



HAZARDOUS WASTE TRAINING MANUAL



COMPLIANCE TRAINING FOR:
HMDCs, HMDOs
SITE MANAGERS
HANDLERS

AUGUST 1992



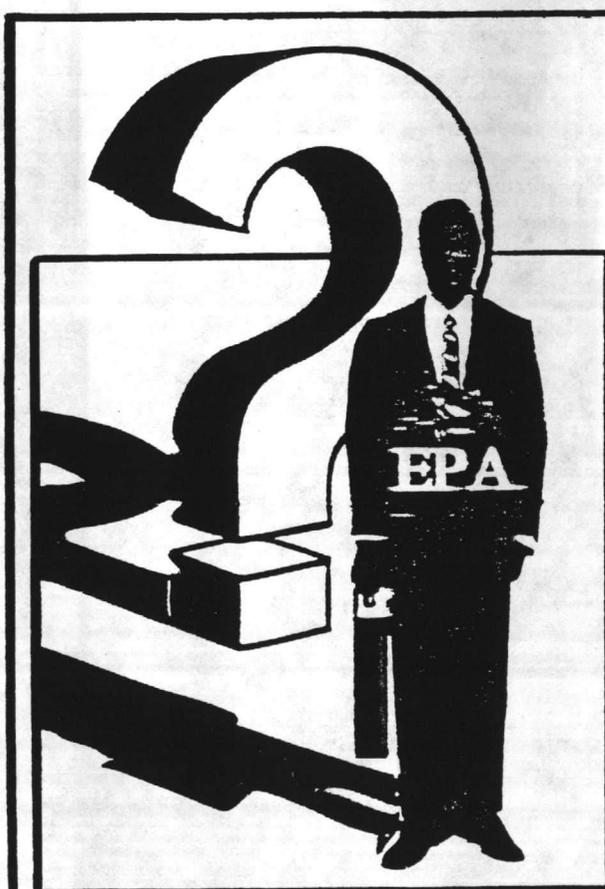
ENVIRONMENTAL MANAGEMENT DEPARTMENT
MARINE CORPS BASE, CAMP LEJEUNE, N.C.

Would You Be Ready If An EPA Inspector "Dropped In" Tomorrow?

IT'S HARD TO KEEP UP WITH ALL THE CHANGES IN THE EPA REGULATIONS.
BUT YOU HAVE TO!

IT'S YOUR RESPONSIBILITY TO KEEP UP TO DATE!

CAN YOU ANSWER "YES" TO THE FOLLOWING QUESTIONS?



- I'm storing my hazardous materials in the proper place.
___ yes ___ no ___ not sure
- I'm using the proper storage drums.
___ yes ___ no ___ not sure
- My materials-management records are up-to-date.
___ yes ___ no ___ not sure
- Employees have received all the hazardous materials training they need.
___ yes ___ no ___ not sure
- The labels on storage barrels are correctly displayed.
___ yes ___ no ___ not sure

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
540 EAST 58TH STREET
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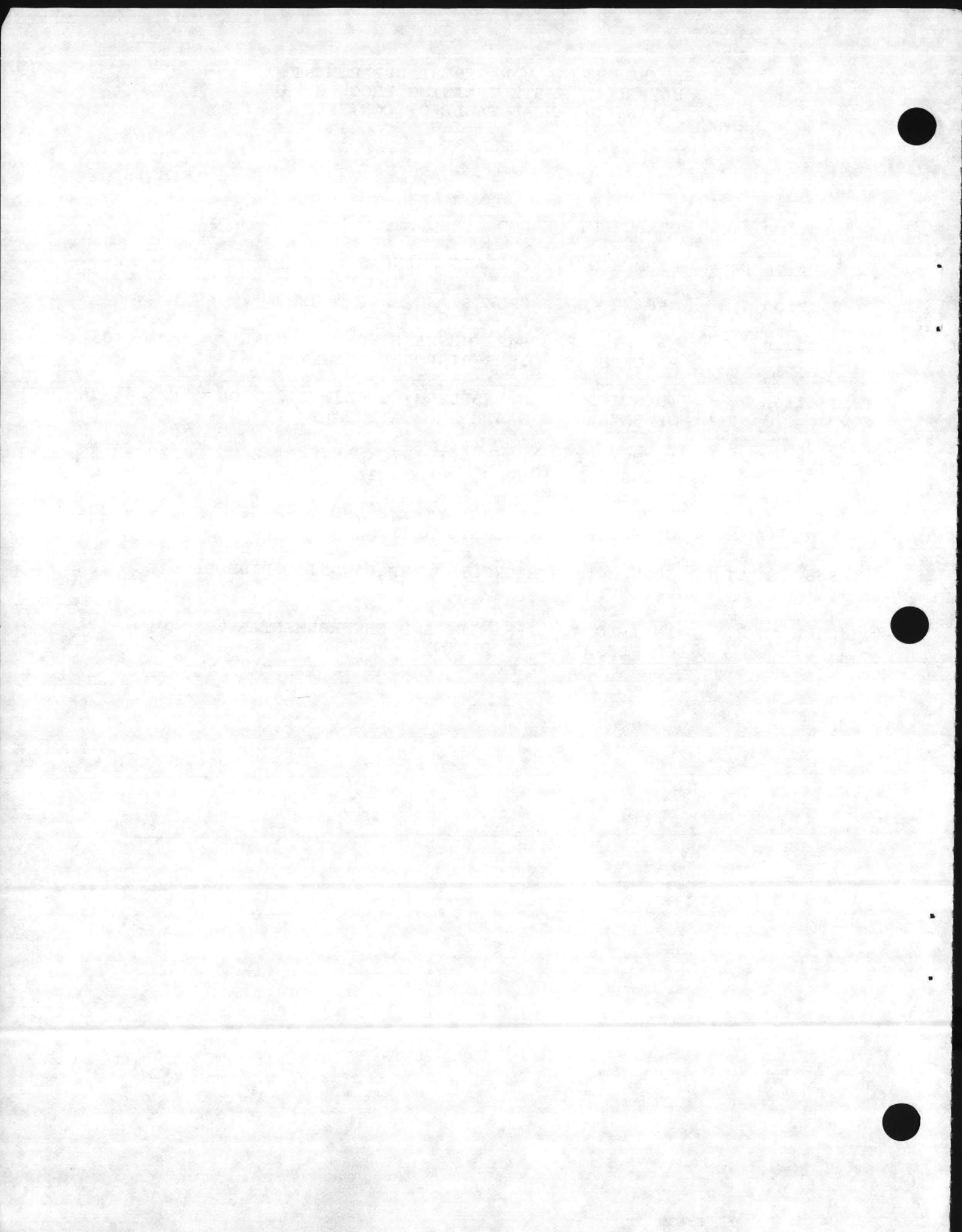
NAME: _____
ADDRESS: _____
CITY: _____
STATE: _____
ZIP: _____
PHONE: _____
FAX: _____
E-MAIL: _____



DATE: _____
SIGNATURE: _____
TITLE: _____

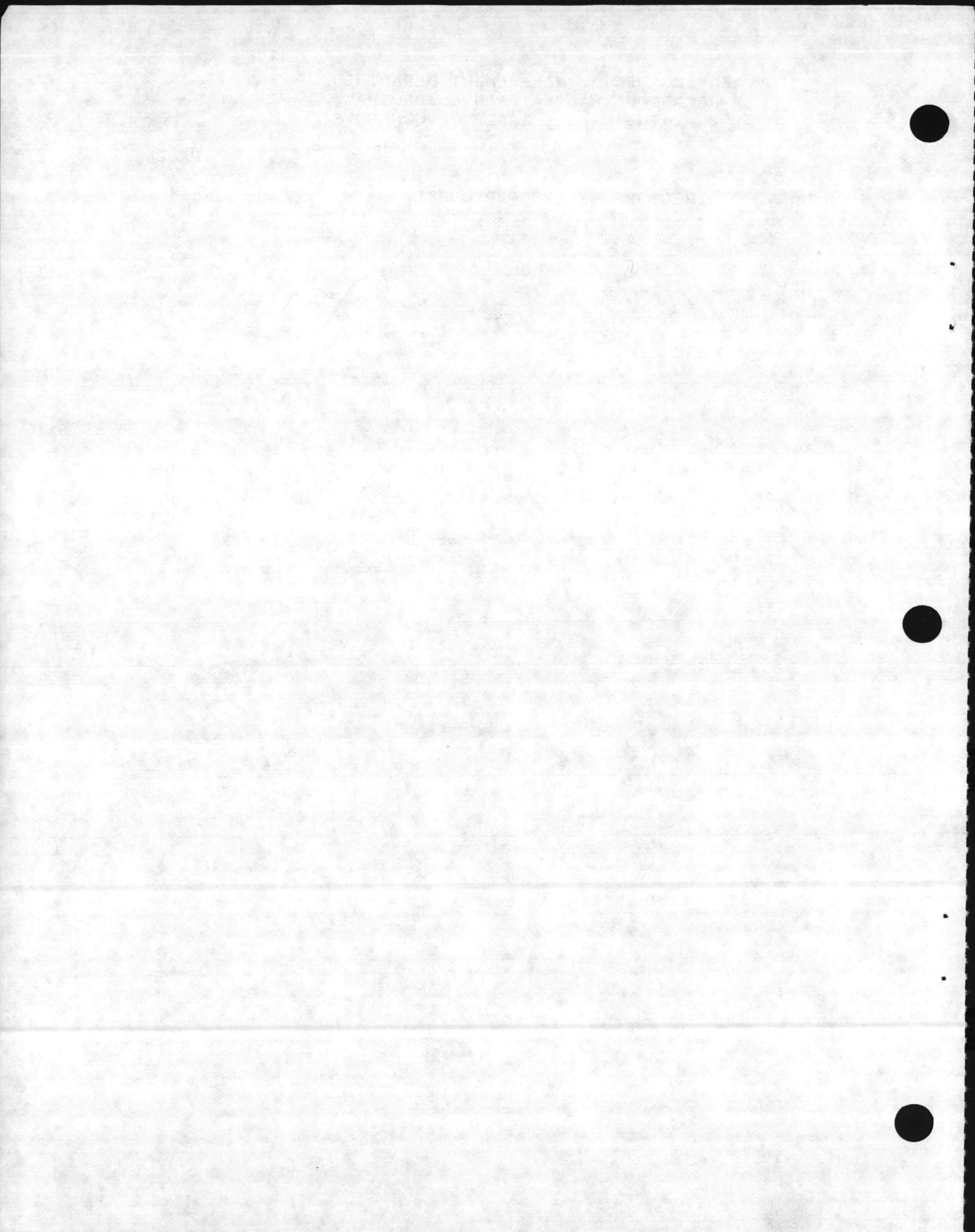
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ENVIRONMENTAL MANGEMENT DEPARTMENT
HAZARDOUS WASTE TRAINING PROGRAM
LIST OF INSTRUCTORS

EMD PERSONNEL	Building	Exten.
Training Coordinator, Manual Editor: Carol S. Shores, Environmental Control Specialist	67	5837
Sammy Gwynn, Head, Resource Conservation and Recovery Branch	67	5837
MGySgt Ernest Palombi, Military Liason SNCO	67	5837
John Riggs, Environmental Planner and Base HMDC	67	5837
Lynn Kimball, Environmental Control Specialist	67	5878
Twylah Hardison, Recycling Specialist	67	5878
Eugene Jones, Biological Technician	913	5468
Bruce Markwick, Biological Technician and Precious Metals Coordinator (Detailed)	67	5878
McArthur Farrow, Motor Vehicle Operator Foreman	913	5468
Sgt Randall Weyer, Hazardous Waste Instructor	1103 67	5549 5878
Cpl Eric Daniels, Hazardous Waste Instructor	1103 67	5549 5878

EMD RECYCLING CENTER

For assistance with recycling	913	5478
For assistance with used oil pickup	913	5478

OTHER INSTRUCTORS

Other departments provide guest Instructors on request:	Exten.
Base Fire Department	2383
Base Safety Office	5725
Industrial Hygiene, Preventive Medicine Unit (Naval Hospital)	2707
For additional information on specific MCAS procedures, contact Mrs. Mary Wheat, Base Safety Office, MCAS, New River	6143

ENVIRONMENTAL MANAGEMENT DEPARTMENT DIRECTORY

(REPORT ALL OIL AND HAZARDOUS SUBSTANCE SPILLS; FOREST FIRES; AND RELATED EMERGENCIES IMMEDIATELY TO BASE FIRE DEPARTMENT AT 911)

1. ENVIRONMENTAL MANAGEMENT DEPARTMENT POINT OF CONTACT: If you have an environmental or natural resources issue requiring assistance of the base Environmental Management Department and are unsure as to which office listed in Section 2 below to call, please contact the office of the Director, Hazardous Waste and Pollution Control Division (HWPCD), Environmental Management Department:

- a. Commercial Telephone (919) 451-5063 EXTENSION 401
- b. DSN Telephone 484-5063 EXTENSION 401

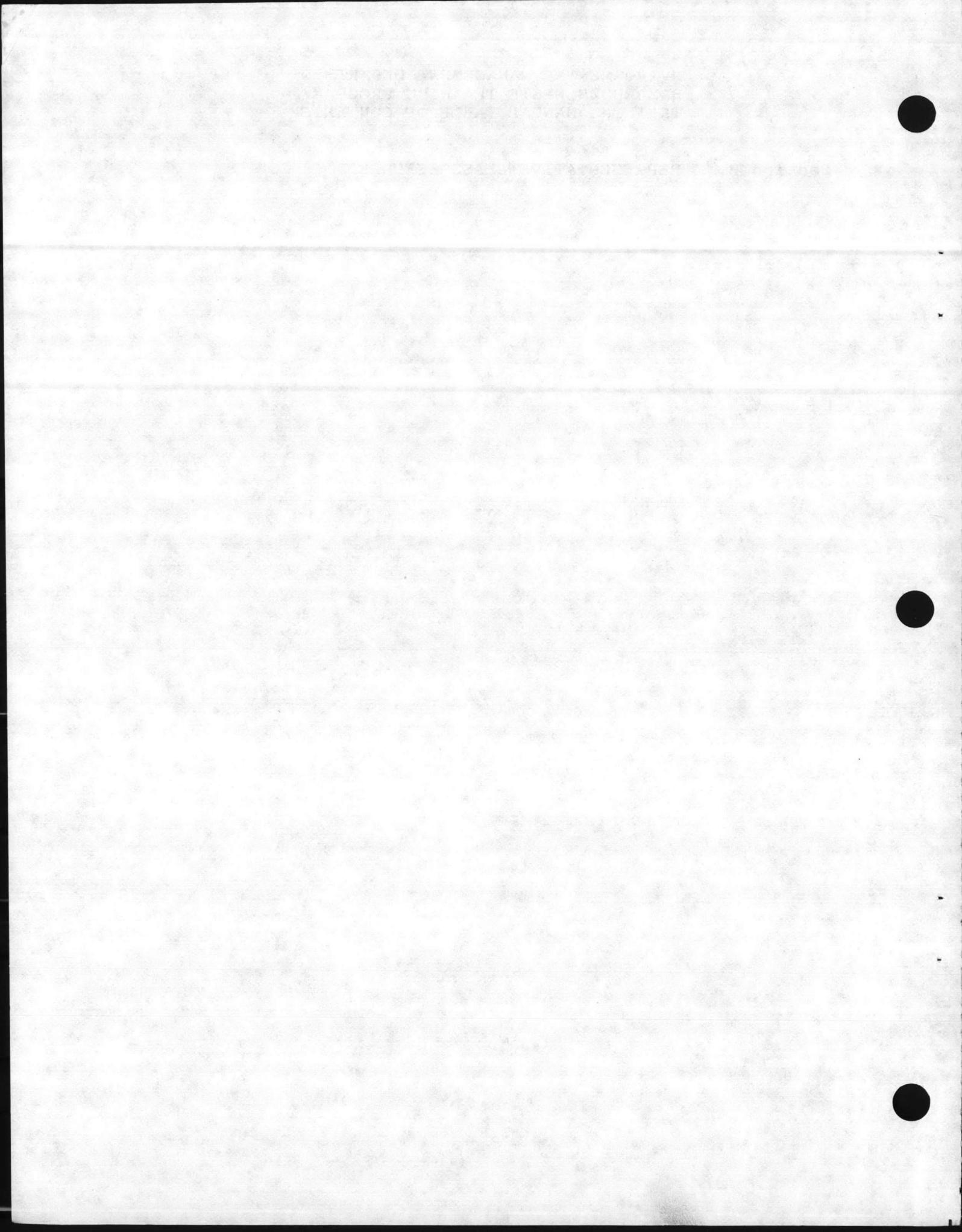
2. SOURCES OF ASSISTANCE BY SUBJECT MATTER:

- a. Servicing of Recycling Collection Dumpsters/Bins/Tanks/etc, used for recycling of used oil, cardboard, metals, etc:
(919) 451-5468 or 5478
- b. Hazardous Waste and Hazardous Material Disposal and Related Environmental Management and Personnel Training Issues
(919) 451-5063 Extension 417
- c. Solid Waste Recycling and Disposal and Related Environmental Management Issues
(919) 451-5063 Extension 417
- d. Environmental Engineering/Impact Assessment/Planning
(919) 451-5063 Extension 407
- e. Forestry Management
(919) 451-5063 Extension 416
- f. Wildlife Management:
 - (1) Nuisance Bird and Animal Complaints
(919) 451-2148
 - (2) Endangered Species Management
(919) 451-2195
 - (3) Wildlife Game Warden (Base Fishing and Hunting Licenses and Permits)
(919) 451-2196 or 5226

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Section B. REPRESENTATIVE CLASS AGENDAS

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ENVIRONMENTAL MANAGEMENT DEPARTMENT
 HAZARDOUS WASTE INITIAL TRAINING
 COMPLIANCE TRAINING FOR HMDCS AND HMDOS
 AGENDA FOR CLASS

TOPIC	TIME	AUD/VS
I. MAJOR TOPICS TO COVER	0800	
A. Overview of the HW Problem Role of EMD		
B. Environmental Regulations/BO6240.5A EMD's Compliance Inspection Program Requirements for manifests HW Training requirements/Record Keeping	0810	
C. Definitions/Identification of HW/HM	0845	
1. Toxicity Characteristic Leachate Procedure		
2. Characteristic and Listed Wastes		
3. Special and Accountable Wastes		
D. Precious Metals Program/BO 4555.1C		
E. HW Training Req/Record Keeping		
BREAK		
F. Hazmin Program/MCO 6280.8	0900	
1. Requirements for minimization		
2. Contractor observations/recommendations		
G. Requirements for 90 day storage and Satellite Accumulation Areas	0930	
H. DD1348-1s/CLINS		
1. Hazardous Waste Profile Sheets		
2. DD1348-1s changes/New worksheets		
2. Disposal/Pickup Procedures		
3. Containerization/Labeling		
4. DRMO/Long term storage		
BREAK		
II. ROLE OF OTHER DEPARTMENTS		
A. Base Safety	1030	
1. Material Safety Data Sheets		
2. HMIS System		
3. Work Place Safety		
B. Industrial Hygiene	1100	
1. Asbestos		
2. Organic vapors		
3. DS2/CitraKleen removal		
4. Carc Paint		
III. Summary/Review/Q&A	1130	
Landban and disposal at landfills		
IV. Final Quiz		
(Note: Students who complete the quiz will receive a Certificate of Attendance from EMD.)		
(Note: Videos shown as time permits.)		

