signature*	Received by: *Signature*	Date/Time
Relinquished by: *Signature*	Received by: *Signature*	Date/Time
Relinquished by: *Signature*	Received by: *Signature*	Date/Time
Relinquished by: *Signature*	Received by Mobile Laboratory for Field analysis: *Signature*	Date/Time
Dispatched by: *Signature* — Date/Time	Received for Laboratory by:	Date/Time

Method of Shipment:

Distribution: Orig —Accompany Shipment
1 Copy—Survey Coordinator Field Files

OR SITE IDENTIFIER	
BASE	ORGANIZATION
WORKPLACE OR SITE	
DATE COLLECTED (YYMMDD)	BLDG NO/LOCATION / ROOM/AREA

MAIL REPORTS TO (circle if change)	
ORIGINAL	
COPY 1	
COPY 2	

SAMPLE COLLECTED BY (Name, Grade, AFSC)	SIGNATURE	AUTOVON

REASON FOR SUBMISSION: A-ACCIDENT/INCIDENT C-COMPLAINT F-FOLLOWUP/CLEANUP R-ROUTINE BACKGROUND/PERIODIC SURVEY O-OTHER

OEHL PID

SOURCE BEING SAMPLED

EXISTING CONTROLS (Personal protective equipment, Engineering, Administrative)

SAMPLE COLLECTION DATA

OEHL SAMPLE NUMBER				
BASE SAMPLE NUMBER				
ANALYSES REQUESTED	A	CHECK FOR	☐ MAJOR COMPONENTS	☐ MAJOR COMPONENTS
	B	NAME		
		NIOSH NO		
	C	NAME		
		NIOSH NO		
	D	NAME		
		NIOSH NO		
	E	CHECK FOR	☐ HAZARDOUS/TOXIC WASTE	☐ HAZARDOUS/TOXIC WASTE
MATERIAL NAME				
LOT NUMBER				
NSN (FSN)				
SPECIFICATION (MIL or FED)				
MANUFACTURER'S NAME				
DESCRIPTION OF MATERIAL USAGE (Heated, brushed, sprayed, etc)				
SUPPORTING SAMPLES	OEHL SAMPLE NO			
	BASE SAMPLE NO			
	SAMPLE TYPE			

COMMENTS

AF FORM JAN 81 2751

APPENDIX C-7

Quality Assurance

DEPARTMENT OF THE USAF
AF Occupational and Environmental
Health Laboratory (AFSC)
Analytical Services Division
Brooks AFB, TX 78235

DIVISION OPERATING INSTRUCTION 161-5
MAY 16, 1989

Aerospace Medicine

Administrative Practices of the Quality Assurance Plan

This operating instruction provides guidance and sets forth division guidelines concerning the quality of analytical results, documentation of that quality, and actions required to maintain quality. It establishes the division's Quality Assurance Plan (QAP) to meet requirements of state, federal and private accrediting agencies, maximize the quality of analytical results, and formalize procedures for correcting deficiencies.

1. OBJECTIVE

a. The objective of this operating instruction is to assure the division meets or exceeds quality control certification requirements by all regulatory agencies through which the laboratory must be accredited. It defines a means for documenting the quality of data produced by various workcenters and analysts using the methods, equipment or individual practices requiring corrective actions to improve quality.

2. RESPONSIBILITIES

a. The Analytical Services Division Chief is responsible for the quality of analytical data.

b. The Chief, Quality Assurance/Quality Control Branch reports directly to the division chief and is responsible for developing and implementing procedures and practices necessary to define the quality of individual procedures, performance of analytical equipment, and competence of individual analysts. Quality Assurance's (SAQ) primary duties are:

(1) Inserting a minimum of one control for each parameter analyzed each month in the routine workload of SA sections (unless more are requested by the SA branch or function chief) and reporting results through SA to the branches and sections.

(2) Periodic auditing of laboratory quality assurance systems

OPR: AFOEHL/SAQ
APPROVED BY: AFOEHL/SA CHIEF (Col Christensen)
DISTRIBUTION: ALL SA BRANCHES

and reporting the results through SA chief to the branches, function, and sections.

(3) Monitoring SA contract laboratories in a fashion similar to those conducted of SA sections.

(4) Maintenance and routine updating of the SA QA manual and SA QA Plan in conjunction with the expanding requirements in the Environmental and Industrial/Occupational Hygiene fields as well as the emerging legal requirements from various local, state, and federal (EPA) regulatory agencies.

c. Individual branch and function supervisors are responsible for assuring that their personnel are familiar with all aspects of the QAP and actively participate in necessary documentation supporting the program's objectives.

d. Each section in the division will support the QA Plan by:

(1) Maintaining complete laboratory analytical methods and procedures for analysis done by the section, sampling data sheets, calibration data sheets, and analytical instrument operating instructions.

(2) Accomplishing and documenting calibration of instruments and equipment in the laboratory, quality control checks on analytical instruments to insure proper function at all times, and an equipment preventive maintenance program.

(3) Collecting, distributing, and retaining laboratory reports with provisions for administrative/technical review.

(4) Preparing and using only fresh reagents and chemicals, and suitable calibrated glassware.

(5) Assuring that proper sample collection, handling, and preservation procedures are used to provide a viable and valid sample for the analytical laboratories.

(6) Following established chain-of-custody procedures to be maintained on all samples where required.

3. <u>QUALITY ASSURANCE POLICY</u>

a. The following policies will be followed to establish and maintain a total analytical quality control program assuring precision and accuracy of laboratory results:

(1) Standardization of all instrumentation shall be verified on each day of use.

(2) At least one standard (traceable to a National Institute of Standards and Technology/Standard Reference Material, NIST/SRM, whenever possible) and one control sample should be included with each

analytical run of unknown samples. A blank sample will also be analyzed to aid in determining the possibility of reagent contamination or other problems impacting on the detection limit.

(3) If results on standard, control, blank or other check samples are not within accepted limits established by historical data, analyses will be repeated and control verified before reports are issued. For all "out of control" situations, the written contingency plans must be followed and all corrective action taken documented.

(4) SAQ will produce reports to sections on their performance on audit blind control samples. SAQ initiates an investigation of results falling outside precision criteria which will be sent to the section supervisor through division channels.

(5) Uniform detection limits and detection limit reporting will be established for all sample data.

(6) The laboratory will participate in interlaboratory quality evaluation programs, and proficiency testing.

(7) SAQ will monitor training and proficiency of personnel in quality control techniques, and will document analyst competence in specified analysis methods.

(8) SAQ will perform periodic audits to insure sections are using approved and current methods, that proper data reduction, validation, and reporting procedures are utilized, and develop and use of appropriate procedures to determine accuracy and precision of results for each analyte measured.

William D. Christensen

WILLIAM D. CHRISTENSEN, Col, USAF, BSC
Chief, Analytical Services Division

Section D

PROCESS INFORMATION

The information provided in this section is submitted in accordance with the requirements of 40 CFR Parts 270.15 and 264.170-176; and NM HWMR 302.A.4.b.(2)(a) and 206.D.4.a throuqh 206.D.4.q.

D.1 Containers [40 CFR 264.171; NM HWMR 206.D.4.b]

Materials will be packaged in accordance with DOT regulations (49 CFR Subchapter C - Hazardous Materials Regulations). No leaking or damaged containers will be accepted for storage unless they have been repackaged. Table D-1 lists the applicable Department of Transportation (DOT) packaging requirements for some of the chemicals listed in Appendix C-2 which may be stored at the HWSF. It should be noted that 49 CFR Section 173.7 (U.S. Government Material) describes packaging requirements for the Department of Defense; containers may be of equal or greater strength and efficiency than DOT requirements. (Refer to Appendix D-1 for DOT and military container specifications.)

D.1.a Containers with Free Liquids. Description of the System [40 CFR 270.15 (a); NM HWMR 302.A.4.b.(2)(a),

Final construction drawings of the containment system are shown in Appendix B-6. The HWSF will contain 14 storage bays. Some are equipped with 8-inch-high concrete berms on 3 sides. The concrete floors in each bay will

Table D-1

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Hazardous Materials To Be Stored at
DRMO-Cannon That Are Specificallv
Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Sulfuric Acid	15A, 15B, 15C, 16A, 19A, or 19B	178.168, 178.169, 178.170, 178.185, 178.190, 178.191	Wooden boxes with inside glass containers, not over 1-gallon capacity each (3-gallon capacity when only one container per box).
	33A	178.150	Polystyrene cases (nonreusable container) with inside glass bottles. Capacity not more than four 5-pint bottles per container.
	1H, 15P, 22C	178.13, 178.182, 178.198	Metal crate with an inside polyethylene carboy; or glued plywood or wooden box, or plywood drum [178.198-2(a). with inside specification 2T or 2TL [178.21, 178.27] polyethylene container.

Table D-1 (Continued)

Description of Containers To Be Used to Store Hazardous Wastes at DRMO - Cannon

Hazardous Materials To Be Stored at DRMO - Cannon Which Are Specifically Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Sulfuric Acid	6D. 37m	178.102. 178.131	Cylindrical steel overpacks with an inside specification 2S, 2SL, or 2T (178.35, 178.35a, 178.21) polyethylene container. Overpack of 30-gallon capacity must be constructed of at least 16-gauge steel throughout when used for sulfuric acid 93% or greater concentration.
	16D	178.187	Wirebound wooden overwrap, with an inside specification 2T, 2TL, 2S, or 2 SL [178.21, 178.27. 178.35, 178.35a] polyethylene container.

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO - Cannon

Hazardous Materials To be Stored at
DRMO - Cannon Which Are Specifically
Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Sulfuric Acid	21P	178.225	Fiber drum overpack with an inside specification 2T or 2U [178.21, 178.24] polyethylene container not over 15 gallon capacity.
	34	178.19	Polyethylene container without overpack, not over 30-gallon capacity.
	1A, 1K	178.1, 178.14	Carboys in boxes
	1D. 1M	178.4, 178.17	Glass carboys in boxes or expanded polystyrene packagings.

Table D-1 (Continued)

Description of Containers To Be Used to Store Hazardous Wastes at DRMO-Cannon

Hazardous Materials To Be Stored at DRMO - Cannon Which Are Specifically Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Potassium hydroxide	15A, 15B, 15c, 16A, 19A, 19B	178.168, 178.169, 178.170, 178.185, 178.190, 178.191	Wooden boxes with inside glass or earthenware containers not over 2 gallons each, or with metal containers, not over 5 gallons each.
	5	178.80	Metal drums. Openings must not exceed 2.3 inches in diameter.
	1H	178.13	Metal crate with inside polyethylene container spec. 2T (178.21)
	12B	178.205	Fiberboard box with inside metal containers. Not more than four 1-gallon or six 1-quart containers per box. Maximum gross weight 65 pounds. Must meet test requirements of 178.210 - 10.

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Hazardous Materials To Be Stored at
DRMO Cannon Which Are Specifically
Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Hydrochloric acid	15A, 15B, 15C, 16A, 19A, 19B	178.168, 178.169, 178.170, 178.185, 178.190, 178.191	Wooden boxes with inside glass, earthenware, polyethylene or other nonfragile plastic containers resistant to the lading (bags are not authorized), not over 1-gallon each, except that inside containers not over 3 gallons each are authorized when only one as packed in each outside box.
	1A, 1K	178.1, 178.14	Carboys in boxes. Not authorized for transportation by aircraft.

Table D-1 (ContInued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Hazardous Materials To Be Stored at
DRMO - Cannon Which Are Specifically
Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Hydrochlorlc acid	12A, 12B	178.210, 178.205	Fiberboard boxes with inside containers of polyethylene, or other nonfragile plastic material resistant to the lading (bags are not authorized), not over 1-gallon capacity each, or not more than one of 3-gallon capacity, suitably cushioned to prevent movement. Gross weight must not exceed 65 pounds.
	6D, 37m	178.102, 178.134	Cylindrical steel overpacks with inside specifications 2S, 2SL, 2T, 2TL. or 2U (178.35, 178.35 a. 178.21, 178.27, 178.24) polyethylene container.

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Hazardous Materials To Be Stored at
DRMO - Cannon Which Are Specifically
Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Hydrochloric acid	37P	178.133	Steel drums constructed of at least 24-gauge metal for drums capacity, with polyethylene liner (nonreusable container). Not authorized for transportation by air.
	16D	178.187	Wirebound wooden overwrap, with inside spec. 2T, 2TL, 2S, or 2SL (178.21, 178.27, 178.35, or 178.35a) Polyethylene container.
	12C	178.206	Fiberboard boxes with inside 5-gallon nominal capacity polyethylene-bottles having minimum wall thickness of 0.015 inch and constructed with screw-type closures. Gross weight not over 65 pounds.

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Hazardous Materials To Be Stored at
DRMO - Cannon Which Are Specifically
Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatorv Section	Container Description
Hydrochloric Acid	21P	178.225	Fiber drum overpack with inside spec. 2T, 2S, 2SL, or 2U polyethylene container.
	22C	178.198	Plywood drum [(178.198-2(b)., with inside spec. 2TL polyethylene container not over 5 gallon capacity.
Calcium hypochlorite	6B, 6C 17E, 17H 37A, 37B	178.98, 178.99 178.116, 178.118, 178.131, 178.132	Metal barrels or drums Metal drums (single trip)
	35	178.16	Non-reusable, removable head polyethylene drum for use without overpack and not over 7 gallons capacity
	12B	178.205	Fiberboard box with not more than two inside minimum 30-gauge thick steel pails containing not over 26 pounds net weight each. Each cover must be gasketed.

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Hazardous Materials To Be Stored at
DRMO - Cannon Which Are Specifically
Regulated by DOT

Hazardous Material	DOT Container Code	Applicable DOT Regulatory Section	Container Description
Chromic acid Solution	1A	178.1	Glass carboy in a box. Not authorized for transportation by air.
	5,5A,5B	178.80, 178.81, 178.82	Metal barrel or drum with openings not exceeding 2-3 inches in diameter. Authorized for solutions containing chromic acid only.
	17E	178.116	Steel drum. Authorized for solutions containing chromic acid only.
(Not exceeding 35 percent by weight	21P	178.225	Fiber drum overpack with inside specification 25 or 25L polyethylene container.

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Flammable Liquids Not Specifically Provided For [49 CFR, 173.119]

Hazardous waste streams to be stored at DRMO-Cannon
that fall within this broad category of hazardous materials include:

Waste paint, enamel, lacquer	Toluene
Waste thinners	Xylene
Methyl ethyl ketone	Sealing compound
Acetone	Adhesive
Methyl alcohol	Cleaning compound

Approved containers to be used for storage of this material include:

DOT Container Code	Applicable DOT Regulatory Section	Container Description
5A, 5C	178.81, 178.83	Steel barrels or drums without removable heads
5B	178.82	Steel barrels or drums with removable heads
5M	178.90	Monel drums
17C	178.115	Single trip steel drums without removable heads
17E	178.116	Single trip steel drums without removable heads
6D	178.102	Cylindrical steel overpack, straight sided, for inside plastic container
2S	178.35	Polyethylene containers

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Corrosive Liquids Not Specifically Provided For [49 CFR 173.245]

Hazardous waste streams to be stored at DRMO-Cannon that fall within this broad category include:

Corrosion resistant
Carbon remover
Paint stripper
Bromochloromethane
2,4,5 Trichlorophenoxy acetic acid
Paint remover

Approved containers to be used for storage of this material include:

DOT Container Code	Applicable DOT Regulatory Section	Container Description
5A, 5C	178.81, 178.83	Steel barrels or drums without removable heads
5B	178.82	Steel barrels or drums with removable heads
5M	178.90	Monel drums
17C	178.115	Single trip steel drums without removable heads

Table D-1 (Continued)

Description of Containers To Be Used to Store
Hazardous Wastes at DRMO-Cannon

Corrosive Liquids Not Specifically Provided For [49 CFR 173.245]

Hazardous Waste streams to be stored at DRMO-Cannon that fall Within this broad category include:

DOT Container Code	Applicable DOT Regulatory Section	Container Description
17E	178.116	Single trip steel drums without removable heads
17F	178.117, 178.118	Single trip steel drums with removable heads
6D	178.102	Cylindrical steel overpack, straight sided, for inside plastic container
2S	178.35	Polyethylene containers
2SL	178.35a	Molded or thermoformed polyethylene containers
2U	178.24	Molded or thermoformed polyethylene containers having rated capacity of over 1 gallon, removable head containers, etc.

TABLE D-1 (Continued)

HAZARDOUS MATERIAL	DOT CONTAINER CODE	APPLICABLE DOT REGULATION SECTION	CONTAINER DESCRIPTION GENERAL PACKING REQUIREMENT
Trichloro-ethylene, Tetrachloro-ethylene, 1,1,1 Tri-chloroethane	None	173.805	IAW 49 CFR 173.605
Naptha Methyl alchol, Petroleum ether	Metal Drums 17C Various	173.119	IAW 49 CFR 173.119
Mercury	Various	173.860	IAW 49 CFR 173.860
Potassium dichromate, DDT	None	173.510	IAW 49 CFR 173.510
Zinc phos-phide	Various	173.365	IAW 49 CFR 173.365

slope towards a grated containment trench (150- or 82.5-gallon capacity each). The loading/unloading platform slopes to a drainage trench in the center (150-gallon capacity).

D.1.a(1) Basic Design parameters, Dimensions, and Materials of Construction [40 CFR 270.15(a)(1) and 264.175(b)(1); NM HWMR 302.A.4.b.(2)(a) and 206.D.4.f.(2)]

The concrete floors in each storage bay are sealed with a chemical resistant material, free of any cracks or gaps and sufficiently impervious to contain leaks and spills until the collected material is detected and removed. Appendix D-2 provides information on the sealant used on the concrete floors.

D.1.a(2) Description of How Design Promotes Drainage or How Containers Are Kept From Contact With Standing Liquids in Containment System [40 CFR 270.15(a)(2); NM HWMR 302.A.4.b.(2)(a)]

Each storage bay has a trench covered with a metal grate at the entrance to the bay. This trench is part of an 8-inch high continuous concrete curb encircling the perimeter of each storage bay. Each trench is designed to contain 82.5 or 150 gallons of spilled liquid. The concrete floors of each storage bay slope toward the trenches.

Small containers are in their original boxes or containers. In some cases, these are palletized. Shelving is provided for storage of small containers. Fifty-five gallon drums are stored on wooden pallets to facilitate loading/unloading activities, to inspect for container damage and to prevent contact with standing liquids.

D.1.a(3) Capacity of the Containment System Relative to the Number and Volume of Containers To Be Stored 40 CFR 270.15(a)(3) and 264.175(b)(3); NM HWMR 302.A.4.b.(2)(a)(i)C and 206.D.4.f.(2)

The total capacity of the containment system for each bay in the flammable/combustible storage area is 150 gallons. The maximum amount of materials that will be stored in one of these bays is 1320 gallons in 55-gallon drums and smaller containers.

The total capacity of the containment system for the smaller bays is 82.5 gallons. The maximum amount of materials that will be stored in one of these bays is 350 gallons in 55-gallon drums and smaller containers.

Thus the secondary containment system will be more than adequate to contain ten percent of the maximum storage volume in the event of a spill.

D.1.a(4) Provisions for Preventing or Managing Run-on 40 CFR 270.15(a)(4) and 264.175(b)(4); NM HWMR 302.A.4.b.(2)(a)(i)D and 206.D.4.f.(2)

The storage areas of the HWSF will be completely enclosed on all four sides, and covered with a roof. The floor of this facility will be composed of concrete, six inches thick, and the building will not be located in a 100-year floodplain. In view of these facts, no run-on into the containment system would be expected. In the event rainwater should accumulate in the collection trenches, it will be removed by a portable pump.

D.1.a(4)(a) Load/unload Area

The load/unload area is sloped away form the building to prevent run-on into the facility. Trucks back up into the building for loading/unloading. Spills would be controlled inside the building.

D.1.a(5) How Accumulated Liquids Can Be Analyzed and Removed to Prevent Overflow [40 CFR 270.15(a)(5) and 264.175(b)(5); NM HWMR 302.A.4.b.(2)(a)(i)E and 206.D.4.f.(2)]

Spilled or leaked waste will be removed from the containment trenches by using either absorbent material or a pump. Absorbent material used will be chemically inert (vermiculite, absorbent pads). Hand-held pumps will have 5-10 gallons per minute pumping capacity. Tubing will be compatible with material being removed. (Refer to Section 5: Emergency Equipment). Spilled liquids will be analyzed according to the hazardous designation of the particular bay with the spill and for the specific chemicals which resulted in the spill. The names of these chemicals will be evident from the container labels involved in the spill and/or from the log books kept onsite which record the name and location of all hazardous wastes stored at this facility. DRMO personnel assigned to handle hazardous materials and wastes will be trained to contain spills. (Refer to Section H - Personnel Training.)

D.1.b Containers Without Free Liquids [40 CFR 270.15(b); NM HWMR 302.A.4.b.(2)(a)(ii)]

All containerized wastes, regardless of whether or not they contain free liquids, will be stored in one of the 14 bays, some of which are equipped with an 8-inch-high concrete berm and a grated trench.

D.1.b(1) Test for Free Liquids [40 CFR 270.15(b)(1); NM HWMR 302.A.4.b.(2)(a)(ii)A]

Because all storage areas are equipped with secondary containment devices, all containers will be handled as if they contain free liquids and, therefore, will not be tested for the presence of free liquids.

D.1.b(2) Description of Storage Area Design and Operation to Drain and Remove Liquids or How Containers are Kept from Contact With Standing Liquids [40 CFR 270.15(b)(2), 264.175(c)(1) and (2): MM HWMR 302.A.4.b.(2)(a)(ii)B, 206.D.4.f.(3)]

Not applicable. Facility handles all containers as if they contain free liquids.

D.1.c Requirements for Ignitable or Reactive Wastes and Incompatible Wastes [40 CFR 270.15(c)] NM HWMR 302.A.4.b.(2)(a)(iii) and (iv), and 206.D.4.(f) and (g)

(1) Appendix B-2 demonstrates compliance with 40 CFR 264.176. Containers holding ignitable and reactive wastes will be stored in separate bays. The facility is located 2000 feet south of the nearest property line of Cannon AFB.

(2) Containers holding hazardous wastes that are incompatible with any waste or other materials stored nearby in other containers will be separated and protected by means of a berm [40 CFR 264.177(c)].

The identity and characteristics of all hazardous wastes are identified at the time they are received (refer to Section C.2), allowing the DRMO to store the wastes compatibly. Storage according to compatibility will serve as a precaution to prevent reactions which could (i) generate extreme heat, pressure, fire, explosions or violent reactions; (ii) produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment; (iii) produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

(iv) damage the structural integrity of the device or facility; or (v) threaten human health through other means [40 CFR 264.17(b) and (c)]. Appendix D-3 presents a summary of potentially incompatible waste materials/waste components and the adverse consequences which could result from mixing one group with another.

(3) Hazardous wastes will not be placed in unwashed containers that previously held incompatible waste or material [40 CFR 264.177(a)]. Any leaking containers will be repackaged in accordance with DOT regulations (49CFR) using new, unused containers.

Appendices C-1 and C-2 indicate the hazardous characteristics of the wastes based upon material safety data sheets and OSHA data sheets for chemicals which have been submitted to DRMO-Cannon. These lists are representative of hazardous materials and wastes which may be stored at the HWSF.

D.1.d Container Management [40 CFR 264.171-173: NM HWMR 206.D.4.b - 206.D.4.d.(2)]

No leaking or damaged containers will be accepted for storage at DRMO-Cannon. If a container holding hazardous wastes should begin rusting or leaking during storage at this facility, its contents will be transferred to another container which will be compatible with the requirements of 40 CFR 264.170: Use and Management of Containers. Containers holding waste are kept closed during storage, except when sampling is being performed. A container will not be opened, handled, or stored in a manner which may cause it to be ruptured or otherwise damaged.

Small containers are stored on the shelves in each bay. Drums are stored on wooden pallets and placed in a bay using a forklift. An aisle space of 10 feet in the larger bays and 4 feet in the smaller bays is provided. An aisle space of 10 feet between bays will be provided, which allows ample room for the operation of a fork-lift. The fork-lift used will be equipped with a spark-arrestor.

An 18" aisle space between pallets is maintained in order to inspect all containers for deterioration caused by corrosion or other factors. A maximum of three (3) drums (55 gal. size) will be stored on each wooden pallet. A storage plan is shown in Figure D-1.

Table D-1 lists the DOT packaging requirements for some of the chemicals listed in Appendix C-2 that will be stored at the HWSF.

D.2 Tanks 40 CFR 270.16; NM HWMR 302.A.4.b.(2)(b)

No tanks will be used for hazardous waste storage at DRMO-Cannon; there- fore Section D-2 is not applicable.

D.3 Waste Piles 40 CFR 270.18; NM HWMR 302.A.4.b.(2)(d)

No waste piles will be used at this facility; therefore, Section D.3 is not applicable.

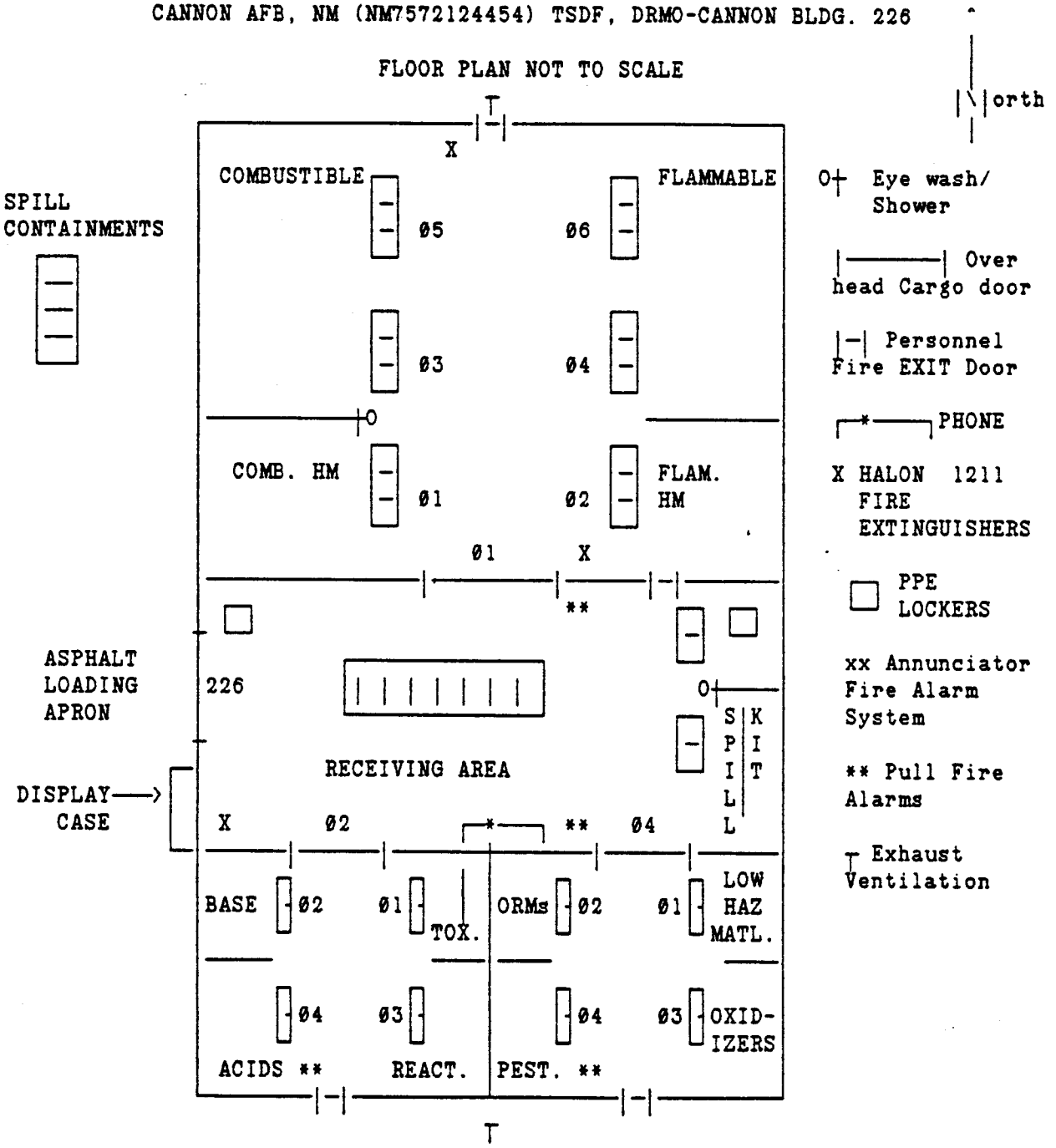
D.4 Surface Impoundments 40 CFR 270.17; NM HWMR 302.A.4.b.(2)(c)

Section D.4 is not applicable.

FIGURE D-1

CANNON AFB, NM (NM7572124454) TSDF, DRMO-CANNON BLDG. 226

FLOOR PLAN NOT TO SCALE



D.5 Incinerators [40 CFR 270.19; NM HWMR 302.A.4.b(2)(e)]

No incinerators will be used at this facility. Therefore Section D.5 is not applicable.

D.6 Landfills [40 CFR 270.21; NM HWMR 302.A.4.b(2)(g)]

No hazardous wastes will be landfilled at DRMO-Cannon. All wastes will be containerized and stored inside the storage facility; therefore, Section D.6 is not applicable.

D.7 Land Treatment [40CFR 270.20; NM HWMR 302.A.4.b(2)(f)]

There will be no land treatment of hazardous wastes; therefore Section D.7 is not applicable.

D.8 Thermal Treatment [40 CFR 265.382; NM HWMR 206.c.11.f]

This section is handled under a separate EPA ID Number.

Appendix D-1

Department of Transportation and Corresponding Military Container Specifications

CONTAINER SPECIFICATIONS

DOT Specification	DOT Section	Federal and Military Specifications	DOT Title of Specification
1A	178.1	PPP-B-585, PPP-B-621	Boxed carboys.
1s	178.2	none	Boxed lead carboys.
1C	178.3	none	Carboys in kegs.
1D	178.4	PPP-B-621, PPP-B-601	Boxed glsss carboys.
1E	178.7	MIL-D-112	Glass carboys in plywood drums.
1EX	178.6	MIL-D-112	Glass carboys in plywood drums.
1H	178.13	none	Polyethylene carboys in log carbon steel of equivalent metal crates.
1K	178.14	none	Glass carboys cushioned with expandable polystyrene in wooden wire-bound box outside container.
1X	178.5	PPP-B-601, PPP-B-621	Boxed carboys, 5 to 6 gallons, for export only.
2A	178.20	MIL-C-38756	Inside containers; metal cans, pails and kits.
2C	178.22	PPP-B-636,Type CF-DW 275	Inside containers, corrugated fiberboard carton.
2D	178.23	UU-S-48	Inside containers, duplex paper bags.
2F	17B.25	PPP-C-96	Inside metal containers and liners.
2G	178.26	MIL-C-3955, MIL-C-12804	Inside containers, fiber cans and boxes.
2J	178.28	PPP-B-1055	Inside containers, waterproof paper bags for linings.
2K	178.29	none	Inside containers, paper bags for lining.
2L	178.30	none	Lining for boxes.
2M	178.31	none	Waterproof paper lining.
2N	178.32	none	Inside containers, metal can.
2P	178.33	none	Inside nonrefillable metal containers.
2Q	178.33A	none	Inside nonrefillable metal containers.
2R	178.34	none	Inside metal containers, metal tubes.
2S	178.35	MIL-D-40030.Styles A&B	Polyethylene containers.
2SL	178.35a	PPP-C-569	Molded or thermoformed polyethylene container.
2TL	178.27	none	Polyethylene container.
2T	178.21	none	Polyethylene container.
2U	178.24	none	Molded or thermoformed polyethylene containers having rated capacity of over 1 gallon, removable head containers, etc.
3A	178.36	MIL-C-7905. MIL-C-11732	Seamless steel cylinders, or 3AX; seamless steel cylinders of capacity over 1,000 pounds water volume.

DOT Specification	DOT Section	Federal and Military Specifications	DOT Title of Specification
3AA	178.37	RR-C-901, MIL-C-11732, MIL-C-7905	Seamless steel cylinders made of definitely prescribed steels or 3AAX; seamless steel cylinders made of definitely prescribed steels of capacity over 1000 pounds water volume.
3B	178.38	none	Seamless steel cylinders.
3BN	178.39	none	Seamless nickel cylinders.
3C	178.40	none	Seamless steel cylinders.
3D	178.41	none	Seamless steel cylinders.
3E	178.42	none	Seamless steel cylinders.
3A 480X	178.43	none	Seamless steel cylinders.
3H.T	178.44	none	Inside containers, seamless steel cylinders for aircraft use made of definitely prescribed steel.
4	178.48	none	Forge-welded steel cylinders.
4A	178.49	none	Forge-welded steel cylinders.
4AA-480	178.56	MIL-C-11733	Welded steel cylinders made of definitely prescribed steels.
4B	178.50	RR-C-910	Welded and brazed steel cylinders.
4BA	178.51	none	Welded or brazed steel cylinders made of definitely prescribed steels.
4B-240-ET	178.55	none	Welded and brazed cylinders made from electric resistance welded tubing.
4B-240-FLW	178.54	none	Welded or welded and brazed cylinders with fusion-welded longitudinal seam.
4BW	178.61	none	Welded steel cylinders made of definitely prescribed steels with electric arc welded longitudinal seams.
4C	178.52	none	Welded and brazed steel cylinders.
4D	178.53	none	Inside containers, welded steel for aircraft use.
4DA	178.58	none	Inside containers, welded steel for aircraft use.
4DS	178.47	none	Inside containers, welded stainless steel for aircraft use.
4E	178.68	RR-C-910	Welded aluminum cylinders.
4L	178.57	none	Welded cylinders, insulated.
5	178.80	PPP-P-704,Type I,Clsss 8 and 12	Steel barrels or drums.
5A	178.81	PPP-D-700, Type I	Steel barrels or drums.
5B	178.82	PPP-D-729,Type I;PPP-D-705,Type 1;Class 8 & 12	Steel barrels or drums.
5C	178.83	PPP-D-700, Type II	Steel barrels or drums.
5D	178.84	PPP-D-700, Type III	Steel barrels or drums, lined.

DOT Specification	DOT Section	Federal and Military Specifications	DOT Title of Specification
5F	178.85	none	Steel drums.
5H	178.87	none	Steel drums or drums, lead-lined.
5K	178.88	none	Nickel barrels or drums.
5L	178.89	MIL-C-1283, 5 gal cans	Steel barrels or drums.
5M	178.90	none	Monel drums.
5P	178.92	none	Lagged steel drums.
5X	178.91	none	Steel drums, aluminum-lined.
6A	178.97	PPP-D-736	Steel barrels or drums.
6B	178.98	PPP-D-736	Steel barrels or drums.
6C	178.99	none	Steel barrels or drums.
6D	178.102	none	Cylindrical steel overpack, straight sided for inside plastic container.
6J	178.100	none	Steel barrels or drums.
6K	178.101	none	Steel barrels or drums.
6L	178.103	none	Metal container for fissile radioactive material.
7A	178.350	none	General packaging, Type A
8	178.59	MIL-C-3701	Steel cylinders with approved porous filling for acetylene.
8AL	178.60	MIL-C-3701	Steel cylinders with approved porous filling for acetylene.
9	178.63	none	Inside containers, seamless or welded or brazed steel cylinders.
10A	178.155	none	Wooden barrels and kegs (tight).
10B	178.156	none	Wooden barrels and kegs (tight).
10C	178.157	none	Wodded barrels and kegs (tight).
11A	178.160	NN-K-231	Wooden barrels and kegs (slack).
11B	178.161	NN-K-231	Wooden barrels and kegs (slack).
12A	178.210	none	Fiberboard boxes.
12B	178.205	PPP-B-636,Type CF or SF	Fiberboard boxes.
12C	178.206	PPP-B-636,Type CF or SF	Fiberboard boxes.
12D	178.207	none	Fiberboard boxes.
12E	178.208	none	Fiberboard boxes.
12H	17B.209	none	Fiberboard boxes.
12P	178.211	none	Fiberboard boxes, nonreusable containers for one inside plastic container greater than 1 gallon capacity, etc.
12R	178.212	none	Paper-faced expanded Polystrene board boxes, nonreusable containers.
13	178.140	none	Metal kegs.
13A	178.141	none	Metal drums.
14	178.165	none	Wooden boxes, nailed.
15A	178.168	PPP-B-621,Styles1,2,2.5, 3,6,and 7.	Wooden boxes, nailed.
15B	178.169	PPP-B-621,Styles1,2,2.5, 3,6,and 7.	Wooden boxes, nailed.
15C	178.170	PPP-B-621,Styles1,2,2.5, 3,6,and 7.	Wooden boxes, nailed.

DOT Specification	DOT Section	Federal and Military Specifications	DOT Title of Specification
15D	178.171	PPP-B-621,Styles1,2,2.5, 3,6,and 7.	Wooden boxes, nailed.
15E	178.172	none	Wooden boxes, fiberboard lined.
15L	178.176	none	Wooden boxes with inside containers for desensitized liquid explosives.
15M	178.177	none	Wooden boxes, metal lined, with inside containers for desensitized liquid explosives.
15P	178.182	none	Glued plywood, or wooden box for inside containers.
15X	178.181	none	Wooden boxes for two 5 gallon cans.
16A	178.185	PPP-B-585	Plywood or wooden boxes, wirebound.
16B	178.186	PPP-B-585	Wooden boxes, wirebound.
16D	178.187	PPP-B-585	Wooden wirebound overwrap for inside containers.
17C	178.115	PPP-P-704;Type I,Class 4 and 11	Steel drums.
17E	178.116	PPP-D-729;PPP-D-705, Type I and II;PPP-P-704,Type I,Class 3 & 9.	Steel drums.
17F	178.116	none	Steel drums.
17H	178.118	PPP-D-729,Type IV;PPP-D-705,Type V;PPP-P-704,Type II, Class 8.	Steel barrels or drums.
17X	178.119	none	Steel barrels or drums.
18B	178.193	none	Wooden kits.
19A	178.190	PPP-B-601	Wooden boxes, glued plywood, cleated.
19B	178.191	none	Wooden boxes, glued plywood, nailed.
21P	178.225	none	Fiber drum, overpack for inside plastic container.
21C	178.224	none	Fiber drums.
22A	178.196	none	Wooden drums, glued plywood.
22B	178.197	none	Wooden drums, glued plywood.
22C	178.198	none	Plywood drum for plastic inside container.
23F	178.214	PPP-B-636,Type CF & SF	Fiberboard boxes.
23G	178.218	none	Special cylindrical fiberboard box for high explosives.
23H	178.219	PPP-B-636, Type SF	Fiberboard boxes.
28	178.8	none	Metal jacketed lead carboys.
28A	178.9	none	Metal jacketed lead carboys.
29	178.226	PPP-T-495, Type 1	Marking tubes.
31	178.15	none	Jugs in tubs.
32A	178.146	MIL-C-3082, Style C	Metal cans, riveted or locked seamed.
32B	178.147	none	Metal cases, welded or riveted.
32C	178.149	none	Metal trunks.
32D	178.148	none	Metal boxes for old and worn-out motion picture film no longer exhibitable.

DOT Specification	DOT Section	Federal and Military Specifications	DOT Title of Specification
33A	178.150	none	Polystyrene cases, nonreusable containers.
34	178.19	HIL-D-43703	Reusable molded Polyethylene container for use without overpack, removable head not authorized.
34B	178.12	none	Aluminum carboys.
36A	178.230	PPP-B-35	Lined cloth bags (triplets).
36B	178.233	PPP-B-35	Burlap bags, lined.
36C	178.234	PPP-B-35	Burlap bags, paper lined.
37A	178.131	PPP-D-705;PPP-P-704, Type II,Class 1,3,& 5.	Steel drums.
37B	178.132	none	Steel drums.
37C	178.135	none	Steel drums.
37K	178.130	none	Steel drums.
37M	178.134	none	Cylindrical steel overpack, straight sided for inside plastic container; nonreusable containers.
37P	178.133	PPP-C-1337	Steel drums with Polyethylene liner.
40	178.66	none	Inside containers, non-refillable seamless or welded or brazed steel cylinders.
41	178.67	none	Inside containers, non-refillable seamless or welded or brazed steel cylinders.
42B	178.107	none	Aluminum drums.
42C	178.108	none	Aluminum barrels or drums.
42D	178.109	none	Aluminum drums.
42E	178.136	none	Aluminum drums.
42F	178.110	none	Aluminum barrels or drums.
42G	178.111	none	Aluminum drums.
42H	178.112	none	Aluminum drums, removable head containers not authorized.
43A	178.18	none	Rubber drums.
44B	178.236	none	Multiwall paper bags.
44C	178.237	none	Multiwall paper bags.
44D	178.238	none	Multiwall paper bags.
44E	178.239	none	Multiwall paper bags.
44P	178.241	none	All plastic bags.
45B	178.240	none	Bags, cloth and paper, lined.

Source: DLAM 4145.3 (CH-4) Attachment 2, 6 November 1981.

Appendix D-2

Specifications for Chemical Sealant

CONO/GLAZE 222

High Chemical Resistant Epoxy Coating

CON/CHEM

DESCRIPTION

CONO/GLAZE 222 is a high build, two-component, 99% solids epoxy, formulated for superior resistance to a wide range of chemicals. This product provides excellent protection at elevated temperatures and for higher concentration chemical exposure - especially inorganic acids, chlorinated and aromatic solvents, fuels and caustics. CONO/GLAZE 222 is airless spray applied at 10-15 mils per coat, and cures to a smooth, high gloss finish. Consult your Con/Chem Representative with the specific requirements of your coating project.

GENERAL USES

CONO/GLAZE 222 is recommended for protection of steel, concrete and other construction materials in corrosive environments. The product provides superior protection of surfaces against splash, spillage and fumes of most chemicals in severe service areas in power plants, mining, plating, secondary oil recovery, metal finishing, electronics, aerospace, drug and pharmaceutical, and other facilities where maximum chemical or temperature resistance is required. Specify CONO/GLAZE 222 for lining applications in tanks, sumps, trenches, ducts, as well as FGD equipment at fossil fuel power plants.

For most lining applications, CONO/GLAZE 222 is recommended as a topcoat for the Fibre/Crete 214, high build, reinforced epoxy lining. On floor surfaces, CONO/GLAZE 222 is often used as a topcoat on our Cono/Crete 116 epoxy mortar surfacer, for improved chemical resistance in constantly wet areas.

FEATURES

- Ultra-high chemical and heat resistance.
- Airless spray, brush or roller application.
- Epoxy adhesion, ambient temperature cure.
- Wet-to-dry cure at same thickness.
- Dry heat resistance exceeds 350°F.
- Virtually solvent-free application safety.

PRODUCT DATA

CONO/GLAZE 222 is available in 1 gallon, 3-gallon and 5-gallon units - total yield, mixed. Nominal applied thickness is about 12 mils per coat at the application rate of 130-140 square feet per gallon. Standard colors are beige and gray. This material is formulated for high chemical resistance and is not color stable.

During application and cure, surface and air temperatures must be not less than 50°F. nor more than 100°F., and at least 5°F. above the dew point. Long term storage temperature must be above 50°F., with storage at not less than 70°F. one week prior to use. During application, all materials must be maintained at 70°-90°F.

SURFACE PREPARATION

All surfaces must be clean, dry and physically sound. Steel surfaces to be coated must be abrasive blasted to a "white metal" finish (SSPC-SP5), or "near white" (SSPC-SP10) for non-immersion surfaces. The surface profile must exceed 2 mils. Concrete surfaces to be coated must be free of voids, "bug holes", and other defects, and must be etched and cleaned as required to remove surface laitance and other contamination. CONO/GLAZE 222 will adhere and perform satisfactorily when applied over most types of existing coatings that are clean and physically sound, with no surface gloss. Apply a small section and test for adhesion before proceeding. Consult your Con/Chem Representative for a specific recommendation regarding surface preparation and the appropriate primer.

MIXING AND APPLICATION

CONO/GLAZE 222 is mixed in whole units with a slow speed, heavy-duty electric or air drill fitted with a "Jiffy" type paint mixing paddle. The mixed material is spray applied using airless spray equipment having a 30:1 or greater ratio. The product may also be brushed or rolled in confined areas. Consult the Cono/Glaze System Application Instructions for complete mixing and application information.

TECHNICAL DATA

Resin Type	Epoxy/amine.
Solids by Volume	99%.
Thickness Range	10-12 mils nominal.
Application Methods	Airless spray, roller, brush.
Pot Life @ 70°F., 50% R.H.	50-60 min.
Initial Set Time @ 70°F., 50% R.H.	5-8 hrs.
Cure Time For Service	24-72 hrs.
Recoat Time @ 70°F., 50% R.H.	8-48 hrs.
Colors	Gray, beige.
Thinner	NC65 or MEK.
Cleaner	MEK.
Storage Life	One year in unopened containers.

WARRANTY

We warrant that our products have been manufactured to conform to the quality control specifications of Con/Chem, Inc. Our sole liability hereunder is limited to the replacement of the products or, at our option, refund of the purchase price, if we find that products delivered are defective in manufacture. In no event shall we be liable for consequential or any other damages, direct or indirect. The technical data and information furnished about our products is accurate to the best of our knowledge, but does not constitute any representation or warranty. WE DISCLAIM ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Acceptance of delivery of our products constitutes acceptance by the purchaser of the terms of this Warranty, contrary provisions of purchase orders or any other statements notwithstanding. No representative of Con/Chem, Inc. is authorized to make any representation or warranty or assume any other liability on our behalf in connection with any sale of our products, their application or installation.

CON/CHEM, INC., 12923 Cerise Avenue, Hawthorne, CA 90250 Phone: (213) 679-3396

Appendix D-3

Incompatible Wastes .

Appendix D-3
Incompatible Wastes

The mixing of a Group A waste with a Group B waste may have the potential consequences as noted.

Group 1-A	Group 1-B
Acetylene sludge	Acid sludge
Alkaline caustic liquids	Acid and water
Alkaline cleaner	Battery acid
Alkaline corrosive liquids	Chemical cleaners
Alkaline corrosive battery fluids	Electrolyte, acid
Caustic wastewater	Etching acid liquid or solvent
Lime sludge and other corrosive alkalides	Liquid cleaning compounds
Lime wastewater	Pickling liquor & other corrosive acids
Lime and water	Sludge acid
Spent caustic	Spent acid
	Spent mixed acid
	Spent sulfuric acid

Potential consequences: Heat generation, violent reaction.

Appendix D-3 (Continued)
Incompatible Wastes

The mixing of a Group A waste with a Group B waste may have the potential consequences as noted.

Group 2-A	Group 2-B
Aluminum Beryllium Calcium Lithium Magnesium Potassium Sodium Zinc powder & other reactive metals & metal hydrides	Any waste in Group 1-A or 1-B

Potential consequences: Fire or explosion: generation of flammable hydrogen gas.

Group 3-A	Group 3-B
Alcohols Water	Any concentrated waste in Groups 1-A or 1-B Calcium Lithium Metal Hydrides Potassium Sodium SO_2Cl_2, $SOCl_2$, PCl_3, Ch_3SiCl_3 and other water-reactive wastes

Potential consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.

Appendix D-3 (Continued)
Incompatible Wastes

The mixing of a Group A waste with a Group B waste may have the potential consequences as noted.

Group 4-A	Group 4-B
Alcohols	
Aldehydes	Concentrated Group 1-A or 1-B Wastes
Halogenated hydrocarbons	
reactive organic compounds & solvents	Group 3-A Wastes
Unsaturated hydrocarbons	

Potential consequences: Fire, explosion or violent reaction.

Group 5-A	Group 5-B
Spent cyanide & sulfide solutions	Group 1-B Wastes

Potential consequences: Generation of toxic hydrogen cyanide or hydrogen sulfide gas.

Group 6-A	Group 6-B
Chlorates & other strong oxidizers	Acetic acid & other organic acids
Chlorine	
Chlorites	Concentrated mineral acids
Chromic acid	Group 2-B wastes
Hypochlorites	Group 3-A wastes
Nitrates	Group 5-A wastes & other flammable & combustible wastes
Nitric acid, fuming	
Perchlorates	
Permanganates	
Peroxides	

Potential consequenses: Fire, explosion, or violent reaction.

SOURCE: "Laws, Regulations and Guidelines for Handling of Hazardous Waste" California Department of Health. February, 1975

Section F

PROCEDURES TO PREVENT HAZARDS

The information provided in this section is submitted in accordance with the requirements of 40 CFR 270.14 (b)(4),(5),(6),(8), and (9). Other regulations addressed to complete this section include 40 CFR 264.14, 264.15, 264.17, 264.194, and 264.254. New Mexico regulations addressed are 302.A.4.b.(1)(d), (e), (f) (h), and (i); 206.B.4, 206.B.5., 206.B.7., 206.D.5.d., and 206.D.7.e.

This section addresses general security provisions; inspection schedules; the spill prevention and containment plan; and the prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

F.1 Security

Security procedures to be implemented in order to prevent hazards are described below.

F.1.a Security Procedures and Equipment [40 CFR 270.11(b)(:) and 264.14; NM HWMR 302.A.1.b.(1)(d) and 206.B.1.]

A waiver of the security requirements is not requested.

F.1.a(1) 24-Hour Surveillance System [40 CFR 264.14(b)(1); NM HWMR 206.B.4.b.(1).

Cannon AFB is responsible for onsite security to control entry at all times through the gates or other entrances to the active portion of the entire installation. All entrances are manned 24 hours per day or are locked. Proper identification is required for entry.

The 27th Tactical Fighter Wing Security Police will continuously monitor the DRMO facility during hours of non-operation (1630-0730 hours). The procedures and personnel used will be determined by the Security Police.

F.1.a(2) Barrier and Means to Control Entry [40 CFR 264.14(b)(2)(i) and (ii); NM HWMR 206.B.4.b.(2).

F.1.a(2)(a) Barrier

A 6-foot-high metal chain-link fence, topped with three strands of barbed wire, will encircle the property of the DRMO and be equipped with two lockable gates.

F.1.a(2)(b) Means to Control Entry [40 CFR 264.14(b)(2)(ii)]

The DRMO facility has two gates which are locked except during hours of operation (0730-1630 hours). The gate from W Street has been designated for use by hazardous waste generators.

DRMO personnel control entry to the facility. Visitors and contractors are required to sign in. Doors to the facility are locked during nonduty hours and when not being used to gain entrance into the facility.

F.1.a(3) Warning Signs [40 CFR Section 264.14(c); NM HWMR 206.B.4.b.(.@).

Warning signs with the legend "Danger Unauthorized Personnel Keep Out" will be posted at each gate to the DRMO and on the storage facility. These signs will be visible from 25 feet and will be printed in English and Spanish.

F.1.b Walver [40 CFR 264.14(a); NM HWMR 206.B.4.a.]

Cannon AFB does not request a waiver.

F.2 Inspection Schedule [40 CFR 270.14(b)(5) and 264.15; NM HWMR 302.A.4.b.(1) and 205.B.5.]

Table F.1.a presents the General Inspection Schedule for inspecting safety and emergency equipment, security devices, operating and structural equipment, monitoring equipment, communication equipment, and mobile equipment at the HWSF. Items listed in Table F-1a are important because of their role in preventing, detecting, or responding to environmental or human health hazards.

F.2.a General Inspection Requirements [40 CFR 264.15(a) and (b) and 270.11(b)(5); NM HWMR 206.B.5.a. and b. and 302.A.4.b.(1)(e)]

DRMO-Cannon will conduct regular inspections at its HWSF for equipment malfunctions. structural deterioration, operator errors, and discharges that could cause or lead to the release of hazardous waste constituents and adversely affect the environment or threaten human health. Inspection log sheets are shown in Appendix F-1.

F.2.a(1) Types of Problems (40 CFR 264.15(b)(3); NM HWMR 206.B.5.b.(2).]

Table F-1a presents the schedules for inspecting monitoring equipment, safety and emergency equipment, security devices, operating and structural equipment. and the container storage areas. Items listed. in the tables are considered important because of their role in preventing, detecting, or responding to environmental or human health hazards. Provided with each item is a list of problems normally encountered.

F.2.a(2) Frequency of Inspection [40 CFR 264.15(b)(4); NM HWMR 206 B.5.C]

Also provided in Table F-1a is the frequency of inspection for each items. The frequency depends upon equipment deterioration, environmental or human health incidences, or equipment malfunction between inspections. The frequency of inspection will increase in these instances when problems are discovered. The loading/unloading dock will be inspected daily when in use.

Date:
Revision No.: 0
Section: F
Cannon

TABLE F-1a

GENERAL INSPECTION SCHEDULE

Area/Equipment	Specific Item	Types of Problems	Frequency of Inspection
Safety and Emergency Equipment	Standard industrial absorbents (Sorb-all, vermiculite, etc.)	Out of stock, saturated with water	Monthly/as needed
	Absorbent containment boom	Worn out, saturated with water	Monthly/as needed
	Flexible hoses with quick couple fittings	Cracks or holes, fittings stick	Monthly
	55-gallon drums (steel, stainless steel)	Corrosion, structural damage	Monthly
	Emergency shower and eyewash	Water pressure, leaking, drainage	Weekly
	Face shields and extra protective eyeglasses	Broken or dirty equipment	Monthly
	Disposable respirators	Out of stock, not designed to filter types of materials being stored	Monthly/as needed
	Portable sump pump	Power, clogging, not explosion-proof	Monthly
	Fire blankets	Torn, worn, or out of stock	As used
	Fire extinguishers	In need of recharging	Monthly/after each use

TABLE F-1a (Continued)

GENERAL INSPECTION SCHEDULE

Area/Equipment	Specific Item	Types of Problems	Frequency of Inspection
	Telephone system	Power failure	Per NFPA
	Generators	Fuel supply, spark plugs, oil	As used
	Emergency lighting system	Battery failure, lights	Per NFPA
	First aid equipment and supplies	Items out of stock or inoperative	As used
	Protective clothing (impermeable full body coveralls, gloves, and foot coverings)	Holes, normal wear and tear	As used
Security devices	Facility fence	Corrosion, damage to chain-link fence or barbed wire	Weekly
	Signs	Illegible	Weekly
	Container storage building doors	Locks missing	Weekly
	Main gate	Locking mechanism jammed	Daily
	Lighting	Burned out	Upon failure
Operating and structural equipment	Berms around storage bays	Cracks, deterioration	Weekly
	Floor or foundation	Erosion; uneven settlement; cracks and spalling in concrete pads, base rings and piers; wet spots	Weekly
	Loading/Unloading dock	Erosion; uneven settlement; cracks and spalling in concrete	Weekly
	Containment bays	Erosion; uneven settlement; cracks and spalling in concrete; wet spots	Weekly

Date:
Revision No.: 0
Section: F
Cannon

TABLE F-1a (Continued)

GENERAL INSPECTION SCHEDULE

Area/Equipment	Specific Item	Types of Problems	Frequency of Inspection
	Roofs	Leaks	Weekly
	Walls	Cracks	Weekly
	Containment Tank	Leaks	Weekly
Monitoring Equipment	Fire Detection System	Power failure	Weekly
Communication	Telephones	Power failure	per NFPA
	Radios	Power failure	Per NFPA
	Fire Alarms	Power failure	Per NFPA
Mobile Equipment	Brakes	Worn, pads, rotors	Per New Mexico State Inspection Schedule
	Hydraulics	Leaking	Weekly
	Trailer Hitches	Loose, missing safety chains	Prior to each use
	Lights-Running/Emergency	Burned out	Per New Mexico State Inspection Schedule
	Horns/Sirens	Inoperative	During use

F.2.b Specific Process Inspection Requirements [40 CFR 270.14(b)(5) and 264.15(b)(4); NM HWMR 302.A.4.(b)(1)(e) and 206.B.5.c]

Specific process inspection items to be discussed below are containers. Inspection of tanks, waste piles, impoundments, incinerators, landfills, thermal treatment,and land treatment facilities are not applicable to this permit application.

F.2.b(1) Container Inspection [40 CFR 264.174; NM HWMR 206.D.4.e.]

Inspections of the container storage area will be conducted weekly in accordance with Table F-1b by an employee trained in hazardous waste management procedures. (Refer to Section H of this document for details regarding personnel training.) Other information contained in Table F-1b includes a summary of the anticipated problems discovered during inspection of the containers and the frequency of inspection.

All results of the general (Section F.2.a) and specific process (Section F.2.b) Inspections will be recorded on log sheets (Appendix F-1) which will be stored at the DRMO. All items listed in Tables F-1a and F-1b will be inspected. Any item(s) not listed specifically on the inspection log sheet (DRMS Form 1713) may be added in one of the "other" or blank spaces. This form has been designed to allow for these types of modifications. Corrective actions may be annotated on the form.

Date:
Revision No.: 0
Section: F
Cannon

TABLE F-1b

SPECIFIC PROCESS INSPECTION SCHEDULE

Area/Equipment	Specific Item	Types of Problems	Frequency of Inspection
Container Storage Area	Container placement and stacking	Aisle space, height of stacks	Weekly
	Sealing of containers	Open lids	Weekly
	Labeling of containers	Improper identification, data missing	Weekly
	Containers	Corrosion, leakage, structural defects	Weekly
	Segregation of incompatible wastes	Storage of incompatible wastes in same area	Weekly
	Pallets	Damaged (e.g., broken wood, warping, nails missing)	Weekly
	Fence, gate and lock	Corrosion, damage to chain-link fence; sticking or corroding lock	Weekly
	Base or foundation	Cracks, spalling, uneven settlement	Weekly
	Dikes around containment bays	Cracks, deterioration	Weekly
	Debris and refuse	Aesthetics, possible reaction with leaks	Weekly
	Loading/Unloading dock	Cracks, spalling, uneven settlement, erosion	Weekly
	Warning signs	Damaged, illegible	Weekly
	Containment tank	Leaks	Weekly

F.2.b(2) Tank Inspection 40 CFR 264.194, NM HWMR 206.D.5.d.

This section is not applicable because.this facility will not store hazardous wastes in tanks.

F.2.b(3) Waste Pile Inspection 40 CFR 264.254, 270.14(b)(5) and 270.18(e); NM HWMR 206.d.7.e, 302.a.4.b.(1)(e) and 302.A.4.b.(2)(d)(v)

This section is not applicable because this facility will not maintain any waste piles.

F.2.b(4) Surface Impoundment Inspection 40 CFR 270.14(b)(5) and 270.17(d) and 264.226(b); NM HWMR 302.A.4.b.(1)(e), 302.A.4.b.(2)(c)(iv) . and 206.D.6.d.(2).

This section is under nogotiations with EPA as to whether applicable or not.

F2.b(5) Incinerator Inspection 40 CFR 264.347; NM HWMR 206.D.8.q.

No incinerators will be maintained at this facility.

F.2.b(6) Landfill Inspection 40 CFR 270.21(d), 264.15(a) and 264.303; NM HWMR 302.A.4.b.(2)(q)(iv), 206.B.5.a., 206.D.10.d

No landfills will be used at this facility.

F.2.b(7) Land Treatment Inspection [40 CFR 270.20(c)(5) and 264.273(q); NM HWMR 302.A.4.b.(2)(f)(iii)E and 206.D.9.d.(7)]

No land treatment of wastes will occur at this facility.

F.2.b(8) Thermal Treatment

NOT APPLICABLE UNDER THIS EPA ID NUMBER.

F.2.c Remedial Action [40 CFR 264.15(c); NM HWMR 206.B.5.d.]

If inspections reveal that non-emergency maintenance is needed, immediate action(s) will be initiated to preclude further damage and to reduce the need for emergency repairs. If a hazard is imminent, or has already occurred during the course of an inspection, or at any time between inspections, then remedial action(s) will immediately be taken. Appropriate authorities will be notified according to the Contingency Plan (Section G).

In the event of an emergency involving the release of hazardous constituents to the environment, efforts will be directed towards containing the hazard, removing it, and subsequently decontaminating the affected area. These procedures are also outlined in Section G.

F.2.d. Inspection Log 40 CFR 264.15(d) and 264.73(b)(5); NM HWMR 206.B.5.e. and 203.C.2.c

The inspection log form DRMS 1713 will be kept onsite at the DRMO for at least three years. Appendix F-1 indicates that the inspection log requires the date of inspection, the time of inspection, the name of the inspector, the items inspected, a notation of the observations made, and the date and nature of any repairs or other remedial actions. This information is provided to 27 CSG/DEEV on a quarterly basis.

F.3 Waiver of Preparedness and Prevention Requirements 40 CFR 270.14(b)(6); NM HWMR 302.A.4.b.(1)(f)

This applicant does not request a waiver of the preparedness and prevention requirements under 40 CFR 264, Subpart C. Requirements of this subpart are addressed in Sections D, F, and G of this application.

F.3.a Equipment Requirements 40 CFR 264.32; NM HWMR 206.B.9.c.

Internal and external communications, emergency and fire control equipment are discussed in Sections G.

F.3.b Aisle Space Requirement [40 CFR 264.35; NM HWMR 206.B.9.q.]

Aisle space requirements are addressed ln Sections D.1.d and F.5.d.

F.4 Preventive Procedures, Structures, and Equipment [40 CFR 270.14(b)(8); NM HWMR 302.A.4.b.(1)(h)]

See Section G.5.

F.4.a Unloading Operations [40 CFR 270.14(b)(8)(i); NM HWMR 302.A.4.b.(1)(h)(i)]

Some of the waste from onsite will be transported on pallets by a forklife and placed directly into storage bays. When waste is transported by truck, drums will be stored on wooden pallets that can easily be loaded or unloaded using a forklift. All drums, loaded or unloaded, will be sealed. In the event of a spill, the hazardous waste will be contained by absorbent material. All contaminated spill materials will be drummed, labeled, and stored in order to arrange for disposal at a permitted hazardous waste landfill.

The loading/unloading dock will be inspected daily, if used, for erosion, cracks, and evidence of spillage or leakage. Results will be entered on the inspection log.

F.4.b Runoff 40 CFR 270.14(b)(8)(ii); NM HWMR 302.A.4.b.(1)(h)(ii)

All hazardous wastes/materials will be loaded on the loading dock located in the HWSF.

All containerized wastes will be stored inside the storage bays, each equipped with a spill containment trench, as well as 8-inch-high berms. No runoff is anticipated as a result of the design of the HWSF.

F.4.c Water Supplies 40 CFR 270.14(b)(8)(iii); NM HWMR .02.A.4.b.(1)(h)(iii)

The water supply for Cannon AFB is taken from wells located on the base. Three wells are located within 1000 feet of the HWSF. The only surface water on the base consists of shallow depressions of playas. The largest of these is called Playa Lake. None are located within 1000 feet of the HWSF.

The design of the storage facility eliminates the likelihood of surface water or groundwater contamination.

F.4.d Equipment and Power Failure [40 CFR 270.14(b)(8)(iv); NM HWMR 302.A.4.b.(1)(h)(iv)]

No automatic waste feed system will exist at either facility. In the event of a brief power interruption all storage activities will cease until power can be restored.

F.4.e Personnel Protection Equipment [40 CFR 270.14(b)(8)(v); NM HWMR 302.A.4.b.(1)(h)(v)]

A description of available protective equipment is presented in Section G. The use of protective equipment is covered in the Property Disposal Hazardous Materials Coarse (Section H). The information in these two sections indicates that any operations such as bulking and consolidation of hazardous wastes will only be accomplished by personnel wearing the appropriate protective equipment. Equipment will include, but not be limited to protective gloves, eye and face guards, overalls, and boots. Depending on the hazard associated with the particular material being handled and its volatility, appropriate respiratory protection will also be required.

Prior to handling any hazardous wastes at the storage facility, the Disposal Turn-in Document (Figure C-1), HMIS data, chemical analysis, MSDS and/or other reference will be reviewed by the Fire Department, Bioenvironmental Engineer, and Safety for the particular waste stream in question to determine which safety equipment will be utilized.

F.5 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes

F.5.a Precautions to Prevent Iqnition or Reaction of Ignitable or Reactive Wastes [40 CFR 270.14(b)(9) and 264.17(a) and (c); NM HWMR 302.A.4.b.(1)(i) and 206.B.7.a. and c.]

Containers, as discussed in Section D.1, will be compatible with the contained wastes; therefore, the only source of ignition will be external to the containers.

Hazardous wastes received at the HWSF will be in non-leaking containers, safe to handle, and will comply with DOT container regulations (49 CFR Parts 173, 178 and 179). This will further minimize the potential for ignition and reaction of hazardous wastes.

Wastes will be separated at the storage facility and protected from sources of ignition or reaction, such as open flames, smoking, cutting and welding, hot surfaces, frictional heat, and sparks (static, electrical, or mechanical). Wastes will be classified as ignitables, reactives, corrosives, toxics, acids and bases. These determinations will be based upon HMIS information, other standard hazardous material reference data, and/or lab analyses. (Refer to Section C.2 for more detail.) In order to prevent a possible source of external ignition, areas with drums containinq ignitable and reactive wastes will prominently display a sign clearly marked with the legend "No Smokinq." Spark-proof tools (brass hammers, wrenches, etc.) will be used on all containers storing ignitable materials.

F.5.b General Precautions for Handling Ignitable or Reactive Wastes and Mixing of Incompatible Wastes [40 CFR 264.17(b) and (c) and 270.14(b)(9); NM HWMR 206.B.7.b. and c. and 302.A.4.b.(1)(i)]

General precautions for handling ignitable or reactive wastes were discussed previously in Section F.5.a. Wastes are not mixed at the storage facility. Furthermore, incompatible wastes with the same hazardous waste characteristic will not be stored in the same bay.

The publication #DPDS-M 6050.1, Environmental Considerations in the DRMS Disposal Process, Change 10, added Chapter 11, "Storage Compatibility." This publication is at the DRMO to assist personnel in determining the compatibility of wastes. Appendix F-1, which is from this manual, presents a list of chemical substances and their hazardous characteristics.

F.5.c Management of Ignitable or Reactive Wastes in Containers [40 CFR 270.15(c) and 264.176: NM HWMR 302.A.4.b.(2)(a)(iii) and 206.D.4.q.]

The maps presented in Section B of this permit application illustrate that the HWSF will be located 2000 feet south of the nearest property line of Cannon AFB and, therefore, will be in compliance with the National Fire Code Standards for container storage holding ignitable or reactive wastes.

F.5.d Management of Incompatible Wastes in Containers [40 CFR 270.15(d) and 264.177(a); NM HWMR 302.A.4.b.(2)(a)(iv) and 206.D.4.h.(1)]

Incompatible wastes or materials will not be mixed at the DRMO. Containers will be segregated by waste type (Sections C.2.a and F.5.a) and stored in the appropriate storaqe bays containing similar waste types. Each bay will have a bermed containment system to prevent mixing of spilled or leaked material or runoff containing waste residues from other storage bays. Wooden pallets with containers will not be stacked. Containers will normally remain in the HWSF until removed by a contractor for disposal. Aisle space will be maintained to allow access for a forklift in the event removal is required at and time due to corrosion, leakage, etc.

F.5.e Management of Ignitable or Reactive Wastes in Tanks [40 CFR 270.16(b) and 264.198(a); NM HWMR 302.A.4.b.(2)(b)(vi) and 206.D.5.f.(1)]

This section is not applicable because DRMO-Cannon will not store hazardous wastes in tanks.

F.5.f Management of Incompatible Wastes in Tanks [40 CFR 264.199(b) and 270.16(f); MM HWMR 206.D.5.q.(2) and 302.A.4.b.(2)(b)(vi).

This section is not applicable because DRMO-Cannon will not store hazardous wastes in tanks.

F.5.g Ignitible or Reactive Wastes in Waste Piles [40 CFR 264.17. 264.256 and 270.18(q);NM HWMR 206.B.7, 206.D.7.f., and 302.A,.4.b.(2)(b)(vii)]

DRMO-Cannon will not have any waste piles; therefore, this section is not applicable.

F.5.h Incompatible Wastes in Waste Piles [40 CFR 264.257; [NM HWMR 302.A.4.b.(2)(d)(viii) and 206.D.7.q.]

This section is not applicable because this facility will not store hazardous wastes in waste piles.

F.5.i Ignitable or Reactive Wastes in Surface Impoundments NM HWMR 302.A.4.b.(2)(c)(viii)

NOT APPLICABLE UNDER NEGOTIATIONS WITH EPA

F.5.j Incompatible Wastes in Surface Impoundment NM HWMR 302.A.4.b(2)(c)(ix)

NOT APPLICABLE UNDER NEGOTIATIONS WITH EPA

F.5.k Ignitable or Reactive Wastes in Landfills 40 CFR 264.312 and 270.21(f); NM HWMR 206.D.10.g and 302.A.4.b.(2)(q)(vi)

This facility will not manage a landfill for hazardous waste;therefore, this section is not applicable.

F.5.1 Incompatible Wastes in Landfills 40 CFR 264.313 and 270.21(q); NM HWMR 206.D.10.h. and 302.A.4.b.(2)(q)(vii)

This facility will not manage a landfill for hazardous waste; therefore,this section is not applicable.

F.5.m Liquid Wastes in Landfills [40 CFR 270.21(h) and 264.314(a): NM HWMR 302.A.4.b.(2)(q)(viii) and 206.D.10.i.]

This facility will not manage a landfill for hazardous waste; therefore, this section is not applicable.

F.5.n Special Requirements for Containers Disposed in Landfills [40 CFR 264.314, 264.315, 264.316 and 270.21(1); NM HWMR 206.D.10.i, 206.D.10.j.,206.D.10.k., and 302.A.4.b.(2)(q)(ix)]

This facility will not manage a landfill for hazardous waste;

therefore, this section is not applicable.

F.5.o Ignitable or Reactive Wastes in Land Treatment [40CFR 270.20(q), 264.281 and 264.17(b) : NM HWMR 302.A.4.b.(2)(f)(vii), 206.D.9.i., and 206.B.7.b.]

This facility will not conduct any land treatment activities; therefore , CFR 270.20 (g) and (h) [NM HWMR 302.A.4.b.(2)(f)(vii) and (viii)] are not applicable.

Appendix F-1

Inspection Log Sheets

INSPECTION LOG

(Prescribing Authority: DRMS M 6050.1)

DATE/TIME	AREA/BLDG *(Specify when HM/HW is stored off site of DRMO)*	SIGNATURE OF INSPECTOR	LEGEND NA - Not applicable

ITEM	TYPE OF PROBLEM	SAT	UN-SAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECT ACTION	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
Face shield & Goggles	Broken or dirty						weekly
Protective clothing	Holes worn						weekly
Absorbents (eg. sorb-all Vermiculite)	Out of Stock; Saturated with water						weekly
Empty drums/containers	Corrosion structural damage						weekly
Emergency eyewash/shower	Water pressures, leaking						weekly
Fire blankets	Torn, worn, missing						weekly
Ventilation systems	Not operating						weekly
Shovel nonsparking broom	Missing, damaged						weekly
Fire Extinguishers	Not charged						monthly
Fire Alarm System	Not operating						monthly
Telephone system	Not operating						monthly
First Aid equipment and supplies	Items out of stock, not sterile						monthly
SECURITY							
Fences, Gates	Signs of tampering						weekly*
Signs	Illegible						weekly
Lighting	Burned out						weekly
Building doors, locks	Locks missing, unlocked						weekly*

DRMS Form 1713 Sep 88 *Daily when in use *(Previous edition may be used until exhausted.)*

Page 1 of 3

DRMO Inspection Log, Form 1713

ITEM	TYPE OF PROBLEM	SAT	UN SAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECT ACTION	FREQUENCY
BUILDING							
Load/unload area General debris & refuse	Aesthetics, obstruction						weekly*
Odor, fumes	Present						weekly*
Bases or foundation, containment trenches, ramps, roof, walls	Wet spots from containers						weekly*
	Leaks from roof/wall						weekly*
	Structural integrity, e g. erosion; uneven settlement, cracks and spalling in concrete						yearly
CONTAINER STORAGE AREA							
Containers	Corrosion leaking structural defects						weekly*
General debris & refuse	Aesthetics, obstruction						weekly*
Containment area coating/sealant	Cracks, worn spots, presence of accumulated liquids						weekly*
Load/unload area	Leaks, incorrect position spots indicating spills						weekly*
Container placement and stacking	Insufficient aisle space, heights of stacks excessive						weekly
Sealing of containers	Open lids						weekly
Labeling of containers	Improper identification; data or label missing; not intact, or not readable						weekly
Segregation of incompatible wastes	Storage of incompatible wastes in same area						weekly
Pallets	Damaged (e g., broken wood, warping, nails missing)						weekly

*Daily when in use

ITEM	TYPE OF PROBLEM	SAT	UN SAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECT ACTION	FREQUENCY
MOBILE EQUIPMENT							
Breaks	Worn pads, rotors						PTEU**
Hydraulics	Leaking						PTEU**
Lights-running emergency	Not operational						PTEU**
Horns/sirens	Not operational						PTEU**
Battery	Not operational						PTEU**
Lubrication	Low level						PTEU**
Tires	Worn, low pressure						PTEU**
Safety equipment	Not operational						PTEU**
Instruments	Not operational						PTEU**
General condition	Deficiencies						PTEU**
Lift, shift, tilt, control mechanisms	Not functional						PTEU**
Accessories	Missing, inoperative						PTEU**

**PTEU Prior to each use but not more often than once per day

APPENDIX F-2

Environmental Considerations in the DRMO Disposal Process,

DPDS-M 6050.1, Change No. 10

dated 10 February 1984 - List of Chemical Substances

Basic Group	Comparable HMIS Code
F	F1, F2, F3, F4, F5, F6
B	B1, B2
T	P1, P2, T3, T4
A	C1, C2*
O	R1
R	R3
PCB	T2**
G	L1, N1, J1***

F. There are items in some HMIS categories which the DPDO does not normally accept (see DoD 4160.21-M Chapter VI and DPDS-H 4160.3 Volume I, Chapter III). These categories are as follows:

A	Radioactives
E1, E2, E3	Explosives Classes A, B, & C
T5	Etiological Agents
R4	Pyrophorics

* When storing acids (C1 & C2) make sure that they are kept separated when placing them in the same storage area.

** The PCBs are listed in HMIS as having storage code T2 and must be stored in a manner which is in compliance with the Toxics Substance Control Act (TSCA). Other bioaccumulatives (such as lead and other heavy metals) may be stored in the most appropriate way.

*** Those items which are in HMIS storage codes L1, N1, and J1 can normally be stored in general warehousing.

HMIS storage codes for gases are G1, G2, G3, G4, G5, G6, and G7. These gases will be stored in accordance to the guidance in DoD 4145.19-R-1.

The HMIS storage for carcinogens is T1. These will be stored in accordance with DLAM 1000.1.

On all items which carry an HMIS storage code of S1 (Special hazard/multiple hazard) call your regional environmentalist for storage guidance.

LIST OF CHEMICAL SUBSTANCES

A. This lists chemical substances that may be found in hazardous waste streams.

B. The list consists of three (3) columns. The first column lists the chemical or trade names of the materials in alphabetical order. The trade names are denoted by asterisks (*). The second column lists the synonyms or common names of the chemical substance when available. The third column lists the basic group to which the material is assigned. These include flammable (F), toxic (T), base (B), acid (A), oxidizer (O), reactive (R), and general warehousing (G). There are some chemicals which are listed as explosive (E) which the DPDO will normally not accept(see DoD 4160.21-M and DPDS-M 4160.3 Volume I). The double asterisk (**) after the BG denotes a strong reducing agent while a triple asterisk (***) behind the BG denotes a substance which will polymerize vigorously under certain conditions. When either (**) or (***) is encountered special storage, conditions may be necessary. Call your Regional Environmental Specialist for guidance on categories not identified.

NAMES	SYNONYMS	BG
Abate*		G
Acenaphthene		G
Acetamide		G
Acetaldehyde		F
Acetic Acid		A
Acetic anhydride		R
Acetone	Dimethyl ketone	F
Acetone cyanohydrin	Hydroxyisobutyronitrile	T
Acetonitrile	Methyl cyanide	F
Acetophenone		G
Acetoxybutane	Butyl acetate	F
Acetoxypentane	Amyl acetate	F
Acetyl acetone	2,4-Pentanedione	G
Acetyl azide		E
Acetyl benzoyl peroxide		O
Acetyl bromide		R
Acetyl chloride		R
Acetylene		F
Acetyl nitrate		E
Acetyl peroxide		O
Acrolein	Aqualin	F***
Acrylic acid		A***
Acrylonitrile		F***
Adhesive		F
Adhesive, liquid cement		F
Adhesive, plastic		G
Adhesive, rubber cemment		F
Adhesive, resin epoxy		G

NAMES	SYNONYMS	BG
Ethylene cyanohydrin	Hydroxypropionitrile	T
Ethylene diamine		T
Ethylene dibromide	Dibromoethane	T
Ethylene dichloride	Dichloroethane	F
Ethylene glycol		G
Ethylene glycol dinitrate	Glycol dinitrate	E
Ethylene glycol monomethyl ether		F
Ethyleneimine	Aziridine	F***
Ethylene oxide	Epoxyethane	F***
Ethyl formate		F
2-Ethylhexyl acrylate		F***
Ethyl mercaptan	Ethanethiol	F
Ethyl nitrate		E
Ethyl nitrite		E
Ethyl propionate		F
Ethyl trichlorosilane		R
Exothion	Endithion	T
Eugenol		F
Fensulfothion	Bayer 25141, Dasanit*	T
Ferbam		T
Ferric arsenate		T
Ferric sulfide		G
Ferrous sulfide		F**
Flouranthrene		F
Fluorent		F
Fluorine		R
Fluorine azide		E
Fluorine monoxide	Oxygen difluoride	R
Fluoroacetanilide		T
Fluoroacetic acid		A
Fluoroboric acid		A
Fluorosulfonic acid	Fluosulfonic acid	R
Fluosulfonic acid	Fluorosulfonic acid	R
Flusilicic acid		A
Fonofos	Dyfonate*	T
Formaldehyde	Methanal	F
Formamide		T
Formetanate hydrochloride		T
Formic acid	Methanoic acid	A
Fostion*	Prothoate	T
Freon*		T
Fumaric acid		A
Fumarin	Coumafuryl	T
Fumazone*	Dibromochloropropane	T
Furadan*	Carbofuran	T
Furan	Furfuran	F
Furfural		F

Section G

CONTINGENCY PLAN

The information contained herein is submitted in accordance with the requirements for a Contingency Plan, as contained in 40 CFR 270.14(b)(7), 264 Subpart D and 264.50 - 264.56, and NM HWMR 302.A.4.b.(1)(g), 206.B.10., and 206.8.10.b. - m.

G.1 General Information [40 CFR 264.52; NM HWMR 206.B.10.]

This Contingency Plan is for the Defense Reutilization and Marketing Office (DRMO) located on Cannon Air Force Base Clovis, New Mexico. The DRMO is owned by the United States Air Force and operated by the Defense Reutilization and Marketing Service (DRMS).

DRMO-Cannon will only store containerized wastes in a metal, enclosed building. An estimated 10,620 Gallons in 55-Gallon drums and smaller containers wlll be the maximum storage capacity at the HWSF. A general site plan and a full description of the facility are contained in SectIon B. A description of the wastes to be stored is provided in Section C, and the containment system is described in Section D.

G.2 Emergency Coordinators [40 CFR 264.52 (d) and 264.55; NM HWMR 206.B.10.g and 206.B.10.1]-

For spills or other emergency situations on Cannon AFB, an On-Scene Coordinator (OSC) and a Spill Response Team (SRT) will be deployed sequentially to the site, as required, to effectively carry out this plan.

A list of emergency coordinators is shown in Table G-1.

The On-Scene Coordinator (OSC) is the individual assigned the responsibility for directing and coordinating all spill response actions. The OSC will have the authority to utilize the expertise and resources of the Spill Response Team (SRT) in determining and performing response actions. Deployment of the SRT will be activated only if called by the OSC or his/her designate. The deployment of the SRT is effected to provide a coordinated response to contain, control, recover and restore the environment for all spills. Members of the SRT are shown in Table G-2. If necessary, the OSC will also contact the outside organizations and agencies that are listed in Table G-3.

TABLE G-1

Emergency Coordinators

Name and Title	Work Address	Home Address
On-Scene Coordinator: Commander, 27 CSG Col David E. Benson	27 CSG/CC Cannon AFB, NM 88103 (505)784-2761	1689 Crossbow Cir Cannon AFB, NM 88103 (505) 784-3102
First Alternate: Base Civil Engineer Lt Col Garry Earls	27 CSG/DED Cannon AFB, NM 88103 (505)784-2008	7726 Oklahoma Ct Cannon AFB, 88103 (505) 784-3694
Second Alternate: Base Fire Chief Wlllian W. Thomas	27 CSG/DEF Cannon AFB, NM 88103 (505) 784-4076	2101 Glenarm Clovis, NM 88101 (505) 762-4855
Environmental Coordinator Jimmie N. Rlchards	27 CSG/DEEV Cannon AFB, NM 88103 (505) 784-4639	Route 3 Box 538 Portales, NM 88130 (505) 356-4830
DRMO Environmentalist Vera Wood	DRMO Cannon Bldg 215 Cannon AFB, NM 88103 (505) 784-2435	324 Sandia Dr Clovis, NM 88101 (505) 763-5722

TABLE G-2

Spill Response Team

	SRT Organizations and Personnel	On-Duty Extension
1.	Commander 27th Combat Support Group (Primary OSC) Col David E. Benson	2761
2.	Base Civil Enqineer (1st Alternate OSC) Lt Col Garry Earls	2008
	CE Service Desk	2001
3.	Base Fire Department	On-base 4117 Off-base 784-4117
	Base Fire Chief (2nd Alternate OSC)	4076
4.	Environmental Coordinator	4639
5.	Bioenvironmental Engineer	4063
6.	Disaster Preparedness Office	4177
7.	Security Police	4111
8.	Liquid Fuels Maintenance Technician	2112
9.	Staff Judge Advocate and Legal Office	2211
10.	Public Affairs Office	4131
11.	Safety Office	2811
12.	Base Hospital (Emergency)	4033
13.	Transportation Squadron	2641
14.	Weather Squadron	2748
15.	Photographic Laboratory	2765
16.	DRMO Cannon	2435

TABLE G-3

Local, State, and Federal
Emergency Contacts

Clovis Police Department	769-1921
Clovis Fire Department	769-2185
National Response Center	(800) 424-8802
EPA Region VI	(214) 767-3274
New Mexico Health and Environment Department: 24-hour emergency number	(505) 827-9329
Hazardous Waste Section Mew Mexico Environmental Improvement Division	(505) 827-2929
CHEMTREC	(800) 424-9300
ETIS	Autovon - 970-6167 Comm. No. (904) 283-6167
Assoc. of American Railroads (Emergency Response Division)	(202) 293-4048
DOW Chemical Company (Emergency Division)	(517) 636-4400
Dupont (Emergency Response)	(302) 774-1000
Monsanto (Safety Office)	(618) 271-5835
National Foam Center (Emergency)	(215) 363-1400
Poison Control Center	(800) 432-6866
EPA Emergency Response Team	(201) 321-6660
HQ TAC Langley AFB VA/DEEV Environmental Coordinator	Duty Hours Autovon - 432-4430 Non-Duty Hours Autovon - 432-2224/2225

The personnel assigned to the SRT and their designated responsibilities are discussed in the following paragraphs.

(1) Commander 27CSG will:

Act as Primary On-Scene Coordinator responsible for directing and coordinating all spill response actions.

(2) Base Civil Engineer (BCE) will:

a. Act as first Alternate On-Scene Coordinator in the event the Commander, 27CSG is unavailable or delegates his/her responsibility to the BCE.

b. Provide an Environmental Coordinator to furnish technical expertise relative to pollution control techniques.

c. Within his capability, provide personnel, transportation and equipment for containment, cleanup, and restoration of landscape due to spills of oils and hazardous substances that exceed the capability of the base agency responsible for the spill.

d. Notify the Commander, 27CSG of personnel and equipment requirements that exceed base capability.

e. Plan, program, and construct interception devices, such as sawdust, and effective plugs for sewer-connected drains to prevent potential sources of pollution from emptying directly into the Cannon AFB sewage lagoons and Playa Lake next to Munitions Storage.

f. Provide suitable inventory and storage for pollution controlling chemical agent, absorbent materials, and control equipment not otherwise specified to be furnished by other units that are employed in combating pollution.

g. Provide a Liquid Fuels Maintenance technician to supply explosion hazard technical assistance to the OSC.

(3) Base Fire Chief will:

a. Act as the On-Scene Coordinator until the Commander 27CSG or BCE, or a desiqnated OSC, arrives at the spill scene. He/she will serve as second Alternate On-Scene Coordinator in the event the Commander 27CSG (the primary OSC), or the BCE (the 1st alternate OSC) is unavailable.

b. Direct Fire Department to record all spill reports received on a designated telephone log.

c. Immediately respond to spills as necessary to protect life and property with due regard for the environment.

d. Activate Disaster Preparedness, OPLAN 355-1, as necessary. This plan establishes procedures for response to major accidents, enemy attack and natural disasters affecting Cannon AFB. Major accidents include those involving nuclear or chemical munitions, biological research agents, and destruction or serious damage to an aircraft, components, materials, agents, or other dangerous material.

e. Direct emergency dispatch operator to notify Base Hospital if injuries are reported. The Base Civil Engineer or Environmental Coordinator will also be notified of the spill occurrence.

f. Provide technical assistance to the OSC concerning response to and handling of combustible or flammable substances.

(4) The Environmental Coordinator will:

a. Report to scene of spill immediately upon notification.

b. Evaluate the severity of spill and determine the response necessary for containment and recovery.

c. Advise the Commander 27CSG (OSC) and BCE as to the necessity for activation of the SRT.

d. On the authorization of the OSC, notify specifically requested members of the SRT or instruct the CE-Service Desk (Fire Department, non-duty hours) to notify these members to assemble at a designated area within 15 minutes of notification.

e. Furnish the OSC technical expertise relative to pollution control techniques.

(5) Bioenvironmental Engineer will:

a. Take periodic samples of all on-base waterways for background information.

b. Upon notification of a spill, and at the direction of the OSC, sample and test the Cannon AFB sewage lagoons for spill contaminants, if needed.

c. Provide technical assistance and advice to the OSC and the hospital with respect to the health hazards associated with oils and hazardous substances.

(6) Disaster Preparedness Officer will:

Ensure that the Cannon AFB Disaster Preparedness OPLAN 355-1 is coordinated with the SPR Plan in the event of a hazardous substance spill requiring the implementation of the OPLAN.

(7) Chief of Security Police will:

a. Instruct his organization to immediately respond to an actual or potential oil or hazardous substance spill, to isolate the spill area, and control traffic when and where necessary as directed by the OSC.

b. Insure that while individuals in the security force are on normal patrols, they are continuously aware of oil and hazardous substance spills and report all areas that appear to be suspect.

(8) The Liquid Fuels Maintenance Technician will report to the scene at the request of the OSC to measure explosive vapor concentrations, and determine where explosion hazards exist. This information will be provided to the OSC for use in establishing the cordon.

(9) Staff Judge Advocate will:

a. Respond to all oil and hazardous substance pollution spills at the request of the OSC to ensure that information, records, and samples adequate for legal purposes are obtained and safeguarded for future use.

b. Advise the OSC on the legal aspects of spill response when parties other than the Air Force are responsible for the spill.

(10) Public Affairs Officer will:

a. Respond to all oil or hazardous substance spills when requested by the OSC.

b. Keep abreast of all base actions during a spill so as to be able to provide prompt and accurate news releases on the nature of the discharge and the steps being taken to correct the problem. This policy must be followed to obtain understanding from the public, ensure cooperation from all interested parties, and to check the spread of misinformation.

c. Coordinate all news media releases involving base actions with the Wing Commander.

d. If the Regional Response Teams' News Office is activated, coordinate all news releases with them. If a Regional Response Team News Office is not activated, the EPA's Public Information Office can be contacted, if deemed appropriate (214) 767-3274.

(11) Safety Officer will:

Provide technical assistance to the OSC with respect to the safety of personnel.

(12) Base Hospital Commander will:

a. Insure that medical personnel and ambulance(s) are dispatched to the site of the spill as directed.

b. Insure that emergency treatment is rendered and injured personnel are removed to the Base Hospital for treatment.

c. Insure current and follow-up information on injured personnel is provided to the OSC as soon as possible.

d. Insure that hospital staff is familiar with health effects of hazardous substances present on the base.

(13) Transportation Officer will:

Provide OSC with transportation as required for spill response personnel and equipment.

(14) Weather Squadron Officer will:

Insure that the OSC is provided with up-to-date weather information as requested.

(15) Chief of Operations and Training will:

Insure that a photographer will document with photographs the extent of the spill and the containment, countermeasures, and restoration procedures utilized, as directed by the OSC.

(16) DRMO Environmentalist:

For spills occuring at the DRMO storage facility will furnish the Environmental Coordinator with information concerning type of material spilled and other property currently stored at the facility.

(17) In addition to the base organizations and personnel assigned to the response effort, provisions have been made for including off-base organizations in the response organization when on-base spill response resources and expertise are insufficient, and when off-base water, land, or air are adversely affected. Some of the significant off-base spill response resources that can be incorporated into the SRT are discussed below. Current telephone numbers to contact these organizations are listed in Table G-3.

a. Tactical Air command (TAC/DEEV):

MAJCOM office responsible for ensuring environmental compliance of Cannon AFB. This office provides advice and staff assistance in all areas of environmental protection including spill response matters. HQ TAC/DEEV is located at Langley AFB, VA and can be reached at AV 432-4430 or 804-764-4430.

b. Air Force Engineering and Services Center (AFESC): AFESC provides technical guidance and assistance to major commands and bases in contingency operations and environmental planning. The AFESC/DEVP is located at Tyndall AFB, Florida and can be contacted as follows: AV 970-6167 or Commercial (904) 283-6167.

c. Regional Response Team:

The Cannon AFB area is under the jurisdiction of the Region 6 US EPA Regional Response Team. The team can be reached by calling the Region 6 EPA Public Information Office at (214) 767-3274.

d. State of New Mexico Response Team:

The State OSC will be briefed fully by the Base OSC on the actual spill response. The State OSC will be familiar with the available sources of spill response equipment within the State of New Mexico. The State 24-hour reporting number is (505) 827-9329.

e. Clovis Area Contact:

The State Environmental Improvement Division Office in Clovis should be notified in case of a spill. The office representative is Mr. David Tanner (505) 762-3728.

f. CHEMTREC:

CHEMTREC, the Chemical Transportation Emergency Center, is a 24-hour hot line that provides warnings and limited guidance to the OSC when a spill product can be identified by either chemical or trade name. CHEMTREC will also assist the OSC in contacting the manufacturer or shipper for additional information. This service should be used whenever adequate spill response information is not available. The telephone number for CHEMTREC is 1-800-424-9300.

g. CHRIS MANUAL-Chemical Hazards Response Information System:

The CHRIS Manual is an official publication of the US Coast Guard that currently provides technical information and appropriate response procedures for over 1000 different substances. The manual contains four volumes which are periodically updated.

h. ETIS-Environmental Technical Information System: ETIS is a computerized information system which contains Federal and State environmental regulations, directories of Federal and State environmental contacts and computer modeling capabilities. The ETIS overall system manager is the U.S. Army Construction Engineering Research Laboratory, located at Champaign, Ill. The

Environmental Planning Directorate at AFESC manages Air Force use of the system. Additional information on the system and how to access it can be obtained by calling AV 970-6167 or Commercial (904) 283-1667.

i. "USAF Occupational and Environmental Health Laboratory" (OEHL):

The OEHL is assigned responsibility for providing consulting services on spill sampling contaminant treatment methods, as well as analytical support during response and recovery operations. For complex spill problems, onsite support may be provided. In CONUS, call AV 240-3305 (consulting) or AV 240-3626 (analytical support).

G.3 Implementation of the Contingency Plan [40 CFR 264.52(a) and 264.56(d); NM HWMR 206.B.10.d. and 206.B.10.m.]

The decision to implement the contingency plan depends upon whether or not an imminent or actual incident could threaten human health or the environment. The purpose of this section is to provide guidance to the emergency coordinator in making this decision by providing decision-making criteria.

The contingency plan will be implemented in the following situations:

1. Fire and/or Explosion

   a. A fire causes the release of toxic vapors.

   b. The fire spreads and could possibly ignite materials at other locations onsite or could cause heat-induced explosions.

   c. The fire could possibly spread to offsite areas.

   d. Use of water or water and chemical fire suppressant could result in contaminated runoff.

   e. An imminent danger exists that an explosion could occur, causing a safety hazard because of flying fragments or shock waves.

   f. An imminent danger exists that an explosion could ignite other hazardous waste at the facility.

   g. An imminent danger exists that an explosion could result in the release of toxic material.

   h. An explosion has occurred.