ENVIRONMENTAL MANAGEMENT DEPARTMENT
HAZARDOUS WASTE INITIAL TRAINING
COMPLIANCE TRAINING FOR HMDCs AND HMDOS
AGENDA FOR FIELD TRIP

(Class will board the bus at 1245 sharp at Bldg 322.)

DEMONSTRATION	TIME	LOCATION
I. 900 Area		
A. Logistic's Solvent Recycling Unit (Example of HW minimization)	1300	907
1. Distillation unit		
2. Satellite Accumulation Area		
3. Parts cleaner		
B. EMD's Recycling Building/Overview of the Recycling Program	1330	913
1. Demo of can crusher		
2. Demo of baler		
3. Examples of materials recycled		
C. Overview of the Waste Oil Program	1345	
Oil/Water Separator/Wash racks		
D. Contaminated Soil/Disposal/Costs	1350	
II. Lot 201- Supply	1400	Lot 201
Proper selection: Type and Size of Containers		
III EMD - Lot 803 Demomonstations	1425	Lot 803
A. Waste Oil Tanks		
B. Waste Oil Storage Drums		
C. Site for future HW/HM storage areas		
D. Satellite accumulation area		
E. Storage area with spill response materials		
IV. DRMO	1445	
A. Functions of DRMO		
B. Observations at TP-451/463 (Long term storage)		Video
C. Storage Compatability		
D. IRIS System		
V. Drive past Fuel Farm to 900 Industrial Area		900 area
A. Installation Restoration		
B. Monitoring Wells		
C. Leaking Underground Storage Tanks		
VI. Fire department and spill contingency	1530	Station 5
A. Fire department's Hazmat team/truck		
B. Hazardous waste and material spills		
c. Spill contingency requirements/plans		

ENVIRONMENTAL MANAGEMENT COMPLIANCE TRAINING
HAZARDOUS WASTE INITIAL TRAINING
FOR SITE MANAGERS AND HANDLERS
AGENDA FOR 8 HOUR CLASS

- | TOPIC | AUDIO VISUAL |
|--|------------------------|
| I. Introduction to Environmental Management Dept. and Environmental Policy | |
| II. Introduction to Hazardous Waste Generation/
Hazardous Waste/Materials Terminology | VIDEO -
Burial Grnd |
| III. Required Orders/Documents/Programs to Implement | |
| A. BO6240.5A/Individual Liability | |
| B. Compliance Inspections:EPA/State/EMD insp. | |
| BREAK | |
| C. <u>HW</u> Ident: EPA Characteristic & Listed Wastes | |
| D. Toxicity Characteristic Leachate Procedure | |
| E. <u>HW</u> Training Require./Training Records/
Request for Training Form | |
| F. Minimization and HazMin Program/MCO6280.8 | |
| G. Spill Contingency req./BO11090.1B | |
| IV. Requirements for Disposal of Hazardous Waste (<u>HW</u>) | |
| A. 90 Day Storage Limitations Message | |
| B. Requirements for Satell Accumulation Areas | |
| C. Inspection of containers/documents | |
| 1. <u>HW</u> labeling | |
| 2. Sampling of <u>HW</u> containers | |
| D. On site storage/DRMO/Off-site disposal | |
| E. Disposal example - Decontamination kits | |
| V. Hazardous Materials - Rollback of new/serviceable
to supply Msg. - Materials disposal through DRMO | |
| BREAK | |
| VI. Specific Procedures for <u>HW</u> and HM disposal | |
| A. Responsibility for <u>HW</u> custody/disposal | |
| B. Flow Chart for Disposal of <u>HW</u> | |
| C. Require. for Waste Material Profile Sheets | |
| D. Completion of DD1348-1s/ <u>HW</u> and HM | |
| E. Proper packaging/selection of containers | |
| F. Disposal of HM: rags/soil w dry sweep/dirt with oil | |
| G. Proper packaging and disp of <u>HW</u> : batteries | |
| H. Disposal of contaminated soil/dry sweep | |
| BREAK | |
| VII. EMD Pollution Abatement Program | |
| A. Used Oil Program/BO 11090.1B & BO 11090.3 | |
| B. Solids Recycling Program/CG MCB msg | |

LUNCH

ENVIRONMENTAL MANAGEMENT COMPLIANCE TRAINING
HAZARDOUS WASTE INITIAL TRAINING
FOR SITE MANAGERS AND HANDLERS
AGENDA FOR 8 HOUR CLASS

TOPIC	AUDIO VISUAL
VIII. Spill Contingency	
A. Spill Contingency Plans	
B. Reportable Spills	
C. HazMat program	
IX. Base Safety Program	
A. Material Safety Data Sheets/requirements	
B. Hazardous Materials Information System	
C. NFPA 23 Labeling System	
D. Requirements for Safety/Acid Lockers	
BREAK	
X. Industrial Hygiene Program	
A. Asbestos Disposal	
B. DS2	
C. CARC Paint	
D. Identification of hazardous chemicals	
E. Chemical storage compatibility	
F. New EMD videos	
XI. Precious Metals Program	VIDEO - Haz Chem
BREAK	
XI. Proper disposal of lead acid batteries and used electrolyte	VIDEO - EMD#1
XII. Other Environmental Compliance Issues	
A. Clean Air Act Amendments of 1990	
B. Landban	
C. Landfill	
XIII. Summary of Class/Questions and Quiz	

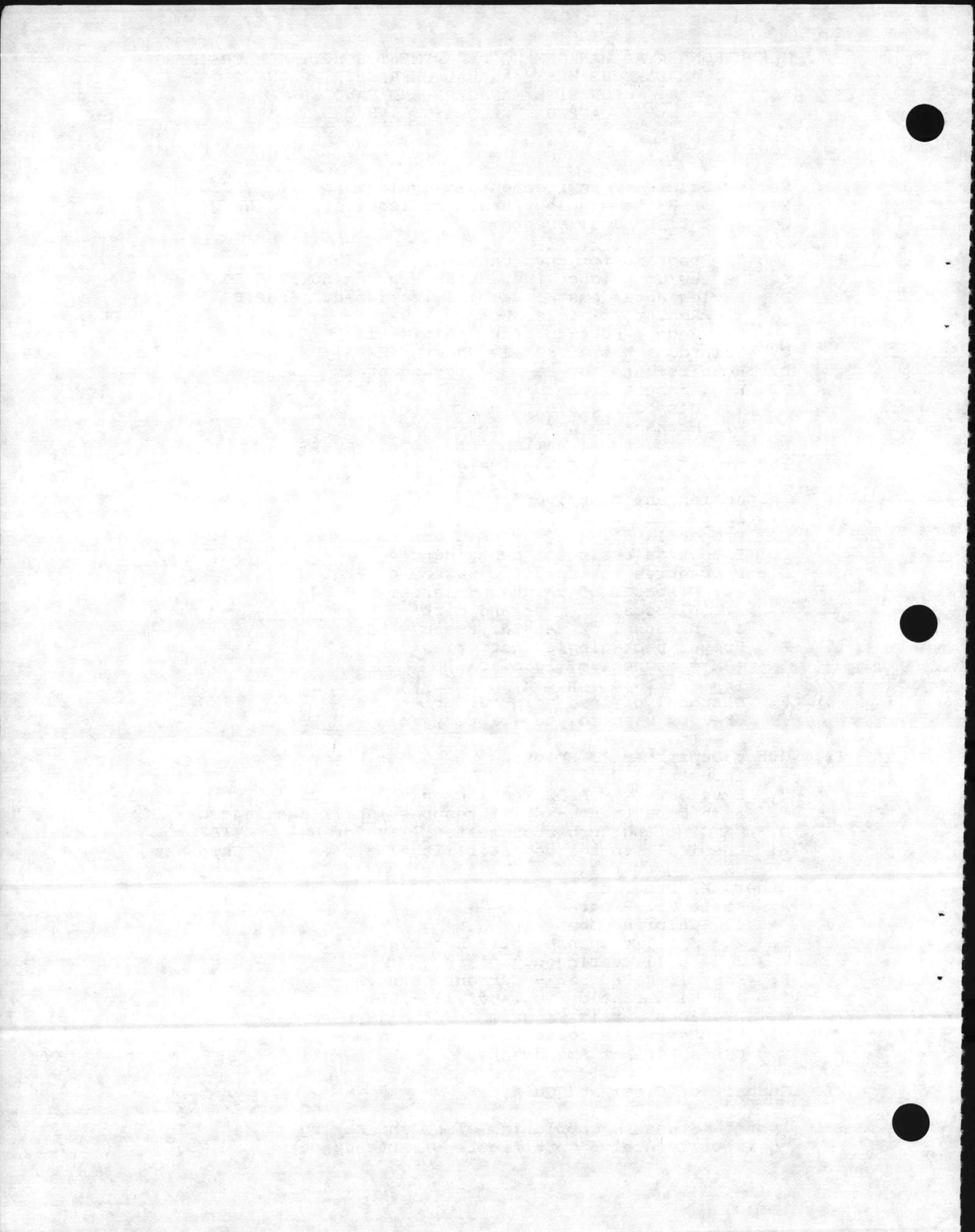
(Note : Students completing class and taking
quiz will receive Certificate of Attendance.)

(A one hour lunch break will be given, and other breaks
as time permits.)

ENVIRONMENTAL MANAGEMENT DEPARTMENT COMPLIANCE TRAINING
 HAZARDOUS WASTE ANNUAL REFRESHER TRAINING
 FOR SITE MANAGERS AND HANDLERS
 AGENDA FOR CLASS 4 HOURS

TOPIC	AUDIO VISUAL
I. Review/Update of Environmental Regulations/ Review of <u>HW</u> terminology/training require./ Documentation requirements	VIDEO HW Ref
II. EMD <u>HW</u> Programs for Environmental Compliance	
A. Review/Compliance Inspection Program/BO 6240.5A	
B. Review/Hazardous Waste Minimization/MCO 6280.8	
1. Reg. to minimize 50% by 1992	
2. Recommendations for minimization	
C. Hazardous Waste Profile Sheets (HWPS)/HW Ident.	
D. Requirements for 90 day storage areas	
E. Requirements for completion of DD1348-1s	
1. Disposal costs/CLIN Numbers	
2. Worksheets for 2d FSSG	
F. Satellite Accumulation Area requirements	
G. Requirements for manifests	
III. Inspection and containerization of <u>HW/HM</u>	
A. Inspection check list	
B. Proper labeling of <u>HW/HM</u> drums/containers	
C. Proper selection of containers	
D. Procedures for specific wastes generated	
1. Disposal of paint and aerosols - <u>HW</u>	
2. Disposal of sand and dirt - HM	
3. Disposal of rags/drysweep - HM	
E. Proper packaging of batteries (HM = magnesium, lead acid) (<u>HW</u> = lithium, nicad, mercury)	
F. Disposal of lead acid batteries and drained electrolyte (battery acid - <u>HW</u>)	VIDEO EMD#1
IV. Other Department's Programs	
A. Industrial Hygiene	
B. Base Safety - MSDS requirements	
C. Fire Department - spill response/spill contingency	
D. DRMO - Long term storage facility for <u>HW</u>	VIDEO
E. Chemical storage compatiblilty	Chem Haz
V. Other EMD Programs	
A. Waste Oil Program	
1. Chlorine test	
2. Spill response/spill materials	
3. Spill contingency plans	
B. Recycling Program - Current changes	
1. Minimization in landfill - 25%	
C. Precious Metals Program	
D. PCB Removal Program	
E. Clean Air Act Amendments	
VI. Summary of Class and Quiz	

(Note: Students completing class and taking
quiz will receive Certificate of Attendance)



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MCO P6090.2 26 SEPT 91	Environmental Compliance and Protection Manual (Excerpts from selected chapters)	1
	Chapter 6 - Air Pollution Abatement	
	Section 2: Federal Statutes	3-4
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	Section 4: Marine Corps Policy	9-11
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	Chapter 9 - Hazardous Materials/Hazardous Waste	
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	Section 2: Federal Statutes	19-23
	Chapter 10 - Solid Waste Management and Resource Recovery	
	Section 1: Introduction	25
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MCO 6280.8 23 JUL 87	Hazardous Waste Minimization Techniques (Encl. 1: HW Minimization techniques)	29-36 35-36
		43)
BO 6240.5A 10 MAR 87	Hazardous Material Diposal Program (deleted 42, (Encl. 3: Record of Hazardous Waste Training)	37-52 51-52
BO 11090.1B 28 MAY 81	Oil Pollution Prevention & Abatement & Oil & Other Hazardous Substances Spill Contingency Plan (Appendix A: Materials and Equipment...) (Attachment A: HW Spill and Related Emergency Contingency Plan)	53-62 54 60-62
BO 11090.3 18 MAY 82	Operation and Maintenance of Oil Pollution Abatement Facilities	63-64
BO 5100.20 30 NOV 88	Hazard Communication Program	65-69
BO 4555.1C 3 AUG 89	Reclamation and Utilization of Precious Metals from Scrap and Waste Materials	71-76

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OTHER DISPOSAL PROCEDURES

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CG MCB msg 011516Z/ JUL 92	Disposal of Used Oil Filters	77-78
CG MCB msg 311212Z/ JUL 92	Disposal of Used Magnesium Batteries	79-80
CG MCB msg 021654Z/ JUL 92	Disposal of Excess/Used Antifreeze	81-82
CG MCB msg 132015Z/ OCT 89	Hazardous Material (HM) and Hazardous Waste (HW) Disposal Program (Deleted Temporarily)	
CG MCB msg 021621Z/ DEC 87	Mandatory Time Limitations for Hazardous Waste Storage (Deleted Temporarily) (See Flow Chart #1 for information)	
CG MCB ltr 6240/3	Procedures for Disposal/Containerization of Batteries	83-87
CG MCB msg 111421Z/ MAR 87	Disposal of Used Wet Cell Batteries and Related Electrolyte	89-91
CG MCB msg 2171403Z/ SEPT 90	Recycling of Scrap Metal	93-96
CG MCB ltr 5 JUL 90	Oily Rags Disposal	97-98
DRMO-ZWM ltr (N.Hensley/ 5652/srs) 25 JUL 91	Container Condition Certification of Hazardous Property for Turn-in	99-100
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Forms	Material Safety Data Sheets - examples of common materials associated with the WMPSS	153-158
Forms	DoD Hazardous Material Information System - comparison to MSDS (generated from a CD-ROM)	159-162
Forms	DD1348-1s - examples of common wastes gener.	163-167
Form	Hazardous Material/Waste Disposal Worksheet for DD1348-1s for 2d FSSG	168

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Chart	Compatibility of Hazardous Waste Categories	184
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List	Appendix A - List of Reactivity Group Numbers for Chemical Substances	186-202

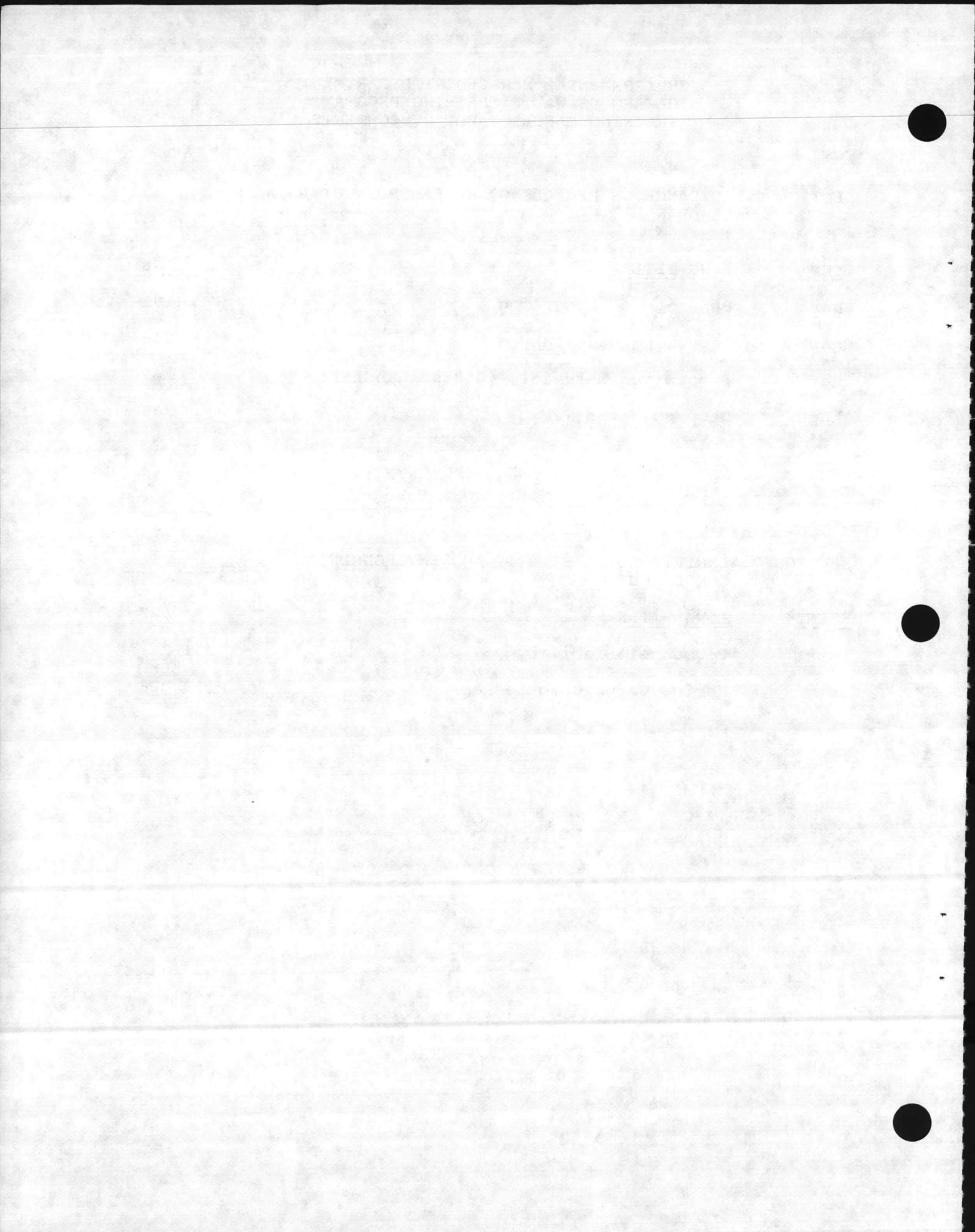
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LANDBAN

<u>ITEM/</u>	<u>LONG TITLE</u>	<u>PAGE</u>
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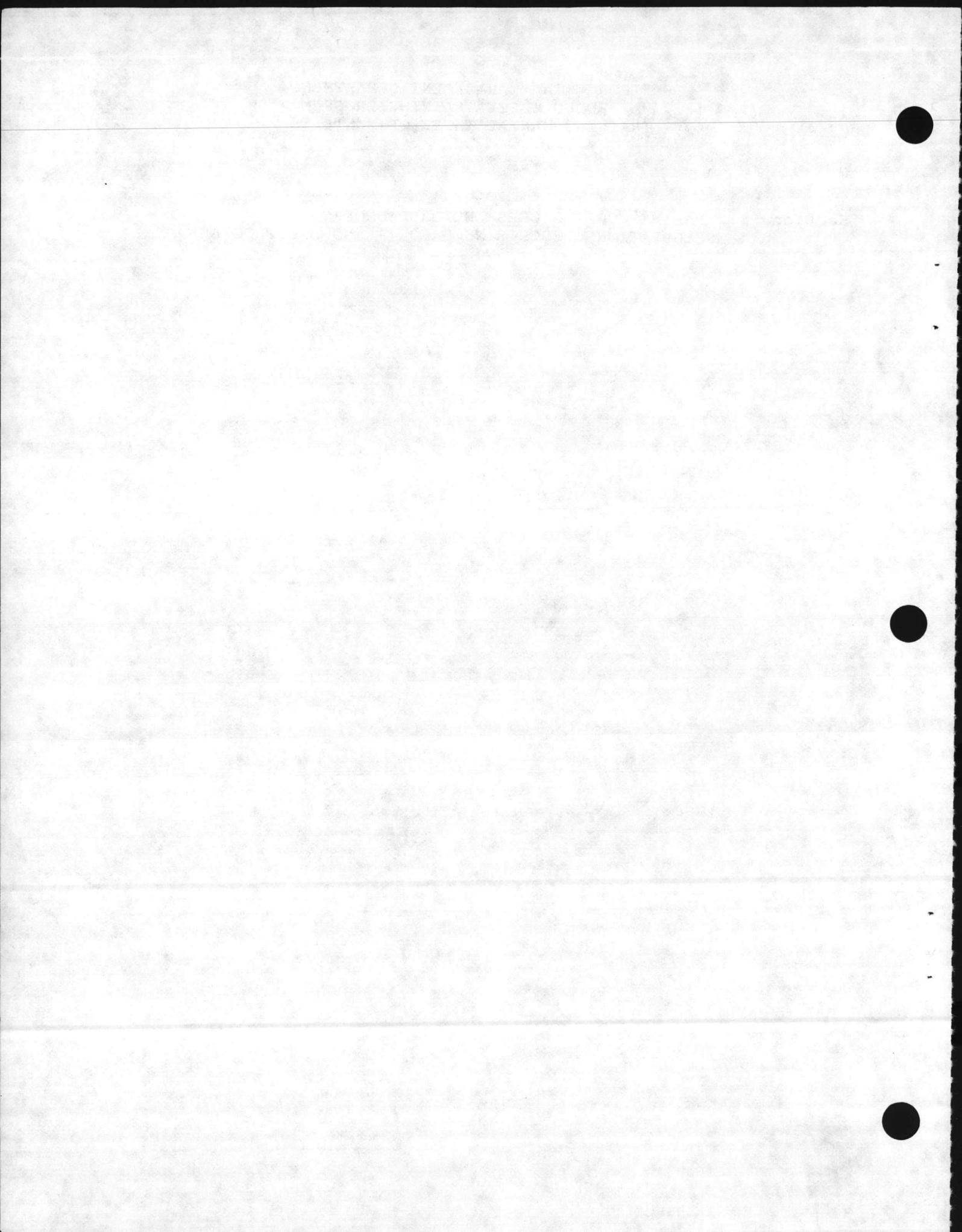
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REGULATIONS DESCRIBING MAJOR PLANS AND PROGRAMS



MCO P5090.2

**ENVIRONMENTAL COMPLIANCE
AND PROTECTION MANUAL**



U.S. MARINE CORPS

PCN 102 071871 00



CHAPTER 6

AIR POLLUTION ABATEMENT

SECTION 2: FEDERAL STATUTES

6200. CLEAN AIR ACT

1. The CAA, 42 U.S.C. 7401 et seq., enacted in 1970 and most recently amended in 1990, is the Federal statute mandating the prevention and control of air pollution from both stationary and mobile sources. The CAA requires the EPA to establish three types of national standards: National Ambient Air Quality Standards (NAAQS), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP). States may obtain authorization for the implementation and enforcement of some programs mandated by the CAA. This requires review and approval of the State Implementation Plan (SIP) by EPA.

2. NAAQS (CAA, sect. 109) establishes the allowable primary and secondary ambient concentrations for six priority pollutants:

- a. Total suspended particulates.
- b. Sulfur dioxide.
- c. Nitrogen oxides.
- d. Carbon monoxide.
- e. Ozone.
- f. Lead.

3. NAAQS apply to pollutant concentrations in ambient air and are not applicable to individual emission sources. The primary standards are meant to protect the health of the population; therefore, they

are more stringent than the secondary standards that were established to protect the public from adverse effects associated with the presence of air pollutants in ambient air. The CAA (sect. 110) mandates that States must develop SIP's that regulate emissions from stationary and mobile sources to ensure attainment and maintenance of NAAQS.

4. There are statutory provisions concerning the construction and modification of stationary sources in areas where air quality is better than that required by NAAQS (CAA, sect. 166). These provisions are intended to prevent significant air quality degradation in such areas. The Prevention of Significant Deterioration (PSD) regulations (CAA, sect. 166), which are specific for each State, establish strict preconstruction guidelines and monitoring requirements. For construction or modification of sources in nonattainment areas (NAA) where one or more NAAQS are not met, there are similar State regulations for preconstruction review, emission control systems, and monitoring.

5. NSPS (CAA, sect. 111) were developed for specific industrial categories to provide a ceiling for emissions from new sources. They are based on the application of the best technology available to reduce emissions. These standards include requirements for notification, recordkeeping, performance tests, maintenance, and monitoring.

6. NESHAP (CAA, sect. 112) were established to control air pollutants for which no ambient air quality standards are applicable and which may cause an increase in mortality or serious irreversible illness. These standards define emission limits, monitoring

requirements, restrictions on material use, worker practice standards, and reporting requirements for hazardous air pollutants. Facilities emitting the following pollutants must comply with the appropriate standard:

- a. Asbestos.
- b. Benzene.
- c. Beryllium.
- d. Coke oven emissions.
- e. Inorganic arsenic.
- f. Mercury.
- g. Radionuclides.
- h. Vinyl chloride.

The NESHAP program can be delegated to any qualifying State.

6201. SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III. In addition to the CAA, title III of SARA of 1986, also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), includes the requirement that facilities report the release of extremely hazardous substances (EHS) to the environment. See chapter 11 for detailed requirements. Implementation of SARA cannot be delegated to the States by EPA.

6202. MONTREAL PROTOCOL (PROTECTION OF STRATOSPHERIC OZONE). The United States is a signatory to the Montreal Protocol, which requires each participating nation to limit its total production and consumption of certain CFC and Halon compounds that degrade stratospheric ozone. The EPA has developed regulations governing production, consumption, and trade of CFC's. The Montreal Protocol was revised in 1990 by the signatory nations. The revisions were published by EPA in the 6 March 1991 Federal Register. Additionally, the provisions of the Montreal Protocol were included in the 1990 amendments to the CAA (title IV). The Marine Corps policy on ozone-depleting substances is identified in paragraph 6408.

6203. PENDING CHANGES. The CAA Amendments of 1990 will result in the regulation of 189 hazardous air pollutants. Many of these pollutants will be regulated for the first time, using technology-based emissions limitations standards and possible further controls based on Risk Assessment (CAA, title III, sect. 112(b)). Additionally, EPA will promulgate, under the authority of the CAA, more stringent regulations for mobile and stationary sources of air pollution. The amendments also addressed the need for federally enforceable State operating permits and tougher enforcement by EPA. There is also a provision for suits by private citizens (CAA, title II). Contained in CAA, title IV are new permitting requirements. Many previously unregulated emission sources will require permits, while sources already permitted will face more stringent emission standards.

CHAPTER 6

AIR POLLUTION ABATEMENT

SECTION 3: REQUIREMENTS

6300. INTRODUCTION. The Federal regulations pursuant to the CAA are codified in 40 CFR, 50-80. State and local air pollution regulators may have more stringent requirements. Requirements applicable to operations at Marine Corps installations are outlined in the following paragraphs.

6301. STATE AND LOCAL AIR TOXICS PROGRAMS

1. Nearly every State in the United States as well as the District of Columbia, the Commonwealth of Puerto Rico, and the Virgin Islands, has or is developing an Air Toxics Program. The State Air Toxics Program is separate from the programs developed under NSPS, NESHAP, and NAAQS described in paragraph 6200. Regulations promulgated by the States under the Air Toxics Program are in response to guidelines provided by EPA. These EPA guidelines are only recommendations. State and local air toxics regulations and guidelines vary greatly. Existing State Air Toxics Programs encompass many activities, including the following:

a. Case-by-case evaluations of air pollution sources as part of other regulatory programs.

b. Emission inventory development.

c. Federal and State initiative review.

2. Marine Corps installations are required to be knowledgeable of and to implement appropriate State and local regulations.

6302. CONTROL OF EMISSIONS. Several State regulatory agencies are requiring existing stationary sources to successively reduce hydrocarbon emissions, and in some instances to reduce nitrogen oxide emissions, in an effort to lower ambient ozone levels. If additional control measures are not sufficient to achieve the Federal ozone standard, regulatory agencies may require Marine Corps installations to apply nontraditional control strategies, including material throughput limitations or emission caps on stationary sources, alternative fuels for mobile sources, and regulation of volatile organic compounds (VOC) from paints and coatings.

6303. STATIONARY SOURCES

1. **Permits.** Marine Corps installations operating, modifying, demolishing, or constructing stationary sources shall identify sources requiring permits, apply for those permits, operate those sources in compliance with permit limits, and periodically renew permits as required by Federal, State, or local air pollution control agencies. Technical assistance is available from the NAVFACENCOM EFD and NEESA (NEESA provides assistance on all aspects of air pollution management) upon request.

2. **Ambient Air Standard Compliance.** Applicants for permits to operate and/or construct air pollution sources are required by State and local agencies to provide assurances that the existing or proposed sources will not degrade ambient air quality. Such demonstrations may involve atmospheric dispersion modeling of the effect of emissions on ambient air

quality concentrations. The modeling shall be performed in compliance with EPA, State, or local regulations and guidance.

3. New Source Performance Standards. Each new, modified, or rebuilt source shall be constructed and operated in compliance with either the EPA-issued NSPS or more stringent State or local requirements. New sources that are smaller than the NSPS minimum qualifying size, or for which no NSPS category has been established, shall meet applicable State or local standards. However, installation commanders are advised that the permitting process can take from 6 to 24 months, and monitoring of the permitting process is recommended to ensure timely issuance of construction permits. Permit requirements for new sources can be coordinated with the cognizant NAVFACENCOM EFD.

4. Existing Source Standards. Existing stationary sources shall be brought into compliance with standards within the time frame required by the regulatory agency or as specified by a variance or delayed compliance order.

5. Operating Out of Compliance. Each installation with a stationary source unable to achieve timely compliance with applicable emission limitations shall request a variance to continue operating until compliance can be attained. Cognizant EPA, State, or local air pollution offices should be contacted to determine the need for delayed compliance orders (40 CFR 65) for sources with approved variances. Delayed compliance orders issued by a State for major sources must also be approved by EPA; they have no force until such approval has been obtained. Delayed compliance orders for nonmajor sources may be disapproved by EPA but are in force until such disapproval has been issued.

6. Monitoring and Reporting. Where applicable, Marine Corps installations shall comply with monitoring requirements prescribed either in Federal NSPS,

or State and local standards, delayed compliance orders, and permits. Reports shall be provided as required by State or local authorities.

7. Fuel Standards. Marine Corps installations shall comply with requirements with respect to sulfur and ash content, and other fuel composition requirements applicable to solid, liquid, and gaseous fuels for stationary fuel-burning equipment. Specific standards for stationary sources are contained in 40 CFR 60.

8. Disposal of Emission Residuals. Pollutants removed by air pollution control equipment shall be disposed of in compliance with requirements pursuant to RCRA (chapter 9) and the CWA (chapter 7). This includes determining if emission residues meet the definition of a RCRA HW (40 CFR 261).

9. Open Burning. SIP's allow varying degrees of control in open burning for firefighting training and for disposal of hazardous substances when no other feasible alternative exists. The Marine Corps shall comply with applicable requirements, which may include prior approval (verbal or written, including permits) for each occurrence from the responsible regulatory agency, burn-period restrictions, and limits on blackness or opacity of smoke emissions. Additionally, installations shall ensure that firefighting training pits and peripheral equipment are maintained and managed per the CWA and RCRA to prevent groundwater contamination from training exercises.

10. Volatile Organic Compound Emissions Compliance. Most States regulate the emission of VOC's into the atmosphere. Typical activities at Marine Corps installations that emit VOC's are JP-4, JP-5, and MOGAS in storage tanks, solvent cleaners and degreasers, painting and coating operations, plating operations, gasoline dispensing facilities, and drycleaning facilities. Emission limitations will vary from State to State and are usually expressed in pounds of VOC per unit volume of substance used.

The specific limits for VOC emissions are determined on a State by State basis and will be described by the installation permit or State regulations.

11. Sulfur Dioxide Emission Compliance. Sources burning fuel containing sulfur are typically limited to an allowable emission rate in pounds of sulfur dioxide per hour. Individual permits will specify these limitations. Testing, monitoring, and sampling data must be retained and available for inspection. In addition, many States regulate the sulfur content of fuel oil used by Marine Corps installations. Typically, sulfur content is limited to 1 to 2 percent.

12. Particulate Emission Compliance. Particulates emitted from fuel-burning equipment and incinerators are typically regulated at the State level through individual permits. Limitations are normally expressed as pounds of particulate per million Btu of heat input. Many States vary particulate emission limitations depending on the regional air quality conditions within the State. In addition, visible emissions are regulated to opacity levels by percentage (e.g., 20 percent opacity). Higher levels of visible emissions (opacity) are normally permitted during certain startup and maintenance operations for short periods of time (e.g., 5 minutes per hour).

6304. HAZARDOUS AIR POLLUTANTS

1. National Emission Standards for Hazardous Air Pollutants. NESHAP are based on health effects with strong reliance on technological capabilities. They apply to both existing and new stationary sources. The NESHAP program can be delegated to any qualifying State. The four substances on the NESHAP's list for which there are current regulations include beryllium, asbestos, mercury, and vinyl chloride.

2. Asbestos. Prior to demolition or repair work with the potential to release asbestos emissions, Marine

Corps installations shall ensure compliance with the Occupational Safety and Health Act of 1970 (29 U.S.C. 651) and contact local pollution control agencies regarding specific air pollution control requirements.

6305. MOBILE SOURCES

1. Motor Vehicle Pollution Devices. Marine Corps installations shall comply with all vehicle emission inspection and maintenance requirements where required by State or local regulations except for such vehicles that are considered military tactical vehicles as described below. Rendering inoperative or tampering with any pollution control device is strictly prohibited by CAA, title II, sect. 203(a)(2)(A). Requests for waivers from emission control standards for vehicles must be arranged with the appropriate State or local air pollution regulatory agency in coordination with installation legal representatives (40 CFR 85). Additionally, the 1990 CAA contains provisions for enhanced vehicle maintenance and inspection requirements in some areas, based on ambient air quality (title II).

2. Tactical Vehicle Exemption. CAA, title I part A 118(c) exempts from compliance with emission standards tactical vehicles that have been specifically identified by DoD and approved by the President. Accordingly, military vehicles and other mobile sources designed and used for combat or tactical purposes are not subject to EPA-established emission standards applicable to new motor vehicles. Installations receiving requests for permits or other controls on unique military equipment or vehicles should contact the CMC (LFL) for guidance.

3. Fuels. All installations in the United States that dispense fuel for vehicles with catalytic converters shall be equipped to dispense unleaded gasoline to such vehicles. Contracts for unleaded gasoline shall not exceed limitations prescribed in Federal regula-

tions. Vehicles designed to operate on unleaded gasoline under no circumstances shall be altered to receive leaded gasoline or to be fueled with leaded gasoline (40 CFR 80 subpart B; and CAA, title II sect. 211(g)(1)). The CAA requires EPA to promulgate standards for diesel fuels by 1 October 1993.

6306. AIR POLLUTION EMERGENCY. Marine Corps installations responsible for operating an air pollution source shall, as required by State law or permit, have an air pollution emergency plan that identifies all actions that can reasonably be taken without compromising essential services and mission responsibilities. This plan shall address such emergencies as described in 40 CFR 51, appendix L, or as directed by State or local requirements. It shall

address operations such as boilers, incinerators, motor vehicle operations, and other mobile or stationary sources of air pollution emissions.

6307. ROUTINE OPERATIONS. All routine training exercises and ongoing actions at Marine Corps installations are to be planned and executed in a manner that ensures compliance with applicable air pollution abatement standards.

6308. TECHNICAL ASSISTANCE. The cognizant NAVFACENGCOM EFD and NEESA are available to provide technical assistance to installations upon request.