2. Spills or Material Release

   a. The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.

   b. The spill could cause the release of toxic liquid or vapors.

   c. The spill can be contained onsite, but the potential exists for groundwater contamination.

d. The spill cannot be contained onsite, resulting in offsite soil contamination and/or ground or surface water pollution.

3. Floods

The potential exists for surface water contamination.

G.4 Emergency Response Procedures

G.4.a Notification [40 CFR 264.56(a); NM HWMR 206.B.10.m.(1)]

The on-base notification system is described in Section G-4.d. Off-base notification will initially be made by the OSC to headquarters at Langley AFB, VA. Appropriate local, state, and Federal agencies will be notified as discussed In Section G-4d.

G.4.b Identification of Hazardous Materials [40 CFR 264.56(b); NM HWMR 206.B.10.M. (2)]

The manager of the HWSF, the DRMO Chief, will immediately identify the character, exact source, amount and area/extent of a release from that facility. This will be accomplished by visual observation and/or review of records.

All wastes received by the DRMO will be stored in bays according to their hazardous characteristics. Generally, the contents of a drum can be determined through a check of the operating record.

G.4.c Hazard Assessment [40 CFR 264.56(c) and (d); NM HWMR 206.B.10.M. (3) and (4)]

The Base Environmental Coordinator and the Base Civil Engineer will assess possible direct and indirect hazards to human health or to the environment that may result from a chemical release, fire, or explosion. Factors which will be considered are the materials involved, their toxicity, the amount involved, and what decomposition products may result. Wind direction and weather conditions will be assessed to determine area of possible contamination. The danger of contamination of surface or groundwater will also be considered.

G.4.d Control Procedures [40 CFR 264.52 (a); NM HWMR 206.B.10.d]

The initial response to any emergency will be to protect human health and safety and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

In the event of a major emergency involving a chemical spill, the person(s) discovering the spill is/are responsible for providing initial defensive actions without undue risk of personal injury.

1. The following actions will be implemented as necessary upon discovery of a spill. The order of the actions will depend on existing conditions.

   - Initiate evacuation, if necessary.

   - Notify Base Fire Department, On-Base Ext 4117, Off-Base Telephone Number 781-4117.

- Stop source of spill when possible without undue risk of personal injury; to include use of onsite spill containment equipment and materials.
- Make spill scene OFF LIMITS to unauthorized personnel.
- Restrict all sources of ignition when flammable substances are involved.
- Report to on-scene coordinator upon arrival.

2. When notifying the Fire Department of the spill occurrence, the following information should be provided if known or can reasonably be determined.

   - Name of individual reporting spill
   - Location of individual reporting spill
   - Number of injured personnel and nature of injuries (if applicable)
   - Substance spilled
   - Amount of spill (estimated)
   - Rate material currently spilling (estimated)
   - Time spill occurred (estimated)
   - Extent which spill has traveled
   - Any additional pertinent information (i.e., other potential hazards)

3. Base personnel other than the Fire Department receiving reports of spills shall aid in channeling the report to the Fire Department who will respond as outlined.

4. The Fire Department will:

a. Record spill reports on a Spill Incident Checklist Log designed to record the information listed in the above paragraph (1)b along with the time of the report.

b. Immediately respond as necessary to protect life and property with due regard for the environment.

c. Notify the Fire Chief and Base Environmental Coordinator (or Base Civil engineer if Environmental Coordinator cannot be contacted) as well as the Base Hospital if injuries are reported. The Spill Incident Checklist Log will contain a notice instructing the dispatch operator to immediately institute these notifications. The checklist will include the duty and non-duty telephone numbers for the above-mentioned personnel.

5. The Base Environmental Coordinator or Civil Engineer will:

a. Immediately proceed to the spill site and evaluate the severity of the spill and determine the response necessary for containment and recovery.

b. Advise the OSC as to the necessity for activation of Spill Response Team (SRT).

c. On the authorization of the OSC, notify specifically requested members of the SRT or instruct the CE Service Desk (Fire Department non-duty hours) to notify these members to assemble at the area designated by the OSC or the Environmental Coordinator within 15 minutes of notification.

d. Respond with appropriate men, equipment and materials.

6. The CE Service Desk will:

a. Maintain a current list of all members of the Spill Response Team (SRT) along with their duty telephone numbers as well as non-duty telephone numbers. A backup copy of this list will be posted at the Fire Department dispatch desk which receives all CE Service Desk calls during non-duty hours.

b. Contact the SRT members designated by the OSC or the Environmental Coordinator and inform them to assemble within 15 minutes at a specified location.

(i) Fire and/or Explosion

The HWSF can easlly be accessed by firefighting and other emergency vehicles and equipment via W Street. The Cannon Fire Department is available 24 hours a day to respond to any emerqency. Until the Fire Department personnel arrive, the fire containment effort will be carried out by DRMO personnel.

In the event of a fire and/or explosion involving hazardous materials, the following actions will be taken:

1. The Base Fire Department will be notified.

2. All doors in the HWSF will be closed.

3. Work in all areas will immediately cease.

4. The OSC will be contacted by the Fire Department or the Civil Engineering Service Desk.

5. All personnel not actively fighting the fire will be evacuated according to instructions from the OSC.

6. All injured persons will be transferred to medical facilities for treatment.

If a highly flamable material is released, the following action will be taken:

1. All persons within a 1/4-mile radius will be notified.

2. All ignition sources will be eliminated.

3. Motor vehicles will be restricted or eliminated to avoid ignition of the vapor.

4. All persons within a 2000-foot radius of the source will be evacuated if the likelihood of an impending explosion is determined.

The Fire Chief will determine when the fire has been controlled and consult with the ERT and OSC to determine when activities in the area can resume.

(ii) Release of Hazardous Waste to Air, Land, or Water

In the event of a spill of oil or hazardous substances, the OSC will be responsible for directing and coordinating all spill response actions. The OSC or his/her designee will maintain an Incident Loq detailing all actions taken during the course of the pollution spill response. The log

will include a description of pollutant, the actions taken to recover the pollutant and restore the environment, and any additional significant information. Spill response actions under the responsibility of the OSC are:

1. Activate or authorize action of appropriate members of the Spill Response Team (SRT) based on information relayed during initial notification or information provided by the Environmental Coordinator, and immediately investigate the reported spill.

2. Determine source, type and approximate quantity of spill substance.

3. Evaluate magnitude and severity of the threat to public health, welfare and natural resources. The Material Safety Data Sheets and other information sources should be utilized as required to determine potential health, fire and pollution effects associated with the spill material.

4. Take appropriate safety precautions to protect response personnel and any additional personnel located in close proximity to the probable spill route. Base Security Police will be utilized for implementing evacuation or traffic control measures.

5. Determine the party responsible for spill, if other than the Air Force. The responsible party should be informed of the spill and if their response actions are inadequate in the judqement of the OSC, they should first be informed of their financial liability. If their spill response actions remain inadequate, the Base OSC should assume control of the spill response. In all response actions involving parties other than the Air Force, the Base Judge Advocate should be informed. If a contractor is involved with a spill, the contracting office should be notified. (EXT. 2941) BLDG. 150

6. Determine cause of spill and institute appropriate action to stop the source of spill if still occurring.

7. Institute spill containment procedures. The primary concern is to confine spills as close to their source as practical and if at all possible prevent spills from exiting base property. Portable skimmers, temporary dikes or booms, absorbent material and sandbags will be used to contain spills.

If the chemical spill is not contained within the bermed areas or grated trenches, then an area of isolation will be established around the spill. The size of this area will generally depend upon the size of the spill and the chemicals involved. If the spill results in the formation of a toxic vapor cloud (by reaction with surrounding materials or by outbreak of fire) and its release (due to high vapor pressures under ambient conditions), then further evacuation efforts will be enforced. An assessment of meteorological

conditions and the calculated toxic corridor will be provided by the Weather Squadron, extension 2748.

When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible, the area will be roped or otherwise blocked off.

8. Contact TAC/DEEV by telecon (AUTOVON 574-4430/7844), even if base personnel are uncertain of the spill classification. The purpose of the telecon is to verify the spill classification or aid in the classification when uncertainty exists, and to gather available information on reportable spills to support the initial command telecon report of USAF/LEEV. For spills occurring after normal duty hours or on weekends, the TAC/DE alert duty officer should be contacted through the TAC Command Post (AUTOVON 574-2224/2225). As much of the following information as can be reasonably determined should be initially reported.

- Name of installation
- Location of incident and geography
- OSC name and telephone number
- Time of spill

- Type and estimated quantity of spill substance
- Magnitude and severity of the threat to public health, welfare and natural resources
- Weather conditions at spill site
- Cause of incident
- Anticipated containment and clean-up action and effectiveness
- Need for assistance by national, regional or state response teams
- Any other pertinent information

9. Determine if a reportable spill has occurred. If so, a confirming message containing the available information identified above must be released and transmitted to TAC LANGLEY AFB VA/DEEV/SGPAE with information copies to HQ USAF WASH DC/LEEV/SGES, HQ AFESC TYNDALL AFB FL/DEVP/PA/DEMM, HQ AFMSC BROOKS AFB TX/SGP, USAF OEHL BROOKS AFB TX/ECW, HQ USAF WASH DC/LEYF (when POL is involved) and HQ USAF WASH DC/RDCM (when industrial facilities are involved). This message should be transmitted within 4 hours of the telecon notification to TAC/DEEV. If the telecon notification is made after 1500 hours local, the message will be transmitted no later than 1000 hours the following day.

10. Telephonic and message notification of other Federal and state agencies must be made promptly following telecon notification of reportable spill to TAC/DEEV. These agencies (New Mexico Environmental Improvement Division, Santa Fe, New Mexico (505) 827-9329) will be notified within 24 hours of any hazardous substance spill, regardless of quantity.

Most waste spills and leaks at the HWSF are easily contained within the berms and grated trenches, and can be collected with absorbent materials or pumped into a container. The contaminated area can then be flushed with water, or some other appropriate solvent. The rinsate and any contaminated absorbents will also be containerized for disposal.

Twenty fifty-five gallon drums, twenty thirty gallon drums and five eighty-five overpacks will be in stock at all times. These drums will be the types approved under DOT and military container specifications.

The final rinsate of equipment and the facility will be analyzed for appropriate parameters (see Section C), depending on materials involved in the spill. A minimum of four samples will be taken.

G.4.e Prevention of Recurrence or Spread of Fires, Explosions, or Releases [40 CFR 264.56(e); NM HWMR 206.B.10.m.(5)]

Procedures which will be followed to prevent the spread of fires, explosions, or releases were discussed in Section G-4d.

The Environmental Coordinator will prepare a Pollution Incident Report which will assess the cause of the fire, explosion, or spill. This report wlll also indicate remedial actions which will be taken to prevent any recurrence of the hazardous situation.

G.f Storage and Treatment of Released Materlal [40 CFR 264.56 (f)and (q)]; NM HWMR 206.B.10.M.(6) and (7)

Any hazardous waste resulting from a spill, fire, or explosion will be placed in overpack drums, labeled, and turned in to DRMO-Cannon for Storage until eventual disposal at a state/EPA approved site. The Chemical Hazards Response Information System (CHRIS), Hazardous Chemical Data Sheets and Material Safety Data Forms will be consulted with regard to special procedures and precautions.

If necessary, the Base Bioenvironmental Engineer will take samples to determine the chemical nature, pollutant concentration and extent of the spill as required for response actions and documentation.

G.4.g Incompatible Waste [40 CFR 264.56 (h)(1); NM HWMR 206.B.10.M.(8)(a)]

The On-Scene Coordinator will ensure that no wastes which may be incompatible with the released material are accepted at the DRMO until cleanup procedures are completed.

G.4.h Post-Emergency Equipment Maintenance [40 CFR 264.56(h)(2) and (i); NM HWMR 206.B.10.m.(8)(b) and 206.B.10.m.(9)]

After an emergency event, all emergency equipment that was utilized for clean-up purposes will be cleaned or replaced so that it will be fit for its intended use. Equipment will be triple-rinsed using water or an appropriate solvent. All rinses will be containerized. The third rinse will be analyzed for appropriate parameters, based on materials involved. An inspection of all safety equipment will be conducted as discussed in Section F-2 before operations are resumed [40 CFR 264.56 (i)]. The Regional U.S. EPA Administrator, state, and local authorities will be notified that post-emergency equipment maintenance has been performed and operations will resume.

G.4.i Container Spills and Leakage [40 CFR 264.56(g) and 264.171; NM HWMR 206.B.10.m.(7) and 206.D.4.b.]

Refer to Section G-4d for a discussion of emergency response procedures for container spills and leaks.

G.4.j Tank Spills and Leakage [40 CFR 264.194(c) and 264.56(g): NM HWMR 206.D.5.d.(3) and 206.B.10.m.(7)]

No tanks will be utilized at this facility.

G.4.k Waste Piles Spills and Leakage [40 CFR 270.14(b)(7), 264.252 and 264.253; NM HWMR 302.A.4.b.(1)(g), 206.D.7.c. and 206.D.7.d]

No waste piles wlll be maintained at this facility.

G.4.1 Surface Impoundments Spills and Leakage and Sudden Drops [40 CFR 270.14(b)(7), 264.222 and 264.227; NM HWMR 302.A.4.b.(1)(g), 206.D.6.c and 206.D.6.c]

No surface impoundments will be maintained at this facility. This section is not applicable.

G.4.m Landfill Leakage 40 CFR 264.302(b); NM HWMR 206.D.10(c)(2)

Sections G-4m(1) and (2) do not apply because this facility will not maintain a landfill for hazardous wastes.

G.5 Emergency Equipment [40 CFR Section 264.52(e); NM HWMR 206.B.10.h]

Two fire hydrants are located approximately 400 feet from the entrance to the storage facility. Also, a freeze-proof hydrant is located 300 feet southeast of the facility. Two portable fire extinguishers will be placed in strategic locations inside the facility.

Two emergency eyewash/shower stations will be located in the HWSF: one in the flammable/combustible storage area, and one in the loading/unloading area just outside the toxic/reactive storage area. A telephone and fire alarm will be located in the facility. Personnel protective equipment available at the HWSF is listed in Table G-4.

Other equipment available at Cannon AFB for emergency response is shown in Table G-5. This equipment is stored in Buildlng 323 and will be used to respond to any major spill on Cannon AFB. In addition, Table G-6 lists equipment stored at each accumulation point for hazardous wastes.

TABLE G-4
DRMO EMERGENCY EQUIPMENT LIST
TSDF BUILDING 226 CAFB,NM

EQUIPMENT	LOCATION	PHY. DESCRIPTION
YALE 'EE' Electirc Forklift	Bldg. 226	Good
Manual Drum lift	Bldg. 226	Good
Manual Pallet Jack	Bldg. 226	Good
Safe Step (AD)Sorbent	Bldg. 226	Good
85-Gallon Over Pack Drums	Bldg. 226	Good
Broom	Bldg. 226	Good
Nonsparking Shovel	Bldg. 226	Good
Bronze Bung Wrench	Bldg. 226	Good
Every Ready First Aid Kit	Bldg. 226	Good
4'X 4' Plastic Bags	Bldg. 226	Good
Chemical Resistant		
Plaxtic Footwear Covers	Bldg. 226	Good
Disposal Shoe Slip Clovers	Bldg. 226 & 215	Good
Rubber Over Boots, Black	Bldg. 226 & 215	Good
Short unlined rubber gloves	Bldg. 226 & 215	Good
Lined rubber gloves	Bldg. 226 & 215	Good
Sol-vex Long, Blue gloves	Bldg. 226 & 215	Good
Neoprene Chemical Protective pioneer style	Bldg. 226	Good
Leather gloves by Ketch All Company	Bldg. 226	Good
Aural (Ear) protector	Bldg. 226	Good
Goggles, Cesco	Bldg. 226	Good
Goggles, Splash, sun, wind	Bldg. 226	Good
Eye protection glasses w/side shields	Bldg. 226	Good
Apron, Rubber, White	Bldg. 226	Good
Acid Protection Suit, Yellow, Rubber Rain Coat and pants	Bldg. 215	Good
Snap Button Type Rain Boots	Bldg. 215	Good
Coveralls, Yellow, Disposal	Bldg. 226	Good
1 piece Coveralls, White Disposal	Bldg. 215	Good
MSA Ultra Twin Respirator and cartridges	Bldg. 226	Good
Face Shield, Industrial	Bldg. 226	Good
White Safety Hat, Sentry	Bldg. 226	Good

TABLE G-5

EMERGENCY RESPONSE EQUIPMENT

ITEM	AMOUNT ON HAND
85 gal drum	48
55 gal drum (OH)	48
55 gal drum (CH)	48
Rags	12 bundles
Neoprene Gloves	60 pair
Unvented Goggles	60
Tyvek Suits	60
Coveralls	60
Hard Hats	60
Rubber Aprons	60
Face Shields	60
Shovels	6
Plastic Bags	12 boxes
Detergent	100 gallons
Bleach	100 gallons
Vermiculite	12 bags
1/2" Tubing	60 feet
Bung Wrench	2
Rubber Boots	60 pair
Plastic Sheets	36 rolls
Absorbent Pads	200
Sodium Bicarbonate	5 100-lb. bags
Freon-11	6 35 gal. drums
Handpump	2
Respiration w/ Cartridges	30

TABLE G-6

CONTENTS OF SPILL KIT

(ACCUMULATION POINTS)

One 55 gallon open-head drum
Four pair neoprene gloves
Two pair unvented goggles
Two respirators and pesticide cartridges
Two chemical resistant aprons
Two pair rubber boots
Two pair 100% cotton overalls
One dust pan
One shop brush
One square point "D" handle shovel
One dozen polyethylene bags with ties (Heavy duty - 2 mil)
One 18-inch pushbroom, synthetic fibers
One gallon liquid detergent
Three gallons household bleach
80 pounds absorbent material
One bung wrench
One drum spigot
One 1-3/8" open-end wrench
One drum pump (manual)
30 foot 1/2 " polyethylene tubing
One wrench bung 2-1/2"
One wrench bung 3/4"
One first aid kit
Blank labels

G.6 Coordination Agreements [40 CFR 264.52(c), 264.53(b), and 264.37(b); NM HWMR 206.B.10.f., 206.B.10.j.(2), and 206.B.9.h.(5)]

The Curry and Roosevelt County Hospitals, and the City of Clovis Fire Department will provide services to the AFB in an emergency situation. These coordination agreements are shown in Appendix G-1. Copies of any correspondence with these organizations will be added to this appendix. A copy of this contingency plan will be provided to these organizations.

The agreement between fire departments states that the requesting party (in this case, the Cannon AFB Fire Department) will be in charge of all operations. The Disaster Preparedness Plan (OPLAN 355-1) assigns the responsibility of Medical Disaster Operations to USAF Hospital, Cannon AFB.

Documentation will also be kept of the refusal of an organization to enter into such an agreement.

G.7 Evacuation Plan [40 CFR 264.52(f); NM HWMR 206.B.10.i]

All emergencies require prompt and deliberate action. In the event of any major emergency, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible; however, in specific emergency situations, the On-Scene Co-ordinator (OSC) may deviate from the procedures to provide a more effective plan for bringing the situation under control. The OSC is responsible for determining which emergency situations require plant evacuation.

In the event an evacuation from the HWSF is necessary, the following actions will be taken:

1. The signal for evacuation will be activated. On Cannon AFB, military police inform all personnel using loudspeakers.

2. No further entry of visitors, contractors, or trucks will be permitted. All vehicle traffic within the DRMO-property will cease to allow the safe exit of personnel and movement of emergency equipment.

3. ALL personnel, visitors, and contractors will immediately leave through the exit gate.

4. No persons shall remain or re-enter the location unless specifically authorized by the person or persons calling for the evacuation. In allowing this, the person in charge assumes responsibility for those persons within the perimeter. Those within the fenced area will normally only include fire brigade personnel or emergency teams.

5. ALL persons will be accounted for by their immediate supervisors, who will ensure that personnel stay together and proceed to a safe location.

The primary evacuation route for the HWSF is north on W Street to Perimeter Road. The alternate route is south on W Street to Torch Boulevard, and southwest on Torch. The second alternate route is south on W Street to Torch Boulevard, southwest on Torch to Argentia. and northwest on Argentia to Overlord Boulevard.

6. Re-entry into the facility will be made only after clearance is given by the OSC.

The On-Scene Coordinator will determine the need for evacuation of additional personnel in the vicinity of the facility.

All personnel are trained in evacuation procedures and means of exit from their respective work areas. Drills are held regularly to practice these procedures.

G.8 Required Reports [40 CFR 264.56(j); NM HWMR 206.B.10.m.(10)]

Any emergency event (e.g., fire, explosion, etc.) that requires implementation of the Contingency Plan will be reported in writing within 15 days to the New Mexico Environmental Improvement Division and/or the Region VI Administrator of EPA. This report must include the information items listed in Figure G-1.

In addition, the DRMO as a tenant on Cannon AFB has internal reporting requirements. The following incidents require that a report be filed:

- All fires
- Chemical spills of more than 5 gallons (or smaller volumes if highly toxic materials are involved)
- All injuries except minor cuts and bruises
- All burns and chemical irritations
- All equipment damage due to malfunction or operating error
- All "near misses" of the above that could have had serious consequences

A form similar to that shown in Figure G-2 will be used for this purpose and will be sent to DRMR, Ogden and DRMS, Battle Creek.

Figure G-1

POLLUTION INCIDENT REPORT

- Name and address of installation and/or owner
- Name and telephone number of OSC
- Incident report (initial, second, third, final)
- Date and Item of incident
- Time of official spill notification to the National Response Center and other regional and state officials
- Location of incident and the nature of the terrain at the location, to include surface and subsurface drainage characteristics and relationships to water bodies (estimate extent of area affected such as miles of stream or acres of lake)
- Weather conditions and how they affected response action
- Cause of incident
- Type and estimated amount (barrels, gallons, pounds) of pollutant and the official size classification (minor, medium, major)
- Actual damage and/or potential threat to human life, to property (private, state, or Federal), and to plant or animal life
- Corrective action taken to eliminate pollution source
- Corrective action taken to remove pollutant
- Assistance required

Figure G-1 (Continued)

POLLUTION INCIDENT REPORT

- Estimated completion date of remedial actions and anticipated effectiveness
- Estimated quantity and disposition of spill material and contaminated soil
- Confirmation that emergency response equipment is back in operation before resuming operating activities
- Description of any problems encountered during implementation of the SPR plan and an explanation of how the Spill Prevention and Response Plan was, or will be, modified to prevent the recurrence of the spill event
- Anticipated or actual reaction by the news media and public to the incident (specify potential for liability in the internal Air Force reports only)

FIGURE G-2

REPORTING FORM FOR EMERGENCY EVENTS

Name, address, and phone number of owner or operator

Name, address, and phone number of facility

Date, time, and type of incident (e.g., fire, explosion, etc.)

Name and quantity of material(s) involved

Extent of injuries (if any)

Assessment of actual or potential hazards to human health or the environment (if applicable)

Estimated quantity and disposition of material recovered from the incident

Send to: New Mexico Environmental Improvement Division
Hazardous Waste Management Section
Groundwater and Hazardous Waste Bureau
Crown Bldg., 725 St. Michael's Drive
P.O. Box 968
Santa Fe, NM 87504-0968

APPENDIX G-1

COORDINATION AGREEMENTS

[illegible] SGH

[illegible]

[illegible]

AGREEMENT FOR MUTUAL SUPPORT DURING DISASTERS

(Curry and Roosevelt County Hospitals)

THIS AGREEMENT is made and effective 1 February 1983 between Clovis High Plains Hospital and Roosevelt General Hospital, both are organized and existing under the laws of the State of New Mexico and USAF Hospital Cannon, operating under the guidelines and regulations of the United States Air Force and the Department of Defense.

NOW, THEREFORE, IN CONSIDERATION of the mutual advantages occurring to the parties hereto, each facility hereby convenants and agrees with each other as follows:

ARTICLE I - AUTONOMY:

The Governing Bodies of the facilities shall continue to have exclusive control of the management, assets, and affairs of their respective facilities, and neither party by virtue of this agreement shall assume any liability for any debts or obligations which have been or which may be incurred by the other party to this agreement.

ARTICLE II - TRANSFER OF PATIENTS:

In the event of a major catastrophe or other events affecting major portions of the communities population which could result in the caring for large numbers of injuries, diseases or other infirmities which exceed the capacity of the aforementioned facilities, each hospital would make available to each other resources to include facilities, personnel, supplies and equipment and transportation assets in order to reduce loss of life, limb or prevent undue suffering. This support will be subject to resources available and in no way be allowed to degrade the existing health care program or circumvent the charter or directives of the parent organization. Support will be provided by all facilities without regard to race, color, creed or national origin. The requesting facility shall give notice to the other facilities as far in advance as possible of any potential or actual situation requiring assistance. In the case of the USAF Hospital Cannon, requests for assistance will be referred to the Commander, Cannon Air Force Base, who will decide whether, and to what extent, support may be provided. In the event of actual transfer of patients, every effort will be made to provide

the receiving facility with current diagnosis and medical care provided prior to transfer. The transfer of patient valuables and personal effects will not be effected until such time as the situation has stabilized.

ARTICLE III - FINANCIAL AGREEMENT

Charges for services performed by one party for patients transferred from the other party pursuant to this agreement shall be collected by the party rendering such services directly from the patient or from the sources normally billed. Neither party shall have any liability to the other for such charges, except to the extent that such liability would exist separate and apart from this agreement. Nor shall either party receiving a transferred patient be responsible for collecting any account receivable of the other party from such patient which still may be outstanding after such transfer takes place.

ARTICLE IV - TERMINATION:

This agreement may be terminated by either party at any time upon the giving of at least 60 days prior written notice. Notwithstanding any notice which may have been given, however; this agreement shall be automatically terminated whenever either party shall have its license to operate revoked, suspended or non-renewed.

ARTICLE V - ADVERTISING AND PUBLICITY:

Neither party shall use the name of the other party in any promotional or advertising material unless review and approval of the intended shall first be obtained from the party whose name is to be used. The requirements of the Privacy Act will be followed by each facility.

ARTICLE VI - NON-EXCLUSIVE CLAUSE:

Nothing in this agreement shall be construed as limiting the right of either party to affiliate or contract with any other hospital, on either a limited or general basis, while this agreement is in effect.

ARTICLE VII - MODIFICATION:

This agreement may be modified, amended, or supplemented by agreement of both parties, but no such ratification,

amendment, or supplement shall be binding on either party unless and until the same is attached hereto in writing and signed by authorized officials of each facility.

AGREED:

FACILITY: Clovis High Plains Hospital DATE 9-8-83

Phillip J. Todd
PHILLIP J. TODD
Hospital Administrator

FACILITY: Roosevelt General Hospital DATE 8 Sep 83

RONALD L. McARTHUR
Hospital Administrator

FACILITY: USAF Hospital Cannon DATE 1 Feb 83

RICHARD G. McGOUGH, Major, USAF, MSC
Hospital Administrator

AGREEMENT FOR MUTUAL AID IN
FIRE PROTECTION

This agreement, entered into this 15 day of August 1983, between the Secretary of the Air Force acting pursuant to the authority of 42 U.S.C. (1856(A)) and the City of Clovis, New Mexico Fire Department is for securing to each the benefits of mutual aid in fire prevention, in the protection of life and property from fire, and in fire fighting. It is agreed that:

a. On request to a representative of the Cannon Air Force Base Fire Department by a representative of the City of Clovis, NM Fire Department, fire fighting equipment and personnel of the Cannon Air Force Base Fire Department will be dispatched to any point within the area for which the City of Clovis, NM Fire Department normally provides fire protection as designated by the representatives of the City of Clovis, NM Fire Department.

b. On request to a representative of the City of Clovis, NM Fire Department by a representative of the Cannon Air Force Base Fire Department, fire fighting equipment and personnel of the City of Clovis, NM Fire Department will be dispatched to any point within the fire fighting jurisdiction of the Cannon Air Force Base Fire Department as designated by the representative of the Cannon Air Force Base Fire Department.

c. Any dispatch of equipment and personnel pursuant to this agreement is subject to the following conditions:

(1) Any request for aid hereunder shall include a statement of the amount and type of equipment and personnel requested, and shall specify the location to which the equipment and personnel are to be dispatched, but the amount and type of equipment and number of personnel to be furnished shall be determined by a representative of the responding organization.

(2) The responding organization shall report to the officer in charge of the requesting organization at the location to which the equipment is dispatched and shall be subject to the orders of that official.

(3) A responding organization shall be released by the requesting organization when the services of the responding organization are no longer required or when the responding organization is needed within the area for which it normally provides fire protection.

(4) In the event of a crash of aircraft owned or operated by the United States or military aircraft of any foreign nation within the area for which the City of Clovis, NM Fire Department normally provides fire protection, the chief of the Cannon Air Force Base Fire Department or his or her representative may assume full command on arrival at the scene of the crash.

d. The City of Clovis, NM Fire Department may claim reimbursement for the direct expenses and losses which are additional fire fighting costs above the normal operating costs incurred while fighting a fire under this agreement as provided in 44 C.F.R., Part 151.

e. Each party waives all claims against every other party for compensation for any loss, damage, personal injury or death occurring as a consequence of the performance of this agreement.

f. All equipment used by the City of Clovis, NM Fire Department in carrying out this agreement will, at the time of action hereunder, be owned by it; and all personnel acting for the City of Clovis, NM Fire Department under this agreement will, at the time of such action, be an employee or volunteer member of the City of Clovis, NM Fire Department.

For City of Clovis, New Mexico

Donald E. Clifton

DONALD E. CLIFTON
CITY MANAGER

For the Secretary of the Air Force

MARY N. TURNER, Colonel, USAF
Commander

APPENDIX G-2

SPILL PREVENTION AND RESPONSE PLAN

OIL AND HAZARDOUS SUBSTANCE SPILL PREVENTION AND RESPONSE PLAN

FEBRUARY 1986

CANNON AFB, NEW MEXICO

DEPARTMENT OF THE AIR FORCE
Headquarters 27th Combat Support Group (TAC)
Cannon Air Force Base, New Mexico 88103-5000

CHANGE 2

Environmental Planning

OIL AND HAZARDOUS SUBSTANCE SPILL PREVENTION AND RESPONSE PLAN

27 TFW OHSSPR Plan, February 1986, is changed as follows:

1. Page Changes:

Delete	Date	Insert
Annex II-9, page II-20	Feb 86	Annex XVI
Annex XIV, pages 2-6	Apr 87	Annex XIV, pages 2-10

2. Write-in Changes:

Area/Page	Paragraph	Line	Action
Section Two/2	6	5	Delete "combined with the PB-4, PB-19, and PB-20 teams."
Section Four/7	(4) d	2	Delete "(Fire Department, non-duty hours)".
Section Four/10	a.	5	Change "AV 432" to read "AV 574".
Section Four/10	e.	3	Change "(505) 3728" to read "(505) 762-3728".
Section Four/13	(3) c	3	Delete "(Fire Department non-duty hours)".
Section Four/13	(4) a	5	Delete "which receives all CE Service Desk calls' during non-duty hours".
Section Four/14	h.	1	Change "AUTOVON 432" to read "AUTOVON 574".
Section Four/15	h.	6	Change "ot" to read "to".
Section Four/15	h.	10	Change "AUTOVON 432" to read "AUTOVON 574".
Section Five/20	3	28	Change "associted" to read "associated".
Annex I/I-1	2	9	Change "I-21" to read "I-14".
Annex I/I-7	Table	5	Delete facility number "173, WPN & RLSE SYS Shop" along with entire line for this facility.
Annex I/I-7	Table	9	Change facility number "185" to read "593".
Annex I/I-7	Table	11	Under the column entitled "Substance Stored", change "B-15" to read "B-22".
Annex I/I-7	Table	13	Delete facility number "189, WPN & RLSE SYS Shop" along with entire line for this facility.
Annex I/I-14	2	8	Change "additoinal" to read "additional".
Annex II/II-4	1	17	Add "Notify Bioenvironmental Engineers Ext. 4063."
Annex II/II-4	1	18	Add "Notify Base Safety Officer Ext. 2811."
Annex II/II-17	1	7	Change "Bldg 185" to read "Bldg 593".
Annex II/II-18	2	16	Change "Bldg 689" to read "Bldg 620".
Annex II/II-18	2	19	Change "Floor drains" to read "Floor drain in wash rack".
Annex II/II-18	2	20	Change facility "5113" to read "5122".
Annex II/II-18	2	23	Change Bldg "5120" to read "5122".

Annex II/II-18	2	31	Change "Bldg 185" to read "Bldg 593".
Annex VI/VI-1	2	12	Change "Col Boyce W. Wiltrout" to read "Col David E. Benson".
Annex VI/VI-1	2	13	Change "784-5921" to read "784-3102".
Annex VII/VII-1	1	1	Change "432" to read "574".
Annex VII/VII-1	1	2	Change "432" to read "574".
Annex XV/XV-1	Table	4-5	Change "1201 Elm Street" to read "1445 Ross Avenue" and "75270" to read "75202"
Annex XV/XV-2	Table	18	Delete "MAED" from Distribution List
Annex XV/XV-2	Table	33	Change "USAF Hospital" to read "27 TFW Hospital".
Annex XV/XV-3	Table	9	Delete "2040ISS/XRP" from Distribution List
Annex XV/XV-3	Table	10	Delete "DET 11, 25 WS/WE" from Distribution List
Annex XV/XV-3	Table	11	Change "111" to read "108".

DEPARTMENT OF THE AIR FORCE
Headquarters 27th Combat Support Group (TAC)
Cannon Air Force Base, New Mexico 88103-5000

CHANGE 1
15 May 1987

Environmental Planning

OIL AND HAZARDOUS SUBSTANCE SPILL PREVENTION AND RESPONSE PLAN

27 TFW OHSSPR Plan, February 1986, is changed as follows:

1. Page-Insert Changes:

Remove	Date	Insert
ANNEX XI Pages 16-59	Feb 86	ANNEX XI Pages 42178-42194
ANNEX XIV Pages 2-7	Feb 86	ANNEX XIV Pages 2-6
NONE	May 87	ANNEX II-15 Pages II-36, 37

2. Write-in Changes:

Area/Page	Paragraph	Line	Action
Section Four/6	(2)b.	1	Add: (27 CSG/DEEV) After Environmental Coordinator.
Section Four/7	(4)	1	Change to read: The Environmental Coordinator (27 CSG/DEEV) will...
Section Four/13	(3)	1	Change to read: The Environmental Coordinator, when directed by the Base Civil Engineer will...
ANNEX II/II-1	TABLE	16	Add: Supply Storage Facilities-Facilities 162, 202, 206, & 211 ANNEX II-15
ANNEX II-3/II-6	1	5	Add: Third notification: o Notify Transportation Squadron Commander, Ext. 2641
ANNEX II-3/II-7	1	3	Change to read: Spills escaping from the oil/water separators at facility 5144 or 375 will enter the sanitary sewer system.

FROM: _____ DATE: _____

SUBJECT: Distribution of (NAME OF PLAN)

TO: 27 CSG/DEEV

1. This headquarters/office is in receipt of _____ copy(s) of subject document.

2. _____ Request distribution be changed as follows:

_____ Exclude from distribution.

_____ Increase number of copies to _____.

_____ Decrease number of copies to _____.

_____ Change office symbol and address:

OLD:

NEW:

3. _____ Above changes apply to this plan only.

4. _____ Above changes apply to all plans distribution for which _____ is OPR.

5. REMARKS:

_____
(Signature of Commander or Authorized Representative)

_____
(Unit/Office Symbol) (Autovon Phone Number)

NOTE: Complete and return form to above address if distribution is not correct and distribution is received is received directly from OPR.

OPR: 27 CSG/DEEV

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 27TH COMBAT SUPPORT GROUP (TAC)
CANNON AIR FORCE BASE, NM 88103

REPLY TO ATTN OF: 27 CSG/DEEV

SUBJECT: 27th Tactical Fighter Wing Oil and Hazardous Substance Spill Prevention and Response Plan (27 TFW SPR)

TO: See Distribution (Annex XV)

1. Forwarded herewith is the 27 TFW OHSSPRP. The plan provides guidance for the containment, storage, disposal, and management of hazardous materials/wastes.

2. This plan fulfills a requirement established by AFR 19-1 and various federal regulations (See Appendix XII). Guidance for the preparation of this plan was provided by HQ AFESC.

3. This plan is effective for implementation on receipt and for execution when directed by 27 CSG Commander or 27 TFW Commander. This plan supersedes the 27 TFW Oil and Hazardous Substance Pollution Contingency Plan (Spill Plan) and augments the 27 TFW Hazardous Waste Management Plan.

4. This plan has been distributed to the Cannon Air Force Base 27th Tactical Fighter Wing, 27th Combat Support Group, and tenant units shown in Annex XV, because they are the users/generators of hazardous materials/wastes, or they possess the equipment and capabilities to support the plan.

5. This plan will be reviewed as of 1 February each year and updated as appropriate. The reviewing officials will sign off the record of annual review (page ii) on all unit-maintained copies of this plan. Unit commanders are welcome to send additions/corrections to this plan to the Base Environmental Coordinator (27 CSG/DEEV), who is the OPR for this document.

6. This letter, as well as the 27 TFW OHSSPR Plan, is unclassified.

BOYCE W. WILTROUT, Colonel, USAF
Commander

1 Atch
27 TFW OHSSPR Plan

Readiness is our Profession

CANNON AIR FORCE BASE
SPILL PREVENTION AND RESPONSE PLAN
Cannon Air Force Base, N. M. 88103
February 1986

SECURITY INSTRUCTIONS/RECORD OF CHANGES/ANNUAL REVIEW

1. The long title of this document is the 27th Tactical Fighter Wing Spill Prevention and Response Plan. The short title is 27TFW SPR. Both titles are unclassified.

2. This document is unclassified, but is designated "For Official Use Only", and should be handled accordingly.

3. This document may be reproduced in whole or in part as required.

4. The provisions of AFR 55-30, Operations Security (OPSEC) and AFR 100-45, Vol 1 Communications Security Policies, Procedures and Instructions (COMSEC) have been considered in the development and implementation of this document.

REVIEW AND AMENDMENT INSTRUCTIONS

1. Any amendments to this SPR plan must be logged on the following record sheet. See Plan Review and Update, Section ii, for additional detail.

2. Amendments significantly affecting the Spill Prevention, Control and Countermeasure (SPCC) Section (Annex I) will necessitate recertification of the plan by a professional engineer.

RECORD OF CHANGES:

Change Number	Date	Date of Entry	Signature and Org of Individual Posting Entry
1	15 Mar 87	3 June 89	[illegible]
2	—	3 June 89	[illegible] 27CSG/DEV

RECORD OF REVIEW:

Reviewed By	Organization	Date Reviewed	Remarks

SPILL PREVENTION AND RESPONSE PLAN

TABLE OF CONTENTS

CONTENTS — PAGE NO.

DISTRIBUTION CHANGE LETTER

LETTER OF TRANSMITTAL

SECURITY INSTRUCTIONS — i

RECORD OF CHANGES/RECORD OF REVIEW — ii

TABLE OF CONTENTS — iii

SPILL PREVENTION AND RESPONSE PLAN (SPR) — 1

SECTION ONE - OVERALL MISSION OF SPR PLAN — 1

SECTION TWO - RESPONSIBILITIES
- Environmental Protection Subcommittee for Spills — 2
- Environmental Protection Committee — 2
- Tasked Commanders and Staff Agnecy Chiefs — 2
- On-Scene Coordinator (OSC) — 2
- Spill Response Team (SRT) — 2
- Individual Assigned or Attached to Cannon AFB — 3

SECTION THREE - MISSION OF THE SPILL CONTROL AND COUNTERMEASURES SECTION OF THE SPR — 4

SECTION FOUR - OIL AND HAZARDOUS SUBSTANCE CONTINGENCY PLAN — 6
- Mission — 6
- Response Organization — 11
- Plan Execution

SECTION FIVE - TRAINING
- Personnel Training Requirements — 19
- Contractors Handling Oils and Hazardous Materials — 20
- Spill Response Team (SRT) Training

SECTION SIX - PLAN REVIEW AND UPDATE — 21

OPR: 27 CSG/DEEV

CONTENTS

		PAGE NO.
ANNEX I	- OIL AND HAZARDOUS SUBSTANCE SITE SPILL PREVENTION MECHANISMS AND CONTINGENCY ACTIONS	I-1
	Oil and Hazardous Substance Site Spill Prevention Control and Countermeasures Summary	
	Oil Storage	
	FUEL TRANSFER FACILITIES	
	CHEMICAL SMALL CONTAINER FACILITIES	
	OHSSPCCS Explanatory TABS	I-13
	Certification and Approval Signatures	I-32
ANNEX II	- SITE-SPECIFIC CONTINGENCY PLANS, INDEX	II-1
ANNEX III	- INDUSTRIAL AND CHRIS MATERIAL SAFETY DATA SHEETS INDEX	III-1
ANNEX IV	- LISTING OF OIL/WATER SEPARATORS LOCATED AT CANNON AFB	IV-1
ANNEX V	- SPILL RESPONSE EQUIPMENT INVENTORY	V-1
ANNEX VI	- LISTING OF CANNON AFB SPILL RESPONSE TEAM (SRT) ORGANIZATIONS AND CURRENT TELEPHONE CONTACT NUMBERS	VI-1
ANNEX VII	- LISTING OF OFF-BASE SPILL NOTIFICATION PROCEDURES AND RESPONSE ORGANIZATIONS	VII-1
ANNEX VIII	- COMPATIBILITY OF HAZARDOUS SUBSTANCES	VIII-1
ANNEX IX	- HAZARDOUS SUBSTANCE SITE LOCATION MAP, DISASTER RESPONSE GRID MAP	IX-1
ANNEX X	- DOT REQUIREMENTS FOR LEAKING CONTAINERS	X-1
ANNEX XI	- REPORTABLE QUANTITIES FOR HAZARDOUS SUBSTANCES	XV-1
ANNEX XII	- APPLICABLE FEDERAL REGULATIONS	XII-1
ANNEX XIII	- DESCRIPTIVE EVACUATION PLANS FOR HAZARDOUS WASTE STORAGE FACILITIES	XIII-1
ANNEX XIV	- HAZARDOUS MATERIAL/WASTE MANAGERS	XIV-1
ANNEX XV	- DISTRIBUTION	XI-1
ANNEX XVI	- Emergency Response Procedures for Liquid Fluorine (LF2) and Nitrogen Tetroxide (N_2O_4)	

SPILL PREVENTION AND RESPONSE PLAN (SPR)

SECTION ONE - OVERALL MISSION

The plan will have a long title of "Oil and Hazardous Substance Spill Prevention and Response Plan" and a short title of "Spill Prevention and Response Plan". This plan is intended to fulfill the requirements of a Spill Prevention Control and Countermeasure (SPCC) Plan, an Oil and Hazardous Substance Pollution Contingency (OHSPC) Plan and the hazardous waste spill prevention and response requirements. The SPCC portion of the document primarily pertains to spill prevention and includes a discussion of the major types of spill prevention procedures, methods and equipment incorporated into the base facilities. The Contingency Plan portion of the document specifies procedures to be followed when responding to releases, accidents and spills involving oils or hazardous substances. These include spill detection, reporting, containment, cleanup and disposal procedures. The plan should be implemented in conjunction with the Cannon AFB Disaster Preparedness OPLAN, 355-1, in the event that the circumstances warrant implementation of the OPLAN. Also included within this document are general procedures for training programs and procedures for plan reviews and updates. The SPR Plan is supported by several vital annexes which provide the specific information associated with the facilities found on Cannon Air Force Base.

IN THE EVENT OF A SPILL OF OIL OR A HAZARDOUS SUBSTANCE, CONCERNED PARTIES SHOULD REFER DIRECTLY TO THE SECTION ENTITLED "PLAN EXECUTION" FOR GENERAL RESPONSE PROCEDURES AND TO ANNEXES I, II AND III FOR SITE SPECIFIC INFORMATION.

These annexes provide relevant site descriptions including location, maximum spill quantity, probable spill route and secondary containment (Annex I); Site Specific Contingency Plans for major potential spill sites (Annex II); and Material Safety Data Sheets for the oils and hazardous substances normally stored on Base (Annex III).

SECTION TWO - RESPONSIBILITIES

Environmental Protection Subcommittee for Spills

The development, review and update of the SPR plan is the responsibility of the appointed "Environmental Protection Subcommittee for Spills". The committee is a subcommittee of the Environmental Protection Committee and is composed of the Commander 27 Combat Support Group who serves as the chairperson of the subcommittee as well as the On-Scene Coordinator in the event of a significant spill; the Base Civil Engineer who directs and coordinates the spill subcommittee in the absence of the Commander; the Base Environmental Coordinator, the Base Fire Chief, the Base Bioenvironmental Engineer and the Base Fuels Management Officer.

Environmental Protection Committee

The Base Environmental Protection Committee is responsible for reviewing the SPR plan prior to its promulgation by the Base Commander and prior to finalization of any modifications occurring during the annual review and update of the plan. The committee will develop pollution abatement policy guidance, monitor implementation of this plan and insure that supporting procedures are published by commanders.

Tasked Commanders and Staff Agency Chiefs

It is the responsibility of the tasked commanders and staff agency chiefs to publish such procedures that are necessary for implementing this plan, insuring adequate training is conducted, and for insuring that environmental protection/pollution abatement procedures are implemented in their areas of responsibility. They will designate additional project officers and monitors as required to insure an effective program and continually inspect the work areas under their control to insure that effective pollution abatement procedures are followed. They will also insure that Site-Specific Contingency Plans developed for their particular areas are posted in prominent locations at the potential spill sites.

On-Scene Coordinator (OSC)

The OSC is the individual assigned the responsibility for directing and coordinating all spill response actions for Air Force spills (see Executive Order 12316). The OSC will have the authority to utilize the expertise and resources of the Spill Response Team (SRT) in determining and performing response actions. It is also the responsibility of the OSC to oversee that training programs regarding spill response activities are routinely conducted at the base.

The primary on-scene coordinator for spills of oil and hazardous substances at Cannon AFB will be the Commander 27 Combat Support Group. The first alternate OSC will be the Base Civil Engineer and the second alternate OSC will be the Base Fire Chief. The alternate OSC will assume full responsibility in the absence of the primary OSC. (See Annex VI for the name and home address of the CAFB OSC.)

Spill Response Team (SRT)

The SRT members, as designated in this document, are tasked to respond to all spills when requested by the OSC and to perform spill containment, recovery, clean-up, disposal and restoration activities as directed by the OSC. The SRT will consist of Civil Engineering personnel assigned to the Gross Area Decontamination Team ~~combined with the PB-4, PB-19, and PB-20 teams~~.

Individuals Assigned, Attached to or Working at Cannon AFB

Each individual assigned, attached to or working at Cannon AFB is tasked to report any spill of oil or hazardous substance to the Base Fire Department and to take every reasonable precaution to prevent the spillage of oil or hazardous substances. In addition, all contractors performing services on base will be notified prior to the initiation of the contract of their responsibilities to take every reasonable precaution to prevent the spillage of oil or hazardous substances and to report any spills of this nature to the Base Fire Department.

SECTION THREE - SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC)

Mission

Spill prevention control and countermeasure procedures, methods and equipment have been developed and implemented for all the Cannon AFB oil and hazardous substance storage and transfer areas. The general mechanisms of spill prevention that are practiced at Cannon AFB are briefly discussed below. The specific spill prevention that are practiced at Cannon AFB are briefly discussed below. The specific spill prevention mechanisms associated with each facility having a potential for a "Reportable Spill" are summarized in the Annex I table and tabs.

Secondary Containment

Secondary Containment is the physical containment or capture of a spill thus preventing or limiting its release to the environment. Examples include: dikes, curbs, oil/water separators, drip pans and collection systems. Additional examples may include remote secondary containment such as floating booms and flow diversions utilizing basins, sumps, ponds, etc (Refer to Annex I, Tab F).

Visual Inspections

Visual Inspections consist of touring or patrolling the potential spill site to detect spills, evidence of spills, or other conditions that could result in a spill (Refer to Annex I, Tab I). These include [illegible] inspections performed by the operating and supervisory personnel and detailed inspections performed by members of the Environmental Protection Subcommittee for Spills, one of which shall be a registered professional engineer who can certify the plan.

Preventative Maintenance

Preventative maintenance, as a part of the SPCC program, involves the periodic lubrication, adjustment and replacement of worn parts in all equipment where equipment failure could result in a spill of oils or hazardous substances, or impede response efforts. This includes the implementation of all Standing Operating Procedures (SOP) and Reoccuring Maintenance Programs (RMP) for the specific areas (Refer to Annex I, Tab J).

Housekeeping

Good housekeeping is the practice of maintaining a clean orderly work environment; thereby reducing the possibility of accidental spills caused by mishandling of equipment and materials, and facilitating the detection of spills and leaks (Refer to Annex I, Tab K).

Material Compatibility

Material Compatibility refers to the compatibility of oil and hazardous substances with the materials of contruction that store or transport them; compatibility of storage or transfer devices with their environment; and compatibility of different substances upon mixing (Refer to Annex I, Tab L).

Security

Security involves the deterrence of unauthorized, unknowing, or accidential entry of personnel, animals or vehicles into potential spill areas when such entry could result in the damage or misuse of equipment containing or conveying oils or hazardous substances (Refer to Annex I, Tab M).

Monitoring

Monitoring entails the prevention of oil and hazardous substance spills by observing operational conditions that could indicate or result in a spill, and early detection of existing spills by monitoring environmental conditions (Refer to Annex I, Tab N). Secondary or backup monitoring should be used where acute health hazards are involved.

SECTION FOUR - OIL AND HAZARDOUS SUBSTANCE CONTINGENCY PLAN

Mission

The Oil and Hazardous Substance Contingency Plan for Cannon AFB designates the procedures to be followed in the event of releases, accidents and spills involving oils or hazardous substances and the organizations, personnel and equipment responsible for carrying out the response functions.

Response Organizations

The On-Scene Coordinator (OSC) is the individual assigned the responsibility for directing and coordinating all spill response actions. The OSC will have the authority to utilize the expertise and resources of the Spill Response Team (SRT) in determining and performing response actions. Deployment of the Spill Response Team (SRT) will be activated only if called by the OSC or his/her designate. The deployment of the SRT is effected to provide a coordinated response to contain, control, recover and restore the environment from all spills. Annex VI summarizes all base telephone numbers used for contacting these organizations. Off-duty telephone numbers are maintained by the primary and alternate OSCs, the Fire Department, and the Civil Engineering Service Desk. Annex VII summarizes all off-base response organizations along with the telephone numbers used for contacting these organizations. The personnel assigned to the SRT and their designated responsibilities are discussed in the following paragraphs.

(1) Commander 27CSG will:

a. Act as primary on-scene coordinator responsible for directing and coordinating all spill response actions.

(2) Base Civil Engineer (BCE) will:

a. Act as first alternate on-scene coordinator in the event the Commander 27CSG, is unavailable or delegates his/her responsibility to the BCE.

b. Provide an Environmental Coordinator (27CSG/DEV) to furnish technical expertise relative to pollution control techniques.

c. Within his capability, provide personnel, transportation and equipment for containment, clean-up and restoration of landscape due to spills of oils and hazardous substances that exceed the capability of the base agency responsible for the spill.

d. Notify the Commander 27CSG of personnel and equipment requirements that exceed base capability.

e. Plan, program and construct interception devices, such as sawdust, and effective plugs for sewer-connected drains to prevent potential sources of pollution from emptying directly into the Cannon AFB sewage lagoons and Playa Lake next to Munitions Storage.

f. Provide suitable inventory and storage for pollution controlling chemical agents, absorbent materials, and control equipment not otherwise specified to be furnished by other units which are employed in combating pollution.

g. Provide a Liquid Fuels Maintenance technician to supply explosion hazard technical assistance to the OSC.

(3) Base Fire Chief will:

a. Act as the on-scene coordinator until the Commander 27 CSG or BCE, or a designated OSC, arrives at the spill scene. He/She will serve as second alternate on-scene coordinator in the event the Commander 27 CSG (the primary OSC), or the BCE (the 1st alternate OSC) are unavailable.

b. Direct Fire Department to record all spill reports received on a designated telephone log.

c. Immediately respond to spills as necessary to protect life and property with due regard for the environment.

d. Activate Disaster Preparedness OPLAN as necessary.

e. Direct emergency dispatch operator to notify Base Hospital if injuries are reported. The Base Civil Engineer or Environmental Coordinator will also be notified of the spill occurrence.

f. Provide technical assistance to the OSC concerning response to, and handling of, combustible or flammable substances.

(4) The Environmental Coordinator (27CSG/DEV) will:

a. Report to scene of spill immediately upon notification.

b. Evaluate the severity of spill and determine the response necessary for containment and recovery.

c. Advise the Commander 27CSG (OSC) and BCE as to the necessity for activation of the SRT.

d. On the authorization of the OSC, notify specifically requested members of the SRT or instruct the CE-Service Desk (~~Fire Department, non-duty hours~~) to notify these members to assemble at a designated area within 15 minutes of notification.

e. Furnish the OSC technical expertise relative to pollution control techniques.

(5) Bioenvironmental Engineer will:

a. Take periodic samples of all on-base waterways for background information.

b. Upon notification of a spill, and at the direction of the OSC, sample and test the Cannon AFB sewage lagoons for spill contaminants, if needed.

c. Provide technical assistance and advice to the OSC and the hospital with respect to the health hazards associated with oils and hazardous substances.

(6) Disaster Preparedness Officer will:

Insure that the Cannon AFB Preparedness OPLAN 355-1 is coordinated with the SPR Plan in the event of a hazardous substance spill requiring the implementation of the OPLAN.

(7) Chief of Security Police will:

a. Instruct his organization to immediately respond to an actual or potential oil or hazardous substance spill, to isolate the spill area and control traffic when and where necessary as directed by the OSC.

b. Insure that while individuals in the security force are on normal patrols, they are continuously aware of oil and hazardous substance spills and report all areas that appear to be suspect.

(8) Liquid Fuels Maintenance Technician will:

Report to the scene at the request of the OSC to measure explosive vapor concentrations, and determine where explosion hazards exist. This information will be provided to the OSC for use in establishing the cordon.

(9) Staff Judge Advocate will:

a. Respond to all oil and hazardous substance pollution spills at the request of the OSC to insure that information, records, and samples adequate for legal purposes are obtained and safeguarded for future use.

b. Advise the OSC on the legal aspects of spill response when parties other than the Air Force are responsible for the spill.

(10) Public Affairs Officer will:

a. Respond to all oil or hazardous substance spills when requested by the OSC.

b. [illegible] abreast of all base actions during a spill so as to be [illegible] to provide prompt and accurate news releases on the nature of the discharge and the steps being taken to correct the problem. This policy must be followed to obtain understanding from the public, insure cooperation from all interested parties, and to check the spread of misinformation.

c. Coordinate all news media releases involving base actions with the Wing Commander.

d. If the Regional Response Teams' News Office is activated, coordinate all news releases with them. If a Regional Response Team News Office is not activated, the EPA's Public Information Office can be contacted, if deemed appropriate (214)-767-3274.

(11) Safety Officer will:
Provide technical assistance to the OSC with respect to the safety of personnel.

(12) Base Hospital Commander will:

a. Insure that medical personnel and ambulance(s) are dispatched to the site of the spill as directed.

b. Insure that emergency treatment is rendered and injured personnel are removed to the Base Hospital for treatment.

c. Insure that current and follow-up information on injured personnel is provided to the OSC as soon as possible.

d. Insure that hospital staff is familiar with health effects of hazardous substances present on the base.

(13) Transportation Officer will:
Provide OSC with transportation as required for spill response personnel and equipment.

(14) Weather Squadron Officer will:
Insure that the OSC is provided with up-to-date weather information as requested.

(15) Chief of Operations and Training will:
Insure that a photographer will document with photographs the extent of the spill and the containment, countermeasures, and restoration procedures utilized, as directed by the OSC.

(16) In addition to the base organizations and personnel assigned to the response effort, provisions have been made for including off-base organizations in the response organization when on-base spill response resources and expertise are insufficient, and when off-base water, land, or air are adversely affected. Some of the significant off-base spill response resources that can be

incorporated into the SRT are discussed below. A current listing of telephone numbers to contact these organizations is in Annex VII.

a. Tactical Air command (TAC/DEEV):
MAJCOM office responsible for ensuring environmental compliance of Cannon AFB. This office provides advice and staff assistance in all areas of environmental protection including spill response matters. HQ TAC/DEEV is located at Langley AFB, VA and can be reached at AV~~432~~ 574-4430 or 804-764-4430.

b. Air Force Engineering and Services Center (AFESC):
AFESC provides technical guidance and assistance to major commands and bases in contingency operations and environmental planning. The AFESC/DEVP is located at Tyndall AFB, Florida and can be contacted as follows: AV 970-6167 or Commercial (904) 283-6167.

c. Regional Response Team:
The Cannon AFB area is under the jurisdiction of the Region 6 USEPA Regional Response Team. The team can be reached by calling the Region 6 EPA Public Information Office at (214) 767-3274.

d. State of New Mexico Response Team:
The State OSC will be briefed fully by the Base OSC on the actual spill response. The State OSC will be familiar with the available sources of spill response equipment within the State of New Mexico. The State OSC can be reached at the 24-hour reporting number, (505) 827-8329.

e. Clovis Area Contact:
The State Environmental Improvement Division Office in Clovis should be notified in case of a spill. The office representative is Mr. David Tanner (505) ~~3728.~~ 762-3728

f. CHEMTREC:
CHEMTREC, the Chemical Transportation Emergency Center, is a 24-hour hot line that provides warnings and limited guidance to the OSC when a spill product can be identified by either chemical or trade name. CHEMTREC will also assist the OSC in contacting the manufacturer or shipper for additional information. This service should be used whenever adequate spill response information is not available. The telephone number for CHEMTREC is 1-800-424-9300.

g. CHRIS MANUAL-Chemical Hazards Response Information System:
The CHRIS Manual is an official publication of the U. S. Coast Guard that currently provides technical information and appropriate response procedures for over 1,000 different substances. The manual contains four volumes which are periodically updated. CHRIS data forms for many of the chemicals stored at the base have been included in Annex III of this document.

h. ETIS-Environmental Technical Information System:
ETIS is a computerized information system which contains Federal and State environmental regulations, directories of Federal and State environmental contacts and computer modeling capabilities. The ETIS overall system manager is the U. S. Army Construction Engineering Research Laboratory located at Champaign Ill. The Environmental Planning Directorate at AFESC manages Air Force use of the system. Additional information on the system and how to access it can be obtained by calling AV 970-6167 or Commercial (904) 283-1667.

i. OHMTADS-Oil and Hazardous Materials Technical Assistance Data System, EPA:
Usually called TADS, this system is a computerized information retrieval file on various hazardous substances. The data base contains chemical, biological, toxicological and response information on more than 1,000 chemicals and can be accessed by either chemical or trade names. The TADS system should be considered for both spill response planning and as a source of vital information during a spill response. AFESC/DEV can provide information on this system including how to subscribe or access the system through ETIS.

j. "USAF Occupational and Environmental Health Laboratory" (OEHL):
The OEHL is assigned responsibility for providing consulting services on spill sampling contaminant treatment methods, as well as analytical support during response and recovery operations. For complex spill problems, on-site support may be provided. In CONUS, call AV 240-3305 (consulting) or AV 240-3626 (analytical support).

Plan Execution

Due to the diversity of materials stored on base and the variable severity of the hazards presented in the event of a spill; the response actions will vary. General procedures are outlined in the following sub-sections. These procedures should be reviewed and if necessary updated prior to adopting coursed of action in a particular situation. The table in Annex I and maps in Annex IX should be consulted with regard to the reportable spill quantities, probable spill routes and contingency actions. If a Site-Specific Contingency Plan exists for the spill area in question, it will be noted in the Contingency Action column of the Annex I table and should be referred to in Annex II. It should be noted that this plan deals primarily with solid and liquid phase pollutants. Releases of gaseous substances, because of their rapid dispersion and often highly hazardous nature should be dealt with in accordance with Cannon AFB OPLAN 355-1, Disaster Preparedness, Annex E.

The execution of the SPR Plan is divided into two phases: Phase I - Spill Discovery and Initial Notification; Phase II - Response Action. Phase I designates the initial spill response procedures to be followed by any individual discovering a spill or potential spill or oil or hazardous substances. It also designates the procedures to be followed by the Fire Department, Base Environmental Coordinator, Base Civil Engineer and CE Service Desk in providing rapid notification of the spill to the proper on-base personnel and organizations. Phase II then designates the general response actions to be taken by the OSC in containing, clean-up and restoring the spill site.

Phase I - Spill Discovery and Initial Notification

(1) Person(s) discovering spill is/are responsible for providing initial defensive actions without undue risk of personal injury.

a. The following actions will be implemented as necessary upon discovery of a spill. The order of the actions will depend on existing conditions.
   - o Initiate evacuation, if necessary.
   - o Notify Base Fire Department, On-Base Ext 4117, Off-Base Telephone Number 784-4117
   - o Stop source of spill when possible without undue risk of personal injury; to include use on on-site spill containment equipment and materials.
   - o Make spill scene OFF LIMITS to unauthorized personnel.
   - o Restrict all sources of ignition when flammable substances are involved.
   - o Report to on-scene coordinator upon arrival.

b. When notifying the Fire Department of the spill occurrence, the following information should be provided if known or can reasonably be determined.
   - o Name of individual reporting spill
   - o Location of individual reporting spill
   - o Number of injured personnel and nature of injuries (if applicable)
   - o Substance spilled
   - o Amount spill (estimated)
   - o Rate material currently spilling (estimated)
   - o Time spill occurred (estimated)
   - o Extent which spill has traveled
   - o Any additional pertinent information (i.e., other potential hazards)

c. Base personnel other than the Fire Department receiving reports of spills shall aid in channeling the report to the Fire Department who will respond as outlined.

(2) The Fire Department will:

a. Record spill reports on a Spill Incident Checklist Log designed to record the information listed in the above paragraph (1)b along with the time of the report.

b. Immediately respond as necessary to protect life and property with due regard for the environment.

c. Notify the Fire Chief and Base Environmental Coordinator (or Base Civil engineer if Environmental Coordinator cannot be contacted) as well as the Base Hospital if injuries are reported. The Spill Incident Checklist Log will contain a notice instructing the dispatch operator to immediately institute these notifications. The checklist will include the Duty and Non-Duty telephone numbers for the above mentioned personnel. The current duty telephone numbers for these personnel are listed in Annex VI.

The Environmental Coordinator, when directed by the Base Civil Engineer will:

(3) ~~The Base Environmental Coordinator or Civil Engineer will:~~

a. Immediately proceed to the spill site and evaluate the severity of the spill and determine the response necessary for containment and recovery.

b. Advise the OSC as to the necessity for activation of Spill Response Team (SRT).

c. On the authorization of the OSC, notify specifically requested members of the SRT or instruct the CE Service Desk (~~Fire Department, non-duty hours~~) to notify these members to assemble at the area designated by the OSC or the Environmental Coordinator within 15 minutes of notification.

d. Respond with available men equipment and materials if requested by appropriate authority and approved by the OSC.

(4) The CE Service Desk will:

a. Maintain a current list of all members of the Spill Response Team (SRT) along with their duty telephone numbers (Annex VI) as well as non-duty telephone numbers. A backup copy of this list will be posted at the Fire Department dispatch desk ~~which receives all CE Service Desk calls during non-duty hours.~~

b. Contact the SRT members designated by the OSC or the Environmental Coordinator and inform them to assemble within 15 minutes at a specified location.

Phase II - Spill Response Actions

(a) In the event of a spill of oil or hazardous substances, the OSC will be responsible for directing and coodinating all spill response actions. The OSC or his/her designee will maintain an Incident Log detailing all actions taken during the course of the pollution spill response. The log will include: a description of pollutant; the actions taken to recover the pollutant and restore the environment; and any additional significant information. Spill response actions under the responsibility of the OSC are:

a. Activate or authorize action of appropriate members of the Spill response Team (SRT) based on information relayed during initial notification or information provided by the Environmental Coordinator, and immediately investigate the reported spill.

b. Determine source, type and approximate quantity of spill substance.

c. Evaluate magnitude and severity of the threat to public health, welfare and natural resources. The Material

Safety Data Sheets contained in Annex III should be utilized as required to determine potential health, fire and pollution affects associated with the spill material.

d. Take appropriate safety precautions to protect response personnel and any additional personnel located in close proximity to the probable spill route. Base Security Police will be utilized for implementing evacuation or traffic control measures.

e. Determine the party responsible for spill, if other than the Air Force. The responsible party should be informed of the spill and their response actions are inadequate in the judgement of the OSC, they should first be informed of their financial liability, and then if their spill response actions remain inadequate, the Base OSC should assume control of the spill response. In all response actions involving parties other than the Air Force, the Base Judge Advocate should be informed. If a contractor is involved with a spill, the contracting office should be notified. (EXT. 2941) BLDG. 150

f. Determine cause of spill and institute appropriate action to stop the source of spill if spill is still occurring.

g. Institute spill containment procedures. The primary concern is to confine spills as close to their source as practical and if at all possible prevent spills from exiting base property. In accomplishing this task, the OSC should refer to the following sources of information contained in this document:

- Annex I for maximum potential spill quantities, available secondary containment, probable spill routes and general contingency actions.
- Annex II for Site-Specific Contingency Plans when the existence of such a plan is stated under "Contingency Action" in Annex I.
- Annex III for the health hazards, fire hazards, pollution potential and physical and chemical properties of the spill material.
- Annex IX for maps to assist in the determination of probable spill routes, access to the spill sites, location of remote secondary containment and spill containment areas.
- Annex V for spill response equipment inventory and location of equipment.
- Annex IV for listing of the oil/water separators located on Base which may potentially be used for containment of spills.

h. Contact TAC/DEEV by telecon (AUTOVON ~~482~~ 574-4430/7844), even if base personnel are uncertain of the spill classification. The purpose of the telecon is to verify the spill classification or aid in the classification when uncertainty

exists and to gather available information on reportable spills, to support the initial command telecon report ot USAF/LEEV. For spills occurring after normal duty hours or on weekends, the TAC/DE alert duty officer should be contacted through the TAC Command Post (AUTOVON ~~432~~-224/2225). As much of the following information as can be reasonably determined should be initially reported.

574

- o Name of installation
- o Location of incident and geography
- o OSC name and telephone number
- o Time of spill
- o Type and estimated quantity of spill substance
- o Magnitude and severity of the threat to public health, welfare and natural resources
- o Weather conditions at spill site
- o Cause of incident
- o Anticipated containment and clean-up action and effectiveness
- o Need for assistance by National, regional or state response teams
- o Any other pertinent information

i. Determine if a Reportable Spill has occurred. Annex I includes Reportable Spill criteria for the substances identified on base as potential Reportable Spill substances. If the spill is deemed a "Reportable Spill" by the OSC, a confirming message containing the available information identified in paragraph (1) q of this section must be released and transmitted to TAC LANGLEY AFB VA/ DEEV/SGPAE with information copies to HQ USAF WASH DC/ LEEV/SGES, HQ AFESC TYNDALL AFB FL/DEVP/PA/DEMM, HQ AFMSC BROOKS AFB TX/SGP, USAF OEHL BROOKS AFB TX/ECW, HQ USAF WASH DC/LEYF (when POL is involved) and HQ USAF WASH DC/ RDCM (when industrial facilities are involved). This message should be transmitted within 4 hours of the telecon notification to TAC/DEEV. If the telecon notification is made after 1500 hours local, the message will be transmitted no later than 1000 hours the following day.

j. Telephonic and message notification of other Federal and state agencies must be made promptly following telecon notification of reportable spill to TAC/DEEV. These agencies are:

National Response Center (800) 424-8802

New Mexico Environmental
Improvement Division, Clovis New Mexico (505) 762-3728

k. Direct Base Bioenvironmental Engineer to take samples to determine the chemical, nature, pollutant concentration and extent of the spill as required for response actions and documentation.

l. Advise Base Public Affairs of the size and nature of the spill and response actions.

m. Initiate clean-up actions. Pollutants will be collected to the maximum extent possible.

- o Petroleum pollutants will be collected and stored in the waste oil storage facility.
- o Absorbent and similar material will be placed in 55 gallon drums, labeled, turned in to the Defense Reutilization & Marketing Office (DRMO) and stored there if necessary until eventual disposal in accordance with Department of Defense (DOD) and RCRA regulations.
- o Hazardous pollutants will be collected in supplied polyethylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102, labeled, turned in to DRMO and stored there if necessary, until eventual disposal in accordance with DOD and RCRA regulations. The Chemical Hazards Response Information System (CHRIS) Hazardous Chemical Data Sheets and Material Safety Data Forms included in Annex III should be consulted with regard to special procedures and precautions.

n. Officially classify oil spills using the following definitions:

- o Minor discharge. Minor discharge means a discharge to the inland waters of less than 1,000 gallons of oil; or a discharge to the costal waters of less than 10,000 gallons of oil.
- o Medium discharge. Medium discharge means a discharge of 1,000 to 10,000 gallons of oil to the inland water; or a discharge of 10,000 gallons to 1000,000 gallons of oil to the coastal waters.
- o Major discharge. Major discharge means a discharge of more than 10,000 gallons of oil, to the inland waters.

o. Following the initial confirmation message, the base will release and transmit subsquent messages every weekday as of 0800 hours due out by 1200 hours the same day. The report may be made by exception. Following the initial message, subsequent messages need not be transmitted on weekends or holidays unless specifically requested by TAC/DEEV. Addresses for the subsquent message reports are the same as those listed in paragraph (1)j of this section.

k. On completion of clean-up operations a "close-up" report will be submitted to TAC/DEEV, with information copies to HQ/LEEV and New Mexico Environmental Improvement Division, Clovis New Mexico (505) 762-3728. In addition the report must be submitted within 60 days of a "major" oil spill to the National Response Team and the Regional Response Team; within 60 days of a 1,000 gallon oil spill, or two (2) reportable oil spills in twelve (12) months to the Regional Administrator of EPA; with 60 days of a reportable spill of Clean Water Act Section 311 substances to the NMEID, Clovis and the USEPA Region VI (214-767-3274) and within 15 days of a spill of hazardous waste requiring the implementation of the SPR Plan to the Region VI Administrator of EPA. Both regulatory agency reports must be in narrative format and the internal Air Force reports must be in the message formate specified in AFR 19-8.

- o Name and address of installation an/or owner;
- o Name and telephone number OSC;
- o Incident report (initial, second, third, final);
- o Date and time of incident;
- o Time of official spill notification to the National Response Center and other regional and state officials;
- o Location of incident and the nature of the terrain at the location, to include surface and subsurface drainage characteristics and relationships to water bodies (estimate extent of area affected such as miles of stream or acres of lake);
- o Weather conditions and how they affected response action;
- o Cause of incident;
- o Type and estimated amount (barrels, gallons, pounds) of pollutant and the official size classification (minor, medium, major);
- o Actual damage and/or potential threat to human life, to property (private, state, or Federal), and to plant or animal life;
- o Corrective action taken to eliminate pollution source;
- o Corrective action taken to remove pollutant;
- o Assistance required;

- Estimated completion date of remedial actions and anticipated effectiveness;
- Estimated quantity and dispostion of spill material and contaminated soil;
- Confirmation that emergency response equipment is back in operation before resuming operating activities;
- Description of any problems encountered during implementation of the SPR plan and an explanation of how the Spill Prevention and Response Plan was, or will be, modified to prevent the recurrence of the spill event;
- Anticipated or actual reaction by the news media and public to the incident (Specify potential for liability in the internal Air Force reports only);
- A copy of this SPR Plan is requested.

SECTION FIVE - TRAINING

Personnel Training Requirements: These training requirements are for non-Fire Department personnel. Fire Department personnel already receive training in the following areas: Non-Fire Department personnel involved with the management and handling of oil and hazardous substances must take part in periodic spill prevention and response training programs. The training program will consist of formal training and on-the-job training incorporated into existing fire and safety training programs. The training will be conducted by an individual familiar with the SPR and hazardous waste management (i.e., the Base Environmental Coordinator and supervisory personnel from respective oil and hazardous substance storage areas). Others assisting with the training will include the Bioenvironmental Engineer, Fire Department and Disaster Preparedness Office. Training programs will include the following key features:

- Health effects of exposure to the oil and hazardous substance;
- Applicable first aid procedures to be used following exposure;
- Protective equipment requirements and procedures for using equipment;
- Evacuation procedures;
- Combustibility of spill material and potential for flash back along vapor trails;
- Applicable fire fighting procedures and special hazards of combustion products;
- Reactivity of spill material with common materials including water;
- Use and maintenance of all alarms and monitoring equipment associated with spill provention or response;
- Initial notification procedures described in the Oil and Hazardous Substances Contingency Plan section and Site-Specfic Contingency Plans, if applicable.
- Location of posted Site-Specific Contingency Plans, if applicable;
- Immediate spill response actions including the location of pump controls and valves to stop spill flows, and the location and use of fire extinguishers, sorbents, neutralizing agents and other immediate spill response procedures, as appropriate;
- The many aspects of visual inspection associated with the particular area;
- The purpose and requirements of good housekeeping as described in the Spill Prevention Control and Countermeasures section;
- The use of the SPR Plan including the legal requirements that resulted in the plan, spill prevention aspects, spill response organizations including the function of the OSC, designated spill response procedures; and the location of spill response equipment.

Training programs will be conducted once per year for all personnel working at oil and hazardous substance sites; within six months (two weeks recommended) for all personnel starting a supervised position, prior to starting work for personnel entering an unsupervised position; after any significant revisions to the training program or the SPR Plan, and after a spill response in which training deficiencies were noted. Records of the type, extent and frequency of each employee's training will be maintained until closure of the applicable area or until three

years after the date the employee last worked. Use of the Air Force Personnel Form 991 and Civilian Personnel Form 971 are recommended for this purpose. Newcomers to the base should be immediately informed of the general spill response and reporting procedures by including a procedural outline in each newcomer sponsor package.

Contractor Handling Oils and Hazardous Materials

Contractors working in areas associated with oils or hazardous substances are responsible for training their personnel in spill response and reporting procedures. The contract administrator for the Air Force is responsible for providing these contractors with a summary of spill response and reporting procedures.

Spill Response Team (SRT) Training

All base personnel designated in this document as part of the SRT must take part in periodic spill response training programs. The training will involve both general training and detailed training. The general training will consist of the applicable laws; base responsibilities; DOD and USAF policies; potential hazards to personnel, property and the environment from spill events; and the use of the SPR Plan including the function of the OSC, the designated responsiblities of member organizations and the general response procedures. The detailed training will be specifically structured for each response organization and address the following:

- The responsibilities of the individual organization being trained;
- The detailed response procedures to be followed in the event of a spill;
- The location and use of spill response equipment;
- The potential health and fire hazards ~~associted~~ associated with spill response activities.

The training will consist of formal classroom training and spill exercises. The OSC is responsible for the training program and the base Environmental Coordinator will implement the program. The frequency of they training programs, at a minimum, will correspond to the requirements designated for base personnel. Spill response exercises will be conducted at least once annually. Response to an actual spill will satisfy the annual requirement for spill response exercises. New SRT members should be given a copy of the SPR Plan and briefed when they are assigned to the team.

SECTION SIX - PLAN REVIEW AND UPDATE

The SPR Plan will be reviewed, at a minimum, annually and amended as required. Other circumstances which will warrant a plan review and update are listed as follows:

- When RCRA permit is modified;
- When facility changes occur which increase the potential for spills or change the spill prevention and response procedure methods and equipment;
- When the SPR Plan fails or proves to be ineffective in the prevention of or response to a spill event;
- At the request of the U.S. Environmental Protection Agency or the New Mexico Environmental Improvement Division;
- When changes occur in the OSC or SRT or spill response equipment list;
- After enactment of, or amendment to, pertinent Federal or state legislation, or changes in DOD USAF policy. Particular attention should be given to changes in reportable spill quantities;
- After pertinent modifications of Federal, regional and state contingency plans;
- After any changes in adjacent land and water use that would affect spill prevention and response considerations;

The Environmental Protection Subcommittee on spills will conduct these reviews utilizing the same procedures used in the initial plan development of the document (refer to USAF Guidance Manual for Preparation of SPR Plans). The review will include detailed inspection of oil and hazardous substance sites and verification of all data generated during the initial plan development. When possible, a professional engineer will take part in these inspections. The Environmental Protection Subcommittee on spills will submit a report to the Environmental Protection Committee describing any deficiencies and recommended corrective actions.

The Environmental Protection Committee will be responsible for reviewing the report, monitoring any corrective actions and amending the SPR Plan when necessary. The review of the SPR Plan, and any resulting amendments or changes to the plan will be logged on the record sheet at the front of this document. If amendments or changes significantly affect the SPCC portion of the plan, Annex I; the plan must be recertified by a professional engineer.

ANNEX I

OIL AND HAZARDOUS SUBSTANCE SITE SPILL PREVENTION MECHANISMS AND CONTINGENCY ACTIONS

Contents

Section I - Oil and Hazardous Substance Site Spill Prevention Control and Countermeasures Summary

Section II - Oil and Hazardous Substance Site Spill Prevention Control and Countermeasures Explanatory TABS

Section III - Certification and Approval Signatures

Section I Oil and Hazardous Substance Site Spill Prevention Control and countermeasures Summary

The table within this section has been divided into four categories: Oil Storage Facilities; Fuel Transfer Areas; Chemical, Drum and Small Container Areas; and Sewage Spills. Each category is arranged in a sequential order by facility number with the miscellaneous non-numbered facilities located at the end of the appropriate category division.

The table contains site description information, maximum spill quantities and the grid coordinates associated with the Oil and Hazardous Substance Site Location Map, Annex IX. In addition, available information concerning reportable spill quantities, secondary containment features, probable spill routes, contingency actions, visual inspection procedures, preventive maintenance, housekeeping, material compatibility, security, monitoring procedures and Standing Operating Procedures (SOPs) are specifically referenced for each facility. These references are described in the SPCC Explanatory TABs found in Section II. A table of abbreviations can be found on page ~~I-21.~~ I-14.

OIL AND HAZA[illegible] SUBSTANCE SITE
SPILL CONTROL [illegible] COUNTER MEASURES

OIL STORAGE FACILITIES AG = ABOVE GROUND UG = UNDERGROUND

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
108	DF2	Maint. Hangar UG Tank	L-6	2000	E-1	F-4	G-1	H-3, H-1, H-2	I-1	J-1 J-6	K-1	L-1	M-1	N-5	12/83
121	DF2	Maint Hangar UG Tank	L-6	2000	E-1	F-4	G-1	H-3, H-1, H-2	I-1	J-6 J-1	K-1	L-1	M-1 M-2	N-5	12/83
129	DF2	Maint Hangar UG Tank	M-7	2000	E-1	F-4	G-1	H-3, H-1, H-2	I-1	J-6 J-1	K-1	L-1	M-1 M-2	N-5	12/83
170	DF2	Maint Hangar UG Tank	N-8	2000	E-1	F-4	G-1	H-3, H-1, H-2	I-1	J-6 J-1	K-1	L-1	M-1 M-2	N-5	12/83
185	DF2	Heating Fac.	N-8	4000	E-1	F-1	G-14	H-1, H-2	I-1	J-1	K-1	L-1	M-1 M-2	N-5	12/83
182	MOGAS	UG Tank & Fill Stand	N-8	2 at 2000 EA	E-1	F-2	G-14	H-2	I-6	J-1 J-2	K-1	L-1	M-1 M-2 M-3	N-1	12/83
183	JP4	UG Tank & Fill Stand	0-8	6000	E-1	F-2	G-15	H-1, H-2	I-1	J-1 J-2	K-1	L-2	M-1 M-2	N-1	12/83
240	Asphalt	CE Stor AG Tank	R-11	8400	E-1	F-3	G-25	H-1	I-1	J-1	K-1	L-2	M-1 M-2	N-3	3/84
241	Asphalt	CE Stor AG Tank	R-11	8400	E-1	F-3	G-25	H-1	I-1	J-1	K-1	L-2	M-1 M-2	N-3	3/84

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

OIL STORAGE FACILITIES AG = ABOVE GROUND UG = UNDERGROUND

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
325	BRINE	Salt Stor AG Tank	P-9	13,500	E-1	F-3	G-22	H-1	I-1	J-1	K-1	L-2	M-1	N-5	12/83
368	MOGAS	AFEES Serv. Sta. UG Tank	Q-8	4 at 6000	E-1	F-4	G-25 G-1	H-12,H-1, H-2, Annex II-12	I-6	J-3	K-1	L-1	M-1 M-2	N-1	12/83
376	MOGAS	Base Serv. Sta. UG Tank	Q-8	5000	E-1	F-4	G-25 G-1	H-12,H-1, H-2	I-6	J-3	K-1	L-1	M-1 M-2	N-1	12/83
377	MOGAS	Base Serv.Sta. UG Tank	Q-8	5000	E-1	F-4	G-25 G-1	H-12,H-1, H-2	I-6	J-3	K-1	L-1	M-1 M-2	N-1	12/83
378	MOGAS	POL Area UG Tank	R-10	25,000	E-1	F-5	G-22	H-12,H-1, H-7	I-6	J-2	K-1	L-2	M-1 M-2 M-3	N-1	3/84
390	JP4 (Waste)	POL Area UG Tank	S-10	2,000	E-1	F-5	G-1	H-3, H-1	I-5	J-6 J-1 J-2	K-1	L-1	M-1 M-2 M-3	N-1	12/83
394	JP4	AG Tank, Diked	S-10	420,000	E-1	F-5	G-22	H-1, H-7 Annex II-1	I-2	J-4 J-1	K-1	L-2 L-3	M-1 M-2 M-3	N-1	12/83
395	JP4	AG Tank, Diked	S-10	840,000	E-1	F-5	G-22	H-1, H-7 Annex II-1	I-2	J-4 J-1	K-1	L-2 L-3	M-1 M-2 M-3	N-1	12/83
396	JP4	AG Tank, Diked	S-10	840,000	E-1	F-5	G-22	H-1, H-7 Annex II-1	I-2	J-4 J-1	K-1	L-2 L-3	M-1 M-2	N-1	12/83

OIL AND HAZARDOUS SUP NCE SITE
SPILL CONTROL AND COU MEASURES

OIL STORAGE FACILITIES AG = ABOVE GROUND UG = UNDERGROUND

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
398	MOGAS	AG Tank Diked	S-10	10,000	E-1	F-5	G-22	H-1, H-7 Annex II-1	I-2	J-1	K-1	L-2	M-1 M-2 M-3	N-1	12/83
399	DF2	AG Tank Diked	S-10	20,000	E-1	F-5	G-22	H-1, H-7 Annex II-1	I-2	J-1	K-1	L-2	M-1 M-2 M-3	N-1	12/83
728	DF2	RAPCON Cent. UG Tank	M-6	1000	E-1	F-4	G-27 G-1	H-1, H-2	I-1	J-1	K-1	L-1	M-1 M-2.	N-5	12/83
1400	DF2	HOSP UG Tank	R-5	24,000	E-1	F-4	G-1 G-30	H-1, H-2	I-1	J-1	K-1	L-1	M-1 M-2	N-5	3/84
2110	DF2	UG Furnace Tank	N-15	700	E-1	F-4	G-1	H-2	I-6	J-7	K-1	L-1	M-1 M-2	N-5	6/84
2105	DF-2	UG Furnace Tank	N-15	700	E-1	F-4	G-1	H-2	I-6	J-7	K-1	L-1	M-1 M-2	N-5	6/84
2280	DF2	ASR UG Tank	J-10	1000	E-1	F-4	G-1	H-1, H-2	I-1	J-1	K-1	L-1	M-1 M-2	N-3	12/83
2285	DF2	DAR UG Tank	I-10	1000	E-1	F-4	G-1	H-1, H-2	I-1	J-1	K-1	L-1	M-1 M-2	N-3	12/83
2328	DF2	DEMP UG Tank	E-6	3000	E-1	F-4	G-1	H-1, H-2	I-1	J-1	K-1	L-1	M-1 M-2	N-3	12/83
4003	CONTAM. Oil	UG Tank	P-9	20,000	E-1	F-4	G-1	H-1, H-2	I-1	J-1 J-2	K-1	L-1	M-1 M-2	N-7	3/84
5113	JP4	Test Stand AG Tank	G-11	2500	E-1	F-3	G-4	H-1, H-6 H-12,H-14	I-6	J-1	K-1	L-2	M-1 M-2	N-5	12/83
5114	JP4	Test Stand Diked AG	G-11	5000	E-1	F-6	G-22	H-1, H-7 H-14,H-12	I-6	J-1	K-1	L-2	M-1 M-2	N-5	12/83

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

OIL STORAGE FACILITIES AG = ABOVE GROUND UG = UNDERGROUND

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPECTION	REV. AINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT.	VERIFI-CATION DATE
POL AREA	JP4 MOGAS DF2	Fill Stand (4) AG Tanks	R-10	N/A	E-1	F-5	G-20	H-1, H-3	I-6	J-2	K-1	L-2	M-1 M-2 M-3	N-1	3/84
Munitions Storage Area	MOGAS	(1)AG Tank Diked	O-16	500	E-1	F-6	G-23	H-1	11, I-8	J-1	K-1	L-2	M-1 M-2 M-3	N-3	6/84
Contractor Storage Area	Waste Oil	R5 Tank	R-11	5,000	E-1	F-6	G-22	H-1, H-2	I-1	J-1 J-2	K-1	L-1	M-1 M-2	N-7	1/86

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

JEL TRANSFER FACILITIES

ACILITY JMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
REA	JP4 MOGAS DF2	Unloading Fac. AG	R-10	N-A	E-1	F-2	G-21	H-1, H-3 H-12, An-nex II-1	I-6	J-2	K-1	L-2	M-1 M-2	N-1	3/84
REA	JP4	Ref. Veh. Parking Area	R-10	15 at 5000 ea	E-1	F-2	G-21	H-1, H-3 H-12, An-	I-7	J-2 J-5	K-1	L-1	M-1 M-2 M-3	N-1	3/84
)95	MOGAS	Ref. Veh. Parking Area	R-10	2 at 1200	E-1	F-2	G-21	H-1, H-3 H-12, An-nex II-1	I-7	J-2 J-5	K-1	L-1	M-1 M-2 M-3	N-1	3/84
6	DF2	Parking Area	P-9	1200	E-1	F-2	G-20	H-1, An-nex II-2	I-7	J-1	K-1	L-1	M-1 M-2 M-3	N-1	3/84
6	Water-Glycol (5%)	Parking	P-9	3 at 250 ea	E-1	F-2	G-20	H-1	I-1	J-1	K-1	L-1	M-1 M-3	N-5	3/84
14	JP4	Apron Air-craft & Trucks	M-8	Varies	E-1	F-2	G-6	H-1, H-4 H-6, H-12	I-7	J-5 J-6	K-1	L-2	M-1 M-2	N-3	3/84

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

CHEMICAL, DRUM AND SAMLL CONTAINER STORAGE AREAS

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
165	B-11	Aircraft Washrack	M-7	8000 lb	B-11	F-1 F-2	G-11	H-3, H-6	I-11	J-6 J-9	K-2	L-4	M-1	N-5 N-6	12/83
170	B-10	Hangar Maint	N-8	50	B-10	F-1 F-2	G-12	Annex II-8, H-6, H-14, H-11	I-11	J-11	K-1	L-1	M-1	N-5	12/83
~~173~~	~~B-12~~	~~WPN & RLSE SYS Shop~~	~~Q-11~~	~~50~~	~~B-12~~	~~F-1~~	~~G-12~~	~~H-1, H-11~~	~~I-11~~	~~J-11~~	~~K-1~~	~~L-1~~	~~M-1 M-6~~	~~N-5~~	~~12/83~~
181	B-13	Mobility Ops Bldg	N-8	50+	B-13	F-3	G-14	H-1	I-11	J-11	K-1	L-1	M-1 M-6	N-5	12/83
593 ~~185~~	B-14	Non-DES Insp Shop	N-8	100+	B-14	F-2	G-14	H-11	I-4	J-1	K-2	L-4	M-1	N-5	12/83
186	B-~~15~~22	AGE Stor. Facility	O-8	1200	B-15	F-3	G-15	H-14, H-11 Annex II-8	I-11	J-1 J-6	K-2	L-4	M-1	N-5	12/83
~~189~~	~~B-16~~	~~WPN & RLSE Sys Shop~~	~~O-8~~	~~110~~	~~B-16~~	~~F-1 F-2~~	~~G-11~~	~~H-11, Annex II-8~~	~~I-4~~	~~J-11~~	~~K-1~~	~~L-1~~	~~M-1~~	~~N-5~~	~~12/83~~
196	B-17	Aircraft Coor. Con-trol	P-10	250+	B-17	F-1 F-2	G-16	Annex II-8, H-3, H-6	I-11	J-11 J-6 J-1	K-1	L-4	M-1 M-3	N-5 N-6	12/83
304	B-18	Base Haz. Stor.	R-9	300+	B-18	F-7	G-20	H-1, H-9	I-11	J-10	K-2	L-4	M-1 M-3	N-5 N-6	2/84
214	B-19	MWR Supply	Q-10	50	B-19	F-3	G-19	H-1	I-11	J-11	K-1	L-1	M-1 M-6	N-5	12/83

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

CHEMICAL, DRUM AND SMALL CONTAINER STORAGE AREAS

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
20	B-1	HSG. Sup-ply & Stor-age	M-6	50	B-1	F-3	G-27	H-9	I-11	J-11	K-1	L-1	M-1 M-3	N-5	3/84
102	B-2	Sqdn Ops	L-5	50	B-2	F-3	G-5	H-9	I-11	J-11	K-1	L-1	M-1 M-6	N-5	3/84
112	B-3	Disaster Prep.	L-6	50	B-3	F-3	G-8	H-9	I-11	J-1 J-11	K-1	L-1	M-1 M-6	N-9	3/84
119	B-4	Maint. Dock	L-5	55	B-4	F-1 F-2	G-4 G-5	H-11,H-14 H-1	I-11	J-6 J-11	K-1	L-1	M-1 M-6	N-5	3/84
120	B-5	CE Stor. Facility	K-5	280	B-5	F-1 F-2	G-6	H-11	I-5	J-11	K-1	L-4	M-1 M-6	N-5	3/84
121	B-6	Hangar Maint.	L-6	50	B-6	F-1	G-7	H-11,H-14 Annex II-8, H-6	I-4	J-6 J-11	K-1	L-1	M-1 M-6	N-5	3/84
123	B-7	Sqdn Ops	L-6	50	B-7	F-2	G-9	H-9	I-11	J-11	K-1	L-1	M-1 M-6	N-9	3/84
130	B-8	Fire Sta.	M-7	50	B-8	F-1 F-2	G-10	H-, H-6	I-4 I-9	J-6 J-11	K-1 K-2	L-4	M-1 M-6	N-5	12/83
135	B-9	Base Ops	M-7	50	B-9	F-2	G-11	H-1	I-11	J-11	K-1	L-1	M-1 M-6	N-5	12/83
150	B-10	Wing HQ	M-7	50	B-10	F-3	G-4	H-1	I-11	J-11	K-1	L-1	M-1 M-6	N-9	12/83

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

CHEMICAL, DRUM AND SMALL CONTAINER STORAGE AREAS

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
212	B-53 B-54	Entomology Stor. Fac. NEW	Q-9	50001b	B-53 B-54	F-7	G-19	H-1, H-7 Annex II-6	I-11	J-12 J-11	K-2	L-4	M-1	N-9	3/84
215	B-20	Base Sup. Equip. WHSE (DRMO)	Q-9	50+	B-20	F-3	G-18	Annex II-7, H-11 H-1	I-11	J-11	K-1	L-4	M-1 M-3	N-9	12/83
216	B-21	Petrol Ops Bldg	Q-9	50+	B-21	F-6	G-20	H-19, Annex II-1	I-4 I-11	J-2	K-1 K-2	L-4 L-2	M-1 M-3	N-5 N-6	12/83
219	B-22	CE Maint Shop	R-10	50+	B-22	F-3	G-21	H-11	I-11	J-1	K-1	L-4	M-1	N-5	12/83
221	B-23	Base Sup Open Stor	Q-10	100+	B-23	F-3	G-2	H-1, Annex II-4	I-11	J-1	K-1 K-2	L-4	M-1 M-3	N-5	12/83
354	B-24	CE Pav & Grnd Fac	Q-8	50	B-24	F-3	G-25	H-1	I-4	J-1	K-1	L-1	M-1	N-5	3/84
357	B-24	CE Maint Shop	Q-8	50	B-24	F-3	G-25	H-1, Annex II-10	I-4	J-1 J-6	K-1	L-1	M-1 M-3	N-5	3/84
379	B-25	Veh Maint Shop	P-8	50	B-25	F-3	G-26	H-11,H-14 H-1	I-11	J-1	K-1	L-4	M-1 M-3	N-5	12/83
389	B-26	CE Covrd Stor Fac	R-9	150+	B-26	F-7	G-4	H-9,H-11 H-1	I-11	J-1 J-11	K-1 K-2	L-4	M-1 M-3	N-5 N-6	12/83
494	B-27	Hobby Shop Automot.	O-8	50	B-27	F-3	G-4	H-11, Annex II-11	I-5	J-1	K-1	L-1	M-1	N-9	12/83
620	B-[illegible]	Avionics Shop	N-7	50	B-28	F-1	G-27	1	I-4	J-1 J-7	K-1	L-1	M-1	N-5	[illegible] 3

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

CHEMICAL, DRUM AND SMALL CONTAINER STORAGE AREA

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
224	B-56	Haz. Waste Stor. Fac (PCB)	Q-9	50	B-56	F-7	G-17	Annex II-5, H-8, H-9	I-11	J-10 J-6	K-1 K-2	L-1	M-1	N-7 N-9	2/84
*226															
620	B-29	Avionics Equip. Test Sta.	N-7	50	B-29	F-3	G-27	H-9	I-11	J-11	K-1	L-1	M-1	N-5	12/83
620	B-30	Avionics Fill Room	N-7	50	B-30	F-1	G-27	H-9	I-11	J-11	K-1	L-1	M-1	N-5	12/83
620	B-31	PMEL	N-7	50	B-31	F-3	G-27	H-9	I-11	J-11	K-1	L-4	M-1	N-9	12/83
680	B-36	A/M Shop Tool Crib	N-7	50	B-36	F-1	G-28	H-1, H-11	I-11	J-11	K-1	L-1	M-1	N-9	12/83
680	B-33	Eng. Shop Airc. Maint	N-7	1000	B-33	F-1	G-28	H-1, H-11 H-14	I-11	J-6	K-1	L-1	M-1	N-9	12/83
680	B-34	Fiberglass Shop	N-7	50	B-34	F-1	G-28	H-1, H-11	I-4	J-11	K-1	L-1	M-1	N-9	12/83
680	B-35	Pneudrau-lics Shop	N-7	80	B-35	F-1	G-28	H-1, H-6 H-11	I-4	J-11	K-1	L-1	M-1	N-9	12/83
689	B-32	Exchange Snack Bar	N-6	50	B-32	F-3	G-28	H-1, H-11	I-11	J-11	K-1	L-1	M-1	N-5	12/83
[illegible]	B-37	AAFES [illegible]	N-6	50	B-37	F-3	G-4	H-1, H-9	I-11	J-11	K-1	L-1	M-1 M-6	N-9	12/83

* See Page I-13 for description

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

CHEMICAL, DRUM AND SMALL CONTAINER STORAGE AREAS

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
723	B-38	Law Cntr	M-6	50	B-38	F-3	G-2	H-9	--	J-11	K-1	L-1	M-1	N-9	12/83
728	B-39	RAPCON Center	M-6	50	B-39	F-3	G-27	H-1	I-4	J-11	K-1	L-1	M-1 M-6	N-9	12/83
772	B-40	Data Proc.	M-6	50	B-40	F-3	G-2	H-1	I-4	J-11	K-1	L-1	M-1 M-6	N-9	12/83
799	B-41	EOD	M-5	50	B-41	F-3	G-31	H-9	I-4 I-8	J-1	K-1	L-4	M-1 M-3.	N-9	12/83
799	B-42	EOD Paint Locker	M-5	50	B-42	F-3	G-31	H-9	I-4	J-1	K-1	L-1	M-1 M-3	N-9	12/83
840	B-44	NCO Open Mess	M-5	50	B-44	F-3	G-4	H-1, H-9	I-11	J-1	K-1	L-1	M-1	N-9	2/84
1400	B-45	HOSP Lab	R-5	50	B-45	F-3	G-30	H-9, H-11	I-11	J-1 J-11	K-1 K-2	L-4	M-1 M-6	N-9	12/83
1400	B-46	Dental Ser.	R-5	50	B-46	F-3	G-30	H-9	I-11	J-11	K-1	L-1	M-1 M-6	N-9	12/83
1400	B-47	Medical Supply	R-5	50	B-47	F-3	G-30	H-9	I-11	J-11	K-1	L-2	M-1 M-6	N-9 N-5	12/83
1400	B-48	Medic. Boiler Rm	R-5	50	B-48	F-3	G-30	H-9	I-4	J-1	K-1	L-4	M-1 M-6	N-9 N-5	12/83
1402	B-49	Sewage Pump Stn.	R-6	50	B-49	F-3	G-2	H-1	I-4	J-13	K-1	L-3	M-1 M-6	N-8	12/83

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

CHEMICAL, DRUM AND SMALL CONTAINER STORAGE AREAS

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
1404	B-50	CE Cov. Stor. Fac.	S-3	50	B-50	F-3	G-32	H-9	I-4	J-11 J-1	K-1	L-1	M-1 M-3	N-9	3/84
1820	B-44	Officers Open Mess	O-3	50+	B-44	F-3	G-4, G-2	H-9, H-11	I-11	J-1	K-1	L-1	M-1	N-9	12/83
1898	B-51	Water Sup-ply Treat-ment	P-5	50+	B-51	F-3	G-29	H-9	I-11	J-13	K-1 K-2	L-4 L-3	M-1 M-6	N-5	12/83
2110	B-52	Convent. Munit.Shop	O-15	50	B-52	F-3	G-23	H-1, H-9	I-11 I-8	J-11	K-1	L-1	M-1 M-3	N-9	12/83
2328	B-57	CE Pav & Grnds Fac	I-8	100	B-57	F-3	G-2	H-1	I-4	J-1	K-1	L-4	M-1	N-9	3/84
4067	B-24	Trans Yard Storage	Q-8	50	B-24	F-3	G-26	H-1	I-4	--	K-1	L-1	M-1 M-3	N-9	12/83
CE YARD HERBICIDE Stor.	B-55	CE Herb. Stor.	Q-8	3000 lb	B-55	F-3	G-25	H-9, H-1	I-4	J-11	K-1 K-2	L-4	M-1 M-3	N-9	3/84
5120	B-58	Aircraft Power Check Pad	J-11	50+	B-58	F-2	G-2 G-4	H-1, H-11	I-4	J-6	K-1	L-1	M-1	N-9 N-6	12/83
2160	B-54 B-53	Entom. Fac. OLD	Q-10	3800 lb	B-57	F-7	G-19	H-9	I-5	J-12 J-11	K-2 K-1	L-4	M-1 M-6	N-9 N-5	3/84
2326	B-59	Water Sup. Bldg	I-8	50	B-59		G-2	H-9, H-11	I-11	J-5 J-1	K-1	L-1	M-1 M-4	N-9 N-5	12/83

OIL AND HAZARDOUS SUBSTANCE SITE
SPILL CONTROL AND COUNTER MEASURES

SEWAGE SPILLS

FACILITY NUMBER	SUB-STANCE STORED	SITE DESCRIP-TION	GRID COORD (ANNEX IX)	MAX. SPILL QTY (GAL)	RE-PORT-ABLE SPILL QTY	SE-COND CONT	PROBABLE SPILL ROUTE (ANNEX IX)	CONTIN-GENCY ACTION	VISUAL INSPEC-TION	PREV. MAINT	HOUSE-KEEP-ING	MAT. COM-PATI-BILITY	SECU-RITY	MONIT	VERIFI-CATION DATE
CAFB Sewage	Sanitary Wastes	Base Sewage	Base-Wide	0.8 M6D	E-2	F-3	Depen-dent on Location	Annex II-14	No Routine	J-13	K-1	L-1	M-1	N-8	3/84
226	B-60	Haz. Waste Stor. Fac.	Q-9	10,250	B-60	F-6	G-18								1/86

SECTION II Oil and Hazardous Substance Site Spill Prevention Control and Countermeasures Explanatory TAB's

SPCC Table and TAB Abbreviations

A/G	- Above ground
BE	- Base Engineering (CE)
CE	- Civil Engineering
Cont.	- Container
Dr.	- Drum
Gal.	- Gallons
Grid Coord.	- Grid Coordinates
ICW	- Intracoastal Waterway
JP-4	- Jet Fuel
LP	- Liquified Petroleum
Mat. Comp.	- Material Compatibility
HSG	- Housing
IEX#	- Issue Exception Code Number
MOGAS	- Gasoline
Monit.	- Monitoring
PCB	- Polychlorinated biphenyl
Perm.	- Permanent
Prev. Maint.	- Preventive Maintenance
Report. Spill	- Reportable Spill Quantity
St.	- Steel Tank
Sec. Cont.	- Secondary Containment
Temp.	- Temporary
U/G	- Underground
@	- each

"B" TAB's

SUBSTANCES STORED AND REPORTABLE SPILL QUANTITIES

NOTE: The "B" Tab contains a listing of chemicals stored at designated facilities on base. Reportable Spill Quantities for the chemicals have also been noted for the chemicals which the Reportable Spill Quantities are known. A dash (-) has been placed in the Reportable Spill Quantities designated in the Clean Water Act (CWA) Section 311 or Section 307a. If a spill occurs with a product which does not have a Reportable Spill Quantity noted in the Tab, OSC should contact CHEMTREC (800-424-9300) to obtain additional information. It should be noted that the reporting requirements for hazardous waste apply only to materials that are hazardous waste prior to the spill. For all hazardous wastes the reportable spill quantity is one (1) pound and this includes spills by small quantity generators under RCRA Subtitle C.