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AIR POLLUTION ABATEMENT

SECTION 4: MARINE CORPS POLICY

6400. NEW SOURCE PLANNING. Under the 1990 CAA amendments, a preconstruction permit is required for the construction, reconstruction, or modification of a major air pollution emission source. New major sources must obtain a preconstruction permit even if EPA fails to promulgate standards for the relevant source category. Therefore, when planning or designing a new emissions source or modifying an existing source at Marine Corps installations, the review of the design must be coordinated with the EPA Regional Office and State or local authorities at the earliest practicable time in the design cycle. Assistance is available from the cognizant NAVFACENCOM EFD in providing design consultation or in permit processing for those design or permit initiatives undertaken by Marine Corps installations.

6401. EMISSION OFFSET

1. The CAA amendments will require stringent emission limitation requirements for nonattainment areas. In these areas, the use of the best available controls on new sources may not be sufficient to meet the allowable emission levels. Under the CAA amendments, controls can be applied to existing sources to reduce emissions, and the reductions can then be applied to new or modified sources through an offset program. In many nonattainment areas, offsets may be the only means to allow operation of new or modified processes.

2. Marine Corps installations should coordinate emission offsets with other DoD installations and

activities in their nonattainment area and with the EPA regional office and State and local authorities. Technical assistance is available from the cognizant NAVFACENCOM EFD.

6402. PERMITS. Permitting authorities should be encouraged to include as many emission sources as practicable in a single operating permit. A single permit will consolidate administrative and compliance oversight activities and requirements. The permitting programs enacted by the 1990 CAA included the incorporation of all applicable Federal and State operating requirements into a single permit enforceable by EPA, the State, and private citizens. Marine Corps installations shall ensure that permit conditions are achievable before such permits are issued. In some cases, one permit to cover all sources under the administrative responsibility of a specific command at a Marine Corps installation may be most practicable. Regulatory agencies should be requested to include conditions in a multiple source permit that preclude actions against all complying sources in the event one source goes out of compliance. The CMC policy prohibits payment of any charge that is determined to be a tax. However, legitimate fees, as required by State or local regulatory agencies, are payable from base operating funds. Questions regarding whether the charge associated with obtaining air emissions permits are fees or taxes should be referred by the environmental coordinator to counsel at the installation level and then to the CMC (LFL).

6403. USE OF NONCOMPLYING FUELS. Extenuating circumstances may force some Marine Corps installations to temporarily burn fuels that fail to meet air pollution control standards. Requests shall be made by the installation to the CMC (LFL) through the chain of command for permission to burn non-complying fuels as soon as it appears that fuels complying with air pollution regulations will not be available.

6404. VOLATILE ORGANIC COMPOUNDS.

Sources of VOC's that will receive additional scrutiny by regulatory agencies include organic liquid storage tanks and process transfer equipment, asphalt concrete plants, equipment leaks, wastewater operations, painting and coating operations, and fuel and fueling operations. VOC control options to be considered by Marine Corps installations include product or material substitution, raw materials or product reformulation, and the application of engineering controls to capture and remove or destroy the VOC's before they are vented into the atmosphere. Additionally, title I of the 1990 CAA substantially revised SIP's for nonattainment areas (classified according to severity of nonattainment). A certified emissions statement from every stationary source of VOC's and NO_x's, or other specific baseline data for VOC's and NO_x's will be used to gauge future reductions in emissions from stationary sources. Therefore, Marine Corps installations that have not yet been required to inventory emissions of VOC, nitrogen oxides, and hazardous air pollutants as identified in the 1990 CAA should begin to do so.

6405. RADIONUCLIDE EMISSIONS. Marine Corps installations are required to comply with MCO 5140.1 regarding airborne emissions of radionuclides that are regulated based on radiation doses to the general public and occupational workers.

6406. RADON

1. Recognizing the health hazards associated with exposure to radon gas, DoD required the military services to develop a radon assessment and mitigation program. To meet the DoD requirement, NAVFACENGCOM was tasked to develop the Navy Radon Assessment and Mitigation Program (NAVRAMP) for DON. The NAVRAMP was developed through a joint effort with CNO, NAVMED, and CHINFO, and coordinated with the CMC.
2. The NAVRAMP follows the EPA guidelines. EPA considers radon levels of less than 4 picocuries per liter (pCi/L) as a low risk, and no mitigation action is required. EPA recommends corrective action within several weeks for buildings with radon levels greater than 200 pCi/L; within 6 months for greater than 20 but less than 200 pCi/L; and within 1 to 5 years for greater than 4 but less than 20 pCi/L.
3. The NAVRAMP is a two-tiered program:
 - a. **Tier 1:** Selective sampling of installations with family housing, hospitals, schools, child care centers, BOQ/BEQ, and brigs.
 - b. **Tier 2:** Comprehensive sampling at installations where the selective sampling showed that radon levels exceeded the EPA recommended action of 4 pCi/L. Comprehensive sampling will identify individual structures with elevated radon levels requiring mitigation actions to reduce/eliminate entry of radon into structures.
4. Based on the results of comprehensive sampling, installations shall plan and budget for radon mitigation projects according to the EPA-recommended schedule. Technical support for radon mitigation is available through the cognizant NAVFACENGCOM EFD.

6407. INSPECTION BY REGULATORY AGENCIES. Federal, State, and local pollution control agency officials, upon presentation of proper credentials, shall be escorted by appropriate personnel and allowed access to Marine Corps installations for the purpose of examining nonclassified records, inspection of monitoring equipment, and sampling of air emissions. Inadequately cleared personnel are not to be allowed access to classified areas or information.

6408. OZONE-DEPLETING SUBSTANCES. Marine Corps installations shall follow policies on ozone-depleting substances per DoD Directive 6050.9 of 13 February 89, SECNAVINST 5090.5 of 20 November 89, and DON Environmental Strategic Plan Objectives of 25 April 91 as follows:

1. Establish procedures to eliminate the unnecessary release of ozone-depleting substances to the atmosphere.
2. Modify operational, training, and testing practices to minimize the emissions of CFC's and Halons when appropriate.

3. Minimize the use of ozone-depleting substances through substitution and conservation practices, where consistent with mission requirements.

4. By 1995, achieve a 50 percent reduction Marine Corps-wide in the procurement of specified CFC and Halon substances from 1986 levels. Identify exceptions for national defense concerns when no suitable substitute has been found. By the year 2000, eliminate procurement of specified CFC and Halon substances.

5. Annual surveys of the acquisition and use of ozone-depleting substances by Marine Corps installations will be performed. Assistance in this area will be provided by the Naval Sea Systems Command (NAVSEA) with support from the Naval Air Engineering Center. Survey data will be used for an annual report from the CMC to OASN (I&E) for eventual submission to DoD.

6. An annual survey of procurement of ozone depleting substances will be performed for the Marine Corps by NAVSEA. Data from the survey will be used for an annual report to OASN (I&E) for eventual submission to DoD.

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CHAPTER 6

AIR POLLUTION ABATEMENT

SECTION 5: RESPONSIBILITIES

6500. COMMANDING GENERAL/COMMANDING OFFICER OF MARINE CORPS INSTALLATIONS

1. Ensures that a base or station order is written implementing this chapter.
2. Determines permit and variance requirements, obtains data, and completes applications. Ensures that permit conditions are achievable prior to issuance of the permit.
3. Signs and secures applications for permits related to demolition, preconstruction, and construction phases of MILCON and non-MILCON-funded projects, and pays related fees. Similarly, signs applications and pays related fees associated with operations permits, variances, or hearings to temporarily operate sources out of compliance with emission limitations. Copies of such permits should be provided to the NAVFACENCOM EFD for review.
4. Identifies compliance requirements for new construction by early coordination of all new projects or modifications with appropriate State, local, and EPA regional offices.
5. Budgets sufficient resources to maintain compliance with applicable air pollution regulations, including all routine air monitoring and scheduled sampling or testing.
6. Notifies State and local authorities of all instances of noncompliance per permit requirements.
7. Refers cases where compliance with fuel standards is impractical to the CMC (LFL) for resolution.
8. Maintains a current inventory of physical, operational, and emission characteristics of stationary air pollution sources.
9. Ensures the development of air pollution emergency plans as required. (NEESA can provide expert assistance in preparing such plans.) Cooperates with EPA, State, and local air pollution control authorities in the execution of air pollution emergency plans.
10. Ensures that motor vehicles, other than exempted combat and tactical types, and other mobile sources comply with applicable emission standards and other requirements.
11. Develops and implements transportation control measures as required by SIP's and as applicable to Marine Corps vehicles and facilities.
12. Implements, as an adjunct to routine vehicle maintenance programs, vehicle emissions inspection and maintenance programs as required for all vehicles other than those exempted as military tactical vehicles. Ensures corrective maintenance necessary for compliance with emission standards is performed prior to returning these vehicles to service.
13. Develops plans and projects to convert vehicle fueling stations that dispense leaded fuels to alternative fuels such as unleaded, diesel, and alcohol, and retrofits dispensers with applicable vapor recovery systems, as required.

14. Plans and budgets for radon mitigation projects according to EPA-recommended schedule.
15. Beginning 1 January 1993, reports emissions of ozone-depleting substances in a format to be established by the SECNAV for eventual submission to EPA.
16. Implements appropriate ozone-depleting substances procurement and requisition procedures when established.
17. Establishes procedures to eliminate emissions of ozone-depleting substances to the atmosphere, and modifies operations, training, and testing practices accordingly.
18. Adopts conservation practices such as substitution and recycling of ozone-depleting substances where possible and when consistent with mission.
19. Submits annual surveys of the acquisition and use of ozone-depleting substances for use in the annual report from the CMC to OASN (I&E) and eventual submission to DoD in a format established by NAVSEA. The criteria for submitting this report are contained in MCO 5090.1. Report Control Symbol DD-5090-01 applies.
20. Identifies appropriate emission offsets, where required for new construction, and prepares and coordinates projects to implement offset requirements.
21. Arranges for visits by regulatory personnel to Marine Corps installations.
22. Submits required PCR exhibits and/or Project Data Forms, DD Form 1391, for air projects per chapter 3.
23. Modifies VOC emissions to meet State or local regulations and/or to meet waste minimization goals.

CHAPTER 6

AIR POLLUTION ABATEMENT

SECTION 6: TERMS AND DEFINITIONS

6600. TERMS AND DEFINITIONS

The following terms and definitions are applicable to chapter 6:

1. **Air Pollution Emergency.** The excessive buildup of air pollutants reaching levels that may cause imminent and substantial endangerment to the health of persons as further defined by State or local air pollution regulatory agencies.

2. **Air Toxics.** Pollutants that may pose a potential health risk when emitted into the air, but for which the EPA has not established NAAQS (as has been done for the criteria pollutants).

3. **Delayed Compliance Order.** An order issued by a State or EPA to a stationary source, which postpones the date by which the source is required to comply with any requirement contained in the applicable State Implementation Plan.

4. **Fuel-Burning Equipment.** Equipment whose primary purpose is the production of energy or power from the combustion of any fuel. The equipment is generally used for, but not limited to, heating water, generating or circulating steam, heating air, and furnishing process heat by transferring energy by fluids or through process vessel walls.

5. **Hazardous Air Pollutant.** An air pollutant to which no ambient air quality standard is applicable, and which in the judgment of the EPA Administrator causes or contributes to air pollution that may reasonably be anticipated to result in an increase in mortality

or an increase in irreversible or incapacitating illnesses.

6. **Ozone-Depleting Substances.** A family of substances that reacts with and breaks down stratospheric ozone. These substances include CFC-11, CFC-12, CFC-113, CFC-114, CFC-115 (also referred to as "Freon" or "refrigerants" 11, 12, 113, 114, and 115), Halon 1211, Halon 1301, and Halon 2402 (also referred to as "R-1211," "1301," and "2402"). Additional chemicals may be added to this list. The EPA has already proposed that carbon tetrachloride and methyl chloroform be added to the list of chemicals regulated under the Montreal Protocol on Substances that Deplete the Ozone Layer.

7. **State Implementation Plan.** The plan, including the most recent revision, which has been approved or promulgated by EPA under CAA, sect. 110, and implements CAA, sect. 110. Its purpose is to ensure achievement of NAAQS.

8. **Stationary Sources.** Stationary sources include boilers; incinerators; petroleum, oil, and lubricants and other hazardous substances in storage tanks; asphalt concrete plants; firefighting training facilities; sites for open burning of munitions; industrial processes such as plating, spray painting, and abrasive blasting; jet engine test cells; and rocket engine test facilities.

9. **Transportable Equipment.** Transportable equipment is often subject to similar air emission standards that apply to stationary sources. Such equipment includes generators, compressors, heaters, asphalt kettles, and other nonself-propelled equipment that is

towed or mounted on a trailer or self-propelled platform.

10. Volatile Organic Compound. Any organic compound that participates in atmospheric photochemical reactions per NSPS.

CHAPTER 9

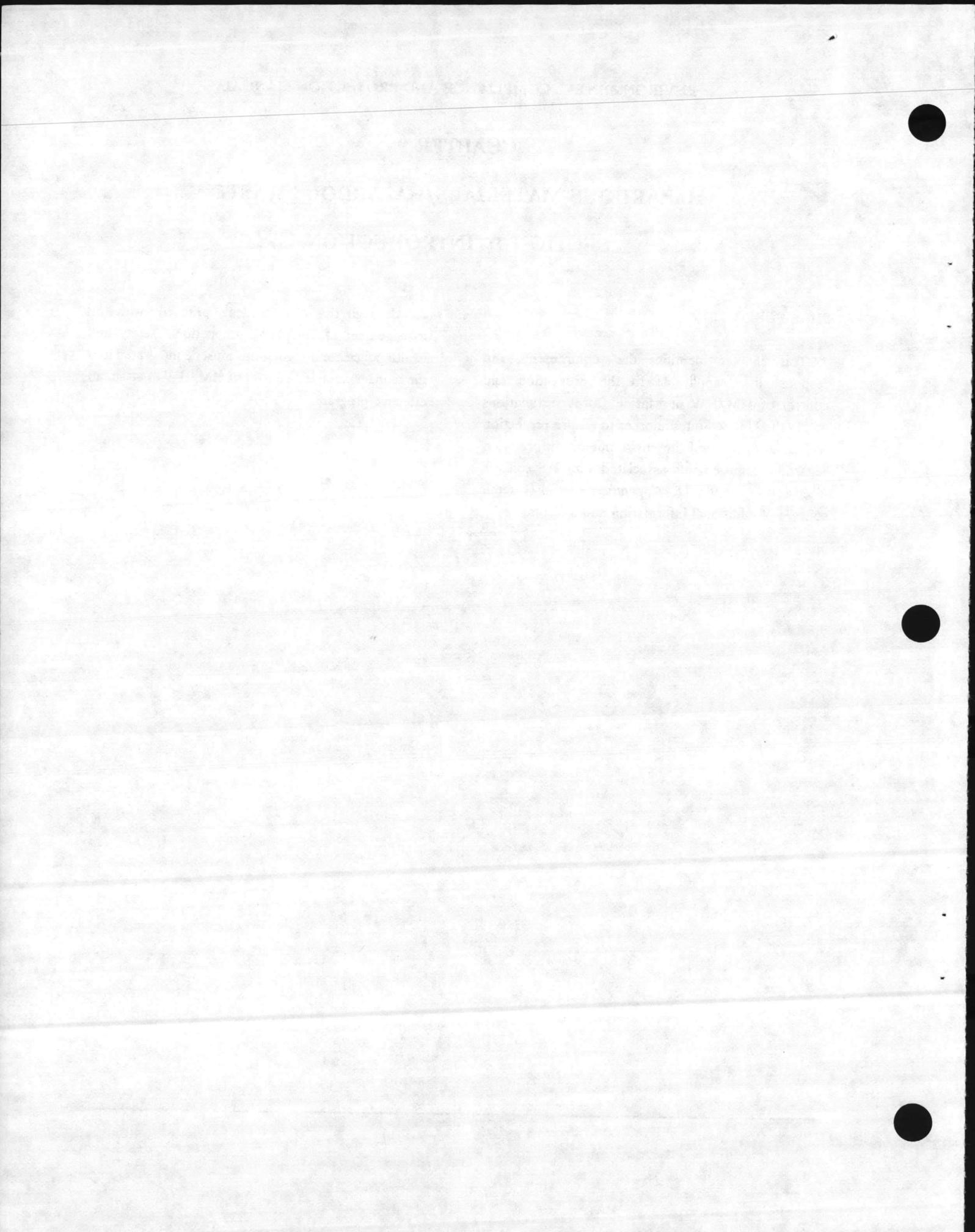
HAZARDOUS MATERIALS/HAZARDOUS WASTE

SECTION 1: INTRODUCTION

9100. PURPOSE

1. This chapter identifies the requirements and responsibilities applicable to the prevention and control of HM/HW at Marine Corps installations within the United States in order to ensure protection of human health and the environment. Information regarding requirements associated with HS spills is discussed in chapter 11. Appendices G and H detail sources of additional information and assistance.

2. Although this chapter deals primarily with the management of HM/HW, occupational safety and health policies and regulations must be integrated into the management and control of HM/HW to attain an effective program.



CHAPTER 9

HAZARDOUS MATERIALS/HAZARDOUS WASTE

SECTION 2: FEDERAL STATUTES

9200. RESOURCE CONSERVATION AND RECOVERY ACT

1. RCRA was enacted as Public Law 94-580 in 1976 as an amendment to the Solid Waste Disposal Act (SWDA). RCRA has since been amended by several public laws, including the Used Oil Recycling Act (UORA) of 1990, and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The act provides for assistance to State and local agencies; prohibits open dumping; regulates the management of HW; encourages recycling, reuse, and treatment of HW; provides guidelines for solid waste management; and promotes beneficial solid waste management, resource recovery, and resource conservation systems. RCRA provides for "cradle to grave" tracking of HW, from generator through transporter, treatment, storage, and ultimate disposal.

a. The EPA may delegate authority to a State to manage a RCRA program in lieu of part or all of the Federal HW program.

b. All HW installations in a State with final authorization are subject to the State program, which must be equivalent to and may be more stringent than the Federal program. A few States have also been granted certain oversight authority for HSWA. States that have received final authorization to manage some or all aspects of RCRA/HSWA are identified in Appendix G, and additional resources for assistance are identified in appendix F.