"B" TAB's

SUBSTANCES STORED AND REPORTABLE SPILL QUANTITIES

Tab #	IEX #	Chemical	Reportable Spill Quantities
B-1		Anhydrous Ammonia Gas	100 lb
B-2	(9)	Adhesive (8040-00-058-2399)	-
	(9)	Lensatic Compass Fluid	-
	(9)	D52 Decontaminating Agent Oxygen	-
B-3		Radiac Meters	-
B-4	(9)	Adhesive (asbestos)(8040-00-014-8442)	-
	(9)	Toluene	1000 lb
	(9)	Propylene glycol	TAB E-1
B-5	(8)	Sulfuric Acid	1000 lb
	(9)	Antifreeze	TAB E-1
B-6		Primer Sealant (8030-00-560-8756)	TAB E-1
B-7		Lensatic Compass Fluid	-
		Dope and Laquer Thinner	TAB E-1
		Oxygen	-
B-8	(8)	Bromochloromethane	-
	(8)	Halon 1211	-
		Carbon Dioxide	-
B-9		Ethylene Glycol	TAB E-1
B-10	(9)	Adhesive	-
B-11	(8)	Sulfuric Acid	1000 lb
	(8)	Nitric Acid	1000 lb
	(8)	Hydrochloric Acid	5000 lb
	(8)	Sodium Hydroxide	1000 lb
B-12	(8)	Bromochloromethane	-
B-13		None	
B-14	(9)	Xylene	1000 lb
	(9)	Trichloroethylene	1000 lb
	(8)	Lead Acid	1000 lb
	(8)	Sulfuric Acid	1000 lb

"B" TAB's

SUBSTANCES STORED AND REPORTABLE SPILL QUANTITIES

Tab #	IEX #	Chemical	Reportable Spill Quantities
B-15	(9)	Trichloroethylene	1000 lb
	(9)	Diethylene Glycol Monobutyl Ether	1000 lb
	(9)	Super Glue	-
B-16	(8)	Trichloroethane	1000 lb
	(9)	Super Glue	-
B-17	(8)	Paint Remover (8010-00-115-3305)	1000 lb
		Alcohol	TAB E-1
	(8)	Sulfuric Acid	1000 lb
	(8)	Primer (8010-00-027-7381)	-
		Dimethylformamide	1000 lb
		Ammonium Hydroxide	1000 lb
	(9)	Xylene	1000 lb
	(9)	Toluene	1000 lb
	(9)	Methyl Isobutyl Ketone	-
	(8)	Methyl Ethyl Ketone	1 lb
	(8)	Zinc Chromate Primer	-
	(9)	Laquer Thinner (8010-00-527-2897)	TAB E-1
	(9)	Thinner (8010-00-527-2896/2089)	TAB E-1
	(8)	Primer (8010-00-515-2208)	-
	(9)	Epoxy Primer	-
	(9)	Polyurethane Coating	-
	(9)	Thinner (8010-00-246-6116)	TAB E-1
	(9)	Polyurethane Paint	-
	(8)	Naptha	5000 lb
	(8)	Dichloromethane	-
	(8)	Acetone	-
	(9)	Zinc Primer (8010-00-514-1861)	-
	(9)	Epoxy Coating	-
B-18	(9)	Cellulose Nitrate Thinner	TAB E-1
	(9)	Paint Thinner	TAB E-1
B-19	(8)	Cleaning Compound (Dichloromethane)	1 lb
B-20	(9)	Xylene	1000 lb
	(9)	Polyester Resin	-
		Denatured Alcohol	-
B-21	(9)	Potassium Dichromate	1000 lb
	(8)	Sulfuric Acid	1000 lb
	(8)	Hydrochloric Acid	5000 lb
	(9)	Propylene Glycol	TAB E-1

"B" TAB's

SUBSTANCES STORED AND REPORTABLE SPILL QUANTITIES

Tab #	IEX #	Chemical	Reportable Spill Quantities
B-22	(9)	PD680 Solvent	-
		Paint Thinner	TAB E-1
B-23	(8)	Cleaning Compound (4850-00-538-0929)	-
	(9)	Trichloroethylene	1000 lb
	(9)	Hydrochloric Acid	5000 lb
B-24	(9)	Thinner	TAB E-1
B-25	(9)	Polyurethane Coating	-
	(8)	Sulfuric Acid	1000 lb
B-24	(8)	Methyl Ethyl Ketone	1 lb
	(9)	Calcium Chloride Anhydrous	-
	(9)	Electrical Insulating Oil	TAB E-1
	(8)	Caustic Soda (Sodium Hydroxide)	1000 lb
B-27	(8)	Cleaning Compound	TAB E-1
B-28	(9)	Super Glue	-
		Trichlorotrifluoroethane (Freon)	-
B-29		Nitrogen Gas	-
B-30		Nitrogen Gas	-
		Trichlorotrifluoroethane (Freon)	-
B-31	(9)	Super Glue	-
		Trichlorotrifluoroethane (Freon)	-
	(9)	Mercury	1 lb
		Nitrogen	-
	(9)	Cesium 137	
	(9)	Plutonium 239	
B-32		Potassium Hydroxide	1000 lb
		BLC (Beerline Cleaner)	-
B-33	(9)	Dibromodifluoromethane	-
	(9)	Paint	TAB E-1
	(9)	Molybdenum	-
	(9)	Lacquer	-
B-34	(9)	Adhesive (asbestos)(8040-00-016-8662)	1 lb
	(9)	Xylene	1000 lb
B-35	(9)	Super Glue	-

"B" TAB's

SUBSTANCES STORED AND REPORTABLE SPILL QUANTITIES

Tab #	IEX #	Chemical	Reportable Spill Quantities
B-36	(9)	Adhesive (asbestos) (8040-PEA934)	1 lb
	(9)	Super Glue	-
B-37	(8)	Sodium Hypochlorite	100 lb
B-38	(9)	Lindane	1 lb
B-39		Electron Tubes	-
	(9)	Super Glue	-
B-40	(9)	Kwikeaze (Brush Cleaner)	TAB E-1
		Propane	-
		Acetylene	-
B-41	(9)	Lensatic Compass Fluid	-
		Oxygen	-
		Nitrogen	-
	(9)	Anti-freeze	TAB E-1
	(9)	Polyurethane Foam Kits	-
B-42		Propane (6 Cans)	-
	(9)	Zinc Chromate (12 Cans)	TAB E-1
	(9)	Adhesive (6 Gals)	-
	(9)	Spray Paint (72 Cans)	-
	(9)	Silicone Compound	-
	(9)	Plastic Bond (6 Cans)	-
	(9)	Grease	TAB E-1
	(9)	Brake Fluid (4 Cans)	-
	(9)	Motor Oil (12 Cans)	TAB E-1
	(9)	Insecticide (24 Cans)	1 lb
B-43		N/A	
B-44	(8)	Lime Away	1000 lb
B-45		Phosphoric Acid	5000 lb
	(8)	Sulfuric Acid	1000 lb
		Hydrochloric Acid	5000 lb
	(9)	P-Dimethylamine Benzaldehyde	1000 lb
		Phosphotungstic Acid	1000 lb
		Toluene	1000 lb
	(9)	Thimerosal Tincture (Hg derivative)	-
	(9)	Lactic Acid	1000 lb
	(9)	Phenol	1000 lb

"B" TAB's

SUBSTANCES STORED AND REPORTABLE SPILL QUANTITIES

Tab #	IEX #	Chemical	Reportable Spill Quantities
B-45	(9)	Chloroform	5000 lb
		Acetic Acid	1000 lb
		Nitric Acid	1000 lb
		Ammonium Hydroxide	1000 lb
	(9)	O-Toluidine	-
B-46	(9)	Mercury	10 lb
	(9)	Oxygen	-
		Nitrogen	-
		Propane	-
B-47		"Saf-d-scaler" (Hydrochloric Acid)	5000 lb
B-48		Hydrochloric Acid	5000 lb
		Scale Remover (Sulfamic Acid)	5000 lb
		Tile Cleaner (Phosphoric Acid)	5000 lb
B-49		Propane	-
	(9)	Ether	-
B-50	(8)	Tetrapydrofuran	-
B-51	(9)	Chlorine	10 lb
	(8)	Sodium Hypochlorite	100 lb
	(9)	Cupric Sulfate	10 lb
B-52	(9)	Super Glue	-
	(9)	Enamel Thinner	-
	(9)	Dope and Lacquer Thinner	-
	(9)	Lacquer Primer (lead based)	-
B-53		Avitrol 50 lb cyl (.5%)	-
		Boygon 2% Roach bait (30 lb)	-
		Diazinon 48% E.L. (5 gal)	1 lb
		Diazinon 5% granules (30 lb)	1 lb
		Diazinon 2% powder (100 lb)	1 lb
		Diphacione .005% (50 lb)	-
		D-Phenothrim 2% Aerosol (lb)	-
		Dursban 10CR Granules (150 lb)	-
		Hi-YIELD 5% Sevin Garden Dust (323 Gal)	100 lb
		Naphthalene Moth Flakes (15 lb)	5000 lb
		Pivaloyl .025% Bait (15 lb)	-
		PT240 Diazinon 1.0% (90 lb)	100 lb
		PT270 Dursban 0.5 (105 lb)	-
		PT565 Pyrethrum 0.5% (75 lb)	-

"B" TABS

SUBSTANCES STORED AND REPORTABLE SPILL QUANTITIES

Tab #	IEX #	CHEMICAL	REPORTABLE SPILL QUNATITIES
		Purnia Fly Patrol - Fly Bait 1% (50 lb)	-
		Rodenticide .3% Universal (11 lb)	-
		Roost No-more 2% Bird Repellent (50 lb)	-
		Sevin (Carbaryl) 80% (430 lb)	100 lb
		Dursban A (1.2%) E.C. (5 Gal)	-
		Di-Syston (19%) G (330 lb)	-
		Chlordane (73%) E.C. (3 Gal)	1 lb
		Lindane E.C. (12%) (10 Gal)	1 lb
		Lindane Powder (1%) (25 lb)	1 lb
		Zinc Phosphide 2% (10 lb) 1000 lb	
		Aluminum Phosphide 55% (1400 lb)	-
B-54		Malathion 57% E.C. (11 Gal)	10 lb
		Malathion 91% Technical (133 Gal)	10 lb
B-55		2,4-D	100 lb
		Monuron 80% WP (2500 lb)	-
		Round-up (25 Gal)	-
		Trimec 27 (10 Gal)	-
		Bentgrass Herbicide (5 Gal)	-
		Bentox 140 (5 Gal)	-
		Stump Remover (3 lb)	-
B-56	(8,9)	POLYCHLORINATED BIPHENYLS (PCB)	1 lb
B-57	(8)	Sulfuric Acide	1000 lb
	(9)	Xylene	1000 lb
	(9)	Cupric Sulfate	10 lb
	(9)	Sulfur Hexafluoride	-
B-58		Synthetic Oil	TAB E-1
B-59		Calcium Hypochlorite	100 lb
B-60		Substances stored are those indicated in the RCRA Part B Permit for the Hazardous Waste Storage Facility. This can be any combination of codes to include PCBs, provided the substances are on the Part B Permit under wastes or material. No radioactive materials will be stored at the HWSF.	

"E" TAB's

REPORTABLE SPILL QUANTITIES

Tab No.	
E-1	A "reportable spill" of oil or other patroleum products occurs when the spill causes a film, sheen or discoloration of the surface of both on-base and off-base surface waters. A "reportable spill" also occurs when a sludge or emulsion is deposited beneath the surface of any surface waters.
E-2	A sanitary wastewater spill is considered reportable when either on-base or off-base surface waters exceed the New Mexico recreational contact (swimming) standards as a direct result of the spill. (Refer to the New Mexico DHEC Water classification standards system.)

"F" TAB's

SECONDARY CONTAINMENT

Tab No.	
F-1	Spill occuring in building will drain to an oil/water separator connected to a storm drainage system.
F-2	Spill occuring on paved area will drain to an oil/water separator connected to a storm drainage system.
F-3	None
F-4	No secondary containment associated with underground tank(s).
F-5	Spilled fuels in the POL bulk fuel storage area should be directed away from the storm drainage system as there is no oil/water separator in the area.
F-6	Area is diked to receive a full capacity spill.
F-7	Facility is designed with a surrounding concrete lip to contain spills according to EPA specifications.
F-8	Facility is designed to contain 10% of a full capacity spill.

"G" TAB's

PROBABLE SPILL ROUTE

Tab No.	
G-1	Leakage from underground tanks will contaminate soil, but will not reach water table.
G-2	Leakage will dissipate in the local area on the ground.
G-3	If the full capacity spills, leakage will spread over paved area and ground and will reach storm drains. The final destination will be the playa depression just south of the junction of the primary and secondary runways.
G-4	Spills will flow to storm drains in the paved area adjacent to the facility.
G-5	Certain spills will enter the drainage ditch next to the 523rd HQ.
G-6	Spills will flow to adjacent parking area storm drains and also to the apron and surrounding ground.
G-7	Spills will spread over parking lot to storm drainage ditch between bldg.108 and hangar 121 on Octagon Ave.
G-8	Spill will spread onto the parking lot between Bldgs 112 and hangar 121 and reach the hangar 121 storm drains.
G-9	Spills will flow over paved area and into the storm drains behind (northwest of) hangar 129.
G-10	Spills inside the building will enter floor drains and the storm drainage system. Spills outside the bldg. will flow over paved area and into storm drain near bldg. 135 or into hangar 129 drains.
G-11	Spills will flow into apron storm drains or into adjacent parking lot drains.
G-12	Spills will flow to drain in the center of the paved area between bldgs 143 and 170.
G-13	Spills will flow into torch blvd. drainage ditch or into parking lot drains adjacent to bldgs 170 and 159.

"G" TABS (Cont'd)

PROBABLE SPILL ROUTE

Tab No.	
G-14	Spills will drain into ditch between Bldgs 185 and 186 and into ditch near Bldg 191.
G-15	AGE Spills will flow over pavement to storm drains west of Bldg 191.
G-16	Spills will flow into apron storm drains or into the shallow ditch along the flightline access road between Bldg 206 and 196.
G-17	Base hazardous storage spills will dissipate over the surrounding ground if they overflow the concrete "lip" surrounding the facility.
G-18	DRMO storage spills will flow into concrete berms, specifically designed for collection of spill or leak, however if overloaded the spill will flow towards a storm drain situated approximately 25 ft. west of Building 226.
G-19	Spills will flow across W Street to storm drain near MOBAGS loading dock.
G-20	Outdoor refueling maintenance spills will flow into drainage along perimeter road.
G-21	Parked refueling truck spills will flow into drainage ditch along the perimeter road and onto the surrounding ground.
G-22	POL Area spills will flow into surrounding dyked areas. Any leakage from dykes will dissipate on ground.
G-23	Outdoor Munitions Storage spills may flow over ground and into ditch along security fence.
G-24	Spills will flow over paved area and into large ditch to the south and west of the building.
G-25	Spills flow over paved area to drainage ditch along Overlord Avenue if not intercepted by storm drains.
G-26	Spills will flow over paved area to drainage ditch along Argentia Avenue and Torch Boulevard.
G-27	Indoor spills flow to floor drains which empty into storm drains. Outdoor spills will flow to Torch Boulevard drainage ditch.

"G" TAB's (Cont'd)

PROBABLE SPILL ROUTE

Tab No.	
G-28	Spills escaping the building will flow into ditch between bldg. 680 and 689 (The Hayloft) or to Torch Blvd. drainage ditch. Indoor spills will drain to storm drainage system.
G-29	Spills of chemicals will spread over adjacent ground and possibly Olympic Ave. if spilled outside the building.
G-30	Outdoor spills will drain into ditches adjacent to hospital and eventually into the playa depression to the north of the facility.
G-31	Outdoor spills will flow over paved area and ground to the drainage ditch along Torch Blvd.

"H" TAB's

CONTINGENCY ACTION

Tab No.	
H-1	Base personnel should respond to spill by containing spilled substance within the most immediate area. This should be accomplished by temporary diking to preclude entrance to ditch or storm sewer. Immediate temporary wood or absorbent type skimmers should be installed both upstream and downstream of any spill entering the drainage ditches. For larger spills, temporary dikes should be enstalled in ditches or temporary plugs placed in sewer lines at applicable manholes. Absorbent material or portable skimmers should be utilized for cleanup.
H-2	Suspected underground spills should be assessed with regard to the maximum quantity which may have escaped. Remaining fuel should be removed from tank immediately. Ditches and surface areas in the vicinity of the underground tank should be closely monitored to detect any traces of the spilled material. Information pertaining to the spill should be evaluated to determine if the incident warrants ground water monitoring.
H-3	Direct flow of spilled material to adjacent oil/water separator. Monitor oil/water separator to prevent the overflow of oil into storm drains.
H-4	Direct flow of spilled substance to adjacent floor and wash rack drains. Monitor operation of pretreatment system to prevent release of spilled material to storm drains.
H-5	Remove remaining fuel from tank.
H-6	All spills should be contained and neutralized immediately by Fire Department to avoid hazards to aircraft and other equipment in the immediate area.
H-7	Assure dike drain valve is closed and locked.
H-8	Assure spill is contained within concrete berm. Collect all PCB waste and contaminated materials in lined drum.
H-9	Spill material should be identified and response should be in accordance with specific procedures identified in Material Safety Sheets found in Annex III.

"H" TABS (Cont'd)

CONTINGENCY ACTION

Tab No.	
H-10	If possible, move the leaking container/equipment to the nearest wash rack. (NOTE: This wash rack is equipped with an oil/water separator and drains into the storm drainage system.) Monitor oil/water separator to prevent overflow of oil into storm drains.
H-11	If non-POL spill occurs within shop facility prevent spill from entering floor drains.
H-12	Spilled fuel on paved surface should be left to evaporate under supervision of Fire Department.
H-13	Engine oil and hydraulic fluid spills on the apron are pumped into separate 55 gallon drums. Ensure that engine oil and hydraulic fluid are not mixed. Residual fluids are absorbed with "Speedie-Dry" (provide NSN of Speedie-Dry) and placed in 30, 55 or 85 gallon containers for turn-in to DRMO. For placement of residual material in dumpster, contact Environmental Coordinator, Ext 4639.
H-14	Engine oil and hydraulic fluid spills should be contained and cleaned up using absorbent material before directing to oil/water separators connected to the floor drains.

"I" TAB's

VISUAL INSPECTION

Tab No.	
I-1	Tanks examined by CE prior to refilling.
I-2	Bulk fuel storage area, including all piping, tanks and dikes, are inspected daily for leaks. In addition, at least once a week the Civil Engineer Liquid Fuels Maintenance Section inspects the system, in conjunction with operations daily inspection. Daily logs are maintained at the supervisors office on all inspection check points.
I-3	Underground fuel tanks are gauged daily and compared with fuel inventory records. Variances over 20 gallons will be rechecked to determine if a leak is present.
I-4	Area inspected daily by supervising personnel.
I-5	Area inspected minimum five days per week.
I-6	Tanks inspected annually and prior to refilling by Fuels Management.
I-7	Mobile fuel carriers inspected daily.
I-8	Area continuously monitored by security patrol.
I-9	Area continuously monitored during training exercises.
I-10	Tank volume inspected weekly.
I-11	Operations and maintenance personnel make daily inspections to determine conditions of storage tanks/drums and equipment and to assure no leaking or accidental discharge of any of the contents stored within the facility occurs.

"J" TAB's

PREVENTIVE MAINTENANCE

Tab No.	
J-1	Tanks cleaned and painted as required via job orders.
J-2	CE Liquid Fuels Maintenance Section performs routine preventive maintenance on all pumps, valves and filters.
J-3	Pumps calibrated every 60 days by Base and every 90 days by the State. Fuel lines only pressure tested when a leak is suspected.
J-4	Cathodic protection inspected annually and replaced as required.
J-5	All refueling vehicles are included in a routine maintenance program.
J-6	Oil/water separator inspected monthly.
J-7	Tanks are leak tested annually.
J-8	Rubber fuel bladders inspected for leaks twice daily when in use.
J-9	Tank pumped as required.
J-10	PCB materials removed by qualified contractor at earliest possible time.
J-11	Stock rotated routinely.
J-12	55 gallon underground storage tank inspected once per week. If contaminated water is found it is pumped and used as make-up water for diluting chemicals.
J-13	Lift station pumps routinely lubricated.
J-14	Conduct simulated drills to prepare and exercise Spill Response plan prior to a real incident.

"K" TAB's

HOUSEKEEPING

Tab No.	
K-1	Area maintained in a clean orderly state.
K-2	Adequate aisle space and segregation of chemicals.

"L" TAB's

MATERIAL COMPATIBILITY

Tab No.	
L-1	No material incompatibilities.
L-2	Tanks should be painted regularly via job orders.
L-3	Cathodic protection provided for tanks and piping. Condition of cathodic protection routinely monitored and evaluated.
L-4	Incompatible materials must be segregated. (See Compatibility of Wastes, ANNEX VIII.)
L-5	Cathodic protection at intervals along pipeline.

"M" TAB's

SECURITY

Tab No.	
M-1	Security provided by Base Security.
M-2	Lock on filler line.
M-3	Area fenced and locked.
M-4	Unmanned pumps are locked.
M-5	Vehicle entrance barred and locked. Valve locked. Check valve located at end of pipe.
M-6	Door to facility locked. Fire alarm boxes located outside doors.

"N" TAB's

MONITORING

Tab No.	
N-1	Fuel levels checked daily. Fuel consumption records maintained and reviewed.
N-2	Tank is gauged before delivery of fuel. Two operators present for each delivery.
N-3	Fuel levels checked periodically. Refilled as required.
N-4	Operator on control panel with driver. Observes gauge level of tank constantly when filling.
N-5	Inventory records maintained. Tank(s) refilled as required.
N-6	Maintenance Branch Chief will insure that periodic inspections of drains, sanitary/storm sewers, separation tanks and valve closures are accomplished to insure operational status.
N-7	Volume of tanks monitored to determine when contents of tanks should be contracted for sale or disposal.
N-8	Monitoring consists of an alarm system to indicate high water levels in primary lift station wet wells.
N-9	An inventory of chemicals stored is maintained by the facility to prevent loss or theft.

SECTION III Certification and Approval Signatures

Certification

Nelson Rutter, a Professional Engineer registered in the State State of New Mexico, certifies that the Oil and Hazardous Substance Spill Prevention and Response Plan and supporting information has been prepared in accordance with good engineering practices and in accordance with the U.S. EPA regulations (40 CFR 112 & 264) on oil pollution prevention, and hazardous waste management.

Nelson Rutter Professional Engineer Date: 10 March 86

New Mexico Registry No. 4609

val of Plan

Date: 11 MAR 86

ommander, 27 Combat Support Group

CANNON AIR FORCE BASE
SPILL PREVENTION AND RESPONSE PLAN
Cannon Air Force Base, N. M. 88103
February 1986

ANNEX II

SITE-SPECIFIC CONTINGENCY PLANS

Site-Specific Contingency Plans Index

POL BULK FUEL STORAGE AREA, WASTE FUELS STORAGE AND REFUELING VEHICLE STORAGE AREA (BLDG. 216)	ANNEX II-1
REFUELING VEHICLE MAINTENANCE SHOP-FACILITY 326	ANNEX II-2
VEHICLE MAINTENANCE BRANCH - FACILITY 335	ANNEX II-3
SUPPLY OPEN STORAGE AREA - FACILITY 221	ANNEX II-4
PCB STORAGE AREA - BUILDING 224	ANNEX II-5
ENTOMOLOGY SHOP STORAGE - FACILITY 212	ANNEX II-6
DRMO YARD - BLDG 215, FAC. 5036, HAZ WASTE STOR, FAC 226	ANNEX II-7
AIRCRAFT AND RELATED EQUIPMENT MAINTENANCE FACILITIES - FACILITIES 196, 194, 186, 121, 170, 159 & 189	ANNEX II-8
ARMAMENT SHOP - FACILITY 193	ANNEX II-9
CIVIL ENGINEERING COMPOUND - FACILITY 357	ANNEX II-10
AUTO HOBBY SHOP - FACILITY 494	ANNEX II-11
BASE SERVICE STATION - FACILITY 368	ANNEX II-12
HYDRAZINE (H-70) SPILL MANAGEMENT AND MEUTRALIZATION PROCEDURES	ANNEX II-13
SANITARY WASTEWATER COLLECTION SYSTEM	ANNEX II-14
[illegible]	ANNEX II-15

NOTE: All of the above facilities are required to post an evacuation map showing all exits from the facility. A fire evacuation plan can be used if available.

ANNEX II-1

SITE-SPECIFIC CONTINGENCY PLAN

POL BULK FUEL STORAGE AREA, WASTE FUELS STORAGE AREA,
REFUELING VEHICLE STORAGE AREA

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill the following actions should be taken. The order of the actions will depend on the existing conditions.

- Evacuate area if necessary.
- Notify Base Fire Department Ext. 4117 .
- Notify Supervisor Fuels Management Branch Ext. 4325 .
- Check cause and stop source of spill when possible without undue risk of personal injury. In case of line breakage, close all valves upstream and downstream of the break.
- If spill occurs in diked area, assure dike drain valve is closed and locked.
- Make spill scene OFF LIMITS to unauthorized personnel.
- Restrict all sources of ignition.
- Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department the following information should be provided if known or can reasonable be determined:

- Name of individual reporting spill.
- Location of spill.
- Number of injured personnel and nature of injuries.
- Substance spilled.
- Amount spilled (estimated).
- Rate substance currently spilling (estimated).
- Time spill occurred (estimated).
- Extent which spill has traveled.
- Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Avoid contact with liquid fuels
FLAMMABLE Liquids - Extinguish with dry chemical, foam or carbon dioxide. Flashback along vapor trail can occur.
See attached Material Safety Data Sheets for additional information.

PROBABLE SPILL ROUTES

POL Bulk Fuel Storage Area, Waste Fuels Storage Area and Refueling Vehicle Storage Area

Spills escaping diked areas and the general confines of the storage areas will enter adjacent drainage ditches which flow to the main drainage ditch in Spill Containment Area 2 with the final destination the Intracoastal Waterway.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- Liquid Fuel Maintenance Technician will measure vapor concentrations and determine where explosion hazards exists.
- In event of JP-4 spills, Fuels Management will dispatch a defuel unit to area to recover reclaimable fuel. This unit will be used to remove only portions of spillage that can be recovered without contaminating the products. Contamination of product normally occurs within 2" of ground.
- CE Liquid Fuels Maintenance will dispatch contaminated AlB unit to collect contaminated fuels. All fuel recovered by BCE will be off-loaded in designated tanks in waste fuels area.
- Spills escaping diked area will drain to adjacent drainage ditches and storm drains. CE will install temporary dikes and/or booms in ditches to contain spilled fuels.
- Sand bags may be utilized to contained spilled fuels from line ruptures.
- Clean-up operations should include the use of absorbent material and/or portable skimmers.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations within the potential spill areas. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- Gasoline
- Hydrazine
- Jet Fuels: JP-4
- Oils: Diesel

ANNEX II-2

SITE-SPECIFIC CONTINGENCY PLAN

REFUELING VEHICLE MAINTENANCE SHOP-FACILITY 326

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill of JP-4, oil or other petroleum base compound which cannot be contained by the facility oil/water separator the following action should be taken. The order of the actions will depend on the existing conditions.

- o Notify Base Fire Department Ext. 4117.
- o Notify Vehicle Maintenance Officer or Vehicle Maintanance Superintendent Ext. 2685.
- o Notify transportation Squadron Commander Ext. 2641.
- o Check cause and stop source of spill when possible without undue risk of personal injury.
- o Restrict all sources of ignition.
- o Make spill scene OFF LIMITS to unauthorized personnel.
- o Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.
- o NOTIFY ENVIRONMENTAL ENGINEERS EXT-4[illegible]
- o NOTIFY BASE SAFETY OFFICER EXT-2[illegible]

When notifying the Fire Department the following information should be provided if known or can reasonably be determined.

- o Name of individual reporting spill.
- o Location of spill.
- o Number of injured personnel and nature of injuries
- o Substance spilled.
- o Amount spilled (estimated).
- o Rate substance currently spilling (estimated).
- o Time spill occurred (estimated).
- o Extent which spill has traveled.
- o Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Avoid contact with liquid fuels.
FLAMMABLE Liquids - Extinguish with dry chemical, foam or carbon dioxide. Flashback along vapor trail can occur.
See attached Material Safety Data Sheets for additional information.

PROBABLE SPILL ROUTE

Dissipate on ground in area of spill. Large spills may drain directly to adjacent ditch flowing to main ditch along the Base Perimeter Road.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- Liquid Fuel Maintenance Technician will measure vapor concentrations and determine where explosion hazards exist.
- In event of JP-4 spills, Fuels Management will dispatch a defuel unit to area to recover reclaimable fuel.
- CE Liquid Fuels Management will dispatch contaminated AlB unit to collect contaminated fuels. All fuel recovered by BCE will be offloaded in designated tanks in the waste fuels area.
- CE will install temporary dikes and/or booms in drainage ditches to contain spilled fuels.
- Clean-up operations should include the use of absorbent material and/or portable skimmers.

POSTING REQUIREMENTS

This site-specific contigency plan will be posted in prominent locations within potential spill areas. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- Gasolines: Automotive
- Jet Fuels: JP-4
- Oils, Miscellaneous: Motor

ANNEX II-3

SITE SPECIFIC CONTINGENCY PLAN

VEHICLE MAINTENANCE BRANCH - FACILITY 335/439

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill of oil or solvent which cannot be contained by the facility oil/water separator the following actions should be taken. The order of the actions will depend on the existing conditions.

- o Notify Base Fire Department Ext. 4117 .
- o Notify Vehicle Maintenance Officer/Superintendent Ext. 2685.
- o Check cause and stop source of spill when possible without undue risk of personal injury. Notify Transportation squadron Coordinator, Ext. 2691
- o Restrict all sources of ignition.
- o Make spill scene OFF LIMITS to unauthorized personnel.
- o Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department the following information should be provided if known or can reasonably be determined.

- o Name of individual reporting spill.
- o Location of spill.
- o Number of injured personnel and nature of injuries.
- o Substance spilled.
- o Amount Spilled (estimated).
- o Rate substance currently spilling (estimated).
- o Time spill occurred (estimated).
- o Extent which spill has traveled.
- o Any other pertinent information (i.e. other potential hazards)

SPECIAL PRECAUTIONARY MEASURES

Avoid contact with spilled substances.
FLAMMABLE Liquids - Extinguish with dry chemicals, foam or carbon dioxide. Flashback along vapor trail can occur.
Refer to attached Material Safety Data Sheets for particular hazards and precautionary measures for specific chemicals.

PROBABLE SPILL ROUTE

Dissipate on ground in area of spill. Large spills may drain directly to adjacent ditch flowing along Argentia Ave. to the ditch paralleling Torch Blvd. Spills escaping from the oil/water separators at ~~Bldg. 374 to~~ Facility 511A or 375 will enter the sanitary sewer system.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- Liquid Fuel Maintenance Technician will measure vapor concentrations and determine where explosion hazards exist.
- CE Liquid Fuels Maintenance will dispatch contaminated A1B unit to collect contaminated fuels from large spills.
- If possible, move the leaking container/equipment to oil/water separator drain located north of service station, Bldg. 368 (NOTE: This drain connects to an oil/water separator discharging into the sanitary sewer system).
- CE will install temporary dikes and/or booms in drainage ditches to contain spills entering the ditches.
- Clean-up operations should include the use of absorbent material and/or portable skimmers.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations within potential spill areas. The following Material Safety Data Sheets (Annex III, SPR Plan) will be attached when posting:

- Ethylene Glycol
- Gasolines: Automotive
- Naptha: Stoddard Solvent
- Oils, Miscellaneous: Motor
- PD-680

ANNEX II-4

SITE-SPECIFIC CONTINGENCY PLAN

SUPPLY OPEN STORAGE AREA - FACILITIES 221/5036

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill the following actions should be taken. The order of the actions will depend on the existing conditions.

- Notify Base Fire Department Ext. 4117.
- Notify Supervisor of Supply Facilities Ext. 2502.
- Check cause and stop source of spill when possible without undue risk of personal injury. If the nature of the spill material is unknown, use extreme caution.
- In case of chlorine spills, don mask and have personnel evacuated.
- Restrict all sources of ignition when flammable substances are involved.
- Make spill scene OFF LIMITS to unauthorized personnel.
- Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team it fully operational.

When notifying the Fire Department the following information should be provided if known or can reasonable be determined.

- Name of individual reporting spill.
- Location of spill
- Number of injured personnel and nature of injuries.
- Substance spilled.
- Amount spilled (estimated).
- Rate substance currently spilling (estimated).
- Time spill occurred (estimated).
- Extent which spill has traveled.
- Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Refer to attached Material Safety Data Sheets for particular hazards and precautionary measures for specific chemicals.

- To find a leak, tie a cloth to the end of a stick, soak the cloth with aqua ammonia and hold close to the suspected area. A white cloud will result if there is any chlorine leakage.
- If a leak occurs in equipment or piping, shut off the chlorine supply, relieve the pressure and make necessary repairs.
- Leaks around valve stems usually can be stopped by tightening the packing gland or packing gland nut. If this does not stop the leak, the container valve should be closed; if it does not shut off tight, the outlet cap or plug should be applied.
- Emergency kits have been designed to contain most leaks which may be encountered in chlorine shipping containers. These kits operate on the principle of capping off leaking valves or, in the case of cylinders, of sealing off a leak in the side wall. The kit contains step by step instructions for the use of devices. All necessary tools are included.

ANNEX II-5

SITE-SPECIFIC CONTINGENCY PLAN

PCB STORAGE AREA - BUILDING 224

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill the following actions should be taken. The order of the actions will depend on the existing conditions.

- o Notify Base Fire Department Ext. 4117.
- o Notify Base Civil Engineer or Environmental Coordinator Ext. 2008 or 4639.
- o Notify Supervisor of DRMO Ext. 2437.
- o Check cause and attempt to contain spill within concrete bermed area. See Special Precautionary Measures.
- o Make spill scene OFF LIMITS to unauthorized personnel.
- o Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department and Base CIvil Engineer or Environmental Planner the following information should be provided if known or can reasonably be determined.

- o Name of individual reporting spill.
- o Location of spill.
- o Number of injured personnel and nature of injuries.
- o Substance spilled.
- o Amount spilled (estimated).
- o Rate substance currently spilling (estimated).
- o Time spill occurred (estimated).
- o Extent which spill has traveled.
- o Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

PCB's are considered hazardous wastes, avoid contact with skin. Wear protective clothing when handling.

PROBABLE SPILL ROUTE

Spills will be contained within a concrete bermed area. If spill occurs outside of the berm, the chemical may enter a storm drain near the facility.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- If spills occur outside bermed area confine spill with sandbags.
- Clean-up operations should include the use of absorbent materials.
- All contaminated materials will be placed in polyethylene lined drums(see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DPDO and disposed in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in a prominent location within the PCB storage area and the office in Building 224. The following Material Safety Data Sheet from Annex III, SPR Plan will be attached when posting:

- Polychlorinated Biphenyl (PCB)

ANNEX II-6

SITE-SPECIFIC CONTINGENCY PLAN

ENTOMOLOGY SHOP STORAGE - FACILITY 212

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill the following actions should be taken. The order of the actions will depend on the existing conditions.

- Notify Base Fire Department Ext. 4117.
- Notify the Base Civil Engineer or Environmental Coordinator Ext. 2008 or 4639.
- Notify Entomology Shop Officer/Superintendent Ext. 2439.
- Check cause and stop source of spill when possible without undue risk of personal injury. See Special Precautionary Measures.
- Restrict all sources of ignition when flammable substances are involved.
- Make spill scene OFF LIMITS to unauthorized personnel.
- Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department the following information should be provided if known or can reasonably be determined.

- Name of individual reporting spill.
- Location of spill.
- Number of injured personnel and nature of injuries.
- Substance spilled.
- Amount spilled (estimated).
- Rate substance currently spilling (estimated).
- Time spill occurred (estimated).
- Extent which spill has traveled.
- Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Avoid contact with spilled substance. Protective clothing should be worn over entire body when handling chemicals. Refer to attached Material Safety Data Sheets for particular hazards and precautionary measures for specific chemicals.

PROBABLE SPILL ROUTE

Dissipate on ground in area of spill. Large spills will drain under adjacent chain-linked fence and flow across W. Street to the storm drain located near the MO BAGS loading dock.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- If leakage occurs in a single container, if possible move the container to the large sink in Building 212.
- Determine and implement decontamination procedures as specified on the Material Safety Data Sheets. If information is not available contact CHEMTREC (phone 800-424-9300).
- All contaminated materials will be placed in polyethylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DPDO and disposed of in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted at prominent locations inside and outside of Building 212. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- Baygon
- Carbaryl
- Chlordane
- Diazinon
- Dursban
- Malathion
- Pyrethrum

ANNEX II-7

SITE-SPECIFIC CONTINGENCY PLAN

DRMO YARD - BUILDING 215, FACILITY 226

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill the following actions should be taken. The order of the actions depend on the existing conditions.

- Notify Base Fire Department Ext. 4117 .
- In the event of all hazardous waste spills regardless of size notify the Base Civil Engineer or Environmental Coordinator Ext. 2008 or 4639.
- Check cause and stop source of spill when possible without undue risk of personal injury. If spill substance is unknown avoid contact.
- Restrict all sources of ignition when flammable substances are involved.
- Make spill scene OFF LIMITS to unauthorized personnel.
- Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department and Base Civil Engineer or Environmental Planner the following information should be provided if known or can reasonably be determined.

- Name of individual reporting spill.
- Location of spill.
- Number of injured personnel and nature of injuries.
- Substance spilled.
- Amount spilled (estimated).
- Rate substance currently spilling (estimated).
- Time spill occurred (estimated).
- Extent which spill has traveled.
- Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Chemical materials stored at DRMO may vary over time. Many chemicals will be considered hazardous wastes and should be handled with extreme caution. Refer to attached Material Safety Sheets for particular hazards and precautionary measures for specific chemicals.

PROBABLE SPILL ROUTE

Spill will dissipate in local area on ground, if full container spilled, chemical may reach open ditch along periphery of storage yard. Final destination of ditch is the storm drainage along W. Street which empties into the playa depression south of the intersection of the primary and secondary runways.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- If possible confine leak from leaking container. Sandbags may be utilized to contain spilled substances.
- Substance should be transferred from leaking drum as soon as possible.
- Clean-up operations should include the use of absorbent materials.
- Spill residues and contaminated materials will be placed in polyethlylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 and disposed in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations within the potential spill areas. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- Naptha: Stoddard Solvent
- PD-680
- Trichloroethylene
- Waste Solvent
- Paint Thinner
- Paint Remover
- Cleaning Compound
- Asbestos
- PCB
- Waste Hydraulic Fluid
- Waste Oil A/C
- Waste Paints
- Acetone

ANNEX II-8

SITE-SPECIFIC CONTINGENCY PLAN

AIRCRAFT AND RELATED EQUIPMENT MAINTENANCE FACILITIES

Corrosion Control	Bldg. 196
AGE	Bldg. 185, 186, 191
Engine Shop	Bldg. 680
Engine Test Cell	Facility - 5113, 5114
Hangers	Bldg. 108, 121, 129, 170
Aircraft Parking Apron	
NDI Laboratory	Bldg. ~~185~~ 693
Wheel and Tire Shop	Bldg. 194

NOTIFICATION AND INITIAL SPILL RESPONSE

Upon discovery of oil or hazardous substance spillage or accidental discharge, the following actions should be taken. The order of the actions will depend on the existing conditions.

- o Notify Base Fire Department Ext. 4117.
- o Notify officer/superintendent of Facility responsible for spill.
- o Check cause and stop source of spill when possible without undue risk of personal injury.
- o Restrict all sources of ignition when flammable substances are involved.
- o Make spill scene OFF LIMITS to unauthorized personnel.
- o Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department, the following information should be provided, if known, or can reasonably be determined.

- o Name of individual reporting spill.
- o Location of spill.
- o Number of injured personnel and nature of injuries.
- o Substance spilled.
- o Amount spilled (estimated).
- o Rate substance currently spilling (estimated).
- o Time spill occurred (estimated).
- o Extent which spill has traveled.
- o Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Refer to attached Material Safety Data Sheets for particular hazards and precautionary measures for specific chemicals.

PROBABLE SPILL ROUTES

Corrosion Control	Bldg. 196	-	Spills will flow into apron storm drains or into the shallow ditch along the access road between Bldg. 206 and 196.
AGE	Bldg. 185, 186, 191	-	Spills will drain into ditch between Bldg. 185 and 186 and/ or into drainage ditch near Bldg. 191. Some materials will reach parking lot drains.
Engine Shop	Bldg. 680	-	Spills escaping the building will flow into ditch between Bldg. 680 and ~~689~~ 680 or to Torch Blvd. drainage ditch. Indoor spills will enter storm drainage system via floor drains.
Engine Test Cell	Facility ~~5113~~ 5122, 5114	-	Spills will flow over paved areas to drains. Oil/water separators are located at Bldg. 5114 and 51~~20~~22.
Hangers	Bldg. 108, 121, 129, 170	-	Spills will flow over paved area to apron drains or over parking lot to storm drains and ditches.
Aircraft Parking Apron		-	Spills will flow across pavement and enter drains or dissipate over the ground.
NDI Laboratory	Bldg. ~~185~~ 593	-	Spills will drain into ditch between Bldg. 185 and 186 and/ or into ditch near Bldg. 191.
Wheel and Tire Shop	Bldg. 194	-	Spills occuring outside will either flow to drains in the adjacent paved area or into the drainage ditch between Bldg. 192 and 194.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- Refer to Site-Specific Contingency Plan, Annex II-15 in the event of a Hydrazine Spill.
- If possible, move the leaking container/equipment to AGE wash rack at Building 165 (NOTE: This wash rack is equipped with an oil/water separator and drains into the sanitary sewer system).
- If the leaking container/equipment cannot be moved, sandbags may be used to contain spills around leaking container.
- The substance should be transferred from leaking drum.
- If required, spilled substances should be neutralized according to methods specified on attached Material Safety Data Sheet.
- Clean-up operations should include the use of absorbent material.
- Spill residues will be placed in polyethlylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DRMO and disposed in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations at the designated potential spill sites. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- Corrosive Paint Remover
- Methyl Ethyl Ketone
- Methyl Isobutyl Ketone
- Naptha: Stoddard Solvent
- PD-680
- Phosphoric Acid
- Sulfuric Acid
- Toluene
- Trichloroethane
- Trichloroethylene

CONTAINMENT, CLEAN-UP AND DISPOSAL

- The material should be transferred from the leaking container as soon as possible.
- If required, spilled sbustances should be neutralized according to methods specified on attached Material Safety Data Sheets.
- Clean-up operations should include the use of absorbent material.
- Spill residues will be placed in polyethlylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DRMO and disposed in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations at the designated potential spill sites. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- PD-680

ANNEX II-10

SITE-SPECIFIC CONTINGENCY PLAN

CIVIL ENGINEERING COMPOUND - FACILITY 357

NOTIFICATION AND INITIAL SPILL RESPONSE

Upon discovery of oil or hazardous substance spillage or accidental discharge, the following actions should be taken. The order of the actions will depend on the existing conditions.

- Notify Base Fire Department Ext. 4117.
- Notify officer/superintendent of shop, responsible for spill.
- Check cause and stop source of spill when possible without undue risk of personal injury.
- Restrict all sources of ignition when flammable substances are involved.
- Make spill scene OFF LIMITS to unauthorized personnel.
- Report to acting on-scene coordinator* upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department, the following information should be provided, if known, or can reasonably be determined.

- Name of individual reporting spill.
- Location of spill.
- Number of injured personnel and nature of injuries.
- Substance spilled.
- Amount spilled (estimated).
- Rate substance currently spilling (estimated).
- Time spill occurred (estimated).
- Extent which spill has traveled.
- Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Refer to attached Material Safety Data Sheets for particular hazards and precautionary measures for specific chemicals.

* BASE COMMANDER, BCE, or FIRE CHIEF

PROBABLE SPILL ROUTE

Spills will flow into apron storm drains or into adjacent parking lot drains.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- The material should be transferred from the leaking container as soon as possible.
- If required, spilled substances should be neutralized according to methods specified on attached Material Safety Data Sheets.
- Clean-up operations should include the use of absorbent material.
- Spill residues will be placed in polyethlylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DRMO and disposed in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations at the designated potential spill sites. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- PD-680

PROBABLE SPILL ROUTE

Spills occurring in CE Compound will drain to adjacent oil/water separator connected to the sanitary sewer system.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- If possible, move the leaking container/equipment to the drain served by the oil/water separator.
- Petroleum products should be washed into the adjacent oil/water separator.
- The substance should be transferred from leaking container as soon as possible.
- Clean-up operations may also include the use of absorbent materials, ("Speedie Dry").
- Spill residues will be placed in polyethylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DRMO and disposed in accordance with DOD regulations and Federal hazardous waste regulations. (SEE ANNEX X, SPR)

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations at the designated spill sites. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- Ethylene Glycol
- Gasoline : Automobile
- Naptha: Stoddard Solvent
- PD-680

CANNON AIR FORCE BASE
SPILL PREVENTION AND RESPONSE PLAN
Cannon Air Force Base, N. M. 88103
February 1986

ANNEX II-11

SITE-SPECIFIC CONTINGENCY PLAN

AUTO HOBBY SHOP - FACILITY 494

NOTIFICATION AND INITIAL SPILL RESPONSE

Upon discovery of oil or hazardous substance spillage or accidental discharge, the following actions should be taken. The order of the actions will depend on the existing conditions.

- Notify Base Fire Department Ext. 4117.
- Notify superintendent of Facility Ext. 2170.
- Check cause and stop source of spill when possible without undue risk of personal injury.
- Restrict all sources of ignition when flammable substances are involved.
- Make spill scene OFF LIMITS to unauthorized personnel.
- Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department, the following information should be provided, if known, or can reasonably be determined.

- Name of individual reporting spill.
- Location of spill.
- Number of injured personnel and nature of injuries.
- Substance spilled.
- Amount spilled (estimated).
- Rate substance currently spilling (estimated).
- Time spill occurred (estimated).
- Extent which spill has traveled.
- Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Refer to attached Material Safety Data Sheets for particular hazards and precautionary measures for specific chemicals.

PROBABLE SPILL ROUTE

Spills will flow into floor drains. If spill occurs outdoors, flow will cross pavement and enter storm drainage system.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- If possible, move the leaking container/equipment to oil/water separator and drains into the sanitary sewer system.
- Petroleum products should be prevented from entering storm drainage system.
- The substance should be transferred from leaking container as soon as possible.
- Clean-up operations may also include the use of absorbent materials.
- Spill residues will be placed in polyethylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DRMO and disposed in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

The site-specific contingency plan will be posted in prominent locations at the designated potential spill sites. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- Ethylene Glycol
- Gasoline: Automobile
- Naptha: Stoddard Solvent
- PD-680

ANNEX II-12

SITE-SPECIFIC CONTINGENCY PLAN

BASE SERVICE STATION - FACILITY 368

NOTIFICATION AND INITIAL SPILL RESPONSE

Upon discovery of oil or hazardous substance spillage or accidental discharge, the following actions should be taken. The order of the actions will depend on the existing conditions.

- o Notify Base Fire Department Ext. 4117.
- o Notify superintendent of Facility Ext. 784-5177.
- o Check cause and stop source of spill when possible without undue risk of personal injury.
- o Restrict all sources of ignition.
- o Make spill scene OFF LIMITS to unauthorized personnel.
- o Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department the following information should be provided, if known, or can reasonably be determined.

- o Name of individual reporting spill.
- o Location of spill.
- o Number of injured personnel and nature of injuries.
- o Substance spilled.
- o Amount spilled (estimated).
- o Rate substance currently spilling (estimated).
- o Time spill occurred (estimated).
- o Extent which spill has traveled.
- o Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Avoid contact with liquid fuels.
FLAMMABLE Liquids - Extinguish with dry chemical, foam carbon dioxide.
Flashback along vapor trail can occur.
See attached Material Safety Data Sheets for additional information.

PROBABLE SPILL ROUTES

Spills not contained by floor drains will flow over paved area into storm drainage along Overlord Ave.

CONTAINMENT, CLEAN-UP AND DISPOSAL

- o Petroleum products should be washed into the adjacent oil/water separators.
- o The substance should be transferred from leaking container as soon as possible.
- o Clean-up operations may also include the use of absorbent materials and/or portable skimmers.
- o Spill residues will be placed in polyethlylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or 102 turned into DRMO and disposed in accordance with DOD regulations and Federal hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be posted in prominent locations at the designated potential spill sites. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting:

- o Ethylene Glycol
- o Gasoline: Automobile
- o Naptha: Stoddard Solvent

ANNEX II-13

SITE-SPECIFIC CONTINGENCY PLAN

HYDRAZINE (H-70) SPILL MANAGEMENT AND NEUTRALIZATION PROCEDURES

(Source: Appendix 8, Annex X, 27TFW Oil and Hazardous Substances Pollution Contingency Plan, 21 January 1983)

NOTIFICATION AND INITIAL SPILL RESPONSE

Although no F-16 aircraft are stationed at Cannon AFB, itinerant F-16's could have an emergency, and in the event of a spill the following actions should be taken. The order of the actions will depend on the existing conditions.

- o Evacuate all non-essential personnel.
- o Notify Base Fire Department Ext. 4117.
- o Restrict all sources of ignition.
- o Report to acting on-scene coordinator and provide assistance until cleanup crew is fully operational.
- o No spill clean-up should be attempted until the personnel conducting the clean-up have put on personal protective clothing/equipment.
- o Personnel directly involved in the cleanup should stay upwind of the spill. Civil Engineering Pavements and Grounds personnel should be employed if they can be supplied with positive pressure breathing apparatus and appropriate protective clothing. If no equipment is available, the spill site should be evacuated until vapors disperse to 0.1 parts per million as determined by the Bioenvironmental Engineer.

When notifying the Fire Department, the following information should be provided, if known, or can reasonably be determined.

- o Name of individual reporting spill.
- o Location of spill.
- o Number of injured personnel and nature of injuries.
- o Substance spilled.
- o Amount spilled (estimated).
- o Rate substance currently spilling (estimated).
- o Time spill occurred (estimated).
- o Extent which spill has traveled.
- o Any other pertinent information (i.e. other potential hazards).

HYDRAZINE SPILL MANAGEMENT AND NEUTRALIZATION PROCUDURES

1. The following information and guidance is provided for cleaning up hydrazine (HG) spills.
   a. No spill clean-up should be attempted until the personnel conducting the clean-up have put on personal protective clothing/equipment.

b. The procedures outlined in this document are appropriate for accidental spills of hydrazine on the flightline ramp, hangar area, or servicing area such as might occur with broken H-70 tank fitting or leaking fuel line. For the purpose of this document, the word "spill" does not include the anticipated release of small quantities (drops) for which preventative measures have been taken. Currently, the F-16 is the only aircraft in the AF inventory with hydrazine routinely on-board.

c. The general idea is to mop up as much of the hydrazine as possible, neutralize any remaining damp spots and flush with water. In those locations where drainage systems have been designed to include a holding sump, immediately flush a spill with water into the holding sump for subsequent treatment and release.

d. All personnel not essential to the clean-up operation should be removed from the area to avoid breathing hydrazine vapors. Care must also be exercised to avoid contact with the skin since hydrazine is readily absorbed through the skin surface.

e. Until it has been neutralized, all possible care must be taken to avoid release of hydrazine to the environment. Hydrazine is toxic (at three parts per million level) to aquatic life.

2. The following materials will be required for accomplishing clean-up and neutralization of H-70 spills:

a. Polypropylene felt - this material is manufactured by the GAF Corporation and is available in lots of 500 sq yds or more. It is compatible with hydrazine and has been successfully used by NASA to clean up hydrazine spills. As of this date action is being initiated to stock list this material. The pieces of felt should always be stored in sealed plastic bags to exclude direct, moisture and other contaminated substances.

b. In the event that the recommended polypropylene felt material is not available, alternative materials may be used. For containing the spill and mopping up, large pieces of CLEAN, white cotton cloth may be used. Also a CLEAN cotton mop with wooden handle may be used.

c. Sodium hypochlorite solution, 5 percent (household bleach) - This may be used to neutralize concrete surfaces contaminated with hydrazine or to neutralize dilute water solutions of hydrazine mopped up after a spill.

d. Ortholidine solution. NSN 6810-00-270-8289.

e. Large container - this should be large enough to hold the entire contents of an EPU H-70 tank (6.8 gals) with room for 3-fold dilution. The container should have handles and be sturdy enough to transport while nearly full of water solution. Materials compatible with hydrazine (Polypropylene, polyethylene, stainless steel) should be used.

f. Field Kit. To insure availability of materials when personnel encountered hydrazine spills, a field kit will be assembled, prepackaged, and located where deemed appropriate by local managers. Specific quantity levels should be established based upon an assessment of local operation. The kit should contain as a minimum (1) Polypropylene felt (or CLEAN white cotton cloth) strips stored in plastic bage, (2) polyethylene squeeze bottle of water, (3) 30 gal heavy duty waste can container partially filled with water,

(4) household bleach solution, (5) tank of water with hose for personnel decontamination

3. The following procedure will be used with spills of H-70 on concrete surfaces:
   a. Clear area of all personnel except clean-up team and summon the SRT. If in a hangar, immediately open all doors and ventilate the area and suspend all operations immediately downwind. If outside, suspend all operations immediately downwind of the spill. Following completion of all spill clean-up procedures, the area will be cleared for re-entry by medical personnel.
   b. Attempt to contain the spill by placing the first pieces of felt on the leading edge of the spill to act as a barrier to further spreading.
   c. Fuming and fire hazard may be reduced by adding minimal amounts of water to the contained spill. The amount of water to add here is up to the OSC. A volume of water equivalent to the volume of H-70 spilled would be sufficient to reduce fuming significantly and render the fuel non-flammable. However, avoid adding too much water as this would increase the area of the spill making clean-up more difficult and the likelihood of environmental contamination greater.
   d. Mop up as much of the spilled fuel as possible. Carefully place the pieces of felt in the large waste container partially filled with water. The volume of fluid in the container should be about 10 gal or enough to cover the fuel-soaked pieces of felt. The pieces of felt may be squeezed out over the container and placed down again to absorb more spilled fuel.
   e. Additional hydrazine can be removed from the damp concrete by adding small quantities of water as before.
   f. The damp area on the concrete must now be treated by adding small amounts of bleach. When excess chlorine can be detected on the spill area using orthotolidine reagent, the spill can be considered neutralized. The Bioenvironmental Engineer can assist in this chemical test.
   g. Finally, the spill area should be flushed with large amounts of water. The Base Environmental Coordinator should be involved in the final stages of clean-up to insure that the proper neutralization procedures have been accomplished prior to final flushing. If the flushing will go directly to grade, it may be necessary to neutralize the excess chlorine with sodium thiosulfate.

4. For cleaning up spills on aircraft, the following procedures should be followed:
   a. Preventive measures - where small leaks are likely to occur during maintenance operations, such as when disconnecting H-70 tank fittings, a piece of cotton cheesecloth lightly moistened with water is satisfactory.
   b. Procedures.
      (1) Clear area of all personnel, except clean-up team, and summon the Fire Department and Base Environmental Coordinator.

(2) Wear respiratory protection, gloves, boots and coveralls as specified.

(3) Spills on the aircraft surface should be sponged up with felt or cloth. Use small amounts of water from a squeeze bottle to rinse down the contaminated area on the aircraft, sponging these up with a clean piece of felt or cloth.

(4) The pieces of felt or cloth should be placed into a container of water for later decontamination. If the amount of hydrazine on the wipes is small (several drops), they may also be placed directly into a container of bleach. Such a container of bleach will usually be available during maintenance operations on the EUP fuel tank. CAUTION: Only small amounts of hydrazine (drops should be placed directly into bleach solution).

(5) On aircraft, spill management actions should occur only with the aircraft outside and downwind from populated areas.

(6) Spill management actions should continue until the 0.1 ppm hydrazine vapor concentration requirement is verified by medical personnel.

5. Once the spill has been cleaned up, the container of diluted hydrazine fuel must be neutralized before release. The solution may be treated with the felt wipes present in the container, discarding the wipes after treatment. The following procedures apply to the neutralization process.

a. The hydrazine waste solution should be diluted with water until the estimated concentration of hydrazine is less than one percent. It may be necessary to transfer successive portions of waste solution to another container in order to achieve this dilution, neutralizing each portion separately. The neutralization procedure should be carried out in a well ventilated area.

b. Either commercial granular calcium hypochlorite (known as HTH) (65 percent Ca (HCLO), or household bleach solution (5 percent NaHCLO) can be used to neutralize solutions of hydrazine. The household bleach is recommended because of its dilute concentration, availability, and lack of controlled storage requirement. HTH has the advantage of being more concentrated, thus requiring less material for neutralization.

c. Estimating the quantitiy of neutralizing agent required will be different for the two materials described. The quantities specified below include enough material to neutralize the hydrazine present and provide a 10 percent excess of hypochlorite.

(1) Five percent Hypochlorite solution (household bleach) - For each volume of H-70 spilled use 100 volumes of bleach. For example, assume the volume of a spill is estimated to be about one pint of H-70 fuel. The volume of bleach required will be about 100 pints (12.5 gals).

(2) Commercial HTH (65 percent calcium hypochlorite, granular) - For each gallon H-70 spilled, use about 42 pounds of HTH. For example, assume that the volume of a spill is estimated to be about one pint of H-70 fuel. The weight of granular HTH required will be 42/8= 5.25 pounds (1 pint - 1/8 gal). Granular calcium hypochlorite may be procured locally or requisitioned as stock number.

NSN 6810-00-242-4770 Unit Of Issue - Box (45/5)
NSN 4810-00-25500472 Unit of Issue - 100 lb. Drum.

d. The decision of which agent to use for neutralization will depend on the volume of H-70 spilled. For small spills (less than a quart), the use of household bleach is recommended. For larger spills, the volume of bleach required becomes unmanageable, and it is preferable to use the more concentrated agent, HTH.

e. Before adding bleach or HTH, the hydrazine waste solution (or portion thereof) must be diluted with water until the concentration of hydrazine is about one percent. HTH or bleach should then be CAUTIOUSLY added in small increments while stirring the solution continuously. A vigorous bubbling action will be observed as the hydrazine is oxidized to nitrogen gas and the solution will become warm.

f. When there is no further bubbling on addition of bleach or HTH, the hydrazine is probable completely oxidized. To be certain, it is necessary to determine if there is a chlorine residual using orthotolidine reagent.

(1) To check for neutralization, 20 mls of the treated waste should be collected and 1.0 ml of orthotolidine reagent added. A bright reddish orange colored solution indicates excess chlorine and the neutralization is complete. A colorless or yellow solution indicates that more HTH or a bleach is required. Add more bleach or HTH to the well mixed waste solution and repeat test until a reddish orange color is obtained.

(2) The orthotolidine solution is prepared by dissolving 1.3g of ortholidine dihydrochloride in 500 mls distilled water and adding a mixture of 15 mls concentrated hydrochloric acid and 350 ml of distilled water. Store in dark brown bottles. Replace after six months. The solution is available premixed as Federal Stock No. 6810-00-270-8289. This reagent is toxic and should be handled carefully.

g. The treated waste solution may usually be released to the sanitary or industrial waste sewer system. Before final disposal of the treated waste solution, consult the base Bioenvironmental Engineer to insure that proper procedures are followed.

6. Protective equipment is recommended for specific tasks with the intent of precluding exposures. Specific personal protective items for maintenance are:

a. Nitrogen Depressurization:

(1) Clean long sleeve coveralls
(2) Full length rubber apron
(3) Gloves, vinyl coated
(4) Faceshield

b. Catalyst Purge: Some equipment as described for nitrogen depressurization tasks.

c. Poppet Valve Replacement: Coveralls, rubber gloves, and faceshield should be worn by the technician actually accomplishing the task. Once the poppet valve has been removed and rinsed with water, it may be handled without gloves for replacement of the O-ring and shear pin.

d. Refilling Operation:
   (1) Clean long sleeve coveralls
   (2) Full length sleeve coveralls
   (3) Gloves, Vinyl coated
   (4) Boots

e. Respiratory Protection: Respiratory protection may be provided by any Type C supplied air respirator as listed in AFOSH Standard 161-1, Table II, Part IV.
   (1) Compressed air for in-line respirators may be provided through use of a compressor such as NSN 4310-00-289-8249 and an air purified assembly.
   (2) Respiratory protection may be supplied by use of a pressure demand, back-pak, NSN 4240-00-919-2864. Three different, qualified respirators may be received when requisitioning this item: U.S. Divers (T.O. 14S5-18-1), MSA (T.O. 14S5-16-1), and the Scott, 30 minute Air-Pak II a, pressure demand, Back-Pak sytle 900014 Series (T.O. 14S5-11-11). The desired item is the Scott respirator because of the availability of the Scott Speak-Ezee II, a self-contained voice amplification device which fits the Scott mask. This device allows personnel wearing faceplate respirators to satisfactorily communicate with others. This device is NIOSH approved for use with the Scott Air-Pak and Scott Air Supplied Respirators, but its use with other masks renders the mask not qualified. The voice amplification device, NSN 4240-00-062-0694, includes the Speak-Ezee II with battery, bracket, feed thru microphone, and nose cup. The nose cup diminishes mask fogging and icing during cold weather.

ANNEX II-14

SITE SPECIFIC CONTINGENCY PLAN

SANITARY WASTEWATER COLLECTION SYSTEM

1. Cannon AFB pumps approximately 700,000 gallons of sewage per day to the sewage lagoons, (facility 4044). The collection systems consist of undergroung gravity fed and force main sewers. The only exposed pipes occur at ditch crossings. The collection system includes four (4) primary lift stations and one (1) smaller compact lift station. A spill could result from the following:
   a. Blockage
   b. Rupture
   c. Pump failure
   d. Power failure

2. Discovery, notification and request for assistance as discussed under Plan Execution are applicable to a sanitary wastewater spill. The following actions should be taken by the individual(s) initially discovering a sewage spill.
   a. Notify Base Fire Department Ext. 4117.
   b. Notify Base Civil Engineering Ext. 4358 or 2001/2.
   c. Check cause and stop source of spill when possible, without undue risk of personal injury.
   d. Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team if fully operational.

3. Containment, clean-up, and disposal procedures described under Plan Execution are supplemented as follows:
   a. Lift stations upstream of a force main break or overflowing manhole may be shut down temporarily, thus eliminating flow in downstream sewerage. Gravity lines upstream of a spill occurring at a lift station or gravity system manhole may be selectively plugged to reduce or eliminate flow. In either instance, the system upstream of the plug or shut down lift station must be monitored to avoid additional sewage overflows.
   b. In some instances, overflowing manholes or lift station wet wells may be pumped to manholes downstream of a line break, line stoppage or malfunctioning lift station.
   c. Flow in portions of the sewage system serving isolated facilities or a small number of facilities may be eliminated by shutting off water supply to the facilities.

d. Simultaneously with or immediately following suppression, an attempt will be made to arrest the movement of untreated sanitary waste toward surface waters:
   (1) Overland flow of liquids can be blocked by dikes constructed by earth moving equipment or by placement of sandbags, hay bails, or any barrier material available.
   (2) During dry weather, storm drainage ditches can be blocked with the same procedures as for overland flow.
e. After spill is contained:
   (1) Consideration should be given to pumping the trapped waste material to a downstream manhole or into a tanker truck for hauling to a downstream manhole.
   (2) If the nature of the spill is such that removal and discharge to the sanitary system is not feasible, the raw waste material should be disinfected with calcium hypocholorite (HTH). HTH should be carefully sprinkled over the raw waste material and mixed into the waste by any means available (e.g., air pump with diffuser). HTH should be applied and mixed until a chlorine residual of 2 ppm is obtained.
   (3) Since the topography of Cannon Air Force Base directs all surface waters to on-base playa lakes, it is very unlikely that any sewage spills will reach off-base areas. It is therefore not a requirement to notify state and/or local agencies about sewage spills on base.
   (4) All solid material removed from the ground surface will be buried in a approved landfill.
f. Upon completion of clean-up and disposal, the OSC will inspect the area of the spill and take the necessary actions to restore the area to its pre-existing condition.

CANNON AIR FORCE BASE
SPILL PREVENTION AND RESPONSE PLAN
Cannon Air Force Base, N.M. 88103
May 1987

ANNEX II-15

SITE-SPECIFIC CONTINGENCY PLAN

SUPPLY STORAGE FACILITIES - FACILITIES 162, 202, 206, & 211

NOTIFICATION AND INITIAL SPILL RESPONSE

In the event of a spill the following actions should be taken. The order of the actions will depend on the existing conditions.

- o Notify Base Fire Department Ext. 4117.
- o Notify Supervisor of Supply Facilities Ext. 2502.
- o Check cause and stop source of spill when possible without undue risk of personal injury. If the nature of the spill material is unknown, use extreme caution.
- o In case of chlorine spills, don mask and have personnel evacuated.
- o Restrict all sources of ignition when flammable substances are involved.
- o Make spill scene OFF LIMITS to unauthorized personnel.
- o Report to acting on-scene coordinator upon spill response team arrival and provide assistance until response team is fully operational.

When notifying the Fire Department the following information should be provided if known or can reasonable be determined.

- o Name of individual reporting spill
- o Location of spill
- o Number of injured personnel and nature of injuries
- o Substance spilled.
- o Amount spilled (estimated).
- o Rate substance currently spilling (estimated).
- o Time spill occurred (estimated).
- o Extent which spill has traveled.
- o Any other pertinent information (i.e. other potential hazards).

SPECIAL PRECAUTIONARY MEASURES

Refer to attached Material Safety Data Sheets for particular hazards and precautionary measures for specific chemicals.

PROBABLE SPILL ROUTES

Facility 162	Spills will flow over paved area to apron drains or over parking lot to storm drains and ditches.
Facility 202	Spills will flow over paved area to drainage ditches on South and West of building.
Facility 206	Spills will dissipate in parking area on North side. Spills on South side will flow across Torch Blvd to drainage ditch.
Facility 211	Spills will dissipate in parking area on North side or into soil on other sides.

CONTAINMENT, CLEAN-UP AND DISPOSAL

o Sandbags may be utilized to contain spilled substance around leaking containers.

o Leaking container should be oriented so as to minimize leaking. Substances should be transfered from leaking drum.

o If required, spilled substances should be neutralized according to methods specified on attached material safety data sheet.

o Clean-up operations should include the use of absorbent material.

o Spill residues will be placed in polyethylene lined drums (see 49 CFR 178.133) or other approved drums under 49 CFR 172.101 or .102, turned into DRMO and disposed of in accordance with DOD, federal and state hazardous waste regulations.

POSTING REQUIREMENTS

This site-specific contingency plan will be placed in prominent locations within the potential spill areas. The following Material Safety Data Sheets from Annex III, SPR Plan will be attached when posting.

Acetylene
Ammonia, Anhydrous
Ammonium Hydroxide
Baygon
Carbon Removing Compound
Carbaryl
Caustic Soda Solution
Chlordane
Chlorine
Cleaning Compound, Engine
Corrosive Paint Removal
Diazinon
Dursban
Ethylene Glycol
Hydrochloric Acid
Malathion
Methyl Isobutyl Ketone
Methyl Ethyl Ketone
Monochlorodi-flouromethane
Naptha: Solvent
Naptha: Stoddard Solvent
PD-680, Cleaning Solvent
Phosphoric Acid
Potassium Hydroxide
Pyrethrum
Sulfuric Acid
Sulfuric Acid, Spent
Toluene
Trichloroethane
Trichloroethylene

CANNON AIR FORCE BASE
SPILL PREVENTION AND RESPONSE PLAN
Cannon Air Force Base, N. M. 88103
February 1986

ANNEX III

MATERIAL SAFETY DATA SHEET INDEX

INDUSTRIAL COMPOUND SAFETY DATA SHEETS

Acetylene
Ammonia (Anhydrous)
Baygon
Dichlorodiflouromethane (Freon 12)
Lacquers, Acrylic
- Black
- Brown
- Olive Drab
- White

Propane
Sodium Hydroxide
Tec-Wash (Caustic Alkali)
Thinner #841
Thinner #811
Trichloroethane (1,1,1) ("Tap Magic")

CHEMICAL HAZARDS RESPONSE INFORMATION SYSTEM SHEETS: (CHRIS)

Acetone
Calcium Chloride
Chloroform
Chlorine
Chlordane
Carbaryl (Sevin)
Dursban
Dimethylamine
Diethylemeglycol Monobutyl Ether
Dichloromethane
Diazinon
Ethylene Glycol
Gasolines: Automotive
Gasolines: Aviation
Hydrochloric Acid
Jet Fuel JP-4
Lactic Acid
Malathion
Mercury
Methyl Ethyl Ketone
Methyl Isobutyl Ketone

Naphtha: Coal Tar
Naphtha: Solvent
Naphthalene, Molten
Nitric Acid
Phenol
Phosphoric Acid
Poly Chlorinated Biphenyl
Potassium Dichromate
Potassium Hydroxide
Propylene Glycol
Pyrethrins
Sodium Hydroxide
Sodium Hypochloride
Sulfuric Acid
Tetramethyl Lead
Toluene
O-Toluidine
Trichloroethane
Trichloroethylene
Xylene
Zinc Chromate
Zinc Phosphide

MATERIAL SAFETY DATA SHEETS

INDUSTRIAL COMPOUNDS

...s an...
...539, Allentown, PA 18105
...(215) 398-4911 · TWX 510-651-3686
...BLE-AIRPROD · TELEX 84-7416

Air Products

Industrial Gas Division

Acetylene Material Safety Data Sheet

EMERGENCY PHONE: 800—523-9374 IN PENNSYLVANIA: 800—322-9092	TRADE NAME AND SYNONYMS	[redacted] Ethyne, Ethine	
	CHEMICAL NAME AND SYNONYMS	Acetylene, Ethyne, Ethine	
ISSUE DATE AND REVISIONS: 31 January 1978	FORMULA	C_2H_2	CHEMICAL FAMILY: Alkynes

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

Acetylene is classified as a simple asphyxiant and has no threshold limit value (TLV).

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED

Symptoms such as headaches, dizziness, shortness of breath, and loss of consciousness may occur if the gas is present in quantities sufficient to dilute the oxygen concentration in air. Symptoms of anoxia occur only when the gas concentrations are within the flammable range and the mixture has not ignited. Do not enter areas within the flammable range due to the immediate fire and explosion hazard. Use a suitable flammable gas meter (explosimeter) calibrated for acetylene to measure concentrations of gas in the air.

TOXICOLOGICAL PROPERTIES

Acetylene is a simple asphyxiant, irritant, and anesthetic. About 100 mg per liter may be tolerated for 0.5—1.0 hour. There is no experimental evidence of chronic harmful effects.

RECOMMENDED FIRST AID TREATMENT

First degree and minor second degree thermal burns from fires should be immersed in cool water for 30 minutes. Major second and third degree burns should be covered in the cleanest material available. Seek immediate aid of a physician. Persons suffering from lack of oxygen should be moved to areas with normal atmosphere. Assisted respiration and supplemental oxygen should be given if the victim is not breathing.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
0°F (-17.8°C)	635°F (335°C)	in air	2.5%	100%

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION GROUP
carbon dioxide, dry chemical, halocarbon	Class 1, Group A

SPECIAL FIRE FIGHTING PROCEDURES

Stop gas flow and fight fire conventionally. Use water spray to keep cylinders or other containers cool if exposed to fire. Keep personnel well away since containers can rupture violently when exposed to fire. For additional information, see Compressed Gas Association Safety Bulletin SB-4.

UNUSUAL FIRE AND EXPLOSION HAZARDS

ACETYLENE IS EXTREMELY FLAMMABLE AND EXPLOSIVE. IT MAY DECOMPOSE VIOLENTLY IN ITS FREE STATE UNDER PRESSURE IN EXCESS OF 15 PSIG. It burns with an intensely hot flame. Potential explosion hazard exists from reignition if fire is extinguished without shutting off acetylene source. Acetylene gas has an approximate specific gravity of 1.0 and tends to stay in pockets rather than dissipate.

DISCLAIMER

...information contained in this data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. ...statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable ...accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information ...ended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering ...process, composition of matter or use.

...nce the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or d...curred from the proper or improper use of such product.

...Products and Chemicals, Inc., 1977

Printed in U.S.A.

BOILING POINT (°F) @ 1 atm	-119.2°F (-84°C)	**FREEZING POINT (°F)** @ 17.4 psia	-114.8°F (81.4°C)
VAPOR PRESSURE (psia) @ 68°F (20°C)	635 psia	**SOLUBILITY IN WATER** @ 32°F (0°C), 1 atm	1.7 CuFt / CuFt H₂O

VAPOR DENSITY (lb / cu ft) @ 70°F (21.1°C), 1 atm	0.0680	**SPECIFIC GRAVITY (AIR = 1)** @ 70°F (21.1°C), 1 atm	0.908
LIQUID DENSITY (lb / cu ft) @ boiling point	38.7	**SPECIFIC GRAVITY (H_2O = 1)** @ boiling point	

APPEARANCE AND ODOR
Pure acetylene is colorless and odorless. Impurities in carbide generated acetylene impart a characteristic garlic like odor.

REACTIVITY DATA

STABILITY	**UNSTABLE**	X	**CONDITIONS TO AVOID** Never utilize free gas outside the cylinder at pressures in excess of 15 psig. Avoid mechanical shocks to containers of acetylene. Never expose cylinders to sources of heat.
	STABLE		

INCOMPATIBILITY (Materials to avoid)
Oxidizers such as oxygen, chlorine or fluorine. Copper, silver, and mercury react with acetylene to form explosive acetylides.

HAZARDOUS DECOMPOSITION PRODUCTS
Acetylene will decompose into elemental carbon and hydrogen under the above conditions.

HAZARDOUS POLYMERIZATION	**MAY OCCUR**		**CONDITIONS TO AVOID**
	WILL NOT OCCUR	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Ventilate area to prevent flammable mixture from forming. Remove sources of ignition, heat, sparks, etc. Avoid entering area of flammable atmosphere. Carefully remove cylinders with slow leaks to a remote outdoor location. Contact Air Products for assistance.

WASTE DISPOSAL METHOD

Do not attempt to dispose of residual gaseous acetylene in cylinders. Return to Air Products for disposal.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
Oxygen deficient atmospheres are in the flammable range. DO NOT ENTER. Respirators will not function.

VENTILATION Natural or mechanical where gas is present.	**LOCAL EXHAUST**	**SPECIAL** Mechanical ventilation for enclosed storage areas must National Electrical Code requirements for Class 1, Group
	MECHANICAL (General)	**OTHER**

PROTECTIVE GLOVES
Ordinary leather work gloves recommended for cylinder handling. Welders gloves required for cutting and welding operations.

EYE PROTECTION
Safety glasses recommended for handling cylinders. Welders goggles, face shield, etc., required for cutting and welding.

OTHER PROTECTIVE EQUIPMENT
Leather apron and other standard protective equipment for cutting and welding.

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

Acetylene shipments must be in accordance with Department of Transportation (DOT) regulations using the DOT "Flammable Gas" label. Consult DOT regulations for details on the shipping of hazardous materials.

SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Acetylene gas cylinders contain gas at high pressure and should be handled with care. Use a pressure-reducing regulator set at less than 15 psig when connecting to lower pressure piping systems. Always keep acetylene cylinders upright and chain cylinders when in use. Never expose an acetylene cylinder to heat. Always open and close acetylene valves slowly. Return cylinders to Air Products with positive pressure and cylinder valve closed. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS

Storage of 2000 cubic feet or less is permissible within buildings. Storage in excess of 2000 cubic feet must be out doors or in well ventilated special rooms or buildings. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Keep acetylene cylinder storage areas away from storage of oxygen and other oxidizers. Storage areas should be free of combustible material. Avoid exposure to areas where salt or other corrosive chemicals are present. Store acetylene cylinders with the valve end up. See Compressed Gas Association Pamphlet P-1 and National Fire Protection Association Standard No. 51 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS

Acetylene is packed in cylinders meeting DOT specification 8 or 8AL. The cylinder contains a porous filler saturated with acetone. The acetylene is stored in the cylinder dissolved in acetone. A full cylinder should not exceed 250 psig @70°F.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Acetylene cylinders should be stored and used in an upright position. When using acetylene, close the cylinder valve before shutting off the regulator to permit the gas to bleed from the regulator. Avoid hazardous mixtures and sources of ignition. Formation of explosive copper acetylides can be avoided by using copper alloys with less than 65 percent copper.

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

Specialty Gas Material Safety Data Sheet

Air Products

PRODUCT NAME	AMMONIA (ANHYDROUS)
EMERGENCY PHONE	(800) 523-9374; IN PENNSYLVANIA (800) 322-9092

AIR PRODUCTS AND CHEMICALS, INC. BOX 538 ALLENTOWN, PA 18105 (215) 481-8257	TRADE NAME AND SYNONYMS Ammonia (Anhydrous)	
	CHEMICAL NAME AND SYNONYMS Ammonia (Anhydrous)	
ISSUE DATE AND REVISIONS 1 May 1978	FORMULA NH_3	CHEMICAL FAMILY Nitrogen Hydride

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT

25 ppm

SYMPTOMS OF EXPOSURE

Ammonia is extremely irritating to the airway, eyes and skin. Depending on the intensity and duration of exposure, effects may vary from mild irritation to severe destruction of tissues. Symptoms of exposure may include burning sensations, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Penetration of ammonia into the lower airway may produce bronchitis, chemical

(Continued on last page)

TOXICOLOGICAL PROPERTIES Inhalation human LCLo:10,000 ppm/3 hours

Exposure to atmospheres contaminated with ammonia is extremely irritating. Its odor and prompt irritant action provides a warning of exposure to toxic conditions. High concentrations are extremely destructive to tissues of the airway, eyes and skin. Inhalation may have fatal consequences as a result of spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Exposure of the eyes to high concentrations may result in ulceration of the conjunctiva and cornea and destruction of all ocular tissues. Contact with the skin causes severe burns.

RECOMMENDED FIRST AID TREATMENT

RESCUE PERSONNEL SHOULD AVOID UNNECESSARY EXPOSURE.

Inhalation: Move the affected person to an uncontaminated atmosphere. If exposure has been to minor concentrations for a limited time, usually no treatment will be required. If breathing has stopped or is impaired, give assisted respiration (e.g. mouth-to-mouth). Supplemental oxygen should be administered. Keep the victim warm and quiet. Assure that the victim does not aspirate vomited material by use of positional drainage. Assure that mucus does not obstruct the airway. Seek medical attention at once.

Eye Contact: CONTACT LENSES SHOULD NOT BE USED BY PERSONS POTENTIALLY EXPOSED TO AMMONIA.

(Continued on last page)

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use

Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss damage incurred from the proper or improper use of such product

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Contact of ammonia with mercury, halogens, calcium or silver oxide can form explosive compounds.

PHYSICAL DATA

ILING POINT -28.17°F (-33.43°C)	LIQUID DENSITY AT BOILING POINT 42.56 lb/ft^3 (681.75 kg/m^3)
POR PRESSURE at 70°F (21.1°C) 128.8 psia (888.1 kPa)	GAS DENSITY AT 70°F, 1 atm 0.0445 lb/ft^3 (0.7128 kg/m^3)
LUBILITY IN WATER Soluble	FREEZING POINT -107.93°F (-77.74°C)
PPEARANCE AND ODOR Colorless gas with a pungent odor	

FIRE AND EXPLOSION HAZARD DATA

ASH POINT (Method used) Gas	AUTO IGNITION TEMPERATURE 1204°F (651°C)	FLAMMABLE LIMITS % BY VOLUME LEL 15% UEL 25%
TINGUISHING MEDIA Water		ELECTRICAL CLASSIFICATION Class I, Group D

PECIAL FIRE FIGHTING PROCEDURES
Stop the flow of gas. Water is the best extinguishing media. Ammonia is soluble in water, so water spray or fog are effective in removing the gas from the atmosphere. Use water also to keep fire-exposed containers cool.

NUSUAL FIRE AND EXPLOSION HAZARDS
Ammonia vapor in certain percentages is flammable in air. However, these high concentrations are seldom encountered. Experience has shown that ammonia is difficult
(Continued on last page)

REACTIVITY DATA

TABILITY		CONDITIONS TO AVOID
Unstable		
Stable	X	

COMPATIBILITY (Materials to avoid)
Copper, copper alloys, halogens, zinc, mercury, cadmium, silver oxide

AZARDOUS DECOMPOSITION PRODUCTS
Above 1544°F (840°C), nitrogen and hydrogen

ZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur		
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

TEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Immediately evacuate the area if ammonia leaks or spills. Leaks can be detected by passing an open bottle of concentrated hydrochloric acid in the suspected area. Dense white fumes form at the leak site. Slowly discharge the gas into sufficient water to absorb the ammonia. For spills, contain fumes with a water-spray. Do not use acid
(Continued on last page)

ASTE DISPOSAL METHOD

Do not attempt to dispose of waste or surplus ammonia. Return all unused quantities to Air Products and Chemicals, Inc. for proper disposal.

©Air Products and Chemicals, Inc. 1980

Air Products and Chemicals, Inc.
Box 538, Allentown, Pa. 18105
(215) 398-8257 or (215) 481-8257

Air Products

Specialty Gas Department

HEALTH HAZARD DATA

SYMPTOMS OF EXPOSURE (Continued)

pneumonitis and pulmonary edema. Contact of ammonia with the eyes will cause pain, tearing, inflammation, swelling of tissue and possible destruction of the eye. Contact of ammonia with the skin will cause severe burns.

RECOMMENDED FIRST AID TREATMENT (Continued)

Ammonia contamination of the eyes should be treated by immediate and prolonged irrigation with large quantities of water. Assure adequate flushing of the eyes by separating the lids with fingers. Obtain medical assistance at once.

Skin Contact: Flush the affected area promptly with large quantities of water for 15 minutes. Remove contaminated clothing as quickly as possible. Except in the most minor, superficial and localized burns, cover the affected area with a sterile dressing or clean sheeting and transport for medical care. DO NOT APPLY GREASES OR OINTMENTS. Control shock if present. Launder contaminated clothing before reuse. Contaminated footwear must generally be discarded.

Ingestion: In the event of ingestion, administer 3 to 4 glasses of water or milk. DO NOT INDUCE VOMITING. Obtain medical care and hospital treatment at once.

FIRE AND EXPLOSION HAZARD DATA

UNUSUAL FIRE AND EXPLOSION HAZARDS (Continued)

to ignite and must first be preheated. Therefore, it is generally treated as a nonflammable gas.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED (Continued)

to neutralize ammonia since the large heat of neutralization promotes the evolution of ammonia fumes. Do not dispose in a sewer system.

SPECIAL PRECAUTIONS

SPECIAL HANDLING RECOMMENDATIONS (Continued)

For additional handling recommendations consult the Air Products Specialty Gas Catalog Safety and Technical Information Section or Compressed Gas Association Pamphlet P-1.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)	Positive pressure self-contained breathing apparatus should be available for emergency use.	
VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (Gen.) X	OTHER
PROTECTIVE GLOVES	Rubber	
EYE PROTECTION	Safety goggles or glasses	
OTHER PROTECTIVE EQUIPMENT	Safety shoes, safety shower, eyebath, rubber apron	

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

D.O.T. Green Label, "Nonflammable Gas"

SPECIAL HANDLING RECOMMENDATIONS

Use only in a well-ventilated area. Never drop cylinders or allow them to strike each other violently. Avoid dragging or sliding cylinders, even for short distances. They should be moved by a suitable hand truck. Keep the valve protection cap in place until cylinder is secured and ready for use. Always insert a trap or check-valve in the line to prevent hazardous back-flow into the cylinder. Use a pressure-reducing regulator when connecting to lower pressure piping systems.