2. RCRA Subtitle C: Hazardous Waste Management

a. Subtitle C provides the statutory basis for EPA to promulgate the regulations contained in 40 CFR 260-272. Specifically, subtitle C (sec. 3001-3007) addresses the following:

- (1) Identification and Listing of HW.
- (2) Standards for Generators of HW.
- (3) Standards for Transporters of HW.
- (4) Standards for Treatment, Storage, and Disposal Facilities.
- (5) Permitting Requirements.

b. **Section 3004(d) Land Disposal Restriction (LDR) Program.** As required by HSWA, EPA has promulgated regulations in 40 CFR 268 that prohibit the land disposal of hazardous wastes, including underground injection, by specific dates. EPA sets treatment standards (constituent concentrations or methods of treatment) for each waste that substantially reduce the toxicity or likelihood of migration of the waste. Wastes that meet the treatment standards, or can demonstrate that there will be no migration of hazardous constituents for as long as the wastes remain hazardous, are not prohibited and may be land disposed. Several categories of waste are covered by the land disposal restrictions regulations:

(1) **F Wastes:** Wastes from nonspecific sources, such as wastewater treatment sludge from electroplating operations.

(2) **K Wastes:** Wastes from specific sources, such as wastewater treatment sludges from the manufacturing and processing of explosives.

(3) **D Wastes:** Characteristic hazardous wastes, such as ignitable, corrosive, reactive, and toxicity characteristic wastes (TC Wastes) as determined by the toxicity characteristic leachate procedure (TCLP) test.

(4) **P Wastes:** Acutely hazardous commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products.

(5) **U Wastes:** Toxic commercial chemical products, manufacturing chemical intermediates or off-specification commercial chemical products.

c. Section 3004(u), Continuing Releases at Permitted Facilities, and Section 3004(v), Corrective Action Beyond Facility Boundary

(1) All treatment, storage, and disposal facilities must satisfy new requirements, including the following:

(a) Identifying all Solid Waste Management Units (SWMU) at the facility.

(b) Identifying releases of HW or constituents that have occurred from those units.

(c) Performing corrective action for those releases.

(2) These provisions apply to all regulated facilities (inactive and closed, as well as operating units). All Federal facilities are subject to the same

extensive corrective action requirements as any facility owned-or-operated by private parties.

(3) Every permit application to operate a Treatment, Storage, and Disposal Facility (TSDF) submitted under RCRA must include "corrective action (40 CFR 264.101) for all releases of HW or constituents" from any SWMU at the facility as a component of the part B application, regardless of when the waste was placed there. The permit applicant thus must provide full disclosure of all wastes within the facility's boundaries since the site was originally opened, and must provide for action to abate any damage that any release of this material has caused.

(4) Section 3004 also requires Federal agencies to operate under the same propertywide definition of "facility" (40 CFR 260) as any nongovernmental entity. This definition includes the entire site under control of the owner or operator involved in HW management. In 1986, EPA interpreted ownership to refer not to the United States as a whole, but rather to individual Federal departments, agencies, and instrumentalities (51 Federal Register 7722 (1986)).

d. Section 3007 Inspections

(1) Section 3007(c) states that the administrator will annually inspect all Federal agency HW treatment, storage, and disposal facilities located in States without an authorized program under RCRA. The administrator may also inspect facilities in States with an authorized program.

(2) Facilities must, upon written request from the State, compile, publish, and submit information relating to onsite waste storage and disposal that have taken place before permits were required. Specifically, the amount, nature, and toxicity of such waste must be ascertained, and any resulting health or environmental hazards must be assessed for each HW site inventory reporting these requirements.

e. Section 3016 Biennial Inventory of Federal Agency Hazardous Waste Facilities

(1) Section 3016 requires that each Federal agency submit to EPA an inventory of the sites that it owns or operates, or previously owned or operated, where HW is or was stored, treated, or disposed of at any time. The inventory should include the following information:

- (a) Location of the site.
- (b) Amount and toxicity of the waste.
- (c) Extent of environmental contamination.
- (d) Current status of site.
- (e) List of disposal sites at the facility and monitoring reports.
- (f) Response actions.
- (g) Identification of wastes treated, stored, or disposed.
- (h) Name and address of the responsible Federal agency for each site.

(2) If a facility does not provide adequate information, the administrator shall notify the chief official of that agency. If after 90 days an inventory has not been developed, the administrator shall carry out the inventory. EPA guidance for developing this inventory is issued on even-numbered years.

(3) In addition, Section 3016 requires EPA to annually inspect Federal facility HW activities.

3. RCRA Subtitle D: State or Regional Solid Waste Management Plans

a. Subtitle D directed EPA to encourage and develop methods for the environmentally sound disposal of solid waste as well as for the maximization of the conservation, reuse, recycling, and recovery of valuable resources. These objectives are to be accomplished through the development of State or regional Solid Waste Management Plans.

b. The criteria to meet these objectives are contained in 40 CFR 257 and set specific standards for solid waste disposal facilities. Facilities that fail to meet these criteria are considered open dumps and are banned.

c. The criteria include guidelines for the protection or consideration of eight environmental issues: floodplains, endangered species, surface water, groundwater, land application, disease, air, and safety.

d. Section 4010 of subtitle D directed EPA to revise existing criteria to regulate "Solid Waste Facilities which may receive household hazardous waste or hazardous waste from small quantity generators" under section 3001(d). As a result, EPA promulgated the regulations contained in 40 CFR 258 impacting municipal solid waste landfills. These regulations contain permitting requirements.

e. Solid waste management requirements are detailed in chapter 10 of this Manual.

4. RCRA Subtitle F: Federal Facilities

a. Section 6001 is a comprehensive waiver of sovereign immunity from applicability of RCRA to Federal facilities. It states: "Each department... of the Federal Government (1) having jurisdiction over any solid waste management facility or disposal site, or (2) engaged in actions resulting or which may result in the disposal or management of solid waste or

hazardous waste shall be subject to, and complying with, all... requirements, both substantive and procedural... respecting control or abatement of solid waste or hazardous waste disposal in the same manner and to the same extent as any person is... subject to such requirements...." This provision includes permitting requirements. It also states that "neither the United States nor any agent, employee or officer thereof shall be immune or exempt from any process or sanction... with respect to enforcement of any such injunctive relief."

b. Therefore, the requirements of RCRA with respect to Federal installations subject them to Federal, State, and local requirements just as any nongovernmental entity. The President may exempt any solid waste management facility or department, if it is "in the paramount interest" of the United States. An exemption may be granted for 1 year.

c. **Section 6002.** Section 6002, Federal Procurement, states that each procuring agency must select those items made of the highest percentage of recovered materials practicable unless such items are unreasonable, fail to meet performance standards, or are available only at an unreasonable price.

d. **Section 6003.** Section 6003, Cooperation with the EPA, states that Federal agencies must make available all information required by the administrator concerning past or present waste management practices and past or presently owned, leased, or operated solid waste or HW facilities.

e. **Section 6004.** Section 6004, Applicability of Solid Waste Disposal Guidance to Executive Agencies, states that executive agencies must comply with solid waste management regulations where the agency:

(1) Has jurisdiction over real property or the operation of a facility that is involved in solid waste management.

(2) Generates solid waste and which, if conducted by a person other than the agency, would require a permit or license to dispose of the waste.

5. **RCRA Subtitle I: Regulation of Underground Storage Tanks.** Subtitle I of RCRA directs EPA to promulgate standards for the management, control, and closure of underground storage tanks (see chapter 13 of this Manual).

6. **RCRA Subtitle J: Demonstration Medical Waste Tracking Program.** Subtitle J of RCRA establishes a medical waste tracking demonstration program. Congress included Federal facilities in demonstration States in the program under section 11006 in the same manner and to the same extent that they are compelled to comply with any other requirements of RCRA. Congress is currently debating whether to extend the demonstration program for an additional 2 years.

9201. HAZARDOUS MATERIAL TRANSPORTATION ACT. The Hazardous Material Transportation Act, which is administered by the DOT, regulates the shipping, marking, labeling, placarding, and recordkeeping requirements for HM (49 CFR part 172.101). Marine Corps installations that ship HM must comply with DOT regulations.

9202. COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT NOTIFICATION OF RELEASE REQUIREMENTS. Pursuant to Section 103 of CERCLA, EPA has promulgated regulations at 40 CFR 302 that require notification to the National Response Center whenever there is a release of a reportable quantity of any HS. Release into the environment is interpreted broadly to mean release into the water or air or onto the land. If a release is contained within a building or closed facility, it does not need to be reported under these regulations. The regulations specify reportable

quantities as listed in table 302.4 of 40 CFR 302 (also see chapter 11 of this Manual).

9203. OCCUPATIONAL SAFETY AND HEALTH ACT. The OSH Act provides the principal means for protecting the health and safety of workers engaged in hazardous or potentially hazardous activities, or working with hazardous or potentially hazardous materials.

1. The OSHA Safety and Health Standards (29 CFR 1910) governs storage and handling of HM. Even though not considered strictly as environmental regulations, they are described in this chapter because they are considered to be an integral part of an effective HM/HW management program.

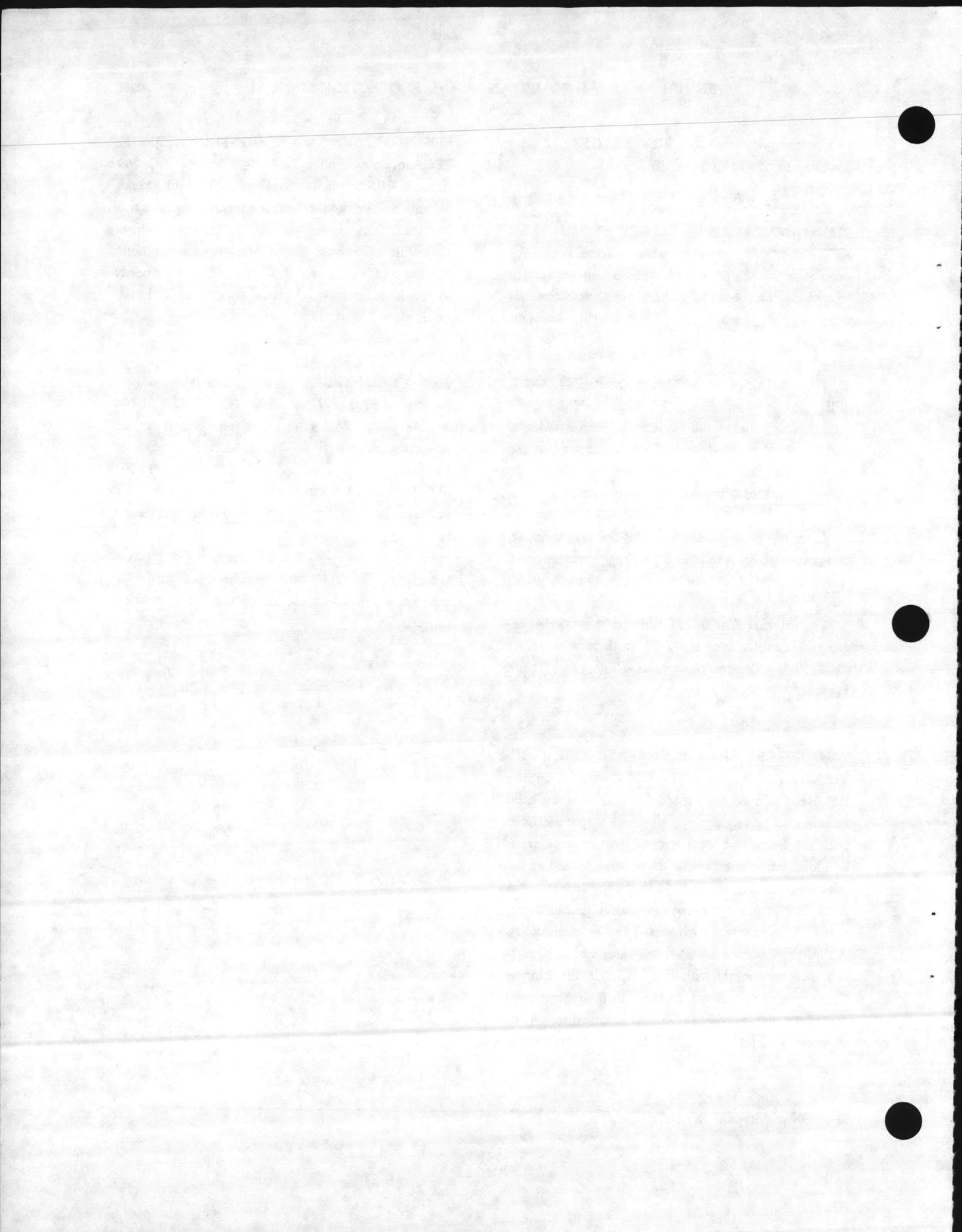
2. A more detailed description of the requirements and responsibilities relative to the health and safety of workers and visitors may be found in 29 CFR 1910.

3. The Marine Corps has adopted the OSHA requirements relative to HM/HW in their entirety per MCO 5100.8, Ground Occupational Safety and Health Program.

9204. SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III. Under SARA, the EPCRA of 1986 was passed. This act was designed to promote emergency planning and preparedness at both the State and local levels. It provides citizens and local governments with information regarding the potential hazards in their community. EPCRA requires the use of emergency planning, and designates chemicals and toxins used in the community. Although Federal installations are not currently required to comply with title III, it is the Marine Corps policy to adhere to the substantive requirements to the maximum extent practicable. (See chapter 11 of this Manual for details.)

9205. TOXIC SUBSTANCES CONTROL ACT. The TSCA of 1976 (Public Law 94-469), 15 U.S.C. 260, requires EPA to regulate and control harmful chemical and toxic substances in commercial use. Congress enacted TSCA to reduce unreasonable risks from chemicals to human health and the environment. Section 6 of TSCA provides EPA with the authority to regulate hazardous chemical substances and mixtures.

9206. CLEAN AIR ACT. CAA, established in 1970 and amended in 1977 and 1990 (Public Law 91-604 and 42 U.S.C. 7401 et seq.), is the Federal statute governing air pollution. The CAA amendments of 1970 required EPA to establish NESHAP's (40 CFR 61). In 1971, EPA listed asbestos as a hazardous air pollutant and subsequently established emission standards for the manufacture, fabrication, spray application, waste packaging, labeling, and disposal of asbestos. The act also establishes standards for asbestos emissions during renovation and demolition projects.



CHAPTER 10

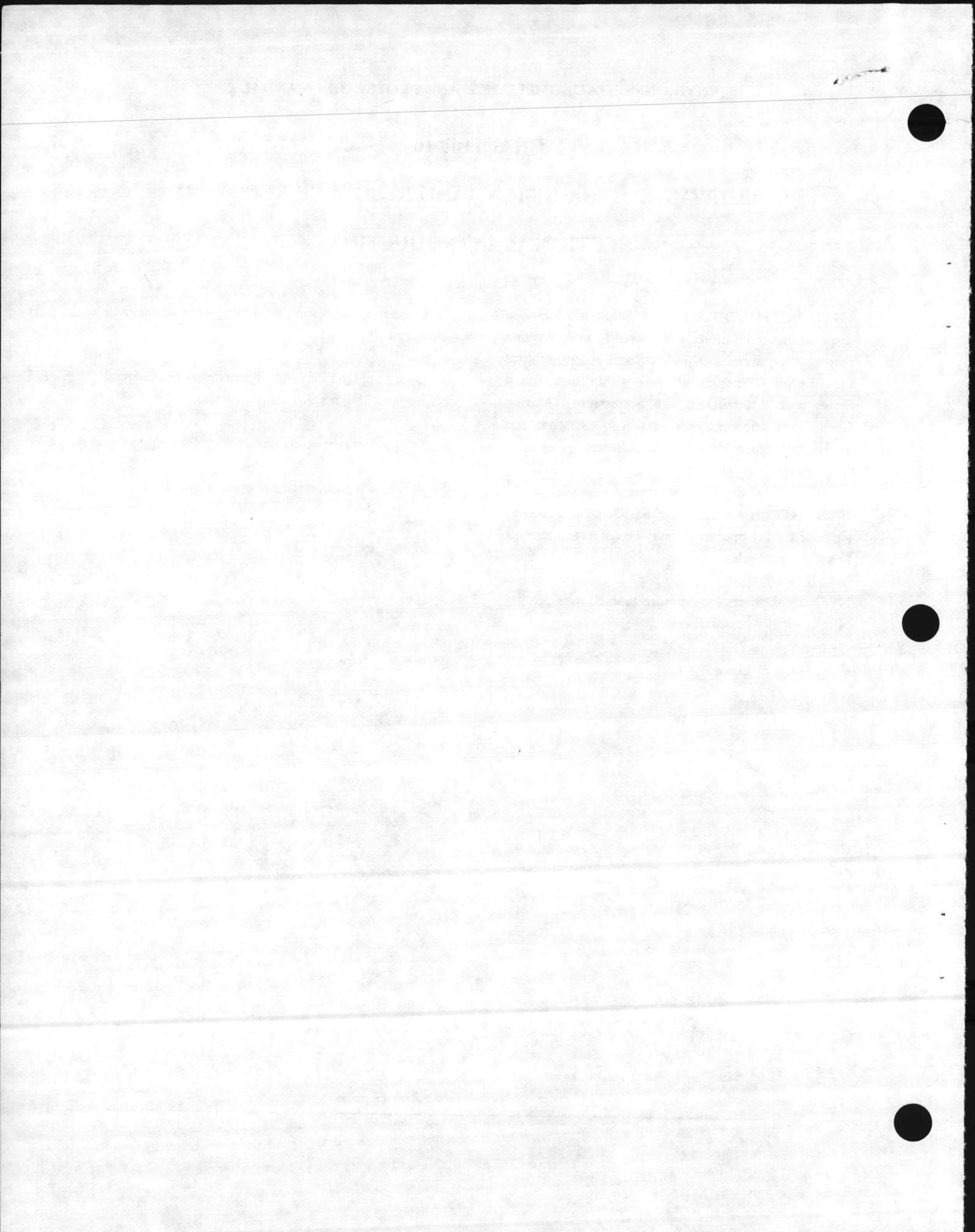
SOLID WASTE MANAGEMENT AND RESOURCE RECOVERY

SECTION 1: INTRODUCTION

10100. PURPOSE. This chapter identifies solid waste disposal, waste minimization, recycling, and resource recovery requirements, policies, and responsibilities for Marine Corps installations within the United States and its territories and possessions. Marine Corps installation requirements in foreign countries are discussed in section 4 of this chapter.