Never heat an ammonia cylinder with a flame since uncontrolled heating will cause the build up of dangerous hydrostatic pressures. Heat only in a thermostated water or oil bath. Do not use ammonia near sources of heat or ignition.

(Continued on last page)

SPECIAL STORAGE RECOMMENDATIONS

Protect against physical damage. Store cylinders in a cool, dry, well-ventilated area of noncombustible construction. Protect cylinders from excessive temperature rise by storing away from sources of heat. No part of a cylinder should be subjected to a temperature above 125°F (52°C). Store cylinders in an upright position and firmly secured. Segregate full and empty cylinders. Isolate from oxygen, halogens and other oxidizing materials. Underground storage is not recommended.

For additional storage recommendations consult the Air Products Specialty Gas Catalog Safety and Technical Information Section or Compressed Gas Association Pamphlet P-1.

SPECIAL PACKAGING RECOMMENDATIONS

Dry ammonia does not attack most common metals. However, in the presence of trace amounts of water, ammonia will vigorously attack copper, silver, zinc and their alloys. Iron and steel are the preferred materials of construction. Piping should be of rigid steel.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Ground and bond all lines and equipment used with ammonia. Do not use ammonia around sparking motors or other nonexplosion-proof equipment. Since ammonia readily combines with mercury to form explosive fulminating compounds, the use of mercury-containing equipment should be avoided.

* Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which must be observed. The user should know these regulations to ensure that he is in full compliance.

MATERIAL SAFETY DATA SHEET

MOBAY CHEMICAL CORPORATION — PITTSBURGH, PA. 15205

DATA SHEET NO. 5056
DIVISION Ag Chem
ISSUE DATE 7-15-81
ISSUED BY CDS
SUPERSEDES ISSUE OF 6-25-80

MANUFACTURING DIV. ADDRESS

MOBAY CHEMICAL CORPORATION - AGRICULTURAL CHEMICALS DIVISION
P.O. Box 4913 (Hawthorn Road) Kansas City, Missouri 64120

CHEMTREC CHEMICAL TRANSPORTATION EMERGENCY TELEPHONE NO: 800-424-9300; DISTRICT OF COLUMBIA: 202-483-7616	MOBAY NON-TRANSPORTATION EMERGENCY NO.: (816) 242-2582
PRODUCT NAME: BAYGON 1.5	PRODUCT CODE NUMBER (Formula No.): 021135
CHEMICAL FAMILY: Carbamate pesticide	CHEMICAL NAME & SYNONYMS: 2-(1-methylethoxy)phenol methylcarbamate
CHEMICAL FORMULA: $2\text{-}(i\text{-}C_3H_7O)C_6H_4OCO\ NHCH_3$	TRADE NAME & SYNONYMS: Propoxur, Sendran, Arprocarb, Unden, Suncide

HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS OR GASES	%	CURRENT TLV
BAYGON	13.9	0.5 mg/m^3
Methylene Chloride	~27	200 ppm
Trichloroethylene	~37	100 ppm

PHYSICAL DATA

APPEARANCE (SOLID, LIQUID, GAS): Liquid	MOLECULAR WEIGHT: 209.2 (A.I.)	MELT POINT: 32° F	SPECIFIC GRAVITY: 1.27 @ 20° C
DENSITY (AR=1): NE	COLOR: Pale amber	BULK DENSITY: NA	BOILING POINT: 104° F
VAPOR PRESSURE: NE	SOLUBILITY: Slight (A.I.)	ODOR: Strong solvent odor	% VOLATILE BY VOLUME: NE

FIRE & EXPLOSION DATA

FLASH POINT °F (METHOD USED): Non flammable	FLAMMABLE LIMIT: Lel NA Uel NA	EXTINGUISHING MEDIA: Dry chemical, CO_2, Water spray

SPECIAL FIRE FIGHTING PROCEDURES

Use self-contained breathing equipment. Stay out of smoke. Cool exposed containers.

UNUSUAL FIRE OR EXPLOSION HAZARDS

TOXICITY DATA

LD50, ORAL (INGESTION): Rat 168 mg/kg	LD50, DERMAL (SKIN CONTACT): Rabbit >2,000 mg/kg	INHALATION LC50: Rat 4,900 ug/L/hr
FISH, LC50 (LETHAL CONCENTRATION): NE	TLV (UNITS) (THRESHOLD LIMIT VALUE): (BAYGON) 0.5 mg/m^3	SKIN IRRITATION: NE
EFFECTS TO EYE: NE	EFFECTS TO LUNG: NE	OTHER: NE

EMERGENCY AND FIRST AID PROCEDURES, EFFECTS OF OVER EXPOSURE

If swallowed, induce vomiting.

Remove contaminated clothing and flush eyes and skin with water. Shower thoroughly washing skin and hair with soap and water.

Symptoms of overexposure are headaches, dizziness, ataxia, constricted pupils, nausea, vomiting, sweating, respiratory depression, and cholinesterase depression.

Consult physician.

BAYGON

REACTIVITY DATA

Formula No. 021135

STABILITY	CONDITIONS TO AVOID
Stable	Heat, excess heat (above 100° F causes high pressure in cans)
POLYMERIZATION	**CONDITIONS TO AVOID**
Will not occur	

INCOMPATABILITY (MATERIALS TO AVOID)
Oxidizing agents and alkaline materials

HAZARDOUS DECOMPOSITION PRODUCTS
CO, CO_2, Phosgene, CH_3NCO, CH_3NH , HCl

SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb spilled material. Scrub contaminated area with strong detergent and bleach. Rinse wi
water. Avoid skin contact and breathing vapors.

WASTE DISPOSAL METHOD
Bury in secure landfill or burn in an incinerator approved for pesticide destruction.

SPECIAL PROTECTION DATA

RESPIRATOR TYPE
NIOSH-approved chemical cartridge or full-face respirator with pesticide canisters.

EYE PROTECTION	GLOVES
Splash-proof goggles	Latex or Neoprene

OTHER PROTECTIVE EQUIPMENT
Rubber boots and apron. Launder clothing daily after use.

SPECIAL PRECAUTIONS & STORAGE DATA

STORAGE TEMPERATURE	AVERAGE SHELF LIFE
Min. 32° F Max. 90° F	

SPECIAL SENSITIVITY (HEAT, LIGHT, MOISTURE)
Heat

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
DO NOT store near any materials intended for use or consumption by humans or animals

SHIPPING DATA

D.O.T. SHIPPING NAME	TECHNICAL SHIPPING NAME
NA	Propoxur
D.O.T. HAZARD CLASSIFICATION	
Primary: NA	Secondary:
D.O.T. LABELS REQUIRED	**FREIGHT CLASSIFICATION**
NA	Insecticides, O/T, Agricultural

REASON FOR ISSUE
Revised Material Safety Data Sheet

INITIATED BY:	TITLE	APPROVED BY:	TITLE
Larry R. Thompson	Industrial Hygienist	Wm. J. Brinkman	Mgr., Air Qual. & Ind
DATE INITIATED: 7-15-81		DATE APPROVED: 7-15-81	02

N.E. - NOT ESTABLISHED N.A. - NOT APPLIC

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Mobay Chemical Corporation. The data on this sheet relates only to the specific material designated herein. Mobay Chemical Corporation assumes no legal responsibility for use or reliance upon these data.

U.S. DEPARTMENT OF LABOR

Occupational Safety & Health Administration

MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTURER'S NAME: E. I. Du Pont de Nemours & Company, Inc.	EMERGENCY TELEPHONE NO.: (302)-774-2421
ADDRESS (Number, Street, City, State, and ZIP Code): Freon® Products Division, Wilmington, Delaware 19898	
CHEMICAL NAME AND SYNONYMS: Dichlorodifluoromethane	TRADE NAME AND SYNONYMS: Freon® 12
CHEMICAL FAMILY: Halogenated Hydrocarbon	FORMULA: CCl_2F_2

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F.)		-21.6	SPECIFIC GRAVITY (H_2O=1)	77°F	1.311
VAPOR PRESSURE (mm Hg.)	77°F.	4893	PERCENT VOLATILE BY VOLUME (%)		100
VAPOR DENSITY (AIR=1)		6.33	EVAPORATION RATE (_____=1)		Rapid
SOLUBILITY IN WATER	77°F	0.028			

APPEARANCE AND ODOR: Colorless liquid - slight ethereal odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used): None	FLAMMABLE LIMITS: None	Lel	Uel

EXTINGUISHING MEDIA: Nonflammable

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

NOTICE FROM DU PONT

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 1000 ppm

EFFECTS OF OVEREXPOSURE
Light-headedness, giddiness, shortness of breath, possible narcosis, possible cardiac arrhythmias at high concentrations.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation: Remove to fresh air, call a physician. Do not give epinephrine or similar drugs.

Skin or Eye Contact: Flush with water; call a physician.

SECTION VI REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		Open flames or high temperatures
	STABLE	X	

INCOMPATABILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS
Hydrochloric and Hydrofluoric acid, possible carbonyl fluoride

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Ventilate area - especially low places where heavy vapor might collect. Remove open flames.

WASTE DISPOSAL METHOD
Reclaim by distillation.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
Use air mask in high concentrations.

VENTILATION		
	LOCAL EXHAUST: When large amounts are released	SPECIAL
	MECHANICAL (General): Especially in low places	OTHER

PROTECTIVE GLOVES: When handling liquid

EYE PROTECTION: When handling liquid

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store cylinders in a clean, dry [illegible]. Do not store above 130°F.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET

NPCA 1-78

FOR COATINGS, RESINS AND RELATED MATERIALS

(APPROVED BY US DEPARTMENT OF LABOR, ESSENTIALLY SIMILAR TO FORM OSHA-20)

DATE OF PREP 09/81

SECTION I

MANUFACTURERS NAME PRATT & LAMBERT - WICHITA DIVISION VER-02

STREET ADDRESS 630 EAST 13TH CITY, STATE, AND ZIP CODE ANDOVER, KANSAS 67002

EMERGENCY PHONE NO. (DAY) 316-733-1361

INFORMATION TELEPHONE NO. 316-733-1361

PRODUCT CLASS MANUFACTURER'S CODE I.D. 794704

TRADE NAME LACQUER ACRYLIC

CARBUE BLACK #37038

SECTION II – HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WT.	TLV PPM	TLV MG/M3	LEL	VAPOR PRESSUR
CYCLOHEXANONE	10-20	50		1.10	3.2
METHYL ETHYL KETONE	20-30	200		1.80	78.0
ISOPROPYL ALCOHOL	5	400		2.50	31.2
TOLUOL/TOLUENE	10-20	100		1.30	22.4

SECTION III – PHYSICAL DATA

BOILING RANGE 174 TO 321 DEG F.

VAPOR DENSITY HEAVIER [ ] LIGHTER [ ] THAN AIR

VOC 4.95 #/GA

EVAPORATION RATE FASTER [ ] SLOWER [X] THAN ETHER

PERCENT VOLATILE BY VOLUME 69

WEIGHT PER GALLON 9.1 GM/LI

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION CLASS I B FLASH POINT 21 DEG F. TCC LEL 1.10

EXTINGUISHING MEDIA

USE NATIONAL FIRE PROTECTION ASSOC. (NFPA) CLASS B EXTINGUISHI CARBON DIOXIDE, DRY CHEMICAL OR ALCOHOL FOAM) DESIGNED TO EXTINGUISH NFPA CLASS FIRES. POLYMER FOAM PREFERRED AT STANDARD APPLICATION RATE FOR LARGE FIRES.

UNUSUAL FIRE AND EXPLOSION HAZARDS

KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY TO VERY HOT SURFACES.

SPECIAL FIRE FIGHTING PROCEDURES

SELF-CONTAINED BREATHING APPARATUS SHOULD BE AVAILABI FIREMEN. WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSI WI EXPOSED TO EXTREME HEAT. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE.

SECTION V – HEALTH HAZARD DATA

ESHOLD LIMIT VALUE SEE SECTION II.

FFECTS OF OVEREXPOSURE INHALATION: ANESTHETIC, IRRITATION OF THE RESPIRATORY TRACT ACUTE NERVOUS SYSTEM DEPRESSION CHARACTERIZED BY HEADACHE, DIZZINESS, STAGGERIN IT, CONFUSION, UNCONSCIOUSNESS OR COMA.

SKIN OR EYE CONTACT: PRIMARY IRRITATION.

MERGENCY AND FIRST AID PROCEDURES IN CASE OF CONTACT, FLUSH SKIN AND EYES WITH PLENTY WATER WHILE REMOVING CONTAMINATED CLOTHING. IF INHALED, REMOVE TO FRESH AIR. LL A PHYSICIAN IF SYMPTOMS PERSIST.

SECTION VI – REACTIVITY DATA

	UNSTABLE	STABLE	CONDITIONS TO AVOID
TABILITY	[ ]	[XX]	AVOID FIRES, HEAT, AND HOT SURFACES.

NCOMPATABILITY (MATERIALS TO AVOID)

IAZARDOUS DECOMPOSITION PRODUCTS

IAZARDOUS POLYMERIZATION [ ] MAY OCCUR [XX] WILL NOT OCCUR

ONDITIONS TO AVOID

SECTION VII – SPILL OR LEAK PROCEDURES

TEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED REMOVE ALL SOURCES OF IGNITION LAMES, HOT SURFACES, AND ELECTRICAL, STATIC, OR FRICTIONAL SPARKS). AVOID BREATH C VAPORS. VENTILATE AREA. REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS.

ASTE DISPOSAL METHOD DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL JLATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAI S.

SECTION VIII – SPECIAL PROTECTION INFORMATION

ESPIRATORY PROTECTION IN OUTDOOR OR OPEN AREAS, USE BUREAU OF MINES APPROVED CHANICAL FILTER RESPIRATOR TO REMOVE SOLID AIR BORNE PARTICLES OF OVERSPRAY DURI RAY APPLICATION. IN RESTRICTED VENTILATION AREAS, USE BUREAU APPROVED CHEMICAL-CHANICAL FILTERS DESIGNED TO REMOVE A COMBINATION OF PARTICULATE AND GAS AND POR. IN CONFINED AREAS USE BUREAU APPROVED AIR LINE TYPE RESPIRATORS OR HOODS.

ENTILATION PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND TTERN TO KEEP TLV OF MOST HAZARDOUS INGREDIENTS IN SECTION III BELOW ACCEPTABLE MIT, LEL IN SECTION IV BELOW STATED LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS RING WELDING OR FLAME CUTTING ON SURFACES COATED WITH THIS MATERIAL.

ROTECTIVE GLOVES REQUIRED FOR PROLONGED OR REPEATED CONTACT.

YE PROTECTION USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

THER PROTECTIVE EQUIPMENT PREVENT PROLONGED SKIN CONTACT TO CONTAMINATED CLOTHING.

SECTION IX – SPECIAL PRECAUTIONS

RECAUTIONS TO BE TAKEN IN HANDLING AND STORING DO NOT STORE ABOVE 120 F. STORE LARGE ANTITIES IN BUILDING DESIGNED TO COMPLY WITH OSHA 1910.106.

OL STORAGE CATEGORY

THER PRECAUTIONS CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL QUID IN EXCESS OF A FEW INCHES. DO NOT FLAME CUT, BRAZE OR WELD COATED MATERIAL THOUT BUREAU OF MINES APPROVED RESPIRATOR OR APPROPRIATE VENTILATION. ADD LABEL RNING. DO NOT TAKE INTERNALLY.

MATERIAL SAFETY DATA SHEET

NPCA 1-78

FOR COATINGS, RESINS AND RELATED MATERIALS

(APPROVED BY US DEPARTMENT OF LABOR, ESSENTIALLY SIMILAR TO FORM OSHA-20)

DATE OF PREP 9/81

SECTION I

VER-01

MANUFACTURERS NAME PRATT & LAMBERT - WICHITA DIVISION

STREET ADDRESS 630 EAST 13TH CITY, STATE, AND ZIP CODE ANDOVER, KANSAS 67002

EMERGENCY PHONE NO. (DAY) 316-733-1361

INFORMATION TELEPHONE NO. 316-733 1361

PRODUCT CLASS MANUFACTURER'S CODE I.D. 794012

TRADE NAME LAC ACRYLIC BROWN 20117

SECTION II – HAZARDOUS INGREDIENTS

MM HG @ 20

INGREDIENT	PERCENT BY WT.	TLV PPM	TLV MG/M3	LEL	VAPOR PRESSURE
CELLOSOLVE ACETATE	5-10	100		1.70	1.70
XYLOL/XYLENE	< 5	100		1.00	9.50
TOLUOL/TOLUENE	20-30	100		1.30	22.40
NORMAL BUTYL ALCOHOL	< 5	50		2.60	5.50

SECTION III – PHYSICAL DATA

BOILING RANGE 223 TO 329 DEG F.

VAPOR DENSITY HEAVIER [XX] LIGHTER [ ] THAN AIR

VOC 3.61 #/GA 433.20 GM/LI

VAPORATION RATE FASTER [ ] SLOWER [XX] THAN ETHER

PERCENT VOLATILE BY VOLUME 49

WEIGHT PER GALLON 10.4

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION FLASH POINT 44 DEG F. TCC LEL 1.00

FLAMMABLE LIQUID - CLASS I B

EXTINGUISHING MEDIA USE NATIONAL FIRE PROTECTION ASSOC. (NFPA) CLASS B EXTINGUISHER (CARBON DIOXIDE, DRY CHEMICAL OR ALCOHOL FOAM) DESIGNED TO EXTINGUISH NFPA CLASS FIRES. POLYMER FOAM PREFERRED AT STANDARD APPLICATION RATE FOR LARGE FIRES.

UNUSUAL FIRE AND EXPLOSION HAZARDS KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY TO VERY HOT SURFACES.

FIRE FIGHTING PROCEDURES SELF CONTAINED BREATHING APPARATUS SHOULD BE AVAILABLE TO FIREMEN. WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE.

SECTION V – HEALTH HAZARD DATA

T_ ESHOLD LIMIT VALUE SEE SECTION II.

EFFECTS OF OVEREXPOSURE INHALATION: ANESTHETIC, IRRITATION OF THE RESPIRATORY TRACT, ACUTE NERVOUS SYSTEM DEPRESSION CHARACTERIZED BY HEADACHE, DIZZINESS, STAGGERI IT, CONFUSION, UNCONSCIOUSNESS OR COMA.

SKIN OR EYE CONTACT: PRIMARY IRRITATION.

EMERGENCY AND FIRST AID PROCEDURES IN CASE OF CONTACT, FLUSH SKIN AND EYES WITH PLENTY WATER WHILE REMOVING CONTAMINATED CLOTHING. IF INHALED, REMOVE TO FRESH AIR. ALL A PHYSICIAN IF SYMPTOMS PERSIST.

SECTION VI – REACTIVITY DATA

STABILITY UNSTABLE [ ] STABLE [XX] CONDITIONS TO AVOID AVOID FIRES, HEAT, AND HOT SURFACES.

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION [ ] MAY OCCUR [XX] WILL NOT OCCUR

CONDITIONS TO AVOID

SECTION VII – SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED REMOVE ALL SOURCES OF IGNITION (FLAMES, HOT SURFACES, AND ELECTRICAL, STATIC, OR FRICTIONAL SPARKS). AVOID BREATI ING VAPORS. VENTILATE AREA. REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS.

WASTE DISPOSAL METHOD DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL JLATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAINERS

SECTION VIII – SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION IN OUTDOOR OR OPEN AREAS, USE BUREAU OF MINES APPROVED CHANICAL FILTER RESPIRATOR TO REMOVE SOLID AIR BORNE PARTICLES OF OVERSPRAY DUR PRAY APPLICATION. IN RESTRICTED VENTILATION AREAS, USE BUREAU APPROVED CHEMICAL-ECHANICAL FILTERS DESIGNED TO REMOVE A COMBINATION OF PARTICULATE AND GAS AND APOR. IN CONFINED AREAS USE BUREAU APPROVED AIR LINE TYPE RESPIRATORS OR HOODS.

VENTILATION PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND ATTERN TO KEEP TLV OF MOST HAZARDOUS INGREDIENTS IN SECTION III BELOW ACCEPTABLE IMIT, LEL IN SECTION IV BELOW STATED LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS URING WELDING OR FLAME CUTTING ON SURFACES COATED WITH THIS MATERIAL.

PROTECTIVE GLOVES REQUIRED FOR PROLONGED OR REPEATED CONTACT.

EYE PROTECTION USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

OTHER PROTECTIVE EQUIPMENT PREVENT PROLONGED SKIN CONTACT TO CONTAMINATED CLOTHING.

SECTION IX – SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING DO NOT STORE ABOVE 120 F. STORE LARGE JUANTITIES IN BUILDING DESIGNED TO COMPLY WITH OSHA 1910.106.

OOL STORAGE CATEGORY

OTHER PRECAUTIONS CONTAINERS SHOULD BE GROUNDED DURING POURING. AVOID FREE FALL JID IN EXCESS OF A FEW INCHES. DO NOT FLAME CUT, BRAZE OR WELD COATED MATERIAL ITHOUT BUREAU OF MINES APPROVED RESPIRATOR OR APPROPRIATE VENTILATION. ADD LABEL ARNING. DO NOT TAKE INTERNALLY.

MATERIAL SAFETY DATA SHEET

NPCA 1-78

FOR COATINGS, RESINS AND RELATED MATERIALS

(APPROVED BY US DEPARTMENT OF LABOR, ESSENTIALLY SIMILAR TO FORM OSHA-20)

DATE OF PREP 09/81

SECTION I

VER-01

MANUFACTURERS NAME PRATT & LAMBERT - WICHITA DIVISION

STREET ADDRESS 630 EAST 13TH

CITY, STATE, AND ZIP CODE ANDOVER, KANSAS 67002

EMERGENCY PHONE NO. (DAY) 316-733-1361

INFORMATION TELEPHONE NO. 316-733-1361

PRODUCT CLASS

MANUFACTURER'S CODE I.D. 794416

TRADE NAME LACQUER ACRYLIC OLIVE DRAB 13087

SECTION II – HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WT.	TLV PPM	TLV MG/M3	LEL	MM HG @ 20 VAPOR PRESSURE
MEDIUM CHROME YELLOW	< 5				
LD 50 VALUE > 10.000 GMS/KG					
CYCLOHEXANONE	20-30	50		1.10	3.20
METHYL ETHYL KETONE	20-30	200		1.80	78.00
ISOPROPYL ALCOHOL	< 5	400		2.50	31.20
TOLUOL/TOLUENE	10-20	100		1.30	22.40
ITEM/S BELOW DERIVED FROM ONE OR MORE COMPONENTS LISTED ABOVE					
** LEAD **	1.80				
** CHROMATE **	.99				

SECTION III – PHYSICAL DATA

BOILING RANGE 174 TO 321 DEG F.

VAPOR DENSITY HEAVIER [ ] LIGHTER [ ] THAN AIR

VOC 5.44 #/GA 650.80 GM/LI

EVAPORATION RATE FASTER [ ] SLOWER [XX] THAN ETHER

PERCENT VOLATILE BY VOLUME 75

WEIGHT PER GALLON 8.0

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY CLASSIFICATION FLASH POINT 21 DEG F. TCC LEL 1.10

FLAMMABLE LIQUID - CLASS I B

EXTINGUISHING MEDIA USE NATIONAL FIRE PROTECTION ASSOC. (NFPA) CLASS B EXTINGUISHER (CARBON DIOXIDE, DRY CHEMICAL OR ALCOHOL FOAM) DESIGNED TO EXTINGUISH NFPA CLASS FIRES. POLYMER FOAM PREFERRED AT STANDARD APPLICATION RATE FOR LARGE FIRES.

UNUSUAL FIRE AND EXPLOSION HAZARDS KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. CLOSED CONTAINERS MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT. DO NOT APPLY TO VERY HOT SURFACES.

SPECIAL FIRE FIGHTING PROCEDURES SELF-CONTAINED BREATHING APPARATUS SHOULD BE AVAILABLE TO FIREMEN. WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSION WHEN EXPOSED TO EXTREME HEAT. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE.

SECTION V – HEALTH HAZARD DATA

ESHOLD LIMIT VALUE SEE SECTION II.

FECTS OF OVEREXPOSURE INHALATION ANESTHETIC. IRRITATION OF THE RESPIRATORY TRACT ACUTE NERVOUS SYSTEM DEPRESSION CHARACTERIZED BY HEADACHE, DIZZINESS, STAGGERI CONFUSION, UNCONSCIOUSNESS OR COMA.
SKIN OR EYE CONTACT PRIMARY IRRITATION.

MERGENCY AND FIRST AID PROCEDURES IN CASE OF CONTACT, FLUSH SKIN AND EYES WITH PLENTY WATER WHILE REMOVING CONTAMINATED CLOTHING. IF INHALED, REMOVE TO FRESH AIR. A PHYSICIAN IF SYMPTOMS PERSIST.

SECTION VI – REACTIVITY DATA

	UNSTABLE	STABLE	CONDITIONS TO AVOID
ABILITY	[ ]	[XX]	AVOID FIRE, HEAT, AND HOT SURFACES.

COMPATABILITY (MATERIALS TO AVOID)

AZARDOUS DECOMPOSITION PRODUCTS

AZARDOUS POLYMERIZATION [ ] MAY OCCUR [XX] WILL NOT OCCUR

ONDITIONS TO AVOID

SECTION VII – SPILL OR LEAK PROCEDURES

EPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED REMOVE ALL SOURCES OF IGNITION LAMES, HOT SURFACES, AND ELECTRICAL, STATIC, OR FRICTIONAL SPARKS). AVOID BREA NG VAPORS. VENTILATE AREA. REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS.

ASTE DISPOSAL METHOD DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL JLATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAIN

SECTION VIII – SPECIAL PROTECTION INFORMATION

ESPIRATORY PROTECTION IN OUTDOOR OR OPEN AREAS, USE BUREAU OF MINES APPROVED CHANICAL FILTER RESPIRATOR TO REMOVE SOLID AIR BORNE PARTICLES OF OVERSPRAY DUR RAY APPLICATION. IN RESTRICTED VENTILATION AREAS, USE BUREAU APPROVED CHEMICAL CHANICAL FILTERS DESIGNED TO REMOVE A COMBINATION OF PARTICULATE AND GAS AND POR. IN CONFINED AREAS USE BUREAU APPROVED AIR LINE TYPE RESPIRATORS OR HOODS.

ENTILATION PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND TTERN TO KEEP TLV OF MOST HAZARDOUS INGREDIENTS IN SECTION III BELOW ACCEPTABLE MIT, LEL IN SECTION IV BELOW STATED LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS RING WELDING OR FLAME CUTTING ON SURFACES COATED WITH THIS MATERIAL.

ROTECTIVE GLOVES REQUIRED FOR PROLONGED OR REPEATED CONTACT.

YE PROTECTION USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

THER PROTECTIVE EQUIPMENT PREVENT PROLONGED SKIN CONTACT TO CONTAMINATED CLOTHING.

SECTION IX – SPECIAL PRECAUTIONS

RECAUTIONS TO BE TAKEN IN HANDLING AND STORING DO NOT STORE ABOVE 120 F. STORE LARGE ANTITIES IN BUILDING DESIGNED TO COMPLY WITH OSHA 1910.106.

OL STORAGE CATEGORY

THER PRECAUTIONS CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL C JID IN EXCESS OF A FEW INCHES. DO NOT FLAME CUT, BRAZE OR WELD COATED MATER THOUT BUREAU OF MINES APPROVED RESPIRATOR OR APPROPRIATE VENTILATION. ADD LABEL RNING. DO NOT TAKE INTERNALLY.

MATERIAL SAFETY DATA SHEET

NPCA 1-78

FOR COATINGS, RESINS AND RELATED MATERIALS

(APPROVED BY US DEPARTMENT OF LABOR, ESSENTIALLY SIMILAR TO FORM OSHA-20)

DATE OF PREP
?/81

SECTION I

VER-01

ANUFACTURERS NAME PRATT & LAMBERT - WICHITA DIVISION

TREET ADDRESS 630 EAST 13TH CITY, STATE, AND ZIP CODE ANDOVER, KANSAS 67002

MERGENCY PHONE NO. (DAY) 316-733-1361
FORMATION TELEPHONE NO. 316-733-1361
RODUCT CLASS MANUFACTURER'S CODE I.D. 794720

RADE NAME LACQUER ACRYLIC CAMOUFLAGE WHITE37875

SECTION II – HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WT.	TLV PPM	TLV MG/M3	LEL	MM HG @ 20 VAPOR PRESSURE
CYCLOHEXANONE	10-20	50		1.10	3.20
METHYL ETHYL KETONE	20-30	200		1.80	78.00
ISOPROPYL ALCOHOL	< 5	400		2.50	31.20
TOLUOL/TOLUENE	5-10	100		1.30	22.40

SECTION III – PHYSICAL DATA

ILING RANGE 174 TO 321 DEG F.

VAPOR DENSITY HEAVIER [XX] LIGHTER [ ] THAN AIR

VOC 4.86 #/GA
583.20 GM/LI

VAPORATION RATE FASTER [ ] SLOWER [XX] THAN ETHER

PERCENT VOLATILE BY VOLUME 67

WEIGHT PER GALLON 9.6

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

LAMMABILITY CLASSIFICATION FLASH POINT 21 DEG F. TCC LEL 1.10

AMMABLE LIQUID - CLASS I B

XTINGUISHING MEDIA USE NATIONAL FIRE PROTECTION ASSOC. (NFPA) CLASS B EXTINGUISHER
ARBON DIOXIDE, DRY CHEMICAL OR ALCOHOL FOAM) DESIGNED TO EXTINGUISH NFPA CLASS
CS. POLYMER FOAM PREFERRED AT STANDARD APPLICATION RATE FOR LARGE FIRES.

NUSUAL FIRE AND EXPLOSION HAZARDS KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT,
CTRICAL EQUIPMENT, SPARKS AND OPEN FLAME. CLOSED CONTAINERS MAY EXPLODE WHEN
OSED TO EXTREME HEAT. DO NOT APPLY TO VERY HOT SURFACES.

E FIRE FIGHTING PROCEDURES SELF-CONTAINED BREATHING APPARATUS SHOULD BE AVAILABLE
FIREMEN. WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CLOSED
TAINERS TO PREVENT PRESSURE BUILD-UP AND POSSIBLE AUTOIGNITION OR EXPLOSION HE
OSED TO EXTREME HEAT. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE.

SECTION V – HEALTH HAZARD DATA

ESHOLD LIMIT VALUE SEE SECTION II.

FFECTS OF OVEREXPOSURE INHALATION: ANESTHETIC, IRRITATION OF THE RESPIRATORY TRACT ACUTE NERVOUS SYSTEM DEPRESSION CHARACTERIZED BY HEADACHE, DIZZINESS, STAGGERIN IT, CONFUSION, UNCONSCIOUSNESS OR COMA.

SKIN OR EYE CONTACT: PRIMARY IRRITATION.

MERGENCY AND FIRST AID PROCEDURES IN CASE OF CONTACT, FLUSH SKIN AND EYES WITH PLENTY WATER WHILE REMOVING CONTAMINATED CLOTHING. IF INHALED, REMOVE TO FRESH AIR. LL A PHYSICIAN IF SYMPTOMS PERSIST.

SECTION VI – REACTIVITY DATA

	UNSTABLE	STABLE
ABILITY	[ ]	[XX]

CONDITIONS TO AVOID AVOID FIRES, HEAT, AND HOT SURFACES.

ICOMPATABILITY (MATERIALS TO AVOID)

AZARDOUS DECOMPOSITION PRODUCTS

AZARDOUS POLYMERIZATION [ ] MAY OCCUR [XX] WILL NOT OCCUR

ONDITIONS TO AVOID

SECTION VII – SPILL OR LEAK PROCEDURES

EPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED REMOVE ALL SOURCES OF IGNITION AMES, HOT SURFACES, AND ELECTRICAL, STATIC, OR FRICTIONAL SPARKS). AVOID BREATH- VAPORS. VENTILATE AREA. REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS.

ASTE DISPOSAL METHOD DISPOSE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL ULATIONS. INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAIN.

SECTION VIII – SPECIAL PROTECTION INFORMATION

SPIRATORY PROTECTION IN OUTDOOR OR OPEN AREAS, USE BUREAU OF MINES APPROVED CHANICAL FILTER RESPIRATOR TO REMOVE SOLID AIR BORNE PARTICLES OF OVERSPRAY DURIN AY APPLICATION. IN RESTRICTED VENTILATION AREAS USE BUREAU APPROVED CHEMICAL- CHANICAL FILTERS DESIGNED TO REMOVE A COMBINATION OF PARTICULATE AND GAS AND OR. IN CONFINED AREAS USE BUREAU APPROVED AIR LINE TYPE RESPIRATORS OR HOODS.

NTILATION PROVIDE GENERAL DILUTION OR LOCAL EXHAUST VENTILATION IN VOLUME AND TERN TO KEEP TLV OF MOST HAZARDOUS INGREDIENTS IN SECTION III BELOW ACCEPTABLE IT, LEL IN SECTION IV BELOW STATED LIMIT, AND TO REMOVE DECOMPOSITION PRODUCTS ING WELDING OR FLAME CUTTING ON SURFACES COATED WITH THIS MATERIAL.

OTECTIVE GLOVES REQUIRED FOR PROLONGED OR REPEATED CONTACT.

E PROTECTION USE SAFETY EYEWEAR DESIGNED TO PROTECT AGAINST SPLASH OF LIQUIDS.

HER PROTECTIVE EQUIPMENT PREVENT PROLONGED SKIN CONTACT TO CONTAMINATED CLOTHING.

SECTION IX – SPECIAL PRECAUTIONS

ECAUTIONS TO BE TAKEN IN HANDLING AND STORING DO NOT STORE ABOVE 120 F. STORE LARGE NTITIES IN BUILDING DESIGNED TO COMPLY WITH OSHA 1910.106.

L STORAGE CATEGORY

HER PRECAUTIONS CONTAINERS SHOULD BE GROUNDED WHEN POURING. AVOID FREE FALL OF QUID IN EXCESS OF A FEW INCHES. DO NOT FLAME CUT, BRAZE OR WELD COATED MATERI HOUT BUREAU OF MINES APPROVED RESPIRATOR OR APPROPRIATE VENTILATION. ADD LABEL NING. DO NOT TAKE INTERNALLY.

DATE February, 1980

MATERIAL SAFETY DATA SHEET

("ESSENTIALLY SIMILAR" TO FORM OSHA-20)

ERE APPLICABLE, THIS PRODUCT HAS BEEN REPORTED FOR THE EPA'S CHEMICAL SUBSTANCE INVENTORY.

SECTION I – IDENTIFICATION OF PRODUCT

MANUFACTURERS NAME: PHILLIPS PETROLEUM COMPANY	EMERGENCY TELEPHONE NUMBER: DURING BUSINESS HOURS (918) 661-3865; OUTSIDE BUSINESS HOURS (918) 661-8115
ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE): BARTLESVILLE, OK 74004	CAS NUMBER: 74-98-6
TRADE NAME: Propane	CHEMICAL NAME: Propane
CHEMICAL FAMILY: Paraffinic Hydrocarbons	CHEMICAL FORMULA: C_3H_8
DOT CLASSIFICATION: Flammable Gas	

SECTION II – HAZARDOUS COMPONENTS OF MIXTURES

INGREDIENTS	% BY WT.	THRESHOLD LIMIT VALUE (UNITS)
Propane	100	

SECTION III – TYPICAL PHYSICAL DATA

APPEARANCE AND ODOR: Liquified gas under pressure; colorless; strong odor of rotting cabbage from added odorant.	SPECIFIC GRAVITY: 60/60F 0.509
BOILING POINT (°F): -44	PERCENT VOLATILE (BY VOLUME): 100
VAPOR PRESSURE: 70°F 123 psig	EVAPORATION RATE: (Ether = 1) >1.0
VAPOR DENSITY (AIR): 1.5	SOLUBILITY IN WATER: Negligible

SECTION IV – FIRE AND EXPLOSION – HAZARD DATA

FLASH POINT (METHOD)	FLAMMABLE LIMITS (% BY VOLUME)	Lel	Uel
-156°F (Estimated)		2.1	9.5

FIRE EXTINGUISHING MEDIA: Dry Chemical; CO_2

SPECIAL FIRE FIGHTING PROCEDURES: Shut-off source of propane if possible. Use water spray or fog to cool exposed tank or equipment. If possible, allow gas to burn until gas flow is shut off.

UNUSUAL FIRE AND EXPLOSION HAZARDS: one-Typical of Liquified petroleum gas.

NO GUARANTY IS MADE AS TO THE ACCURACY OF ANY DATA OR STATEMENT CONTAINED HEREIN. WHILE THIS MATERIAL IS FURNISHED IN FAITH, NO WARRANTY EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE IS MADE. THIS MATERIAL IS OFFERED ONLY F YOUR CONSIDERATION, INVESTIGATION AND VERIFICATION AND PHILLIPS, INCLUDING ITS DIVISIONS, AFFILIATES AND SUBSIDIARIES, SHALL IN ANY EVENT BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH ITS PUBLICATION. LIKEWISE, NO STATEMENT MADE HEREIN SHALL BE CONSTRUED AS A PERMISSION OR RECOMMENDATION FOR THE USE OF ANY PRODUCT IN A MANNER TH MIGHT INFRINGE EXISTING P... TS.

(SEE REVERSE SIDE)

SECTION V – HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE:

The 1977 ACGIH list of TLVs considers propane as an inert gas.

EFFECTS OF OVEREXPOSURE:

Inhalation of excessive vapor concentrations may produce anesthetic effects. Liquid contact with eyes or skin may cause a burn due to the freezing effect.

EMERGENCY AND FIRST AID PROCEDURES:

For overexposure to excessive vapor concentrations via inhalation, remove to fresh air and administer oxygen. In case of liquid contact with eyes or skin, irrigate with tepid water until normal color appears. Handle affected area gently and place in care of physician.

SECTION VI – REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID:
	UNSTABLE		Ignition sources.
	STABLE	X	

INCOMPATIBILITY (MATERIALS TO AVOID FOR PURPOSES OF TRANSPORT, HANDLING AND STORAGE ONLY): Oxygen and strong oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID:
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII – SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Ventilate area. Protect from ignition. Keep personnel upwind. For large releases or entry into confined areas wear a NIOSH approved, self-contained breathing apparatus.

WASTE DISPOSAL (INSURE CONFORMITY WITH LOCAL DISPOSAL REGULATIONS):

Controlled burning at a safe location.

SECTION VIII – PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NIOSH approved, self-contained breathing apparatus.

VENTILATION				
	LOCAL EXHAUST		SPECIAL	
	MECHANICAL (GENERAL)	X	OTHER	

PROTECTIVE GLOVES: Where contact may occur.

EYE PROTECTION: Where contact may occur.

OTHER PROTECTIVE EQUIPMENT:

SECTION IX – HANDLING AND STORAGE PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

For additional information see NFPA 58.

OTHER PRECAUTIONS:

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: Parkside Systems, Inc.	EMERGENCY TELEPHONE NO.: (916) 533-3861
ADDRESS (Number, Street, City, State, and ZIP Code): 2760 5th Ave. So. / Oroville, CA. 95965	
CHEMICAL NAME AND SYNONYMS: Compound of Sodium Hydroxide	TRADE NAME AND SYNONYMS: Rust/Corrosion Inhibitor
CHEMICAL FAMILY: Stong Alkali	FORMULA: 5040 Proprietary

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS		N/A	BASE METAL		N/A
CATALYST		N/A	ALLOYS		N/A
VEHICLE		N/A	METALLIC COATINGS		N/A
SOLVENTS		N/A	FILLER METAL PLUS COATING OR CORE FLUX		N/A
ADDITIVES		N/A	OTHERS		N/A
OTHERS		N/A			N/A

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Caustic Soda	9	

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	N/A	SPECIFIC GRAVITY (H_2O=1)	N/A
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT, VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____ =1)	N/A
SOLUBILITY IN WATER	N/A		
APPEARANCE AND ODOR	Clear Odorless Liquid		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	None	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA	N/A			

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PAGE (1)

(Continued on reverse side)

Form OSHA-20
Rev. May 72

Figure 1

SECTION V · HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Based on 50% NaOH 2 MG/M^3 Mist

EFFECTS OF OVEREXPOSURE
Liquid caustic soda can destroy body tissue. Contact with eyes or swallowing causes severe injury

EMERGENCY AND FIRST AID PROCEDURES
Immediately flush skin and eyes with copious amounts of water for 15 minutes. If swallowed, do not induce vomiting, give large quanity of water. CALL PHYSICIAN

SECTION VI · REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY (Materials to avoid) N/A

HAZARDOUS DECOMPOSITION PRODUCTS N/A

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII · SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Flush with copious amounts of water

WASTE DISPOSAL METHOD

Flush with water, may be neutralized with diluted acid.

SECTION VIII · SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) N/A

VENTILATION			
	LOCAL EXHAUST	X	SPECIAL
	MECHANICAL (General)		OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Rubber	

OTHER PROTECTIVE EQUIPMENT

SECTION IX · SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Do Not get into eyes, or contact skin. Do not take internally.

OTHER PRECAUTIONS

PAGE (2)
GPO 930-540

Figure 1

Form OSHA-20
Rev. May 72

U. S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44 R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: DIVERSEY CHEMICALS	EMERGENCY TELEPHONE NO.: (312) 297-7500
ADDRESS (Number, Street, City, State, and ZIP Code): 1855 S. Mt. Prospect Rd., Des Plaines, Ill. 60018	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS: [redacted]
CHEMICAL FAMILY: Caustic Alkali	FORMULA: Mixture

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Caustic potash	13	2 mg/m^3

SECTION III - PHYSICAL DATA

BOILING POINT (°F)	220°F	SPECIFIC GRAVITY (H_2O=1)	1.261
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____=1)	N/A
SOLUBILITY IN WATER	Complete		

APPEARANCE AND ODOR: Pale yellow liquid with slight chlorine odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used): None	FLAMMABLE LIMITS	Lel	Uel	

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PAGE (1)

(Continued on reverse side)

Form OSHA 20

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

EFFECTS OF OVEREXPOSURE Can cause skin irritation or eye damage.

EMERGENCY AND FIRST AID PROCEDURES SKIN- flush with water. EYES-flush with water for at least 15 minutes. Call or see a physician. INTERNAL - give water or milk. Follow with dilute vinegar or fruit juices. Call a physician.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Mop up or flush to a drai. Rinse area with water.

WASTE DISPOSAL METHOD Dump spent solution down drain.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

VENTILATION			
	LOCAL EXHAUST	X	SPECIAL
	MECHANICAL *(General)*		OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Rubber	Goggles

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING Prevent contact with skin, eyes and clothing.

OTHER PRECAUTIONS

FORM 11641-A-PWO

Traffic

75-5008-4100-4

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME: 3M COMPANY	EMERGENCY TELEPHONE NO: (612) 733-1110
ADDRESS (Number, Street, City, State, and ZIP Code): 3M CENTER, ST. PAUL, MINNESOTA 55101	
CHEMICAL NAME AND SYNONYMS:	TRADE NAME AND SYNONYMS: SCOTCHLITE Brand Thinner #841
CHEMICAL FAMILY: Solvent	FORMULA:

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
High flash petroleum distillates	60-70	100ppm(est)
Pine Oil	30-40	

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1)	
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY ~~VOLUME~~ (%) weight	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (1)	
SOLUBILITY IN WATER	Insoluble		
APPEARANCE AND ODOR	Clear liquid, solvent odor.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	140°F; 59°C	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA	CO_2, foam, dry chemicals			
SPECIAL FIRE FIGHTING PROCEDURES				
UNUSUAL FIRE AND EXPLOSION HAZARDS				

(Continued on reverse side)

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
See Section II.

EFFECTS OF OVEREXPOSURE
Causes eye irritation. May be irritating to the skin. Vapors may be irritating to the eyes and respiratory system and cause nausea, dizziness and headaches.

EMERGENCY AND FIRST AID PROCEDURES
EYE Contact: Immediately flush eyes with plenty of water for at least ten minutes. Call a physician.

SKIN Contact: Wash with soap and water.

INHALATION: Provide fresh air.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Observe Health Hazard Data (Section V), Special Protection Information (Section VIII), and Special Precautions (Section IX). Cover with absorbent material. Scoop into drum. Seal drum.

WASTE DISPOSAL METHOD
Destroy by high temperature incineration in accordance with local regulations, or bury in a state approved chemical (or hazardous) waste landfill. Do not bury solvent containing waste near potable water.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL *(General)*	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Impervious gloves	Chemical eye goggles

OTHER PROTECTIVE EQUIPMENT
Safety shower and eye wash bath.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep away from heat and open flame. Avoid eye contact. Avoid prolonged or repeated skin contact. Avoid prolonged breathing of vapors. Use only with adequate ventilation to maintain airborne vapor concentrations below recognized health and safety levels.

OTHER PRECAUTIONS

FORM 11641 - PWO

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

MANUFACTURER'S NAME 3M COMPANY	EMERGENCY TELEPHONE NO. (612)733-1110
ADDRESS (Number, Street, City, State, and ZIP Code) 3M CENTER, ST. PAUL, MINNESOTA 55101	
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS [redacted] Thinner #811
CHEMICAL FAMILY Solvent	FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)
Aromatic petroleum distillates	100	100*
*TLV suggested by vendor		

SECTION III - PHYSICAL DATA

BOILING POINT (°F.) °C	175-213°	SPECIFIC GRAVITY (H_2O=1)	0.89
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	Insoluble		
APPEARANCE AND ODOR	Clear liquid; kerosine odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	140°F (CC)	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA	CO_2, foam, dry chemicals			
SPECIAL FIRE FIGHTING PROCEDURES				
UNUSUAL FIRE AND EXPLOSION HAZARDS				

(Continued on reverse side)

7805R

SECTION V · HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

See Section II.

EFFECTS OF OVEREXPOSURE

Vapors are irritating to the eyes, nose and throat and may cause headaches, dizziness and nausea. Liquid may be irritating to the eyes and cause defatting of the skin.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - provide fresh air.

Eye contact- flush with plenty of water. Call a physician.

Skin contact - wash with soap and water.

SECTION VI · REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY *(Materials to avoid)*

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition may produce CO and CO_2.

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII · SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Observe Health Hazard Data and [illegible]ial Precautions. Cover with absorbent material. Scoop into drum. Seal drum.

WASTE DISPOSAL METHOD

Destroy by incineration or bury in a state approved chemical (or hazardous) waste landfill. Avoid burying solvent-containing wastes, especially near potable water sources.

SECTION VIII · SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION *(Specify type)*

VENTILATION	LOCAL EXHAUST	SPECIAL
	Recommended	
	MECHANICAL *(General)*	OTHER
	Recommended	

PROTECTIVE GLOVES	EYE PROTECTION
Recommended	Recommended

OTHER PROTECTIVE EQUIPMENT

Shower and eye bath.

SECTION IX · SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep away from heat, sparks, and flames. Use only in well ventilated area. Avoid breathing of vapors. Avoid eye and prolonged skin contact.

OTHER PRECAUTIONS

CLASS 715005

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: The Steco Corporation	REGULAR TELEPHONE NO. (501) 375-5644 EMERGENCY TELEPHONE NO. (501) 562-6250
ADDRESS: 2330 Cantrell Road, Box 2238, Little Rock, Arkansas 72203	
TRADE NAME: TAP MAGIC [redacted]	
SYNONYMS: None	
SHIPPING NAME — DOT: Methyl Chloroform (1,1,1 Trichloroethane)	Hazard Class: ORM-A Non hazardous material
SHIPPING NAME — IATA: Methyl Chloroform-Non hazardous material.	No labels required.

II HAZARDOUS INGREDIENTS

MATERIAL OR COMPONENT	CAS NO.	%	HAZARD DATA
1, 1, 1 Trichloroethane	71-55-6	>80	8 hour time weighted average for vapor exposure = 350 ppm

III PHYSICAL DATA

BOILING POINT, 760 MM HG	158-190°F (70-80°C)	MELTING POINT	-35°C
SPECIFIC GRAVITY (H_2O = 1)	1.35	VAPOR PRESSURE	100mm Hg @ 68°F (20°C)
VAPOR DENSITY (AIR = 1)	4.55	SOLUBILITY IN H_2O % BY WT	Insoluble
% VOLATILES BY VOL.	>80%	EVAPORATION RATE (BUTYL ACETATE = 1)	~0.6 gal/sq ft/day @ 76.6°F (24.4°C)
APPEARANCE AND ODOR	Amber liquid, aromatic odor - nonaqueous		

IV FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)	None (TOC, TCC, PMCC)	AUTOIGNITION TEMPERATURE	None
FLAMMABLE LIMITS IN AIR, % BY VOL.	LOWER: None	UPPER:	None
EXTINGUISHING MEDIA	Product is not flammable		
SPECIAL FIRE FIGHTING PROCEDURES	Product will not sustain combustion		
UNUSUAL FIRE AND EXPLOSION HAZARD	Product does not present any fire hazard, however, when concentrated vapors are exposed to open flames or high energy electrical arcs, irritating and toxic gasses (HCl) may be formed.		

V HEALTH HAZARD INFORMATION

HEALTH HAZARD DATA	HAZARD CLASSIFICATION	BASIS FOR CLASSIFICATION	SOURCE
ROUTES OF EXPOSURE INHALATION	Moderate Toxicity	Concentrations in excess of 2,600 ppm for 15 minutes may cause loss of coordination. Concentrations in excess of 20,000 ppm may cause death from respiratory depression.	Ann. Occup. H. Vol II, pp 71-79 Ammer. Ind. Hyg. Assn Journal Vol. 19, Number 5. MCA Chemical SDS SD-90
SKIN CONTACT	Slightly Toxic	Prolonged or repeated exposure may cause defatting of the skin and subsequent rash or other irritation.	MCA Chemical SDS 90, page 19
SKIN ABSORPTION	Slightly Toxic	Skin absorbtion can occur; however, skin absorbtion presents no significant problem in ordinary usage.	ANSI 237.26-1970
EYE CONTACT	Slightly Toxic	Can cause slight pain and irritation.	CRC Handbook of Toxicology
INGESTION	Slightly Toxic	Estimated for man: LD_{50}= 16 g/Kg.	JAMA, Vol 195 pp 904-905

EFFECTS OF OVEREXPOSURE Light headedness, eye irritation.

ACUTE OVEREXPOSURE Incoordination, functional depression of the central nervous system typical of anesthetic agents.

CHRONIC OVEREXPOSURE NO permanent injury as the result of chronic exposure has been reported. Product is excreted unchanged via the respiratory tract.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Flush eys with large amounts of water-supportive treatment is recommended by physician.

SKIN: Remove clothing until dry. Wash with mild soap and water.

INHALATION: Remove to fresh air. Individuals showing pronounced anesthetic effects may require artificial respiration & oxygen. Epinephrine & other drugs with similar activity should not be administered.

INGESTION: Vomiting should be induced with salt or aoapy water; mustard water and tickling the throat with the forefinger. Aspiration of the vomitus can cause pulmonary compliations and thus must be avoided if possible. No specific antidote is known and treatment is usually symptomatic.

NOTES TO PHYSICIAN: Epinephrine and other drugs with similar activity (sentsitization of the myocardium) should hot be administed.

VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY The product is very stable under most conditions. Prolonged storage in contact with water may cause some decomposition and the formation of hydrochloric acid (when storing @ temperatures in excess of 150°F.

INCOMPATIBILITY Magnesium and aluminum are attached at elevated temperatures. Polystyrene, cellulose acetate propionate and polycarbonate plastics are dissolved. Softens asphalt, swells natural or Buna rubber.

HAZARDOUS DECOMPOSITION PRODUCTS When exposed to open flames (welding torches) or high energy electric arcs, product may decompose yielding hydrogen chloride (HCl) gas.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION None, Product will not polymerize.

VII DISPOSAL, SPILL OR LEAK PROCEDURES

AQUATIC TOXICITY (E.G. 96 HR. TLM): The product has a low biochemical oxygen demand (BOD), does not interfere with biological treatment, and is easily aerated out of water solutions. The odor threshold in water solution is 350 ppm.

WASTE DISPOSAL METHOD Accomplished by allowing the material to evaporate to the atmosphere out of doors at a reasonable distance from work or other inhabited areas. This evaporation process may be accelerated by pouring over porous surfaces such as sand. The product may be buried away from water supplies.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED Small spills (less than 1 quart) can be cleaned up with mop or rags or other absorbent material. Soaked rags should be placed out of doors until dry. Large spills (several gallons) can be washed to ground with water and allowed to evaporate. Doors and windows should be open. Wetted clothing should be removed and allowed to dry.

NEUTRALIZING CHEMICALS Product has no appreciable acid/base character.

VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS

Normal ventilation with regular use to maintain the TLV below recommended values (350 ppm).

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT Protective equipment is not necessary under normal conditio however, eye protection is recommended.

RESPIRATORY (SPECIFY IN DETAIL) Not required during normal use.

EYE

Single safety glasses to cup-type goggles

GLOVES Synthetic rubber gloves, aprons and over=shoes may be necessary to prevent excessive skin contact when dealing with large spills (many gallons)

OTHER CLOTHING AND EQUIPMENT

Not required during normal use.

IX SPECIAL PRECAUTIONS

PRECAUTIONARY STATEMENTS

Use with adequate ventilation. Avoid prolonged or repeated breathing of vapors. Avoid prolonged or repeated contact with skin. DO NOT TAKE INTERNALLY.

OTHER HANDLING AND STORAGE REQUIREMENTS

The original or other steel containers are recommended for storage and use of the product. At elevated temperatures, aluminum may be corroded and therefore, aluminum is not recommended for containers. Ideally, a cool, dry, well ventilated storage area should be selected, however, a properly sealed container may be stored under higher ambient temperatures (150°F) and humidity conditions without concern. Shelf life is indefinite at ambient temperatures.

ADDITIONAL REGULATORY CONCERNS

FEDERAL: None

FDA

USDA

CPSC

TSCA IS THIS PRODUCT, OR ALL ITS INGREDIENTS; BEING CERTIFIED FOR INCLUSION ON THE TOXIC SUBSTANCES CONTROL ACT INVENTORY OF CHEMICAL SUBSTANCES? Yes

OTHER OSHA Safety & Health Standards (29 CFR 1910) part 1910.1000, Table Z-1.

STATE: None

ADDITIONAL INFORMATION: TAP MAGIC does not contain NITRITES, NITRITE DERIVATIVES, AMINES, POLYNUCLEAR AROMATIC COMPOUNDS or BENEZENE either as an ingredient or a trace contaiminant.

MANUFACTURING CODE NUMBER: 8358

COMMIDITY NUMBER: 332-9150

PREPARED BY Asa L. Morton

TITLE Chief Chemist

COMPANY American Interplex Corporation

ADDRESS 3400 Asher Avenue. Little Rock, AR 72204 (501) 664-5060

CHRIS HAZARDOUS CHEMICAL DATA FORMS

ACETONE

Common Synonyms		
Dimethyl ketone Propanone	Watery liquid	Colorless	Sweet odor

Floats and mixes with water. Flammable, irritating vapor is produced.

Stay upwind and use water spray to "knock down" vapor.
Shut off ignition sources and call fire department. Keep people away.
Stop discharge if possible.
Isolate and remove discharged material.
Avoid contact with liquid and vapor.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Extinguish with dry chemical, alcohol foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, may cause difficult breathing or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to eyes.
Not irritating to skin.
IF IN EYES, hold eyelids open and flush with plenty of water.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.
Notify local health and pollution control officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — high flammability
Disperse and flush

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Dimethyl ketone
2-Propanone

3.2 **Coast Guard Compatibility Classification:** Ketone

3.3 **Chemical Formula:** CH_3COCH_3

3.4 **IMCO/United Nations Numerical Designation:** 3.1/1090

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Sweetish, pleasant, resembling that of mint or fruit; pungent, sharp, penetrating residual; ketonic, pleasant, non-residual

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor canister or air-supplied mask; synthetic rubber gloves; chemical safety goggles or face splash shield.

5.2 **Symptoms Following Exposure:**
INHALATION: vapor irritating to eyes and mucous membranes, acts as an anesthetic in very high concentrations. INGESTION: low order of toxicity but very irritating to mucous membranes. SKIN: prolonged excessive contact causes defatting of the skin, possibly leading to dermatitis.

5.3 **Treatment for Exposure:**
INHALATION: if victim is overcome, remove to fresh air and call a physician; administer artificial respiration if breathing is irregular or stopped. INGESTION: if victim has swallowed large amounts and is conscious and not having convulsions, induce vomiting and get medical help promptly, no specific antidote known. SKIN: wash well with water. EYES: flush with water immediately for at least 15 min. Consult a physician.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 1000 ppm

5.5 **Short-Term Inhalation Limits:** 1000 ppm for 30 min.

5.6 **Toxicity by Ingestion:** Grade 1; LD_{50} 5 to 15 g/kg (dog)

5.7 **Late Toxicity:** Not pertinent

5.8 **Vapor (Gas) Irritant Characteristics:** If present in high concentrations, vapors cause moderate irritation of the eyes or respiratory system. Effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** No appreciable hazard. Practically harmless to the skin because it is very volatile and evaporates quickly from the skin.

5.10 **Odor Threshold:** 100 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 4°F O.C., 0°F C.C.

6.2 **Flammable Limits in Air:**
2.6% - 12.8%

6.3 **Fire Extinguishing Agents:** Alcohol foam, dry chemical, carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:**
Water in straight hose stream will scatter and spread fire and should not be used.

6.5 **Special Hazards of Combustion Products:**
Not pertinent

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 869°F

6.8 **Electrical Hazard:** Class I, Group D

6.9 **Burning Rate:** 3.9 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:**
No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:**
Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
14,250 ppm/24 hr/sunfish/killed/tap water
13,000 ppm/48 hr/mosquito fish/TL_m/turbid water

8.2 **Waterfowl Toxicity:** Not pertinent

8.3 **Biological Oxygen Demand (BOD):**
(Theor) 122%, 5 days

8.4 **Food Chain Concentration Potential:**
None noted

9. SELECTED MANUFACTURERS

1. Allied Chemical Corp
Specialty Chemicals Div
Wilmington Turnpike
Marcus Hook, Pa 19061
2. Shell Chemical Co
Industrial Chemicals Div.
Houston, Texas 77001
3. Union Carbide Corp
Chemicals and Plastics Div
270 Park Ave
New York, N.Y. 10017

10. SHIPPING INFORMATION

10.1 **Grades or Purity:**
Technical: 99.5% plus 0.5% water
Reagent: 99.5% plus 0.5% water

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-P-Q-R-S

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:**
Flammable liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	0
Poisons	0
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	1
Aesthetic Effect	1
Reactivity	
Other Chemicals	2
Water	0
Self-Reaction	1

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:**
Liquid

13.2 **Molecular Weight:** 58.08

13.3 **Boiling Point at 1 atm:**
133°F = 56.1°C = 329.3°K

13.4 **Freezing Point:**
−138°F = −94.7°C = 178.5°K

13.5 **Critical Temperature:**
455°F = 235°C = 508°K

13.6 **Critical Pressure:**
682 psia = 46.4 atm = 4.70 MN/m²

13.7 **Specific Gravity:** 0.791 at 20°C (liquid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:**
Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** 2.0

13.11 **Ratio of Specific Heats of Vapor (Gas):**
1.127

13.12 **Latent Heat of Vaporization:**
220 Btu/lb = 122 cal/g = 5.11×10^5 J/kg

13.13 **Heat of Combustion:** −12,250 Btu/lb
= −6808 cal/g = -285.0×10^5 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

CLC

CALCIUM CHLORIDE

Common Synonyms			
Calcium chloride, anhydrous Calcium chloride hydrate	Solid or water solution Sinks and mixes with water.	White to off-white	Odorless

Avoid contact with liquid and solid. Keep people away.
Wear rubber overclothing (including gloves).
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.

Exposure

CALL FOR MEDICAL AID.
SOLUTION OR SOLID
Will burn skin and eyes.
If swallowed will cause nausea and vomiting.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Disperse and flush

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Calcium chloride, anhydrous; Calcium chloride hydrates

3.2 **Coast Guard Compatibility Classification:** Not listed

3.3 **Chemical Formula:** $CaCl_2 \cdot xH_2O$ where x = 0 to 6

3.4 **IMCO/United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid, or water solution

4.2 **Color:** White to off-white

4.3 **Odor:** None

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Safety glasses or face shield, dust-type respirator, rubber gloves

5.2 **Symptoms Following Exposure:** Inhalation causes irritation of nose and throat. Ingestion causes irritation of mouth and stomach. Contact with eyes (particularly by dust) causes irritation and possible transient corneal injury. Contact of solid with dry skin causes mild irritation; strong solutions can cause marked irritation, even a superficial burn.

5.3 **Treatment for Exposure:** INHALATION: move to fresh air, if discomfort persists, get medical attention. INGESTION: give large amounts of water. EYES: promptly flood with water and continue washing for at least 15 min.; consult an ophthalmologist. SKIN: flush with water

5.4 **Toxicity by Inhalation (Threshold Limit Value):** Data not available

5.5 **Short-Term Inhalation Limits:** Data not available

5.6 **Toxicity by Ingestion:** Grade 2; oral LD_{50} = 1,000 mg/kg (rat)

5.7 **Late Toxicity:** Data not available

5.8 **Vapor (Gas) Irritant Characteristics:** Data not available

5.9 **Liquid or Solid Irritant Characteristics:** Data not available

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable

6.2 **Flammable Limits in Air:** Not flammable

6.3 **Fire Extinguishing Agents:** Not pertinent

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:**

6.6 **Behavior in Fire:**

6.7 **Ignition Temperature:** Not pertinent

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** Not pertinent

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Anhydrous grade dissolves with evolution of some heat

7.2 **Reactivity with Common Materials:** Metals will slowly corrode in aqueous solutions

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
555 ppm/168 hr/rock bass/killed/tap water
10,650 ppm/96 hr/sunfish/LD_{50}/fresh water
2,400 ppm/48 hr/marine fish/TL_m/sea water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** None

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Dow Chemical Co.
Midland, Mich. 48640
2. Michigan Chemical Corp.
351 E. Ohio St.
Chicago, Ill. 60611
3. Allied Chemical Corp.
Industrial Chemicals Div.
P.O. Box 1139R
Morristown, N.J. 07960

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Anhydrous 90–97%, water solutions containing 51–86%

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

SS

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not Listed

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid

13.2 **Molecular Weight:** 110.99 (solute)

13.3 **Boiling Point at 1 atm:** Not pertinent

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 2.15 at 20°C (solid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** Not pertinent

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** −292 Btu/lb = −162 cal/g = -6.79×10^5 J/kg

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

CHLOROFORM

[illegible]	Watery liquid — Colorless — Sweet odor Sinks in water. Irritating vapor is produced.

Avoid contact with liquid and vapor. Stay upwind.
Wear goggles and self-contained breathing apparatus.
Stop discharge if possible. Keep people away.
Notify local health and pollution control agencies.

Fire

Not flammable.
POISONOUS AND IRRITATING GASES ARE PRODUCED WHEN HEATED.
Wear goggles and self-contained breathing apparatus.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to [illegible] and throat.
If inhaled, will c[illegible] [illegible], nausea, dizziness, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
Harmful if swallowed.
Remove contaminated clothing.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS AND HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and pollution control officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — air contaminant
Restrict access.
Should be removed

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Trichloromethane
3.2 **Coast Guard Compatibility Classification:** Halogenated compound
3.3 **Chemical Formula:** $CHCl_3$
3.4 **IMCO/United Nations Numerical Designation:** 9.0/1888

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Pleasant, sweet, ethereal

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Chemical goggles. 50 ppm to 2%: suitable full-face gas mask. Above 2%: suitable self-contained system.
5.2 **Symptoms Following Exposure:** Headache, nausea, dizziness, drunkenness, narcosis
5.3 **Treatment for Exposure:** INHALATION: if ill effects develop, get victim to fresh air, keep him warm and quiet, and get medical attention. If breathing stops, start artificial respiration. INGESTION: induce vomiting and get medical attention. No known antidote, treat symptoms. EYES: flush with plenty of water for at least 15 minutes and get medical attention. SKIN: wash with soap and water, remove contaminated clothing and free of chemical.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 10 ppm for 10-hour work day
5.5 **Short-Term Inhalation Limits:** 50 ppm for 10 min.
5.6 **Toxicity by Ingestion:** Grade 2; LD_{50} 0.5 to 5 g/kg
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
5.10 **Odor Threshold:** 205-307 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Poisonous and irritating gases are produced when heated
6.6 **Behavior in Fire:** Decomposes, producing toxic gases
6.7 **Ignition Temperature:** Not flammable
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Allied Chemical Corp
Specialty Chemicals Division
Moundsville, W. Va. 26041
2. Dow Chemical Co
Midland, Mich. 48640
3. Stauffer Chemical Co
Industrial Chemicals Division
Louisville, Ky. 40200

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical, USP
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A, X

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** ORM-A
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	2
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	0
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 119.39
13.3 **Boiling Point at 1 atm:** 142°F = 61.2°C = 334.4°K
13.4 **Freezing Point:** −82.3°F = −63.5°C = 209.7°K
13.5 **Critical Temperature:** 506°F = 263.2°C = 536.4°K
13.6 **Critical Pressure:** 790 psia = 54 atm = 5.5 MN/m²
13.7 **Specific Gravity:** 1.49 at 20°C (liquid)
13.8 **Liquid Surface Tension:** 27.1 dynes/cm = 0.0271 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** 32.8 dynes/cm = 0.0328 N/m at 20°C
13.10 **Vapor (Gas) Specific Gravity:** 4.1
13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.146
13.12 **Latent Heat of Vaporization:** 106.7 Btu/lb = 59.3 cal/g = 2.483 × 10³ J/kg
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

CLX — CHLORINE

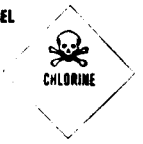
Common Synonyms	Liquefied compressed gas Greenish yellow Irritating, bleach-like choking odor Sinks and boils in water. Poisonous, visible vapor cloud is produced.
	AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away. Wear goggles, self-contained breathing apparatus and rubber overclothing (including gloves). Stop discharge if possible. Evacuate area in case of large discharge. Stay upwind and use water spray to "knock down" vapor. Notify local health and pollution control agencies.
Fire	Not flammable. May cause fire on contact with combustibles. POISONOUS GASES ARE PRODUCED IN FIRES. Stop flow of gas if possible. Cool exposed containers and protect men affecting shutoff with water. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Exposure	CALL FOR MEDICAL AID. VAPOR POISONOUS IF INHALED. Will burn eyes. Move to fresh air. If breathing has stopped, give artificial respiration (but NOT mouth-to-mouth). If breathing is difficult, give oxygen. IF IN EYES, hold eyelids open and flush with plenty of water. LIQUID Will burn skin and eyes. Will cause frostbite. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. DO NOT RUB AFFECTED AREAS.
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning – poison
Restrict access.
Evacuate area

2. LABEL



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** No common synonyms

3.2 **Coast Guard Compatibility Classification:** Halogen

3.3 **Chemical Formula:** Cl_2

3.4 **IMCO/United Nations Numerical Designation:** 2.0/1017

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquefied compressed gas

4.2 **Color:** Greenish yellow

4.3 **Odor:** Characteristic choking

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Quick-opening safety shower and eye fountain, respirator equipment approved for chlorine service. Wear safety goggles at all times when in vicinity of liquid chlorine.

5.2 **Symptoms Following Exposure:** Eye irritation, sneezing, copious salivation, general excitement and restlessness. Irritation may persist for several days. High concentrations cause respiratory distress and violent coughing, often with retching. Death may result from suffocation.

5.3 **Treatment for Exposure:** INHALATION: remove victim from source of exposure, call a doctor, support respiration, administer oxygen. EYES: flush with copious amounts of water for at least 15 min.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 1 ppm

5.5 **Short-Term Inhalation Limits:** 3 ppm for 5 min

5.6 **Toxicity by Ingestion:** Not pertinent; ingestion unlikely (chlorine is a gas above −34.5°C)

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.

5.9 **Liquid or Solid Irritant Characteristics:** Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure.

5.10 **Odor Threshold:** 3.5 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable

6.2 **Flammable Limits in Air:** Not flammable

6.3 **Fire Extinguishing Agents:** Not pertinent

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Toxic products are generated when combustibles burn in chlorine.

6.6 **Behavior in Fire:** Most combustibles will burn in chlorine, although gas is not flammable.

6.7 **Ignition Temperature:** Not flammable

6.8 **Electrical Hazard:** Data not available

6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Forms a corrosive solution.

7.2 **Reactivity with Common Materials:** Reacts vigorously with most metals at high temperature. Copper may burn spontaneously.

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
0.08 ppm/168 hr/trout/TL_m/fresh water
10 ppm/1 hr/tunicates/killed/salt water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** None

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Diamond Shamrock Corp
   Electro Chemicals Division
   Deer Park, Texas 77536
2. Dow Chemical Co
   Midland, Mich 48640
3. PPG Industries Inc
   Industrial Chemicals Division
   Barberton, Ohio 44203

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Research purity, ultra high purity, high purity

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Safety relief (300 psi)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-C-I-J

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Nonflammable compressed gas

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	0
Health	
Vapor Irritant	4
Liquid or Solid Irritant	2
Poisons	4
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	4
Water	1
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	0
	OXY

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Gas

13.2 **Molecular Weight:** 70.91

13.3 **Boiling Point at 1 atm:** −29.4°F = −34.1°C = 239.1°K

13.4 **Freezing Point:** −150°F = −101°C = 172°K

13.5 **Critical Temperature:** 291°F = 144°C = 417°K

13.6 **Critical Pressure:** 1118 psia = 76.05 atm = 7.704 MN/m²

13.7 **Specific Gravity:** 1.424 at 15°C (liquid)

13.8 **Liquid Surface Tension:** 26.55 dynes/cm at −35.3°C

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** 2.4

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.325

13.12 **Latent Heat of Vaporization:** 124 Btu/lb = 68.7 cal/g = 2.87 × 10⁵ J/kg

13.13 **Heat of Combustion:** Not pertinent

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

CDN

CHLORDANE

Common Synonyms

Chlordan
1, 2, 4, 5, 6, 7, 8, 8-octachloro-2, 3, 3a, 4, 7, 7a-hexahydro-4, 7-methanoindene
Toxichlor
Octa-Klor
Velsicol 1068

Liquid or solution — Brown — Sharp odor

Sinks in water.

AVOID CONTACT WITH LIQUID. KEEP PEOPLE AWAY.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Stop discharge if possible.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable but solution may be combustible.
POISONOUS GASES MAY BE PRODUCED IN FIRE.
Extinguish with dry chemicals, foam or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.
LIQUID OR SOLUTION
POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED.
Irritating to skin and eyes.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
DO NOT RUB AFFECTED AREAS.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAS CONVULSIONS, do nothing except keep victim warm.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4)

Issue warning—poison
Restrict access
Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Chlordan; 1, 2, 4, 5, 6, 7, 8, 8-Octachloro-2, 3, 3a, 4, 7, 7a-hexahydro-4, 7-methanoindene; Velsicol 1068; CD-68; Toxichlor; Octa-Klor

3.2 **Coast Guard Compatibility Classification:** Not applicable

3.3 **Chemical Formula:** $C_{10}H_6Cl_8$

3.4 **IMCO/United Nations Numerical Designation:** 6.1/1615

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Brown

4.3 **Odor:** Penetrating, aromatic; slightly pungent, like chlorine

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Respirator for sprays, fogs, or dust; goggles; rubber gloves.

5.2 **Symptoms Following Exposure:** Moderately irritating to eyes and skin. Ingestion, absorption through skin, or inhalation of mist or dust may cause excitability, convulsions, nausea, vomiting, diarrhea, and some local irritation of the gastrointestinal tract.

5.3 **Treatment for Exposure:** INHALATION: administer oxygen and give fluid therapy; do not give epinephrine, since it may induce ventricular fibrillation; enforce complete rest. EYES: flush with water for at least 15 min. SKIN: wash off skin with adequate quantities of soap and water; do NOT scrub. INGESTION: induce vomiting and follow with gastric lavage and administration of saline cathartics; ether and barbiturates may be used to control convulsions; oxygen and fluid therapy are also recommended; do NOT give epinephrine. Since no specific antidotes are known, symptomatic therapy must be accompanied by complete rest.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 0.5 mg/m³

5.5 **Short-Term Inhalation Limits:** 2 mg/m³ for 30 min.

5.6 **Toxicity by Ingestion:** Grade 3; oral LD_{50} = 283 mg/kg (rat)

5.7 **Late Toxicity:** Possible liver damage; loss of appetite and weight.

5.8 **Vapor (Gas) Irritant Characteristics:** Data not available

5.9 **Liquid or Solid Irritant Characteristics:** Data not available

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** Solution 225°F O.C.; 132°F C.C. Solid is not flammable.

6.2 **Flammable Limits in Air:** 0.7% 5% (kerosene solution)

6.3 **Fire Extinguishing Agents:** Dry chemical, foam, carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective on solution fire

6.5 **Special Hazards of Combustion Products:** Irritating and toxic hydrogen chloride and phosgene gases may be formed when kerosene solution of compound burns.

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 410°F (kerosene solvent)

6.8 **Electrical Hazard:** Data not available

6.9 **Burning Rate:** Not pertinent

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable to 160°F

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 0.5 ppm/96 hr/goldfish/TL_m/fresh water

8.2 **Waterfowl Toxicity:** LD_{50} = 1,200 mg/kg

8.3 **Biological Oxygen Demand (BOD):** Data not available

8.4 **Food Chain Concentration Potential:** High

9. SELECTED MANUFACTURERS

1. Velsicol Chemical Corp.
   341 East Ohio Street
   Chicago, Ill. 60611
2. S. B. Penick & Co.
   100 Church Street
   New York, N. Y. 10007
3. Chempar Chemical Co.
   260 Madison Avenue
   New York, N. Y. 10016

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical. A variety of dusts, powders, and solutions in kerosene containing 2-80% chlordane are shipped.

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 448-3)

A-X-Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Combustible Liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES*

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 409.8

13.3 **Boiling Point at 1 atm:** Decomposes

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.6 at 25°C (liquid)

13.8 **Liquid Surface Tension:** (est.) 25 dynes/cm = 0.025 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** (est.) 50 dynes/cm = 0.05 N/m at 20°C

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** (est.) −4,000 Btu/lb = −2,200 cal/g = -93×10^3 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

* Properties refer to undiluted, technical-grade chlordane.

(Continued on pages 5 and 6)

NOTES

CBY

CARBARYL

Common Synonyms			
Sevin 1-Naphthyl N-methyl-carbamate	Solid powder, or in solution	White to gray	Weak odor
	Solid sinks in water; solution may float on water.		

Stop discharge if possible.
Call fire department.
Avoid contact with solid and solution.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Solid not flammable, but usually dissolved in combustible liquid.
Extinguish with water, foam, dry chemical or carbon dioxide.

Exposure

CALL FOR MEDICAL AID.
SOLID OR SOLUTION
Irritating to skin and eyes.
Harmful if swallowed.

Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
Foaming to shoreline.
May be dangerous if it causes water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning – water contaminant
Should be removed

2. LABELS

No hazard label required by
Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** 1-Naphthyl N-methylcarbamate
Sevin

3.2 **Coast Guard Compatibility Classification:** Not applicable

3.3 **Chemical Formula:** $C_{12}H_{11}NO_2$

3.4 **IMCO/United Nations Numerical Designation:** 6.1/6.1/1615

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid

4.2 **Color:** Off-white

4.3 **Odor:** Weak

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Data not available

5.2 **Symptoms Following Exposure:** Data not available

5.3 **Treatment for Exposure:** SKIN AND EYE CONTACT: flood affected tissues with water
INGESTION: induce vomiting.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 5 mg/m³

5.5 **Short-Term Inhalation Limits:** Dust, 30 mg/m³ for 30 min

5.6 **Toxicity by Ingestion:** Grade 2, LD_{50} 0.5 to 5 g/kg (rat LD_{50} 0.51 g/kg)

5.7 **Late Toxicity:** Liver damage to rats at high dose by mouth.

5.8 **Vapor (Gas) Irritant Characteristics:** None

5.9 **Liquid or Solid Irritant Characteristics:** No hazard

5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable

6.2 **Flammable Limits in Air:** Not flammable

6.3 **Fire Extinguishing Agents:** Solution fires: Water, foam, dry chemical, CO_2

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** Not flammable

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 5.5 ppm/96 hr/bluegill/TL_m/fresh water
0.013 ppm/48 hr/white shrimp/TL_m/salt water. Toxic to shrimp and crab species

8.2 **Waterfowl Toxicity:** LD_{50} = 2179 mg/kg

8.3 **Biological Oxygen Demand (BOD):** Data not available

8.4 **Food Chain Concentration Potential:** None observed

9. SELECTED MANUFACTURERS

Union Carbide Corp.
Chemicals and Plastics Division
270 Park Ave
New York, N.Y. 10017

10. SHIPPING INFORMATION

10.1 **Grades or Purity:**
Sevin 50 W wettable powder
Sevin sprayable 80% powder
Sevin 4 oil

10.2 **Storage Temperature:** Data not available

10.3 **Inert Atmosphere:** Data not available

10.4 **Venting:** Data not available

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

11

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Class A

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid

13.2 **Molecular Weight:** Not pertinent

13.3 **Boiling Point at 1 atm:** Not pertinent

13.4 **Freezing Point:** 288°F = 142°C = 415°K

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.23 at 20°C (solid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** Not pertinent

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

NOTES

REVISED 1978

DUR — DURSBAN

COMMON SYNONYMS

Chlorpyrifos
Dowco 179
Killmaster
Lorsban
ENT 27, 311

Solid crystals or liquid solutions — White — Mild mercaptan

Sinks in water.

AVOID CONTACT WITH LIQUID. Keep people away.
Wear chemical protective suit with self-contained breathing apparatus.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

FIRE

Fire data not available.

EXPOSURE

CALL FOR MEDICAL AID.

LIQUID OR SOLID
POISONOUS IF SWALLOWED OR SKIN IS EXPOSED.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

WATER POLLUTION

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning - poison, water contaminant.
Restrict access.
Should be removed.
Chemical and physical treatment.

2. LABELS

3. CHEMICAL DESIGNATIONS

3.1 SYNONYMS: Chlorpyrifos; Dowco 179; o,o-Diethyl o (3,5,6-Trichloro-2-Pyridyl) phosphorothiorate
3.2 COAST GUARD COMPATIBILITY CLASSIFICATION: Not applicable
3.3 CHEMICAL FORMULA: $C_9H_{11}Cl_3NO_3PS$
3.4 IMCO/UNITED NATIONS NUMERICAL DESIGNATION: 6.1/1615 (< 2.5% concentration); 9/1615 (< 2.5% concentration)

4. OBSERVABLE CHARACTERISTICS

4.1 PHYSICAL STATE (AS SHIPPED): Solid or liquid
4.2 COLOR: White
4.3 ODOR: Mild mercaptan

5. HEALTH HAZARDS

5.1 PERSONAL PROTECTIVE EQUIPMENT: Protective clothing, masks, suitable eye protection such as safety glasses.
5.2 SYMPTOMS FOLLOWING EXPOSURE: INHALATION: Symptoms of organophosphate insecticide poisoning: cholinesterase inhibition, headache, fatigue, dizziness, blurred vision, weakness, nausea, cramps, diarrhea, chest discomfort, sweating, miosis, tearing, salivation, vomiting, cyanosis, papilledema, and muscle twitching. In advanced cases convulsions, coma, loss of reflexes and loss of sphincter control may occur. EYES: Can produce mild to moderate eye irritation and transient corneal injury. SKIN: Undiluted liquid products can cause skin irritation. Prolonged or repeated exposure may cause superficial burns.
5.3 TREATMENT FOR EXPOSURE: Call physician immediately. INHALATION: Give first aid. Artificial respiration may be required. EYES: Irrigate with plenty of clear water. SKIN: Remove any contaminated clothing and wash patient thoroughly with copious quantities of water - use soap, if available. INGESTION: If conscious, give copious quantities of soapy or salty water and induce vomiting. Some formulations contain petroleum distillates but, because of the toxicity of Dursban, inducing vomiting is recommended unless a physician is present and can do gastric lavage. OTHER: Atropine (2 to 4 mg) every 5 to 10 minutes until signs of atropinization occur.
5.4 TOXICITY BY INHALATION (THRESHOLD LIMIT VALUE): Skin; 0.2 mg/m³
5.5 SHORT TERM INHALATION LIMITS: TLV - STEL; 0.6 maximum for 15 minutes
5.6 TOXICITY BY INGESTION: Grade 3 LD50: 50 to 500 mg/kg
5.7 LATE TOXICITY: Plasma, red cell, and brain cholinesterase activity was depressed.
5.8 VAPOR (GAS) IRRITANT CHARACTERISTICS: Data not available.
5.9 LIQUID OR SOLID IRRITANT CHARACTERISTICS: Minimum hazard. If spilled on clothing and allowed to remain may cause smarting and reddening of skin.
5.10 ODOR THRESHOLD: Data not available.

6. FIRE HAZARDS

6.1 FLASH POINT: Data not available
6.2 FLAMMABLE LIMITS IN AIR: Data not available
6.3 FIRE EXTINGUISHING AGENTS: Data not available
6.4 FIRE EXTINGUISHING AGENTS NOT TO BE USED: Data not available
6.5 SPECIAL HAZARDS OF COMBUSTION PRODUCTS: Data not available
6.6 BEHAVIOR IN FIRE: Data not available
6.7 IGNITION TEMPERATURE: Data not available
6.8 ELECTRICAL HAZARD: Data not available
6.9 BURNING RATE: Data not available

7. CHEMICAL REACTIVITY

7.1 REACTIVITY WITH WATER: No reaction
7.2 REACTIVITY WITH COMMON MATERIALS: No reaction
7.3 STABILITY DURING TRANSPORT: Stable
7.4 NEUTRALIZING AGENTS FOR ACIDS AND CAUSTICS: Data not available
7.5 POLYMERIZATION: Data not available
7.6 INHIBITOR OF POLYMERIZATION: Data not available

8. WATER POLLUTION

8.1 AQUATIC TOXICITY
48-hour LC50 - Rainbow trout = 0.02 ppm
24-hour LC50 - Rainbow trout = 0.550 ppm at 1.6 C
24-hour LC50 - Rainbow trout 0.110 ppm at 7.2 C
24-hour LC50 - Rainbow trout 0.053 ppm at 12.7 C
36-hour TLm - Mosquito fish 0.23 ppm laboratory
36-hour TLm - Mosquito fish 0.595 ppm acclimated
36-hour TLm - Bluegill - 0.038 ppm - laboratory

(continued below)

9. SELECTED MANUFACTURERS

1. Dow Chemical Company
2020 Dow Center
Midland, MI 48640

10. SHIPPING INFORMATION

10.1 GRADES OR PURITY: Technical grade - minimum 98% purity
10.2 STORAGE TEMPERATURE: Data not available
10.3 INERT ATMOSPHERE: Data not available
10.4 VENTING: Data not available

11. HAZARD ASSESSMENT CODE

(See Hazard assessment Handbook, CG 446-3)

12. HAZARD CLASSIFICATIONS

12.1 CODE OF FEDERAL REGULATIONS: Poison B
12.2 NAS HAZARD RATING FOR BULK WATER TRANSPORTATION: Not listed
12.3 NFPA HAZARD CLASSIFICATIONS: Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 PHYSICAL STATE AT 15°C AND 1 ATM.
13.2 MOLECULAR WEIGHT: 350.59
13.3 BOILING POINT AT 1 ATM: Data not available
13.4 FREEZING POINT: 106.7° to 110.3°F = 41.5° to 43.5°C = 314.7° to 316.7°K
13.5 CRITICAL TEMPERATURE: Data not available
13.6 CRITICAL PRESSURE: Data not available
13.7 SPECIFIC GRAVITY: Data not available
13.8 LIQUID SURFACE TENSION: Data not available
13.9 LIQUID/WATER INTERFACIAL TENSION: Data not available
13.10 VAPOR (GAS) SPECIFIC GRAVITY: 12.09 (calculated)
13.11 RATIO OF SPECIFIC HEATS OF VAPOR (GAS): Data not available
13.12 LATENT HEAT OF VAPORIZATION: Data not available
13.13 HEAT OF COMBUSTION: Data not available
13.14 HEAT OF DECOMPOSITION: Data not available
13.15 HEAT OF SOLUTION: Data not available
13.16 HEAT OF POLYMERIZATION: Data not available

8. WATER POLLUTION (cont'd)

8.1 AQUATIC TOXICITY
36-hour TLm - Bluegill = 0.125 ppm acclimated
8.2 WATERFOWL TOXICITY: Mallard LD50 = 70 to 80 mg/kg
8.3 BIOLOGICAL OXYGEN DEMAND (BOD): Degradable
8.4 FOOD CHAIN CONCENTRATION POTENTIAL: 1/2 is lost from fish flesh in less than 1 week.

DMA

DIMETHYLAMINE

Common Synonyms

Liquefied compressed gas Colorless Dead fish or ammonia odor

Floats and boils on water. Flammable, irritating vapor is produced. Boiling point is 44° F.

Avoid contact with liquid and vapor. Keep people away.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Shut off ignition sources and call fire department.
Stop discharge if possible.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
May explode if ignited in an enclosed area.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Stop flow of gas if possible.
Cool exposed containers and protect men effecting shutoff with water.
Let fire burn.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause difficult breathing.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED, and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

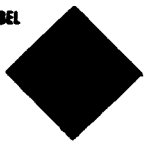
HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning - high flammability
Restrict access
Evacuate area

2. LABEL



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** No common synonyms

3.2 **Coast Guard Compatibility Classification:** Amine

3.3 **Chemical Formula:** $(CH_3)_2NH$

3.4 **IMCO/United Nations Numerical Designation:** 2.0/1032

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Compressed gas

4.2 **Color:** Colorless

4.3 **Odor:** Fishy, strongly ammoniacal

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Chemical goggles and full face shield; molded rubber acid gloves; self-contained breathing apparatus.

5.2 **Symptoms Following Exposure:** Inhalation at high concentration (> 100 ppm) causes nose and throat irritation progressing all the way to pulmonary edema. Eye and skin irritation.

5.3 **Treatment for Exposure:** INHALATION: remove victim to fresh air and call a physician; if breathing has stopped, administer artificial respiration and oxygen; keep victim warm and quiet, do not give stimulants. EYES: flush continuously and thoroughly with water for at least 15 min. SKIN: remove contaminated clothing immediately; flush affected area with large amounts of water and then wash with soap and water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 10 ppm

5.5 **Short-Term Inhalation Limits:** 20 ppm for 5 min.

5.6 **Toxicity by Ingestion:** Not pertinent

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Causes smarting of the skin and first-degree burns on short exposure and may cause secondary burns on long exposure.

5.10 **Odor Threshold:** 0.047 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 20°F C.C.

6.2 **Flammable Limits in Air:** 2.8% - 14.4%

6.3 **Fire Extinguishing Agents:** Stop flow of gas. Use water spray, carbon dioxide, or dry chemical for fires in water solutions.

6.4 **Fire Extinguishing Agents Not to be Used:** Do not use foam.

6.5 **Special Hazards of Combustion Products:** Vapors are eye, skin and respiratory irritants.

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 756°F

6.8 **Electrical Hazard:** Data not available

6.9 **Burning Rate:** 4.5 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No hazardous reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 50 ppm/24 hr/chub/died/fresh water
>100 ppm/48 hr/shrimp/LC_{50}/salt water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** Data not available

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Commercial Solvents Corp
245 Park Ave
New York, N. Y. 10017
2. GAF Corp
Chemical Division
Calvert City, Ky. 42029
3. Rohm and Haas Co
Independence Mall West
Philadelphia, Pa. 19105

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Anhydrous 99.5%
Aqueous solutions 25%, 40%, 50%, 60%

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Safety relief

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-B-C-K-L-M-N

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable compressed gas

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	4
Health	
Vapor Irritant	2
Liquid or Solid Irritant	2
Poisons	2
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	3
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	4
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Gas

13.2 **Molecular Weight:** 45.08

13.3 **Boiling Point at 1 atm:** 44.42°F = 6.9°C = 280.1°K

13.4 **Freezing Point:** −134.0°F = −92.2°C = 181.0°K

13.5 **Critical Temperature:** 328.3°F = 164.6°C = 437.8°K

13.6 **Critical Pressure:** 770 psia = 52.4 atm = 5.31 MN/m²

13.7 **Specific Gravity:** 0.671 at 6.9°C (liquid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** 1.6

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.139

13.12 **Latent Heat of Vaporization:** 252.9 Btu/lb = 140.5 cal/g
= 5.882 × 10⁵ J/kg

13.13 **Heat of Combustion:** −16,800 Btu/lb
= −9340 cal/g = −391.0 × 10⁵ J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** −515 Btu/lb
= −286 cal/g = −12.0 × 10⁵ J/kg

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

DME — DIETHYLENEGLYCOL MONOBUTYL ETHER

Common Synonyms

2-(2-Butoxyethoxy)ethanol
Butoxydiethylene glycol
Butyl "Carbitol"
Dowanol DB
Poly-solv DB

Liquid — Colorless — Mild pleasant odor

Mixes with water.

Stop discharge if possible. Keep people away.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
Extinguish with water, dry chemicals, alcohol foam, or carbon dioxide.
Cool exposed containers with water.

Exposure

Call for medical aid.

LIQUID
Irritating to skin and eyes.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook CG 446-4)

Issue warning — water contaminant
Disperse and flush

2. LABELS

No label required by Code of Federal Regulations.

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Butoxydiethylene glycol; Butoxydiglycol; Diglycol monobutyl ether; Butyl "Carbitol"; Dowanol DB; Poly-Solv DB

3.2 **Coast Guard Compatibility Classification:** Glycol ether

3.3 **Chemical Formula:** $C_4H_9OCH_2CH_2OCH_2CH_2OH$

3.4 **IMCO/United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Mild, characteristic, pleasant

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Safety goggles or face shield

5.2 **Symptoms Following Exposure:** Inhalation for brief periods has no significant effect. Contact with liquid causes moderate irritation of eyes and corneal injury. Prolonged contact with skin causes only minor irritation.

5.3 **Treatment for Exposure:** INHALATION: remove to fresh air; if ill effects are observed, call a doctor. EYES: immediately flush with plenty of water for at least 15 min. SKIN: wash well with soap and water. INGESTION: give large amounts of water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** Data not available

5.5 **Short-Term Inhalation Limits:** Data not available

5.6 **Toxicity by Ingestion:** Grade 2; oral LD_{50} = 2 g/kg (guinea pig)

5.7 **Late Toxicity:** Data not available

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** No appreciable hazard. Practically harmless to the skin.

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** 280°F (O.C.), 172°F (C.C.)

6.2 **Flammable Limits in Air:** Not pertinent

6.3 **Fire Extinguishing Agents:** Water, "alcohol" foam, carbon dioxide, dry chemical

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 442°F

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** 3.3 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** 34% of theoretical in 5 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Union Carbide Corporation
   Chemicals and Plastics Division
   270 Park Avenue
   New York, N.Y. 10017
2. Shell Chemical Company
   Industrial Chemicals Division
   One Shell Plaza
   Houston, Texas 77001
3. Jefferson Chemical Company, Inc.
   260 Madison Avenue
   New York, N.Y. 10016

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Commercial

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

A P Q

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	1
Liquid or Solid Irritant	0
Poisons	1
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	3
Aesthetic Effect	1
Reactivity	
Other Chemicals	2
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	2
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 162.2

13.3 **Boiling Point at 1 atm:** 448°F = 231°C = 504°K

13.4 **Freezing Point:** −90°F = −68°C = 205°K

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 0.954 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 34 dynes/cm = 0.034 N/m at 25°C

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** 130 Btu/lb = 74 cal/g = 3.1 × 10⁵ J/kg

13.13 **Heat of Combustion:** (est.) −14,000 Btu/lb = −7,900 cal/g = −330 × 10³ J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** (est.) −36 Btu/lb = −20 cal/g = −0.84 × 10³ J/kg

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

DCM — DICHLOROMETHANE

Common Synonyms			
Methylene chloride Methylene dichloride	Watery liquid	Colorless	Sweet, pleasant odor

Sinks in water. Irritating vapor is produced.

Stop discharge if possible.
Avoid contact with liquid and vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
POISONOUS GASES ARE PRODUCED WHEN HEATED.
Wear goggles and self-contained breathing apparatus.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause nausea and dizziness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and pollution control officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Disperse and flush

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Methylene chloride; Methylene dichloride

3.2 **Coast Guard Compatibility Classification:** Halogenated hydrocarbon

3.3 **Chemical Formula:** CH_2Cl_2

3.4 **IMCO/United Nations Numerical Designation:** 9.0/1593

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Pleasant, aromatic, like chloroform, sweet, ethereal

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor canister mask, safety glasses, protective clothing.