10101. APPLICABILITY OF RCRA. The following types of facility operations may be subject to subtitle D solid waste rules:

1. Thermal processing of more than 50 tons per day of municipal-type solid waste.
2. Collecting and storing residential, commercial and industrial solid waste.
3. Operating land disposal sites or using commercial offsite landfills for solid waste disposal.
4. Selling beverage containers.
5. Purchasing products that contain recycled materials (40 CFR 248-253).



CHAPTER 10

SOLID WASTE MANAGEMENT AND RESOURCE RECOVERY

SECTION 2: FEDERAL STATUTES

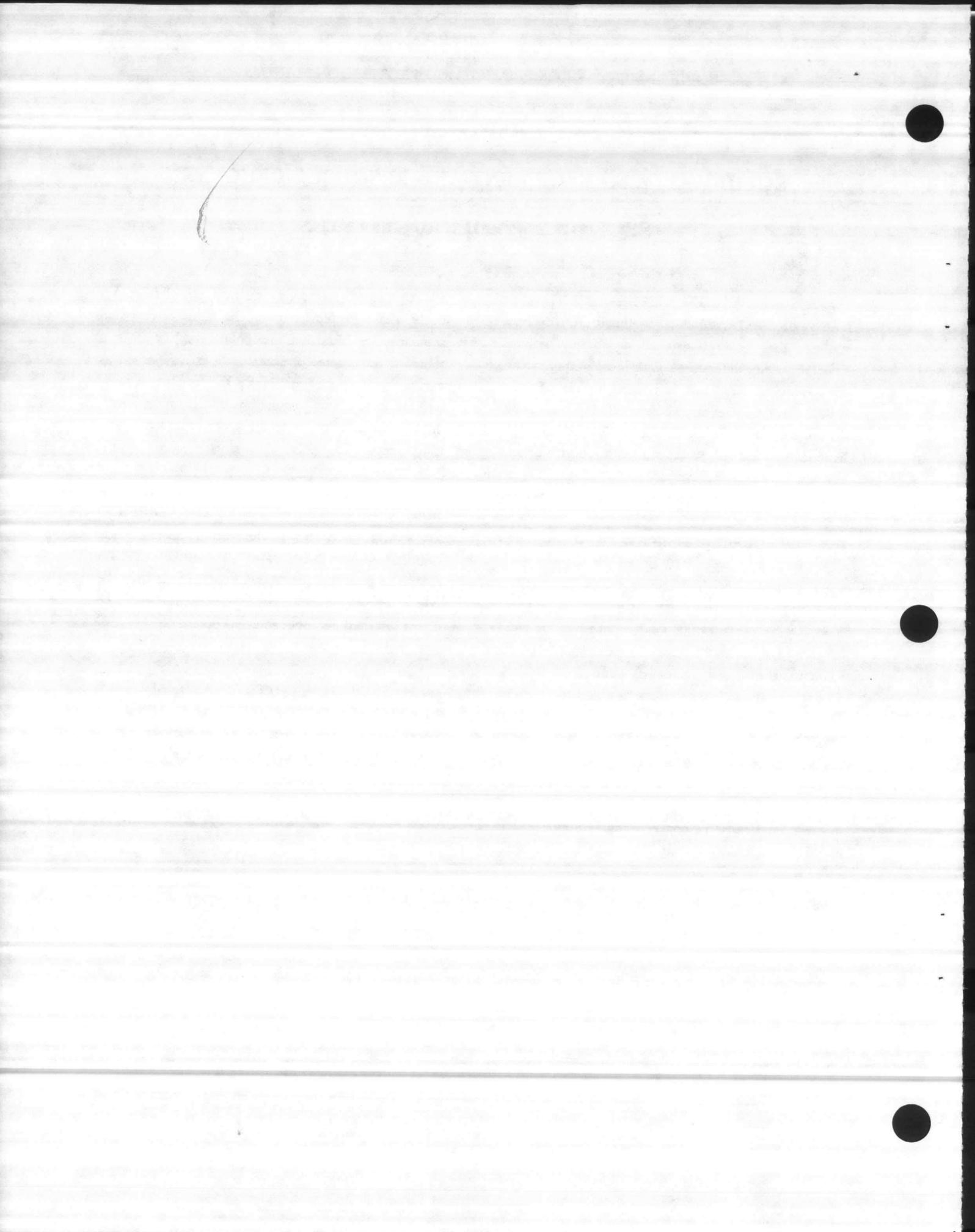
10200. SOLID WASTE DISPOSAL ACT. The SWDA of 1965, as amended by the RCRA of 1976, requires that Federal installations comply with all Federal, State, interstate, and local requirements concerning the disposal and management of solid waste. These requirements include permitting, licensing, and reporting. The SWDA encourages beneficial reuse of waste through recycling and burning for energy recovery.

10201. RESOURCE CONSERVATION AND RECOVERY ACT. The RCRA of 1976 has had a substantial effect on the handling of solid waste. The act defines solid wastes that are hazardous and sets strict requirements for the handling of HW. Disposal of many liquids and sludges formerly deposited at solid waste disposal facilities is banned by RCRA. The act encourages the conservation and recycling of solid waste with residual value. Subtitle D of RCRA establishes Federal standards for management of nonhazardous solid waste. The primary goals of subtitle D are to encourage environmentally sound solid waste management practices, recycling of waste material, and resource conservation. Subtitle D has mandatory technical standards for nonhazardous solid waste disposal facilities.

10202. CLEAN AIR ACT. Section 112 of the CAA of 1970 gives authority to the EPA to set emission standards for hazardous air pollutants. In 1973, a standard for control of asbestos fiber was issued as part of the National Emissions Standards for Hazardous Air Pollutants. Regulations addressing asbestos disposal in solid waste landfills are included in the CAA, section VI, Special Pollutants.

10203. MILITARY CONSTRUCTION CODIFICATION ACT. Section 6 of the Military Construction Codification Act (Public Law 97-214; 10 U.S.C. 2577) contains a provision that allows net proceeds from the sale of recyclable materials to be used by Marine Corps installations for certain purposes.

10204. FEDERAL PROPERTY AND ADMINISTRATIVE SERVICES ACT. Section 203 of the Federal Property and Administrative Services Act of 1949 (10 U.S.C. 484) contains provisions on the sale of recyclable materials.





DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380-0001

MCO 6280.8
LFL-dt
23 Jul 1987

MARINE CORPS ORDER 6280.8

From: Commandant of the Marine Corps
To: Distribution List

Subj: Hazardous Waste Minimization

Ref: (a) MCO P11000.8B

Encl: (1) Hazardous Waste Minimization Techniques

Report Required: Hazardous Waste Report (Report Symbol
MC-6280-02), par. 4c(4)

1. Purpose. To identify the background and concepts for the minimization of hazardous waste (HW) generation through various methods and techniques.

2. Background

a. The Marine Corps hazardous waste minimization (HAZMIN) policy is to minimize the volume and toxicity of the HW it generates in a practical and economical manner. HAZMIN consists of two parts:

(1) Avoiding HW generation through the application of best management, engineering, and equipment to Marine Corps processes and procedures.

(2) Reuse and/or treatment of HW that is generated by a Marine Corps process or procedure reducing it to a nonhazardous state.

Emphasis is on HW generation reduction and elimination. This program uses HAZMIN technologies, such as plastic media paint stripping and zero discharge hard chrome plating, as well as changed management procedures to reduce/eliminate HW generation.

b. Due to the national concern that buried waste has the potential to enter the groundwater or otherwise pollute the environment, two strict environmental laws have been implemented. These laws are: the Resource Conservation and Recovery Act (RCRA) which sets up a system to track and control the handling and disposal of HW produced today; and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the "Superfund Law" which holds the generator of a HW responsible for that waste as long as it exists, regardless of who has assumed management custody.

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If the Marine Corps generates a HW today, and it causes an environmental or health problem at anytime in the future, the Marine Corps is legally responsible for that problem and appropriate corrective action despite "proper" disposal in accordance with all requirements. In summary, this responsibility cannot be delegated to another party.

c. The RCRA recognizes the long-term problems of HW landfills. A 20-year guaranteed landfill "liner" is obviously of little comfort if a HW does not degrade with time; in fact, no one can really "guarantee" a HW landfill. Consequently, the RCRA prohibits placement of bulk or noncontainerized liquid HW in any landfill. The Office of the Secretary of Defense, noting the long-term liabilities of HW, and solvents in particular, has banned the disposal of waste solvents by landfill (whether through contract or otherwise) and required solvent users to start recycling nearly all solvents by October 1986.

d. The RCRA also requires every generator of HW to: (1) certify on the HW manifest which accompanies all HW that the generator has a program to minimize the amount and toxicity of wastes generated to the degree the generator determines to be economically practicable, and that the generator's proposed treatment, storage, or disposal method minimizes the present and future threat to human health and the environment, and; (2) include in the biennial report to the Environmental Protection Agency (EPA) Regional Administrator -(40 CFR 262.41), the activity's efforts to reduce the waste volumes and toxicity, as well as describe the changes already accomplished. Also, any installation that holds a RCRA permit to operate a HW treatment, storage, or disposal facility must make similar certifications at least annually per 40 CFR 264.73. This certification is maintained at the facility as part of the operating record until closure of the facility.

3. Discussion

a. HAZMIN is required by law. As stated in paragraph 2d, preceding, Marine Corps installation commanders (or their designated representatives) must certify they have HAZMIN programs. There are also legal timetables in the RCRA that will shutdown future landfill disposal of many HWs, whether or not there are adequate alternate means of disposal.

b. Basic HAZMIN techniques are outlined in the enclosure. The three consecutive steps in the HAZMIN program are as follows:

(1) Avoid generation of HW through:

(a) Considering of HAZMIN in the weapons and support equipment acquisition process.

(b) Tighting control of hazardous materials at Marine Corps installations.

(c) "Delisting" of specific Marine Corps wastes from generic HW streams listed by regulatory agencies.

(d) Substituting of a material in a process so that HW generation is reduced or eliminated.

(e) Changing the process to reduce or eliminate HW generation.

(f) Extending of shelf-life and other factors which cause hazardous materials to become excess and enter the Defense Logistics Agency (DLA) reuse, transfer, donation, and sale screening process.

(2) Recycle the HW by:

(a) Using it as the input for a process which does not require the degree of purity of the original process (called cascade use).

(b) Cleansing (e.g., filtering or distilling), or otherwise upgrading the HW so that it can be used for the original or another process.

(3) Treat the HW to a nonhazardous state by neutralization, solidification, volume reduction, detoxification, or thermal destruction. (Note, there may be hazardous residues; i.e., waste, from these treatment processes.)

c. The HAZMIN program is not exclusively an environmental program; it must be a cooperative effort between acquisition, supply, production, facilities, and environmental personnel at every level of command.

d. The Department of the Navy HAZMIN program is a 5-year program to put into place equipment and procedures which will reduce the quantity of the HW now treated and disposed of off-station by contract (DLA or Navy/Marine Corps contract), or disposed of on the installation. The goals are a 50 percent reduction (by weight) in HW generated and the elimination of the disposal of all untreated HW by 1992 Marine Corps-wide. These are based on reductions considered to be achievable in each process which generates HW.

e. The HAZMIN program will be financed through several mechanisms:

(1) Local resources will be used to implement management and operational changes to effect HW generation reduction to the maximum extent practical.

(2) Limited Headquarters Marine Corps Environmental Management (P1 and R2) Operations and Maintenance Marine Corps funds are available to support HAZMIN studies and required construction (chapter 4 of the reference applies).

(3) Additional funding through the Defense Environmental Restoration Account (DERA) will periodically be available to supplement activity projects requiring procurement and installation of HW reduction equipment. These funds must be considered supplemental, and internal Marine Corps resources must be used to the maximum extent possible.

4. Action

a. The Commandant of the Marine Corps (CMC) (LF) will:

(1) Oversee implementation of a hazardous material control program at each activity.

(2) Plan, program, and budget, through normal channels, funds (beyond those made available from the DERA) for projects necessary to achieve HAZMIN goals for field activities.

(3) Initiate actions necessary to assure that HAZMIN projects and procedures do not adversely affect either the mission of the activity or the quality of the product of the activity.

(4) Provide funds for HAZMIN projects insofar as funds are available from the DERA or other fund sources.

(5) Report progress on meeting HAZMIN goals to SECNAV and Department of Defense.

b. The CMC (LM) will:

(1) Ensure that the acquisition process for all weapons and support systems considers HAZMIN. This should include review of maintenance cycles and materials recommended by vendors, to ensure they prescribe minimum maintenance frequency and use the lowest volume and toxicity of hazardous materials which will effectively maintain the equipment.

(2) Ensure to the maximum extent practicable, consumable hazardous materials which have shelf-life considerations accurately define maximum shelf-life and are procured only in quantities sufficient to meet mission requirements.

c. Commanding generals/commanding officers of Marine Corps activities shall:

(1) Develop and implement programs using the steps described in paragraph 3b, preceding, to meet HAZMIN goals.

(2) Identify and program HAZMIN projects per the procedures in chapter 4 of the reference.

(3) Certify to the Defense Reutilization and Marketing Office and on HW manifests that HAZMIN programs are implemented. This Order provides the basis for such certification.

(4) Include a description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated and actual reductions achieved in the Biennial Report to the Regional Administrator of EPA. This report is due no later than 1 March of each even numbered year. Instructions and Form EPA 8700-13 (Hazardous Waste Report) are available from the cognizant EPA Regional Administrator or the EPA Forms and Publications Distribution Center, 26 West Saint Clair, Cincinnati, OH 45268. Copies of this report shall be provided to the CMC (LFL), the cognizant Naval Facility Engineering Command, Engineering Field Division, and the Naval Energy and Environmental Support Activity, Port Hueneme, CA 93043. Report Control Symbol MC-6280-02 is assigned to this report.

5. Records Disposition

a. Hazardous material control program records and related data are accumulated by Marine Corps commanders during the process of implementing HW management programs. Included are surveys, studies, and data documenting histories of unusual incidents, evaluations, and recommendations concerning hazardous conditions, together with related supportive records.

Retention period: Transfer to the Washington National Records Center when 5 years old. Destroy when 75 years old.

b. Hazardous waste manifests.

Retention period: At least 3 years from date waste was accepted by the initial transporter.

MCO 6280.8
23 Jul 1987

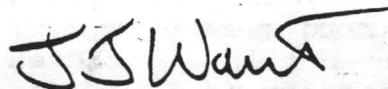
c. Biennial Report and Exception Reports.

Retention period: At least 3 years from due date of report unless unresolved enforcement actions regarding the regulated activity exist, in which case reports may not be destroyed until actions are resolved.

d. Records of test results, waste analyses, or other determinations.

Retention period: At least 3 years from date waste was sent to on-site or off-site treatment, storage, or disposal.

NOTE: Though these timeframes comply with the regulatory minimum retention periods, the long term environmental and personal liabilities associated with HW management dictate retention of these records longer if space permits.



J. J. WENT
Deputy Chief of Staff
for Installations and Logistics

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HAZARDOUS WASTE MINIMIZATION TECHNIQUES

<u>Industrial Operation or Process</u>	<u>Hazardous Waste Generated</u>	<u>Hazardous Waste Reduction Techniques</u>
Metal working/ heat treating	coolants; quenching oils; salt baths	filtration, centri- fuge for reuse; fuel supplements; neutral- ization
Painting	thinners; heavy metals; polyurethanes	process change: airless sprays, powders, water base primers; recycle; segregation; incineration; replace water curtain with dry filters in spray booth
Transport vehicle maintenance	oils; lubricants; coolants; petroleum; alcohols	fuel supplements; waste segregation; recycle
Cleaning, degreasing	solvents; detergents; ketones; freon	fuel supplements; recovery; substitution
Electrical/electronic maintenance	heavy metals; Poly- chlorinated biphenyls; solvents; freon	material control; substitution; incineration
Stripping	solvents; caustics	process change: dry media blasting; laser stripping; water jet
Metal plating/ finishing	acids; bases; metal rinses	process change: zero discharge hard chrome plating; industrial waste treatment: neutralization, ion exchange, electrolytic pre- cipitation; non- cyanide baths

MCO 6280.3
23 Jul 1987

<u>Industrial Operation or Process</u>	<u>Hazardous Waste Generated</u>	<u>Hazardous Waste Reduction Techniques</u>
Battery shop operations	acids; bases, cyanides	neutralization; industrial waste treatment; domestic waste treatment (with dilution)
Laboratory operations	spent/used/expired chemicals; silver (photography)	material control; recovery; industrial or domestic waste treatment
Test and evaluation	contaminated soils; calibration fluids	test/burning pad; recovery/reuse; static testing
Propellant, explosive manufacture	pink, red acid wastes	industrial waste treatment
Industrial waste treatment	sludges; spent carbon; ion exchangers; filters	dewatering; delist- ing; regeneration; incineration
Fuel storage	tank bottoms; contam- inated or excess POL	biological treat- ment; fuel suppl- ment; reblend; recycle
Munitions demil	OB/OD residues; contaminated soil	burning pads; con- tainment facilities; delisting; down- grade; reuse; incineration

ENCLOSURE (1)



UNITED STATES MARINE CORPS
Marine Corps Base
Camp Lejeune, North Carolina 28542-5001

BO 6240.5A
NREAD/st
10 Mar 1987

BASE ORDER 6240.5A

From: Commanding General
To: Distribution List

Subj: HAZARDOUS MATERIAL DISPOSAL PROGRAM

Ref: (a) Resource Conservation and Recovery Act (Pub No. 94-580) (42 USC 6901-6987) (NOTAL)
(b) EPA Regulations contained in Code of Federal Regulations, Title: 40 Parts 260-265 (NOTAL)
(c) DOT Regulations contained in Code of Federal Regulations, Title: 49 Parts 100-179 (NOTAL)
(d) BO 11090.1B
(e) BO 11320.1G

Encl: (1) Procedures for Collection, Storage and Turn-In of Hazardous Material and Hazardous Waste for Disposal
(2) Responsibilities for Hazardous Material/Hazardous Waste Disposal
(3) Hazardous Waste Training Requirements and Guidelines

1. Purpose. To revise responsibilities, procedures and guidance for hazardous material (HM) and hazardous waste (HW) disposal and related environmental protection for the Camp Lejeune and Marine Corps Air Station, New River complex.

2. Cancellation. BO 6240.5.

3. Background

a. Congress and the state legislatures have responded to the threats to human life and the environment caused by mismanagement and illegal spilling and dumping of toxic substances by enacting laws which not only attempt to avert future threats but which impose civil and criminal penalties. In enacting many of these environmental laws, Congress waived federal supremacy, requiring federal agencies including the Marine Corps, to comply with federal, state and local environmental laws. Federal officers and employees now face the possibility that they may be personally liable for civil and criminal penalties and fines as well as imprisonment.

b. The Environmental Protection Agency (EPA) has authorized the State of North Carolina to enforce the requirements of references (a) and (b) through a state HW regulatory program. The Solid and Hazardous Waste Management Branch, Division of Health Services (DHS), is the primary enforcing agency within North Carolina. DHS enforcement personnel have authority to investigate HW spills and perform routine inspections of work sites where HW are handled and stored. These investigations and inspections can result in citations being issued to supervisors and/or personnel at the work site for civil and/or criminal violations of HW regulations.

c. State regulations promulgated under reference (a) and EPA regulations contained in reference (b) require both initial and annual refresher training for personnel involved in HW management and handling. The majority of discrepancies identified during EPA and DHS inspections can be directly, or indirectly, attributed to lack of adequate HW training. The relatively rapid rate of personnel turnover within the Camp Lejeune Complex requires that HW training be readily available. Publishing of this revised order is an essential step in strengthening the subject program. In addition to addressing the HW training issues, this revised order provides for the following: (1) better internal controls by organizations generating and handling HW; (2) improved availability of HW related supplies and equipment and; (3) formalizing efforts to reduce the volume and toxicity of HW generated within the Camp Lejeune Complex. Enclosures (1) through (3) outline revised procedures for managing HW and providing compliance with related requirements of references (a), (b) and (c).

d. This order formally establishes two collateral duty positions to coordinate and to assist with the implementation of the subject program. These positions are the Hazardous Material Disposal Coordinator (HMDC) and Hazardous Material Disposal Officer (HMDO). HMDC will be established within each major command and within Marine Aircraft Groups. HMDO's will be appointed at the Battalion, Separate Company and Squadron level (or equivalent). HMDC and HMDO responsibilities are outlined in enclosure (2). The appointment and training of qualified primary and alternate HMDCs and HMDOs are essential to implementation of the complex requirements of the subject program.

4. Action

a. Organizational commanders shall on a continuing basis take action required to implement the following HW management goals and objectives:

(1) HW operations will be supervised by properly trained personnel who have access to equipment and supplies required for handling HW.

(2) Written descriptions of HW duties will be developed for all HW managers and handlers, and appropriate records maintained to document that proper training is being provided to personnel in accordance with enclosure (3).

(3) OIC/NCOIC's will ensure that HW facilities are inspected weekly and timely corrective action is taken and properly documented per this Order and related instructions of HMDO/HMDC.

(4) OIC/NCOIC's will prepare a written HW management Standard Operating Procedure (HWSOP) in cooperation with HMDO for each facility where HW are routinely handled and stored. SOP will be readily available at HW generation and storage sites.

(5) A system of continuous internal controls will be implemented to ensure that violations of this Order are identified and if appropriate, that disciplinary action is taken to discourage recurring violations.

b. Major commands will take action required to limit HW generation to the minimum number of locations practical, to identify HW handling and storage equipment and facilities requirements and to develop and implement a system of internal controls which provides satisfactory compliance with the requirements of this Order and related regulatory requirements. As a minimum the following action will be taken:

(1) Appoint a primary and alternate HMDC with authority and resources to implement duties outlined in enclosure (2).

(2) Maintain a current listing/directory of facilities where HW are handled and stored. Ensure timely submission of waste identification documents per enclosure (1).

(3) Require OIC/NCOIC's of HW handling and storage facilities to develop and implement a written HW SOP for each facility per enclosures (1) and (3). The SOP will be readily available to personnel routinely handling HW and related emergency response.

(4) Require Commanding Officers of each Aircraft Squadron, Regiment, Battalion and Separate Company (or equivalent) to appoint a primary and alternate HMDO with authority to carry out the duties outlined in enclosure (2).

(5) Establish and promote HW management goals and objectives for supply and maintenance functions which promote the minimization of the volume and toxicity of HW generation.

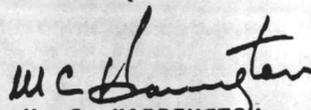
(6) Within 30 days of the date of this Order, and as requested thereafter, provide a current listing of Primary and Alternate HMDO's. The list shall contain name, rank, unit and phone number. The list will be provided to the Director, Natural Resources and Environmental Affairs Division, Marine Corps Base.

c. Director, Natural Resources and Environmental Affairs Division, will inspect all points of HW generation on an annual basis, or more frequently as required, to monitor and evaluate compliance with the order and related state/federal regulations. The results of the annual inspections will be provided in writing to the inspected activity via the chain of command.

d. The Assistant Chief of Staff, Logistics and Assistant Chief of Staff, Facilities will cooperate with the local Defense Reutilization and Marketing Officer in improving HW disposal services to organizations generating HW subject to this Order.

e. Officials responsible for the preparation, awarding and implementation of various types of contracts, shall ensure that all contractor activities are carried out in accordance with the requirements of this Order and related State and Federal regulations.

5. Concurrence. This Order has been coordinated and concurred in by the Commanding Generals, II Marine Amphibious Force, 2d Marine Division, FMF, 2d Force Service Support Group (Rein), FMF, 6th Marine Amphibious Brigade, FMF, and the Commanding Officers, Marine Corps Air Station, New River, Naval Hospital and the Naval Dental Clinic.


M. C. HARRINGTON
Chief of Staff

DISTRIBUTION: A
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PROCEDURES FOR COLLECTION, STORAGE AND TURN-IN OF HAZARDOUS
WASTE (HW) AND HAZARDOUS MATERIAL (HM) FOR RECYCLING OR DISPOSAL

1. Hazardous Waste Management Standard Operating Procedures (HWMSOP). Each organization routinely generating or handling HW or disposing of HM will develop desk top procedures to be followed. As a minimum, the HWMSOP will provide the following:
 - a. Name and telephone number of cognizant Hazardous Material Disposal Officer (HMDO) and Hazardous Material Disposal Coordinator (HMDC).
 - b. A copy of BO 6240.5A, BO 11090.1B, BO 11090.3, and related local instructions.
 - c. Name, title, HW duties and HW training records for each employee per enclosure (3) of BO 6240.5A.
 - d. Waste Identification Document (WID) for each HW generated or handled. WID will be completed in accordance with attachment (A) of this enclosure.
 - e. Procedures and responsibilities for dealing with HW/HM spills and related emergencies, i.e., HW Spill Contingency Plan.
 - f. Copies of weekly inspections of HW storage areas/containers.
 - g. Guidance provided by HMDO/HMDC's to implement HW/HM disposal program.
 - h. Location sketch for each HW generation, accumulation and storage area.
 - i. Material Safety Data Sheets, or hard copy of Hazardous Material Information Systems Data developed per MCO 5100.25 for all HW generated.
 - j. Sample copies of completed turn-in documents (Form DD-1348-1) and HW labels for each type of HW generated and disposed of.
2. HM/HW Collection and Storage Procedures/Requirements.
 - a. Possession of a properly completed and signed WID constitutes authorization to generate the specifically named HW. Failure to submit a WID to HMDC within 30 days of date HW first generated or handled or 60 days of the date of this Order (whichever is later) will be considered a violation of this Order. HMDC's are responsible for monitoring and enforcement of this requirement.
 - b. Only Department of Transportation (DOT) approved containers labeled per WID or HWMSOP will be used for storage of HW awaiting disposal. HMDO's are responsible for enforcing this standard.
 - c. All personnel routinely handling or responsible for HW management must be properly trained per this Order and references (a) and (b). OIC's are responsible for maintaining training records for personnel within their cognizance. HMDC's are responsible for enforcement of this requirement.
 - d. All HW containers and storage areas will be inspected weekly using format provided by cognizant HMDC/HMDO. A written record of corrective action will be maintained per HMDO/HMDC guidance. Director, Natural Resources and Environmental Affairs Division, (NREAD), MCB will assist HMDC/HMDO develop guidelines.
 - e. Spills of HW/HM will be promptly reported to the Base Fire Department at the Emergency Telephone Number 451-3333. OIC's are responsible for maintaining absorbents, safety equipment, and other supplies and equipment required for dealing with minor spills. HWMSOP's will give specific guidance in this area.
 - f. A Form DD-1348-1 will be completed and submitted to the cognizant HMDO not later than 45 days after the "accumulation start date" on the HW label on the container.

ENCLOSURE (1)

10
g. HMDC will be notified by telephone, confirmed in writing, of anytime DRMO has not accepted accountability of a HW within 75 days after the "accumulation start date" on any HW container.

3. Hazardous Material (HM) and Hazardous Waste (HW) Turn-in Procedures. The following steps will be taken to initiate final disposal of HM/HW. At any time that a major problem or controversy arises, the organization attempting to turn-in the item will immediately notify the responsible Hazardous Material Disposal Coordinator (HMDC). The HMDC will be responsible for coordinating efforts to resolve the problem/controversy and will utilize the assistance of the Director, Natural Resources and Environmental Affairs Division (NREAD), Facilities Department, Marine Corps Base, telephone extension 2083, 2195. Unresolved problems/controversies will be referred to the Assistant Chief of Staff, Facilities, Marine Corps Base. See Note 1 below.

STEP 1. The Officer in Charge (OIC) of the organization having physical custody of HM/HW is responsible for turn-in of HM/HW unless otherwise specified by HMDC. OIC will properly containerize the HM/HW and submit a Form DD 1348-1 to the cognizant Hazardous Material Disposal Officer (HMDO) per instructions in organization's HWMSOP. Questions not addressed by HWMSOP will be directed to HMDO.

STEP 2. The HMDO will physically inspect the HM/HW and determine if the Form DD 1348-1 is properly completed and the HM/HW is properly packaged. The HMDO will coordinate correction of any problems. Unresolved problems will be referred to cognizant HMDC for resolution. Once problem's resolved, HMDO will forward (preferably hand deliver) the Form DD 1348-1 to the Defense Reutilization and Marketing Office (DRMO) Headquarters, Bldg. 906. See Note 2 below.

STEP 3. The DRMO will inspect the HM/HW if necessary, and will determine if DRMO is accountable (i.e., responsible) for disposal of the HM/HW. If DRMO determines that the local activity, not DRMO, has responsibility for disposal of the HM/HW, the DRMO will so notify the cognizant HMDC in writing with a copy to the NREAD. The HMDC and NREAD will cooperate in developing case specific procedures for disposal of the item. Assistant Chief of Staff, Logistics, MCB, will provide contracting support.

STEP 4. If DRMO determines that DRMO is accountable for HM/HW, DRMO will determine where the HM/HW will be stored awaiting disposal. HW must be stored at the DRMO facility at TP-451 complex, unless otherwise approved by the Assistant Chief of Staff, Facilities, MCB. DRMO will submit a request to the Assistant Chief of Staff, Logistics to arrange transportation of the HM/HW to DRMO designated facility.

STEP 5. Assistant Chief of Staff, Logistics, in cooperation with HMDO, will determine if generating organization can safely, legally transport the item to DRMO designated facility. Assistant Chief of Staff, Logistics will supervise transportation of HW. Whenever practical, Command turning in a HM will provide transportation. Assistant Chief of Staff, Logistics will cooperate with the HMDC for the generating organization in promoting efficient, safe transportation. Spills or other emergencies will be promptly reported to the Base Fire Department at 451-3333. Drivers will be provided written spill prevention and response guidance.

STEP 6. When the HM/HW arrives at storage facility, DRMO will inspect prior to unloading. DRMO is authorized to refuse the HM/HW if any significant discrepancies exist. DRMO will immediately notify cognizant HMDC and NREAD of DRMO's refusal to accept the HM/HW. The transporting vehicle will be secured and will not be moved outside the immediate vicinity of DRMO facility except for emergency situations involving risk to public safety or to property. DRMO, HMDC and NREAD will cooperate in making an immediate decision on corrective action. If problems cannot be promptly resolved the HM/HW will be returned to the generating organizations facilities. When DRMO accepts physical custody of the HM/HW, turn-in is complete.

NOTE 1: Marine Corps Air Station, New River units will follow turn-in procedures set forth in Air Station Order 6280.1.

NOTE 2: HMDO should maintain a log of documents showing date document accepted by DRMO, accumulation start dates, and the type and quantity of HW.

ENCLOSURE (1)

RESPONSIBILITIES FOR HAZARDOUS MATERIAL (HM)/HAZARDOUS WASTE (HW) DISPOSAL

1. Compliance with hazardous waste management and disposal regulations requires the cooperative effort of many functions within the Camp Lejeune complex. The following outlines the responsibilities of various officers and managers relative to hazardous waste management:

a. Hazardous Material Disposal Officer (HMDO) will:

(1) Provide assistance to HW generators and handlers in the preparation and timely submittal of HW turn-in documents per this Order.

(2) Perform quarterly inspections of HW generation and storage sites and notify OIC's of corrective action required. Inspection format developed per paragraph 1b(2) below will be used.

(3) Keep OIC's and key personnel informed of any changes in regulations affecting HW activities within the HMDO's cognizance and ensure that HW standard operating procedures (SOP) are up-to-date and readily available for review by personnel involved in HW management.

(4) Develop a roster of personnel involved in HW management at each work site within the HMDO's cognizance.

(5) Develop and provide HW training requirements to HMDC for personnel within the HMDO's cognizance.

(6) Actively promote the reduction of volume and toxicity of HW produced by organizations within the HMDO's cognizance.

(7) Conduct surveys required to identify HW generation and storage sites within the HMDO's cognizance and provide periodic updates, as requested, to the HMDC.

b. Hazardous Material Disposal Coordinator (HMDC) will:

(1) Provide assistance to HMDO's in handling HW management problems. Serve as HMDO for organizations not having sufficient HW activity to justify appointment of a HMDO.

(2) Perform annual inspection of HW generation and storage sites and notify HMDO's of corrective action required. Inspection format will be developed in cooperation with the Director, Natural Resources and Environmental Affairs Division, (NREAD), Marine Corps Base.

(3) Inform HMDO's of any changes in regulations affecting HW activities under the HMDO's cognizance.

(4) Serve as point of contact on matters pertaining to HW management and implementation of this order within the HMDC's command.

(5) Develop listings of HW generation and storage facilities.

(6) Be responsible for identifying assistance required to provide HW training. Requests for assistance from MCB will be submitted in writing "Attention Director, NREAD."

c. Assistant Chief of Staff, Facilities will:

(1) Have overall responsibility for implementation of the subject program and maintaining compliance with requirements of references (a) and (b) and related local, state and federal regulations.

(2) Have overall responsibility for management of pollution abatement projects per latest revision of MCO P11000.8.

ENCLOSURE (2)

(3) Have overall responsibility for local implementation of Marine Corps programs to correct environmental discrepancies associated with past HM/HW disposal sites.

(4) Ensure that plans and specifications for new facilities provide adequate facilities and collateral equipment for the handling and storage of HM/HW.

d. Director, Natural Resources and Environmental Affairs Division will:

(1) Provide a staff specialist to serve as HMDC for Marine Corps Base.

(2) Provide a command point of contact with state and federal agencies on matters pertaining to the subject program.

(3) Monitor ongoing activities as required to identify, evaluate and provide up-channel reporting of environmental deficiencies related to the subject program.

(4) Coordinate day-to-day implementation of this Order and provide the following types of technical assistance:

(a) Laboratory support, if required, for HW identification.

(b) Training to HMDC's and HMDO's on state and federal environmental laws, regulations and procedures.

(c) Guidance on HM/HW SOP preparation.

(d) Guidance on HM/HW spill prevention, control, cleanup and related HW disposal.

(e) Coordination of HM/HW recycling/minimization program.

(5) Coordinate development and implementation of HW Training Program required for compliance with references (a) and (b).

e. Base Maintenance Officer will:

(1) Collect and dispose of used POL's and oily wastes from collection tanks and other oil pollution abatement facilities in a manner consistent with this Order and references (a) and (b).

(2) Unless otherwise provided, operate and maintain industrial waste collection, pretreatment and disposal facilities within the Camp Lejeune complex in a manner consistent with this order, references (a) and (b) and related State regulations.

(3) Provide HM/HW spill response services in accordance with reference (d).

f. Base Fire Chief will:

(1) Provide HM/HW spill and related emergency services per references (d) and (e) and related HW/HM Spill Contingency Plans.

(2) Provide routine inspections of facilities where HM/HW are stored and handled, and report all discrepancies to cognizant HMDC. Elimination of the following hazards will be stressed:

(a) HM/HW stored in defective containers or containers which are not properly marked with the chemical name, NSN (if appropriate) and hazard label of the contents.

(b) Incompatible HM/HW are stored in a manner with significant potential threat of fire, explosion, or release of toxic fumes or gases due to chemical reaction during spills or leaks.

(c) HM/HW stored in a manner likely to result in a significant discharge to the environment.

g. Assistant Chief of Staff, Logistics will:

(1) Appoint an officer to serve as HMDO for the Logistics Department.

(2) Ensure that suppliers provide hazardous material safety data sheets for all HM procured through open purchase and will provide one copy to unit ordering HM and one copy to the Base Safety Manager.

(3) Ensure local stocking and availability of the following on a reimbursable basis: empty containers; labels; labeling equipment; absorbents; frequently used minor equipment and HM/HW handling supplies required to implement this Order and reference (d).

(4) Provide contracting services required to dispose of HM or HW for which DRMO is not accountable.

(5) Serve as principal agent for the Commanding General on matters pertaining to HM and HW transportation, and will be responsible for:

(a) Monitoring all HW transportation for compliance with requirements of references (a), (b) and (c) and related state and federal regulations.

(b) Providing transportation services and related record keeping required for implementation of this Order and which are not available from the Defense Reutilization and Marketing Officer or the organization generating the HM/HW.

h. Assistant Chief of Staff, Manpower will:

(1) Coordinate for Marine Corps Base the development of a Hazardous Material Information System, per MCO 5100.25. Assist NREAD in providing safety data and related technical support to HMDC's, HMDO's and other cognizant officials as required to implement this Order.

(2) Provide HM related safety training required to implement HW training plans developed in accordance with paragraph 1d(5) of this enclosure.

i. Officer in Charge, Preservation, Packaging (PP&P) Section, 2dFSSG will provide PP&P support (in accordance with established regulations and procedures) to HMDO's, HMDC's, and other HW managers required to accomplish the following:

(1) Identification of type of containers and labeling required for compliance with reference (c) and this Order.