5.2 **Symptoms Following Exposure:** INHALATION: anesthetic effects, nausea and drunkenness. CONTACT WITH SKIN AND EYES: skin irritation, irritation of eyes and nose.

5.3 **Treatment for Exposure:** INHALATION: remove from exposure. Give oxygen if needed. INGESTION: no specific antidote. CONTACT WITH SKIN AND EYES: remove contaminated clothing; wash skin or eyes if affected.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 500 ppm

5.5 **Short-Term Inhalation Limits:** 100 ppm for 60 min.

5.6 **Toxicity by Ingestion:** Grade 2; LD_{50} 0.5 to 5 g/kg

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** 205-307 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable under conditions likely to be encountered

6.2 **Flammable Limits in Air:** 12% - 19%

6.3 **Fire Extinguishing Agents:** Not pertinent

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Dissociation products generated in a fire may be irritating or toxic

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 1184°F

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** Not pertinent

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Not pertinent

8.2 **Waterfowl Toxicity:** Not pertinent

8.3 **Biological Oxygen Demand (BOD):** Not pertinent

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Ancon Chemical Corp.
   Westlake, La. 70669
2. Dow Chemical Co.
   Midland, Mich. 48640
3. Ethyl Corp
   Industrial Chemicals Division
   451 Florida St
   Baton Rouge, La. 70801

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Aerosol grade; technical grade

10.2 **Storage Temperature:** Data not available

10.3 **Inert Atmosphere:** Inerted

10.4 **Venting:** Data not available

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

A-P-X

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** ORM A

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	2
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	1
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 84.93

13.3 **Boiling Point at 1 atm:** 104°F = 39.8°C = 313.0°K

13.4 **Freezing Point:** −142°F = −96.7°C = 176.5°K

13.5 **Critical Temperature:** 473°F = 245°C = 518°K

13.6 **Critical Pressure:** 893 psia = 60.9 atm = 6.17 MN/m²

13.7 **Specific Gravity:** 1.322 at 20°C (liquid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** 2.9

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.199

13.12 **Latent Heat of Vaporization:** 142 Btu/lb = 78.7 cal/g = 3.30 × 10⁵ J/kg

13.13 **Heat of Combustion:** Not pertinent

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

DZN

DIAZINON

Common Synonyms

O, O-Diethyl O-(2-isopropyl-4-methyl-6-pyrimidinyl) phosphorothioate

O, O-Diethyl O-(2-isopropyl-4-methyl-6-pyrimidyl) thiophosphate

Alfa-tox, Spectracide, Sarolex

Liquid — Light to dark brown

Stable in water.

Stop discharge if possible. Keep people away.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
POISONOUS GASES ARE PRODUCED WHEN HEATED.

Exposure

CALL FOR MEDICAL AID.

LIQUID
POISONOUS IF SWALLOWED.
Irritating to skin and eyes.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning—poison, water contaminant, high flammability (if solution)
Restrict access
Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** O, O-Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate; O, O-Diethyl O-2-isopropyl-4-methyl-6-pyrimidyl thiophosphate; Diethyl 2-isopropyl-4-methyl-6-pyrimidyl thionophosphate; Alfa-tox; Sarolex; Spectracide

3.2 **Coast Guard Compatibility Classification:** Not applicable

3.3 **Chemical Formula:** $C_{12}H_{21}N_2O_3PS$

3.4 **IMCO/United Nations Numerical Designation:** 6.1/1615

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid, or liquid solution

4.2 **Color:** Amber to dark brown

4.3 **Odor:** Data not available

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Goggles or face shield; rubber gloves; protective clothing.

5.2 **Symptoms Following Exposure:** Ingestion or prolonged inhalation of mist causes headache, giddiness, blurred vision, nervousness, weakness, cramps, diarrhea, discomfort in the chest, sweating, mucosa, tearing, salivation and other excessive respiratory tract secretion, vomiting, cyanosis, papilledema, uncontrollable muscle twitches, convulsions, coma, loss of reflexes, and loss of sphincter control. Liquid irritates eyes and skin.

5.3 **Treatment for Exposure:** INHALATION: remove to fresh air; keep warm; get medical attention at once. EYES: flush with plenty of water for at least 15 min. and get medical attention. SKIN: wash contaminated area with soap and water. INGESTION: get medical attention at once; give water slurry of charcoal; do NOT give milk or alcohol.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** Data not available

5.5 **Short-Term Inhalation Limits:** Not pertinent

5.6 **Toxicity by Ingestion:** Grade 3, oral LD_{50} = 76 mg/kg (rat)

5.7 **Late Toxicity:** May be mutagenic

5.8 **Vapor (Gas) Irritant Characteristics:** Data not available

5.9 **Liquid or Solid Irritant Characteristics:** Data not available

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** 82–105°F C.C. (solutions only; pure liquid difficult to burn)

6.2 **Flammable Limits in Air:** Not pertinent

6.3 **Fire Extinguishing Agents:** (for solutions) Foam, dry chemical, or carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective.

6.5 **Special Hazards of Combustion Products:** Oxides of sulfur and of phosphorus are generated in fires.

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** Not pertinent

6.8 **Electrical Hazard:** Data not available

6.9 **Burning Rate:** (for solutions) 4 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
0.025 ppm/96 hr/stonefly nymph/TL_m/fresh water
30 μg/l/48 hr/bluegill/TL_m/fresh water
(becomes bound to soil when used according to directions)

8.2 **Waterfowl Toxicity:**
LD_{50} = 3.54 mg/kg
LC_{50} = 5 days, 90 ppm mallard duck
LC_{50} = 7 days, 68 ppm quail

8.3 **Biological Oxygen Demand (BOD):** Data not available

8.4 **Food Chain Concentration Potential:** Data not available

9. SELECTED MANUFACTURERS

Ciba-Geigy Corporation
Agricultural Division
P. O. Box 11422
Greensboro, N. C. 27409

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical; wettable powders; a variety of emulsifiable solutions in combustible solvents.

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-X-Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** ORM-A

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 304.4

13.3 **Boiling Point at 1 atm:** Very high; decomposes

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.117 at 20°C (liquid)

13.8 **Liquid Surface Tension:** (est.) 35 dynes/cm = 0.035 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** (est.) 40 dynes/cm = 0.040 N/m at 20°C

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** (est.) −12,000 Btu/lb = −6,500 cal/g = -270×10^3 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

EGL — ETHYLENE GLYCOL

Common Synonyms
Glycol
Monoethylene glycol
1,2-Ethanediol

Thick liquid | Colorless | Odorless

Sinks and mixes with water.

Stop discharge if possible.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
Extinguish with dry chemical, alcohol foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause loss of consciousness.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Disperse and flush

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** 1,2 Dihydroxyethane; 1,2 Ethanediol; Ethylene dihydrate; Glycol; Monoethylene glycol

3.2 **Coast Guard Compatibility Classification:** Glycol

3.3 **Chemical Formula:** $HOCH_2CH_2OH$

3.4 **IMCO/United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Slight odor

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Goggles, shower and eye bath

5.2 **Symptoms Following Exposure:** Inhalation of vapor is not hazardous. Ingestion causes stupor or coma, sometimes leading to fatal kidney injury

5.3 **Treatment for Exposure:** INGESTION: induce vomiting and call a physician. SKIN AND EYES: flush with water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 100 ppm

5.5 **Short-Term Inhalation Limits:** Not pertinent

5.6 **Toxicity by Ingestion:** Grade 1; LD_{50} 5 to 15 g/kg (rat, guinea pig, mouse)

5.7 **Late Toxicity:** Fatal kidney injury may result if ingested

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors are nonirritating to the eyes and throat

5.9 **Liquid or Solid Irritant Characteristics:** No appreciable hazard. Practically harmless to the skin

5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** 240°F (O.C.), 232°F (C.C.)

6.2 **Flammable Limits in Air:** LFL = 3.2%, UFL not listed

6.3 **Fire Extinguishing Agents:** Water fog, alcohol foam, carbon dioxide, or dry chemical

6.4 **Fire Extinguishing Agents Not to be Used:** Water or foam may cause frothing

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 775°F

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** 1.0 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** > 100 ppm/48 hr/shrimp/LC_{50}/salt water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** 12.5% (theor.), 5 days, 78% (theor.), 20 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Dow Chemical Co.
   Midland, Mich. 48640
2. PPG Industries, Inc.
   Chemical Division
   Guayanilla, Puerto Rico 00656
3. Union Carbide Corp.
   Chemicals and Plastics Division
   270 Park Ave.
   New York, N.Y. 10017

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Industrial grade; low-conductivity grade

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-5)

A-P-Q

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	0
Liquid or Solid Irritant	0
Poisons	1
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	1
Aesthetic Effect	1
Reactivity	
Other Chemicals	2
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	1
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 62.07

13.3 **Boiling Point at 1 atm:** 387.7°F = 197.6°C = 470.8°K

13.4 **Freezing Point:** 8.6°F = −13°C = 260°K

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.115 at 20°C (liquid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.095

13.12 **Latent Heat of Vaporization:** 344 Btu/lb = 191 cal/g = 8.00×10^5 J/kg

13.13 **Heat of Combustion:** −7259 Btu/lb = −4033 cal/g = -168.9×10^5 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** (est.) −20 Btu/lb = −12 cal/g = -0.5×10^5 J/kg

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

GAT — GASOLINES: AUTOMOTIVE

(< 4.23g lead/gal)

Common Synonyms

Watery liquid Colorless to pale brown or pink Gasoline odor

Floats on water. Flammable, irritating vapor is produced.

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Extinguish with dry chemical, foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause dizziness, headache, difficult breathing or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea or vomiting.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

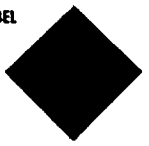
HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
Fouling to shoreline.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-6)

Issue warning — high flammability
Evacuate area
Disperse and flush

2. LABEL



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Motor spirit
Petrol

3.2 **Coast Guard Compatibility Classification:** Miscellaneous hydrocarbon mixtures

3.3 **Chemical Formula:** (Mixture of hydrocarbons)

3.4 **IMCO/United Nations Numerical Designation:** 3.1/1203

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless to brown

4.3 **Odor:** Gasoline

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Protective goggles, gloves

5.2 **Symptoms Following Exposure:** Irritation of mucous membranes and stimulation followed by depression of central nervous system. Breathing of vapor may also cause dizziness, headache, and incoordination or, in more severe cases, anesthesia, coma, and respiratory arrest. If liquid enters lungs, it will cause severe irritation, coughing, gagging, pulmonary edema, and, later, signs of bronchopneumonia and pneumonitis. Swallowing may cause irregular heartbeat.

5.3 **Treatment for Exposure:** INHALATION: maintain respiration and administer oxygen; enforce bed rest if liquid is in lungs. INGESTION: do NOT induce vomiting, stomach should be lavaged (by doctor) if appreciable quantity is swallowed. EYES: wash with copious quantity of water. SKIN: wipe off and wash with soap and water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** No single TLV applies

5.5 **Short-Term Inhalation Limits:** 500 ppm for 30 min.

5.6 **Toxicity by Ingestion:** Grade 2; LD_{50} 0.5 to 5 g/kg

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** 0.25 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** −36 F (C.C.)

6.2 **Flammable Limits in Air:** 1.4 – 7.4

6.3 **Fire Extinguishing Agents:** Foam, carbon dioxide, dry chemical

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective

6.5 **Special Hazards of Combustion Products:** None

6.6 **Behavior in Fire:** Vapors release into air and may travel considerable distance to a source of ignition and flash back

6.7 **Ignition Temperature:** 853°F

6.8 **Electrical Hazard:** Class I, Group D

6.9 **Burning Rate:** 4 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
90 ppm/24 hr juvenile American shad/TLm/fresh water
91 mg/l/24 hr juvenile American shad TLm/salt water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** 30/5 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Exxon Co.
50 Rockefeller Plaza
New York, N.Y. 10020
2. Shell Oil Co.
Shell Plaza
Houston, Texas 77001
3. Sun Oil Co.
St. Davids, Pa. 19087

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Various octane ratings, military specifications

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-E-U-V-W

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	0
Water	0
Self Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** Not pertinent

13.3 **Boiling Point at 1 atm:** 140 – 390°F = 60 – 199°C = 333 – 472°K

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 0.7321 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 19 – 23 dynes/cm = 0.019 – 0.023 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** 49 – 51 dynes/cm = 0.049 – 0.051 N/m at 20°C

13.10 **Vapor (Gas) Specific Gravity:** 3.4

13.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.054

13.12 **Latent Heat of Vaporization:** 130 – 150 Btu/lb = 71 – 81 cal/g = 3.0 – 3.4 × 10^5 J/kg

13.13 **Heat of Combustion:** −18,720 Btu/lb = −10,400 cal/g = −435.1 × 10^5 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

GAV — GASOLINES: AVIATION

(< 4.86g lead/gal)

Common Synonyms

Watery liquid | Red, blue, green, brown or purple | Gasoline odor

Floats on water. Flammable, irritating vapor is produced.

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Extinguish with dry chemical, foam or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled will cause dizziness, headache, difficult breathing or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea or vomiting.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

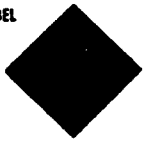
HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
Fouling to shoreline.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning – high flammability
Evacuate area
Disperse and flush

2. LABEL



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** No common synonyms
3.2 **Coast Guard Compatibility Classification:** Miscellaneous hydrocarbon mixtures
3.3 **Chemical Formula:** Not pertinent
3.4 **IMCO/United Nations Numerical Designation:** 3.1/1203

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Red, blue, green, brown, purple
4.3 **Odor:** Gasoline

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Protective goggles, gloves.
5.2 **Symptoms Following Exposure:** INHALATION causes irritation of upper respiratory tract, central nervous system stimulation followed by depression of varying degrees ranging from dizziness, headache, and incoordination to anesthesia, coma, and respiratory arrest; irregular heartbeat is dangerous complication. ASPIRATION causes severe lung irritation with coughing, gagging, dyspnea, substernal distress, and rapidly developing pulmonary edema; later, signs of bronchopneumonia and pneumonitis; acute onset of central nervous system excitement followed by depression. INGESTION causes irritation of mucous membranes of throat, esophagus, and stomach; stimulation followed by depression of central nervous system; irregular heartbeat
5.3 **Treatment for Exposure:** Seek medical attention. INHALATION: maintain respiration, give oxygen if needed. ASPIRATION: enforce bed rest, administer oxygen. INGESTION: do NOT induce vomiting; lavage carefully if appreciable quantity was ingested; guard against aspiration into lungs. EYES: wash with copious quantity of water. SKIN: wipe off and wash with soap and water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** No single TLV applicable.
5.5 **Short-Term Inhalation Limits:** 500 ppm for 30 min.
5.6 **Toxicity by Ingestion:** Grade 2; LD_{50} 0.5 to 5 g/kg
5.7 **Late Toxicity:** None

6. FIRE HAZARDS

6.1 **Flash Point:** −50°F C.C.
6.2 **Flammable Limits in Air:** 1.2% – 7.1%
6.3 **Fire Extinguishing Agents:** Foam, carbon dioxide, dry chemical
6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective
6.5 **Special Hazards of Combustion Products:** None
6.6 **Behavior in Fire:** Vapor is heavier than air and may travel a considerable distance to a source of ignition and flash back
6.7 **Ignition Temperature:** 824°F
6.8 **Electrical Hazard:** Class I, group D
6.9 **Burning Rate:** 4 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 90 ppm/24 hr juvenile American shad/TLm/fresh water
91 ppm/24 hr/juvenile American shad/TLm/salt water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** 8%, 5 days
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Exxon Co
30 Rockefeller Plaza
New York, N. Y. 10020
2. Shell Oil Co
1 Shell Plaza
Houston, Texas 77001
3. Sun Oil Co
St. Davids, Pa. 19087

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Grades 80/87, 100/130, and 115/145. Specification MIL-G-5572e
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-T-U-V-W

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	4
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	0
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** Not pertinent
13.3 **Boiling Point at 1 atm:** 160 – 340°F = 71 – 171°C = 344 – 444°K
13.4 **Freezing Point:** <76°F = <24.4°C = <297.6°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 0.711 at 15°C (liquid)
13.8 **Liquid Surface Tension:** 19 – 23 dynes/cm = 0.019 – 0.023 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** 49 – 51 dynes/cm = 0.049 – 0.051 N/m at 20°C
13.10 **Vapor (Gas) Specific Gravity:** 3.4
13.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.054
13.12 **Latent Heat of Vaporization:** 130 – 150 Btu/lb = 71 – 81 cal/g = 3.0 – 3.4 × 10^5 J/kg
13.13 **Heat of Combustion:** −18,720 Btu/lb = −10,400 cal/g = −435.4 × 10^5 J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

5. HEALTH HAZARDS (Cont'd.)

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin
5.10 **Odor Threshold:** 0.25 ppm

REVISED 1978

HCL — HYDROCHLORIC ACID

Common Synonyms
Muriatic Acid

Watery liquid — Colorless — Sharp, irritating odor

Sinks and mixes with water. Irritating vapor is produced.

AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away.
Wear chemical protective suit with self-contained breathing apparatus.
Stop discharge if possible.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
Flammable gas may be produced on contact with metals.
Wear chemical protective suit with self-contained breathing apparatus.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause coughing or difficult breathing
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook CG 446-4)

Issue warning — corrosive
Restrict access
Disperse and flush

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Muriatic acid
3.2 **Coast Guard Compatibility Classification:** Non-oxidizing mineral acid
3.3 **Chemical Formula:** $HCl(H_2O)$
3.4 **IMCO/United Nations Numerical Designation:** 8 0/1789

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless to light yellow
4.3 **Odor:** Pungent, sharp, pungent, irritating

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Self-contained breathing equipment, air line mask, or industrial canister type gas mask, rubber or rubber-coated gloves, apron, coat, overalls, shoes
5.2 **Symptoms Following Exposure:** Inhalation of fumes results in coughing and choking sensation, and irritation of nose and lungs. Liquid causes burns
5.3 **Treatment for Exposure:** INHALATION: remove person to fresh air, keep him warm and quiet and get medical attention immediately, start artificial respiration if breathing stops. INGESTION: have person drink water or milk; do NOT induce vomiting. EYES: immediately flush with plenty of water for at least 15 min. and get medical attention, continue flushing for another 15 min. if physician does not arrive promptly. SKIN: immediately flush skin while removing contaminated clothing, get medical attention promptly, use soap and wash area for at least 15 min.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 5 ppm
5.5 **Short-Term Inhalation Limits:** 5 ppm for 5 min.
5.6 **Toxicity by Ingestion:** Data not available
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations
5.9 **Liquid or Solid Irritant Characteristics:** Fairly severe skin irritant, may cause pain and second-degree burns after a few minutes' contact
5.10 **Odor Threshold:** 1-5 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Toxic and irritating vapors are generated when heated
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** Not flammable
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** Corrosive to most metals with evolution of hydrogen gas, which may form explosive mixtures with air
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Flush with water, apply powdered limestone, slaked lime, soda ash, or sodium bicarbonate
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
282 ppm/96 hr/mosquito fish/TL_m/fresh water
100-330 ppm/48 hr/shrimp/LC_{50}/salt water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Diamond Shamrock Corp
Electro Chemicals Division
300 Union Commerce Bldg
Cleveland, Ohio 44115
2. Stauffer Chemical Co
Industrial Chemicals Division
299 Park Ave
New York, N.Y. 10017
3. Vulcan Materials Co
Chemicals Division
Wichita, Kan. 67201

10. SHIPPING INFORMATION

10.1 **Grades or Purity:**
Food processing or technical
18° Be' — 27.9%, 20 Be' — 31.5%,
22° Be' — 35.2%.
Reagent, ACS and USP 23° Be' — 37.1%
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

A P

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Corrosive material
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	0
Health	
Vapor Irritant	3
Liquid or Solid Irritant	3
Poisons	2
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES*

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** Not pertinent
13.3 **Boiling Point at 1 atm:** 123°F = 50.5°C = 323.8°K
13.4 **Freezing Point:** Not pertinent
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.19 at 20°C (liquid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** 178 Btu/lb = 98.6 cal/g = 4.13×10^5 J/kg
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** -860 Btu/lb = -480 cal/g = -20×10^5 J/kg
13.16 **Heat of Polymerization:** Not pertinent

*Physical properties apply to 37% solution

(Continued on pages 5 and 6)

NOTES

REVISED 1978

JPF	JET FUELS: JP-4

Common Synonyms	Watery liquid	Colorless	Fuel oil odor
	Floats on water.		

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Avoid contact with liquid.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Extinguish with dry chemical, foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

LIQUID
Irritating to skin and eyes.
Harmful if swallowed.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

Dangerous to aquatic life in high concentrations.
Fouling to shoreline.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG-446-4)

Issue warning: high flammability
Mechanical containment
Should be removed
Chemical and physical treatment

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** No common synonyms
3.2 **Coast Guard Compatibility Classification:** Miscellaneous hydrocarbon mixtures
3.3 **Chemical Formula:** C_nH_{2n+2}
3.4 **IMCO/United Nations Numerical Designation:** 3.2/1863

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless to light brown
4.3 **Odor:** Like fuel oil

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Protective gloves, goggles or face shield
5.2 **Symptoms Following Exposure:** Vapor causes slight irritation of eyes and nose. Liquid irritates stomach, if taken into lungs, causes coughing, distress, and rapidly developing pulmonary edema
5.3 **Treatment for Exposure:** ASPIRATION: enforce bed rest; administer oxygen, call a doctor. INGESTION: do NOT induce vomiting, call a doctor. EYES: wash with plenty of water. SKIN: wipe off and wash with soap and water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 200 ppm
5.5 **Short-Term Inhalation Limits:** 2500 mg/m^3 for 60 min.
5.6 **Toxicity by Ingestion:** Grade 2; LD_{50} 0.5 to 5 g/kg
5.7 **Late Toxicity:** Data not available
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
5.10 **Odor Threshold:** 1 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** −10°F to +30°F (C.C.)
6.2 **Flammable Limits in Air:** 1.3% – 8.0%
6.3 **Fire Extinguishing Agents:** Foam, dry chemical, or carbon dioxide
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** 464°F
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** 4 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 500 ppm/* salmon (lingering lethal) fresh water
*Time period not specified
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** <5 in 5 days
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Exxon Co.
   50 Rockefeller Plaza
   New York, N.Y. 10020
2. Shell Oil Co.
   One Shell Plaza
   Houston, Tex. 77001
3. Sun Oil Co.
   240 Radnor Rd.
   St. Davids, Pa. 19087

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** 100%
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG-446-3)

A-T-U

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	1
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	1
Aesthetic Effect	3
Reactivity	
Other Chemicals	0
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	0
Flammability (Red)	2
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** Not pertinent
13.3 **Boiling Point at 1 atm:** 349–549°F = 176–287°C = 449–560°K
13.4 **Freezing Point:** <−54°F = <−48°C = <225°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 0.8 at 20°C (liquid)
13.8 **Liquid Surface Tension:** (est.) 25 dynes/cm = 0.025 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** (est.) 50 dynes/cm = 0.05 N/m at 20°C
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.040
13.12 **Latent Heat of Vaporization:** 140 Btu/lb = 78 cal/g = 3.3 × 10^5 J/kg
13.13 **Heat of Combustion:** −18,540 Btu/lb = −10,300 cal/g = −430.24 × 10^5 J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

LTA — LACTIC ACID

Common Synonyms
2-Hydroxypropanoic acid
Racemic lactic acid
Milk acid
Alpha-Hydroxypropionic acid

Thick Liquid Colorless to Yellow Weak Unpleasant Odor

Sinks and Mixes with water.

Avoid contact with liquid and vapor, keep people away.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible
Extinguish with water, dry chemicals, or carbon dioxide.

Exposure

CALL FOR MEDICAL AID.
VAPOR
Irritating to eyes, nose and throat.
If inhaled will cause coughing or difficult breathing.
If in eyes, hold eyelids open and flush with plenty of water.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.
LIQUID
Will burn skin and eyes.
If swallowed will cause nausea.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4)

Disperse and flush

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** 2-Hydroxypropanoic acid, alpha-Hydroxypropionic acid; Milk acid; Racemic lactic acid
3.2 **Coast Guard Compatibility Classification:** Not listed
3.3 **Chemical Formula:** $CH_3CHOHCOOH \cdot H_2O$
3.4 **IMCO/United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Syrupy liquid
4.2 **Color:** Yellow to colorless
4.3 **Odor:** None or weak acidic

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Rubber gloves, goggles; self-contained breathing apparatus where high concentrations of mist are present
5.2 **Symptoms Following Exposure:** Inhalation of mist causes coughing and irritation of mucous membranes. Ingestion, even of diluted preparations, has a corrosive effect on the esophagus and stomach. Contact with more concentrated solutions can cause severe burns of skin or eye.
5.3 **Treatment for Exposure:** INHALATION: move to fresh air. INGESTION: give large amount of water. EYES: flush with water for at least 15 min. SKIN: flush with water, wash well with soap and water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** Data not available
5.5 **Short-Term Inhalation Limits:** Data not available
5.6 **Toxicity by Ingestion:** Grade 2, oral LD_{50} = 1,810 mg/kg (guinea pig)
5.7 **Late Toxicity:** Data not available
5.8 **Vapor (Gas) Irritant Characteristics:** Data not available
5.9 **Liquid or Solid Irritant Characteristics:** Data not available
5.10 **Odor Threshold:** 4.0 × 10 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** Not pertinent (not flammable or burns with difficulty)
6.2 **Flammable Limits in Air:** Not pertinent
6.3 **Fire Extinguishing Agents:** Water, foam, dry chemical, carbon dioxide
6.4 **Fire Extinguishing Agents Not to be Used:**
6.5 **Special Hazards of Combustion Products:**
6.6 **Behavior in Fire:**
6.7 **Ignition Temperature:** Not pertinent
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not pertinent

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** Slowly corrodes most metals
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Dilute with water, rinse with sodium bicarbonate or lime solution
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
430 ppm/>100 hr/goldfish/no effect/fresh water
654 ppm/6 hr/goldfish/killed/fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** 72%, 5 days
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Clinton Corn Processing Co.
P. O. Box 340
Clinton, Iowa 52732
2. Mallinckrodt Chemical Works
223 Westside Avenue
P. O. Box 484
Jersey City, N. J. 07303
3. Monsanto Company
800 North Lindbergh Blvd.
St. Louis, Mo. 63166

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** USP, Reagent, Technical, 88%, Food processing, 50%, 80%. The balance is water in all cases.
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A, P

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 90
13.3 **Boiling Point at 1 atm:** Not pertinent (decomposes)
13.4 **Freezing Point:** Not pertinent
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.20 at 20° (liquid)
13.8 **Liquid Surface Tension:** Data not available
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** −6,520 Btu/lb = −3,620 cal/g = −152 × 10^3 J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 1 and 6)

NOTES

MLT

MALATHION

Common Synonyms
Cythion Insecticide

Liquid — Yellow to dark brown — Skunk-like odor

Sinks in water. Freezing point is 37° F.

AVOID CONTACT WITH LIQUID. Keep people away.
Wear chemical protective suit with self-contained breathing apparatus.
Stop discharge if possible.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES ARE PRODUCED IN FIRE AND WHEN HEATED.
Containers may explode in fire.
Wear chemical protective suit with self-contained breathing apparatus.
Extinguish with dry chemical, carbon dioxide, water, or foam.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

LIQUID
POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED.
Irritating to eyes.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — poison, water contaminant
Restrict access
Should be removed
Chemical and physical treatment

2. LABEL

POISON

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** CYTHION Insecticide
S-[1,2-Bis (ethoxycarbonyl) ethyl] 0,0-dimethyl phosphorodithioate

3.2 **Coast Guard Compatibility Classification:** Not applicable

3.3 **Chemical Formula:** $C_{10}H_{19}O_6PS_2$

3.4 **IMCO/United Nations Numerical Designation:** 6.1/1893

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Yellow to dark brown.

4.3 **Odor:** Characteristic skunk-like mercaptan

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Wear self-contained breathing apparatus (or respirator for organophosphate pesticides) and rubber clothing while fighting fires of malathion with chlorine bleach solution. All clothing contaminated by fumes and vapors must be decontaminated.

5.2 **Symptoms Following Exposure:** Exposure to fumes from a fire or to liquid causes headache, blurred vision, constricted pupils of the eyes, weakness, nausea, cramps, diarrhea, and tightness in the chest. Muscles twitch and convulsions may follow. The symptoms may develop over a period of 8 hours.

5.3 **Treatment for Exposure:** *Speed is essential.* INHALATION: in the nonbreathing victim *immediately* institute artificial respiration, using the mouth-to-mouth, the mouth-to-nose, or the mouth-to-oropharyngeal method. *Call physician!* INGESTION: administer milk, water or salt-water and induce vomiting repeatedly. SKIN OR EYE CONTACT: flood and wash exposed skin areas *thoroughly* with water. Remove contaminated clothing under a shower. Administer atropine, 2 mg (1/30 gr) intramuscularly or intravenously as soon as any local or systemic signs or symptoms of an intoxication are noted; repeat the administration of atropine every 3-8 min. until signs of atropinization (mydriasis, dry mouth, rapid pulse, hot and dry skin) occur; initiate treatment in children with 1 mg of atropine. Watch respiration, and remove bronchial secretions if they appear to be obstructing the airway, intubate if necessary. Give 2-PAM (Pralidoxime; *Protopam*), 2.5 gm in 100 ml of sterile water or in 5% dextrose and water, intravenously, slowly, in 15-30 min.; if sufficient fluid is not available, give 1 gm of 2-PAM in 3 ml of distilled water by deep intramuscular injection, repeat this every half hour if respiration weakens or if muscle fasciculation or convulsions recur.

6. FIRE HAZARDS

6.1 **Flash Point:** > 325°F

6.2 **Flammable Limits in Air:** Data not available

6.3 **Fire Extinguishing Agents:** Dry chemical, carbon dioxide, water spray, foam

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Vapors and fumes from fires are hazardous. They include sulfur dioxide and phosphoric acid.

6.6 **Behavior in Fire:** Gives off hazardous fumes. Area surrounding fire should be diked to prevent water runoff.

6.7 **Ignition Temperature:** Data not available

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** Data not available

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** None

7.2 **Reactivity with Common Materials:** No hazardous reaction

7.3 **Stability During Transport:** Not pertinent

7.4 **Neutralizing Agents for Acids and Caustics:** Liquid bleach solution for decontamination.

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 0.09 ppm/96 hr/bluegill/TL_m/fresh water
0.033-0.083 ppm/96 hr/marine crustaceae/LC_{50}

8.2 **Waterfowl Toxicity:** LD_{50}=1485 mg/kg

8.3 **Biological Oxygen Demand (BOD):** Data not available

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

American Cyanamid Co.
Agricultural Division
P. O. Box 400
Princeton, N. J. 08540

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** CYTHION Insecticide, Malathion ULV Concentrate Insecticide. Many powders, dusts, and spray solutions are sold under a variety of trade names.

10.2 **Storage Temperature:** Below 120°F. Decomposition (non-hazardous) occurs at higher temperatures.

10.3 [illegible] Data not available

10.4 [illegible] Data not available

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-X-Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Poisonous liquid or solid, Class B

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Standard 704 Identification:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 330.36

13.3 **Boiling Point at 1 atm:** Very high

13.4 **Freezing Point:** 37°F = 2.9°C = 276°K

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.234 at 25°C (liquid)

13.8 **Liquid Surface Tension:** 37.1 dynes/cm = 0.0371 N/m at 24°C

13.9 **Liquid-Water Interfacial Tension:** 19 dynes/cm = 0.019 N/m at 24°C

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** Data not available

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

5. HEALTH HAZARDS (Cont'd.)

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 10 mg/m³

5.5 **Short-Term Inhalation Limits:** Data not available

5.6 **Toxicity by Ingestion:** Grade 2, LD_{50} 0.5 to 5 g/kg (rat)

5.7 **Late Toxicity:** Data not available

5.8 **Vapor (Gas) Irritant Characteristics:** None likely

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** Data not available

REVISED 1978

MCR

MERCURY

Common Synonyms
Quicksilver

Liquid | Silver | Odorless

Sinks in water.

AVOID CONTACT WITH LIQUID. Keep people away.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.

Exposure

CALL FOR MEDICAL AID.
LIQUID
Effects of exposure may be delayed.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4)

Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by
Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Quicksilver
3.2 **Coast Guard Compatibility Classification:** Not applicable
3.3 **Chemical Formula:** Hg
3.4 **IMCO/United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Silvery
4.3 **Odor:** None

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Avoid contact of liquid with skin. For vapor use chemical cartridge (Hopcalite) respirator.
5.2 **Symptoms Following Exposure:** No immediate symptoms. As poisoning becomes established, slight muscular tremor, loss of appetite, nausea, and diarrhea are observed. Psychic, kidney, and cardiovascular disturbances may occur.
5.3 **Treatment for Exposure:** Consult a doctor.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 0.05 ng/m³
5.5 **Short-Term Inhalation Limits:** Data not available
5.6 **Toxicity by Ingestion:** No immediate toxicity
5.7 **Late Toxicity:** Development of mercury poisoning
5.8 **Vapor (Gas) Irritant Characteristics:** None
5.9 **Liquid or Solid Irritant Characteristics:** None
5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** Not flammable
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
0.5–1 ppm/48 hr/carassius ardium TL_m/fresh water
0.29 ppm/48 hr/marine fish/TL_m/salt water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** Mercury concentrates in liver and kidneys of ducks and geese to levels above FDA limit of 0.5 ppm. Muscle tissue usually well below the limit.

9. SELECTED MANUFACTURERS

1 Belmont Smelting and Refining Works, Inc
330 Belmont Ave
Brooklyn, N.Y. 11207

2 Engelhard Minerals and Chemical Corp
Philipp Bros. Division
299 Park Ave
New York, N.Y. 10017

3 NL Industries
Goldsmith Division
900 W. 18th St
Chicago, Ill. 60608

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Pure
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 448-3)

A-X

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** ORM-B
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 200.59
13.3 **Boiling Point at 1 atm:** 675°F = 357°C = 630°K
13.4 **Freezing Point:** −38.0°F = −38.9°C = 234.3°K
13.5 **Critical Temperature:** 2664°F = 1462°C = 1735°K
13.6 **Critical Pressure:** 23,300 psia = 1587 atm = 160.8 MN/m²
13.7 **Specific Gravity:** 13.55 at 20°C (liquid)
13.8 **Liquid Surface Tension:** 470 dynes/cm = 0.470 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** 375 dynes/cm = 0.375 N/m at 20°C
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

MEK — METHYL ETHYL KETONE

Common Synonyms
MEK
2-Butanone
Ethyl methyl ketone

Liquid | Colorless | Sweet odor

Floats and mixes with water. Flammable, irritating vapor is produced.

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to "knock down" vapor.
Avoid contact with liquid and vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.

Extinguish with dry chemical, alcohol foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause nausea, vomiting, headache, dizziness, difficult breathing, or loss of consciousness.

Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn eyes.
Harmful if swallowed.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.

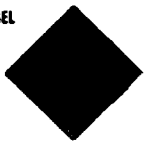
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning—high flammability
Disperse and flush

2. LABEL



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** 2-Butanone
Ethyl methyl ketone
MEK

3.2 **Coast Guard Compatibility Classification:** Ketone

3.3 **Chemical Formula:** $CH_3COCH_2CH_3$

3.4 **IMCO/United Nations Numerical Designation:** 3.2/1193

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Like acetone; pleasant; pungent

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic canister or air pack; plastic gloves, goggles or face shield.

5.2 **Symptoms Following Exposure:** Liquid causes eye burn. Vapor irritates eyes, nose, and throat; can cause headache, dizziness, nausea, weakness, and loss of consciousness.

5.3 **Treatment for Exposure:** INHALATION: remove victim to fresh air; if breathing is irregular or has stopped, start resuscitation and administer oxygen. EYES: wash with plenty of water for at least 15 min. and call physician.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 200 ppm

5.5 **Short-Term Inhalation Limits:** 290 mg/m^3 for 60 min.

5.6 **Toxicity by Ingestion:** Grade 2; 0.5 to 5 g/kg (rat)

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** 10 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 20°F C.C., 22°F O.C.

6.2 **Flammable Limits in Air:** 1.8% - 11.5%

6.3 **Fire Extinguishing Agents:** Alcohol foam, dry chemical, or carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 961°F

6.8 **Electrical Hazard:** Class I, Group D

6.9 **Burning Rate:** 4.1 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 5640 mg/l/48 hr/bluegill/TLm/fresh water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** 214%, 5 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Celanese Corp
   Celanese Chemical Co. Division
   245 Park Ave
   New York, N. Y. 10017
2. Exxon Chemical Co
   Houston, Tex. 77001
3. Shell Chemical Co
   Industrial Chemicals Division
   Houston, Tex. 77001

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** 99.5+%

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

A-P-Q-R-S

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	1
Aesthetic Effect	1
Reactivity	
Other Chemicals	2
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 72.11

13.3 **Boiling Point at 1 atm:** 175.3°F = 79.6°C = 352.8°K

13.4 **Freezing Point:** −123.3°F = −86.3°C = 186.9°K

13.5 **Critical Temperature:** 504.5°F = 262.5°C = 535.7°K

13.6 **Critical Pressure:** 603 psia = 41.0 atm = 4.15 MN/m^2

13.7 **Specific Gravity:** 0.806 at 20°C (liquid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** 2.5

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.075

13.12 **Latent Heat of Vaporization:** 191 Btu/lb = 106 cal/g = 4.44 × 10^5 J/kg

13.13 **Heat of Combustion:** −13,480 Btu/lb = −7491 cal/g = −313.6 × 10^5 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** (est.) −9 Btu/lb = −5 cal/g = −0.2 × 10^5 J/kg

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

MIK

METHYL ISOBUTYL KETONE

Common Synonyms
4-Methyl-2-pentanone
Isobutyl methyl ketone
MIBK

Watery liquid — Colorless — Mild pleasant odor

Floats and mixes slowly with water. Flammable, irritating vapor is produced.

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to "knock down" vapor.
Avoid contact with liquid and vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemical, alcohol foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause dizziness or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
Harmful if swallowed.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

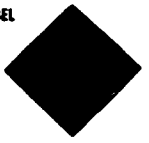
Effect of low concentrations on aquatic life is unknown.
Floating to shoreline.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning - high flammability
Evacuate area
Disperse and flush

2. LABEL



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Hexone; Isobutyl methyl ketone; Isopropylacetone; 4-Methyl-2-pentanone; MIBK; MIK

3.2 **Coast Guard Compatibility Classification:** Ketone

3.3 **Chemical Formula:** $(CH_3)_2CHCH_2COCH_3$

3.4 **NIOSH/United Nations Numerical Designation:** 3.2/1245

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Pleasant, mild, characteristic, sharp; non-residual, ketonic

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic canister or air pack; rubber gloves, goggles or face shield.

5.2 **Symptoms Following Exposure:** Vapor causes irritation of eyes and nose; high concentrations cause anesthesia and depression. Liquid dries out skin and may cause dermatitis; irritates eyes but does not injure them.

5.3 **Treatment for Exposure:** INHALATION: remove to fresh air, give artificial respiration if needed, call a doctor. SKIN OR EYES: wash eyes thoroughly with water; wash skin with water until irritation stops.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 100 ppm

5.5 **Short-Term Inhalation Limits:** 100 ppm for 60 min.

5.6 **Toxicity by Ingestion:** Grade 2; LD_{50} 0.5 to 5 g/kg (rat)

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** 0.47 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 73°F C.C., 75°F O.C.

6.2 **Flammable Limits in Air:** 1.4% - 7.5%

6.3 **Fire Extinguishing Agents:** Alcohol foam, dry chemical, or carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective

6.5 **Special Hazards of Combustion Products:** Irritating vapors are generated when heated

6.6 **Behavior in Fire:** Vapors may travel a considerable distance and ignite

6.7 **Ignition Temperature:** 854°F

6.8 **Electrical Hazard:** Class I, Group D

6.9 **Burning Rate:** Data not available

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** (theor.) 1.8%, 0.5 day; (theor.) 12%, 5 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Exxon Chemical Co.
   Houston, Tex. 77001
2. Shell Chemical Co.
   Industrial Chemicals Division
   Houston, Tex. 77001
3. Union Carbide Corp.
   Chemicals & Plastics Division
   270 Park Ave
   New York, N.Y. 10017

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** 99+%

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-P-Q-T-U

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	1
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	1
Aesthetic Effect	2
Reactivity	
Other Chemicals	2
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 100.16

13.3 **Boiling Point at 1 atm:** 241.2°F = 116.2 = 389.4°K

13.4 **Freezing Point:** −119°F = −84°C = 189°K

13.5 **Critical Temperature:** 568.9°F = 298.3°C = 571.5°K

13.6 **Critical Pressure:** 475 psia = 32.3 atm = 3.27 MN/m²

13.7 **Specific Gravity:** 0.802 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 23.6 dynes/cm = 0.0236 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** 15.7 dynes/cm = 0.0157 N/m at 22.7°C

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.061

13.12 **Latent Heat of Vaporization:** 149 Btu/lb = 82.5 cal/g = 3.45 × 10⁵ J/kg

13.13 **Heat of Combustion:** (est.) −10,400 Btu/lb = −5,800 cal/g = −242 × 10⁵ J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** (est.) −9 Btu/lb = −5 cal/g = −0.2 × 10⁵ J/kg

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

NCT

NAPHTHA: COAL TAR

Common Synonyms
Mixture of benzene, toluene, xylene

Watery liquid Colorless to pale yellow Gasoline-like odor

Floats on water. Irritating vapor is produced.

Stop discharge if possible. Keep people away.
Call fire department.
Avoid contact with liquid and vapor.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
Extinguish with foam, dry chemical or carbon dioxide.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause dizziness, headache, difficult breathing or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea or vomiting.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
Floating to shoreline.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Mechanical containment
Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Mixture of benzene, toluene, and xylenes
3.2 **Coast Guard Compatibility Classification:** Miscellaneous hydrocarbon mixtures
3.3 **Chemical Formula:** Not applicable
3.4 **IMCO/United Nations Numerical Designation:** 3.2/1138

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless to pale yellow
4.3 **Odor:** Like benzene, toluene, and xylene

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Hydrocarbon vapor canister or air pack, plastic gloves, goggles or face shield.
5.2 **Symptoms Following Exposure:** Primarily a narcotic, causing unconsciousness in high concentrations. The symptoms of acute benzene poisoning are not likely, since the compound has components other than benzene.
5.3 **Treatment for Exposure:** Remove from exposure. Support respiration. Call physician.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 100 ppm
5.5 **Short-Term Inhalation Limits:** 75 ppm for 30 min
5.6 **Toxicity by Ingestion:** Grade 3, LD$_{50}$ 50 to 500 mg/kg
5.7 **Late Toxicity:** Leukemia
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause a smarting and reddening of the skin.
5.10 **Odor Threshold:** 4.68 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 107°F C.C.
6.2 **Flammable Limits in Air:** Data not available
6.3 **Fire Extinguishing Agents:** Foam, carbon dioxide, or dry chemical
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** 900-950°F
6.8 **Electrical Hazard:** Class I, Group D
6.9 **Burning Rate:** 4 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** Data not available
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Crowley Tar Products, Inc.
   271 Madison Ave
   New York, N.Y. 10016
2. Koppers Co
   Organic Materials Division
   Koppers Bldg.
   Pittsburgh, Pa. 15219
3. Neville Chemical Co
   Neville Island
   Pittsburgh, Pa. 15225

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Purity varies with coal used and distillation range taken
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open (flame arrester)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-T-C-V-W

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Combustible Liquid
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** Not pertinent
13.3 **Boiling Point at 1 atm:** 200-500°F = 93-260°C = 366-533°K
13.4 **Freezing Point:** Not pertinent
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 0.86-0.88 at 20°C (liquid)
13.8 **Liquid Surface Tension:** (est.) 20 dynes/cm = 0.020 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** (est.) 45 dynes/cm = 0.045 N/m at 20°C
13.10 **Vapor (Gas) Specific Gravity:** Data not available
13.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.030
13.12 **Latent Heat of Vaporization:** (est.) 101 Btu/lb = 56.2 cal/g = 2.35 × 10^5 J/kg
13.13 **Heat of Combustion:** (est.) −18,200 Btu/lb = −10,100 cal/g = −424 × 10^3 J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

NSV

NAPHTHA: SOLVENT

Common Synonyms
Petroleum solvent

Watery liquid — Colorless — Gasoline-like odor

Floats on water. Vapor is produced.

Stop discharge if possible. Keep people away.
Call fire department.
Avoid contact with liquid and vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Compatible with foam, dry chemical or carbon dioxide.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Not irritating to eyes, nose or throat.
If inhaled, will cause dizziness or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
Floats to shoreline.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Mechanical containment
Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Light naphtha
Petroleum solvent

3.2 **Coast Guard Compatibility Classification:** Miscellaneous hydrocarbon mixtures

3.3 **Chemical Formula:** Not applicable

3.4 **IMCO/United Nations Numerical Designation:** 3.2/1256

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Like kerosine and gasoline

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Goggles or face shield (as for gasoline).

5.2 **Symptoms Following Exposure:** High concentration of vapors may cause intoxication. If liquid is swallowed, it may get into lungs by aspiration, not very irritating to skin or eyes.

5.3 **Treatment for Exposure:** INHALATION: remove to fresh air, treat symptoms. INGESTION: do NOT induce vomiting; call a doctor. EYES: flush with water for 15 min. SKIN: wipe off, wash with soap and water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 200 ppm

5.5 **Short-Term Inhalation Limits:** 500 ppm for 30 min.

5.6 **Toxicity by Ingestion:** Grade 2; LD_{50} 0.5 to 5 g/kg

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors are nonirritating to eyes and throat.

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of skin.

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** >100°F C.C.

6.2 **Flammable Limits in Air:** 0.8% - 5.0%

6.3 **Fire Extinguishing Agents:** Foam, carbon dioxide, or dry chemical

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 444°F

6.8 **Electrical Hazard:** Class I, Group D

6.9 **Burning Rate:** 4 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** Data not available

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Pennsylvania Refining Co.
Butler, Pa. 16001
2. Sun Oil Co.
St. Davids, Pa. 19087
3. Union Oil Co.
Amsco Division
3100 S. Meachem Rd.
Palatine, Ill. 60067

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Refined solvent; crude light solvent, crude heavy solvent

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-T-U

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Combustible Liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** Not pertinent

13.3 **Boiling Point at 1 atm:** 266 - 311°F = 130 - 155°C = 403 - 428°K

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 0.85 - 0.87 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 19 - 23 dynes/cm = 0.019 - 0.023 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** 39 - 51 dynes/cm = 0.039 - 0.051 N/m at 20°C

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.030

13.12 **Latent Heat of Vaporization:** 130 - 150 Btu/lb = 71 - 81 cal/g = 3.0 - 3.4 × 10^5 J/kg

13.13 **Heat of Combustion:** (est.) −18,200 Btu/lb = −10,100 cal/g = −424 × 10^5 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

NTM

NAPHTHALENE, MOLTEN

Common Synonyms
Naphthalin
Tar camphor

Molten solid — Colorless — Mothballs odor

Solidifies and floats or sinks in water.

Stop discharge if possible. Keep people away
Call fire department.
Avoid contact with liquid and solid.
Isolate and remove discharged material
Notify local health and pollution control agencies

Fire

Combustible.

Wear goggles and self-contained breathing apparatus.
Extinguish with water, foam, dry chemical or carbon dioxide
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID
SOLID OR LIQUID
Irritating to skin and eyes.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
Fouling to shoreline.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4)

Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by
Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Naphthalin
Tar Camphor

3.2 **Coast Guard Compatibility Classification:** Aromatic hydrocarbon

3.3 **Chemical Formula:** $C_{10}H_8$

3.4 **IMCO/United Nations Numerical Designation:** 4.1/1334

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Coal tar, moth balls

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** U.S. Bureau of Mines approved organic vapor canister unit (USBM Type B), rubber gloves, chemical safety goggles, face shield, coveralls and/or rubber apron, rubber shoes or boots

5.2 **Symptoms Following Exposure:** Vapors or fumes are irritating to eyes, nose, and throat and may cause headaches, dizziness, nausea, etc. Solid may be irritating to skin

5.3 **Treatment for Exposure:** INHALATION: remove to fresh air. SKIN OR EYES: flush immediately with plenty of water for at least 15 min.; remove contaminated clothing immediately; call a physician.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 10 ppm

5.5 **Short-Term Inhalation Limits:** 15 ppm for 5 min

5.6 **Toxicity by Ingestion:** Grade 2; oral rat LD_{50} = 1780 mg/kg

5.7 **Late Toxicity:** Data not available

5.8 **Vapors (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Hot liquid can cause severe burn. The solid may irritate the skin.

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** 174°F C.C., 190°F O.C.

6.2 **Flammable Limits in Air:** 0.9% - 5.9%

6.3 **Fire Extinguishing Agents:** Water fog, carbon dioxide, dry chemical, or foam

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Toxic vapors given off in a fire

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 979°F

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** 4.3 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Molten naphthalene spatters and foams in contact with water. No chemical reaction is involved.

7.2 **Reactivity with Common Materials:** None

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 150 mg/l/96 hr/sunfish/TL_m fresh water 1.8 ppm/72 hr/fingerling salmon/critical/salt water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** (theor.) 59.5%, 6 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Allied Chemical Corp.
Industrial Chemicals Division
Morristown, N.J. 07960

2. Ashland Oil, Inc.
Ashland Chemical Co. Division
Columbus, Ohio 43216

3. United States Steel Corp.
USS Chemicals Division
525 William Penn Place
Pittsburgh, Pa. 15230

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Pure, crude, 95%
Pure mp = 176°F
Crude mp = 165-176°F

10.2 **Storage Temperature:** Elevated

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-T-U-X

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** ORM-A

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	2
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	3
Aesthetic Effect	3
Reactivity	
Other Chemicals	1
Water	0
Self Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	2
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid

13.2 **Molecular Weight:** 128.18

13.3 **Boiling Point at 1 atm:** 424°F = 218°C = 491°K

13.4 **Freezing Point:** 176.4°F = 80.2°C = 353.4°K

13.5 **Critical Temperature:** 882.4°F = 475.2°C = 748.4°K

13.6 **Critical Pressure:** 588 psia = 40.0 atm = 4.05 MN/m²

13.7 **Specific Gravity:** 1.145 at 20°C (solid)

13.8 **Liquid Surface Tension:** 31.8 dynes/cm = 0.0318 N/m at 100°C

13.9 **Liquid-Water Interfacial Tension:** Data not available

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.068

13.12 **Latent Heat of Vaporization:** 145 Btu/lb = 80.7 cal/g = 3.38 × 10³ J/kg

13.13 **Heat of Combustion:** −16,720 Btu/lb = −9287 cal/g = −388.8 × 10³ J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on page 5 and 6)

NOTES

REVISED 1970

NAC — NITRIC ACID

Common Synonyms

Watery liquid Colorless to light brown Choking odor

Sinks and mixes with water. Harmful vapor is produced.

AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away.
Wear chemical protective suit with self-contained breathing apparatus.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
May cause fire on contact with combustibles.
Flammable gas may be formed on contact with metals.
Poisonous gases are produced when heated.
Wear chemical protective suit with self-contained breathing apparatus.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Will burn eyes, nose and throat.
If inhaled, will cause difficult breathing or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

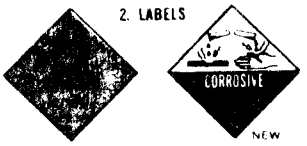
HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning - corrosive
Restrict access
Evacuate area
Disperse and flush

2. LABELS



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** No common synonyms
3.2 **Coast Guard Compatibility Classification:** Nitric acid
3.3 **Chemical Formula:** HNO_3 H_2O
3.4 **IMCO/United Nations Numerical Designation:** 8.0/2031

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Acrid, sweet to acrid

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Air mask, rubber acid suit, hood, boots and gloves, chemical goggles, safety shower and eye bath.
5.2 **Symptoms Following Exposure:** Vapors irritate eyes and respiratory tract; lung injury does not become apparent for several hours following exposure. Liquid may cause severe burns to eyes and skin.
5.3 **Treatment for Exposure:** INHALATION: remove to fresh air, administer artificial respiration if required. INGESTION: drink large volumes of water, do NOT induce vomiting. SKIN OR EYES: flush with water for at least 15 min.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 2 ppm
5.5 **Short-Term Inhalation Limits:** 15 ppm for 5 min
5.6 **Toxicity by Ingestion:** Grade 3; LD_{50} 50 to 500 mg/kg
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** 98-68%: Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations (5%). Vapors cause severe irritation of eye and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.
5.9 **Liquid or Solid Irritant Characteristics:** Severe skin irritant. Causes second- and third-degree burns on short contact and is very injurious to the eyes.
5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** [illegible]
6.4 **Fire Extinguishing Agents Not to be Used:** Not [illegible]
6.5 **Special Hazards of Combustion Products:** May [illegible] nitrogen oxides and nitric acid [illegible]
6.6 **Behavior in Fire:** Decomposes [illegible] oxides of nitrogen
6.7 **Ignition Temperature:** Not applicable
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not applicable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** May heat up [illegible] with water, but explosion of formation of steam is [illegible]
7.2 **Reactivity with Common Materials:** Very corrosive to skin, paper, cloth and most metals. Forms [illegible] explosive [illegible]
7.3 **Stability During Transport:** [illegible] nitrogen
7.4 **Neutralizing Agents for Acids and Caustics:** Flush with water
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not applicable

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
72 ppm/96 hr mosquito fish, TL_{m}/fresh water
680/1000 ppm/48 hr cockle, LC/salt water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Allied Chemical Corp
Agricultural Division
Morristown, N.J. 07960
2. E. I. duPont de Nemours & Co., Inc
Explosives Dept
Wilmington, Del. 19898
3. Hercules, Inc
Explosives & Chemical Proposition Dept
Bessemer, Ala. 35020

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Various grades ≥2.98%
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-5)

X/P

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** [illegible]
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	0
Health	
Vapor Toxicity	[illegible]
Liquid or Solid Toxicity	3
Poisons	[illegible]
Water Pollution	
Human Toxicity	[illegible]
Aquatic Toxicity	[illegible]
Aesthetic Effect	[illegible]
Reactivity	
Other Chemicals	1
Water	0
Self Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	0
[illegible]	[illegible]

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** Not pertinent
13.3 **Boiling Point at 1 atm:** 192.0°F = 88.9°C = 362 K
13.4 **Freezing Point:** 0°F = −45.6°C = 227.6 K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.49 at 20°C (liquid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.248
13.12 **Latent Heat of Vaporization:** 214 Btu/lb = 119 cal/g = 4.98 × 10^5 J/kg
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** −205 Btu/lb = −114 cal/g = −4.76 × 10^5 J/kg
13.16 **Heat of Polymerization:** Not pertinent

Continued on pages 5 and 6

NOTES

REVISED 1978

PHN — PHENOL

Common Synonyms
Carbolic acid
Hydroxybenzene

Solid crystals, or watery liquid — White solid, or light pink liquid — Sweet tarry odor

May float or sink, and mixes slowly with water

AVOID CONTACT WITH LIQUID AND SOLID. Keep people away.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Stop discharge if possible. Call fire department.
Evacuate area in case of large discharge.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES ARE PRODUCED IN FIRE.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Extinguish with water, carbon dioxide, dry chemical, or foam.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

LIQUID OR SOLID
POISONOUS IF SWALLOWED.
Will burn skin and eyes.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning: poison
Restrict access
Should be removed
Chemical and physical treatment

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Carbolic acid, Hydroxybenzene, Phenic acid, Phenyl hydroxide
3.2 **Coast Guard Compatibility Classification:** Phenol
3.3 **Chemical Formula:** C_6H_5OH
3.4 **IMCO/United Nations Numerical Designation:** 9.0/1671

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid or liquid
4.2 **Color:** Colorless to light pink
4.3 **Odor:** Characteristically sweet, sweet tarry, pungent, distinctive, distinct aromatic, somewhat sickening sweet and acrid

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Fresh-air mask for confined areas, rubber gloves, protective clothing, full face shield
5.2 **Symptoms Following Exposure:** Will burn eyes and skin. The analgesic action may cause loss of pain sensation. Readily absorbed through skin, causing increase in heart rate, convulsions, and death.
5.3 **Treatment for Exposure:** INHALATION: if victim shows any ill effects, move him to fresh air, keep him quiet and warm, and call a doctor immediately; if breathing stops, give artificial respiration. INGESTION: do NOT induce vomiting, give milk, egg whites, or large amounts of water and call doctor immediately, no known antidote; treat the symptoms. EYES: immediately flush with plenty of water for at least 15 min.; continue for another 15 min. if doctor has not taken over. SKIN: immediately remove all clothing while in a shower and wash affected area with abundant flowing water or soap and water for at least 15 min.; clean clothing thoroughly or discard.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 5 ppm (includes skin exposure)
5.5 **Short-Term Inhalation Limits:** Data not available
5.6 **Toxicity by Ingestion:** Grade 2, LD_{50} 0.5 to 5 g/kg (rat)
5.7 **Late Toxicity:** Carcinogenic in laboratory animals
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Fairly severe skin irritant; may cause pain and second-degree burns after a few minutes' contact.
5.10 **Odor Threshold:** 0.05 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 185°F (C.C.), 175°F (C.C.)
6.2 **Flammable Limits in Air:** 1.7% - 8.6%
6.3 **Fire Extinguishing Agents:** Water fog, foam, carbon dioxide, or dry chemical
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Toxic and irritating vapors are generated when heated.
6.6 **Behavior in Fire:** Yields flammable vapors when heated which will form explosive mixtures with air.
6.7 **Ignition Temperature:** 1319°F
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** 3.5 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
11.5-28.5 mg/l/96 hr/bluegill TL_m/fresh water
1.5 ppm/48 hr/rainbow trout/TL_m/fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** 2000/5 days
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Allied Chemical Corp
   Plastics Division
   Morristown, N.J. 07960
2. Dow Chemical Co
   Midland, Mich. 48640
3. Monsanto Company
   Monsanto Polymers & Petrochemicals Co
   800 North Lindbergh Blvd
   St. Louis, Mo. 63166

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** 90-99% (solid), 60-85% (liquid). Technical 82-92% (contains cresols)
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-P-Q

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Poisonous liquid or solid, Class B
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	2
Liquid or Solid Irritant	3
Poisons	3
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	3
Aesthetic Effect	3
Reactivity	
Other Chemicals	2
Water	0
Self Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	2
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid or liquid
13.2 **Molecular Weight:** 94.11
13.3 **Boiling Point at 1 atm:** 359.2°F = 181.8°C = 455.0°K
13.4 **Freezing Point:** 105.6°F = 40.9°C = 314.1°K
13.5 **Critical Temperature:** 790.0°F = 421.1°C = 694.3°K
13.6 **Critical Pressure:** 889 psia = 60.5 atm = 6.13 MN/m²
13.7 **Specific Gravity:** 1.058 at 41°C (liquid)
13.8 **Liquid Surface Tension:** 36.5 dynes/cm = 0.0365 N/m at 55°C
13.9 **Liquid-Water Interfacial Tension:** (est.) 20 dynes/cm = 0.02 N/m at 42°C
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.089
13.12 **Latent Heat of Vaporization:** 130 Btu/lb = 72 cal/g = 3.0 × 10⁵ J/kg
13.13 **Heat of Combustion:** −13,400 Btu/lb = −7,445 cal/g = −311.7 × 10⁵ J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED

PAC — PHOSPHORIC ACID

Common Synonyms
Orthophosphoric acid

Thick liquid — Colorless — Odorless

Sinks and mixes with water

AVOID CONTACT WITH LIQUID. Keep people away.
Wear chemical protective suit.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable
Flammable gas is formed on contact with metals.
Wear chemical protective suit with self-contained breathing apparatus.

Exposure

CALL FOR MEDICAL AID.

LIQUID
Will burn skin and eyes.
If swallowed, will cause nausea, vomiting, or loss of consciousness.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — corrosive
Restrict access
Dispersal and flush

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Orthophosphoric acid
3.2 **Coast Guard Compatibility Classification:** Non-oxidizing mineral acid
3.3 **Chemical Formula:** H_3PO_4
3.4 **IMCO/United Nations Numerical Designation:** 9.0/1805

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Odorless

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Goggles or face shield, rubber gloves and protective clothing
5.2 **Symptoms Following Exposure:** Burns on mouth and lips, sour acid taste, severe gastrointestinal irritation, nausea, vomiting, bloody diarrhea, difficult swallowing, severe abdominal pains, thirst, acidemia, difficult breathing, convulsions, collapse, shock, death
5.3 **Treatment for Exposure:** INGESTION: do NOT induce vomiting, give water, milk, or vegetable oil. SKIN OR EYE CONTACT: flush with water for at least 15 min
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 1.0 mg/m³
5.5 **Short-Term Inhalation Limits:** Not pertinent
5.6 **Toxicity by Ingestion:** Grade 3; LD_{50} 50 to 500 mg/kg
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** Not volatile
5.9 **Liquid or Solid Irritant Characteristics:** Fairly severe skin irritant; may cause pain and second degree burns after a few minutes' contact
5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** Not flammable
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Mild evolution of heat
7.2 **Reactivity with Common Materials:** Reacts with metal to liberate flammable hydrogen gas
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Flush with water, neutralize with lime
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 100 ppm/24 hr, mosquito fish/TL_m/fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. C F Industries Inc
   Bartow Phosphate Complex
   Bartow, Fla 33830
2. Cities Service Co., Inc
   North American Chemicals & Metals Group
   60 Wall St
   New York, N.Y. 10005
3. Freeport Minerals Co
   Freeport Chemical Co Division
   161 East 42 St
   New York, N.Y. 10017

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** NF, food, fertilizer, commercial, all 75-85%, the balance being water
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-2)

A-F

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Corrosive liquid
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	0
Health	
Vapor Irritant	0
Liquid or Solid Irritant	3
Poisons	1
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 98.00
13.3 **Boiling Point at 1 atm:** >260°F = >140°C = >413°K
13.4 **Freezing Point:** Not pertinent
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.892 at 25°C (liquid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** -52 Btu/lb = -29 cal/g = -1.2×10^5 J/kg
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

PCB — POLYCHLORINATED BIPHENYL

Common Synonyms
PCB
Chlorinated biphenyl
Aroclor

Oily liquid to solid powder — Light yellow liquid, or white powder — Weak odor

Sinks in water

Stop discharge if possible. Keep people away
Avoid contact with liquid and solid.
Call fire department.
Isolate and remove discharged material
Notify local health and pollution control agencies.

Fire

Combustible
Extinguish with water, foam, dry chemical, or carbon dioxide

Exposure

CALL FOR MEDICAL AID.

LIQUID OR SOLID
Irritating to skin and eyes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook CG 446-4)

Issue warning — water contaminant
Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Aroclor, Chlorinated biphenyl, Halogenated waxes, PCB, Polychloropolyphenyls

3.2 **Coast Guard Compatibility Classification:** Not applicable

3.3 **Chemical Formula:** $(C_6H_{5-x}Cl_x)_2$

3.4 **IMCO/United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid or solid

4.2 **Color:** Pale yellow (liquid), colorless (solid)

4.3 **Odor:** Practically odorless

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Gloves and protective garments

5.2 **Symptoms Following Exposure:** Acne from skin contact

5.3 **Treatment for Exposure:** SKIN: wash with soap and water

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 0.5 to 1.0 mg/m³

5.5 **Short-Term Inhalation Limits:** Data not available

5.6 **Toxicity by Ingestion:** Grade 2; oral rat LD_{50} = 3980 mg/kg

5.7 **Late Toxicity:** Causes chromosomal abnormalities in rats, birth defects in birds

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause severe irritation of eyes and throat and cause eye and lung injury. They cannot be tolerated even at low concentrations.

5.9 **Liquid or Solid Irritant Characteristics:** Contact with skin may cause irritation

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** >286°F

6.2 **Flammable Limits in Air:** Data not available

6.3 **Fire Extinguishing Agents:** Water, foam, dry chemical, or carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Irritating gases are evolved [illegible]

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** Data not available

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** Data not available

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Not reactive

7.2 **Reactivity with Common Materials:** Not reactive

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
0.278 ppm/96 hr bluegill TLm fresh water
0.005 ppm/336-1080 hr pinfish TLm salt water

8.2 **Waterfowl Toxicity:** LD_{50} 2000 ppm (mallard duck)

8.3 **Biological Oxygen Demand (BOD):** Very low

8.4 **Food Chain Concentration Potential:** High

9. SELECTED MANUFACTURERS

Monsanto Industrial Chemicals Co
800 North Lindbergh Blvd
St. Louis, Mo. 63166

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** 11 grades (some liquid, some solids) which differ primarily in their chlorine content (20-60% by weight)

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

II

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid or liquid

13.2 **Molecular Weight:** Not pertinent

13.3 **Boiling Point at 1 atm:** Very high

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.3-1.6 at 20°C (liquid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** Not pertinent

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

Continued on pages 5 and 6

NOTES

REVISED 1978

PTD

POTASSIUM DICHROMATE

Common Synonyms
Potassium bichromate
Bichrome

Solid crystals — Red to orange — Odorless

Sinks and mixes with water.

Avoid contact with solid and dust. Keep people away.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable
May cause fire on contact with combustibles.
Flood discharge area with water.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

DUST
Irritating to eyes, nose, and throat.
If inhaled, will cause difficult breathing.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

SOLIDS
Will burn skin and eyes.
If swallowed, will cause nausea, vomiting, or loss of consciousness.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — water contaminant
Disperse and flush

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Potassium bichromate, Bichrome

3.2 **Coast Guard Compatibility Classification:** Not applicable

3.3 **Chemical Formula:** $K_2Cr_2O_7$

3.4 **IMCO/United Nations Numerical Designation:** 9.0/1874

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid

4.2 **Color:** Orange-red

4.3 **Odor:** Odorless

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Approved dust mask, protective gloves, goggles or face shield

5.2 **Symptoms Following Exposure:** Highly corrosive to skin and mucous membranes. If ingested causes violent gastroenteritis, peripheral vascular collapse, vertigo, muscle cramps, coma, and (later) toxic nephritis with glycosuria. Allergic reactions may also occur.

5.3 **Treatment for Exposure:** INGESTION: have victim drink water or milk; do NOT induce vomiting. SKIN: treat like acid burns; external lesions may be scrubbed with 2% solution of sodium thiosulfate.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** Not pertinent

5.5 **Short-Term Inhalation Limits:** Not pertinent

5.6 **Toxicity by Ingestion:** Grade 3; 50 to 500 mg/kg (human)

5.7 **Late Toxicity:** Some suggestion of lung cancer.

5.8 **Vapor (Gas) Irritant Characteristics:** Dusts or mists may cause severe irritation of eyes and throat and can cause eye and lung injury. They cannot be tolerated even at low concentrations.

5.9 **Liquid or Solid Irritant Characteristics:** Severe skin irritant; causes second- and third-degree burns on short contact and is very injurious to the eyes.

5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable

6.2 **Flammable Limits in Air:** Not flammable

6.3 **Fire Extinguishing Agents:** Flood spill area with water

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** May decompose, generating oxygen. Supports the combustion of other materials.

6.7 **Ignition Temperature:** Not flammable

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** Ignition may occur when in contact with finely divided combustibles, such as sawdust.

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 739 ppm, 24 hr, bluegill, TL_m, fresh water; 17.8 ppm,*, silver salmon, toxic, salt water
* Time period not specified

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** None

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Allied Chemical Corp.
Industrial Chemicals Division
Morristown, N.J. 07960

2. Diamond Shamrock Corp.
Soda Products Division
Belleville Tpk.
Kearny, N.J. 07032

3. Mallinckrodt Chemical Works
Industrial Chemicals Division
2nd and Mallinckrodt Sts.
St. Louis, Mo. 63160

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** 99.9%

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

SS

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** ORM-A

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	0
Reactivity (Yellow)	1
	OXY

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid

13.2 **Molecular Weight:** 294.19

13.3 **Boiling Point at 1 atm:** Decomposes

13.4 **Freezing Point:** 748°F = 398°C = 671°K

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 2.676 at 25°C (solid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** Not pertinent

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

Continued on pages 5 and 6

NOTES

REVISED 1978

PTH

POTASSIUM HYDROXIDE

Common Synonyms
Caustic potash
Lye

Solid crystals, or watery liquid — White solid or colorless liquid — Odorless

Solid sinks and mixes slowly with water. Liquid mixes with water.

Avoid contact with liquid, solid, vapor, and dust
Keep people away.
Wear rubber overclothing (including gloves).
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
Flammable gas may be produced on contact with metals.
May cause fire on contact with moisture and combustibles.
Wear rubber overclothing (including gloves).
Flood discharge area with water.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

DUST OR MIST
Irritating to eyes, nose and throat.
Harmful if inhaled.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.
IF IN EYES, hold eyelids open and flush with plenty of water.

SOLID OR LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing or shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning: corrosive
Restrict access
Disperse and flush

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Caustic potash
3.2 **Coast Guard Compatibility Classification:** Not applicable
3.3 **Chemical Formula:** KOH
3.4 **IMCO/United Nations Numerical Designation:** 8.0/1814

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid
4.2 **Color:** White
4.3 **Odor:** None

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Wide-brimmed hat and close-fitting safety goggles with rubber side shields, respirator for dust, long-sleeved cotton shirt or jacket with buttoned collar and buttoned sleeves, rubber or rubber-coated canvas gloves (shirt sleeves should be buttoned over the gloves), rubber shoes or boots, cotton coveralls (with trouser cuffs worn over boots), rubber apron.
5.2 **Symptoms Following Exposure:** Causes severe burns of eyes, skin, and mucous membranes.
5.3 **Treatment for Exposure:** (Act quickly!) Call a physician at once, even when injury seems to be slight. INGESTION: give water and milk; do NOT induce vomiting. EYES: flush with water at once for at least 15 min. SKIN: flush with water, then rinse with dilute vinegar.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** Not pertinent
5.5 **Short-Term Inhalation Limits:** Not pertinent
5.6 **Toxicity by Ingestion:** Grade 3; oral rat LD_{50} = 364 mg/kg
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** Not pertinent
5.9 **Liquid or Solid Irritant Characteristics:** Severe skin irritant. Causes second- and third-degree burns on short contact, and is very injurious to the eyes.
5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** Not flammable
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Dissolves with liberation of much heat, may steam and spatter.
7.2 **Reactivity with Common Materials:** When wet, attacks metals such as aluminum, tin, lead, and zinc to produce flammable hydrogen gas.
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Flush with water, rinse with dilute acetic acid.
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 80 ppm/24 hr/mosquito fish/TL m/fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Diamond Shamrock Corp.
Electro Chemicals Division
300 Union Commerce Bldg
Cleveland, Ohio 44115
2. Monsanto Co.
Monsanto Industrial Chemicals Co.
800 North Lindbergh Blvd.
St. Louis, Mo. 63166
3. Occidental Petroleum Corp.
Hooker Chemical Corp.
Industrial Chemicals Division
Niagara Falls, N.Y. 14302

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical flake, 85-90%; USP pellets, 85-90%
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

SS

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Corrosive Material
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	1

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid
13.2 **Molecular Weight:** 56.11
13.3 **Boiling Point at 1 atm:** Very high
13.4 **Freezing Point:** 716°F = 380°C = 653°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 2.04 at 15°C (solid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 9

PPG	PROPYLENE GLYCOL

Common Synonyms
1, 2-Propanediol
1, 2-Dihydroxypropane

Thick liquid — Colorless — Odorless

Mixes with water.

Stop discharge if possible. Keep people away.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
Extinguish with water, dry chemical, alcohol foam, or carbon dioxide.
Cool exposed containers with water.

Exposure

Not harmful.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4.)

Disperse and flush.

2. LABELS

No hazard label required by Code of Federal Regulations.

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** 1,2-Dihydroxypropane; Methylethylene glycol; 1,2-Propanediol
3.2 **Coast Guard Compatibility Classification:** Glycol
3.3 **Chemical Formula:** $CH_3CH(OH)CH_2OH$
3.4 **IMCO, United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Odorless

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Goggles
5.2 **Symptoms Following Exposure:** Liquid may irritate eyes.
5.3 **Treatment for Exposure:** Flush eyes with plenty of water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** Not pertinent
5.5 **Short-Term Inhalation Limits:** Not pertinent
5.6 **Toxicity by Ingestion:** Grade 2, LD_{50} 0.5 to 5 g/kg (mouse)
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors are nonirritating to the eyes and throat.
5.9 **Liquid or Solid Irritant Characteristics:** No appreciable hazard. Practically harmless to the skin.
5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** 210°F (C.C.) — 225°F (O.C.)
6.2 **Flammable Limits in Air:** [illegible]
6.3 **Fire Extinguishing Agents:** Water fog, alcohol foam, carbon dioxide, dry chemical
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** 760°F
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** [illegible]

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Not reactive
7.2 **Reactivity with Common Materials:** None
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not polymerizable
7.6 **Inhibitor of Polymerization:** None

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** 2.2% of theoretical in 5 days
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Dow Chemical Co., Midland, Mich. 48640
2. Quaker Oats Corp., 520 Alexander St., Princeton, N.J. 08540
3. Union Carbide Corp., Chemicals and Plastics Division, 270 Park Ave., New York, N.Y. 10017

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** USP, industrial, food (all 99+%)
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open (flame arrester)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 448-3.)

A P Q

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	0
Liquid or Solid Irritant	0
Poisons	0
Water Pollution	
Marine Toxicity	0
Aquatic Toxicity	1
Aesthetic Effect	1
Reactivity	
Other Chemicals	1
Water	0
Self Reactivity	0

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 76.10
13.3 **Boiling Point at 1 atm:** 369.1°F = 187.3°C = 460.5°K
13.4 **Freezing Point:** < −76°F = < −60°C = < 213°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.04 at 20°C (liquid)
13.8 **Liquid Surface Tension:** 36 dynes/cm = 0.036 N/m at 25°C
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.073
13.12 **Latent Heat of Vaporization:** 306 Btu/lb = 170 cal/g = 7.12×10^5 J/kg
13.13 **Heat of Combustion:** −10,410 Btu/lb = −5,728 cal/g = -239.8×10^5 J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

Continued on pages 5 and 6.

NOTES

REVISED 1978

PRR — PYRETHRINS

COMMON SYNONYMS			
Persian-insect powder Pyrethrum flowers Dalmation-insect powder	Viscous liquid Sinks in water	Yellow to brown	Characteristic odor of carrier

Avoid contact with liquid, vapor, or dust. Keep people away.
Wear goggles, self contained breathing apparatus, and rubber [illegible]
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

FIRE

Not flammable
POISONOUS GASES MAY BE PRODUCED IN FIRE OR WHEN HEATED.

Wear goggles and self contained breathing apparatus.

EXPOSURE

CALL FOR MEDICAL AID

VAPOR
Irritating to skin and eyes.
If inhaled, may cause sneezing, nasal discharge, and nasal stuffiness.

Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed may cause nausea, vomiting, headache, and other CNS disturbances.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

WATER POLLUTION

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4)

Issue warning - water contaminant.
Should be removed.
Chemical and physical treatment.
Disperse and flush.

2. LABELS

No hazard label required by Code of Federal Regulations.

3. CHEMICAL DESIGNATIONS

3.1 SYNONYMS: Persian insect powder, Pyrethrum flowers, Dalmation-insect powder
3.2 COAST GUARD COMPATIBILITY CLASSIFICATION: Not applicable
3.3 CHEMICAL FORMULA
$C_{21}H_{28}O_3$ - Pyrethrin I
$C_{22}H_{28}O_5$ - Pyrethrin II
$C_{20}H_{28}O_3$ - Cinerin I
$C_{21}H_{28}O_5$ - Cinerin II

(continued below)

4. OBSERVABLE CHARACTERISTICS

4.1 PHYSICAL STATE (AS SHIPPED): Viscous liquid
4.2 COLOR: Yellow to brown
4.3 ODOR: Characteristic odor of carrier

5. HEALTH HAZARDS

5.1 PERSONAL PROTECTIVE EQUIPMENT: Protective clothing and filter mask recommended.
5.2 SYMPTOMS FOLLOWING EXPOSURE: INHALATION: Sneezing, serous nasal discharge, nasal stuffiness. A few cases of extrinsic asthma have been reported. Rare anaphylactic reaction, peripheral vascular collapse and respiratory difficulty. EYES: May be irritating. SKIN: Contact dermatitis - a mild erythematous, vesicular dermatitis with papules in moist areas and intense pruritis. INGESTION: Excitation - to convulsions - to tetanic paralysis, muscular fibrillations, death from respiratory failure.
5.3 TREATMENT FOR EXPOSURE: Call a doctor. INHALATION: Symptomatic, antihistamines are of value. EYES: Flush with water. SKIN: Wash with soap and water. INGESTION: Gastric lavage followed by saline catharsis. For nervous manifestations pentobarbitol should be used. Diarrhea can be controlled with atropine sulfate.
5.4 TOXICITY BY INHALATION (THRESHOLD LIMIT VALUE): 5 mg/m^3
5.5 SHORT-TERM INHALATION LIMITS: 10 mg/m^3.
5.6 TOXICITY BY INGESTION: Grade 2, LD50: 0.5 to 5 g/kg.
5.7 LATE TOXICITY: May cause hypersensitive reaction, especially following previous sensitizing exposure. May cause eczematous dermatitis.
5.8 VAPOR (GAS) IRRITANT CHARACTERISTICS: Data not available
5.9 LIQUID OR SOLID IRRITANT CHARACTERISTICS: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of skin.
5.10 ODOR THRESHOLD: Data not available.

6. FIRE HAZARDS

6.1 FLASH POINT: Not flammable
6.2 FLAMMABLE LIMITS IN AIR: Not flammable
6.3 FIRE EXTINGUISHING AGENTS: Not pertinent
6.4 FIRE EXTINGUISHING AGENTS NOT TO BE USED: Not pertinent
6.5 SPECIAL HAZARDS OF COMBUSTION PRODUCTS: Highly toxic fumes are imminent
6.6 BEHAVIOR IN FIRE: Data not available
6.7 IGNITION TEMPERATURE: Not flammable
6.8 ELECTRICAL HAZARD: Not pertinent
6.9 BURNING RATE: Not flammable

7. CHEMICAL REACTIVITY

7.1 REACTIVITY WITH WATER: No reaction
7.2 REACTIVITY WITH COMMON MATERIALS: Data not available
7.3 STABILITY DURING TRANSPORT: Unstable in the presence of light, moisture and air
7.4 NEUTRALIZING AGENTS FOR ACIDS AND CAUSTICS: Data not available
7.5 POLYMERIZATION: Data not available
7.6 INHIBITOR OF POLYMERIZATION: Data not available

8. WATER POLLUTION

8.1 AQUATIC TOXICITY:
24 hour LC50 Rainbow trout = 0.56 ppm
24 hour LC50 Bluegills = 0.078 ppm
24 hour LC50 Mosquito fish = 0.027 ppm
24 hour LC50 Mosquito fish = 93 ppm
96 hour LC50 Bluegills = 74 ppm
96 hour LC50 Channel catfish = 80 ppm
96 hour LC50 Rainbow trout = 54 ppm
8.2 WATERFOWL TOXICITY: Oral LD50 Young mallards = >10,000 mg/kg
8.3 BIOLOGICAL OXYGEN DEMAND (BOD): Data not available
8.4 FOOD CHAIN CONCENTRATION POTENTIAL: None

9. SELECTED MANUFACTURERS

1. CPC International, Inc.
S. B. Penick and Company Division
Montville, NJ 07632

2. FMC Corporation
Niagra Chemical Division
Middleport, NY 14105

3. McLaughlin Gormley King Company
1715 S.E. Fifth Street
Minneapolis, MN 55414

10. SHIPPING INFORMATION

10.1 GRADES OR PURITY: Data not available
10.2 STORAGE TEMPERATURE: Cool
10.3 INERT ATMOSPHERE: Data not available
10.4 VENTING: Data not available

11. HAZARD ASSESSMENT CODE

(See Hazard assessment Handbook, CG 448-3)

AX

12. HAZARD CLASSIFICATIONS

12.1 CODE OF FEDERAL REGULATIONS: Not listed
12.2 NAS HAZARD RATING FOR BULK WATER TRANSPORTATION: Not listed
12.3 NFPA HAZARD CLASSIFICATIONS

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	1
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 PHYSICAL STATE AT 15°C AND 1 ATM: Liquid
13.2 MOLECULAR WEIGHT:
328.4 Pyrethrin I
372.4 Pyrethrin II
316.4 Cinerin I
360.4 Cinerin II
13.3 BOILING POINT AT 1 ATM: 0.1 mm (decomposes)
338°F = 170°C = 443.2°K (Pyrethrin I)
392°F = 200°C = 473.2°K (Pyrethrin II)
279°F = 137°C = 410.2°K (Cinerin I)
361°F = 183°C = 456.2°K (Cinerin II)
13.4 FREEZING POINT: Data not available
13.5 CRITICAL TEMPERATURE: Data not available
13.6 CRITICAL PRESSURE: Data not available
13.7 SPECIFIC GRAVITY: Data not available
13.8 LIQUID SURFACE TENSION: Data not available
13.9 LIQUID WATER INTERFACIAL TENSION: Data not available
13.10 VAPOR (GAS) SPECIFIC GRAVITY: Data not available
13.11 RATIO OF SPECIFIC HEATS OF VAPOR (GAS): Data not available
13.12 LATENT HEAT OF VAPORIZATION: Data not available
13.13 HEAT OF COMBUSTION: Data not available
13.14 HEAT OF DECOMPOSITION: Data not available
13.15 HEAT OF SOLUTION: Data not available
13.16 HEAT OF POLYMERIZATION: Data not available

3 CHEMICAL DESIGNATIONS (contd)

3.4 IMCO UNITED NATIONS NUMERICAL DESIGNATION
6.1:1615 (-5%)
9:1615 (-5%)

SHD

SODIUM HYDROXIDE

Common Synonyms
Caustic soda
Lye

Solid flakes or pellets **White** **Odorless**

Sinks and mixes with water

Avoid contact with solid and dust. Keep people away.
Wear rubber overclothing (including gloves).
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
May cause fire on contact with combustibles.
Flammable gas may be produced on contact with metals.

Wear rubber overclothing (including gloves).
Flood discharge area with water.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

DUST
Irritating to eyes, nose and throat.

Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.
IF IN EYES, hold eyelids open and flush with plenty of water.

SOLID
Will burn skin and eyes.
Harmful if swallowed.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

Dangerous to aquatic life in high concentrations.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning – corrosive.
Restrict access.
Disperse and flush.

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Caustic soda
3.2 **Coast Guard Compatibility Classification:** Not applicable
3.3 **Chemical Formula:** NaOH
3.4 **IMCO/United Nations Numerical Designation:** 8.0/1823

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid
4.2 **Color:** White
4.3 **Odor:** Odorless

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Chemical safety goggles, face shield, filter or dust type respirator, rubber boots, rubber gloves.
5.2 **Symptoms Following Exposure:** Strong corrosive action on contacted tissues. INHALATION: dust may cause damage to upper respiratory tract and lung itself, producing from nasal mucous irritation to pneumonitis. INGESTION: severe damage to mucous membranes, severe scar formation or perforation may occur. EYE CONTACT: produces severe damage.
5.3 **Treatment for Exposure:** INHALATION: remove from exposure, support respiration, call physician. INGESTION: give water or milk followed by dilute vinegar or fruit juice; do NOT induce vomiting. SKIN: wash immediately with large quantities of water under emergency safety shower while removing clothing, continue washing until medical help arrives, call physician. EYES: irrigate immediately with copious amounts of water for at least 15 min, call physician.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** Not pertinent
5.5 **Short-Term Inhalation Limits:** Not pertinent
5.6 **Toxicity by Ingestion:** (10% solution) oral rabbit LDL_0 = 500 mg/kg
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** Non-volatile
5.9 **Liquid or Solid Irritant Characteristics:** Severe skin irritant. Causes second- and third-degree burns on short contact and is very injurious to the eyes.
5.10 **Odor Threshold:** Not pertinent

6. FIRE HAZARDS

6.1 **Flash Point:** Not applicable
6.2 **Flammable Limits in Air:** Not applicable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** None
6.6 **Behavior in Fire:** None
6.7 **Ignition Temperature:** None
6.8 **Electrical Hazard:** None
6.9 **Burning Rate:** None

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Dissolves with [illegible] of much heat [illegible] of [illegible]
7.2 **Reactivity with Common Materials:** Will react with [illegible] to produce [illegible] hydrogen and [illegible] to produce [illegible] heat [illegible]
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Flush with water [illegible] dilute acetic acid
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
125 ppm/96 hr mosquitofish TLm, fresh water
[illegible] ppm/24 hr oysters lethal, salt water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

Diamond Shamrock Corp.
[illegible] Chemicals Division
Dallas, Texas [illegible]
Dow Chemical Co.
Midland, Michigan 48640
Ethyl Corporation
Petroleum Chemical Division
Baton Rouge, Louisiana [illegible]
Olin Corporation
Chemical Division
Brooklyn, Ohio 44203

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical flakes, USP pellets
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-2)

SS

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Corrosive Material
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	1

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid
13.2 **Molecular Weight:** 40.00
13.3 **Boiling Point at 1 atm:** Very high
13.4 **Freezing Point:** 318.4°C = 591.5°F = 591.5°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 2.13 at 20°C (solid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

SHC — SODIUM HYPOCHLORITE

Common Synonyms
Clorox
Liquid bleach

Watery liquid — Green to yellow — Bleaching liquid odor

Sinks and mixes with water.

Stop discharge if possible.
Avoid contact with liquid.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.

Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.
LIQUID
Irritating to skin and eyes.
Harmful if swallowed.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk, and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Harmful to aquatic life in very low concentrations.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — corrosive
Disperse and flush

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Clorox
Liquid bleach

3.2 **Coast Guard Compatibility Classification:** Not applicable

3.3 **Chemical Formula:** $NaOCl \cdot H_2O$

3.4 **IMCO/United Nations Numerical Designation:** 8.0/1791

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Green-yellow

4.3 **Odor:** Like bleach solution

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Rubber gloves, goggles

5.2 **Symptoms Following Exposure:** Liquid can be irritating to skin and eyes if contact is maintained

5.3 **Treatment for Exposure:** INGESTION: induce vomiting, give water, and repeat. SKIN: wash off contacted skin area. EYES: flush with plenty of water for 15 min. and consult a physician

5.4 **Toxicity by Inhalation (Threshold Limit Value):** Not pertinent

5.5 **Short-Term Inhalation Limits:** Not pertinent

5.6 **Toxicity by Ingestion:** Grade 1; oral rat LD_{50} = 8.91 g/kg

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Slight irritation of eyes and mucous membranes

5.9 **Liquid or Solid Irritant Characteristics:** Irritates eyes and skin on prolonged contact

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable

6.2 **Flammable Limits in Air:** Not flammable

6.3 **Fire Extinguishing Agents:** Not pertinent

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** May decompose generating irritating chlorine gas

6.7 **Ignition Temperature:** Not flammable

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Destroy with sodium bisulfite or hypo and water; then neutralize with soda ash

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** None

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Clorox Co.
7901 Oakport St.
Oakland, Calif. 94621
2. Purex Corp. Ltd.
5101 Clark Ave.
Lakewood, Calif. 90712
3. Sobin Chemicals, Inc.
Sobin Park
Boston, Mass. 02210

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Several grades and concentrations, typified by ordinary household bleach

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A P

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** Not applicable

13.3 **Boiling Point at 1 atm:** Decomposes

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.06 at 20°C (liquid)

13.8 **Liquid Surface Tension:** Not pertinent

13.9 **Liquid-Water Interfacial Tension:** Not pertinent

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** Not pertinent

13.13 **Heat of Combustion:** Not pertinent

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** (est.) −90 Btu/lb = −50 cal/g = -2×10^5 J/kg

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVI[illegible]78

SFA — SULFURIC ACID

Common Synonyms
Oil of vitriol
Battery acid
Fertilizer acid

Oily liquid — Colorless — Odorless

Sinks and mixes violently with water. Irritating mist is produced

AVOID CONTACT WITH LIQUID. Keep people away.
Wear goggles, self-contained breathing apparatus, and rubber overclothing.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
May cause fire on contact with combustibles.
Flammable gas may be produced on contact with metals.
POISONOUS GAS MAY BE PRODUCED IN FIRE.
Wear goggles, self-contained breathing apparatus, and rubber overclothing.
DO NOT USE WATER ON ADJACENT FIRES.
Extinguish with dry chemical or carbon dioxide.

Exposure

CALL FOR MEDICAL AID

MIST
Irritating to eyes, nose and throat.
If inhaled, will cause coughing, difficult breathing, or loss of consciousness.
Move to fresh air.
IF IN EYES, hold eyelids open and flush with plenty of water.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4)

Issue warning: corrosive
Restrict access
Disperse and flush with care

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Battery acid, Chamber acid, Fertilizer acid, Oil of vitriol
3.2 **Coast Guard Compatibility Classification:** Sulfuric acid
3.3 **Chemical Formula:** H_2SO_4
3.4 **IMCO/United Nations Numerical Designation:** 8 0/1830

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless (pure) to dark brown
4.3 **Odor:** Odorless unless hot, then choking

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Safety shower, eyewash fountain, safety goggles, face shield, approved respirator (self-contained or air-line), rubber safety shoes, rubber apron
5.2 **Symptoms Following Exposure:** Inhalation of vapor from hot, concentrated acid may injure lungs. Swallowing may cause severe injury or death. Contact with skin or eyes causes severe burns.
5.3 **Treatment for Exposure:** Call a doctor. INHALATION: observe victim for delayed pulmonary reaction. INGESTION: have victim drink water if possible, do NOT induce vomiting. EYES AND SKIN: wash with large amounts of water for at least 15 min; do not use oils or ointments in eyes; treat skin burns.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 1 mg/m³
5.5 **Short-Term Inhalation Limits:** 10 mg/m³ for 5 min; 5 mg/m³ for 10 min; 2 mg/m³ for 30 min; 1 mg/m³ for 60 min
5.6 **Toxicity by Ingestion:** No effects except those secondary to tissue damage
5.7 **Late Toxicity:** None
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors from hot acid (77-98%) cause moderate irritation of eyes and respiratory system. Effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** 77-98% acid causes severe second- and third-degree burns of skin on short contact and is very injurious to the eyes.
5.10 **Odor Threshold:** Greater than 1 mg/m³

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Water used on adjacent fires should be carefully handled.
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Not flammable
6.7 **Ignition Temperature:** Not flammable
6.8 **Electrical Hazard:** None
6.9 **Burning Rate:** Not flammable

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Reacts violently with evolution of heat. Spattering occurs when water is added to the compound.
7.2 **Reactivity with Common Materials:** Extremely hazardous in contact with many materials, particularly metals and combustibles. Dilute acid reacts with most metals, releasing hydrogen which can form explosive mixtures with air in confined spaces.
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Dilute with water, then neutralize with lime, limestone, or soda ash.
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 24.5 ppm/24 hr/bluegill/lethal/fresh water; 42.5 ppm/48 hr/prawn/LC_{50}/salt water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Allied Chemical Corp
   Industrial Chemicals Division
   P. O. Box 1139R
   Morristown, N. J. 07960
2. Cities Service Co., Inc.
   North American Chemicals and Metals Group
   60 Wall St.
   New York, N. Y. 10005
3. E. I. duPont de Nemours & Co., Inc.
   Explosives Dept.
   Wilmington, Del. 19898

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** C.P., U.S.P., Technical, at 33% to 98% (50° Be to 66° Be)
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-2)

X P O

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Corrosive Material
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	0
Health	
Vapor Irritant	2
Liquid or Solid Irritant	4
Poisons	2
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	4
Water	3
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	2
	W

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 98.08
13.3 **Boiling Point at 1 atm:** 644°F = 340°C = 613 K
13.4 **Freezing Point:** Not pertinent
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.84 at 20°C (liquid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** −418.0 Btu/lb = −232.2 cal/g = −9.715 × 10⁵ J/kg
13.16 **Heat of Polymerization:** Not pertinent

*Physical properties apply to concentrated (98%) acid unless otherwise stated. More dilute acid is more water-like.

(Continued on pages 5 and 6)

NOTES

REVISED 1978

TML

TETRAMETHYL LEAD

Common Synonyms
Lead tetramethyl

Oily liquid | Colorless | Fruity odor

Sinks in water. Poisonous, flammable vapor is produced.

AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Stop discharge if possible.
Call fire department.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
Containers may explode in fire.
Vapor may explode if ignited in an enclosed area.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Combat fires from behind barrier or protected location.
Extinguish with water, dry chemicals, foam, or carbon dioxide.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
POISONOUS IF INHALED.
Irritating to eyes.
Move to fresh air.
If breathing has stopped, give artifical respiration.
If breathing is difficult, give oxygen.

LIQUID
POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED.
Will burn eyes.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning: poison, water contaminant
Restrict access
Should be removed
Chemical and physical treatment

2. LABEL

POISON

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Lead tetramethyl
3.2 **Coast Guard Compatibility Classification:** Special class
3.3 **Chemical Formula:** $Pb(CH_3)_4$
3.4 **IMCO/United Nations Numerical Designation:** 6.1, 1649

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Dyed red or other distinctive color
4.3 **Odor:** Faint fruity odor

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor canister face mask for short periods; air line mask for longer periods; protective goggles or face shield; neoprene-coated protective gloves; rubber shoes or boots; white or light-colored clothing
5.2 **Symptoms Following Exposure:** Increased urinary output of lead. If inhaled or absorbed by skin, may cause insomnia, excitability, delirium, coma, and death. Do not confuse with inorganic lead
5.3 **Treatment for Exposure:** Remove victim from contaminated area. SKIN: wash with kerosene or similar petroleum distillate, followed by soap and water; consult physician immediately
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 0.15 mg/m³
5.5 **Short-Term Inhalation Limits:** Data not available
5.6 **Toxicity by Ingestion:** Grade 3; oral rat LD_{50} = 109 mg/kg
5.7 **Late Toxicity:** Lead poisoning
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary
5.9 **Liquid or Solid Irritant Characteristics:** Causes smarting of the skin and first degree burns on short exposure; may cause secondary burns on long exposure
5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** 100°F (O.C.)
6.2 **Flammable Limits in Air:** Data not available
6.3 **Fire Extinguishing Agents:** Water, foam, dry chemical, or carbon dioxide
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Toxic gases are generated in fire
6.6 **Behavior in Fire:** May explode
6.7 **Ignition Temperature:** Data not available
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Data not available

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable; to decompose at about 212°F. If confined may explode or deflagrate at high temperatures
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** Data not available
8.4 **Food Chain Concentration Potential:** Data not available

9. SELECTED MANUFACTURERS

1. Ethyl Corp.
Industrial Chemicals Division
451 Florida St.
Baton Rouge, La. 70801
2. E. I. duPont de Nemours & Co., Inc.
Petroleum Chemicals Division
Vernon, Calif. 90058
3. PPG Industries Inc.
Houston Chemical Co. Division
Beaumont, Tex. 77704

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

X X Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Poisonous liquid or solid, Class B
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	4
Flammability (Red)	1
Reactivity (Yellow)	4

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 267.33
13.3 **Boiling Point at 1 atm:** 230°F = 110°C = 383°K
13.4 **Freezing Point:** −13°F = −27.8°C = 245.2°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.999 at 20°C (liquid)
13.8 **Liquid Surface Tension:** Data not available
13.9 **Liquid-Water Interfacial Tension:** Data not available
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** (est.) 555 Btu/lb = 308 cal/g = 1.29 × 10⁶ J/kg
13.13 **Heat of Combustion:** (est.) −5290 Btu/lb = −2940 cal/g = −12.3 × 10⁶ J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

TOL	TOLUENE

Common Synonyms
Toluol
Methylbenzene
Methylbenzol

Watery liquid — Colorless — Pleasant odor

Floats on water. Flammable, irritating vapor is produced.

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to "knock down" vapor.
Avoid contact with liquid and vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.

Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemical, foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause nausea, vomiting, headache, dizziness, difficult breathing, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea, vomiting or loss of consciousness.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

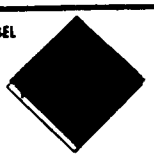
Dangerous to aquatic life in high concentrations.
Fouling to shoreline.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — high flammability
Evacuate area

2. LABEL



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Methylbenzene, Methylbenzol, Toluol
3.2 **Coast Guard Compatibility Classification:** Aromatic hydrocarbon
3.3 **Chemical Formula:** $C_6H_5CH_3$
3.4 **IMCO/United Nations Numerical Designation:** 3.2, 1294

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Pungent, aromatic, benzene-like, distinct, pleasant

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Air-supplied mask, goggles or face shield, plastic gloves
5.2 **Symptoms Following Exposure:** Vapors irritate eyes and upper respiratory tract, cause dizziness, headache, anesthesia, respiratory arrest. Liquid irritates eyes and causes drying of skin. If aspirated, causes coughing, gagging, distress, and rapidly developing pulmonary edema. If ingested causes vomiting, griping, diarrhea, depressed respiration.
5.3 **Treatment for Exposure:** INHALATION: remove to fresh air, give artificial respiration and oxygen if needed; call a doctor. INGESTION: do NOT induce vomiting; call a doctor. EYES: flush with water for at least 15 min. SKIN: wipe off, wash with soap and water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 100 ppm
5.5 **Short-Term Inhalation Limits:** 600 ppm for 30 min
5.6 **Toxicity by Ingestion:** Grade 2, LD_{50} 0.5 to 5 g/kg
5.7 **Late Toxicity:** Kidney and liver damage may follow ingestion
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
5.10 **Odor Threshold:** 0.17 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 40.0°C (55.4°F) CC
6.2 **Flammable Limits in Air:** 1.27 – 7
6.3 **Fire Extinguishing Agents:** Carbon dioxide or dry chemical; foam; mist; fires involving tanks or large lots
6.4 **Fire Extinguishing Agents Not to be Used:** Water in a solid stream
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:** Vapor mixes with air and may travel along ground; ignite distant; ignite source of ignition and flashback
6.7 **Ignition Temperature:** 896°F
6.8 **Electrical Hazard:** Class I, Group D
6.9 **Burning Rate:** 5.0 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 1180 mg/l, 96 hr, sunfish, TL_{50}, fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** 0% 5 days, 30% theor. 28 days
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Exxon Chemical Co., Houston, Tex. 77001
2. Shell Chemical Co., Petrochemicals Division, Houston, Tex. 77001
3. Sun Oil Co., St. Davids, Pa. 19087

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Research, reagent, nitration — all 99.8+% industrial contains 94+% with 5% xylene and small amounts of benzene and nonaromatic hydrocarbons; 90/120 less pure than industrial
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open (flame arrester) or pressure vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-5)

A.1.1

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	1
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	0
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 92.14
13.3 **Boiling Point at 1 atm:** 231.1°F = 110.6°C = 383.8°K
13.4 **Freezing Point:** −139°F = −95.0°C = 178.2°K
13.5 **Critical Temperature:** 605.4°F = 318.6°C = 591.8°K
13.6 **Critical Pressure:** 596.1 psia = 40.55 atm = 4.108 MN/m²
13.7 **Specific Gravity:** 0.867 at 20°C (liquid)
13.8 **Liquid Surface Tension:** 29.0 dynes/cm = 0.0290 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** 36.1 dynes/cm = 0.0361 N/m at 25°C
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.089
13.12 **Latent Heat of Vaporization:** 155 Btu/lb = 86.1 cal/g = 3.61 × 10⁵ J/kg
13.13 **Heat of Combustion:** −17,430 Btu/lb = −9686 cal/g = −405.5 × 10⁵ J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

TLI

o-TOLUIDINE

Common Synonyms
2-Amino-1-methylbenzene
2-Aminotoluene
2-Methylaniline
o-Methylaniline

Liquid | Colorless to yellow-brown | Chemical odor

May float or sink in water.

Avoid contact with liquid. Keep people away.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES MAY BE PRODUCED IN FIRE
Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemicals, foam or carbon dioxide
Water may be ineffective on fire.
Cool exposed containers with water

Exposure

CALL FOR MEDICAL AID

LIQUID
Irritating to skin and eyes.
If swallowed with deep coma, vomiting, or loss of consciousness
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water
IF IN EYES, hold eyelids open and flush with plenty of water
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm

Water Pollution

Effect of low concentrations on aquatic life is unknown
Fouling to shoreline
May be dangerous if it enters water intakes
Notify local health and wildlife officials
Notify operators of nearby water intakes

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook CG 446-4)

Issue warning - water contaminant
Restrict access
Mechanical containment
Should be removed
Chemical and physical treatment

2. LABELS

No hazard label required by Code of Federal Regulations

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** 2-Amino-1-methylbenzene, 2-Aminotoluene, 2-Methylaniline, o-Methylaniline

3.2 **Coast Guard Compatibility Classification:** Not listed

3.3 **Chemical Formula:** $1,2\text{-}CH_3C_6H_4NH_2$

3.4 **IMCO/United Nations Numerical Designation:** 6.1/1708

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Clear to light yellow, turns yellow brown or deep red on exposure to air and light

4.3 **Odor:** Aromatic, aniline like

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Chemical safety goggles, face shield, Bu. Mines approved respirator, leather or rubber safety shoes, butyl rubber gloves

5.2 **Symptoms Following Exposure:** Absorption of toxic quantities by any route causes cyanosis (blue discoloration of lips, nails, skin), nausea, vomiting, and coma may follow. Repeated inhalation of low concentrations may cause pallor, low grade secondary anemia, fatigability and loss of appetite. Contact with eyes causes irritation

5.3 **Treatment for Exposure:** Get medical attention following all exposures to this compound. INHALATION: move to fresh air. INGESTION: if victim is conscious, promptly induce vomiting by giving lukewarm soapy water or mustard and water. EYES: flush with copious amounts of water for at least 15 min., holding lids apart. SKIN: remove all contaminated clothing, wash affected areas immediately and thoroughly with plenty of warm water and soap

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 5 ppm

5.5 **Short-Term Inhalation Limits:** Data not available

5.6 **Toxicity by Ingestion:** Grade 2, oral LD_{50} = 900 mg/kg (rat)

5.7 **Late Toxicity:** Causes tumors in urinary bladder of rats

5.8 **Vapor (Gas) Irritant Characteristics:** Data not available

5.9 **Liquid or Solid Irritant Characteristics:** Data not available

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** 167°F (C.C.), 85°F (C.C.)

6.2 **Flammable Limits in Air:** Data not available

6.3 **Fire Extinguishing Agents:** Foam, dry chemical, or carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective

6.5 **Special Hazards of Combustion Products:** Toxic oxides of nitrogen and flammable vapors may form in fire

6.6 **Behavior in Fire:**

6.7 **Ignition Temperature:** 900°F

6.8 **Electrical Hazard:** Data not available

6.9 **Burning Rate:** 3.62 cm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:**

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 180 ppm * fish lethal, fresh water
* Time period not specified

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** 1.43% 5 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. First Chemical Corp.
656 N. State St.
Jackson, Miss. 39205
2. E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del. 19898
3. Aldrich Chemical Co.
940 W. Saint Paul Ave.
Milwaukee, Wis. 53233

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Commercial, 99.5+%

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester)

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

A P Q T E N Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed

12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	2
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 107.2

13.3 **Boiling Point at 1 atm:** 392°F = 200°C = 473°K

13.4 **Freezing Point:** 11°F = −24°C = 249°K

13.5 **Critical Temperature:** 790°F = 421°C = 694°K

13.6 **Critical Pressure:** 544 psia = 37.0 atm = 3.75 MN/m²

13.7 **Specific Gravity:** 0.998 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 43.55 dynes/cm = 0.04355 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** Data not available

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent

13.12 **Latent Heat of Vaporization:** 179.1 Btu/lb = 99.5 cal/g = 4.16 × 10⁵ J/kg

13.13 **Heat of Combustion:** −16,180 Btu/lb = −8,990 cal/g = −3.76 × 10⁷ J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

TRICHLOROETHANE

Common Synonyms			
1,1,1-Trichloroethane Methylchloroform	Watery liquid	Colorless	Sweet odor
	Sinks in water. Irritating vapor is produced.		

Stop discharge if possible. Keep people away.
Avoid contact with liquid and vapor.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES ARE PRODUCED IN FIRE
Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemical, carbon dioxide, or foam.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause dizziness or difficult breathing.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to [illegible]
If swallowed, [illegible]
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink [illegible] or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING [illegible] VULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Should be removed.
Chemical and physical treatment.

2. LABELS

No hazard label required by Code of Federal Regulations.

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Aerothene
Chlorothene
Methyl chloroform
1,1,1-Trichloroethane

3.2 **Coast Guard Compatibility Classification:** * Halogenated hydrocarbon

3.3 **Chemical Formula:** CH_3CCl_3

3.4 **IMCU/United Nations Numerical Designation:** Not listed

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Chloroform-like, sweetish

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor-acid gas canister, self-contained breathing apparatus for emergencies; neoprene or polyvinyl-alcohol type gloves, chemical safety goggles and face shield; neoprene safety shoes (or leather safety shoes plus neoprene footwear); neoprene or polyvinyl alcohol suit or apron for splash protection.

5.2 **Symptoms Following Exposure:** INHALATION: symptoms range from loss of equilibrium and incoordination to loss of consciousness; high concentration can be fatal due to simple asphyxiation combined with loss of consciousness. INGESTION: produces effects similar to inhalation and may cause some feeling of nausea. EYES: slightly irritating and lachrymatory. SKIN: defatting action may cause dermatitis.

5.3 **Treatment for Exposure:** Get medical attention for all eye exposures and any other serious over exposures. Do NOT administer adrenalin or epinephrine; otherwise, treatment is symptomatic. INHALATION: remove victim to fresh air, if necessary, apply artificial respiration and/or administer oxygen. INGESTION: have victim drink water and induce vomiting. EYES: flush thoroughly with water. SKIN: remove contaminated clothing and wash exposed area thoroughly with soap and warm water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 350 ppm

5.5 **Short-Term Inhalation Limits:** 1000 ppm for 60 min. in man

Toxicity by Ingestion: Grade 1; LD_{50} 5 to 15 g/kg (rat, mouse, rabbit, guinea pig)

5.7 **Late Toxicity:** Data not available

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

(Continued on page 4)

6. FIRE HAZARDS

6.1 **Flash Point:** Data not available

6.2 **Flammable Limits in Air:** 7% - 16%

6.3 **Fire Extinguishing Agents:** Dry chemical, foam, or carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent

6.5 **Special Hazards of Combustion Products:** Toxic and irritating gases are generated in fires.

6.6 **Behavior in Fire:** Not pertinent

6.7 **Ignition Temperature:** 932°F

6.8 **Electrical Hazard:** Not pertinent

6.9 **Burning Rate:** (est.) 2.9 mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Reacts slowly, releasing corrosive hydrochloric acid

7.2 **Reactivity with Common Materials:** Corrodes aluminum, but reaction is not hazardous.

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 75 - 150 ppm * pinfish; 11 m/salt water
* Time period not specified

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** Data not available

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Dow Chemical Co.
Midland, Mich. 48640
2. PPG Industries, Inc.
Industrial Chemicals Division
1 Gateway Center
Pittsburgh, Pa. 15222
3. Vulcan Materials Co.
Chemicals Division
Wichita, Kan. 67201

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Uninhibited, inhibited, industrial, inhibited, white, room, cold, cleaning

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Pressure/vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A X Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 133.41

13.3 **Boiling Point at 1 atm:** 165°F = 74°C = 347°K

13.4 **Freezing Point:** < -38°F = < -39°C = < 234°K

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 1.31 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 25.4 dynes/cm = 0.0254 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** (est.) 45 dynes/cm = 0.045 N/m at 20°C

13.10 **Vapor (Gas) Specific Gravity:** 4.6

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.104

13.12 **Latent Heat of Vaporization:** 100 Btu/lb = 58 cal/g = 2.4 × 10^5 J/kg

13.13 **Heat of Combustion:** (est.) 4700 Btu/lb = 2600 cal/g = 110 × 10^5 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

5. HEALTH HAZARDS (Cont'd.)

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** 100 ppm

REVISED 1978

TCL — TRICHLOROETHYLENE

Common Synonyms
Trichloroethene
Trichlor

Watery liquid | Colorless | Sweet odor

Sinks in water. Irritating vapor is produced.

Stop discharge if possible. Keep people away.
Avoid contact with liquid and vapor.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES ARE PRODUCED IN FIRE.
Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemical, carbon dioxide, or foam.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause nausea, vomiting, difficult breathing, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea, vomiting, difficult breathing, or loss of consciousness.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook CG 446-4)

Should be removed.
Chemical and physical treatment.

2. LABELS

No hazard label required by Code of Federal Regulations.

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Algylen, Chlorylen, Gemalgene, Threthylene, Trethylene, Tri, Trichloran, Trichloroethene, Tri Clene, Trielene, Trilene, Triline, Trimar
3.2 **Coast Guard Compatibility Classification:** Halogenated hydrocarbon
3.3 **Chemical Formula:** $CHCl=CCl_2$
3.4 **IMCO/United Nations Numerical Designation:** 9.0/1710

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Colorless
4.3 **Odor:** Chloroform-like, ethereal

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor/acid gas canister, self-contained breathing apparatus for emergencies, neoprene or vinyl gloves, chemical safety goggles, face shield, neoprene safety shoes, neoprene suit or apron for splash protection.
5.2 **Symptoms Following Exposure:** INHALATION: symptoms range from irritation of the nose and throat to nausea, an attitude of irresponsibility, blurred vision, and finally disturbance of central nervous system resulting in cardiac failure. Chronic exposure may cause organic injury. INGESTION: symptoms similar to inhalation. SKIN: defatting action can cause dermatitis. EYES: slightly irritating sensation and lachrymation.
5.3 **Treatment for Exposure:** Do NOT administer adrenalin or epinephrine; get medical attention for all cases of overexposure. INHALATION: remove victim to fresh air, if necessary, apply artificial respiration and/or administer oxygen. INGESTION: have victim drink water and induce vomiting, repeat three times, then give 1 tablespoon epsom salts in water. EYES: flush thoroughly with water. SKIN: wash thoroughly with soap and warm water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 100 ppm
5.5 **Short-Term Inhalation Limits:** 200 ppm for 30 min
5.6 **Toxicity by Ingestion:** Grade 3, LD_{50} 50 to 500 mg/kg
5.7 **Late Toxicity:** Data not available
5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
5.10 **Odor Threshold:** 50 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 90°F (C.C.) practically nonflammable
6.2 **Flammable Limits in Air:** N.D.
6.3 **Fire Extinguishing Agents:** Water fog
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Toxic and irritating gases are produced in fire situations.
6.6 **Behavior in Fire:** Not pertinent
6.7 **Ignition Temperature:** 770°F
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not pertinent

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** No reaction
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 660 mg/l/40 hr daphnia kill fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** Data not available
8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Dow Chemical Co.
Midland, Mich. 48640
2. E. I. duPont de Nemours & Co., Inc.
Electrochemicals Dept.
Wilmington, Del. 19898
3. PPG Industries Inc.
Industrial Chemical Division
Lake Charles, La. 70601

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical, dry cleaning, degreasing, extraction
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

A-X-Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** ORM-A
12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	1
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	1
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self Reaction	1

12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 131.39
13.3 **Boiling Point at 1 atm:** 189°F = 87°C = 360°K
13.4 **Freezing Point:** −123.5°F = −86.4°C = 186.8°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.46 at 20°C (liquid)
13.8 **Liquid Surface Tension:** 29.3 dynes/cm = 0.0293 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** 34.5 dynes/cm = 0.0345 N/m at 24°C
13.10 **Vapor (Gas) Specific Gravity:** 4.5
13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.116
13.12 **Latent Heat of Vaporization:** 103 Btu/lb = 57.2 cal/g = 2.40×10^5 J/kg
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

Continued on pages 5 and 6

NOTES

REVISED 1978

XLM

m-XYLENE

Common Synonyms
4, 3-Dimethylbenzene
Xylol

Watery liquid — Colorless — Sweet odor

Floats on water. Flammable, irritating vapor is produced.

Stop discharge if possible. Keep people away.
Call fire department.
Avoid contact with liquid and vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Wear self-contained breathing apparatus.
Extinguish with foam, dry chemical, or carbon dioxide
Water may be ineffective on fire
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose, and throat.
If inhaled, will cause headache, difficult breathing, or loss of consciousness.

Move to fresh air
If breathing has stopped, give artificial respiration
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea, vomiting, or loss of consciousness

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS
Floating to shoreline.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning — high flammability
Evacuate area
Should be removed
Chemical and physical treatment

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** 1,3-Dimethylbenzene
Xylol

3.2 **Coast Guard Compatibility Classification:** Aromatic hydrocarbon

3.3 **Chemical Formula:** m-$C_6H_4(CH_3)_2$

3.4 **NIOSH/Method Sampling Numerical Designation:** 3.2/1307

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless

4.3 **Odor:** Like benzene, characteristic aromatic

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Approved canister or air-supplied mask, goggles or face shield; plastic gloves and boots

5.2 **Symptoms Following Exposure:** Vapors cause headache and dizziness. Liquid irritates eyes and skin. If taken into lungs, causes severe coughing, distress, and rapidly developing pulmonary edema. If ingested, causes nausea, vomiting, cramps, headache, and coma; can be fatal. Kidney and liver damage can occur.

5.3 **Treatment for Exposure:** INHALATION: remove to fresh air, administer artificial respiration and oxygen if required, call a doctor. INGESTION: do NOT induce vomiting, call a doctor. EYES: flush with water for at least 15 min. SKIN: wipe off, wash with soap and water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 100 ppm

5.5 **Short-Term Inhalation Limits:** 300 ppm for 30 min

5.6 **Toxicity by Ingestion:** Grade 3, LD_{50} to 500 g/kg

5.7 **Late Toxicity:** Kidney and liver damage

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** 0.05 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** 84°F C.C.

6.2 **Flammable Limits in Air:** 1.1% - 6.4

6.3 **Fire Extinguishing Agents:** Foam, dry chemical, or carbon dioxide

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective

6.5 **Special Hazards of Combustion Products:** Not pertinent

6.6 **Behavior in Fire:** Vapors heavier than air and may travel considerable distance to a source of ignition and flashback

6.7 **Ignition Temperature:** 986°F

6.8 **Electrical Hazard:** Class I, Group D

6.9 **Burning Rate:** [illegible] mm/min

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Nonreactive

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 22 ppm/96 hr/bluegill/TLm/fresh water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** 0 lb/lb, 5 days, 0% (theor.), 8 days

8.4 **Food Chain Concentration Potential:** Data not available

9. SELECTED MANUFACTURERS

1. ARCO Chemical Co
   260 South Broad St
   Philadelphia, Pa. 19101
2. Chevron Chemical Co
   Industrial Chemicals Division
   200 Bush St
   San Francisco, Calif. 94120
3. Fallek Chemical Corp
   460 Park Ave
   New York, N.Y. 10022

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Research, 99.99%; Pure, 99.9%; Technical, 99.2%

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-3)

A-T-U

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	3
Aesthetic Effect	2
Reactivity	
Other Chemicals	1
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	2
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** 106.16

13.3 **Boiling Point at 1 atm:** 269.4°F = 131.9°C = 405.1°K

13.4 **Freezing Point:** −54.2°F = −47.9°C = 225.3°K

13.5 **Critical Temperature:** 650.8°F = 343.8°C = 617.0°K

13.6 **Critical Pressure:** 513.8 atm = 34.95 psia = 3.540 MN/m²

13.7 **Specific Gravity:** 0.864 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 28.6 dynes/cm = 0.0286 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** 36.4 dynes/cm = 0.0364 N/m at 30°C

13.10 **Vapor (Gas) Specific Gravity:** Not pertinent

13.11 **Ratio of Specific Heats of Vapor (Gas):** 1.071

13.12 **Latent Heat of Vaporization:** 147 Btu/lb = 81.9 cal/g = 3.43 × 10³ J/kg

13.13 **Heat of Combustion:** −17,554 Btu/lb = −9752.4 cal/g = −408.31 × 10³ J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

REVISED 1978

ZCR — ZINC CHROMATE

Common Synonyms			
Zinc chromate(VI) hydroxide Zinc yellow Buttercup yellow	Solid Sinks in water.	Yellow	Odorless

Avoid contact with solid and dust. Keep people away.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.

Exposure

CALL FOR MEDICAL AID

DUST
Irritating to eyes, nose and throat.
If inhaled will cause coughing or difficult breathing.
If in eyes, hold eyelids open and flush with plenty of water.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

SOLID
Irritating to skin and eyes.
If swallowed will cause nausea and vomiting.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook CG 446-4)

Should be removed.
Chemical and physical treatment.

2. LABELS

No hazard label required by Code of Federal Regulations.

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Buttercup yellow, Zinc chromate(VI) hydroxide, Zinc yellow.
3.2 **Coast Guard Compatibility Classification:** Not listed.
3.3 **Chemical Formula:** (approx.) $4ZnO \cdot K_2O \cdot 4CrO_3 \cdot 3H_2O$
3.4 **IMCO/United Nations Numerical Designation:** Not listed.

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid
4.2 **Color:** Yellow
4.3 **Odor:** None

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Suitable respirator (for dust), rubber gloves, chemical goggles or face shield.
5.2 **Symptoms Following Exposure:** Inhalation of dust causes irritation of nose and throat. Ingestion can cause irritation or corrosion of the alimentary tract, circulatory collapse, and toxic nephritis. Contact with eyes or skin causes irritation.
5.3 **Treatment for Exposure:** INHALATION: move to fresh air; if exposure has been severe, get medical attention. INGESTION: induce vomiting followed by prompt and complete gastric lavage, catharsis, and demulcents. EYES: flush with water. SKIN: wash thoroughly with soap and water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** 0.1 mg/m³
5.5 **Short-Term Inhalation Limits:** Data not available
5.6 **Toxicity by Ingestion:** Grade 2, LD_{50} 0.5 - 5 g/kg
5.7 **Late Toxicity:** Possible lung cancer
5.8 **Vapor (Gas) Irritant Characteristics:** Data not available
5.9 **Liquid or Solid Irritant Characteristics:** Data not available
5.10 **Odor Threshold:** Odorless

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Not pertinent
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Not pertinent
6.6 **Behavior in Fire:**
6.7 **Ignition Temperature:** Not pertinent
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not pertinent

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:**
7.3 **Stability During Transport:** Stable
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** None
8.4 **Food Chain Concentration Potential:** Both chromium and zinc are concentrated by some organisms but are not considered to be bioconcentrative in a spill situation.

9. SELECTED MANUFACTURERS

1. Mineral Pigments Corp
   7011 Muirkirk Road
   Beltsville, Md 20705
2. Fisher Scientific Co
   711 Forbes Ave
   Pittsburgh, Pa 15219
3. Pfaltz and Bauer, Inc
   375 Fairfield Ave
   Stamford, Conn 06902

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Commercial, 100%
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Open

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook CG 446-3)

SS

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Not listed
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	0
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid
13.2 **Molecular Weight:** 874 (approx.)
13.3 **Boiling Point at 1 atm:** Not pertinent (decomposes)
13.4 **Freezing Point:** Not pertinent
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 3.43 at 20°C (solid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** Not pertinent
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

PP

ZINC PHOSPHIDE

Common Synonyms	Solid	Grey to black	Faint odor
	Sinks in water		

Avoid contact with solid and dust. Keep people away.
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
Irritating gases may be produced when heated.

Exposure

CALL FOR MEDICAL AID.
DUST
Irritating to eyes, nose and throat.
If inhaled will cause dizziness, difficult breathing, or loss of consciousness.

If in eyes, hold eyelids open and flush with plenty of water.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.
SOLID
POISONOUS IF SWALLOWED.
Irritating to skin and eyes.
If swallowed will cause dizziness, nausea, vomiting or loss of consciousness.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

Effect of low concentrations on aquatic life is unknown.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-4)

Issue warning: poison, water contaminant, air contaminant
Restrict access
Should be removed
Chemical and physical treatment

2. LABEL

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** No common synonyms
3.2 **Coast Guard Compatibility Classification:** Not listed
3.3 **Chemical Formula:** Zn_3P_2
3.4 **IMCO/United Nations Numerical Designation:** 6.1, 1714

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Solid
4.2 **Color:** Gray or gray black
4.3 **Odor:** Faint phosphorus

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Dust mask or self contained breathing apparatus, goggles or face shield; protective gloves
5.2 **Symptoms Following Exposure:** When inhaled or ingested, compound releases phosphine, which causes faintness, weakness, nausea, vomiting, dyspnea, fall in blood pressure, change in pulse rate, diarrhea, intense thirst, convulsions, paralysis, and coma. Contact with eyes or skin causes irritation.
5.3 **Treatment for Exposure:** INHALATION: move to fresh air, give artificial respiration if required, get medical attention for phosphine poisoning. INGESTION: give one tablespoonful of mustard in a glass of warm water, repeat until vomit fluid is clear, avoid use of all oils, call a physician immediately, have patient lie down and keep warm. EYES: flush with water for at least 15 min. SKIN: flush with water, wash with soap and water.
5.4 **Toxicity by Inhalation (Threshold Limit Value):** Data not available
5.5 **Short-Term Inhalation Limits:** Data not available
5.6 **Toxicity by Ingestion:** Grade 4, oral LD_{50} = 40 mg/kg (rat)
5.7 **Late Toxicity:** Data not available
5.8 **Vapor (Gas) Irritant Characteristics:** Data not available
5.9 **Liquid or Solid Irritant Characteristics:** Data not available
5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** Not flammable
6.2 **Flammable Limits in Air:** Not flammable
6.3 **Fire Extinguishing Agents:** Use water, foam, or dry chemical on adjacent fires
6.4 **Fire Extinguishing Agents Not to be Used:** Any agent with an acidic reaction (e.g. carbon dioxide or halogenated agents) will liberate phosphine, a toxic and spontaneously flammable gas
6.5 **Special Hazards of Combustion Products:** Irritating oxides of phosphorus may be formed in fires
6.6 **Behavior in Fire:**
6.7 **Ignition Temperature:** Not pertinent
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Not pertinent

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** Reacts slowly with water, more rapidly with dilute acid, to form phosphine gas, which is toxic and spontaneously flammable
7.2 **Reactivity with Common Materials:**
7.3 **Stability During Transport:** Stable unless exposed to moisture. Toxic phosphine gas may then be released and collect in closed spaces
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** Data not available
8.2 **Waterfowl Toxicity:** 1,285 ppm LC_{50}
8.3 **Biological Oxygen Demand (BOD):** Data not available
8.4 **Food Chain Concentration Potential:** Zinc is accumulated by some organisms but is not considered to be bioconcentrative

9. SELECTED MANUFACTURERS

- Hooker Chemical Corp
  Industrial Chemicals Div
  Niagara Falls, N.Y. 14302
- American Hoechst Corp
  Chemicals and Plastics Div
  Rt. 202—206 North
  Somerville, N.J. 08876
- Fisher Scientific Co
  711 Forbes Ave
  Pittsburgh, Pa. 15219

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical 94%
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Pressure vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-2)

II

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Poisonous solid, Class B
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:** Not listed

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Solid
13.2 **Molecular Weight:** 258.10
13.3 **Boiling Point at 1 atm:** 2,012°F = 1,110°C = 1,383°K
13.4 **Freezing Point:** (sublimes) 788°F = 420°C = 693°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 4.55 at 13°C (solid)
13.8 **Liquid Surface Tension:** Not pertinent
13.9 **Liquid-Water Interfacial Tension:** Not pertinent
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** 4,100 Btu/lb = 2,270 cal/g = 95×10^5 J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

CANNON AIR FORCE BASE
SPILL PREVENTION AND RESPONSE PLAN
Cannon Air Force Base, NM 88103
February 1986

Oil/Water Separators

FAC #	CAPACITY	SERVICE FREQUENCY	INFORMATION SOURCE*	DISCHARGES TO	IF ON SC SUBSISTANCE REMOVED
108	500 gal	1 per mo.	SC, IRP, RFW	Sanitary Sewer	Petroleum, Oil
119	375 gal	" " "	" " "	Storm Sewer	" "
121	500 gal	" " "	" " "	Sanitary Sewer	" "
129	500 gal	" " "	" " "	" "	" "
165	600 gal	" " "	" " "	Storm Sewer	" "
170	500 gal	" " "	" " "	Sanitary Sewer	" "
186	2 @ 600 gal	" " "	" " "	" "	" "
194	200 gal	" " "	" " "	Storm Sewer	" "
195	200 gal	" " "	" " "	" "	" "
	200 gal	" " "	" " "	" "	" "
326	50 gal & 220 gal UG Storage Tank	" " "	SC, RFW	Dry Well	JP-4
357 5144	1700 gal	" " "	SC, IRP, RFW	Sanitary Sewer	Oil
374 5077	2 @ 760 gal 1 @ 1675 gal	" " "	" " "	" "	"
379	500 gal	" " "	" " "	" "	Petroleum, Oil
390	1 @ 2000 gal Tank 1 @ 357 gal	" " "	SC, RFW	Service Contract	JP-4
680	1 @ 1000 gal 1 @ 400 gal	" " "	IRP, RFW	Dry Well Sanitary Sewer	"
4096	135 gal	3 per yr.	SC, IRP	Leaching Field	Oil
5144	100 gal	3 per mo.	SC, IRP, RFW	Leaching Pond	Petroleum, Oil
5120	100 gal	3 per yr.	" " "	" "	" "
5121	100 gal	" " "	" " "	" "	" "
Hush House					
5122	100 gal	1 per yr.	Construction Plans	" "	" "

NOTE: SC = Current Ser Cont.
IPR = Installation Restoration Program
RFW = Removal of Fuel Waste-1979

AF FORM 3126 PREVIOUS EDITION W... GENERAL PURPOSE

ANNEX V SPILL RESPONSE EQUIPMENT INVENTORY

1. GENERAL: The following list of general purpose, special purpose, and heavy equipment is under the direct control and assigned to Cannon Air Force Base. Availability of assigned vehicles/equipment will be determined through vehicle status charts in Damage Control Center and Motor Pool Vehicle Dispatch, Ext 2832.

RECOVERY REQUIREMENTS	ASSETS	QUANTITY UNDER BCE CONTROL
GENERAL PURPOSE VEHICLES		
Bus, 28 Pass.	5	0
Bus, 44 Pass.	2	0
Step Van, 1 Ton	37	6
Step Van, 1 1/2 Ton	1	0
Commerc. 2 1/2 Ton Crgo	2	0
1 Ton	3	3
1 1/2 Ton	13	2
SPECIAL PURPOSE VEHICLES		
M-35 Series, 2 1/2 Ton	2	1
M-52 Series, 5 Ton	1	0
5 Ton Tractor	3	0
10 Ton Tractor	5	0
Commerc. Wrecker, 5 Ton	1	0
Telephone Maintenance	6	5
High Reach	1	1
1200 Gal Gas Truck	3	0
H-11 Crane	2	0
Wrecker, 5 to M-816	1	0
R5 Refueling	7	0
A-34 D-Con Truck	4	0
MB-4 Aircraft Tug	21	0
U-18 Crash Recover Tug	1	0
Snow Removal 32 U-39	1	1
AGE Tractor	21	0
Farm Tractor, WHLD Indust	15	11
Sweeper, R/W	2	2
R-9 Refueling	8	
A-24 Refueling	3	
C300 Refueling	3	

SPECIAL PURPOSE VEHICLES	ASSETS	QUANTITY UNDER BCE CONTROL
Sweeper, Street	2	2
Snow Removal, Air Blast	2	1
1500 Gal Water Truck	2	1
800 Gal Distribution Bit Truck	1	1
Warehouse Tug, 4000 lbs	9	0
Rough Terrain, 6000 lbs Fork Lift	1	0
15,000 lbs Fork Lift	3	0
4,000 lbs Fork Lift	6	0
6,000 lbs Fork Lift	4	0
Battery Run Fork Lift 2,000 lbs	2	0
25,000 lb loader A/C	2	0
6,000 lbs, 463L Fork Lift	2	0
10,000 lbs, 4631 Fork Lift	4	0
HEAVY EQUIPMENT		
Dump Truck, 2½ Ton	6	2
Dump Truck, 5 Ton	6	3
Dump Truck, 10 Ton	1	0
M Series DT, 5 Ton	2	2
Crane, 20 Ton	1	1
Crane, 50 Ton	1	0
D-6 Dozer	2	0
Road Grader	4	2
Road MT2, TN2RL-5 to 8 Ton	1	1
TD-20 Dozer	1	1

2. The following list of spill containment equipment is required by 40 CFR 265.56 and the Report of Audit 503-5-16, Hazardous Waste/Hazardous Material:

ITEM	U/M	QUANTITY
85 gal drum	ea	48
55 gal drum (OH)	ea	48
55 gal drum (CH)	ea	48
Rags	bundle	12
Neoprene Gloves	pair	60
Unvented Goggles	ea	60
Tyvek Suits	ea	60
Coveralls	ea	60
Hard Hats	ea	60
Rubber Aprons	ea	60
Face Shields	ea	60
Shovels	ea	6
Plastic Bags	box	12
Detergent	gal	100
Bleach	gal	100
Vermiculite	bag	12
1/2" Tubing	lf	60
Bung Wrench	ea	2
Rubber Boots	pair	60
Plastic Sheets	roll	36
Absorbent Pads	ea	200
Sodium Bicarbonate	100 lb bag	5
Freon-11	35 gal drum	6
Handpump	ea	2
Respiration w/Cartridges	ea	30

3. This equipment would be stored in Bldg 174 to be used to respond to any major spill on Cannon AFB. The manpower for the Decon Team would be supplied by the Pavement and Grounds Shop from the Civil Engineering organization with augmentees from other base units. The team will consist of a minimum of thirty people to allow for shift work. Augmentees would be trained by 27 CSG/DEEV.

4. Each accumulation point manager should have a spill kit in his area which should consist of the following items:

One 55 gallon open-head drum
Four pair neoprene gloves
Two pair unvented goggles
Two respirators and pesticide cartridges
Two chemical resistant aprons
Two pair rubber boots
Two pair 100% cotton coveralls
One dust pan
One square point "D" handle shovel
One dozen polyethlene bags with ties (Heavy duty - 2 mil)
One 18-inch pushbrooms, synthetic fibers
One gallon liquid detergent
Three gallons household bleach
80 pounds absorbent material
One bung wrench
One drum spigot
One 1-3/8" open-end wrench
One drum pump (manual)
30 foot 1/2" polyethylene tubing
One wrench bung 2-1/2"
One wrench bung 3/4"
One first aid kit
Blank labels

ANNEX VI

SUMMARY OF CANNON AFB SPILL RESPONSE TEAM (SRT) ORGANIZATIONS AND CURRENT TELEPHONE CONTACT NUMBERS

In the event of a significant oil or hazardous substance spill requiring the activation of the SRT the following personnel or organizations will be contacted as authorized by the Commander 27CSG, Base Fire Chief, Base Civil Engineer or Environmental Coordinator. The listing in this Annex requires routine updating to insure all telephone numbers remain current. Radio notification may also be utilized in addition to telephone contacts. The off-duty telephone numbers of the following personnel are maintained by the Commander 27CSG, the Base Environmental Coordinator, the CE Service Desk and the Base Fire Department.

SRT Organizations and Personnel			On-Duty Extension
(1) Commander 27 Combat Support Group (Primary OSC) Col ~~Boyce W. Wiltrout~~ DAVID E. BENSON 1689 Crossbow, CAFB, Home Phone 784-~~5921~~ 3102			2761
(2) Base Civil Engineer (1st Alternate OSC) Lt Col David S. O'Brien 7726 Oklahoma, CAFB, Home Phone 784-3013			4358
CE Service Desk			2001/2002
(3) Base Fire Department	24 Hours	On-base	4117
		Off-base	784-4117
Base Fire Chief (2nd Alternate OSC)			4076
(4) Environmental Coordinator			4639
(5) Bioenvironmental Engineer			4063
(6) Disaster Preparedness Office			4177
(7) Security Police			2351
(8) Liquid Fuels Maintenance Technician			2112
(9) Staff Judge Advocate/Legal Office			2211
(10) Public Affairs Office			4131
(11) Safety Office			2811

ANNEX VI (CONT'D)

	SRT Organizations and Personnel	On-Duty Extension
(12)	Base Hospital (Emergency)	4033
(13)	Transportation Squadron	2641
(14)	Weather Squadron	2306
(15)	Photographic Laboratory	2765

ANNEX VII

SUMMARY LISTING OF OFF-BASE SPILL NOTIFICATION PROCEDURES AND RESPONSE ORGANIZATIONS

OFF-BASE REPORTABLE SPILL NOTIFICATION REQUIREMENTS

1. HQ TAC LANGLEY AFB VA/DEEV — Duty Hours Autovon ~~432~~ 574-4430
   Environmental Coordinator — Non-Duty Hours Autovon ~~432~~ 574-2224/432-2225

HQ TAC/DEEV should be contacted even if base personnel are uncertain of spill classification. The purpose of the telecon is to verify spill classification when uncertainty exists and to gather available information on reportable spills to assist the initial command telecon report to USAF/LEEV. As much of the following information as can be reasonably determined should be initially reported:

a. Name of installation;
b. Location of incident and local geography;
c. OSC name and telephone number;
d. Date and time of spill;
e. Type and estimated quantity of spill substance;
f. Magnitude and severity of threat to public, health, welfare and natural resources;
g. Weather conditions at the spill site;
h. Cause of incident;
i. Anticipated containment and clean-up action and effectiveness;
j. Need for assistance by National, Regional or State response teams;
k. Any other pertinent information.

2. "REPORTABLE SPILL" NOTIFICATION REQUIREMENTS

If spill is deemed a "Reportable Spill" by the OSC the following additional organizations and agencies will be notified promptly following telecon notification of TAC/DEEV. The notification should include as much of the information outlined in Item 1 as possible.

Federal and State Agencies:

National Response Center	(800) 424-8802
EPA Region VI	(214) 767-3274
New Mexico Environment Improvement Division, Clovis Office	(505) 762-3728

Additional Air Force Organizations:

If spill is deemed a "Reportable Spill" by the OSC a confirming message containing the available information outlined below must be released and transmitted to the following organizations:

HQ TAC LANGELY AFB VA/DEEV/SGPAE
HQ USAF WASH DC/LEEV/SGES
HQ AFESC TYNDALL AFB FL/DEVP/PA/DEMM
HQ AFMSC BROOKS AFB TX/SGP
USAF OEHL BROOKS AFB TX/ECW
HQ USAF WASH DC/LEYF (When POL is involved)
HQ USAF WASH DC/RDCM (When industrial facilities are involved)

Contents of Confirming Message:

- Name and address of installation and/or owner;
- Name and telephone number of OSC;
- Incident report (initial, second, third, final);
- Date and time of incident;
- Time of official spill notification to the National Response Center and other regional and state officials;
- Location of incident and the nature of the terrain at the location, to include surface and subsurface drainage characteristics and relationships to water bodies (estimate extent of area affected such as miles of stream or acres of lake);
- Weather conditions and how they affected response action;
- Cause of incident;
- Type and estimated amount (barrels, gallons, pounds) of pollutant and the official size classification (minor, medium, major);
- Actual damage and/or potential threat to human life, to property (private, state, or Federal), and to plant or animal life;
- Corrective action taken to eliminate pollution source;
- Corrective action taken to remove pollutant;
- Assistance required;
- Estimated completion date of remedial actions and anticipated effectiveness;
- Estimated quantity and disposition of spill material and contaminated soil;
- Confirmation that emergency response equipment is back in operation before resuming operating activities;
- Description of any problems encountered during implementation of the SPR plan and an explanation of how the Spill Prevention and Response Plan was, or will be, modified to prevent the recurrence of the spill event;
- Anticipated or actual reaction by the news media and public to the incident (Specify potential for liability in the internal Air Force reports only);
- A copy of this SPR Plan if requested.

The information will be transmitted in message format identified in AFR 19-8 within 4 hours of telecon notification to TAC/DEEV. If telecon notification is made after 1500 hours local, the message will be transmitted no later than 1000 hours the following day.

ADDITIONAL OFF-BASE SPILL RESPONSE RESOURCES

If in the judgement of the OSC, additional off-base resources are required to respond to the spill, the Disaster Preparedness OPLAN will be implemented and the following agencies and organizations can be contacted if deemed necessary:

CLOVIS POLICE DEPARTMENT	769-1921
CLOVIS FIRE DEPARTMENT	769-2185

If adequate spill response information is unavailable for a spill product which can be identified by either chemical, trade name or manufacturer the following organization can be contacted by telephone to assist in providing specific information concerning the spilled product:

CHEMTREC		(800) 424-9300
ETIS	Autovon	970-6167
	Comm. No.	(904) 283-6167
ASSOC. OF AMERICAN RAILROADS (Emergency Response Div.)		(202) 293-4048
DOW CHEMICAL (Emergencies Div.)		(517) 636-4400
DUPONT (Emergency Response)		(302) 774-1000
MONSANTO (Safety Office)		(618) 271-5835
NATIONAL FOAM CENTER (Emergency)		(215) 363-1400
POISON CONTROL CENTER		(800) 432-6866
EPA EMERGENCY RESPONSE TEAM		(201) 321-6660

ANNEX VIII

COMPATIBILITY OF WASTES

1. COMPATIBILITY OF WASTES

a. Paragraph 2 below lists compatilility groups extracted from Federal regulations and Air Force Engineering and Services Center draft guidance. The authors of these groupings caution that the listings are not exhaustive. The groupings provide, however, a sound guide to precautions.

b. Most drummed wastes produced on base for disposal by service contract are in compatibility group 4A. Accordingly, any organization producting wastes in drums which fall into compatibility group 1-A, 1-B, 2-A, or 6-A will notify the Base Hazardous Waste Facility Manager when the drums are transported to the facility, so that they may be physically separated from the rest of the wastes.

c. No Group 3-B waste will be poured into the sanitary sewer.

2. COMPATIBILITY AND INCOMPATIBILITY TABLES:

In the lists below, the MIXING of a Group A material with a Group B material may have the potential consequences as noted.

GROUP 1-A	GROUP 1-B
Acetylene sludge	Acid sludge
Alkaline caustic liquids	Acid and water
Alkaline cleaner	Battery acid
Alkaline corrosive liquids	Chemical cleaners
Caustic wastewater	Electrolyte, Acid
Lime sludge and other	Etching acid liquid or solvent
Corrosive alkalines	Pickling liquor and other corrosive acids
Lime wastewater	Spent acid
Lime and water	Spent mixed acid
Spent Caustic	Spent sulfuric acid

Potential Consequences: Heat generation, violent reaction.

GROUP 2-A	GROUP 2-B
Aluminum Berylium Calcium Lithium Magnesium Potassium Sodium Zinc Powder Other reactive metals and metal hydrides	Any waste in Group 1-A or 1-B

Potential Consequences: Fire or explosion; generation of flammable hydrogen gas.

GROUP 3-A	GROUP 3-B
Alcohols Water	Any concentrated waste in groups 1-A or 1-B Calcium Lithium Metal hydrides Potassium SO_2CL_2, $SOCl_2$, PCR_3, CH_3SiCl_3 Other water reactive waste

Potential Consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.

GROUP 4-A	GROUP 4-B
Alcohols Aldehydes Halogenated hydrocarbons Nitrated hydrocarbons Unsaturated hydrocarbons Other reactive organic compounds and solvents	Concentrated Group 1-A or Group 1-B wastes Group 2-A wastes

Potential Consequences: Fire, explosion, or violent reaction.

GROUP 5-A	GROUP 5-B
Spent cyanide and sulfide solutions	Group 1-B wastes

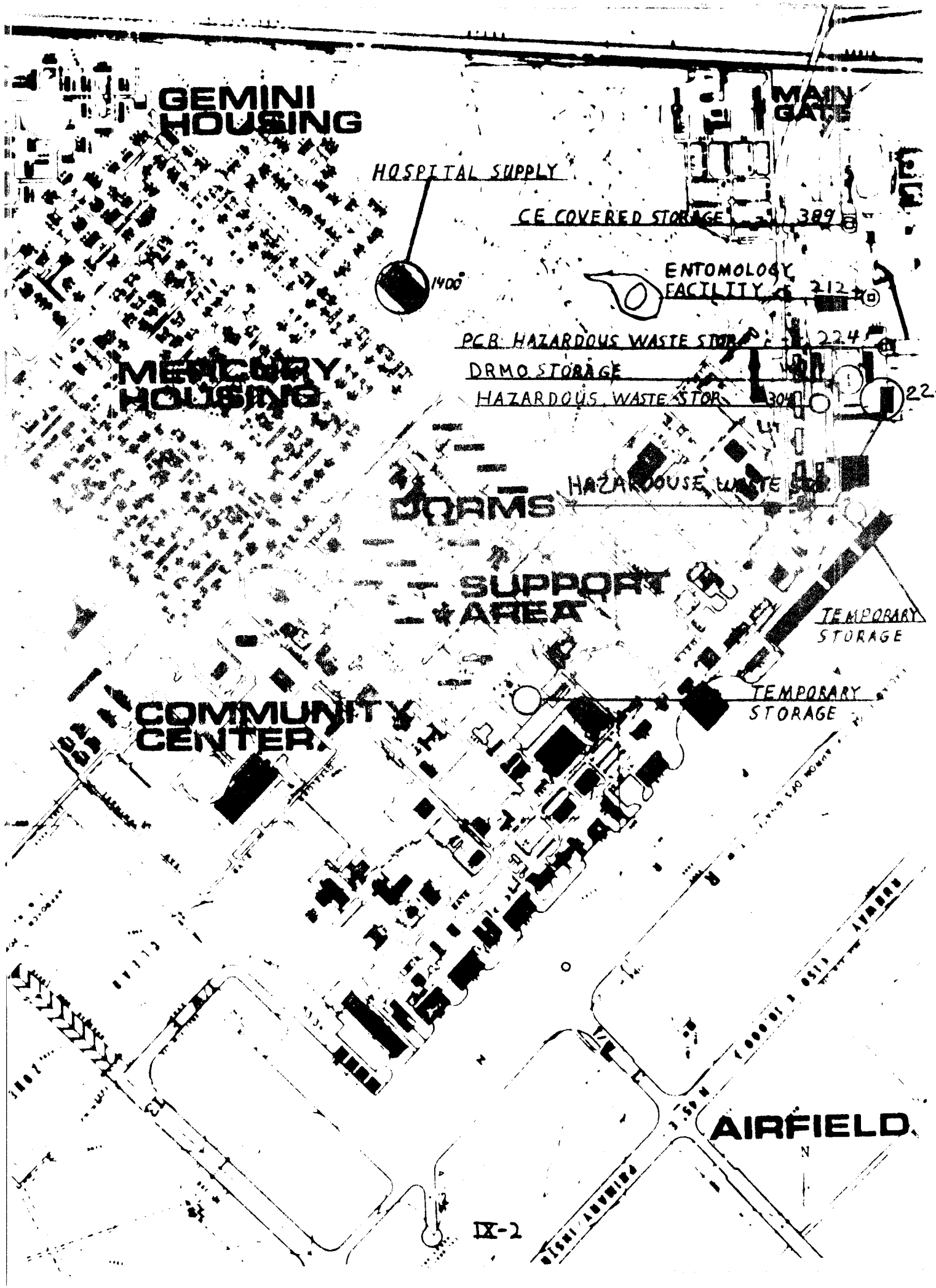
Potential Consequeces: Generation of toxic hydrogen cyanide, cyanogen, chloride or hydorgen sulfide gas.

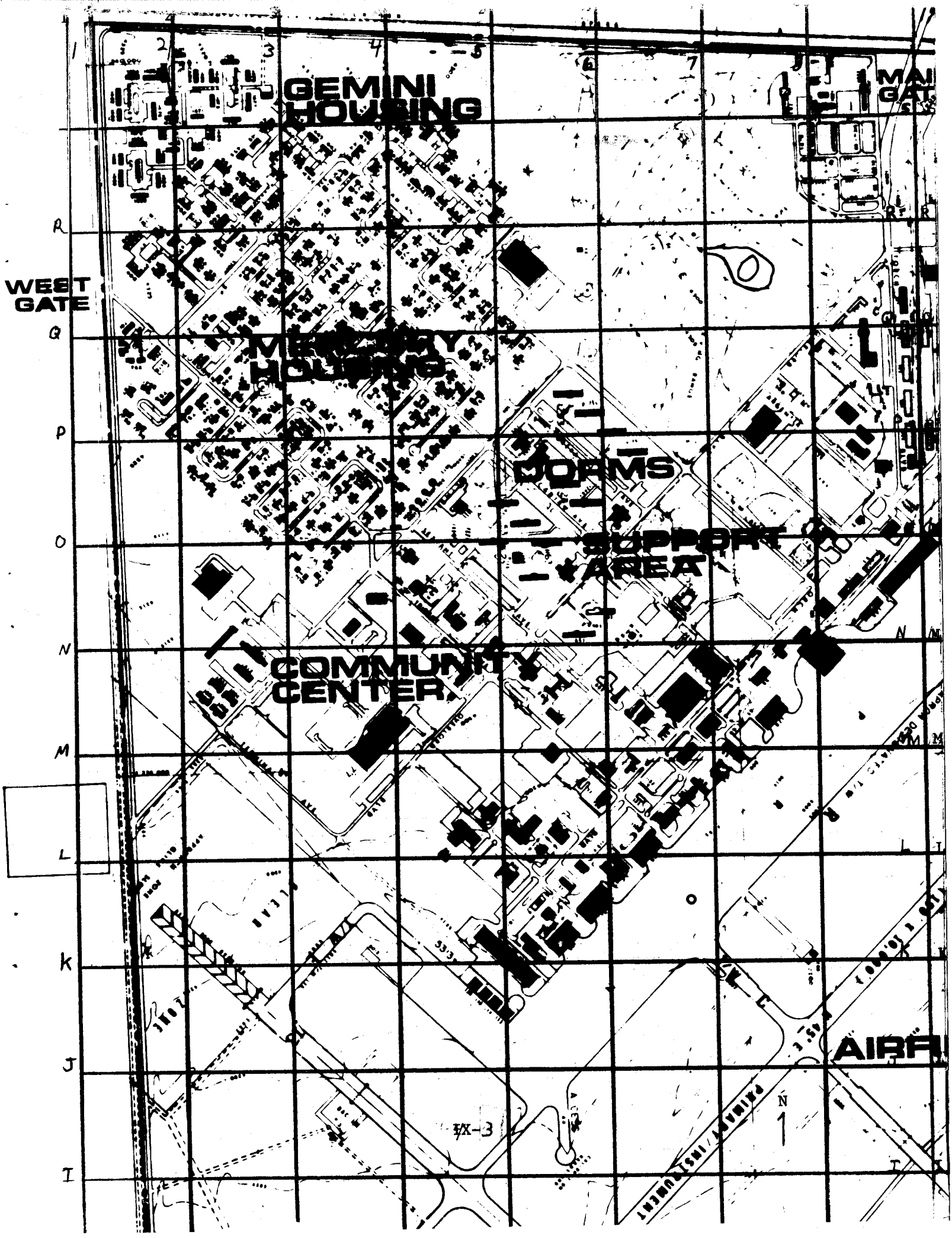
GROUP 6-A	GROUP 6-B
Chlorates	Acetic acid and other organic acids
Chlorine	Concentrated mineral acids
Chlorites	Group 2-A wastes
Chromic acid	Group 4-A wastes
Hypocholorites	Other flammable and combustible wastes
Nitrates	
Nitric acid, fuming	
Perchlorates	
Permanganates	
Peroxides	
Other strong oxidizers	

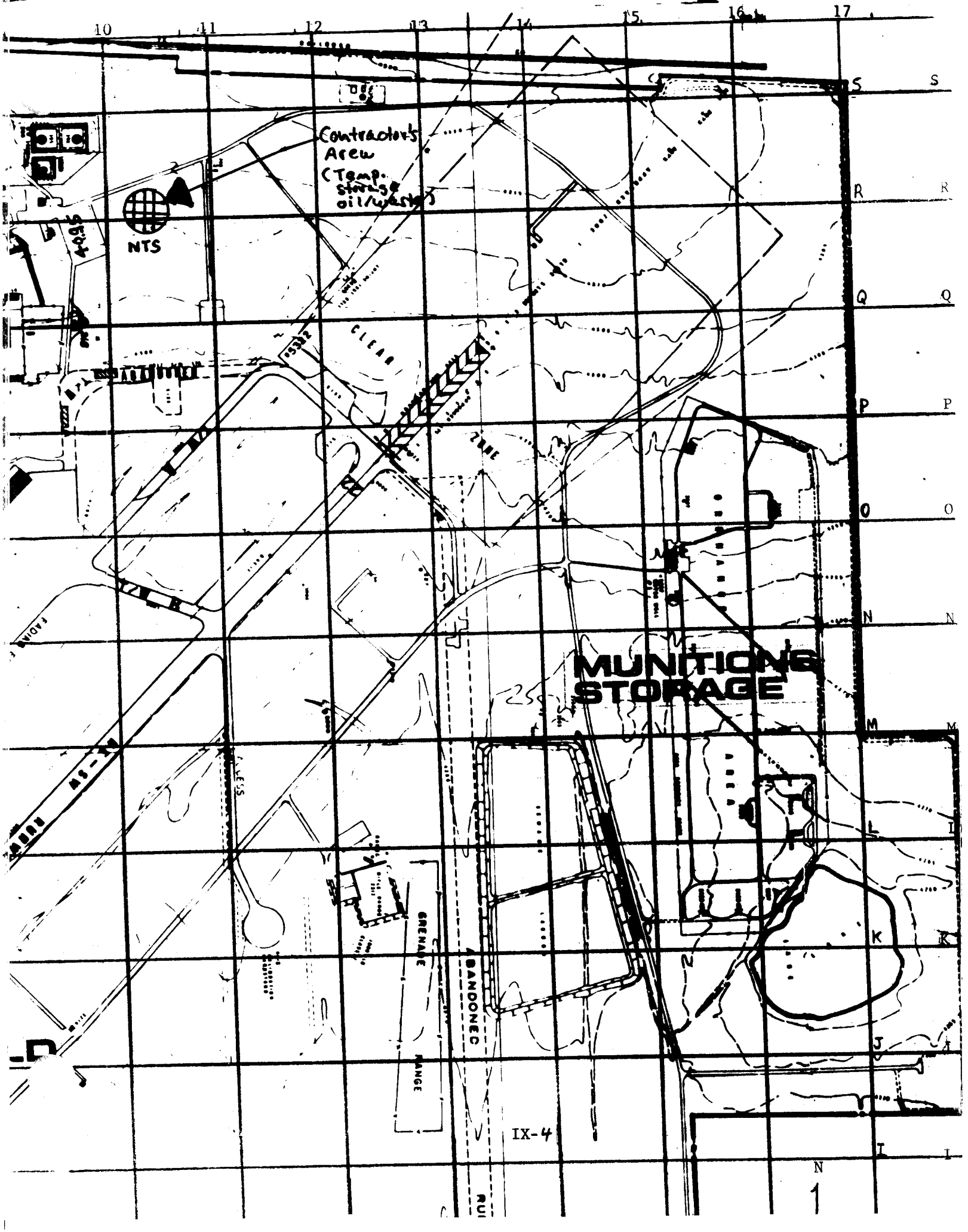
Potential Consequence: Fire, explosion or violent reaction.

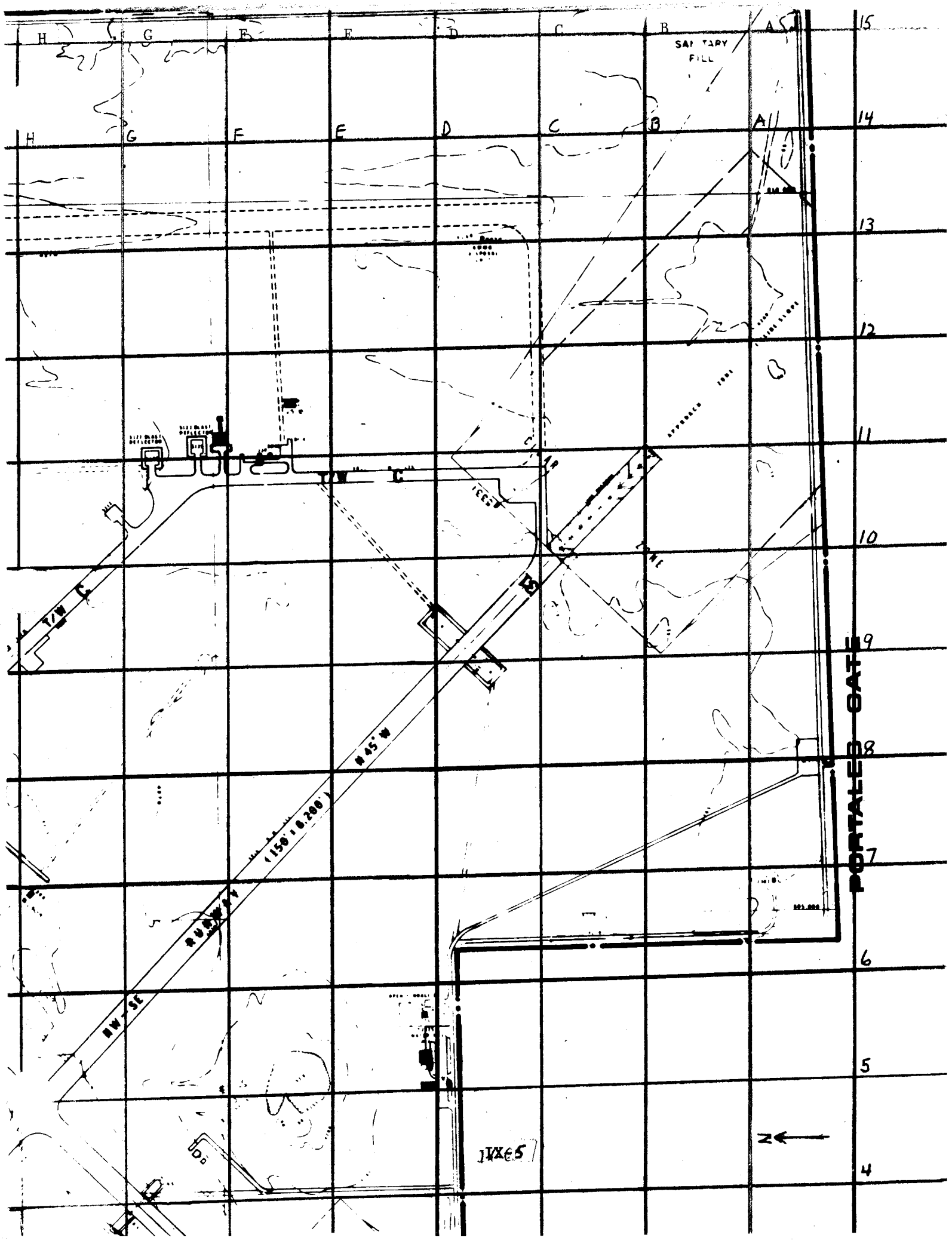
ANNEX IX

OIL AND HAZARDOUS SUBSTANCE SITE LOCATION MAP, GRID RESPONSE MAP


GEMINI HOUSING
MAIN GATE
HOSPITAL SUPPLY
CE COVERED STORAGE
389
1400
ENTOMOLOGY FACILITY
212
PCB HAZARDOUS WASTE STOR
224
DRMO STORAGE
HAZARDOUS WASTE STOR
304
226
MERCURY HOUSING
DORMS
HAZARDOUSE WASTE
SUPPORT AREA
TEMPORARY STORAGE
TEMPORARY STORAGE
COMMUNITY CENTER
AIRFIELD
N


GEMINI HOUSING
MAIN GATE
WEST GATE
MERCURY HOUSING
DORMS
SUPPORT AREA
COMMUNITY CENTER
AIRF
PRIMARY INSTRUMENT
N
1
1
2
3
4
5
6
7
R
Q
P
O
N
M
L
K
J
I


10
11
12
13
14
15
16
17
S
R
Q
P
O
N
M
L
K
J
I
Contractor's Area (Temp. storage oil/waste)
NTS
CLEAR
ZONE
MUNITIONS STORAGE
GRENADE
RANGE
ABANDONED
IX-4


H
G
F
E
D
C
B
A
15
14
13
12
11
10
9
8
7
6
5
4
SANITARY FILL
T/W
RUNWAY
NW-SE
N 45° W
(150' x 8,200')
PORTALES GATE
N

ANNEX X

DOT REQUIREMENTS CONCERNING LEAKING CONTAINERS of HAZARDOUS MATERIALS[1]

A shipper or generator of hazardous wastes has three options concerning leakers:

1. Repair the leaker in compliance with DOT spec packaging requirements.
2. Transfer the hazardous material or waste to a new or reconditioned packaging. In the case of hazardous waste, the container must be selected in conformance with DOT specification standards. DOT allows the reuse of single-trip containers (STC's) and non-reusable containers (NRC's) for one shipment of a hazardous waste from the generators plant to a treatment, storage or disposal facility. No reconditioning of the containers would be required.
3. Leakers may be placed in a metal, removable head salvage drum that is materially compatible with the waste and shipped for disposal provided that:
   a. the drum utilized is a DOT specification container or better, and is less than 110 gallons.
   b. there is adequate closure and, when necessary, provided with sufficient cushioning and absorbant material to absorb all free liquid.

[1]HAZARDOUS MATERIALS AND WASTE MGT., OCT 1983

ANNEX XI

EPA DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION REQUIREMENTS FOR HAZARDOUS SUBSTANCES UNDER CERCLA

(40 CFR 302; 50 FR 13474, April 4, 1985, Effective July 3, 1985)

PART 302—DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION

Sec.
302.1 Applicability.
302.2 Abbreviations.
302.3 Definitions.
302.4 Designation of hazardous substances.
302.5 Determination of reportable quantities.
302.6 Notification requirements.
302.7 Penalties.

Authority: Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9602; Sections 311 and 501(a) of the Federal Water Pollution Control Act, 33 USC 1321 and 1361.

§ 302.1 Applicability.

This regulation designates under section 102(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("the Act") those substances in the statutes referred to in section 101(14) of the Act, identifies reportable quantities for these substances, and sets forth the notification requirements for releases of these substances. This regulation also sets forth reportable quantities for hazardous substances designated under section 311(b)(2)(A) of the Clean Water Act.

§ 302.2 Abbreviations.

CASRN = Chemical Abstracts Service Registry Number
RCRA = Resource Conservation and Recovery Act of 1976, as amended
lb = pound
kg = kilogram
RQ = reportable quantity

§ 302.3 Definitions.

As used in this part, all terms shall have the meaning set forth below:

"The Act", "CERCLA", or "Superfund" means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Pub. L. 96-510);

"Administrator" means the Administrator of the United States Environmental Protection Agency ("EPA");

"consumer product" shall have the meaning stated in 15 U.S.C. 2052;

"environment" means (1) the navigable waters, the waters of the contiguous zone, and the ocean waters of which the natural resources are under the exclusive management authority of the United States under the Fishery Conservation and Management Act of 1976, and (2) any other surface water, ground water, drinking water supply, land surface or subsurface strata, or ambient air within the United States or under the jurisdiction of the United States;

"facility" means (1) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or (2) any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel;

"hazardous substance" means any substance designated pursuant to 40 CFR 302;

"hazardous waste" shall have the meaning provided in 40 CFR 261.3;

"navigable waters" or "navigable waters of the United States means waters of the United States, including the territorial seas;

"offshore facility" means any facility of any kind located in, on, or under, any of the navigable waters of the United States, and any facility of any kind which is subject to the jurisdiction of the United States and is located in, on, or under any other waters, other than a vessel or a public vessel;

"onshore facility" means any facility (including, but not limited to, motor vehicles and rolling stock) of any kind located in, on, or under, any land or non-navigable waters within the United States;

"person" means an individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, United States Government, State, municipality, commission, political subdivision of a State, or any interstate body;

"release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, but excludes (1) any release which results in exposure to persons solely within a workplace, with respect to a claim which such persons may assert against the employer of such persons, (2) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine, (3) release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Energy Act of 1954, if such release is subject to requirements with respect to financial protection established by the Nuclear Regulatory Commission under Section 170 of such Act, or for the purposes of Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act or any other response action, any release of source, byproduct, or special nuclear material from any processing site designated under section 102(a)(1) or 302(a) of the Uranium Mill Tailings

hazardous substances. Elements and compounds are listed first, in alphabetical sequence. Following the listing of elements and compounds is a listing of waste streams and their corresponding "F numbers". They are listed in numerical sequence by "F number". Column 2 of the list, entitled *"Synonyms"*, contains the names of synonyms for certain of the elements and are listed for waste streams. Synonyms are useful in identifying hazardous substances and in selecting proper shipping names. Column 3 of the list, entitled *"Reportable quantity (RQ)"*, contains the reportable quantity (RQ), in pounds and kilograms, for each hazardous substance listed in Column 1.

3. The procedure for selecting a proper compounds listed in Column 1. No synonyms shipping name for a hazardous substance is set forth in § 172.101(c)(9).

4. A series of notes is used throughout the list to provide additional information concerning certain hazardous materials. These notes are explained at the end of the list.

BILLING CODE 4910-60-M

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Acenaphthene		100 (45.4)
Acenaphthylene		5000 (2270)
Acetaldehyde *	Ethanal	1000 (454)
Acetaldehyde, chloro-	Chloroacetaldehyde	1000 (454)
Acetaldehyde, trichloro-	Chloral	1 (0.454)
Acetamide, N-(aminothioxomethyl)-	1-Acetyl-2-thiourea	1000 (454)
Acetamide, N-(4-ethoxyphenyl)-	Phenacetin	1 (0.454)
Acetamide, N-fluoren-2-yl-	2-Acetylaminofluorene	1 (0.454)
Acetamide, 2-fluoro-	Fluoroacetamide	100 (45.4)
Acetic acid *		5000 (2270)
Acetic acid, ethyl ester	Ethyl acetate	5000 (2270)
Acetic acid, fluoro-, sodium salt	Fluoroacetic acid, sodium salt	10 (4.54)
Acetic acid, lead salt	Lead acetate	5000 (2270)
Acetic acid, thallium(I) salt	Thallium(I) acetate	100 (45.4)
Acetic anhydride *		5000 (2270)
Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-methyl ester	Methomyl	100 (45.4)
Acetone *	2-Propanone	5000 (2270)
Acetone cyanohydrin *	Propanenitrile, 2-hydroxy-2-methyl- 2-Methyllactonitrile	10 (4.54)
Acetonitrile *	Ethanenitrile	5000 (2270)
3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts	Warfarin	100 (45.4)
Acetophenone	Ethanone, 1-phenyl-	5000 (2270)
2-Acetylaminofluorene	Acetamide, N-fluoren-2-yl-	1 (0.454)
Acetyl bromide *		5000 (2270)
Acetyl chloride *	Ethanoyl chloride	5000 (2270)
1-Acetyl-2-thiourea	Acetamide, N-(aminothioxomethyl)-	1000 (454)
Acrolein *	2-Propenal	1 (0.454)
Acrylamide	2-Propenamide	5000 (2270)
Acrylic acid *	2-Propenoic acid	5000 (2270)
Acrylonitrile *	2-Propenenitrile	100 (45.4)
Adipic acid		5000 (2270)
Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L-	Melphalan	1 (0.454)
Aldicarb	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime	1 (0.454)
Aldrin *	1,2,3,4,10-10-Hexachloro-1,4,4a,5,8,8a-hexahydro- 1,4:5,8-endo,exo-dimethanonaphthalene	1 (0.454)
Allyl alcohol *	2-Propen-1-ol	100 (45.4)
Allyl chloride *		1000 (454)
Aluminum phosphide *		100 (45.4)
Aluminum sulfate *		5000 (2270)
2-Amino-1-methyl benzene	o-Toluidine	1 (0.454)
4-Amino-1-methyl benzene	p-Toluidine	1 (0.454)
5-(Aminomethyl)-3-isoxazolol	3(2H)-Isoxazolone, 5-(aminomethyl)-	1000 (454)
4-Aminopyridine	4-Pyridinamine	1000 (454)
Amitrole	1H-1,2,4-Triazol-3-amine	1 (0.454)
Ammonia *		100 (45.4)
Ammonium acetate		5000 (2270)
Ammonium benzoate		5000 (2270)
Ammonium bicarbonate		5000 (2270)
Ammonium bichromate	Ammonium dichromate @	1000 (454)
Ammonium bifluoride *		100 (45.4)
Ammonium bisulfite *		5000 (2270)
Ammonium carbamate *		5000 (2270)
Ammonium carbonate *		5000 (2270)
Ammonium chloride		5000 (2270)
Ammonium chromate		1000 (454)
Ammonium citrate, dibasic		5000 (2270)
Ammonium dichromate @	Ammonium bichromate	1000 (454)
Ammonium fluoborate *		5000 (2270)
Ammonium fluoride *		100 (45.4)
Ammonium hydroxide *		1000 (454)
Ammonium oxalate *		5000 (2270)
Ammonium picrate *	Phenol, 2,4,6-trinitro-, ammonium salt	10 (4.54)
Ammonium silicofluoride *		1000 (454)
Ammonium sulfamate		5000 (2270)
Ammonium sulfide *		100 (45.4)
Ammonium sulfite		5000 (2270)
Ammonium tartrate		5000 (2270)
Ammonium thiocyanate		5000 (2270)
Ammonium thiosulfate		5000 (2270)
Ammonium vanadate	Vanadic acid, ammonium salt	1000 (454)
Amyl acetate *		5000 (2270)
iso-Amyl acetate		
sec-Amyl acetate		
tert-Amyl acetate		
Aniline *	Benzenamine	5000 (2270)
Anthracene		5000 (2270)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Antimony ¢		5000 (2270)
ANTIMONY AND COMPOUNDS		**
Antimony pentachloride *		1000 (454)
Antimony potassium tartrate *		100 (45.4)
Antimony tribromide *		1000 (454)
Antimony trichloride *		1000 (454)
Antimony trifluoride *		1000 (454)
Antimony trioxide		1000 (454)
Aroclor 1016		10 (4.54)
Aroclor 1221	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1232	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1242	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1248	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1254	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1260	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Arsenic * ¢		1 (0.454)
Arsenic acid *		1 (0.454)
ARSENIC AND COMPOUNDS		**
Arsenic disulfide *		5000 (2270)
Arsenic(III) oxide	Arsenic trioxide *	5000 (2270)
Arsenic(V) oxide	Arsenic pentoxide *	5000 (2270)
Arsenic pentoxide *	Arsenic(V) oxide	5000 (2270)
Arsenic trichloride *		5000 (2270)
Arsenic trioxide *	Arsenic(III) oxide	5000 (2270)
Arsenic trisulfide *		5000 (2270)
Arsine, diethyl-	Diethylarsine	1 (0.454)
Asbestos * ¢¢		1 (0.454)
Auramine	Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	1(0.454)
Azaserine	L-Serine, diazoacetate (ester)	1 (0.454)
Azindone	Ethylenimine	1 (0.454)
Azinphos methyl @	Guthion *	1 (0.454)
Azirino(2',3':3,4)pyrrolo(1,2-a)indole-4,7-dione,6-amino-8-[((aminocarbonyl)oxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-	Mitomycin C	1 (0.454)
Barium cyanide *		10 (4.54)
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	3-Methylcholanthrene	1 (0.454)
Benz[c]acridine	3,4-Benzacridine	1 (0.454)
3,4-Benzacridine	Benz[c]acridine	1 (0.454)
Benzal chloride	Benzene, dichloromethyl-	5000 (2270)
Benz[a]anthracene	Benzo[a]anthracene	1 (0.454)
1,2-Benzanthracene	1,2-Benzanthracene	1 (0.454)
	Benz[a]anthracene	1 (0.454)
1,2-Benzanthracene, 7,12-dimethyl-	Benzo[a]anthracene	1 (0.454)
Benzenamine	7,12-Dimethylbenz[a]anthracene	5000 (2270)
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	Aniline *	1(0.454)
Benzenamine, 4-chloro-	Auramine	1000 (454)
Benzenamine, 4-chloro-2-methyl-, hydrochloride	p-Chloroaniline	1 (0.454)
Benzenamine, N,N-dimethyl-4-phenylazo-	4-Chloro-o-toluidine, hydrochloride	1 (0.454)
Benzenamine, 4,4'-methylenebis(2-chloro-	Dimethylaminoazobenzene	1 (0.454)
Benzenamine, 2-methyl-, hydrochloride	4,4'-Methylenebis(2-chloroaniline)	1 (0.454)
Benzenamine, 2-methyl-5-nitro-	o-Toluidine hydrochloride	1 (0.454)
Benzenamine, 4-nitro-	5-Nitro-o-toluidine	1 (0.454)
Benzene *	p-Nitroaniline	5000 (2270)
Benzene, 1-bromo-4-phenoxy-	4-Bromophenyl phenyl ether	1000 (454)
Benzene, chloro-	Chlorobenzene *	100 (45.4)
Benzene, chloromethyl-	Benzyl chloride *	100 (45.4)
Benzene, 1,2-dichloro-	o-Dichlorobenzene *	100 (45.4)
	1,2-Dichlorobenzene	100 (45.4)
Benzene, 1,3-dichloro-	m-Dichlorobenzene	
	1,3-Dichlorobenzene	100 (45.4)
Benzene, 1,4-dichloro-	p-Dichlorobenzene *	
	1,4-Dichlorobenzene	100 (45.4)
Benzene, dichloromethyl-	Benzal chloride	5000 (2270)
Benzene, 2,4-diisocyanatomethyl-	Toluene diisocyanate *	100 (45.4)
Benzene, dimethyl-	Xylene * (mixed)	1000 (454)
m-Benzene, dimethyl-	m-Xylene	
o-Benzene, dimethyl-	o-Xylene	
p-Benzene, dimethyl-	p-Xylene	
Benzene, hexachloro-	Hexachlorobenzene	1 (0.454)
Benzene, hexahydro-	Cyclohexane *	1000 (454)
Benzene, hydroxy-	Phenol *	1000 (454)
Benzene, methyl-	Toluene *	1000 (454)
Benzene, 1-methyl-2,4-dinitro-	2,4-Dinitrotoluene *	1000 (454)
Benzene, 1-methyl-2,6-dinitro-	2,6-Dinitrotoluene *	1000 (454)
Benzene, 1,2-methylenedioxy-4-allyl-	Safrole	1 (0.454)
Benzene, 1,2-methylenedioxy-4-propenyl-	Isosafrole	1 (0.454)
Benzene, 1,2-methylenedioxy-4-propyl-	Dihydrosafrole	1 (0.454)
Benzene, 1-methylethyl-	Cumene	5000 (2270)
Benzene, nitro-	Nitrobenzene *	1000 (454)
Benzene, pentachloro-	Pentachlorobenzene	10 (4.54)
Benzene, pentachloronitro-	Pentachloronitrobenzene	1 (0.454)
Benzene, 1,2,4,5-tetrachloro-	1,2,4,5-Tetrachlorobenzene	5000 (2270)
Benzene, trichloromethyl-	Benzotrichloride	1 (0.454)
Benzene, 1,3,5-trinitro-	sym-Trinitrobenzene *	10 (4.54)
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	Ethyl 4,4'-dichlorobenzilate	1 (0.454)
1,2-Benzenedicarboxylic acid anhydride	Phthalic anhydride	5000 (2270)
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester	Bis(2-ethylhexyl)phthalate	1 (0.454)
1,2-Benzenedicarboxylic acid, dibutyl ester	Di-n-butyl phthalate	10 (4.54)
	Dibutyl phthalate	
	n-Butyl phthalate *	
1,2-Benzenedicarboxylic acid, diethyl ester	Diethyl phthalate	1000 (454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
1,2-Benzenedicarboxylic acid, dimethyl ester	Dimethyl phthalate	5000 (2270)
1,2-Benzenedicarboxylic acid, di-n-octyl ester	Di-n-octyl phthalate	5000 (2270)
1,3-Benzenediol	Resorcinol *	5000 (2270)
1,2-Benzenediol 4-[1-hydroxy-2-(methylamino)ethyl]-	Epinephrine	1000 (454)
Benzenesulfonic acid chloride	Benzenesulfonyl chloride	100 (45.4)
Benzenesulfonyl chloride	Benzenesulfonic acid chloride	100 (45.4)
Benzenethiol	Phenyl mercaptan @	100 (45.4)
	Thiophenol	
Benzidine *	(1,1'-Biphenyl)-4,4'-diamine	1 (0.454)
1,2-Benzisothiazolin-3-one,1,1-dioxide, and salts	Saccharin and salts	1 (0.454)
Benzo[a]anthracene	Benz[a]anthracene	1 (0.454)
	1,2-Benzanthracene	
Benzo[b]fluoranthene		1 (0.454)
Benzo[k]fluoranthene		1 (0.454)
Benzo[j,k]fluorene	Fluoranthene	100 (45.4)
Benzoic acid		5000 (2270)
Benzonitrile *		5000 (2270)
Benzo[ghi]perylene		5000 (2270)
Benzo[a]pyrene	3,4-Benzopyrene	1 (0.454)
3,4-Benzopyrene	Benzo[a]pyrene	1 (0.454)
p-Benzoquinone	1,4-Cyclohexadienedione	10 (4.54)
Benzotrichloride	Benzene, trichloromethyl-	1 (0.454)
Benzoyl chloride *		1000 (454)
1,2-Benzphenanthrene	Chrysene	1 (0.454)
Benzyl chloride *	Benzene, chloromethyl-	100 (45.4)
Beryllium c	Beryllium dust c	1 (0.454)
BERYLLIUM AND COMPOUNDS		**
Beryllium chloride *		5000 (2270)
Beryllium dust c	Beryllium c	1 (0.454)
Beryllium fluoride *		5000 (2270)
Beryllium nitrate *		5000 (2270)
alpha - BHC		1 (0.454)
beta - BHC		1 (0.454)
delta - BHC		1 (0.454)
gamma - BHC	Hexachlorocyclohexane (gamma isomer)	1 (0.454)
	Lindane *	
2,2'-Bioxirane	1,2:3,4-Diepoxybutane	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine	Benzidine *	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethyl-	3,3'-Dimethylbenzidine	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dichloro-	3,3'-Dichlorobenzidine	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethoxy-	3,3'-Dimethoxybenzidine	1 (0.454)
Bis(2-chloroethoxy) methane	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	1000 (454)
Bis(2-chloroethyl) ether	Dichloroethyl ether	1 (0.454)
	Ethane, 1,1'-oxybis[2-chloro-	
Bis(2-chloroisopropyl) ether	Propane, 2,2'-oxybis[2-chloro-	1000 (454)
Bis(chloromethyl) ether	Methane, oxybis[chloro-	1 (0.454)
Bis(dimethylthiocarbamoyl) disulfide	Thiram	10 (4.54)
Bis(2-ethylhexyl)phthalate	1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)]ester	1 (0.454)
Bromine cyanide	Cyanogen bromide *	1000 (454)
Bromoacetone *	2-Propanone, 1-bromo-	1000 (454)
Bromoform	Methane, tribromo-	100 (45.4)
4-Bromophenyl phenyl ether	Benzene, 1-bromo-4-phenoxy-	100 (45.4)
Brucine	Strychnidin-10-one, 2,3-dimethoxy-	100 (45.4)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	Hexachlorobutadiene *	1(0.454)
1-Butanamine, N-butyl-N-nitroso-	N-Nitrosodi-n-butylamine	1 (0.454)
Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene-	Chlorambucil	1 (0.454)
1-Butanol	n-Butyl alcohol *	5000 (2270)
2-Butanone	Ethyl methyl ketone @	5000 (2270)
	Methyl ethyl ketone *	
2-Butanone peroxide	Methyl ethyl ketone peroxide *	10 (4.54)
2-Butenal	Crotonaldehyde *	100 (45.4)
2-Butene, 1,4-dichloro-	1,4-Dichloro-2-butene *	1 (0.454)
Butyl acetate *		5000 (2270)
iso-Butyl acetate		
sec-Butyl acetate		
tert-Butyl acetate		
n-Butyl alcohol *	1-Butanol	5000 (2270)
Butylamine *		1000 (454)
iso-Butylamine		
sec-Butylamine		
tert-Butylamine		
Butyl benzyl phthalate		100 (45.4)
n-Butyl phthalate *	Di-n-butyl phthalate	10 (4.54)
	Dibutyl phthalate	
	1,2-Benzenedicarboxylic acid, dibutyl ester	
Butyric acid *		5000 (2270)
iso-Butyric acid		
Cacodylic acid	Hydroxydimethylarsine oxide	1 (0.454)
Cadmium c		1 (0.454)
Cadmium acetate		100 (45.4)
CADMIUM AND COMPOUNDS		**
Cadmium bromide		100 (45.4)
Cadmium chloride		100 (45.4)
Calcium arsenate *		1000 (454)
Calcium arsenite *		1000 (454)
Calcium carbide *		10 (4.54)
Calcium chromate	Chromic acid, calcium salt	1000 (454)
Calcium cyanide *		10 (4.54)
Calcium dodecylbenzene sulfonate		1000 (454)
Calcium hypochlorite *		10 (4.54)
Camphene, octachloro-	Toxaphene *	1 (0.454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Captan		10 (4.54)
Carbamic acid, ethyl ester	Ethyl carbamate (Urethan)	1 (0.454)
Carbamic acid, methylnitroso-, ethyl ester	N-Nitroso-N-methylurethane	1 (0.454)
Carbamide, N-ethyl-N-nitroso-	N-Nitroso-N-ethylurea	1 (0.454)
Carbamide, N-methyl-N-nitroso-	N-Nitroso-N-methylurea	1 (0.454)
Carbamide, thio-	Thiourea	1 (0.454)
Carbamimidoselenoic acid	Selenourea	1000 (454)
Carbamoyl chloride, dimethyl-	Dimethylcarbamoyl chloride	1 (0.454)
Carbaryl *		100 (45.4)
Carbofuran *		10 (4.54)
Carbon bisulfide *	Carbon disulfide *	100 (45.4)
Carbon disulfide *	Carbon bisulfide *	100 (45.4)
Carbonic acid, dithallium (I) salt	Thallium(I) carbonate	100(45.4)
Carbonochloridic acid, methyl ester	Methyl chlorocarbonate	1000 (454)
Carbon oxyfluoride	Carbonyl fluoride	1000 (454)
Carbon tetrachloride *	Methane, tetrachloro-	5000 (2270)
Carbonyl chloride	Phosgene *	10 (4.54)
Carbonyl fluoride	Carbon oxyfluoride	1000 (454)
Chloral	Acetaldehyde, trichloro-	1 (0.454)
Chlorambucil	Butanoic acid, 4-[bis(2-chloroethyl)amino]benzene-	1 (0.454)
Chlordane *	Chlordane, technical *	1 (0.454)
CHLORDANE (TECHNICAL MIXTURE AND METABOLITES)	4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-	••
Chlordane, technical *	Chlordane *	1 (0.454)
	4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-	
CHLORINATED BENZENES		••
CHLORINATED ETHANES		••
CHLORINATED NAPHTHALENE		••
CHLORINATED PHENOLS		••
Chlorine *		10 (4.54)
Chlorine cyanide	Cyanogen chloride *	10 (4.54)
Chlornaphazine	2-Naphthylamine, N,N-bis(2-chloroethyl)-	1 (0.454)
Chloroacetaldehyde	Acetaldehyde, chloro-	1000 (454)
CHLOROALKYL ETHERS		••
p-Chloroaniline	Benzenamine, 4-chloro-	1000 (454)
Chlorobenzene *	Benzene, chloro-	100 (45.4)
4-Chloro-m-cresol	p-Chloro-m-cresol	5000 (2270)
p-Chloro-m-cresol	Phenol, 4-chloro-3-methyl-	5000 (2270)
	Phenol, 4-chloro-3-methyl-	
	4-Chloro-m-cresol	
Chlorodibromomethane	Epichlorohydrin *	100 (45.4)
1-Chloro-2,3-epoxypropane	Oxirane, 2-(chloromethyl)-	1000 (454)
Chloroethane	Ethyl chloride @	
2-Chloroethyl vinyl ether	Ethene, 2-chloroethoxy-	1 (0.454)
Chloroform *	Methane, trichloro-	1000 (454)
Chloromethane	Methane, chloro-	5000 (2270)
Chloromethyl methyl ether	Methyl chloride	1 (0.454)
	Methane, chloromethoxy-	
beta-Chloronaphthalene	Methylchloromethyl ether @	1 (0.454)
	Naphthalene, 2-chloro-	
2-Chloronaphthalene	2-Chloronaphthalene	5000 (2270)
	beta-Chloronaphthalene	
2-Chlorophenol	Naphthalene, 2-chloro-	5000 (2270)
	o-Chlorophenol	
o-Chlorophenol	Phenol, 2-chloro-	100 (45.4)
	Phenol, 2-chloro-	
4-Chlorophenyl phenyl ether	2-Chlorophenol	100 (45.4)
1-(o-Chlorophenyl)thiourea	Thiourea, (2-chlorophenyl)-	5000 (2270)
3-Chloropropionitrile	Propanenitrile, 3-chloro-	100 (45.4)
Chlorosulfonic acid *		1000 (454)
4-Chloro-o-toluidine, hydrochloride	Benzenamine, 4-chloro-2-methyl-, hydrochloride	1000 (454)
Chlorpyrifos *		1 (0.454)
Chromic acetate		1 (0.454)
Chromic acid *		1000 (454)
Chromic acid, calcium salt	Calcium chromate	1000 (454)
Chromic sulfate *		1000 (454)
Chromium c		1000 (454)
CHROMIUM AND COMPOUNDS		1 (0.454)
Chromous chloride		••
Chrysene	1,2-Benzphenanthrene	1000 (454)
Cobaltous bromide		1 (0.454)
Cobaltous formate		1000 (454)
Cobaltous sulfamate		1000 (454)
Coke Oven Emissions		1000 (454)
Copper c		1 (0.454)
COPPER AND COMPOUNDS		5000 (2270)
Copper cyanide *		••
Coumaphos *		10 (4.54)
Creosote		10 (4.54)
Cresols *	Cresylic acid	1 (0.454)
m-Cresols	m-Cresylic acid	1000 (454)
o-Cresols	o-Cresylic acid	
p-Cresols	p-Cresylic acid	
Cresylic acid	Cresols *	1000 (454)
m-Cresols	m-Cresylic acid	
o-Cresols	o-Cresylic acid	
p-Cresols	p-Cresylic acid	
Crotonaldehyde *	2-Butenal	100 (45.4)
Cumene	Benzene, 1-methylethyl-	5000 (2270)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Cupric acetate		100 (45.4)
Cupric acetoarsenite *		100 (45.4)
Cupric chloride *		10 (4.54)
Cupric nitrate *		100 (45.4)
Cupric oxalate		100 (45.4)
Cupric sulfate		10 (4.54)
Cupric sulfate ammoniated		100 (45.4)
Cupric tartrate		100 (45.4)
CYANIDES		**
Cyanides (soluble cyanide salts), not elsewhere specified *		10 (4.54)
Cyanogen *		100 (45.4)
Cyanogen bromide *	Bromine cyanide	1000 (454)
Cyanogen chloride *	Chlorine cyanide	10 (4.54)
1,4-Cyclohexadienedione	p-Benzoquinone	10 (4.54)
Cyclohexane *	Benzene, hexahydro-	1000 (454)
Cyclohexanone		5000 (2270)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	Hexachlorocyclopentadiene *	1 (0.454)
Cyclophosphamide	2H-1,3,2-Oxazaphosphorine,2-[bis(2-chloroethyl)amino] tetrahydro-2-oxide	1 (0.454)
2,4-D Acid	2,4-D *, salts and esters *	100 (45.4)
	2,4-Dichlorophenoxyaceticacid, salts and esters	
2,4-D Esters *		100 (45.4)
2,4-D *, salts and esters *	2,4-D Acid	100 (45.4)
	2,4-Dichlorophenoxyacetic acid *, salts and esters *	
Daunomycin	5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-.	1 (0.454)
DDD	Dichlorodiphenyl dichloroethane	1(0.454)
	TDE *	
	4,4' DDD	
4,4' DDD	DDD	1(0.454)
	Dichlorodiphenyl dichloroethane	
	TDE *	
DDE	4,4' DDE	1 (0.454)
4,4' DDE	DDE	1 (0.454)
DDT *	Dichlorodiphenyl trichloroethane *	1 (0.454)
	4,4'DDT	
4,4'DDT	DDT *	1 (0.454)
	Dichlorodiphenyl trichloroethane *	
DDT AND METABOLITES		**
Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta[c,d]-pentalen-2-one	Kepone *	1 (0.454)
Diallate	S-(2,3-Dichloroallyl) diisopropylthiocarbamate	1 (0.454)
Diamine	Hydrazine *	1 (0.454)
2,4-Diaminotoluene	2,4-Toluenediamine *	1 (0.454)
	Toluene-2,4-diamine	
Diazinon *		1 (0.454)
Dibenz[a,h]anthracene	Dibenzo[a,h]anthracene	1 (0.454)
	1,2:5,6-Dibenzanthracene	
1,2:5,6-Dibenzanthracene	Dibenz[a,h]anthracene	1 (0.454)
	Dibenzo[a,h]anthracene	
Dibenzo[a,h]anthracene	Dibenz[a,h]anthracene	1 (0.454)
	1,2:5,6-Dibenzanthracene	
1,2:7,8-Dibenzopyrene	Dibenz[a,i]pyrene	1 (0.454)
Dibenz[a,i]pyrene	1,2:7,8-Dibenzopyrene	1 (0.454)
1,2-Dibromo-3-chloropropane	Propane, 1,2-dibromo-3-chloro-	1(0.454)
Dibutyl phthalate	Di-n-butyl phthalate	10 (4.54)
	n-Butyl phthalate *	
	1,2-Benzenedicarboxylic acid, dibutyl ester	
Di-n-butyl phthalate	Dibutyl phthalate	10 (4.54)
	n-Butyl phthalate *	
	1,2-Benzenedicarboxylic acid, dibutyl ester	
Dicamba		1000 (454)
Dichlobenil		100 (45.4)
Dichlone		1 (0.454)
S-(2,3-Dichloroallyl) diisopropylthiocarbamate	Diallate	1 (0.454)
3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide	Pronamide	5000 (2270)
Dichlorobenzene (mixed)		100 (45.4)
1,2-Dichlorobenzene	Benzene, 1,2-dichloro-	100 (45.4)
	o-Dichlorobenzene *	
1,3-Dichlorobenzene	Benzene, 1,3-dichloro-	100 (45.4)
	m-Dichlorobenzene	
1,4-Dichlorobenzene	Benzene, 1,4-dichloro-	100 (45.4)
	p-Dichlorobenzene *	
m-Dichlorobenzene	Benzene, 1,3-dichloro-	100 (45.4)
	1,3-Dichlorobenzene	
o-Dichlorobenzene *	Benzene, 1,2-dichloro-	100 (45.4)
	1,2-Dichlorobenzene	
p-Dichlorobenzene *	Benzene, 1,4-dichloro-	100 (45.4)
	1,4-Dichlorobenzene	
DICHLOROBENZIDINE		**
3,3'-Dichlorobenzidine	(1,1'-Biphenyl)-4,4'diamine,3,3'dichloro-	1 (0.454)
Dichlorobromomethane		5000 (2270)
1,4-Dichloro-2-butene *	2-Butene, 1,4-dichloro-	1 (0.454)
Dichlorodifluoromethane *	Methane, dichlorodifluoro-	5000 (2270)
Dichlorodiphenyl dichloroethane	DDD	1(0.454)
	TDE *	
	4,4' DDD	
Dichlorodiphenyl trichloroethane *	DDT *	1 (0.454)
	4,4'DDT	
1,1-Dichloroethane	Ethane, 1,1-dichloro-	1000 (454)
	Ethylidene dichloride	
1,2-Dichloroethane	Ethane, 1,2-dichloro-	5000 (2270)
	Ethylene dichloride *	

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
1,1-Dichloroethylene	Ethene, 1,1-dichloro-	5000 (2270)
	Vinylidene chloride *	
1,2-trans-Dichloroethylene *	Ethene, trans-1,2-dichloro-	1000 (454)
Dichloroethyl ether	Bis (2-chloroethyl) ether	1 (0.454)
	Ethane, 1,1'-oxybis(2-chloro-	
2,4-Dichlorophenol	Phenol, 2,4-dichloro-	100 (45.4)
2,6-Dichlorophenol	Phenol, 2,6-dichloro-	100 (45.4)
2,4-Dichlorophenoxyacetic acid *, salts and esters *	2,4-D Acid	100 (45.4)
	2,4-D *, salts and esters *	
Dichlorophenylarsine	Phenyl dichloroarsine *	1 (0.454)
Dichloropropane *		1000 (454)
1,1-Dichloropropane		1000 (454)
1,3-Dichloropropane		1000 (454)
1,2-Dichloropropane	Propylene dichloride *	1000 (454)
Dichloropropane - Dichloropropene (mixture)		100 (45.4)
Dichloropropene *		100 (45.4)
2,3-Dichloropropene		
1,3-Dichloropropene *	Propene, 1,3-dichloro-	100 (45.4)
2,2-Dichloropropionic acid *		5000 (2270)
Dichlorvos *		10 (4.54)
Dieldrin *	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-dimethanonaphthalene.	1 (0.454)
1,2,3,4-Diepoxybutane	2,2'-Bioxirane	1 (0.454)
Diethylamine *		1000 (454)
Diethylarsine	Arsine, diethyl-	1 (0.454)
1,4-Diethylene dioxide	1,4-Dioxane *	1 (0.454)
O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate	Disulfoton *	1 (0.454)
N,N'-Diethylhydrazine	Hydrazine, 1,2-diethyl-	1 (0.454)
O,O-Diethyl S-methyl dithiophosphate	Phosphorodithioic acid, O,O-diethyl S-methyl ester	5000 (2270)
Diethyl-p-nitrophenyl phosphate	Phosphonic acid, diethyl p-nitrophenyl ester	100 (45.4)
Diethyl phthalate	1,2-Benzenedicarboxylic acid, diethyl ester	1000 (454)
O,O-Diethyl O-pyrazinyl phosphorothioate	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	100 (45.4)
Diethylstilbestrol	4,4'-Stilbenediol, alpha,alpha'-diethyl-	1 (0.454)
1,2-Dihydro-3,6-pyridazinedione	Maleic hydrazide	5000 (2270)
Dihydrosafrole	Benzene, 1,2-methylenedioxy-4-propyl-	1 (0.454)
Diisopropyl fluorophosphate	Phosphorofluoridic acid, bis(1-methylethyl) ester	100 (45.4)
Dimethoate	Phosphorodithioic acid, O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester	10 (4.54)
3,3'-Dimethoxybenzidine	(1,1'-Biphenyl)-4,4'diamine,3,3'dimethoxy-	1 (0.454)
Dimethylamine *	Methanamine, N-methyl-	1000 (454)
Dimethylaminoazobenzene	Benzenamine, N,N-dimethyl-4-phenylazo-	1 (0.454)
7,12-Dimethylbenz[a]anthracene	1,2-Benzanthracene, 7,12-dimethyl-	1 (0.454)
3,3'-Dimethylbenzidine	(1,1'Biphenyl)-4,4'-diamine,3,3'-dimethyl-	1 (0.454)
alpha,alpha-Dimethylbenzylhydroperoxide	Hydroperoxide, 1-methyl-1-phenylethyl-	10 (4.54)
3,3-Dimethyl-1-(methylthio)-2-butanone, O-[(methylamino)carbonyl] oxime	Thiofanox	100 (45.4)
Dimethylcarbamoyl chloride	Carbamoyl chloride, dimethyl-	1 (0.454)
1,1-Dimethylhydrazine *	Hydrazine, 1,1-dimethyl-	1 (0.454)
1,2-Dimethylhydrazine	Hydrazine, 1,2-dimethyl-	1 (0.454)
O,O-Dimethyl O-p-nitrophenyl phosphorothioate	Methyl parathion *	100 (45.4)
Dimethylnitrosamine	N-Nitrosodimethylamine	1 (0.454)
alpha,alpha-Dimethylphenethylamine	Ethanamine, 1,1-dimethyl-2-phenyl-	5000 (2270)
2,4-Dimethylphenol	Phenol, 2,4-dimethyl-	100 (45.4)
	2,4-Xylenol @	
Dimethyl phthalate	1,2-Benzenedicarboxylic acid, dimethyl ester	5000 (2270)
Dimethyl sulfate *	Sulfuric acid, dimethyl ester	1 (0.454)
Dinitrobenzene * (mixed)		100 (45.4)
m-Dinitrobenzene		100 (45.4)
o-Dinitrobenzene		100 (45.4)
p-Dinitrobenzene		100 (45.4)
4,6-Dinitro-o-cresol and salts	Phenol, 2,4-dinitro-6-methyl-, and salts	10 (4.54)
4,6-Dinitro-o-cyclohexylphenol *	Phenol, 2-cyclohexyl-4,6-dinitro-	100 (45.4)
Dinitrophenol *		10 (4.54)
2,5-Dinitrophenol		10 (4.54)
2,6-Dinitrophenol		10 (4.54)
2,4-Dinitrophenol *	Phenol, 2,4-dinitro-	10 (4.54)
Dinitrotoluene *		1000 (454)
3,4-Dinitrotoluene		
2,4-Dinitrotoluene *	Benzene, 1-methyl-2,4-dinitro-	1000 (454)
2,6-Dinitrotoluene *	Benzene, 1-methyl-2,6-dinitro-	1000 (454)
Dinoseb	Phenol, 2,4-dinitro-6-(1-methylpropyl)-	1000 (454)
Di-n-octyl phthalate	1,2-Benzenedicarboxylic acid, di-n-octyl ester	5000 (2270)
1,4-Dioxane *	1,4-Diethylene dioxide	1 (0.454)
DIPHENYLHYDRAZINE		**
1,2-Diphenylhydrazine	Hydrazine, 1,2-diphenyl-	1 (0.454)
Diphosphoramide, octamethyl-	Octamethylpyrophosphoramide	100(45.4)
Dipropylamine	1-Propanamine, N-propyl-	5000 (2270)
Di-n-propylnitrosamine	N-Nitrosodi-n-propylamine	1 (0.454)
Diquat		1000 (454)
Disulfoton *	O,O-Diethyl S-[2-(ethylthio)ethyl]phosphorodithioate	1 (0.454)
2,4-Dithiobiuret	Thiomidodicarbonic diamide	100 (45.4)
Dithiopyrophosphonic acid, tetraethyl ester	Tetraethyldithiopyrophosphate	100 (45.4)
Diuron		100 (45.4)
Dodecylbenzenesulfonic acid *		1000 (454)
Endosulfan *	5-Norbornene-2,3-dimethanol,1,4,5,6,7,7-hexachloro,cyclic sulfite	1 (0.454)
alpha - Endosulfan		1 (0.454)
beta - Endosulfan		1 (0.454)
ENDOSULFAN AND METABOLITES		**
Endosulfan sulfate		1 (0.454)
Endothall	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	1000 (454)
Endrin *	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene.	1 (0.454)
Endrin aldehyde		1 (0.454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
ENDRIN AND METABOLITES		**
Epichlorohydrin *	1-Chloro-2,3-epoxypropane	1000 (454)
	Oxirane, 2-(chloromethyl)-	
Epinephrine	1,2-Benzenediol,4-[1-hydroxy-2-(methylamino)ethyl]	1000 (454)
Ethanal	Acetaldehyde *	1000 (454)
Ethanamine, 1,1-dimethyl-2-phenyl-	alpha,alpha-Dimethylphenethylamine	5000 (2270)
Ethanamine, N-ethyl-N-nitroso-	N-Nitrosodiethylamine	1 (0.454)
Ethane, 1,2-dibromo-	Ethylene dibromide *	1000 (454)
Ethane, 1,1-dichloro-	Ethylidene dichloride	1000 (454)
	1,1-Dichloroethane	
Ethane, 1,2-dichloro-	Ethylene dichloride *	5000 (2270)
	1,2-Dichloroethane	
Ethane, 1,1,1,2,2,2-hexachloro-	Hexachloroethane *	1 (0.454)
Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	Bis(2-chloroethoxy)methane	1000 (454)
Ethane, 1,1'-oxybis-	Ethyl ether *	100 (45.4)
Ethane, 1,1'-oxybis[2-chloro-	Bis'(2-chloroethyl) ether	1 (0.454)
	Dichloroethyl ether	
Ethane, pentachloro-	Pentachloroethane	1 (0.454)
Ethane, 1,1,1,2-tetrachloro-	1,1,1,2-Tetrachloroethane *	1 (0.454)
Ethane, 1,1,2,2-tetrachloro-	1,1,2,2-Tetrachloroethane *	1 (0.454)
Ethane, 1,1,2-trichloro-	1,1,2-Trichloroethane	1 (0.454)
Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)-	Methoxychlor	1 (0.454)
1,2-Ethanediylbiscarbamodithioic acid	Ethylenebis(dithiocarbamic acid)	5000 (2270)
Ethanenitrile	Acetonitrile *	5000 (2270)
Ethanethioamide	Thioacetamide	1 (0.454)
Ethanol, 2,2'-(nitrosoimino)bis-	N-Nitrosodiethanolamine	1 (0.454)
Ethanone, 1-phenyl-	Acetophenone	5000 (2270)
Ethanoyl chloride	Acetyl chloride *	5000 (2270)
Ethenamine, N-methyl-N-nitroso-	N-Nitrosomethylvinylamine	1 (0.454)
Ethene, chloro-	Vinyl chloride *	1 (0.454)
Ethene, 2-chloroethoxy-	2-Chloroethyl vinyl ether	1000 (454)
Ethene, 1,1-dichloro-	Vinylidene chloride *	5000 (2270)
	1,1-Dichloroethylene	
Ethene, 1,1,2,2-tetrachloro-		1 (0.454)
	Perchloroethylene	
	Tetrachloroethene	
	Tetrachloroethylene	
Ethene, trans-1,2-dichloro-	1,2-trans-Dichloroethylene *	1000 (454)
Ethion *		10 (4.54)
2-Ethoxyethanol	Ethylene glycol monoethyl ether *	1 (0.454)
Ethyl acetate	Acetic acid, ethyl ester	5000 (2270)
Ethyl acrylate *	2-Propenoic acid, ethyl ester	1000 (454)
Ethylbenzene *		1000 (454)
Ethyl carbamate (Urethan)	Carbamic acid, ethyl ester	1 (0.454)
Ethyl chloride @	Chloroethane	1 (0.454)
Ethyl cyanide	Propanenitrile	10 (4.54)
Ethyl 4,4'-dichlorobenzilate	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	1 (0.454)
Ethylene dibromide *	Ethane, 1,2-dibromo-	1000 (454)
Ethylene dichloride *	1,2-Dichloroethane	5000 (2270)
	Ethane, 1,2-dichloro-	
Ethylene glycol monoethyl ether *	2-Ethoxyethanol	1 (0.454)
Ethylene oxide *	Oxirane	1 (0.454)
Ethylenebis(dithiocarbamic acid)	1,2-Ethanediylbiscarbamodithioicacid	5000 (2270)
Ethylenediamine *		5000 (2270)
Ethylenediamine tetraacetic acid (EDTA)		5000 (2270)
Ethylenethiourea	2-Imidazolidinethione	1 (0.454)
Ethylenimine	Aziridine	1 (0.454)
Ethyl ether *	Ethane, 1,1'-oxybis-	100 (45.4)
Ethylidene dichloride	Ethane, 1,1-dichloro-	1000 (454)
	1,1-Dichloroethane	
Ethyl methacrylate	2-Propenoic acid, 2-methyl-, ethyl ester	1000 (454)
Ethyl methanesulfonate	Methanesulfonic acid, ethyl ester	1 (0.454)
Ethyl methyl ketone @	2-Butanone	5000 (2270)
	Methyl ethyl ketone *	
Famphur	Phosphorothioic acid, O,O-dimethyl O-[p-[(dimethylamino)-sulfonyl] phenyl] ester	1000 (454)
Ferric ammonium citrate		1000 (454)
Ferric ammonium oxalate		1000 (454)
Ferric chloride		1000 (454)
Ferric dextran ***	Iron dextran ***	5000 (2270)
Ferric fluoride		100 (45.4)
Ferric nitrate *		1000 (454)
Ferric sulfate		1000 (454)
Ferrous ammonium sulfate		1000 (454)
Ferrous chloride *		100 (45.4)
Ferrous sulfate		1000 (454)
Fluoranthene	Benzo[j,k]fluorene	100 (45.4)
Fluorene		500 (2270)
Fluorine *		10 (4.54)
Fluoroacetamide	Acetamide, 2-fluoro-	100 (45.4)
Fluoroacetic acid, sodium salt	Acetic acid, fluoro-, sodium salt	10 (4.54)
Formaldehyde *	Methylene oxide	1000 (454)
Formic acid *	Methanoic acid	5000 (2270)
Fulminic acid, mercury(II)salt	Mercury fulminate	10 (4.54)
Fumaric acid		5000 (2270)
Furan *	Furfuran	100 (45.4)
Furan, tetrahydro-	Tetrahydrofuran *	1000 (454)
2-Furancarboxaldehyde	Furfural *	5000 (2270)
2,5-Furandione	Maleic anhydride *	5000 (2270)
Furfural *	2-Furancarboxaldehyde	5000 (2270)
Furfuran	Furan *	100 (45.4)
D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	Streptozotocin	1 (0.454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Glycidylaldehyde	1-Propanal, 2,3-epoxy-	1 (0.454)
Guanidine, N-nitroso-N-methyl-N'-nitro-	N-Methyl-N'-nitro-N-nitrosoguanidine	1 (0.454)
Guthion *	Azinphos methyl @	1 (0.454)
HALOETHERS		**
HALOMETHANES		**
Heptachlor *	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	1 (0.454)
HEPTACHLOR AND METABOLITES		**
Heptachlor epoxide		1 (0.454)
Hexachlorobenzene	Benzene, hexachloro-	1 (0.454)
Hexachlorobutadiene *	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1(0.454)
HEXACHLOROCYCLOHEXANE (all isomers)		**
Hexachlorocyclohexane (gamma isomer)	gamma - BHC Lindane *	1 (0.454)
Hexachlorocyclopentadiene *	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	1 (0.454)
1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene.	Endrin *	1 (0.454)
1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-dimethanonaphthalene.	Dieldrin *	1 (0.454)
Hexachloroethane *	Ethane, 1,1,1,2,2,2-hexachloro-	1 (0.454)
Hexachlorohexahydro-endo,endo-dimethanonaphthalene	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-endo,endo-dimethanonaphthalene.	1 (0.454)
1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-endo,endo-dimethanonaphthalene.	Hexachlorohexahydro-endo,endo-dimethanonaphthalene	1 (0.454)
1,2,3,4,10-10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-endo,exo-dimethanonaphthalene.	Aldrin *	1 (0.454)
Hexachlorophene	2,2'-Methylenebis(3,4,6-trichlorophenol)	100(45.4)
Hexachloropropene	1-Propene, 1,1,2,3,3,3-hexachloro-	1000 (454)
Hexaethyl tetraphosphate *	Tetraphosphonic acid, hexaethyl ester	100 (45.4)
Hydrazine *	Diamine	1 (0.454)
Hydrazine, 1,2-diethyl-	N,N'-Diethylhydrazine	1 (0.454)
Hydrazine, 1,1-dimethyl-	1,1-Dimethylhydrazine *	1 (0.454)
Hydrazine, 1,2-dimethyl-	1,2-Dimethylhydrazine	1 (0.454)
Hydrazine, 1,2-diphenyl-	1,2-Diphenylhydrazine	1 (0.454)
Hydrazine, methyl-	Methyl hydrazine *	10 (4.54)
Hydrazinocarbothioamide	Thiosemicarbazide	100 (45.4)
Hydrochloric acid *		5000 (2270)
Hydrocyanic acid *	Hydrogen cyanide	10 (4.54)
Hydrofluoric acid *	Hydrogen fluoride *	100 (45.4)
Hydrogen cyanide	Hydrocyanic acid *	10 (4.54)
Hydrogen fluoride *	Hydrofluoric acid *	100 (45.4)
Hydrogen phosphide	Phosphine *	100 (45.4)
Hydrogen sulfide *	Hydrosulfuric acid Sulfur hydride	100 (45.4)
Hydroperoxide, 1-methyl-1-phenylethyl-	alpha,alpha-Dimethylbenzylhydroperoxide	10 (4.54)
Hydrosulfuric acid	Hydrogen sulfide *	100 (45.4)
Hydroxydimethylarsine oxide	Sulfur hydride Cacodylic acid	1 (0.454)
2-Imidazolidinethione	Ethylenethiourea	1 (0.454)
Indeno(1,2,3-cd)pyrene	1,10-(1,2-Phenylene)pyrene	1 (0.454)
Iron dextran ***	Ferric dextran ***	5000 (2270)
Isobutyl alcohol	1-Propanol, 2-methyl-	5000 (2270)
Isocyanic acid, methyl ester	Methyl isocyanate *	1 (0.454)
Isophorone		5000 (2270)
Isoprene *		1000 (454)
Isopropanolamine dodecylbenzene sulfonate		1000 (454)
Isosafrole	Benzene, 1,2-methylenedioxy-4-propenyl-	1 (0.454)
3(2H) Isoxazolone, 5-(aminomethyl)-	5-(Aminomethyl)-3-isoxazolol	1000 (454)
Kelthane		10 (4.54)
Kepone	Decachloroctahydro-1,3,4-metheno-2H-cyclobuta[c,d]-pentalen-2-one	1 (0.454)
Lasiocarpine		1 (0.454)
Lead c		1 (0.454)
Lead acetate	Acetic acid, lead salt	5000 (2270)
LEAD AND COMPOUNDS		**
Lead arsenate *		5000 (2270)
Lead chloride *		100 (45.4)
Lead fluoborate *		100 (45.4)
Lead fluoride *		100 (45.4)
Lead iodide		100 (45.4)
Lead nitrate *		100 (45.4)
Lead phosphate	Phosphoric acid, lead salt	1 (0.454)
Lead stearate		5000 (2270)
Lead subacetate		1 (0.454)
Lead sulfate *		100 (45.4)
Lead sulfide		5000 (2270)
Lead thiocyanate		100 (45.4)
Lindane *	gamma - BHC Hexachlorocyclohexane (gamma isomer)	1 (0.454)
Lithium chromate		1000 (454)
Malathion *		100 (45.4)
Maleic acid *		5000 (2270)
Maleic anhydride *	2,5-Furandione	5000 (2270)
Maleic hydrazide	1,2-Dihydro-3,6-pyridazinedione	5000 (2270)
Malononitrile	Propanedinitrile	1000 (454)
Melphalan	Alanine, 3-[p-bis(2-chloroethyl)amino]phenyl-, L-	1 (0.454)
Mercaptodimethur		10 (4.54)
Mercuric cyanide *		1 (0.454)
Mercuric nitrate *		10 (4.54)
Mercuric sulfate *		10 (4.54)
Mercuric thiocyanate		10 (4.54)
Mercurous nitrate *		10 (4.54)
Mercury *		1 (0.454)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
MERCURY AND COMPOUNDS		**
Mercury, (acetato-O)phenyl-	Phenylmercuric acetate	100 (45.4)
Mercury fulminate	Fulminic acid, mercury(II)salt	10 (4.54)
Methacrylonitrile	2-Propenenitrile, 2-methyl-	1000 (454)
Methanamine, N-methyl-	Dimethylamine *	1000 (454)
Methane, bromo-	Methyl bromide *	1000 (454)
Methane, chloro-	Methyl chloride *	1 (0.454)
Methane, chloromethoxy-	Chloromethyl methyl ether	1 (0.454)
	Methylchloromethyl ether @	
Methane, dibromo-	Methylene bromide	1000 (454)
Methane, dichloro-	Methylene chloride *	1000 (454)
Methane, dichlorodifluoro-	Dichlorodifluoromethane *	5000 (2270)
Methane, iodo-	Methyl iodide	1 (0.454)
Methane, oxybis(chloro-	Bis(chloromethyl) ether	1 (0.454)
Methane, tetrachloro-	Carbon tetrachloride *	5000 (2270)
Methane, tetranitro-	Tetranitromethane *	10 (4.54)
Methane, tribromo-	Bromoform	100 (45.4)
Methane, trichloro-	Chloroform *	5000 (2270)
Methane, trichlorofluoro-	Trichloromonofluoromethane	5000 (2270)
Methanesulfenyl chloride, trichloro-	Perchloromethyl mercaptan @	100 (45.4)
	Trichloromethanesulfenyl chloride	
Methanesulfonic acid, ethyl ester	Ethyl methanesulfonate	1 (0.454)
Methanethiol	Methyl mercaptan *	100 (45.4)
	Thiomethanol	
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-a,4,7,7a-tetrahydro-	Heptachlor *	1 (0.454)
Methanoic acid	Formic acid *	5000 (2270)
4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-	Chlordane *	1 (0.454)
	Chlordane, technical *	
Methanol *	Methyl alcohol *	5000 (2270)
Methapyrilene	Pyridine, 2-[(2-(dimethylamino)ethyl)-2-thenylamino]-	5000 (2270)
Methomyl	Acetimidic acid, N-[(methylcarbamoyl)oxy]thio-, methyl ester	100 (45.4)
Methoxychlor	Ethane, 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)-	1 (0.454)
Methyl alcohol *	Methanol *	5000 (2270)
Methylamine @	Monoethylamine *	100 (45.4)
2-Methylaziridine	1,2-Propylenimine	1 (0.454)
Methyl bromide *	Methane, bromo-	1000 (454)
1-Methylbutadiene	1,3-Pentadiene	100 (45.4)
Methyl chloride *	Methane, chloro-	1 (0.454)
Methyl chlorocarbonate	Carbonochloridic acid, methyl ester	1000 (454)
Methyl chloroform *	1,1,1-Trichloroethane *	1000 (454)
Methylchloromethyl ether @	Chloromethyl methyl ether	1 (0.454)
	Methane, chloromethoxy-	
3-Methylcholanthrene	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	1 (0.454)
4,4'-Methylenebis(2-chloroaniline)	Benzenamine, 4,4'-methylenebis(2-chloro-	1 (0.454)
2,2'-Methylenebis(3,4,6-trichlorophenol)	Hexachlorophene	100(45.4)
Methylene bromide	Methane, dibromo-	1000 (454)
Methylene chloride *	Methane, dichloro-	1000 (454)
Methylene oxide	Formaldehyde *	1000 (454)
Methyl ethyl ketone *	2-Butanone	5000 (2270)
	Ethyl methyl ketone @	
Methyl ethyl ketone peroxide *	2-Butanone peroxide	10 (4.54)
Methyl hydrazine *	Hydrazine, methyl-	10 (4.54)
Methyl iodide	Methane, iodo-	1 (0.454)
Methyl isobutyl ketone	4-Methyl-2-pentanone	5000 (2270)
Methyl isocyanate *	Isocyanic acid, methyl ester	1 (0.454)
2-Methyllactonitrile	Acetone cyanohydrin *	10 (4.54)
	Propanenitrile, 2-hydroxy-2-methyl-	
Methyl mercaptan *	Methanethiol	100 (45.4)
	Thiomethanol	
Methyl methacrylate *	2-Propenoic acid, 2-methyl-, methyl ester	1000 (454)
N-Methyl-N'-nitro-N-nitrosoguanidine	Guanidine, N-nitroso-N-methyl-N'-nitro-	1 (0.454)
Methyl parathion *	O,O-Dimethyl O-p-nitrophenyl phosphorothioate	100 (45.4)
4-Methyl-2-pentanone	Methyl isobutyl ketone	5000 (2270)
Methylthiouracil	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	1 (0.454)
Mevinphos *		10 (4.54)
Mexacarbate *		1000 (454)
Mitomycin C	Azirino(2',3':3,4)pyrrolo(1,2-a)indole-4,7-dione,6-amino-8-[((aminocarbonyl)oxy) methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-.	1 (0.454)
Monoethylamine *	Methylamine @	100 (45.4)
Monomethylamine		100 (45.4)
5,12-Naphthacenedione, (8S-cis)-8-acetyl-10-[3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl) oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-.	Daunomycin	1 (0.454)
Naphthalene *		100 (45.4)
Naphthalene, 2-chloro-	beta-Chloronaphthalene	5000 (2270)
	2-Chloronaphthalene	
1,4-Naphthalenedione	1,4-Naphthoquinone	5000 (2270)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-[1,1'-biphenyl]-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	Trypan blue	1 (0.454)
Naphthenic acid		100 (45.4)
1,4-Naphthoquinone	1,4-Naphthalenedione	5000 (2270)
alpha-Naphthylamine	1-Naphthylamine	1 (0.454)
beta-Naphthylamine	2-Naphthylamine	1 (0.454)
2-Naphthylamine, N,N-bis(2-chloroethyl)-	Chlornaphazine	1 (0.454)
1-Naphthylamine	alpha-Naphthylamine	1 (0.454)
2-Naphthylamine	beta-Naphthylamine	1 (0.454)
alpha-Naphthylthiourea	Thiourea, 1-naphthalenyl-	100 (45.4)
Nickel c		1 (0.454)
Nickel ammonium sulfate		5000 (2270)
NICKEL AND COMPOUNDS		**
Nickel carbonyl *	Nickel tetracarbonyl	1 (0.454)
Nickel chloride *		5000 (2270)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Nickel cyanide *	Nickel(II) cyanide	1 (0.454)
Nickel(II) cyanide	Nickel cyanide *	1 (0.454)
Nickel hydroxide		1000 (454)
Nickel nitrate *		5000 (2270)
Nickel sulfate		5000 (2270)
Nickel tetracarbonyl	Nickel carbonyl *	1 (0.454)
Nicotine * and salts *	Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts	100 (45.4)
Nitric acid *		1000 (454)
Nitric oxide *	Nitrogen(II) oxide	10 (4.54)
p-Nitroaniline *	Benzenamine, 4-nitro-	5000 (2270)
Nitrobenzene *	Benzene, nitro-	1000 (454)
Nitrogen dioxide *	Nitrogen(IV) oxide	10 (4.54)
Nitrogen(II) oxide	Nitric oxide *	10 (4.54)
Nitrogen(IV) oxide	Nitrogen dioxide *	10 (4.54)
Nitroglycerine *	1,2,3-Propanetriol, trinitrate-	10 (4.54)
Nitrophenol * (mixed)		100 (45.4)
m-Nitrophenol		100 (45.4)
o-Nitrophenol	2-Nitrophenol	100 (45.4)
p-Nitrophenol	Phenol, 4-nitro-	100 (45.4)
o-Nitrophenol *	4-Nitrophenol	100 (45.4)
p-Nitrophenol *	2-Nitrophenol *	100 (45.4)
	Phenol, 4-nitro-	100 (45.4)
2-Nitrophenol *	4-Nitrophenol *	100 (45.4)
4-Nitrophenol *	o-Nitrophenol *	100 (45.4)
	p-Nitrophenol *	100 (45.4)
	Phenol, 4-nitro-	100 (45.4)
NITROPHENOLS		**
2-Nitropropane	Propane, 2-nitro-	1 (0.454)
NITROSAMINES		**
N-Nitrosodi-n-butylamine	1-Butanamine, N-butyl-N-nitroso-	1 (0.454)
N-Nitrosodiethanolamine	Ethanol, 2,2'-(nitrosoimino)bis-	1 (0.454)
N-Nitrosodiethylamine	Ethanamine, N-ethyl-N-nitroso-	1 (0.454)
N-Nitrosodimethylamine	Dimethylnitrosamine	1 (0.454)
N-Nitrosodiphenylamine		100 (45.4)
N-Nitrosodi-n-propylamine	Di-n-propylnitrosamine	1 (0.454)
N-Nitroso-N-ethylurea	Carbamide, N-ethyl-N-nitroso-	1 (0.454)
N-Nitroso-N-methylurea	Carbamide, N-methyl-N-nitroso-	1 (0.454)
N-Nitroso-N-methylurethane	Carbamic acid, methylnitroso-, ethyl ester	1 (0.454)
N-Nitrosomethylvinylamine	Ethenamine, N-methyl-N-nitroso-	1 (0.454)
N-Nitrosopiperidine	Pyridine, hexahydro-N-nitroso-	1 (0.454)
N-Nitrosopyrrolidine	Pyrrole, tetrahydro-N-nitroso-	1 (0.454)
Nitrotoluene *		1000 (454)
m-Nitrotoluene		
o-Nitrotoluene		
p-Nitrotoluene		
5-Nitro-o-toluidine	Benzenamine, 2-methyl-5-nitro-	1 (0.454)
5-Norbornene-2,3-dimethanol,1,4,5,6,7,7-hexachloro,cyclic sulfite	Endosulfan *	1 (0.454)
Octamethylpyrophosphoramide	Diphosphoramide, octamethyl-	100(45.4)
Osmium oxide	Osmium tetroxide	1000 (454)
Osmium tetroxide	Osmium oxide	1000 (454)
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	Endothall	1000 (454)
1,2-Oxathiolane, 2,2-dioxide	1,3-Propane sultone	1 (0.454)
2H-1,3,2-Oxazaphosphorine,2-[bis(2-chloroethyl) amino] tetrahydro-2-oxide	Cyclophosphamide	1 (0.454)
Oxirane	Ethylene oxide *	1 (0.454)
Oxirane, 2-(chloromethyl)-	Epichlorohydrin *	1000 (454)
	1-Chloro-2,3-epoxypropane	
Paraformaldehyde *		1000 (454)
Paraldehyde *	1,3,5-Trioxane, 2,4,6-trimethyl-	1000 (454)
Parathion *	Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl)ester	1 (0.454)
Pentachlorobenzene	Benzene, pentachloro-	10 (4.54)
Pentachloroethane	Ethane, pentachloro-	1 (0.454)
Pentachloronitrobenzene	Benzene, pentachloronitro-	1 (0.454)
Pentachlorophenol *	Phenol, pentachloro-	10 (4.54)
1,3-Pentadiene	1-Methylbutadiene	100 (45.4)
Perchloroethylene *	Ethene, 1,1,2,2-tetrachloro-	1 (0.454)
	Tetrachloroethene	
	Tetrachloroethylene *	
Perchloromethyl mercaptan @	Methanesulfenyl chloride, trichloro-	100 (45.4)
	Trichloromethanesulfenyl chloride	
Phenacetin	Acetamide, N-(4-ethoxyphenyl)-	1 (0.454)
Phenanthrene		5000 (2270)
Phenol *	Benzene, hydroxy-	1000 (454)
Phenol, 4-chloro-3-methyl-	p-Chloro-m-cresol	5000 (2270)
	4-Chloro-m-cresol	
Phenol, 2-chloro-	o-Chlorophenol	100 (45.4)
	2-Chlorophenol	
Phenol, 2-cyclohexyl-4,6-dinitro-	4,6-Dinitro-o-cyclohexylphenol *	100 (45.4)
Phenol, 2,4-dichloro-	2,4-Dichlorophenol	100 (45.4)
Phenol, 2,6-dichloro-	2,6-Dichlorophenol	100 (45.4)
Phenol, 2,4-dimethyl-	2,4-Dimethylphenol	100 (45.4)
	2,4-Xylenol @	
Phenol, 2,4-dinitro-6-(1-methylpropyl)-	Dinoseb	1000 (454)
Phenol, 2,4-dinitro-6-methyl-, and salts	4,6-Dinitro-o-cresol andsalts	10 (4.54)
Phenol, 2,4-dinitro-	2,4-Dinitrophenol *	10 (4.54)
Phenol, 4-nitro-	p-Nitrophenol *	100 (45.4)
	4-Nitrophenol *	
Phenol, pentachloro-	Pentachlorophenol *	10 (4.54)
Phenol, 2,3,4,6-tetrachloro-	2,3,4,6-Tetrachlorophenol *	10 (4.54)
Phenol, 2,4,5-trichloro-	2,4,5-Trichlorophenol *	10 (4.54)
Phenol, 2,4,6-trichloro-	2,4,6-Trichlorophenol *	10 (4.54)
Phenol, 2,4,6-trinitro-, ammonium salt	Ammonium picrate *	10 (4.54)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Phenyl dichloroarsine *	Dichlorophenylarsine	1 (0.454)
1,10-(1,2-Phenylene)pyrene	Indeno(1,2,3-cd)pyrene	1 (0.454)
Phenyl mercaptan @	Benzenethiol	100 (45.4)
	Thiophenol *	
Phenylmercuric acetate	Mercury, (acetato-O)phenyl-	100 (45.4)
N-Phenylthiourea	Thiourea, phenyl-	100 (45.4)
Phorate	Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methylester	10 (4.54)
Phosgene *	Carbonyl chloride	10 (4.54)
Phosphine *	Hydrogen phosphide	100 (45.4)
Phosphoric acid *		5000 (2270)
Phosphoric acid, diethyl p-nitrophenyl ester	Diethyl-p-nitrophenyl phosphate	100 (45.4)
Phosphoric acid, lead salt	Lead phosphate	1 (0.454)
Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	Phorate	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-methyl ester	O,O-Diethyl S-methyl dithiophosphate	5000 (2270)
Phosphorodithioic acid, O,O-dimethyl S-[2 (methylamino)-2-oxoethyl] ester	Dimethoate	10 (4.54)
Phosphorofluoridic acid, bis(1-methylethyl) ester	Diisopropyl fluorophosphate	100 (45.4)
Phosphorothioic acid, O,O-diethyl O-(p-nitrophenyl) ester	Parathion *	1 (0.454)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	O,O-Diethyl O-pyrazinyl phosphorothioate	100 (45.4)
Phosphorothioic acid, O,O-dimethyl O-[p-[(dimethylamino)-sulfonyl] phenyl] ester	Famphur	1000 (454)
Phosphorus *		1 (0.454)
Phosphorus oxychloride *		1000 (454)
Phosphorus pentasulfide *	Phosphorus sulfide	100 (45.4)
	Sulfur phosphide	
Phosphorus sulfide	Phosphorus pentasulfide *	100 (45.4)
	Sulfur phosphide	
Phosphorus trichloride *		1000 (454)
PHTHALATE ESTERS		**
Phthalic anhydride	1,2-Benzenedicarboxylic acid anhydride	5000 (2270)
2-Picoline	Pyridine, 2-methyl-	5000 (2270)
Plumbane, tetraethyl-	Tetraethyl lead *	10 (4.54)
POLYCHLORINATED BIPHENYLS (PCBs) *		10 (4.54)
Aroclor 1016	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1221	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1232	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1242	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1248	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1254	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
Aroclor 1260	POLYCHLORINATED BIPHENYLS (PCBs)	10 (4.54)
POLYNUCLEAR AROMATIC HYDROCARBONS		**
Potassium arsenate *		1000 (454)
Potassium arsenite *		1000 (454)
Potassium bichromate	Potassium dichromate @	1000 (454)
Potassium chromate		1000 (454)
Potassium cyanide *		10 (4.54)
Potassium dichromate @	Potassium bichromate	1000 (454)
Potassium hydroxide *		1000 (454)
Potassium permanganate *		100 (45.4)
Potassium silver cyanide		1 (0.454)
Pronamide	3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide	5000 (2270)
1-Propanal, 2,3-epoxy-	Glycidylaldehyde	1 (0.454)
Propanal, 2-methyl-2-(methylthio)-,O-[(methylamino)carbonyl]oxime	Aldicarb	1 (0.454)
1-Propanamine	n-Propylamine *	5000 (2270)
1-Propanamine, N-propyl-	Dipropylamine	5000 (2270)
Propane, 1,2-dibromo-3-chloro-	1,2-Dibromo-3-chloropropane	1(0.454)
Propane, 2-nitro-	2-Nitropropane	1 (0.454)
Propane, 2,2'-oxybis(2-chloro-	Bis(2-chloroisopropyl) ether	1000 (454)
1,3-Propane sultone	1,2-Oxathiolane, 2,2-dioxide	1 (0.454)
Propanedinitrile	Malononitrile	1000 (454)
Propanenitrile	Ethyl cyanide	10 (4.54)
Propanenitrile, 3-chloro-	3-Chloropropionitrile	1000 (454)
Propanenitrile, 2-hydroxy-2-methyl-	Acetone cyanohydrin *	10 (4.54)
	2-Methylactonitrile	
1,2,3-Propanetriol, trinitrate-	Nitroglycerine *	10 (4.54)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	Tris(2,3-dibromopropyl)phosphate	1 (0.454)
1-Propanol, 2-methyl-	Isobutyl alcohol	5000 (2270)
2-Propanone	Acetone *	5000 (2270)
2-Propanone, 1-bromo-	Bromoacetone *	1000 (454)
Propargite		10 (4.54)
Propargyl alcohol *	2-Propyn-1-ol	1000 (454)
2-Propenal	Acrolein *	1 (0.454)
2-Propenamide	Acrylamide	5000 (2270)
Propene, 1,3-dichloro-	1,3-Dichloropropene *	100 (45.4)
1-Propene, 1,1,2,3,3,3-hexachloro-	Hexachloropropene	1000 (454)
2-Propenenitrile	Acrylonitrile *	100 (45.4)
2-Propenenitrile, 2-methyl-	Methacrylonitrile	1000 (454)
2-Propenoic acid	Acrylic acid *	5000 (2270)
2-Propenoic acid, ethyl ester	Ethyl acrylate *	1000 (454)
2-Propenoic acid, 2-methyl-, ethyl ester	Ethyl methacrylate	1000 (454)
2-Propenoic acid, 2-methyl-, methyl ester	Methyl methacrylate *	1000 (454)
2-Propen-1-ol	Allyl alcohol *	100 (45.4)
Propionic acid *		5000 (2270)
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	Silvex	100 (45.4)
	2,4,5-TP @	
	2,4,5-TP acid	
Propionic anhydride		5000 (2270)
n-Propylamine *	1-Propanamine	5000 (2270)
Propylene dichloride *	1,2-Dichloropropane	1000 (454)
Propylene oxide *		100 (45.4)
1,2-Propylenimine *	2-Methylaziridine	1 (0.454)
2-Propyn-1-ol	Propargyl alcohol *	1000 (454)
Pyrene		5000 (2270)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Pyrethrins		1 (0.454)
4-Pyridinamine	4-Aminopyridine	1000 (454)
Pyridine *		1000 (454)
Pyridine, 2-[[2-(dimethylamino)ethyl]-2- thenylamino]-	Methapyrilene	5000 (2270)
Pyridine, hexahydro-N-nitroso-	N-Nitrosopiperidine	1 (0.454)
Pyridine, 2-methyl-	2-Picoline	5000 (2270)
Pyridine, (S)-3-(1-methyl-2-pyrrolidinyl)-, and salts	Nicotine * and salts *	100 (45.4)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	Methylthiouracil	1 (0.454)
Pyrophosphonic acid, tetraethyl ester	Tetraethyl pyrophosphate *	10 (4.54)
Pyrrole, tetrahydro-N-nitroso-	N-Nitrosopyrrolidine	1 (0.454)
Quinoline		5000 (2270)
RADIONUCLIDES ***		1 (0.454)
Reserpine	Yohimban-16-carboxylic acid,11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester.	5000 (2270)
Resorcinol *	1,3-Benzenediol	5000 (2270)
Saccharin and salts	1,2-Benzisothiazolin-3-one,1,1-dioxide, and salts	1 (0.454)
Safrole	Benzene, 1,2-methylenedioxy-4-allyl-	1 (0.454)
Selenious acid		10 (4.54)
Selenium ¢		100 (45.4)
SELENIUM AND COMPOUNDS		**
Selenium dioxide	Selenium oxide *	10 (4.54)
Selenium disulfide	Sulfur selenide	1 (0.454)
Selenium oxide *	Selenium dioxide	10 (4.54)
Seleniourea	Carbamimidoselenoic acid	1000 (454)
L-Serine, diazoacetate (ester)	Azaserine	1 (0.454)
Silver ¢		1000 (454)
SILVER AND COMPOUNDS		**
Silver cyanide *		1 (0.454)
Silver nitrate *		1 (0.454)
Silvex	Propionic acid, 2-(2,4,5-trichlorophenoxy)-	100 (45.4)
	2,4,5-TP @	
	2,4,5-TP acid	
Sodium *		10 (4.54)
Sodium arsenate *		1000 (454)
Sodium arsenite *		1000 (454)
Sodium azide *		1000 (454)
Sodium bichromate	Sodium dichromate @	1000 (454)
Sodium bifluoride *		100 (45.4)
Sodium bisulfite *		5000 (2270)
Sodium chromate		1000 (454)
Sodium cyanide *		10 (4.54)
Sodium dichromate @	Sodium bichromate	1000 (454)
Sodium dodecylbenzene sulfonate		1000 (454)
Sodium fluoride *		1000 (454)
Sodium hydrosulfide *		5000 (2270)
Sodium hydroxide *		1000 (454)
Sodium hypochlorite *		100 (45.4)
Sodium methylate *		1000 (454)
Sodium nitrite *		100 (45.4)
Sodium phosphate, dibasic		5000 (2270)
Sodium phosphate, tribasic		5000 (2270)
Sodium selenite *		1000 (454)
4,4'-Stilbenediol, alpha,alpha'-diethyl-	Diethylstilbestrol	1 (0.454)
Streptozotocin	D-Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	1 (0.454)
Strontium chromate		1000 (454)
Strontium sulfide		100 (45.4)
Strychnidin-10-one, and salts	Strychnine * and salts *	10 (4.54)
Strychnidin-10-one, 2,3-dimethoxy-	Brucine	100 (45.4)
Strychnine * and salts *	Strychnidin-10-one, and salts	10 (4.54)
Styrene		1000 (454)
Sulfur hydride	Hydrogen sulfide *	100 (45.4)
	Hydrosulfuric acid	
Sulfur monochloride		1000 (454)
Sulfur phosphide	Phosphorus pentasulfide *	100 (45.4)
	Phosphorus sulfide	
Sulfur selenide	Selenium disulfide	1 (0.454)
Sulfuric acid		1000 (454)
Sulfuric acid, dimethyl ester	Dimethyl sulfate *	1 (0.454)
Sulfuric acid, thallium(I) salt	Thallium(I) sulfate *	100 (45.4)
2,4,5-T acid	2,4,5-T *	1000 (454)
	2,4,5-Trichlorophenoxyacetic acid *	
2,4,5-T amines *		5000 (2270)
2,4,5-T esters *		1000 (454)
2,4,5-T salts *		1000 (454)
2,4,5-T *	2,4,5-T acid	1000 (454)
	2,4,5-Trichlorophenoxyacetic acid *	
TDE *	DDD	1(0.454)
	Dichlorodiphenyl dichloroethane	
	4,4' DDD	
1,2,4,5-Tetrachlorobenzene	Benzene, 1,2,4,5-tetrachloro-	5000 (2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)		1 (0.454)
1,1,1,2-Tetrachloroethane *	Ethane, 1,1,1,2-tetrachloro-	1 (0.454)
1,1,2,2-Tetrachloroethane *	Ethane, 1,1,2,2-tetrachloro-	1 (0.454)
Tetrachloroethene	Ethene, 1,1,2,2-tetrachloro-	1 (0.454)
	Perchloroethylene *	
	Tetrachloroethylene *	
Tetrachloroethylene *	Ethene, 1,1,2,2-tetrachloro-	1 (0.454)
	Perchloroethylene *	
	Tetrachloroethene	
2,3,4,6-Tetrachlorophenol	Phenol, 2,3,4,6-tetrachloro-	10 (4.54)
Tetraethyl lead *	Plumbane, tetraethyl-	10 (4.54)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Tetraethyl pyrophosphate *	Pyrophosphonic acid, tetraethyl ester	10 (4.54)
Tetraethyldithiopyrophosphate	Dithiopyrophosphonic acid, tetraethyl ester	100 (45.4)
Tetrahydrofuran *	Furan, tetrahydro-	1000 (454)
Tetranitromethane *	Methane, tetranitro-	10 (4.54)
Tetraphosphonic acid, hexaethyl ester	Hexaethyl tetraphosphate *	100 (45.4)
Thallic oxide	Thallium(III) oxide	100 (45.4)
Thallium e		1000 (454)
THALLIUM AND COMPOUNDS		**
Thallium(I) acetate	Acetic acid, thallium(I) salt	100 (45.4)
Thallium(I) carbonate	Carbonic acid, dithallium (I) salt	100(45.4)
Thallium(I) chloride		100 (45.4)
Thallium(I) nitrate		100 (45.4)
Thallium(III) oxide	Thallic oxide	100 (45.4)
Thallium(I) selenide		1000 (454)
Thallium(I) sulfate *	Sulfuric acid, thallium(I) salt	100 (45.4)
Thioacetamide	Ethanethioamide	1 (0.454)
Thiofanox	3,3-Dimethyl-1-(methylthio)-2-butanone,O-[(methylamino)carbonyl] oxime	100 (45.4)
Thiomidodicarbonic diamide	2,4-Dithiobiuret	100 (45.4)
Thiomethanol	Methanethiol	100 (45.4)
Thiophenol *	Methyl mercaptan *	
	Benzenethiol	100 (45.4)
	Phenyl mercaptan @	
Thiosemicarbazide	Hydrazinecarbothioamide	100 (45.4)
Thiourea	Carbamide, thio-	1 (0.454)
Thiourea, (2-chlorophenyl)-	1-(o-Chlorophenyl)thiourea	100 (45.4)
Thiourea, 1-naphthalenyl-	alpha-Naphthylthiourea	100 (45.4)
Thiourea, phenyl-	N-Phenylthiourea	100 (45.4)
Thiram	Bis(dimethylthiocarbamoyl) disulfide	10 (4.54)
Toluene *	Benzene, methyl-	1000 (454)
Toluene-2,4-diamine	2,4-Diaminotoluene	1 (0.454)
2,4-Toluenediamine *	2,4-Toluenediamine *	
	Toluene-2,4-diamine	1 (0.454)
	2,4-Diaminotoluene	
Toluene diisocyanate *	Benzene, 2,4-diisocyanatomethyl-	100 (45.4)
o-Toluidine hydrochloride	Benzenamine, 2-methyl-, hydrochloride	1 (0.454)
o-Toluidine	2-Amino-1-methyl benzene	1 (0.454)
p-Toluidine	4-Amino-1-methyl benzene	1 (0.454)
Toxaphene *	Camphene, octachloro-	1 (0.454)
2,4,5-TP @	Propionic acid, 2-(2,4,5-trichlorophenoxy)-	100 (45.4)
	Silvex	
2,4,5-TP acid esters	2,4,5-TP acid	
2,4,5-TP acid	2,4,5-TP ester @	100 (45.4)
	Propionic acid, 2-(2,4,5-trichlorophenoxy)-	100 (45.4)
	Silvex	
2,4,5-TP ester @	2,4,5-TP @	
1H-1,2,4-Triazol-3-amine	2,4,5-TP acid esters	100 (45.4)
Trichlorfon	Amitrole	1 (0.454)
1,2,4-Trichlorobenzene		100 (45.4)
1,1,1-Trichloroethane *		100 (45.4)
1,1,2-Trichloroethane	Methyl chloroform *	1000 (454)
Trichloroethane	Ethane, 1,1,2-trichloro-	1 (0.454)
Trichloroethylene *	Trichloroethylene *	1000 (454)
Trichloromethanesulfenyl chloride	Trichloroethene	1000 (454)
	Methanesulfenyl chloride, trichloro-	100 (45.4)
Trichloromonofluoromethane	Perchloromethyl mercaptan @	
Trichlorophenol *	Methane, trichlorofluoro-	5000 (2270)
2,3,4-Trichlorophenol		10 (4.54)
2,3,5-Trichlorophenol		
2,3,6-Trichlorophenol		
Phenol, 2,4,5-trichloro-	2,4,5-Trichlorophenol	10 (4.54)
Phenol, 2,4,6-trichloro-	2,4,6-Trichlorophenol	10 (4.54)
3,4,5-Trichlorophenol		
2,4,5-Trichlorophenol *	Phenol, 2,4,5-trichloro-	10 (4.54)
2,4,6-Trichlorophenol *	Phenol, 2,4,6-trichloro-	10 (4.54)
2,4,5-Trichlorophenoxyacetic acid *	2,4,5-T *	1000 (454)
	2,4,5-T acid	
Triethanolamine dodecylbenzene sulfonate		1000 (454)
Triethylamine		5000 (2270)
Trimethylamine *		100 (45.4)
sym-Trinitrobenzene *	Benzene, 1,3,5-trinitro-	10 (4.54)
1,3,5-Trioxane, 2,4,6-trimethyl-	Paraldehyde	1000 (454)
Tris(2,3-dibromopropyl) phosphate	1-Propanol, 2,3-dibromo-, phosphate (3:1)	1 (0.454)
Trypan blue	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt.	1 (0.454)
Unlisted Hazardous Wastes Characteristic of Corrosivity		100(45.4)
Unlisted Hazardous Wastes Characteristic of EP Toxicity		
Arsenic D004		1 (0.454)
Barium D005		1000 (454)
Cadmium D006		1 (0.454)
Chromium D007		1 (0.454)
Lead D008		1 (0.454)
Mercury D009		1 (0.454)
Selenium D010		10 (4.54)
Silver D011		1 (0.454)
Endrin D012		1 (0.454)
Lindane D013		1 (0.454)
Methoxychlor D014		1 (0.454)
Toxaphene D015		1 (0.454)
2,4-D D016		100 (45.4)
2,4,5-TP D017		100 (45.4)

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
Unlisted Hazardous Wastes Characteristic of Ignitability		100 (45.4)
Unlisted Hazardous Wastes Characteristic of Reactivity		100 (45.4)
Uracil, 5-[bis(2-chloroethyl)amino]-	Uracil mustard	1 (0.454)
Uracil mustard	Uracil, 5-[bis(2-chloroethyl)amino]-	1 (0.454)
Uranyl acetate *		100 (45.4)
Uranyl nitrate *		100 (45.4)
Vanadic acid, ammonium salt	Ammonium vanadate	1000 (454)
Vanadium(V) oxide	Vanadium pentoxide *	1000 (454)
Vanadium pentoxide *	Vanadium(V) oxide	1000 (454)
Vanadyl sulfate		1000 (454)
Vinyl acetate *		5000 (2270)
Vinyl chloride *	Ethene, chloro-	1 (0.454)
Vinylidene chloride *	Ethene, 1,1-dichloro-	5000 (2270)
	1,1-Dichloroethylene	
Warfarin	3-(alpha-Acetonylbenzyl)-4-hydroxycoumarin and salts	100 (45.4)
Xylene * (mixed)	Benzene, dimethyl-	1000 (454)
m-Benzene, dimethyl	m-Xylene	
o-Benzene, dimethyl	o-Xylene	
p-Benzene, dimethyl	p-Xylene	
Xylenol *		1000 (454)
2,4-Xylenol @	2,4-Dimethylphenol	100 (45.4)
	Phenol, 2,4-dimethyl-	
Yohimban-16-carboxylic acid,11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester.	Reserpine	5000 (2270)
Zinc ¢		1000 (454)
ZINC AND COMPOUNDS		**
Zinc acetate		1000 (454)
Zinc ammonium chloride		1000 (454)
Zinc borate		1000 (454)
Zinc bromide		1000 (454)
Zinc carbonate		1000 (454)
Zinc chloride		1000 (454)
Zinc cyanide *		10 (4.54)
Zinc fluoride		1000 (454)
Zinc formate		1000 (454)
Zinc hydrosulfite *		1000 (454)
Zinc nitrate *		1000 (454)
Zinc phenolsulfonate		5000 (2270)
Zinc phosphide *		100 (45.4)
Zinc silicofluoride		5000 (2270)
Zinc sulfate		1000 (454)
Zirconium nitrate *		5000 (2270)
Zirconium potassium fluoride		1000 (454)
Zirconium sulfate *		5000 (2270)
Zirconium tetrachloride *		5000 (2270)
F001		1 (0.454)
The following spent halogenated solvents used in degreasing and sludges from the recovery of these solvents in degreasing operations:.		
(a) Tetrachloroethylene		1 # (0.454)
(b) Trichloroethylene		1000 # (454)
(c) Methylene chloride		1000 (454)
(d) 1,1,1-Trichloroethane		1000 (454)
(e) Carbon tetrachloride		5000 # (2270)
(f) Chlorinated fluorocarbons		5000 (2270)
F002		1 (0.454)
The following spent halogenated solvents and the still bottoms from the recovery of these solvents.		
(a) Tetrachloroethylene		1 # (0.454)
(b) Methylene chloride		1000 (454)
(c) Trichloroethylene		1000 # (454)
(d) 1,1,1-Trichloroethane		1000 (454)
(e) Chlorobenzene		100 (45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane		5000 (2270)
(g) o-Dichlorobenzene		100 (45.4)
(h) Trichlorofluoromethane		5000 (2270)
F003		100 (45.4)
The following spent non-halogenated solvents and solvents		
(a) Xylene		1000 (454)
(b) Acetone		5000 (2270)
(c) Ethyl acetate		5000 (2270)
(d) Ethylbenzene		1000 (454)
(e) Ethyl ether		100 (45.4)
(f) Methyl isobutyl ketone		5000 (2270)
(g) n-Butyl alcohol		5000 (2270)
(h) Cyclohexanone		5000 (2270)
(i) Methanol		5000 (2270)
F004		1000 (454)
The following spent non-halogenated solvents and the stillbottoms from the recovery of these solvents: (a) Cresols/Cresylic acid (b) Nitrobenzene.		
F005		100 (45.4)
The following spent non-halogenated solvents and the stillbottoms from the recovery of these solvents: (a) Toluene (b) Methyl ethyl ketone (c) Carbon disulfide (d) Isobutanol (e) Pyridine.		
F006		1 (0.454)
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 carbonsteel. (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		

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
F007		10 (4.54)
Spent cyanide plating bath solutions from electroplating operations		
F008		10 (4.54)
Plating bath sludges from the bottom of plating baths fromelectroplating operations where cyanides are used in the process (except for precious metals electroplating plating bath sludges).		
F009		10 (4.54)
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process (except for precious metals electroplating spent stripping and cleaning bath solutions).		
F010		10 (4.54)
Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process (except for precious metals heat-treating quenching bath sludges).		
F011		10 (4.54)
Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning).		
F012		10 (4.54)
Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process (except for precious metals heat treating quenching wastewater treatment sludges).		
F019		1 (0.454)
Wastewater treatment sludges from the chemical conversion coating of aluminum		
F020		1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri-or-tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from highly purified 2,4,5-trichlorophenol.).		
F021		1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.		
F022		1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.		
F023		1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the productionor use of hexachlorophene from highly purified 2,4,5-trichlorophenol.).		
F024		1 (0.454)
Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout 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, spent dessicants(sic), wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in Section 261.32.).		
F026		1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.		
F027		1 (0.454)
Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derivedfrom these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.).		
F028		1 (0.454)
Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.		
K001		1 (0.454)
Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.		
K002		1 (0.454)
Wastewater treatment sludge from the production of chrome yellow and orange pigments.		
K003		1 (0.454)
Wastewater treatment sludge from the production of molybdate orange pigments		
K004		1 (0.454)
Wastewater treatment sludge from the production of zinc yellow pigments		
K005		1 (0.454)
Wastewater treatment sludge from the production of chrome green pigments		
K006		1 (0.454)
Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).		
K007		1 (0.454)
Wastewater treatment sludge from the production of iron blue pigments		
K008		1 (0.454)
Oven residue from the production of chrome oxide green pigments		
K009		1 (0.454)
Distillation bottoms from the production of acetaldehyde from ethylene		

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
K010		1 (0.454)
Distillation side cuts from the production of acetaldehydefrom ethylene		
K011		1 (0.454)
Bottom stream from the wastewater stripper in the production of acrylonitrile		
K013		1 (0.454)
Bottom stream from the acetonitrile column in the production of acrylonitrile		
K014		5000 (2270)
Bottoms from the acetonitrile purification column in the production of acrylonitrile		
K015		1 (0.454)
Still bottoms from the distillation of benzyl chloride		
K016		1 (0.454)
Heavy ends or distillation residues from the production ofcarbon tetrachloride		
K017		1 (0.454)
Heavy ends (still bottoms) from the purification column inthe production of epichlorohydrin.		
K018		1 (0.454)
Heavy ends from the fractionation column in ethyl chlorideproduction		
K019		1 (0.454)
Heavy ends from the distillation of ethylene dichloride inethylene dichloride production.		
K020		1 (0.454)
Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.		
K021		1 (0.454)
Aqueous spent antimony catalyst waste from fluoromethanes production		
K022		1 (0.454)
Distillation bottom tars from the production of phenol/acetone from cumene		
K023		5000 (2270)
Distillation light ends from the production of phthalic anhydride from naphthalene		
K024		5000 (2270)
Distillation bottoms from the production of phthalic anhydride from naphthalene		
K025		1 (0.454)
Distillation bottoms from the production of nitrobenzene by the nitration of benzene.		
K026		1000 (454)
Stripping still tails from the production of methyl ethyl pyridines		
K027		1 (0.454)
Centrifuge and distillation residues from toluene diisocyanate production		
K028		1 (0.454)
Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.		
K029		1 (0.454)
Waste from the product steam stripper in the production of1,1,1-trichloroethane		
K030		1 (0.454)
Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.		
K031		1 (0.454)
By-product salts generated in the production of MSMA and cacodylic acid		
K032		1 (0.454)
Wastewater treatment sludge from the production of chlordane		
K033		1 (0.454)
Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.		
K034		1 (0.454)
Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.		
K035		1 (0.454)
Wastewater treatment sludges generated in the production of creosote		
K036		1 (0.454)
Still bottoms from toluene reclamation distillation in theproduction of disulfoton		
K037		1 (0.454)
Wastewater treatment sludges from the production of disulfoton		
K038		1 (0.454)
Wastewater from the washing and stripping of phorate production		
K039		10 (4.54)
Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.		
K040		1 (0.454)
Wastewater treatment sludge from the production of phorate		
K041		1 (0.454)
Wastewater treatment sludge from the production of toxaphene		
K042		1 (0.454)
Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.		
K043		1 (0.454)
2,6-dichlorophenol waste from the production of 2,4-D		
K044		10 (4.54)
Wastewater treatment sludges from the manufacturing and processing of explosives.		
K045		10 (4.54)
Spent carbon from the treatment of wastewater containing explosives		
K046		100 (45.4)
Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.		
K047		10 (4.54)
Pink/red water from TNT operations		
K048		1 (0.454)
Dissolved air flotation (DAF) float from the petroleum refining industry		
K049		1 (0.454)
Slop oil emulsion solids from the petroleum refining industry		

LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES—Continued

Hazardous Substance	Synonyms	Reportable Quantity(RQ) Pounds(Kilograms)
K050		1 (0.454)
Heat exchanger bundle cleaning sludge from the petroleum refining industry		
K051		1 (0.454)
API separator sludge from the petroleum refining industry		
K052		10 (4.54)
Tank bottoms (leaded) from the petroleum refining industry		
K060		1 (0.454)
Ammonia still lime sludge from coking operations		
K061		1 (0.454)
Emission control dust/sludge from the primary production of steel in electric furnaces.		
K062		1 (0.454)
Spent pickle liquor from steel finishing operations		
K069		1 (0.454)
Emission control dust/sludge from secondary lead smelting		
K071		1(0.454)
Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.		
K073		1 (0.454)
Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.		
K083		100 (45.4)
Distillation bottoms from aniline extraction		
K084		1 (0.454)
Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.		
K085		1 (0.454)
Distillation or fractionation column bottoms from the production of chlorobenzenes.		
K086		1 (0.454)
Solvent washes and sludges, caustic washes and sludges, orwater washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, dyers, soaps, and stabilizers containing chromium and lead.		
K087		100 (45.4)
Decanter tank tar sludge from coking operations		
K093		5000 (2270)
Distillation light ends from the production of phthalic anhydride from ortho-xylene		
K094		5000 (2270)
Distillation bottoms from the production of phthalic anhydride from ortho-xylene		
K095		1 (0.454)
Distillation bottoms from the production of 1,1,1-trichloroethane		
K096		1 (0.454)
Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.		
K097		1 (0.454)
Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.		
K098		1 (0.454)
Untreated process wastewater from the production of toxaphene		
K099		1 (0.454)
Untreated wastewater from the production of 2,4-D		
K100		1 (0.454)
Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.		
K101		1 (0.454
Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.		
K102		1 (0.454)
Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.		
K103		100 (45.4)
Process residues from aniline extraction from the production of aniline		
K104		1 (0.454)
Combined wastewater streams generated from nitrobenzene/aniline chlorobenzenes.		
K105		1 (0.454)
Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.		
K106		1 (0.454)
Wastewater treatment sludge from the mercury cell process in chlorine production.		
K111		1 (0.454)
Product washwaters from the production of dinitrotoluene via nitration of toluene.		
K112		1 (0.454)
Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.		
K113		1 (0.454)
Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.		
K114		1 (0.454)
Vicinals from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.		
K115		1 (0.454)
Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.		
K116		1 (0.454)
Organic condensate from the solvent recovery column in theproduction of toluene diisocyanate via phosgenation of toluenediamine.		

ANNEX XII

MAJOR FEDERAL OIL AND HAZARDOUS SUBSTANCES SPILL PREVENTION AND RESPONSE LEGISLATION AND REGULATIONS

Clean Water Act (CWA), PL 92-500, 33 USC 1251 as amended by PL 95-217 and PL 95-576. Effective date 1977.
The CWA authorizes the President to issue regulations establishing procedures, methods, equipment, and other requirements to prevent discharges of oil and hazardous substances from onshore and offshore facilities, and to contain such discharges.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), PL 96-510, 42 USC 9601. Effective date 11 December 1980.
CERCLA provides for spill reporting, liability compensation, cleanup, and emergency response for hazardous substances (excluding oil) released into the environment and the cleanup of inactive disposal sites.

Resource Conservation and Recovery Act (RCRA), PL 94-580, 42 USC 6910. Effective date 21 October 1976.
Subtitle C of the Solid Waste Disposal Act, as amended by RCRA, directs the Environmental Protection Agency to promulgate regulations establishing a Federal hazardous waste management system.

33 CFR 153, Control of Pollution by Oil and Hazardous Substances, Discharge Removal. Effective date 26 April 1976.
Requires the notification of the Duty Officer, National Response Center, U.S. Coast Guard of the discharge of oil or a hazardous substance from a facility in violation of section 311(b)(3) of the CWA.

40 CFR 110, Environmental Protection Agency Regulations on Discharge of Oil. Effective date 11 November 1976.
Defines a reportable spill of oil.

40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Effective date 19 May 1980.
Established requirements under Section 3004 of RCRA for owners and operators of facilities that treat, store, and dispose of hazardous waste. Requirements include preparedness and prevention of hazards, contingency planning, emergency procedures, manifests, record keeping, reporting, security, inspection of facilities, and personnel training.

40 CFR 265, Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities. Effective date 19 May 1980.

Established interim requirements for owners and operators of facilities that treat, store, and dispose of hazardous wastes. Requirements include preparedness and prevention of hazards, contingency planning, emergency procedures, manifests, record keeping, reporting, security, inspection of facilities and personnel training.

40 CFR 300, National Oil and Hazardous Substance Pollution Contingency Plan. Effective date 14 July 1982.

Provides for coordinated Federal action to try to prevent discharges of oil and hazardous substances, and to protect the environment from damage when discharges occur. The plan also requires Federal-local contingency plans for Federal installations and promotes Federal-state coordination.

40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Use Prohibitions. Effective date 31 May 1979.

Establishes procedures for the storage and disposal of oils and other materials containing PCBs. Strict storage requirements are designated for PCB containing wastes that are awaiting disposal.

ANNEX XIII

DESCRIPTIVE EVACUATION PLAN FOR HAZARDOUS WASTE STORAGE FACILITIES

SITE: Corrosion Control Accumulation Point (behind building 196). Depending on the wind direction and instructions, the following primary and alternate routes can be used:

a. Primary Evacuation Route: Proceed southwest behind building 195 then proceed northwest on driveway adjacent to building 192, across Torch Boulevard and northwest on Argentina to Overlord Boulevard.

b. Alternate Evacuation Route 1: Proceed southwest behind building 195, the proceed northwest on driveway adjacent to building 192 and then southwest on Torch Boulevard.

c. Alternate Evacuation Route 2: Proceed northwest behind building 196 then turn east moving towards the flightline and then north (on abandoned taxiway) past buildings 174, 218 and 216 on to perimeter road.

d. Alternate Evacuation Route 3: Proceed northwest behind building 196 and then west to "W" street. Go north on "W" street to perimeter road.

SITE: DRMO Hazardous Waste Storage Facility (Facility 304). Depending on the wind direction and instructions, the following primary and alternate routes can be used:

a. Primary Evacuation Route: Proceed north on "W" Street past buildings 310 and 214 to perimeter road.

b. Alternate Evacuation Route 1: Proceed south on "W" street to Torch Boulevard, then southwest on Torch Boulevard.

c. Alternate Evacuation Route 2: Proceed south on "W" Street to Torch Boulevard, the southwest on Torch Boulevard to Argentina and then northwest on Argentina to Overlord Boulevard.

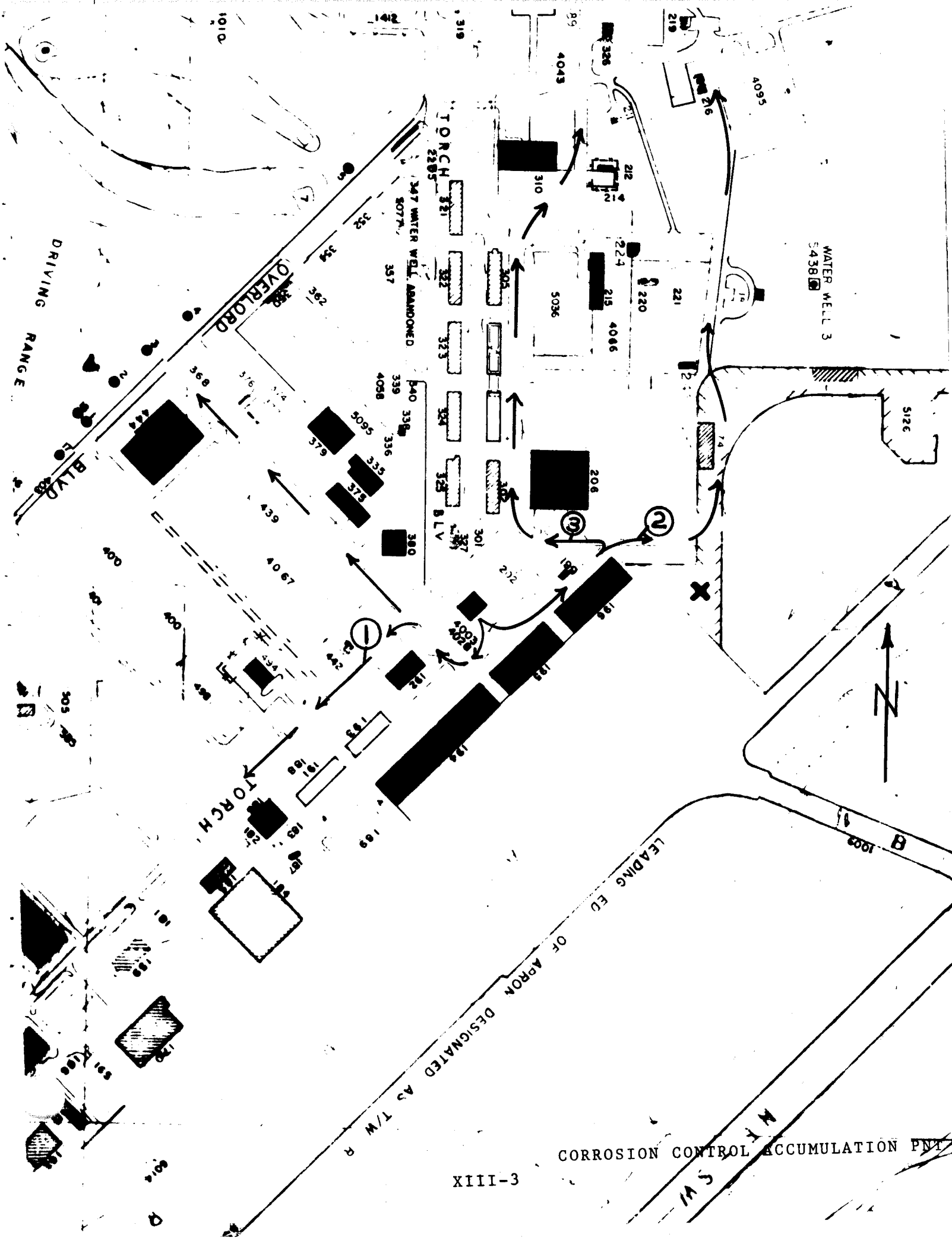
SITE: Behind Component Repair Squadron, Building 680. Depending on the wind direction and instructions, the following primary and alternate routes can be used:

a. Primary Evacuation Route: Leave area northeast via the parking lot behind building 680 then northwest on Arcadia Avenue and out of the area.

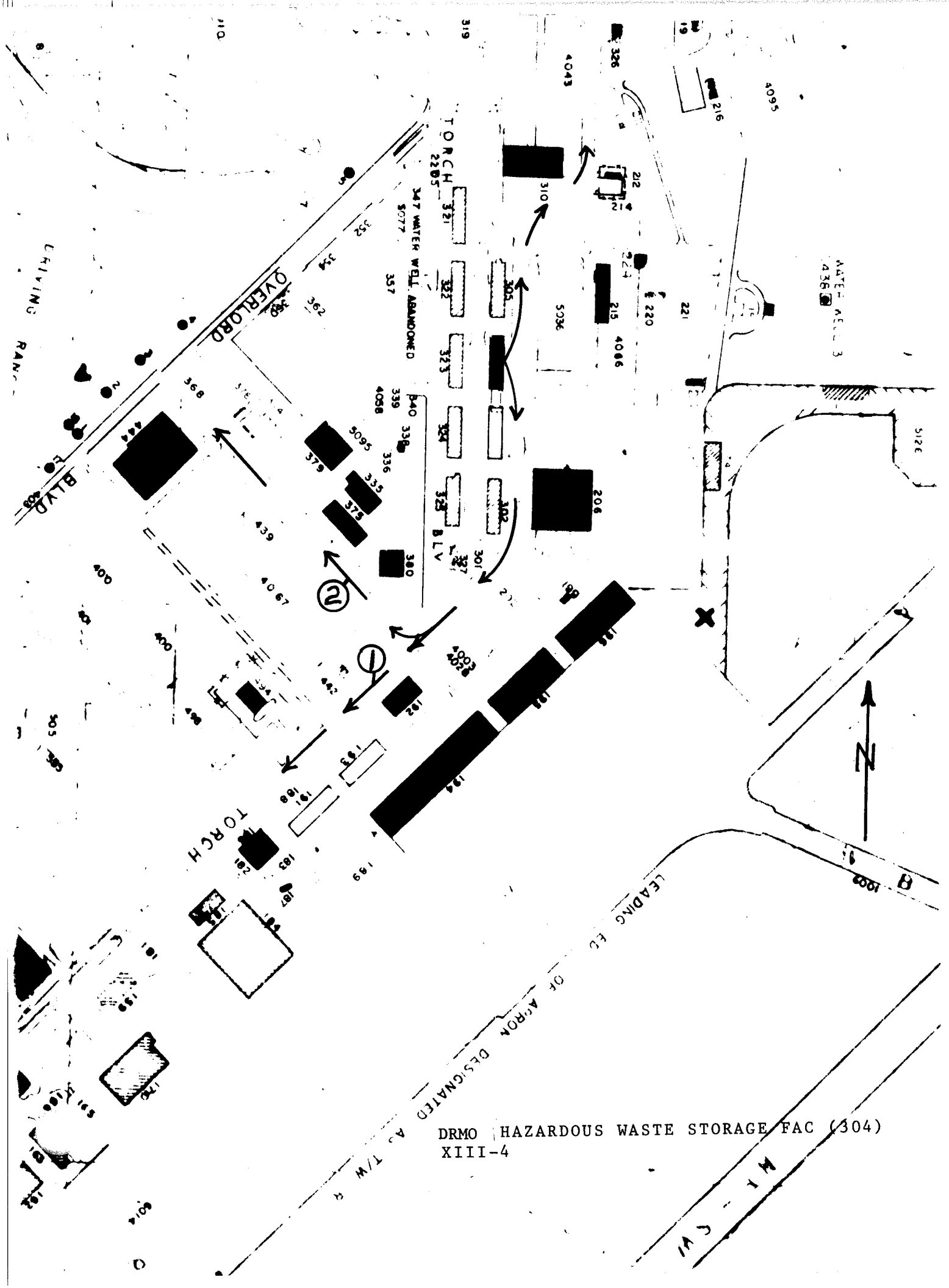
b. Alternate Evacuation Route 1: Leave area northeast via the parking lot behind building 680 then southeast on Arcadia Avenue to Torch, then northeast on Torch Boulevard and out of the area.

c. Alternate Evacuation Route 2: Proceed southwest via the parking lot behind building 680 then northwest on Sextant Avenue.

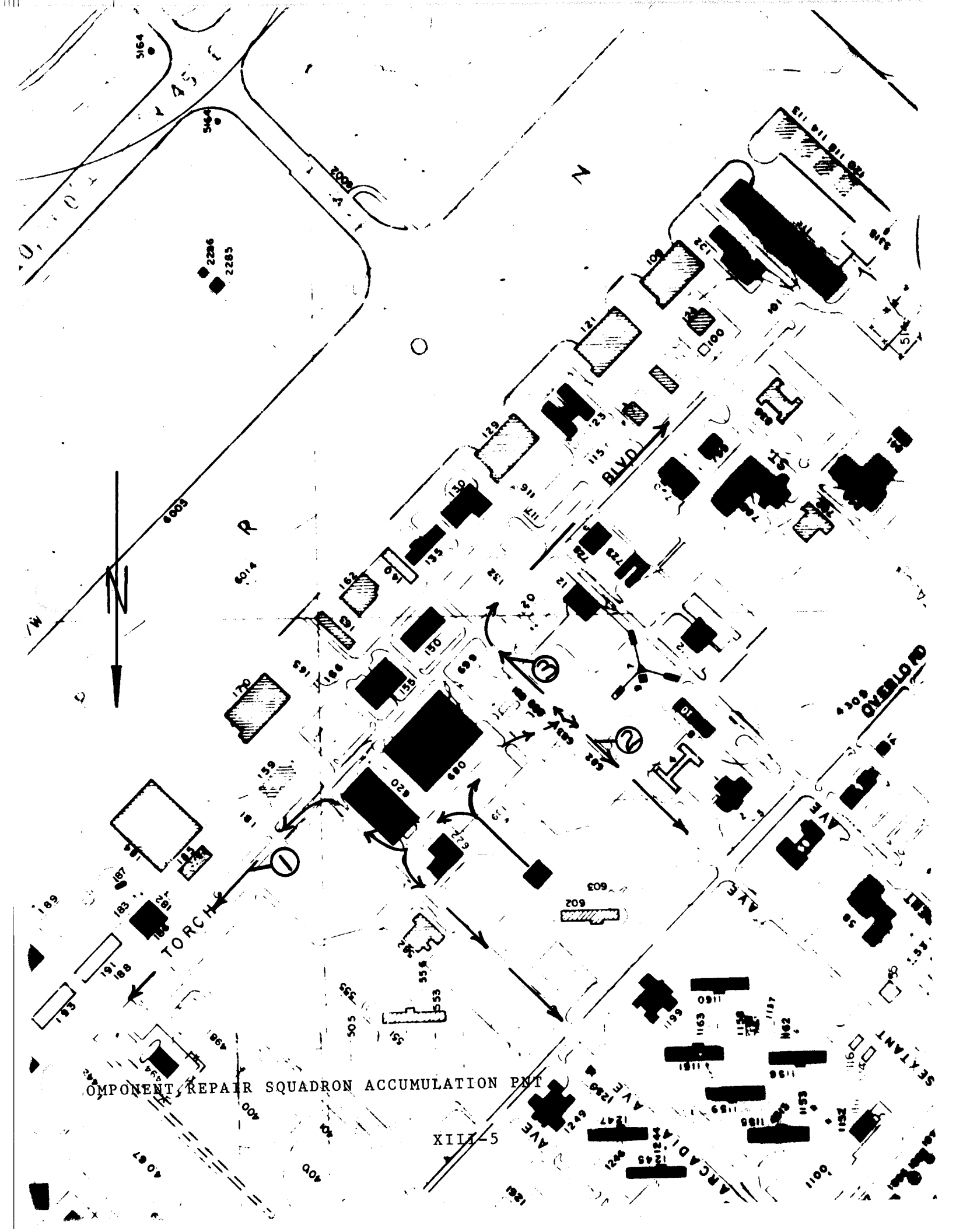
d. Alternate Evacuation Route 3: Proceed southwest via the parking lot behind building 680, then southeast on Sextant Avenue to Torch Boulevard then southwest on Torch Boulevard.



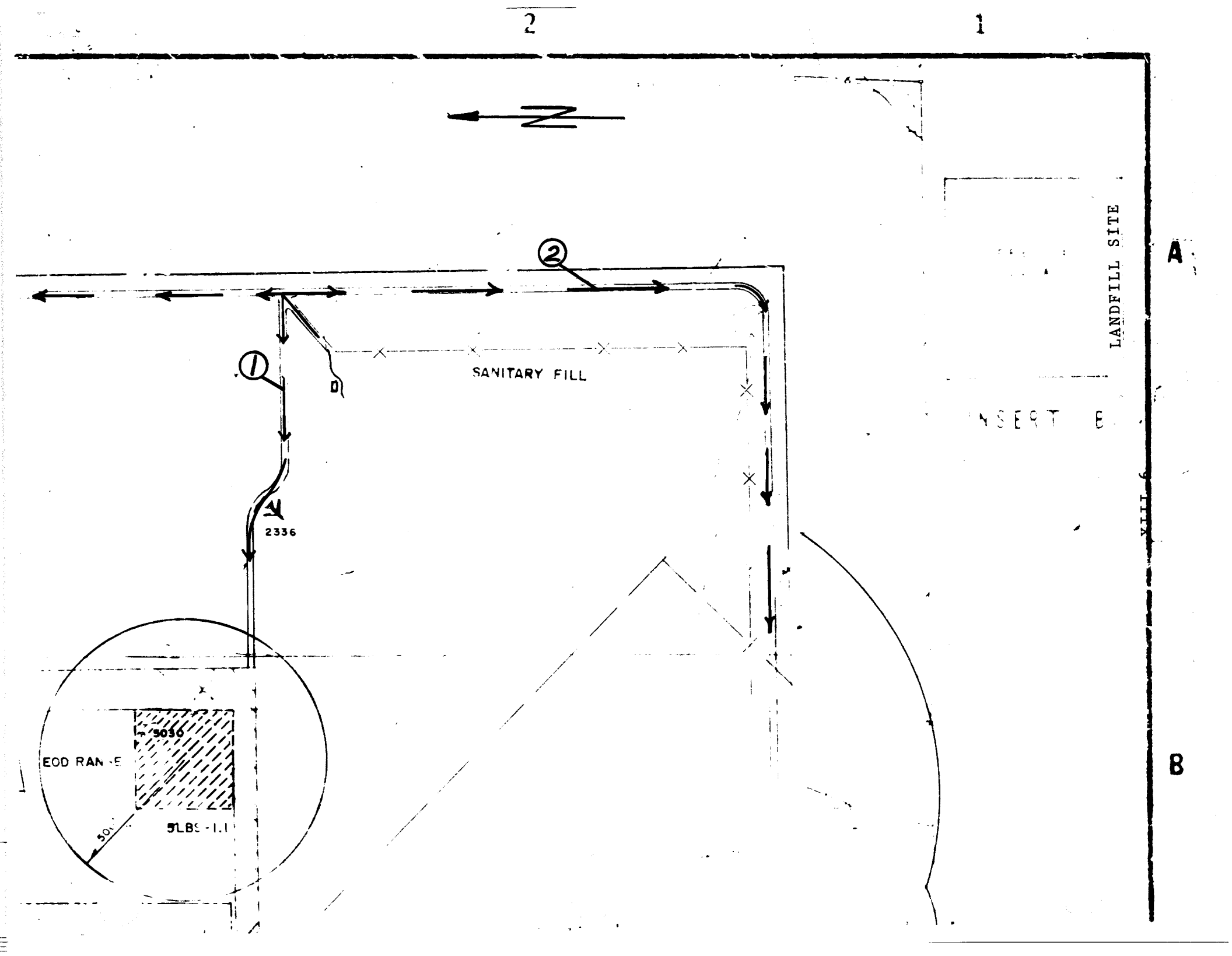
CORROSION CONTROL ACCUMULATION PNT



DRMO HAZARDOUS WASTE STORAGE FAC (304)



OMPONENT REPAIR SQUADRON ACCUMULATION PNT


2
1
A
B
LANDFILL SITE
SANITARY FILL
2
1
D
2336
EOD RAN-E
5050
5LBS-1.1

ANNEX XIV

HAZARDOUS MATERIAL/WASTE MANAGERS

FROM: 27AGS/MAAM

SUBJECT: Appointment of Hazardous Waste Managers and Alternates

TO: 27 CSG/DEEV

The following personnel are designated as Hazardous Material/Waste Coordinator, Manager or Alternate for the 27 AGS by their workcenters.

MAAM

2Lt Mark R. Olin	Coordinator	4515

MAAR

TSgt Mark S. Reinert	Primary	4737
SSgt David A. Lawton	Alternate	4737

MAAB

TSgt Juan Sainz	Primary	2056
SSgt James A. Derksen	Alternate	2056

MAAY

TSgt Ronald N. Welshans	Primary	2356
SSgt Robert G. Lahue	Alternate	4303

ALBERT H. TRIBE, JR., Lt Col, USAF
Commander

FROM: 27 CRS/CC 02 MAR 1990

SUBJECT: Appointment of Hazardous Material/Waste Managers and Alternates

TO: 27 CES/DEEV

1. The following individuals are designated as the hazardous material/waste managers for the 27th CRS.

2Lt Cato Jr., Douglas C.	OIC	2670
SSgt Holcomb, Kevin J.	Primary	2456
TSgt Chavarria, Armando Jr.	Alternate	2298

2. The following personnel are designated as Branch/Section hazardous materials/waste managers and alternates:

MACA-Avionics Branch

SSgt Maxey, Rick	Primary	4108
Sgt Roschi, Larry	Alternate	4108

MACAS-Manuals/Electronic Warfare

SSgt Knight, Charles	Primary	4815
TSgt Sells, Jack O.	Alternate	4815

MACBE-Environmental

SSgt Sagucio, Andrew	Primary	2540
SSgt LaFlamme, Lisa	Alternate	2540

MACBL-Electrics

SSgt Platero, Rodolfo	Primary	2626
A1C Evans, Michael	Alternate	2626

MACBF-Fuels

SSgt Salois, Jerome	Primary	2447
Sgt Bice, Jim	Alternate	2447

MACBP-Pneudraulics

Sgt Paquin, Valentino	Primary	2456
A1C Summers, Terry	Alternate	2456

MACE-PMEL

SSgt Dmitrevsky, George	Primary	2672
A1C Peterson, Eric	Alternate	2672

MACP-Propulsion Branch

TSgt Chavarria, Armando Jr.	Primary	2298
SSgt Lewis, Mark	Alternate	2307

MACPT-Test Cell

Sgt Darby, Thomas
SrA Nix, William

Primary 2745
Alternate 2745

CAMERON R. STEWART, Lt Col, USAF
Commander, 27 CRS

29 DEC 87

SUBJ: Appointment of Hazardaous Material/Waste (HMW) Monitors and Alternates

TO: 27TFW/MAQ

1. The following are designated as HWM manager and alternate for the 27 Equipment Maintenance Squadron:

Primary	1Lt Hukka, Randall J.	X4694
Alternate	2Lt Kohler, Kerry L.	X4289

2. The following are designated as Branch/Section HMW managers and alternates:

BRANCH	POSITION	RANK	NAME	PHONE
MAEA	PRIMARY	TSgt	Brin	2852
MAEAP	Alt	SSgt	Rose	2852
MAEAY	Alt	TSgt	Cowley	4451
MAEAR	Alt	TSgt	Parsons	2643
MAEAB	Alt	SrA	Bell	4197
MAEB	PRIMARY	CMSgt	Martindale	2231
	Alt	2Lt	Snyder	2548
MAEBI	PRIMARY	TSgt	Peppinger	2484
	Alt	SrA	Kulsonak	2484
MAEBR	PRIMARY	MSgt	McAllen	2399
	Alt	SSgt	Morrison	2399
MAEBT	PRIMARY	SSgt	Yarber	2020
	Alt	A1C	Dell	2020
MAEBW	PRIMARY	SSgt	Matthews	2598
	Alt	Sgt	Chinn	2598
MAEC	PRIMARY	TSgt	McCutcheon	4127
	Alt	TSgt	Russell	2067
MAEE	PRIMARY	TSgt	Cook	2908
	Alt	MSgt	Silva	2908
MAEF	PRIMARY	SMSgt	Wilson	4694
	Alt	MSgt	Becker	4694
MAEFC	PRIMARY	WS-9	Bigelow	2144
	Alt	SSgt	Hart	2144
	Alt	A1C	Adams	2144
	Alt	A1C	Moles	2144
MAEFM	PRIMARY	Sgt	Miller	4189
	Alt	Amn	Week	4189
MAEFN	PRIMARY	MSgt	Johnson	2831
	Alt	TSgt	Rasmussen	2831
MAEFSM	PRIMARY	TSgt	Thomson	2036
	Alt	TSgt	Schmitz	2036

3. This letter supersedes letter dated 4 Aug 87, same subject.

JOHN R. MILNER, Major, USAF
Commander, 27EMS

16 MAR 1987

FROM: 27 CSG/SSR

SUBJ: Management of Contaminated/Used Petroleum Products - CAFBR 19-14 (Your Ltr, 2 Mar 87)

TO: 27 CSG/DEEV

1. The information requested in your 2 Mar 87 letter is as follows:

a. Waste/used petroleum products are generated by our patrons who change oil in their vehicles at the Auto Hobby Shop.

b. The oil is stored in underground storage tanks outside the shop.

c. The Auto Hobby staff makes sure only oil is poured into these tanks through drain pipes located inside the shop.

d. Same as item c.

e. We have no need to keep records.

f. The waste oil is picked up by the Lubbock Waste Oil Company out of Lubbock, Texas.

2. MWR's Hazardous Waste Monitors are:

a. Primary - Roy Wethington, WG-10, 27 CSG/SSRHA, Bldg #494, ext 2170.

b. Alternate - Ralph Wyatt, WG-10, 27 CSG/SSRHA, Bldg #494, ext 2170.

KAREN S. NIGG, Capt, USAF
Chief, MWR Division

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
ARMY AND AIR FORCE EXCHANGE SERVICE
CANNON AIR FORCE BASE EXCHANGE
CANNON AIR FORCE BASE
CLOVIS, NEW MEXICO 88103

27CSG/SVE

9 Mar 87

SUBJECT: Management of Contaminated/Used Petroleum Products
CAFB Regulation 19-14

TO: 27CSG/DEEV

1. Reference CSG/DE letter dated 2 Mar 87, subject as above.

2. The Hazardous Waste Monitor for Cannnon AFB Exchange is:

Phillip Capshaw
Service Station Manager
UA-06
27CSG/SVE
Bld 368
784-5177

JAMES E. MOORE
Exchange Manager

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 27TH TACTICAL FIGHTER WING (TAC)
CANNON AIR FORCE BASE NM 88103

REPLY TO ATTN OF: LGT/CC

5 Jan 88

SUBJECT: Petroleum Waste Monitor

TO: CSG/DEEV

The following persons are appointed as Petroleum Waste Monitors for the 27th Transportation Squadron:

SSgt James A. Weller	LGTM	4139
SSgt Claude C. Bresse	LGTM	2600

GARY W. GIBBS, Capt, USAF
Commander, 27th Transportation Squadron

Readiness is our Profession

FROM: 27 TFW/MA

SUBJECT: Hazardous Waste/Used Solvents Monitor

TO: 27 TFW/DEEV

The below individual is appointed the Hazardous Waste/Used Solvents monitor for the DCM complex:

NAME	RANK	OFF/SYM	PHONE
Hukka Randall J.	1Lt	EMS/CPC	X2110

GRADY H. REED III, Colonel, USAF
Deputy Commander for Maintenance

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 27TH COMBAT SUPPORT GROUP (TAC)
CANNON AIR FORCE BASE, NM 88103

REPLY TO ATTN OF: DEME-PW (TSgt Buckmiller, 2940)

27 April 87

SUBJECT: Primary/Alternate Hazardous Waste Monitors

TO: 27th CES/DEEV

1. The following personnel are appointed as Primary/Alternate Hazardous Waste Monitors:

RANK	NAME	OFFICE	SQUADRON	BLD	DUTY PH.	
TSgt	Mckinney, Randolph	DEME-PW	27CES	120	2940	PRIMARY
TSgt	Buckmiller, Joseph	DEME-PW	27CES	120	2940	Alternate

JOSEPH A. BUCKMILLER, TSgt, USAF
NCOIC Power Production

Readiness is our Profession

ANNEX XV

DISTRIBUTION Addressee	Number of Copies
HQ TAC/DEEV, Langley AFB, VA 23665	4
US EPA, Region VI, ~~1201 Elm Street~~ 1445 ROSS AVENUE, Dallas, Texas ~~75270~~ 75202	2
NMEID, P.O. Box 968, Santa Fe, NM 87503	1
NMEID, 820 W. 6th St., Box 1832 Clovis, NM 88102-1832	1
27TFW, Cannon AFB, NM 88103	
CC	1
CV	1
HO	4
PA	2
OI	1
SE	1
DO	1
DOTA	1
DOX	1
DOW	1
DOR	1
MA	1
MAA	1
MAAO	1
MAAR	1
MAARA	1
MAARB	1
MAARS	1
MAAB	1
MAABC	1
MAABD	1
MAABS	1
MAAY	1
MAAYE	1
MAAYF	1
MAAYS	1
MAS	1
MAC	4
MACA	1
MACAS	1
MACAP	1
MACB	1

DISTRIBUTION	Number of Copies
MACBE	1
MACBG	1
MACBL	1
MACBF	1
MACBP	1
MACD	1
MACE	1
MACP	1
MACPT	1
MAE	4
MAEA	1
MAEB	1
MAEBI	1
MAEBR	1
MAEBT	1
MAEC	1
MAECA	1
MAED	1
MAEE	1
MAEF	1
MAEFC	1
MAEFN	1
MAQ	1
RM	1
LGX	1
LGS	1
LGSDI	1
LGSF	1
LGSM	1
LGT	1
LGTM	1
LGTT	1

USAF Hospital, Cannon AFB, NM 88103

SG	1
SGPB	3

27CSG, Cannon AFB, NM 88103

CC	1
CD (Chairman, Environmental Protection Committee)	1
JA	1
DW	1
SS	2
OT	1
OTR	1
OTM	1
MWR	2
DE	1
DED	1
DEA	1
DEE	5
DEF	5
DEI	1

DISTRIBUTION	Number of Copies
DEM	2
DEMP	2
SP	1
SV	1
SPO	1
Tenant Units, Cannon AFB, NM 88101	
DRMO	3
~~2040ISS/XRR~~	~~1~~
~~DET 11, 25WS/WE~~	~~1~~
TOTAL	~~111~~ 108

ANNEX XVI

Emergency Response Procedures for Liquid Flourine (LF_2) and Nitrogen Tetroxide (N_2O_4)

1. This annex establishes an interim emergency response plan for DoD sponsored shipments of Nitrogen Tetroxide (N_2O_4) and Liquid Flourine (LF_2).

2. Background:

a. N_2O_4 is a hypergolic classed by the Department of Transportation (DOT) as a class of poison, oxidizer and inhalation hazard used on DoD space launch vehicles. Bulk highway shipment is authorized by DOT exemption-3121.

b. LF_2 is classed as a poison B, oxidizer and inhalation hazard used in DoD research and development programs. Bulk highway shipment is authorized by DOD exemption-1479.

c. H_2O_4 and LF_2 are both shipped in specially designed tank trailers specifically authorized by their respective exemptions. The Air Force has shipped both H_2O_4 and LF_2 for over twenty years without an accident or incident involving product loss. Cannon AFB has been designated as a safe haven for shipments of these chemicals.

d. The Directorate of Energy Management Transportation Office (SA-ALC/SFRM) Kelly AFB, TX manages the commercially-owned N_2O_4 trailers which are in dedicated service under exclusive use contract to the Air Force. SA-ALC/SFRM also manages the government-owned LF_2 trailers. All government N_2O_4 and LF_2 shipments are directed by SA-ALC/SFRM and are considered Air Force shipments.

3. This interim plan will be superseded by the appropriate directive/instruction when approved by HQ TAC/DEMF, Langley AFB, VA.

4. The following are actions to be taken in the event of an accident/incident involving H_2O_4 or LF_2.

a. Initial notification of the accident/incident may be made by any of the following sources:

(1) Commercial driver(s).

(2) Bystanders.

(3) Local emergency responders.

(4) Chemtrec.

(5) Commercial carriers (H_2O_4: Matlack, Inc.; Superior Carriers, Inc.; W. S. Hatch Co.) (LF_2: Matlack, Inc.)

(6) Shipping Activity (N_2O_4: Cedar Chemical, Vicksburg Division, Vicksburg, MS) (LF_2: Allied Chemical, Metropolis, IL)

(7) Receiving Activities (N_2O_4: Cape Canaveral AFB, FL; NASA White Sands Test Facility, NM; Martin-Marietta Aerospace, Denver, CO; Aerojet Tech Systems, Sacramento, CA; Vandenberg AFB, CA) (LF_2: TRW Systems, San Clemente, CA)

b. Notification of an N_2O_4 or LF_2 accident or incident will be made to the following 24 hour telephone number: "National Response Center (NRC): (800) 424-8802 or area code (202) 267-2675".

c. DD Form 836 (Special Instructions for Motor Vehicle Drivers) for N_2O_4 nd LF_2 shipments will be overprinted or annotated as follows:

Notification required: The following telephone number for the National Response Center must be called for assistance in the event of an emergency involving release of product, whether intentional or unintentional, fire, accident, or mechanical breakdown of transport equipment:

National Response Center (800) 424-8802 or Area Code (202) 267-2675

NOTE: Notification to the NRC will initiate the appropriate emergency response actions as required by the circumstances.

d. Response coordination function: Upon being notified, the NRC will notify the federal on-scene coordinator (FOSC) who will determine the level of emergency response required. Emergency response will be in accordance with the National Contingency Plan and may entail use of the National Response Team, Regional Response Teams, and/or other governmental resources as deemed appropriate by the FOSC.

e. After notifying the FOSC, the NRC will notify the following HQ USAF 24-hour telehpone number: "HQ USAF Operations Center (202) 697-6103/Autovon 227-6103".

f. The Air Force Operations Center (AFOC) will provide notification to the following activities:

(1) HQ USAF/LETT

(2) SA-ALC/SFRM (Transportation Office) Kelly AFB, TX for:

(a) Assistance and Technical Information concerning transport equipment.

(b) Shipment information (consignor, consignee, quantities shipped, tractor and trailer number, drivers' names, routes of movement, etc.)

(c) Coordination with the commercial carrier(s).

(d) Coordination with shipping activity.

(e) Coordination with the receiving activity.

NOTE: SA-ALC/SFRN will be directly involved in coordinating and resolving non-emergency problems (e.g. flat tires, mechanical breakdowns, etc.) SA-ALC/SFRN telephone (512) 925-6937/Autovon 945-6937. Duty hours: Kelly AFB Command Post telephone (512) 925-6906/Autovon 945-6906, non-duty hours.

(3) HQ MTMC Operations Center (202) 756-1125/Autovon 289-1125.

(4) AFOC will contact the Army Operations Center (AOC), (202) 697-0218/Autovon 227-0218, or the Naval Sea Systems Command Duty Officer, (202) 692-7754/Autovon 222-7754 (extension 7527 after duty hours) for assistance IAW paragraph 4.g from the military installation determined to be nearest to the scene of an accident/incident involving N_2O_4 or LF_2.

g. Assistance from Cannon Air Force Base: Because Cannon is along the route of movement for Nitrogen Tetroxide and Liquid Flourine, the Command Post will be notified if there is a spill in the area and assistance is required. Upon notification, the Command Post will contact the Base Fire Department to initiate emergency response procedures. The Base Fire Department will contact the Base Civil Engineering service desk to put the Spill Response Team on standby and notify the Base Civil Engineer. The Base Civil Engineer will report immediately, in uniform, directly to the entry point of the spill site to serve as the DoD representative to local on-scene responders and as the DoD point of contact for the federal on-scene coordinator.

h. Two information sheets are attached for Nitrogen Tetroxide and Liquid Flourine. All emergency response personnel should be familiar with this information before responding ot an incident involving these chemicals.

RN - 10544-72-6
RN - 10544-72-6
NAME - NITROGEN TETROXIDE
HIST - ND
DOT - Health Hazards: Poisonous; may be fatal if inhaled. Contact may cause burns to skin and eyes. Contact with liquid may cause frostbite. Runoff from fire control or dilution water may cause pollution. /Nitrogen Tetroxide; or Nitric Oxide and Nitrogen Tetroxide mixture/ [DOT. EMERGENCY RESPONSE GUIDEBOOK 1984 G-20]

DOT - Fire or Explosion: May ignite other combustible materials (wood, paper, oils, etc.). Mixture with fuels may explode. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors or in sewers. /Nitrogen Tetroxide; or Nitric Oxide and Nitrogen Tetroxide mixture/ [DOT. EMERGENCY RESPONSE GUIDEBOOK 1984 G-20]
DOT - Emergency Action: Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Ventilate closed spaces before entering them. Wear positive pressure breathing apparatus and full protective clothing. Evacuate area endangered by gas. If water pollution occurs, notify appropriate authorities. FOR EMERGENCY ASSISTANCE CALL CHEMTREC (800) 424-9300. /Nitrogen Tetroxide; or Nitric Oxide and Nitrogen Tetroxide mixture/ [DOT. EMERGENCY RESPONSE GUIDEBOOK 1984
DOT - Fire: Small Fires: Dry chemical or CO2. Large Fires: Water spray, fog or foam. Move container from fire area if you can do it without risk. Stay away from ends of tanks. Cool containers that are exposed to flames with water from the side until well after fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. /Nitrogen Tetroxide; or Nitric Oxide and Nitrogen Tetroxide mixture/ [DOT. EMERGENCY RESPONSE GUIDEBOOK 1984 G-20]
DOT - Spill or Leak: Keep combustibles (wood, paper, oil, etc.) away from spilled material. Stop leak if you can do it without risk. Use water spray to reduce vapor but do not put water on leak or spill area. Isolate area until gas has dispersed. /Nitrogen Tetroxide; or Nitric Oxide and Nitrogen Tetroxide mixture/ [DOT. EMERGENCY RESPONSE GUIDEBOOK 1984 G-20]
DOT - First Aid: Move victim to fresh air; call emergency medical care. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove and isolate contaminated clothing and shoes at the site. In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes. Keep victim quiet and maintain normal body temperature. Effects may be delayed; keep victim under observation. /Nitrogen Tetroxide; or Nitric Oxide and Nitrogen Tetroxide mixture/ [DOT. EMERGENCY RESPONSE GUIDEBOOK 1984 G-20]
DOT - Isolation & Evacuation: If a spill or leak from a drum or smaller container or a small leak from a tank, then isolate 110 feet in all directions. If a large spill from a tank or from many containers or drums, etc., first isolate 220 feet in all directions. Then evacuate in a downwind direction, an area 0.5 miles wide and 0.8 miles long. [DOT. EMERGENCY RESPONSE GUIDEBOOK 1984 TABLE]
CLUP - 1. Ventilate area of spill or leak to disperse gas. 2. If in the liquid form, allow to vaporize. 3. If in the gaseous form, stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped inplace, remove the leaking cylinder to a safe place in the open air, and repair the leak or allow the cylinder to empty. [NIOSH OSHA. OCCUPAT HEALTH GUIDE CHEM HAZARDS. 1981]

Poisonous; may be fatal if inhaled.
Vapor extremely irritating.
Contact may cause burns to skin and eyes.
Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION

May ignite other combustible materials (wood, paper, oil, etc.).
Mixture with fuels may explode.
Container may explode in heat of fire.
Vapor explosion and poison hazard indoors, outdoors or in sewers.

EMERGENCY ACTION

Keep unnecessary people away; isolate hazard area and deny entry.
Stay upwind; keep out of low areas.
Wear **positive pressure** breathing apparatus and special protective clothing.
Evacuate area endangered by gas. (See Isolation and Evacuation Table in back of guidebook; find the material by name.)
FOR EMERGENCY ASSISTANCE CALL CHEMTREC **(800) 424-9300.**
If water pollution occurs, notify appropriate authorities.

FIRE

Small Fires: Dry chemical, soda ash or lime.
Large Fires: Water spray, fog (flooding amounts).
Do not get solid stream of water on liquid pool.
Do not get water inside container.
Move container from fire area if you can do it without risk.
For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

If you have not donned special protective clothing approved for this material, **do not expose yourself** to any risk of this material touching you.
Stop leak if you can do it without risk.
Use water spray to reduce vapors but **do not** put water on leak or spill area.
Isolate area until gas has dispersed.
A fine water spray applied to the edge of the spill pool will start a hot flare fire which will burn the spilled material. (Use extreme caution.)

FIRST AID

Move victim to fresh air; call emergency medical care.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
Remove and isolate contaminated clothing and shoes at the site.
In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes.
Keep victim quiet and maintain normal body temperature.
Effects may be delayed; keep victim under observation.

TABLE OF ISOLATION & EVACUATION DISTANCES

NAME OF MATERIAL SPILLING OR LEAKING (ID No.)	INITIAL ISOLATION SPILL or LEAK FROM (drum, smaller container, or small leak from tank) ISOLATE in all Directions feet	INITIAL EVACUATION LARGE SPILL FROM A TANK (or from many containers, drums, etc.) FIRST ISOLATE in all Directions feet	THEN EVACUATE IN A DOWNWIND DIRECTION Width miles	Length miles
Fluorine, cryogenic liquid (9192)	460	980	2.5	3.9

Section H

PERSONNEL TRAINING

The information contained in this section outlines training programs for personnel, in accordance with 40 CFR Sections 264.16 and 270.14(b)(12), and NM HWMR 206.B.6 and 302.A.4.b.(1)(1).

H.1 Outline of Training Program [40 CFR 270.14(b)(12); NM HWMR 302.A.4.b.(1)(1)]

DRMO personnel who handle hazardous wastes must successfully complete a program of classroom instruction and/or on-the-job training in order to prepare them to operate and to maintain the facility in a manner which ensures the facility's compliance with 40 CFR 264.16. Relevant course selections are determined by DRMS Headquarters in Battle Creek, Michigan. Headquarters personnel review the content of available military, government, and professional hazardous waste management training courses in an effort to select the most appropriate training program which will correspond to specific job tasks, and to comply with training requirements in 40 CFR 264.16(a)(3). This guidance is provided to DRMO-Cannon by DRMR-Ogden.

The personnel handling hazardous wastes at DRMO-Cannon have attended or will attend the Property Disposal Hazardous Materials Handling Course offered by the Army Logistics Management Command in Ft. Lee, Virginia (Figure H-1), which consists of 40 hours of lecture and practical exercises. In addition, DRMO employees may attend the course, "Hazardous Chemicals Safety," offered by the J. T. Baker Chemical Company. This course consists

of 16 hours of lecture and practical exercises (Figure H-2). Employees are also required to read and understand the DRMO publication entitled Environment Considerations in the DRMS Disposal Process (Figure H-3).

On-the-job training is provided to DRMO-Cannon by DRMS-Battle Creek and DRMR-Ogden environmental specialists throughout the year during periodic quality assurance visits. Also, the Oil and Hazardous Substance Spill Prevention and Response Plan for Cannon AFB will be executed at least once annually for training purposes.

All personnel at Cannon AFB involved in hazardous waste management attend the Hazardous Waste Management Training Program developed by the Research Triangle Institute for the Department of the Air Force. A copy of the training manual for this course is included as Appendix H-1.

H.1.a Job Titles and Duties 40 CFR 264.16(d)91 and (2);NM HWMR 206.B.6.d.(1) and (2)

(i) DRMO-Cannon

Three DRMO employees will be directly responsible for handling hazardous wastes. The duties, responsibilities, and qualifications of each of these positions are as follows:

Position Title: Chief, DRMO

Date:
Revision No.: 4
Section: H
Cannon

Fiqure H-1

Property Disposal Hazardous Materials Course,
Army Logistics Management Command

Ft. Lee, Virginia

Topic

1. Identification, categorization, and recognition of hazardous wastes that are the responsibility of Defense Reutilization and Marketing Service for disposal.

2. Safety and health hazards, both acute and chronic.

3. Personal protective equipment requirements and their proper use.

4. Segregation and storage procedures for hazardous property

5. Packing, marking, labeling, placarding, and transportation requirements.

6. Spill containment and control.

7. DRMS responsibilities with regard to current legislation in the environment arena, with particular emphasis on the ramifications of the Resource Conservation and Recovery Act of 1976.

8. Requirements for final disposal of wastes (includes, but is not limited to, recognition, manifesting, reporting, and recordkeeping).

Figure H-2

Topics Covered by the Course, Hazardous Chemical Safety, which is offered by the J.T. Baker Chemical Company.

1. Safety Fundamentals
2. Safety Policies Training
3. Toxic Chemicals
4. Toxic Chemical Monitoring
5. Material Release Investigation and Response
6. Safety Planning
7. Hazardous Materials Labeling
8. Flammable Chemical Hazards
9. Corrosive Chemical Hazards
10. Safety Audits
11. Reactive Chemical Hazards
12. Insidious Hazards
13. Compressed Gas Hazards
14. Cryogenic Liquid Hazards
15. Fire Safety
16. Storage of Hazardous Materials and Hazardous Waste
17. Hazardous Waste Disposal According to RCRA
18. Measuring Effectiveness

Figure H-3

Environmental Considerations in the DRDS Disposal Process,
DPDS-M #6050.1, Section V

Chapter

1. Asbestos Disposal Procedures
2. Containers
3. PCB Disposal Procedures
4. Oil and Hazardous Materials/Hazardous Wastes (HM/HW) Spill Prevention and Response
5. Transportation of Hazardous Material/Hazardous Waste
6. Batteries
7. Retrogrades
8. Chemical Handling Procedures
9. Packaging of Hazardous Materials/Hazardous Wastes
10. Pesticide Disposal Procedures
11. Storage Compatibility
12. Spill Residue Disposal Procedures
13. Record Keeping

Responsibilities:

Directs the operation of disposal services to military activities at Cannon AFB. Disposal services provided include the acceptance of accountability for excess and surplus personal property from Department of Defense (DOD) generating activities; physical receipt, storage, and issue of property accepted; reutilization of excess property by DOD activities in lieu of new procurement; transfer of excess property to the General Services Administration and other Federal government agencies, educational institutions, public service organizations, etc.; sale of surplus property to the general public; and abandonment or destruction when other methods of disposal have been exhausted. The DRMO receives a limited volume but wide variety of excess property, ranging from scrap and common-use, commercial -type items to complex and highly specialized equipment, including precious metals and hazardous materials and wastes. Approximately 25 percent or more of the usual items received are complex or specialized items.

The DRMO Chief supervises a subordinate staff comprised of 10 to 20 employees in technical, clerical. and wage grade positions. He receives general supervision from the Commander and Deputy of the Defense Property Disposal Region (DRMR), who provides overall program direction, goals and objectives, and policy guidance, and applies judgment and resourcefulness to independently direct operations of the DRMO within the framework of regulations, policy, and procedures established by the Defense Property Disposal Service (DRMS) and higher level authorities within DOD.

Duties:

Directs the local property disposal program by establishing and maintaining contact with the Cannon AFB Installation Commander and other generating activity officials, including supply officers, civil engineers, maintenance shop foremen. interservice support agreement (ISA) coordinators, and others. Also maintains contact with key officials of tenant organizations and off-base generating activities. Acquires a knowledge of missions, functions, and contemplated program changes to gain insight into the effect such activity will have on the generation of excess property. Advises activities served of steps they can take to facilitate turn-in of excess property and when special handling, storage. or transportation are required. periodically visits generating activities to promote reutilization screening, discuss the quality or services provided by the DPMO, resolve problems experienced by either party. and coordinate very large turn-ins. Educates those interested in or affected by the property disposal program and conducts training on the proper procedures for turn-in of excess property, screening and requisitioning of DPMO property for reutilization, and buying property offered for sale. Explains and verifies compliance with special requirements for segregation of scrap and turn-in of hazardous materials and wastes, weapons, machine tools, and automatic data processing equipment. Coordinates the proper handling and disposition of property which cannot be stored at the DRMO.

Assures that employees receiving excess hazardous/toxic materials and wastes can properly identify items that may pose a threat to the health and safety of individuals or to the environment. Decides whether to accept or reject property based on hazardous characteristics or improper identification, ascertains the type of special handling required and assures

it is provided, accepts or refuses physical custody based on adequacy of storage facilities, and requests laboratory analyses as appropriate. Periodically inspects hazardous items, even when physically stored by generating activity, and repackages if necessary. Keeps abreast of applicable environmental regulations promulgated by the New Mexico Environmental Improvement Division and the U. S. Environmental Protection Agency and maintains close working relationships with representatives of local safety and environmental organizations to verify that DPMO operations comply with governing requirements. Serves as an active member of the environmental committee, explaining DRMS policy relating to acceptance of custody versus accountability, packaging, manifesting, placarding, and transportation. Serves as the contracting officer's representative on service contracts for the removal and disposal of hazardous materials and wastes, assuring that the contractor complies with the terms and conditions of the contract, as well as the Department of Transportation standards.

Experience and Qualifications:

Ability to manage the DRMO operation by planning work for his staff, establishing priorities and preparing work schedules, determining training needs and arranging attendance at specific training courses.

Ability to amend and improve the receipt, storage, and issue methods, to define equipment and supply needs, and to determine the nature and quantity of services that DRMO will need from Cannon AFB, such as vehicle and equipment maintenance, fire protection, safety and security support, and building maintenance.

Position Title: Environmental Protection Specialist

Responsibilities:

Provides technical guidance to DRMO personnel involved in the receipt/storage/handling/accounting/disposal of hazardous property. Determines, through coordination with turn-in activities, if hazardous property is a DRMS disposal responsibility and if the DRMO will take physical custody of the property. Participates in coordinating and scheduling receipt of hazardous property, assuring that pre-receipt examination is performed when necessary. Assures that hazardous property is properly identified including hazardous waste categorization, identification of all contaminants and, as required, presence of a laboratory analysis. Determines the nature (e.g., flammability) and degree (e.g., repercussions of long-term storage) of the hazard. Determines if containers are safe to handle, non-leaking, capable of withstanding routine handling, and safe for required period of storage. When required, determines if containers are DOT-approved and are marked and labeled in accordance with DOT regulations. Determines DTID requirements (e.g., RCRA manifest information, as required, and hazard codes), makes storage compatibility determinations, and determines the need for special handling of property (e.g., friable asbestos, PCBs, batteries, pesticides, etc.). Rejects property not meeting turn-in requirements. Assures that hazardous property storage areas are inspected weekly (or more frequently if dictated by state/local requirements) to ensure that property is properly accounted for, identified, stored and that necessary measures (e.g., repackaging) are taken to compensate for deterioration of substances and containers. Inspects the facility and equipment required by the facility inspection schedule and documents findings. Participates in inspection conducted by the host and

NMEID/Federal EPA personnel. During the preparation of sales property lists, ensures proper identification, lotting, and designation of hazardous wastes/materials. Reviews completed property lists to confirm the preceding and resolves discrepancies. Provides assistance during pre-award surveys (i.e., investigate statement of intent, permitting, etc., required for hazardous property.). Acts as the Emergency Spill Coordinator at the DRMO site and organizes a similar function at each Off-Site Branch (OSB). Executes required actions if a spill occurs and ensures personnel are trained to act during this absence. Maintains cognizance of the host installation contingency plan, the location and characteristics of the wastes handled, the location of all facility records, and the facility layout. Contains and cleans up spills for which the DRMO has the capability. Decontaminates and replenishes spill equipment and supplies. Ensures spill incident reports are prepared in accordance with applicable regulations.

Insures DRMO/OSB compliance with DRMS operating policy at each phase of the disposal cycle. Determines disposal cycle processing requirements in accordance with established criteria. Ensures shipping operations comply with DOT and EPA (i.e.. packaging, placarding, transportation, and manifesting). Initiates corrective action to resolve manifest discrepancies. Maintains proper visibility of hazardous property inventory utilizing IDMS outputs and other methods. Requests and justifies accelerated disposal of hazardous property when normal disposal timeframes would cause deterioration of hazardous property containers, impact storage capabilities, or create unsafe conditions or other circumstances which dictate emergency action. Intensifies inventory management control to accommodate shortened timeframes.

Contacts to host personnel, customers, generating activities, DRMR personnel, and local environmental personnel to coordinate requirements of environmental policies and directives. Serves as the DRMO representative in meetings, discussions and liaison visits. Serves as DRMO representative on the Host Environmental Board. Resolves problems within established DOD disposal policies.

Initiates and maintains required environmental reports/plans/records in the processing of hazardous property. Ensures that RCRA recordkeeping requirements are complied with (e.g.. facility operating records, training records, inspection schedule/log contingency plan, HW management report, unmanifested waste report etc.). Ensures consistency of plans with host installation Hazardous Waste Management Plans, Spill Contingency plans, and ISAs. Ensures that local support agreements with Host and/or surrounding communities are in existence. Assists in the preparation of hazardous waste facility permit applications. Prepares and provides required reports to host installation and higher headquarters. Ensures that an internal spill continqency plan is prepared and complied with at the DRMO/OSB.

Coordinates with turn-in activities to identify inventory for requirements contracts. Verifies quantities and storage locations and forwards to DRMR. Reviews pre-solicitation documents for errors or omissions in inventories, pick-up points, points of contact and any special considerations (i.e., security requirements, removal time frames, minimum order quantities, etc.) and refers to DRMR/DRMS for corrective action. May be assigned COR for contracts when appointed by DRMS. As COR prepares delivery order and forwards them to CO. Maintains COR files of all correspondence and conversations with the CO and with the contractor.

Accompanies contractor during removals of DRMO property. Verifies the contractor-prepared manifest and shipping papers and DOT markings, packaging and labeling requirements. Confirms that the transporter and final destination of the hazardous property are authorized in contract. Monitors contractor compliance with the contract and all environmental and safety requirements during removal. Notifies CO of discrepancies in contractor performance and may immediately stop the contractor's work for violation of safety regulations. Documents removals and forwards documentation to the CO. Recommends changes to existing and future service contracts.

Performs other duties as assigned.

Position Title: Material Sorter and Classifier

Responsibilities:

Researches applicable DOD/DLA policies in order to properly inspect, classify, and identify materials for storage; reviews shipping manifests to ensure that the descriptions of the items intended for storage match the labels on the containers.

Major duties:

Physically inspects the condition of property intended for DRMO storage; determines the proper storage location maintains logbooks which inventory all items in storage to include: NSN, noun name, volume, manufacturer's name. etc.; writes letters stating requirements for property

requiring special handling procedures (i.e., hazardous materials/wastes); detirmines the condition of sales and the need for disposal of property; refuses property if not properly packaged and manifested; operates a forklift.

Experience and Oualifications:

Ability to differentiate between various materials (i.e., corrosives, flammables, reactives); to catalog storage items by utilizing the HMIS and other reference documents; to read and to understand technical data presented on manifest and container labels. Skill in operating a forklift.

H.1.b Training Content, Frequency, and Techniques [40 CFR 264.16(c) and 264.16(d)(3): NM HWMR 206.B.6.c. and 206.B.6.d.(3)]

The training program employed by DRMS for employees handling hazardous wastes combines supervised on-the-job instruction and formal classroom training. Each employee learns about particular dangers associated with hazardous wastes typically stored at the DRMO and their storage requirements. Training specified in this section will be provided across the board to all DRMO employees having duties relating to hazardous waste management. Continuing training will be of the refresher type and will address the same topics discussed in the initial training, plus any additional pertinent information available.

On-the-job training requires hazardous waste management personnel to read and understand the manual entitled Environmental Considerations in the DRMS Disposal Process. Publication #DRMS-M 6050.1. Section V of this publication outlines procedures to ensure the proper management and handling of hazardous wastes. In part, each employee's performance of his/her assigned duties will be dependent upon his/her demonstration of an understanding of the information/guidance provided in this manual. The employee's performance is continuously monitored by the on-site supervisor and is formally evaluated at least annually during the employee's performance appraisal. In addition, employee compliance with the requirements set forth in 6050.1 are also reviewed during DRMR, DRMS, Inspector General, and to a lesser extent, by EPA/NMEID visits to the facility. Reference materials describing technical and regulatory aspects of hazardous waste manaqement are also available at the DRMO Administrative Office.

Additional on-the-job training is provided by DRMS-Battle Creek and DRMR-Ogden by environmental specialists who make periodic quality assistance visits throughout the year. These individuals provide guidance to DRMO personnel for the proper identification, handling, and storage of hazardous wastes.

After receiving sufficient on-the-job training, employees will take the Property Disposal Hazardous Materials Course offered by the Army Logistics Management Command. DRMS assisted in developing this course, which consists of 40 hours of lecture and practical exercises. As Figure H-1 indicates. topics addressed include:

1. Federal and state hazardous waste regulatory requirements including manifests and log notebooks.

2. Hazards for specific wastes.

3. Spill prevention control. and decontamination procedures for equipment and employees.

The J. T. Baker course "Hazardous Chemical Safety" consists of 16 hours of lecture and practical exercises demonstrating the nature of hazardous materials and waste.

The topics covered in these courses provide the employee with an understanding of potential hazards inherent in the job, as well as with the precautions necessary to minimize these hazards.

All Cannon AFB personnel also take the course developed by the Research Triangle Institute for the Department of the Air Force.

This training program is divided into eighteen elements. The elements in which personnel receive training depend upon the type of hazardous waste management activities they perform. (See Appendix H-1). Job descriptions will be modified to include the duties and responsibilities of the employee with respect to hazardous waste management.

H.1.c Training Director [40 CFR Section 264.16(a)(2); NM HWMR 206.B.6.a.(1)]

DRMR, Ogden is responsible for ensuring that DRMO personnel receive adequate training in handling hazardous wastes. No personnel will be allowed to provide on-the-job training without first demonstrating an understanding of hazardous waste management procedures sufficient to ensure operation of the facility in a manner that complies with all State and Federal regulations.

The Commander, 27th Combat Support Group, is responsible for ensuring that personnel on Cannon AFB receive training. This responsibility is delegated to 27 CSG/DEV.

H.1.d Relevance of Training to Job Position [40 CFR 264.16(a)(2); NM HWMR 206.B.6.a.(2)]

The training outlined in the preceding sections is relevant to the job descriptions in that the training teaches those personnel to recognize hazardous waste, handle it safely in accordance with federal and state regulations, be able to respond and take appropriate action in the case of an emergency, etc.

Since this is a specified duty under the job description, the training is sufficient to satisfy the requirements of NM HWMR 206.B.6.a.

Courses which offer more in-depth instruction on labeling and storage requirements include:

(i) Hazardous Materials, Chemicals and Waste Training and Compliance Course, Hazardous Materials and Waste Management Assoc., Inc., Transportation Skills Program, Inc. (8 hours) (Figure H-4).

(ii) Hazardous Materials Incident Response Operations Course, Office of Emergency and Remedial Response, U.S. Environmental Protection Agency (5 days), Edison, N.J. - (Figure H-5).

(iii) Hazardous Materials Compliance and Enforcement Course, U.S. Department of Transportation (1 week) - (Figure H-6).

At least one of these courses would be recommended as advanced hazardous waste management training for DRMO personnel.

Figure H-4

Hazardous Materials, Chemical and
Waste Training and Compliance Course

Hazardous Materials & Waste
Management Assoc. Inc., Transportation
Skills Program Inc.

Seminar Content Covers:

- The regulatory interface between DOT, EPA, and OSHA.
- The current status of DOT, EPA, and OSHA regulations affecting hazardous materials, substances, chemicals, and waste. (Two-Part presentation featuring an audiovisual. presentation and a review of supporting Federal and state documentation.)
- Training requirements for company personnel on all applicable DOT, EPA, and OSHA regulations.
- RCRA contingency/emergency plans required for all generators and owners/operators of treatment, storage, and disposal facilities.
- How to prepare "lab packs" and the new EPA regulations for recyclable hazardous waste.
- New OSHA regulations for manufacturers, users, generators, transporters, and carriers for Material Safety Data sheets.
- Training requirements for all employees required by the Hazard Determination and Communications Training Program. (This portion of the seminar features an audiovisual program and review of actual regulatory documentation.)

Figure H-4 (continued)

Hazardous Materials, Chemical and
Waste Training and Compliance Course

Hazardous Materials & Waste
Management Assoc. Inc., Transportation
Skills Program Inc.

Seminar Content Covers:

- Current and proposed EPA and DOT regulations for handling "empties," "non-empties," and "leakers."
- Emergency response requirements for hazardous materials, substances, chemicals, and waste under DOT, EPA, and OSHA.
- Current and proposed DOT, EPA, and OSHA shipping papers and manifest requirements for hazardous materials, substances, chemicals, and waste. (This portion of the seminar features an audiovisual presentation and review of applicable documentation.)
- Current and proposed DOT, EPA, and OSHA requirements for identifying. classifying, labeling. marking, placarding, and packaging of hazardous materials, substances, chemicals, and wastes.

Figure H-5

Hazardous Materials Incident Response Operations Course
Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Edison, New Jersey

This course provides attendees with practical knowledge concerning incident response operations. The course focuses on response team function, methods, procedures, and safety in responding to hazardous substances spills or abandoned wastes sites.

After completing the course, attendees should be more familiar with selection, use, and limitation of respiratory protection apparatus and protective clothing; site entry, control, and decontamination procedures; the use of field instruments and equipment; and response organization and management.

Approximately one-third of the course is classroom instruction. The remaining time is hands-on use of monitoring equipment. personnel protective apparatus, and other applications of classroom topics. Decision-making in incident response operations is practiced by responding as teams to a simulated vehicular accident and an abandoned waste site.

Course topics include: respiratory protection apparatus, protective clothing, field instruments, hazard analysis, response organization, and standard operating safety procedures.

Course Mo. 165.5

Continuing Education Units: 2.3

Length of Course: 5 days

Figure H-6

Hazardous Materials Compliance and
Enforcement Course
U.S. Department of Transportation

Course Content

Introduction and Legal Aspects	Cargo Tanks Specifications Inspection Procedures
Organization and Introduction to 49 CFR	
Procedure for Using HM Regulations	Roadside Inspection Procedures
Shipper Functions (All Modes)	Enforcement and Field Problems
Hazardous Substances and Wastes	Citing Non-Compliance
Modal Requirements	Emergency Response
Overview: Int'l Civil Aviation Education Organization (IcAo)	Training and Education
Overview: Int'l Maritime Organization Procedures (IMO)	Inspection
Introduction to Radioactive Materials	

Note: Prior to Phase I each course participant will receive:

Title 49, CFR, Parts 100-177, Phase I Student Text and Workbook, and a qualifying examination.

During Phase II (in-residence - 5 days) Participants will receive:

Title 49, CFR, Parts 178-199, Phase II Student Workbook and other support material.

H.1.e Training for Emergency Response [40 CFR 264.16(a)(3); NM HWMR 206.B.6.a.(3)] .

The DRMS training program ensures that its employees receive emergency response training. On-the-job training requires each employee to read and to understand Section V, Chapter 4 of publication # DPDS-M 6050.1 entitled, "Oil and Hazardous Materials/Hazardous Wastes Spill Prevention and Response."

Emergency response is also covered in classroom instruction with lectures and practical exercises. The Property Disposal Hazardous Materials Course (Fiqure H-1. item 6) addresses the topic. Spill Containment and Control. In addition. the Air Force Training Program provides instruction in emergency response, spill clean-up, and the line of personnel to be contacted.

H.1.e(1) Procedures for Using, Inspecting, Repairing, and Replacing Facility Emergency and Monitoring Equipment [40 CFR 264.16(a)(3)(i); NM HWMR 206.B.6.a.(3)(a)]

Refer to Section G-5.

H.1.e(2) Key Parameters for Automatic Waste Feed Cut-Off Systems [40 CFR 264.16(a)(3)(ii); NM HWMR 206.B.6.a.(3)(b)] .

No automatic waste feed cut-off system will exist on Cannon AFB. All hazardous wastes will be containerized in accordance with DOT specifications.

H.1.e(3) Communications or Alarm Systems [40 CFR 264.16(a)(3)(iii); NM HWMR 206.B.6.a.(3)(c)]

Refer to Section G-5.

H.1.e(4) Response to Fires or Explosions [40 CFR 264.16(a)(3)(iv); NM HWMR 206.B.6.a.(3)(d)]

In addition to hazardous waste management personnel, the Fire Department on Cannon AFB is continuously prepared to respond to all fires involving hazardous wastes. Specific procedures that will be followed in the event of a flre or explosion are outlined in the Contingency Plan, Sectlon G.

H.1.e(5) Response to Groundwater Contamination Incidents [40 CFR 264.16(a)(3)(v); NM HWMR 206.B.6.a.(3)(e)]

The potential for groundwater contamination in the vicinity of the DRMO will be unlikely considering the fact that all hazardous wastes/materials will be stored in DOT approved leak-proof containers.

The floors of the HWSF are coated with a chemical-resistant sealant. Each bay slopes toward a trench to contain spills. In the event of a spill, a pre-established contingency plan (Section G-4) provides for swift cleanup, thereby minimizing the risk of an outside spill or leak. Personnel will be trained in spill response, i.e., implementing the Contingency Plan.

H.1.e(6) Shutdown of Operations 40 CFR 264.16(a)(3)(vi); NM HWMR 206.B.6.a.(3)(f)

When operations must shut down, no special actions are required; therefore, no specific training is required.

H.2 Implementation of Training Program 40 CFR 264.16(d)(4) and 264.16(b); NM HWMR 206.B.6.b., (c), (d) and (e)

Current and future DRMO employees assigned to manage/handle hazardous materials and hazardous wastes will complete the training program discussed in Section H-1b within six months of their date of employment. At a minimum, DRMO employees will attend the Property Disposal Hazardous Materials Course offered by ALMC. If classroom instruction cannot be scheduled within six months, then it will be schedule as soon thereafter as possible. The Air Force Training Program will be completed within six months of employment or assignment to a new activity, unless the employee has a record of previous hazardous waste management training.

No employee will work unsupervised with hazardous wastes until he/she successfully completes on-the-job training. This training will be provided by DRMO by either the DRMS or DRMR environmental specialists during their periodic quality assurance visits throughout the year.

Additional formal training programs will be attended by DRMO personnel. The content of these programs is outlined in Figures H-3 through H-5. Facility personnel will also take part in an annual review of the training program.

For DRMO employees, all records documenting the job title for each position, job descriptions, employee names, and completed training programs (both introductory and review) will be kept onsite in the DRMO Office. Duplicate records will be kept at 27 CSG/DEV. The above information for Cannon AFB personnel is also maintained bY 27 CSG/DEV.

These records will be kept until closure of the facility for current employees, and for three years from the date of an individual employee's termination for former employees.

APPENDIX H-1

Hazardous Waste Management Training Program

RESEARCH TRIANGLE INSTITUTE

Hazardous Waste Management Training Program Manual

Cannon Air Force Base, New Mexico

M. E. Deerhake
R. K. M. Jayanty
Research Triangle Institute
and
C. A. Hughes
Computrac, Inc.

Prepared for
United States Air Force
Contract No. F33615-83-D-4010

July 1985

POST OFFICE BOX 12194 RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709

ELEMENT 18

TRAINING PROGRAM

18.1 OVERVIEW:

"Training Program" is the eighteenth in a series of eighteen hazardous waste management training elements prepared for Tactical Air Command.

18.1.1 ELEMENT OBJECTIVES:

This element will inform professional environmental staff personnel about the content of the training program they will administer. The staff will also learn what they should instruct treatment, storage, and disposal facility and accumulation point managers about the training program.

18.1.2 MATERIAL TO BE COVERED:

The following material is addressed in this element:

RCRA regulation requiring training
Implementation of the training program
Job descriptions

Training records

Training topics

Elements of the program

18.1.3 THIS ELEMENT APPLIES TO:

This element applies to professional environmental staff members who will coordinate the base hazardous waste training program.

18.2 RCRA REGULATION ON TRAINING:

The Resource Conservation and Recovery Act (RCRA) regulations require that "facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the [RCRA regulations]." The U.S. Air Force also applies this requirement to all hazardous waste accumulation point personnel.

18.2.1 PURPOSE OF THE TRAINING PROGRAM:

This program is intended to:

ensure personnel safety through instruction on such topics as what personal safety equipment and work practices should be followed when handling hazardous wastes;

have release prevention and emergency response crews ready, should an accident occur, by training on how to handle spill episodes, what materials to use to clean up specific spills, how to handle spilled materials once collected, and the line of personnel to contact in an emergency: and

assure proper facility operation and maintenance by instructing personnel on how to operate/maintain equipment, record data, maintain the facility, and sample, analyze, and screen wastes to ensure permit compliance.

18.3 IMPLEMENTATION OF THE RCRA TRAINING PROGRAM:

18.3.1 TIMING:

Treatment, storage, and disposal facility and accumulation point personnel shall complete classroom and/or on-the-job training within six months of taking a new position or employment dealing with hazardous waste management. UNTRAINED PERSONNEL SHALL NOT WORK UNSUPERVISED UNTIL THEIR TRAINING IS SUCCESSFULLY COMPLETED.

18.3.2 TRAINING PROGRAM:

Subject-specific classroom training shall be administered to all personnel occupationally exposed to or who handle hazardous waste This classroom training is coordinated by the base Environmental Coordinator and his assigned staff. Formal training such as classroom lextures provides a solid foundation for on-the-job training because the trainee will need to understand the basic concepts of RCRA and its requirements.

"On-the-job training is a planned training program designed to qualify or upgrade trainees through self-study and supervised instruction, to perform a given job while actually working on the job. The training is conducted in the actual work situation generally by designated supervisors who have also worked in support of the organization."

This training program is devided into 18 elements. The elements in which personnel receive training depend upon the type(s) of hazardous waste management activities they perform.

The audience for this program includes, for example, flightline maintenance personnel and professional staff such as the Bioenvironmental Engineer, Fire Chief, and the Chief of Ground Safety.

Following successful completion of the classroom and on-the- job aspects of this element, trainees shall be capable of performing assigned hazardous waste management tasks safely and effectively.

18.3.3 FREQUENCY OF TRAINING:

After the initial training requirement is fulfilled, personnel shall receive job-specific training in hazardous waste management at least annually.

18.4 JOB DESCRIPTIONS:

Each treatment, storage, and disposal facility and accumulation point manager, as specified in the Base Hazardous Waste Management Plan, or designated by the installation commander, shall maintain job descriptions for each position dealing with hazardous waste. These job descriptions specify the skills and the level of training required for the position. Each job description shall include:

required skills

required education

required training (both introductory and continuing)

other necessary qualifications

hazardous waste-related duties for the position

The HQ TAC/DEEV will issue a standard job description covering hazardous waste management activities in accordance with AFR 50- 1. Position descriptions for affected personnel will be modified by their supervisor to include their hazardous waste duties. Training for Air Force personnel will be documented on AF Form 991. Job descriptions for civilian personnel will be modified, as required, using the Civilian Personnel Position Description AF Form 1378. The modified position description shall include the duties and responsibilities of the employee with respect to hazardous waste management. Training for civilian emoloyees shall be documented on AF Form 971.

18.5 TRAINING RECORDS:

Each treatment, storage, and disposal facility and accumulation point manager shall maintain training records for

assigned personnel. These records shall include:

Job title and current employee's name for each position related to hazardous waste management

Documentation of training status for each person: e.g., the trainee has successfully completed the required training

A log of training elements to include the type and amount of both introductory and continuing training to be given; subject matter: hours taught; and instructor

The Environmental Coordinator shall maintain a master log of training administered to personnel and a written description of each hazardous waste-generating work area's training plan.

Training records shall be kept until closure of the facility: training records of former employees must be kept for at least three years from the date the employee last worked at the facility. Training records for personnel who have been reassigned may accompany personnel to their new assignment within the Air Force.

Here is an example of how a training record should be structured.

18.6 COMMON TRAINING PROGRAM SUBJECTS:

This portion of the training element is presented for the training instructor's benefit. It provides a general background on each element of this training program. This includes the title of the element; a summary of its intended audience and content; and the frequency at which the element should be repeated.

As previously stated, the Environmental Coordinator and his staff administer the training program. It is their duty to ensure that training schedules are established and followed. The Environmental Coordinator determines the order and grouping of training elements to be taught to personnel. All personnel must successfully complete training within six months after their employment or assignment to a new activity, unless they have a record of previous hazardous waste management training. Until training is completed, personnel are not allowed to work unsupervised.

Audiences for training will include the following Air Force hazardous waste management groups:

Group 1 Hazardous Waste Generators

Group 2 Accumulation Point Personnel

Group 3 Treatment, Storage, and Disposal Facility Personnel

Group 4 Air Force Professional Staff, consisting of:

Base Bioenvironmental Engineer

Fire Chief

Public Affairs Officer

Chief of Ground Safety

Staff Judge Advocate

Chief of Supply

Chief of Defense Property Disposal. Office (DPDO)

Transportation Management Officer

We will now describe each of the training program elements and identify which of these four waste management groups participates in each.

1. INTRODUCTION TO RCRA

This element is an introduction to state, Federal, and military hazardous waste management regulations. Generators: accumulation point personnel: treatment, storage, and disposal facility personnel: and the Air Force professional staff are required to participate in this element of the course. Personnel shall repeat this element annually.

2. IDENTIFICATION OF TYPICAL TAC RCRA COMPOUNDS

Base activities that generate hazardous wastes are identified in this element. It also includes the composition and hazardous properties of typical wastes and identifies data sources for hazardous material data and information. Generators: accumulation point personnel; treatment, storage, and disposal facility personnel are required to receive this training element annually. It is recommended that Air Force professional staff also participate in the element annually.

3. RCRA INTERNAL SURVEYS

"RCRA Internal Surveys" is an explanation on how to monitor hazardous waste operations at Air Force bases. Generators and accumulation point personnel shall receive this element as required. It is recommended that the Air Force professional staff receive the survey element annually.

4. ACCUMULATION POINT MANAGEMENT

This element contains RCRA regulations and Air Force operating requirements for the temporary storage of hazardous waste. Accumulation point personnel must receive it semiannually.

5. CONTAINERS AND CONTAINER MANAGEMENT

The container management element guides personnel in the selection and proper management of hazardous waste containers such as 55-gallon drums. Generators must take this course element annually: however, accumulation point personnel will be required to take the element semiannually since this topic is such an important part of their work and the base hazardous waste management program.

6. CONTAINER MARKING AND LABELING.

RCRA, DOT, and DLA requirements for properly identifying hazardous wastes that are managed and transported are the focus of this training element. It is designed for generators and treatment, storage, and disposal facility personnel who must receive this training annually. Again, accumulation point personnel will be required to take the element semiannually, due to the significance of this topic to their work.

7. RECORDKEEPING

This element guides accumulation point personnel through the preparation and maintenance of annual reports, manifests, training records, and operating records. These personnel must receive this training semiannually.

8. TREATMENT, STORAGE, AND DISPOSAL FACILITY MANAGEMENT

This element discusses RCRA requirements for hazardous waste treatment, storage, and disposal facilities. Treatment, storage, and disposal facility personnel must receive this training element semiannually; professional staff are recommended to take the course element annually.

9 TURN-IN PROCEDURES

This element explains how to prepare hazardous wastes for turn-in to DRMO. Generators and accumulation point personnel are required to take this course semiannually.

10. ORGANIZATION/ACTIVITY RESPONSIBILITY

This element describes Air Force offices and positions involved with hazardous waste management and their responsbilities. Professional staff must receive this training element as required.

11. CLOSURE OF ACCUMULATION POINTS/TREATMENT, STORAGE, DISPOSAL FACILITIES

This hazardous waste management element provides guidance on how to institute facility closure and post-closure programs. Accumulation personnel and treatment, storage, and disposal facility personnel shall take this course element annually. Professional staff must receive the element as frequently as require for example, when portions of a facility or an accumulation point is scheduled for closure.

12. CONTINGENCY PLANS/EMERGENCY RESPONSE

Procedures for responding to hazardous material and waste emergencies such as a spill are described in this element. Generators: accumulation point personnel; treatment, storage, and disposal facility personnel; and professional staff are required to attend this training element class annually.

13. MANIFEST AND TRANSPORTATION

This element provides guidance on how to prepare for and follow on the transportation of hazardous wastes. It is designed for generators; accumulation point personnel: and treatment, storage, and disposal facility personnel. Each trainee shall attend this course annually.

14. COMMERCIAL DISPOSAL FACILITIES OVERVIEW

This element is an overview of commercial hazardous waste treatment storage, and disposal facilities. It contains guidance on how to select the appropriate facility for the base's needs. Treatment, storage, and disposal facility personnel shall receive this element annually. As required, professional staff members shall attend the training element session.

15. HAZARDOUS SUBSTANCE CHARACTERIZATION AND COMPATIBILITY

Hazardous waste sampling and analysis are discussed in this element, along with the issue of waste compatibility. It is required that generators; accumulation point personnel: and treatment, storage, and disposal personnel receive this element annually. It is also recommended that professional staff attend this element course annually.

16. FIRE CONSIDERATIONS

This element contains instructions on how to deal with flammable and combustible materials. Generators: accumulation point personnel: and treatment, storage, and disposal facility personnel shall attend this course element annually.

17. SAFETY CONSIDERATIONS

"Safety Considerations" provides guidance to personnel on how to handle typical hazardous waste safely. Again, generators; accumulation point personnel: and treatment, storage, and disposal facility personnel must receive this course element annually.

18. TRAINING PROGRAM

This final base hazardous waste management element outlines the requirements for training and the content of the base training program. Professional staff are recommended to receive this training element annually. Generators: accumulation point personnel: and treatment, storage, and disposal facility personnel shall receive the element annually.

This matrix identifies the groups of Air Force hazardous waste management personnel and the designated training elements they shall receive. Within each box is shown the frequency trainees attend elements each year.

18.7 INITIAL TRAINING PROGRAM REQUIREMENTS:

To ensure compliance with the RCRA training regulations, new, untrained personnel shall receive initial training within six months after they assume their positions. Thereafter, they shall continue to be trained in accordance with the training schedule provided in the previous section.

Initial training will include the following elements:

Element 12 - Contingency Plans/Emergency Response

MINIMUM CLASSROOM TRAINING REQUIRED ANNUALLY
(after initial training completed)

TRAINING ELEMENTS	TRAINING FREQUENCY			
	Group 1	Group 2	Group 3	Group 4
1. Introduction to RCRA	1	1	1	1
2. Identification of Typical RCRA Compounds	1	1	1	R-1[2]
3. RCRA Internal Surveys	AR[3]	AR		R-1
4. Accumulation Point Management		2		
5. Containers and Container Mgt.	1	2		
6. Container Marking and Labeling	1	2	1	
7. Recordkeeping		2		
8. Treatment, Storage, and Disposal Facility Management			2	R-1
9. Turn-In Procedures	2	2		
10. Organization/Activity Responsibility				AR
11. Closure of Accumulation Points/TSDFs		1	1	AR
12. Contingency Plans/ Emergency Response	1	1	1	1
13. Manifest and Transportation	1	1	1	
14. Commercial Disposal Facilities Overview		1		AR
15. Hazardous Substance Characterization and Compatibility	1	1	1	R-1
16. Fire Considerations	1	1	1	
17. Safety Considerations	1	1	1	
18. Training Program	1	1	1	R-1

Group 1 - Hazardous Waste Generators
Group 2 - Accumulation Point Personnel
Group 3 - Treatment, Storage, and Disposal Facility Personnel
Group 4 - Air Force Professional Staff

2 R-1 - Recommended annually.

3 AR - As required.

Training Frequency:
1 = annual training
2 = semiannual training

ELEMENT 18

TRAINING PROGRAM

COMMENTS

Each of the training program elements is designed to be completed within a one-half hour time period. It is recommended that a minimum of one hour be scheduled for any training session. Therefore, two training program elements could be presented during the hour. The elements are structured with the Summary and Questions and Answers at the end, followed by the Talking Paper, Comments, and Handouts.

The Questions and Answers are for use by the instructor. You may choose to prepare new or additional questions. The Questions only, without the answers, are included in the handouts. The questions and discussion should be the last ten minutes of the half-hour training session. If you have a number of questions from the audience, you may want to eliminate use of the prepared questions. You should use the questions as a method of stimulating discussion, if needed.

The Talking Paper follows the text of the element and focuses on the highlights of the element. Its use is intended for personnel familiar with the subject who will use the Talking Paper, in combination with the element slides, to do the presentation. If you are going to use the Talking Paper, I suggest you run through the slides and time your presentation. I

think you will find that the presentation will take longer, due to the tendency to spend more time giving a detailed explanation of each slide. You may also want to modify the slides, including more shots of your specific situation, or to replace some of the more general base slides.

The Comments following each element are designed to provide additional resource information and some guidance in interpretation of the regulations. As you might expect, interpretation is somewhat difficult, due to the variations from State to State, as well as from inspector to inspector. We have tried to point out those areas where we have seen inspectors making demands for corrective actions without any regulatory requirement. Remember that they can always use the catch-all "to protect public safety and the environment."

The course instructors for this program must be fully qualified to present the program. This entails attending the AFIT course at Wright-Patterson AFB in Environmental Training. The course is a one-week program starting in fiscal year 1986. AF Form 1556 should be submitted to Mr. Ed Legrow, DEM, for TAC personnel.

You should maintain close contact with the Judge Advocate office regarding changes or amendments to the regulations. You will need to modify the text and presentation to accommodate the revisions. It is suggested that the texts be placed on the base

word processing system to facilitate updating and revising.

Section 18.6 and the remainder of the training element are designed to assist you in briefing senior base officials about the training program.

Section I

CLOSURE PLAN, POST CLOSURE PLAN AND FINANCIAL REQUIREMENTS

This section is submitted in accordance with the requirements of 40 CFR 270.14(b)(13), 270.14(b)(15-18), 264.110-261.115, 264.351, 264.178 and 264.197, and NM HWMR 302.A.4.b.(1)(m),(n),(o),(p),(q), 206.D.2.a-f., 206.D.8.h., 206.D.4.i. and 206.D.5.e.

I.1 Closure Plans [40 CFR 270.14(b)(13); NM HWMR 302.A.4.(b)(1)(m)]

This plan identifies all steps that will be necessary to partially close the storage facility at any point during the intended operating life and to completely close the facility at the end of its intended operating life.

DRMO Cannon and Cannon AFB will maintain an on site copy of the approved closure plan, and of all revisions to the plan. Revisions will be made whenever any modifications are made to the existing equipment, structures, instruments, or procedures related to the management of the facility.

I.1.a Closure Performance Standard [40 CFR 264.111 and 264.112; NM HWMR 206.D.2a. and b.]

This closure plan is designed to: ensure that the facility will not require further maintenance and controls; minimize and eliminate threats to human health and the environment; and prevent escape of hazardous wastes,

hazardous waste constituents, or waste decomposition products to the ground or surface waters or to the atmosphere. If there is evidence of any spills or leaks, samples will be taken and analyzed to determine the extent of contamination in the soil and, if necessary, in groundwater. Any contaminated soil will be excavated, removed, and disposed of at a proper disposal facility. Any contaminated ground water attributable to the handling practices of hazardous wastes at this facility will be treated so that any contamination resulting from the above handling practices is below local, state, and/or Federal limits. Specific procedures are discussed in Section I.1.e.

I.1.b Partial and Final Closure Activities [40 CFR 264.112(a)(1)-264.112(a)(4); NM HWMR 206.D.2.c.(1)(a)]

Partial closure of the container storage is not planned. However, in the event that future circumstances or decisions force the facility to discontinue their activities, the procedures for final closure will be followed.

I.1.c Maximum Waste Inventory [40 CFR 264.112(a)(2); NM HWMR 206.D.2.c.(1)(b)]

At a maximum, there will be 10,720 gallons in 55-gallon drums and smaller containers of hazardous waste in storage at any one time during the operational life of the storage facility.

I.1.d Schedule for Closure [40CFR 264.112(a)(4); NM HWMR 206.D.2.c.(1)(d)]

Cannon AFB is an integral part of the defense system of the United States; it is not anticipated that closure will occur. However, a closure date of 2034 can be estimated for the DRMO facility.

I.1.d(1) Time Allowed for Closure [40 CFR 264.113(a) and (b); NM HWMR 206.D.2.c(2)]

Within 90 days after the receipt of the final volume of hazardous wastes, final closure activities will be initiated. Table I-1 presents an estimated schedule for closure which gives an estimate of the total time required to close the facility and the time required for intervening closure activities.

Notification of intent to close will be sent to the New Mexico Environmental Improvement Division, Hazardous Waste Management Section and/or the EPA Regional Administrator 180 days before beginning final closure. Final closure will be supervised and certified by an independent registered professional engineer.

I.1.d(2) Extensions for Closure Time [40 CFR 261.113(a) and (b); NM HWMR 206.D.2.d.(1) and (2)

No extension for closure time is anticipated. If, however, an extension would be necessary to properly close the HWSF, then a petition will be sent to the permitting authority amending the closure schedule listed in Table I-1. This petition will demonstrate:

(i) The need for more than 90 days to remove wastes received at the facility prior to commencement of the closure activities.

(ii) The need for more than 180 days to close the facility.

(iii) There is a reasonable likelihood that a person other than the owner/operator will recommence operation of the site.

(iv) Closure would be incompatible with continued operation.

(v) All steps have and will be taken to prevent threats to human health and the environment from the unclosed but inactive facility.

I-1e. Inventory Disposal, Removal, or Decontamination of Equipment [40 CFR 264.114]

Upon formal notification to proceed with facility closure, no additional hazardous property will be accepted at the storage facilities. Furthermore, all hazardous waste/property remaining in inventory will be removed in accordance with a contractual agreement to a State and/or EPA-TSD facility or recycling site(s). If this process cannot be accomplished within the allotted time for closure, then the hazardous property will be transferred to an operational DRMO with a valid approved TSD permit. After the final inventory of waste has been removed the hazardous waste storage facility will be inspected for loose items; i.e., papers, pallets, or empty containers. These items will be removed and properly disposed.

Trained personnel wearing appropriate protective equipment (rubber gloves, rubber boots, and coveralls) will remove and clean-up all visible signs of contamination. Then a series of three solvent washes will be used to wash the walls and floors of each room, closet, and hall. All washings will be collected in a portable tank and the washwater analyzed. If the analysis indicates that the wash is hazardous, then it will be drummed and disposed of as hazardous waste. If the analysis shows no evidence of contamination, the wash will be discharged to the sewer system. The load/unload area and catch basin will be cleaned in the same manner after the equipment decontamination has taken place.

The samples of the washwater will be analyzed for EP toxic metals, total organic carbon (TOC), total organic halogens (TOX) and pH. The washwater will be considered hazardous if:

1. The concentration of any EP toxic metal exceeds the concentration in 40 CFR 261.24, table I, or;
2. pH <2 or > 12.5, or;
3. The Flash point is below 140°F
4. The cyanide concentration exceeds 1 mg/l
5. The TOC concentration exceeds 25 mg/l, or;
6. The TOX concentration exceeds 25 mg/l.

All equipment which has come into contact with hazardous waste will be decontaminated at closure, or shipped offsite to a permitted hazardous waste disposal site. The equipment, forklifts, and hand tools, will be decontaminated on the load/unload area of the storage building. Equipment, where applicable, will be triple rinsed and the washwater collected.

If there is evidence of any spills or leaks, samples will be taken to determine the extent of contamination in the soil. Surface samples will be taken initially, and will be analyzed for halogenated organics, non-halogenated organics, corrosivity and EP toxicity. These parameters are selected based on the information provided in Appendix C. All sampling and analysis methods will be in accordance with EPA Publication SW 846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", 2nd ed., 1982. A minimum of four samples will be collected. A representative background sample will be taken outside the area defined as potentially contaminated. Sites will be selected by the contractor hired to develop and implement the sampling protocol.

If results indicate that contaminant levels are above allowable concentrations and/or background levels, additional samples will be taken down to a depth of one foot, using an auger. Based on these analyses, the contractor will then determine the need for further soil sampling and whether samples should be analyzed for additional parameters. If unacceptable concentrations of contaminants are found at greater depths, the contractor will also determine the need for establishing groundwater monitoring wells.

Any contaminated soil will be removed until pollutant levels in the remaining soil are down to allowable concentrations and/or background levels. Additional sampling will be performed until decontamination is verified. Any contaminated groundwater attributable to the handling or storing of hazardous wastes at this facility will be treated so that any contamination is reduced to a level below local, state and/or Federal limits specific for that contaminant. If necessary, the site will be regraded subsequent to closure in order to prevent erosion.

Facility decontamination procedures will be conducted by trained personnel. The services of these personnel will be obtained at the time of closure notification in accordance with contractual procedures established by DRMS. DRMS will prescribe requirements for decontamination and will require the contractor to provide all necessary equipment and protective clothing to safely effect decontamination.

Following the final disposition process, soil samples will be taken to determine whether contamination of the area exists. If necessary, soil will be removed and the area re-tested until no appreciable level of contamination remains. Any soil removed will be containerized and transported to either the DRMO storage facility or to a state/EPA approved disposal site.

Verification of all analyses will be supplied by an independent laboratory.

I-1e(1). Closure of Containers [40 CFR 264.178; NM HWMR 206.D.4.i.]

The removal of waste containers previously discussed in Section I-1(e) will be verified by an independent registered professional engineer. All containers will be sealed and labeled prior to shipment in accordance with 40 CFR Sections 261 and 262. Manifests for container removal will be maintained by the Defense Property Disposal Service Headquarters Office, 74 N. Washington, Battle Creek, MI 49016.

I-1e(2). Closure of Tanks [40 CFR 264.197; NM HWMR 206.D.5.e.]

No tanks will be used to store wastes at this facility.

I-1e(3). Closure of Waste Piles (Reserved) [40 CFR 270.17(i) and 264.258; NM HWMR 302.A.4.b.(2)(d)(ix), and 206.D.7.h.]

No waste piles will be located at this facility.

I-1e(4). Closure of Surface Impoundments [40 CFR 270.17(i) and 264.228; NM HWMR 302.A.4.b(2)(c)(vii) and 1206.D.6.f.]

No surface impoundments will be located near this facility. This section is not applicable.

I.1e(5) Closure of Incinerators 40 CFR 264.351; NM HWMR 206.D.8.h

I.1e(6) Closure of Landfills 40 CFR 270.21(e) and 264.310(a); NM HWMR 302.A.4.b.(2)(g)(v), 206.D.10.f

No landfills will be located at this facility.

I.1e(7) Closure of Land Treatment 40 CFR 270.20(d)(6), 264.280(a) and (b); NM HWMR 302.A.4.b(2)(f)(vi), 206.D.9.h.(1) and (2)

No land treatment activities will occur at this facility.

I.2 Post Closure Plans 40 CFR 270.14(b)(13), 264.117 and 264.118; NM HWMR 302.A.4.b(1)(m), 206.D.2.q, 1206.D.2.h

Post closure plans will not be needed because all wastes will be removed and the facilities will be decontaminated at closure.

I.3 Notices Required for Disposal Facilities

I.3a Notice to Local Land Authority 40 CFR 264.119; NM HWMR 206.D.2.i

Refer to section I.3b.

I.3b Notice in Deed to Property 40 CFR 270.14(b)(14); NM HWMR 302.A.4.b(1)(n)

DRMO-Cannon will operate a hazardous waste storage facility, not a disposal facility. Therefore a notation is not necessary in the deed to inform potential purchasers of restrictions associated with a disposal site, as required by 40 CFR Sections 264.120 and 270.14(b)(14) NM HWMR 206.D.2.j and 302.A.4.b(1)(n).

I.4 Closure Cost Estimate 40 CFR 270.14(b)(15) and 264.142(a) and (b); NM HWMR 302.A.4.b(1)(o) and 206.D.3.c(1) and (2)

DRMO-Cannon and Cannon AFB are exempt from the closure cost estimate requirement because they are owned and operated by the federal government.

Table I-1

Estimated Closure Schedule

DAYS		ACTIVITY
1.	Receipt of final volume of hazardous waste	0-10
2.	Removal/disposal of final waste inventory	10-90
3.	Decontamination of storage facility	90-100
4.	Completion of closure and certification submittal to the permitting authority	180

APPENDIX I-1

Soil Classification

Soil Classification

The following soils are classified using the Unified System. This system identifies soils according to particle size, plasticity and liquid limit.

SOIL TYPES

SC Sands with nonplastic or plastic fines.

CL Nonplastic or plastic fine-grained materials with low liquid limits.

CH Primarily nonplastic or plastic fine-grained materials with high liquid limit.

APPENDIX I-2

Land Management Plan

LAND MANAGEMENT PLAN

FOR

CANNON AIR FORCE BASE, NEW MEXICO

FOR PLAN PERIOD

JANUARY 1983 THRU DECEMBER 1987

AUTHOR: 27CSG/DEEV

Approving Officials:

Installation Commander — Date: 9 Dec 1983

MAJCOM Agronomist — Date: 13 Feb 1984

1. Forward: The purpose of this plan is to recommend methods, procedures, techniques, and materials required for developing, improving, maintaining, and repairing grounds, and for other soil and water conservation and management practices.

2. Description:

a. Location: Cannon Air Force Base is located approximately seven miles west of Clovis, New Mexico in Curry County.

b. Acreage:

(1) Improved Grounds:

(a) 45.56 acres of administrative and athletic area mowed by squadron organizations or other installation organizations.

(b) 184.59 acres of administrative, athletic, and housing area mowed by Base Civil Engineer.

(c) 210.24 acres of family housing lawns mowed by occupants.

(d) 23.5 acres of golf course fairways and greens.

(e) 0 acres maintained by service contract.

(f) 463.89 total acres of improved grounds.

(2) Semi-Improved Grounds:

(a) 1114.15 acres maintained in house.

(b) 0 acres maintained by service contract.

(c) 1114.15 acres of semi-improved grounds.

(3) Unimproved Grounds:

(a) No forest land under management.

(b) No crop and hay outleases.

(c) No grazing outleases.

(d) 1730.72 acres of other unimproved grounds.

(e) 1730.72 total acres of unimproved grounds.

(4) Land Under Facilities: 472.74 acres under buildings, roads, and parking and airfield pavements.

(5) Total Acres of Installation Land - 3781.5

3. Soils and Climate:

a. Soils Inventory:

(1) Soil: The predominate soil is Amarillo Fine Sandy Loam, classified as Class 3 cropland by the United States Soil Conservation Service. Classification can be raised to Class 2 by irrigation.

(2) Topography: The topography is smooth and gently sloping.

(3) Drainage: The drainage characteristics of top soils range from poor to practically impervious.

(4) Susceptibility to Wind or Water Errosion: The soil is highly susceptible to errosion from the persistent winds of the plains. Heavy downpours during summer thunderstorms can cause errosion on sides of unstabilized embankments and drainage ditches.

(5) Natural Fertility or Productivity: The soil is high in potassium, phosphorous, and the trace elements of zinc and iron but alkalinity ties up the phosphorous and the trace elements.

(6) Surface and Subsoil pH: The pH value is between 7.2 and 7.4 throughout the area.

(7) Soil Test Results: See Attachment A-6.

(8) Native Vegetation Cover: The native vegetation cover is comprised of Blue Grama and Side-Oats Grama.

b. Climate Data:

(1) The prevailing winds from November to April are westerly and from May to October are southerly.

(2) The first average killing frost is 20 October and the last average killing frost is 29 April.

(3) The length of the growing season is 175 days.

(4) Average annual precipitation by month (25 years record):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
.40	.35	.45	.57	1.39	2.08	2.77	2.20	1.68	1.40	.45	.44	14.18

(5) Extreme High and Low Temperatures (30 years record):

High - 106°F in June
Low - Minus 11°F in January and December

(6) Average Daily High and Low Temperatures (30 years record):

Average High - 70°F
Average Low - 44°F

4. Establishing Vegetation:

a. Preferred Planting Season: The preferred planting season is spring.

b. Acceptable Planting Season: Early summer is an acceptable planting season.

c. Mulch Requirements: For mulching the soil should be tilled to a depth of 5 or 6 inches and peat moss applied at a rate of 7 lbs per 1,000 sq ft.

d. Plant Species to be Used: The plant species to be used is Bermuda Grass (Cynodon Dactylon) or Kentucky Bluegrass (Poa Pratensis). See Attachment A-10 for complete listing.

e. Seed Mixtures and Seeding Rate: The seeding rate for Bermuda Grass on semi-improved areas or unimproved areas should be at a rate of 15 to 30 lbs per acre and 40 to 80 lbs on improved grounds. The rate for Kentucky Bluegrass should be 20 to 30 lbs per acre for semi-improved or unimproved grounds and 100 - 110 lbs per acre on improved grounds.

f. Sodding: Sod shall be obtained from commercial sod nurseries or cut from acceptable areas on base. It shall be cut in strips approximately 15" wide and 4' long and cut to leave 1/2" to 3/4" of soil attached to the roots. Ends of strips shall be staggered. On irregular areas, sod shall be layed in both directions from the longest straight line that can be drawn through the area. Immediately after installation water heavy and roll with a light roller to eliminate irregularities.

g. Fertilizer: Commerical fertilizer shall contain a minimum of 16(N) 20(P) 0(K) and applied at a rate of 1 pound of actual nitrogen per 1000 sq ft initially and then again 60 days after the establishment of grass.

h. Soil Amendments to be Used: See Attachment A-6.

i. Maintenance and Guarantee (Contracts):

(1) Trees and Shrubs - The responsibility for maintenance of plants will be for a period of 30 days. Maintenance shall include watering, weeding, spraying, pruning, re-setting plants to proper grade or upright position, and restoration of planting basins when required. Guarantee and replacement will be for a period of 90 days and any badly impaired plant shall be replaced in the same manner as specified for the original planting.

(2) Seeding or Sodding - The responsibility for the proper care of areas for sod is 14 days after completion and seeding shall be maintained through the first cutting. If the desired cover is established in less time, shortening of the period of responsibility may be authorized. When any portion of the area becomes gullied, damaged or evident that portions have not rooted, the affected portion shall be repaired and replaced with sod or seed of the same grass composition as originally specified.

5. Maintenance of Lands:

a. Improved Areas:

(1) Bermuda Grass (Cynodon Dactylon) constitutes the principal part of present vegetative cover for improved grounds. Fertilizer used is 16% nitrogen, 20% phosphorous acid and 1.2% sulphur, the application rate is 300 pounds per acre. Sixty tons of fertilizer is used primarily during the early spring. No other soil amendments are used. All improved areas are cut to a height of 1-1/2 inches and allowed to grow to 3 inches. All improved grounds are mowed weekly.

(2) Dandelions are the major weed problem. Weed-B-Gone is being used at the present time for control of dandelions. Monuron is being used to control weed growth in cracks and sidewalk joints. The recommended rate of application is 20 to 60 pounds per acre.

(3) Insect problems are elm leaf beetle, bagworms, and webworms. The chemical used is .1% carbaryl (sevin) suspension applied as required during the months of April thru October.

(4) During the warmest months of the year irrigation is required on all improved grounds. Irrigation is done twice weekly with 1 inch of water per application. Early morning and late afternoon is the suggested time to water.

(5) Pruning is done by Civil Engineering except for some minor pruning done by housing occupants. Pruning should be done when the tree is dormant. Trees are allowed to assume their natural shape and not cropped or pruned to a uniform level in a round, flat topped, or other unnatural form.

(6) There are no threatened or endangered plants on Cannon Air Force Base.

b. Semi-Improved Areas:

(1) Blue Grama (Bouteloua Gracilis) and Side-Oats Grama (Bouteloua Curtipendula) constitute the principal part of the present vegetative cover for semi-improved grounds.

(2) The greatest rodent problem is the black-tailed prairie dog (Cynomys ludovicianus). The primary control measure used is aluminum phosphide (phostoxin) in tablet form.

6. The following instructions were extracted from the Cannon Air Force Base Family Housing Brochure dated January 1982.

a. Landscaping:

(1) Trees and Shrubs: The planting of trees and shrubs by the occupant is permitted and encouraged. When planting, the harmony of color and growth characteristics should be considered. A housing area landscaping plan has been developed by BCE; therefore, before extensive planting or construction is attempted by the occupant, prior approval of location must be obtained from BCE. It is also beneficial to contact O&M to obtain information on the variety of shrubs or trees that grow best in this dry area. It is the

occupant's responsibility to prune all shrubs, bushes and tree limbs which can be reached easily, and to remove all tree seedlings from yards surrounding quarters. Other tree areas will be pruned periodically by Civil Engineering.

(2) Flower Beds: Planting of flowers by the occupants is permitted and encouraged. Generally, flowers should be planted adjacent to the house, patios and driveways. The maximum size of flower beds should not exceed 2' x 12'.

b. Lawns: In order to prevent the grass from drying out in hot weather, it should not be cut any lower than three inches in height. Lawns are not to be used for motor vehicle, boat or trailer parkings.

c. Water Conservation: It is the responsibility of each occupant to water the lawn. Water in this dry area is a precious commodity. DO NOT WATER EXCESSIVELY (watering twice a week is normally adequate to provide for healthy development). Even-numbered quarters water lawns on even days, odd-numbered quarters on odd days. Hours: 1800-midnight; midnight-0900.

d. Policing Your Area: In addition to cutting and edging the lawn, all occupants are responsible for policing their area. All occupants are responsible for the area half way to the nearest facility including policing to the center of the street and removing weeds and grass from expansion joints or cracks in sidewalks, driveways and curbs. Occupants residing on corner lots must maintain the entire lot. The ranking officer/NCO residing in military family quarters is appointed as area manager of the common-use area located in their local area, i.e., children's playgrounds and meridian in their area. This appointment will be for a period of one year. The duty of the common area manager is to assist the Base Commander in keeping the area free of litter, weeds, and other debris. The appointed area managers will use the occupants of their area to help keep the common-use areas clean.

7. Golf Course Maintenance:

a. Two personnel are assigned entirely to golf course maintenance with two additional personnel helping during the summer.

b. Golf Course Equipment:

Type of Equipment	Authorized	On Hand
Chain Saw	1	1
11-16 Sod Cutter	1	1
6 HP Roto Tiller	1	1
590 Lawn Renovator	1	1
Tractor Lawn Mower	1	1
Power Lawn Mower	3	3
4F018 Tractor Mower	1	1
Top Soil Dressing Machine	1	1
Vertical Lawn Mower	1	1
Turf Aerator	1	1
Weedy 67 Weed Cutter	2	2
Pulverizing Machine	1	1
TOTAL	15	15

GOLF COURSE RECURRING MAINTENANCE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mowing (Regular)												
Greens (4 x week)(3/16")	X	X	X	X	X	X	X	X	X	X	X	X
Fairways (3 x week)(1")				X	X	X	X	X	X	X	X	
Roughs (2 x week)(1-½")					X	X	X	X	X	X		
Mowing (Verticutting)				X		X		X		X		
Irrigation												
Greens												
Apr - Nov (each night)(30 min)				X	X	X	X	X	X	X	X	
Dec - Mar (2 x week)(30 min)	X	X	X									X
Fairways (2 x week)(45 min)	X	X	X	X	X	X	X	X	X	X	X	X
Roughs (2 x week)(45 min)	X	X	X	X	X	X	X	X	X	X	X	X
Fertilizing (16-20-0)												
Greens (4 x yr, 50 lb/green)				X			X	X		X		
Fairways (2 x yr, 400 lb/fairway)			X						X			
Roughs (None)												
Areation												
Greens (3 x year)						X	X	X				
Fairways (3 x year)						X	X	X				
Topdressing (2 x year)												
Sand and Peat Moss						X		X				
Weed Control (As required)												
Dandelions												
Greens (Bentgrass Trimec)												
Fairways (Fairway Trimec)												
Diseases (As required)												
Dollar Spot												
Greens (Diconil 2787)												

8. Fire Suppression: Fire guards have been cut and are maintained in areas susceptible to fire damage. These guards are positioned to provide the greatest protection to private property and afford the most benefit to firefighters. Fire guards are 15 feet wide clear areas and are kept free of dry vegetation. Cannon has a mutual agreement with the Clovis, New Mexico Fire Department. Controlled burning is not allowed and firebreaks are maintained by Civil Engineering. Area fire protection and prevention inspections are performed by the Base Fire Department monthly.

9. Environmental Pollution Prevention: A continuing effort is made by all personnel engaged in land management activities to not pollute water, soil or air. Pesticide applications are done at times that are least likely to cause pollution. All personnel that apply pesticides have completed technical training at Sheppard AFB, TX and are certified by TAC as pest controllers.

10. Floodplains and Wetlands: There are no floodplains or wetlands on Cannon Air Force Base.

11. Prime and Unique Farmland: There is no prime or unique farmland on Cannon Air Force Base.

12. Environmental Assessment: An environmental analysis process has been conducted for this plan in accordance with the requirements of AFR 19-2. There will be no adverse impact on the environment nor public controversy. Therefore, additional documentation and analysis is not required.

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

FOR ENVIRONMENTAL PLANNING USE ONLY

I REQUEST

1. TO: (Environmental Planning Function) 27CSG/DEEV
2. FROM: (Organization and Office Symbol) 27CSG/DEEV
3. CONTROL NUMBER
4. ESTIMATED COMP DATE
5. REQUESTOR (Name, Office Symbol and Phone No.) Richard M. Brubaker, 1Lt, DEEV, 2739
6. TYPE OF ANALYSIS NEEDED

X	CATEX DETERMINATION		PRELIMINARY ENVIRONMENTAL SURVEY		ENVIRONMENTAL ASSESSMENT		ENVIRONMENTAL IMPACT STATEMENT

7. TITLE OF PROPOSED ACTION
LAND MANAGEMENT PLAN

II DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA)

8. PURPOSE OF AND NEED FOR ACTION (Continued on Sheets)

The purpose of this plan is to outline methods, procedures, techniques, and materials required for developing, improving, maintaining, and repairing grounds, and for other soil and water conservation and management practices. This plan is required by HQ TAC and follows the guidelines and format as given by HQ TAC.

9. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (Continued on Sheets)

This plan describes the division of acreage into improved, semi-improved, and unimproved grounds. It describes the soil and climate of this area as well as the recommended method of establishing vegetation. The plan also describes the maintenance performed on grounds and lists equipment that is available for maintenance. This maintenance is recurring and does not change procedures that were previously followed.

10. EPC MEMBER DOPAA REVIEW CERTIFICATION (Name and Grade) Richard M. Brubaker, 2Lt	SIGNATURE Richard M. Brubaker	DATE 20 Dec 83
11. ORGANIZATIONAL APPROVAL (Name and Grade of Commander) GERALD S. HUNACEK, JR., Maj, USAF 27CES, Commander	SIGNATURE Gerald S. Hunacek Jr	DATE 20 DEC 83

III ADDITIONAL APPROVAL (AS REQUIRED)

12. CONTRACT CONSULTANT APPROVAL AUTHORITY (Name and Grade) N/A	SIGNATURE	DATE

IV ENVIRONMENTAL PLANNING RESPONSE

13. RESPONSES ATTACHED

	Preliminary Environmental survey (AF Form 814) attached
X	Proposed action qualified for Catex (Appropriate Documentation attached)
	Proposed action does not qualify for Catex, assessment required

14. REMARKS

The proposed action can be classified under, "Preparing regulations, directives, manuals, or other guidance documents that implement (without substantial change) the regulations, directives, manuals, or other guidance documents from higher headquarters or other federal agencies." and therefore qualifies for a categorical exclusion (CATEX) according to 32 CFR 989.16(b)(2). Part 989 is derived from AFR 19-2, Environmental Impact Analysis Process (EIAP), 10 AUG 82.

15. ENVIRONMENTAL PLANNER CERTIFICATION (Name and Grade) JIMMIE N. RICHARDS, GS-11	SIGNATURE Jimmie N. Richards	DATE 1 Dec 83
16. ENVIRONMENTAL PROTECTION COMMITTEE APPROVAL (Name and Grade) N/A	SIGNATURE	DATE

AF FORM JUL 79 813

☆ U. S. Government Printing Office: 1980—310-871/4053

VL - Very Low L - Low M - Moderate H - High VH - Very High

LOCATION NO.	pH	Salts E. C.	Sodium % Exch.	Organic Matter %	Nitrate (N) ppm	Phosphorous (P) ppm	Potassium (K) ppm	Texture
1	7.31 M	0.48 L	0 VL	1.08 M	0.47 VL	2.5 VL	21.8 L	SL
2	7.56 M	0.57 L	0 VL	1.08 M	0.47 VL	4.2 VL	51.7 M-H	SL

No recommendations are given as no information was provided on crop to be fertilized.

For the most part these soils have poor fertility. Incorporation of organic matter would be helpful.

I-2k

VL = Very Low L = Low M = Moderate H = High VH = Very High

LAB NO.	pH	Salts E. C.	Sodium % Exch.	Organic Matter %	Nitrate (N) ppm	Phosphorous (P) ppm	Potassium (K) ppm	Texture
3	7.35 M	0.53 L	0 VL	1.11 M	0.50 VL	9.6 L	44.9 M	SL
4	7.53 M	0.85 L	0 VL	2.22 H	0.84 VL	14.3 L	47.1 M	SL

No recommendations are given as no information was provided on crop to be fertilized.

For the most part these soils have poor fertility. Incorporation of organic matter would be helpful.

VL = Very Low L = Low M = Moderate H = High VH = Very High

LAB NO.	pH	Salts E. C.	Sodium % Exch.	Organic Matter %	Nitrate (N) ppm	Phosphorous (P) ppm	Potassium (K) ppm	Texture
5	7.40 M	1.10 L	0 VL	1.90 H	0.80 VL	4.8 VL	31.8 M	SL
6	7.76 M	0.36 L	0 VL	0.92 M	0.53 VL	1.4 VL	18.4 L	SL

VL = Very Low L = Low M = Moderate H = High VH = Very High

LAB NO.	pH	Salts E. C.	Sodium % Exch.	Organic Matter %	Nitrate (N) ppm	Phosphorous (P) ppm	Potassium (K) ppm	Texture
7	7.47 M	1.02 L	0 VL	1.99 H	0.60 VL	6.5 L	32.5 M	SL
8	7.51 M	0.73 L	0 VL	1.47 M	0.60 VL	6.5 L	28.7 L	SL

VL = Very Low L = Low M = Moderate H = High VH = Very High

LAB NO.	pH	Salts E. C.	Sodium % Exch.	Organic Matter %	Nitrate (N) ppm	Phosphorous (P) ppm	Potassium (K) ppm	Texture
9	7.55 M	0.57 L	0 VL	1.28 L	0.95 VL	10.3 L	59.8 H	SCL
10	7.53 M	1.00 L	0.7 VL	1.64 M	0.70 VL	7.1 L	26.8 L	SL

VL = Very Low L = Low M = Moderate H = High VH = Very High

LAB NO.	pH	Salts E. C.	Sodium % Exch.	Organic Matter %	Nitrate (N) ppm	Phosphorous (P) ppm	Potassium (K) ppm	Texture
11	7.67 M	1.47 L	0.5 VL	2.09 H	1.84 VL	15.7 M	51.7 M	SL
12	7.67 M	1.57 L	0 VL	0.95 L	1.40 VL	15.4 M	54.9 M	

VL = Very Low L = Low M = Moderate H = High VH = Very High

LAB NO.	pH	Salts E. C.	Sodium % Exch.	Organic Matter %	Nitrate (N) ppm	Phosphorous (P) ppm	Potassium (K) ppm	Texture
13	7.84 M	0.50 L	0.2 VL	1.11 M	0.39 VL	8.4 L	18.2 L	SL
14	7.63 M	0.39 L	0 VL	0.98 M	0.47 VL	3.0 VL	26.8 L	SL
15	7.45 M	0.49 L	0 VL	0.85 M	0.38 VL	2.5 VL	29.9 M	SL

LOCATION NO.	PROPOSED CROP	N	P_2O_5	K_2O	OTHER
1	Lawn	6	2½	1½	
2	Lawn	6	2½	½	
3	Lawn	6	2½	1	Rate is lb./1000 sq. ft
4	Lawn	4	2	1	
5	Lawn	4	2½	1	See below
6	Lawn	6	2½	½	
7	Lawn	4	2½	1	
8	Lawn	6	1	1	
9	Lawn	6	2	–	Rate is lb./1000 sq. ft
10	Lawn	6	2	1	
11	Lawn	4	1	½	See below
12	Lawn	6	1	½	
13	Lawn	5	2½	1½	
14	Lawn	6	2½	1	Rate is lb./1000 sq. ft
15	Lawn	6	2½	1	See below

Split the nitrogen into 3 applications beginning in the early spring. Both P_2O_5 and K_2O could be applied as one application in the spring.

For trees and shrubs use approximately 1/8 lb. of nitrogen and 1/16 P_2O_5 per each inch of trunk diameter. Do not exceed 5 lb. of N and do not apply after July 10.

GROUNDS MAINTENANCE EQUIPMENT

Type of Equipment	Authorized	On Hand
Flat Bed Trailer	1	1
Torch Cutter Outfit	1	1
Chain Saw	3	3
Harrow Disk	1	1
Soil Pulverizer	1	1
Sickle Bar Attachment	1	1
Insecticide Sprayer	2	2
Power Lawn Mower	13	13
2 HP Gas Lawn Edger	1	1
Tow Tractor, Field Mower	4	4
Lawn Mower	11	11
Weedy 67 Weed Cutter	13	13
Pneumatic Drill	2	2
Paving Breaker	3	3
Earth Auger	1	1
Weed Burner	1	1
Concrete Saw	1	1
Concrete Vibrator	1	1
Heating Kettle	1	1
Vibrating Tamper	1	1
Stump Cutter	1	1
Joint Cleaning MP3	2	2
Finishing Machine	1	1
Midgiroller Roller	1	1
Rotary Compressor	1	1
Blast Cleaning Machine	1	1
Land A Washer	1	1
Pressurized Steam Cleaner	1	1
Mark 2 Generator	1	1
Bulk Storage Cabinet	8	8
TOTAL	81	81

RECURRING MAINTENANCE OPERATIONS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mowing												
Improved Grounds (2 x week)				X	X	X	X	X	X	X		
Semi-Improved Grounds (2 x month)				X	X	X	X	X	X	X		
Unimproved Grounds (semi-annual)					X					X		
Irrigation												
Improved Grounds (2 x week)(1" water)				X	X	X	X	X	X	X		
Fertilization												
Improved Grounds (2 x year)(300 lb/acre)				X				X				
Policing (Daily)	X	X	X	X	X	X	X	X	X	X	X	X
Insect Control												
(Elm Leaf Beetle)				X	X	X	X	X	X	X		
(.1% Carbaryl)												
Pruning	X	X	X								X	X
Weed Control												
Improved Grounds												
(Dandelions)(Weed B Gone)				X								
(Grass in Cracks)(Monuron)				X	X	X						
Disease Control (As required)												
Improved Grounds												
(Fungus)(Diconil 2787)												

Off-road vehicles (ORV) areas and trails are maintained in accordance with the Recreation/ORV Plan. Based on past observation, the limited use of these areas by small ORVs will not increase errosion of the areas nor measurably increase soil compaction. The areas are covered by native wild grasses and are maintained by mowing on a monthly basis. No significant destruction of ground cover has been noted in the past and none is expected in the future.

GROUND COVERS

FULL SUN EXPOSURES

Rock Cotoneaster (Cotoneaster Horizontales)
Euonymus (Euonymus Fortunei Coloratus)
Juniper (Juniperus spp.)
Memorial Rose (Rosa Wichuraiana)
Lavender Cotton (Santolina Chamaecyparissus)
Germander (Teucrium Chamaedrys)

SUNNY OR SHADY EXPOSURES

Purple Leaved Honeysuckle (Lonicera Japonica Purpurea)
Nandina (Nandina Domestica Nana Purpurea)

SHADY EXPOSURES

Blue Leadwort (Ceratustigma Plumbaginoides)
English Ivy (Hedera Helix)
Creeping Lily Turf (Liriope Spicata)
Dwarf Mahonia (Mahonia Aquifolium Compacta)
Canby Pachistima (Pachistima Canbyi)
Japanese Spurge (Pachysandra Termijalis)

SHRUBS

SHADY LOCATIONS

Barberry (Berberis spp.)
Boxwood (Buxus spp.)
Euonymus (Euonymus spp.)
Burford Holly (Ilex Cornuta 'Borfordii')
Dwarf Chinese Holly (Ilex Cornuta Rotunda)
Junipers (Juniperus spp.)
Privet (Ligustrum spp.)
Oregon Hollygrape (Mahonia Aquifolium)

FOUNDATION PLANTING

Glossy Abelia (Abelia Grandiflora)
Barberry (Berberis spp.)
Cotoneaster (Cotoneaster spp.)
Euonymus (Euonymus spp.)
Junipers (Juniperus spp.)
Oregon Hollygrape (Mahonia Aquifolium)
Spirea (Spiraea spp.)
Bonita Arborvitae (Thuja Orientalis 'Bonita')

LOW-GROWING HEDGES

Barberry (Berberis spp.)
Harlands Boxwood (Buxus Harladii)
Cotoneaster (Cotoneaster spp.)
Small-Leaved Euonymus (Euonymus Japonicus 'Microphyllus')
Holly (Ilex spp.)
Tamarix Juniper (Juniperus Sabina Tamariscifolia)
Shrubby Cinquefoil (Potentilla Fruticosa)
Dwarf Flowering Almond (Prunus Amygdalus 'Nana')
Lodense Firethorn (Pyracantha Lodensi)

TALL HEDGES

Common Box (Buxus Sempervirens)
Japanese Eyonymus (Euonymus Japonicus)
Hetz Blue Juniper (Juniperus Chinensis 'Hetzi')
Privet (Ligustrum spp.)
Honeysuckle (Lonicera spp.)
Firethorn (Pyracantha spp.)
Cherry Laurel (Prunus Caroliniana)
Lilac (Syringa spp.)
Baker Arborvitae (Thuja Orientalis 'Baker')

BACKGROUND PLANTINGS AND SCREENING

Fountain Butterfly-Bush (Buxus Alternifolia)
Japanese Euonymus (Euonymus Japonicus)
Rose of Sharon (Hibiscus Syriacus)
Privet (Ligustrum spp.)
Honeysuckle (Lonicera spp.)
Mock-Orange (Philadelphus Virginalis)
Cherry Laurez (Prunus Caroliniana)
Lilac (Syringa spp.)

ATTRACTIVE FOLIAGE COLOR

Mentor Barberry (Berberis Mentorensis)
Japanese Barberry (Berberis Thunbergii)
Red-Leaved Japanese Barberry (Berberis Thunbergii Atropurpurea)
Siberian Dogwood (Cornus Alba 'Siberica')
Red Osier Dogwood (Cornus Stolonifera)
Smoketree (Continus Coggygria)
Fruitland Elaeagnus (Ealeagnus Pongens 'Fruitland')
Euonymus (Euonymus spp.)
Bridalwreath (Spiraea Prunifolia)

BERRIES

Barberry (Berberis spp.)
Siberian Dogwood (Cornus Alba 'Siberica')
Cotoneaster (Cotoneaster spp.)
Japanese Eyonymus (Euonymus Japonicus)
Privet (Ligustrum spp.)
Tatarian Honeysuckle (Lonicera Tatarica)
Oregon Hollygrape (Mahonia Aquifolium)
Firethorn (Pyracantha spp.)
Snowberry (Symphoricarpos Albus)
Coralberry (Symphoricarpos Orbiculatus)

ACCENT OR SPECIMEN USE

Fountain Butterfly-Bush (Buddleia Alternifolia)
Siberian Dogwood (Cornus Alba 'Siberica')
Red Osier Dogwood (Cornus Stolonifera)
Pampas Grass (Cortaderia Selloana)
Smoketree (Continus Coggygria)
Cranberry Cotoneaster (Cotoneaster Apiculata)
Slender Duetzia (Deutzia Gracilis)
Fruitland Elaeagnus (Elaeagnus Pungens 'Fruitland')
Texas Ranger, Sensia (Leucophyllum Frutescens)

TREES

DECIDUOUS

Silver Maple (Acer Saccharinum)
Hackberry (Celtis Occidentalis)
Eastern Redbud (Cercis Canadensis)
Desert Willow (Chilopsis Linearis)
American Persimmon (Diospyros Virginiana)
Ash (Fraxinus spp.)
Thornless Honeylocust (Gleditsia Triacanthos)
Crab Apple (Malus spp.)
Texas Umbrella Tree (Melia Azedarach Umbraculiformis)
Fruitless Mulberry (Morus Alba)
Bird of Paradise (Poinciana Gilliesii)
Flowering Plums (Prunus Cerasifera)
Flowering Peach (Prunus Persica)
Willows (Salix spp.)
Japanese Pagoda Tree (Sophora Japonica)
Smooth-Leaved Elm (Ulmus Carpinifolia)
Chinese Elm (Ulmus Parvifolia)

EVERGREEN

Chinese Column Juniper (Juniperus Chinensis Columnaris)
Hollywood Twisted Juniper (Juniperus Chinensis Torulosa)
Western Red Cedar (Juniperus Scopulorum)
Easter Red Cedar (Juniperus Virginiana)
Pine (Pinus spp.)
Baker's Arborvitae (Thuja Orientalis "Bakeri')

Section J

OTHER FEDERAL LAWS

[40 CFR 270.14(b)(20) and 270.3]

Information will be provided in accordance with the requirements of 40 CFR Part 270.14(b)(20) at the request of the U.S. EPA Regional Administrator or the New Mexico Environmental Improvement Division. At this time, however, we believe that Cannon AFB is in compliance with the following Federal laws: The Wild and Scenic Rivers Act, 16 U.S.C. 1273 et seq; The National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq.; The Endangered Species Act, 16 U.S.C. 1531 et seq.; and the Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq.

Section K

CERTIFICATION

[40 CFR 270.11; NM HWMR 302.B.]

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

Operator

Date 26 MAY 1989

Signature: Walter E. Novak

Walter E. Novak
Colonel, U.S.A.F.
Commander, DRMR-Ogden

Owner

Date 07 JUN 1989

Signature: David E. Benson

David E. Benson
Colonel, U.S.A.F.
Commander, Cannon AFB