(2) Packaging of HM/HW required for safe storage and transportation during disposal per this Order.

(3) HM transportation certification required for compliance with reference (c).

j. Defense Reutilization and Marketing Officer (DRMO) will:

(1) Operate the base Long-Term Hazardous Waste Storage Facility at the TP-451 complex in accordance with state permit issued under regulations promulgated under references (a) and (b).

(2) Provide HM and HW disposal services to organizations within the Camp Lejeune/MCAS, New River complex in accordance with DOD regulations, references (a) and (b), and related state and federal regulations.

ENCLOSURE (2)

(3) Receive and process HM/HW turn-in documents in a timely manner and provide prompt notification to HMDO's of any document not satisfying applicable turn in criteria or which contain HM/HW for which DRMO is not accountable.

(4) Maintain records of DRMO HM/HW storage and disposal activity in a manner which provides information required for preparation and timely submittal of required reports to state and federal regulatory agencies.

(5) Keeps HMDC's, HMDO's and other cognizant officers informed of changes in DRMO policies and procedures which affect local implementation of the subject program.

k. Commanding Officers of the following Base Commands/Organizations will designate a Primary and Alternate HMDO to carry out duties outlined in 1a and 1b above: Marine Corps Engineer School; Rifle Range Detachment; Field Medical Service Support School; Marine Corps Service Support School; Reserve Support Unit; Infantry Training School; Support Battalion; Headquarters Battalion; Assistant Chief of Staff, Morale, Welfare and Recreation; Assistant Chief of Staff, Logistics, and Base Maintenance Officer within their respective commands/organizations.

ENCLOSURE (2)

HAZARDOUS WASTE TRAINING REQUIREMENTS AND GUIDELINES

1. Hazardous waste (HW) training is a specific requirement of state and federal regulations promulgated under the Resource Conservation and Recovery Act (RCRA). A review of RCRA requirements and the actual HW activity aboard the Camp Lejeune/Marine Corps Air Station, New River complex indicates that a relatively small percentage of personnel require highly specialized HW training. Generally, the requirements for the remaining personnel involved in HW management are satisfied by routine on-the-job training and related safety and fire-prevention training readily available locally. Providing this training will have minor impact on organizational commanders, in that training required is directly job related. Appendix (A) Part II identifies the minimum HW training required, for personnel identified in Section 2d below.

2. Initial and annual refresher HW training is required for all personnel in this Section. For the purpose of these guidelines, only those personnel directly involved in HW handling, storage and disposal will be subject to the HW training documentation requirements of RCRA. A special HW training record, i.e., Appendix (A) Part I will be developed for the following personnel:

a. All Hazardous Material Disposal Officers (HMDO), Hazardous Material Disposal Coordinators (HMDC), and alternate HMDO's and HMDC's.

b. Defense Reutilization and Marketing Officer (DRMO) and subordinate personnel routinely involved in HW handling, storage, turn-in and disposal.

c. Activity personnel involved in transportation of HW required for the implementation of this Order.

d. Personnel assigned to work places meeting the definition of HW generators, HW accumulation areas or satellite HW accumulation areas and involved in one or more of the following:

- (1) Collection, handling, storage and transportation of HW.
- (2) Inspection, and related follow-up, of HW handling/storage areas.
- (3) Response to HW spills and related emergencies.
- (4) Preparation and submittal of HW turn-in documents.

3. Other activity personnel providing professional and technical support to HW management include the following:

- a. Fire Protection personnel
- b. Safety specialists
- c. Environmental staff
- d. Industrial hygienists

Preparation of Appendix A for these staff specialists and emergency personnel is not required. Duties and training provided to these individuals will consist of standard position descriptions and civilian personnel records.

4. Responsibility for providing specialized HW training required for compliance with RCRA is assigned to Assistant Chief of Staff, Facilities. The following officials are responsible for notifying Assistant Chief of Staff, Facilities of specialized training requirements of their subordinates and other personnel as shown.

- a. The DRMO for self and subordinates
- b. The Assistant Chief of Staff, Logistics for subordinates.

ENCLOSURE (3)

c. HMDC's for personnel shown in 2d above within HMDC's cognizance

d. Director, Natural Resources and Environmental Affairs Division (NREAD) for subordinates and primary and alternate HMDC's and HMDO's.

5. Organizational commanders are responsible for developing and implementing plans and procedures to provide RCRA required training and maintain records outlined in Appendix A. Organizational commanders will ensure that all new/newly assigned personnel are provided appropriate HW training and close supervision required to comply with RCRA and applicable personnel safety fire prevention and occupational health standards. Organizational commanders will notify HMDC's of HW training requirements. Notification will include names and addresses of persons to be trained and an accurate description of the training required. HMDC and Assistant Chief of Staff, Facilities representative will coordinate the scheduling and funding of specialized HW training.

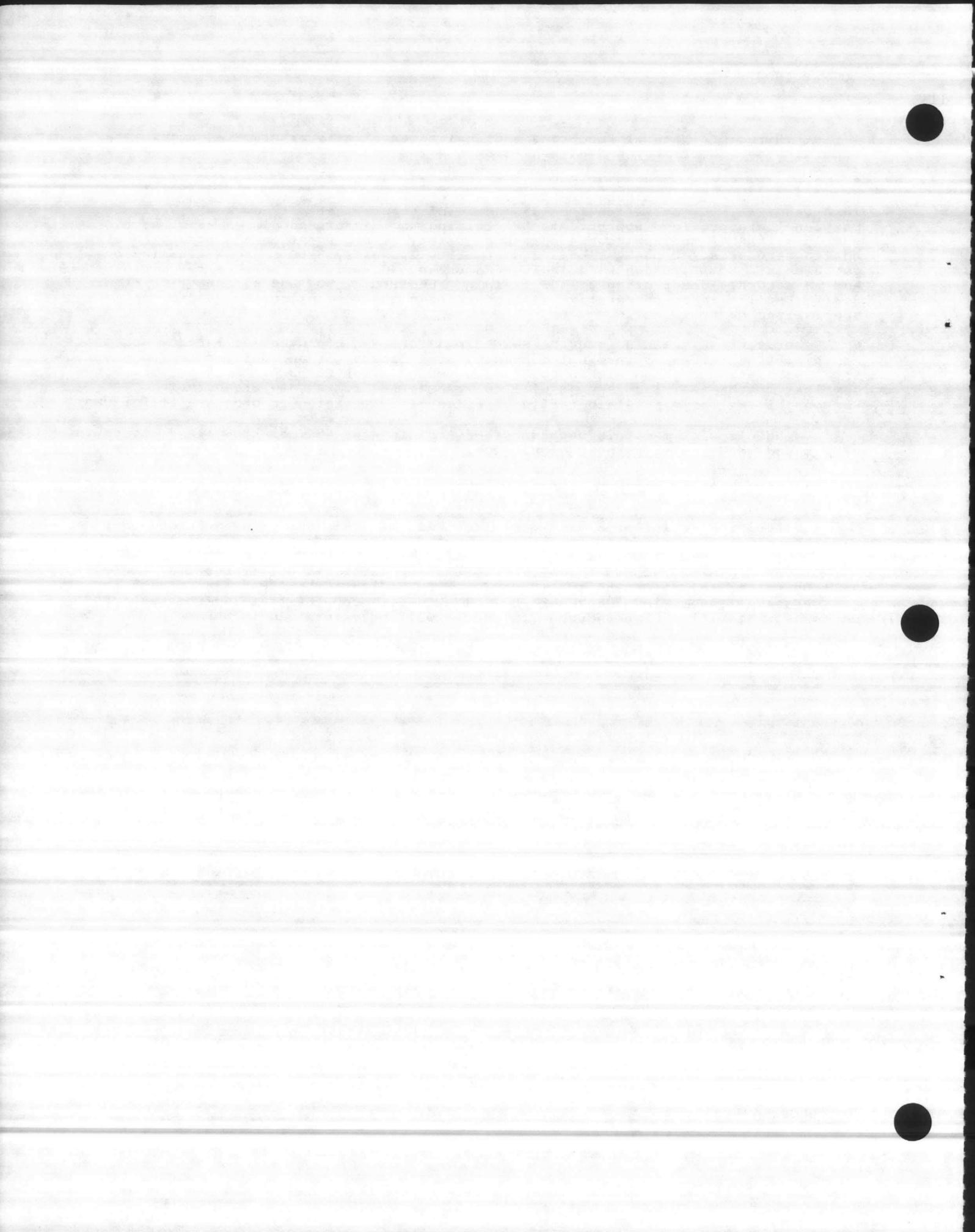
6. Records of HW training must be maintained for each employee for three years after employee transferred or terminated, except as follows: if an employee is transferred to a HW related position within the Camp Lejeune/Marine Corps Air Station, New River complex, the HW training records will be transferred to the new organization. Responsibility for maintaining official files of HW training records are as follows:

a. HMDC's will maintain records of HW training for HMDC's, HMDO's and alternate HMDC's and HMDO's within their cognizance.

b. DRMO will maintain HW training records for all employees identified in paragraph 2b above.

c. Assistant Chief of Staff, Logistics will maintain HW training records for all subordinates involved in activities identified in paragraph 2c above.

d. HW training records for all employees identified in paragraphs 2(a) - 2(d) will be maintained on Appendix A, Part I. HMDO will maintain HW training records for personnel identified in paragraph 2(d) above. A copy of training records for personnel identified in paragraph 2(d) above will be maintained in HWMSOP.





UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

80 11090.1B
MAIN/DDS/th
28 May 1981

BASE ORDER 11090.1B

From: Commanding General
To: Distribution List

Subj: Oil Pollution Prevention and Abatement and Oil and Other Hazardous Substances Spill Contingency Plan

Ref: (a) MCO P11000.8A
(b) Resource Conservation and Recovery Act (RCRA) of 1976 (NOTAL)
(c) Clean Water Act (NOTAL)
(d) Oil Spill Prevention Control and Countermeasure Plan of 10 June 1978, Camp Lejeune, NC (NOTAL)

Encl: (1) Oil and Hazardous Material Spill Prevention, Containment, Cleanup and Disposal Guidelines
(2) Oil and Other Hazardous Material Spill Contingency Plan

1. Purpose. To revise existing oil and other hazardous material related pollution abatement and prevention procedures for Marine Corps Base, Camp Lejeune and Marine Corps Air Station (Helicopter) (MCAS(H)), New River and to assist the Commanding General in the implementation of reference (a) with respect to pollution abatement.

2. Cancellation. 80 11090.1A.

3. Policy. It is the continuing policy of the Commanding General to actively participate in environmental pollution abatement, to take positive planning and programming action to abate and correct oil and other hazardous materials, related pollution problems and to incorporate appropriate pollution control and prevention facilities in all new construction aboard this installation. The intent of this policy is to carry out the applicable measures of references (a), (b), (c) and (d) and to prohibit the discharge of oil, oily mixtures and other hazardous substances except in designated areas by authorized personnel.

4. Responsibilities

a. Base Maintenance Officer has overall responsibility for:

(1) Maintenance of water pollution abatement facilities and the central storage and related collection and transportation of waste petroleum products.

(2) Providing personnel required for routine monitoring, surveillance, upchannel reporting and enforcement of unauthorized discharges of oil and other hazardous materials and related significant environmental problems of an ongoing nature involving the handling and disposal of petroleum products and other hazardous materials regulated by references (a), (b) and (c).

b. Commanding Officers/Area Commanders are charged with the responsibility of preventing spillage and other unauthorized discharge of oil and other hazardous materials within their own areas and will develop and implement plans and procedures which are consistent with applicable regulations and enclosures (1) and (2) for preventing, reporting, containing and cleaning up such spillage or unauthorized discharge.

c. Director, Natural Resources and Environmental Affairs Division, Base Maintenance Department or his representative will assume responsibility of On-Scene Coordinator (OSC) upon arrival at the scene of an oil or other hazardous material spill in accordance with procedures outlined in references (a) and (b) and enclosure (2).

d. Base Fire Chief or his senior representative will provide initial response and other assistance with any spill of oil or other hazardous material as outlined in enclosure (2), until a verification is made that the reported spill has occurred in an aircraft operating area aboard MCAS(H), New River. If the latter situation exists, the Base Fire Chief will provide a standby crew to assist, if the crash crew MCAS(H), New River is unable to contain the spill within the aircraft operating area.

e. Crash Crew, MCAS(H), New River will develop and implement a written procedure for the initial response to and containment and cleanup of oil and other hazardous materials spills in aircraft operating areas aboard MCAS(H), New River. Procedures will be consistent with applicable regulations and enclosure (2).

5. Action. Discharge of oils or other hazardous materials on or into the grounds and streams of this installation is prohibited. Cognizant officers will take necessary action to assure compliance. Commanding Officers/Area Commanders shall conform to the standards and criteria set forth in enclosures (1) and (2).

80 11090.1B

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6. Applicability. Having received the concurrence of the Commanding Generals, 2d Marine Division, FMF; 2d Force Service Support Group, (Rein), FMFLANT; and the Commanding Officers of the Marine Corps Air Station (Helicopter), New River and tenant units; Naval Regional Medical Center; and Naval Regional Dental Center, this Order is applicable to those Commands.

J. R. Fridell
J. R. FRIDELL
Chief of Staff

DISTRIBUTION: A
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OIL AND HAZARDOUS MATERIAL SPILL PREVENTION, CONTAINMENT, CLEANUP, AND DISPOSAL GUIDELINES

1. The prevention of oil and hazardous-material spills and the resultant environmental damage is the responsibility of all Commanders.
2. All Commanders and Department Heads will publish and prominently post directives setting forth detailed policies and procedures for the control and prevention of oil and hazardous-substance pollution specifically applicable to their organization.
3. All Commanders and Department Heads will take the following actions:
 - a. Take positive measures to prevent spills of oil and hazardous substances to include a review of the Command's maintenance and operational procedures.
 - b. Conduct frequent inspections of areas and facilities assigned to ensure compliance with published procedures.
 - c. Establish immediate action procedures for the amelioration of pollution which may result from oil and hazardous-substance spills, to include the stocking of materials required to carry out the procedures.
 - d. Ensure that all personnel within their Command are thoroughly indoctrinated regarding the environmental impact of oil and hazardous substance spills and proper disposition of oil and hazardous substances.
 - e. Encourage maximum reuse of technically contaminated fuels by multifuel-engine powered tactical vehicles.
4. The following guidelines are generally applicable to garrison operations:
 - a. Contaminated fuels which cannot be burned in tactical vehicles and other used petroleum products, except gasoline, will be collected in a tank of at least 250-gallon capacity equipped with a funnel, strainer and cover to prevent entrance into the tank of trash, water and other foreign matter. When the container requires emptying, the Officer in Charge (OIC) will notify the Base Maintenance Department (Telephone 5909). The Base Maintenance Department will dispatch a vehicle to remove the waste oil. In the event of an emergency 55-gallon drums may be used as a temporary expedient storage container for waste oil.
 - b. Waste lubrication grease will be collected, stored in suitable containers and disposed of in accordance with instructions provided by Base Maintenance Department representative. Send request via Chain of Command to the Base Maintenance Officer.
 - c. Oil-saturated soil in the vicinity of oil and petroleum storage areas should be removed to the sanitary landfill and replaced with fresh earth.
 - d. To dispose of contaminated gasoline contact the Base Fire Department (Telephone 3004).
 - e. Disposal of hazardous waste and other hazardous substances such as acids, poisons and solvents through any drainage system to include sinks, wash racks, storm drains and natural drainage systems is specifically prohibited. These products will be segregated and stored in suitable containers and will be disposed of in accordance with instructions provided by Commanding General, Marine Corps Base, Camp Lejeune.
 - f. Petroleum products containers will be disposed of at the sanitary landfill, or recycled, if appropriate, with the exception of 55-gallon drums and durable metal containers which will be disposed of through the Defense Property Disposal Officer, Building 906.
 - g. Personnel changing private owned vehicle (POV) oil on Base will use established Base Special Service facilities and deposit waste oil in one of the authorized collection tanks on Base and the Air Station.
 - h. Oil and gasoline storage containers larger than 550-gallon capacity will be diked to include a drainage line and valve which will be locked. The latter will be operated only by personnel authorized by the Unit Commander.
5. Field operations will comply with the guidance enumerated in the following subparagraphs:
 - a. All tactical refueling systems installed on Base must first be approved by the Base Maintenance Officer.
 - b. Fuel stored in tactical refueling systems will be properly diked, as required by current regulations. As a general rule, the dike must be capable of containing at least the volume of the container stored within it.
 - c. When using fuel tanker vehicles:
 - (1) Hoses, nozzles and connections will be checked frequently for serviceability to avoid leakage of fuel.
 - (2) Refueler operators will stay with the vehicle during refueling operations.
 - (3) Tanker vehicles containing fuel will be parked in such a manner as to avoid the possibility of spilled fuel entering natural or man-made drainage systems.
 - (4) During recirculation operations, nozzles will be secured to the vehicle.
 - (5) All waste petroleum products generated during field exercises will be stored (55-gallon drums, etc.) and disposal instructions obtained from the Director, Natural Resources Division, Base Maintenance Department (451-5003).

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1. Reporting Spills of Oil and Other Hazardous Substances

a. Materials Classification - The following products are examples of oil compounds or hazardous substances which must be reported if spilled on the ground or water in any amount:

Lube Oils	JP-4 & JP-5 Fuels	Paint Thinner	No. 6 Fuel Oil
Gasoline	Hydraulic Fluid	Organic Solvents	
Kerosene	Acids	Cleaning Solutions	
Lube Grease	No. 2 Fuel Oil	Poisonous Chemicals	

b. Reporting Procedures - All spills of oil or hazardous materials shall be reported immediately to the Base Fire Department Phone 3333 (on base) or 451-3333 (off base). The report shall include location (Building Number) of spill, substance spilled and the approximate amount. All spills occurring at Marine Corps Air Station (Helicopter), New River will also be reported to the Station S-4 (455-6068 - 455-6518) during normal working hours and to the Station Officer of the Day after normal working hours (455-6111).

c. Posting of Oil Spill Procedure - Signs shall be posted in every building, tank location and field service location where oil or hazardous materials are used. The sign shall have a yellow background with black lettering indicating the following information:

IN CASE OF AN OIL OR HAZARDOUS MATERIAL SPILL
CALL BASE FIRE DEPARTMENT
ON BASE 3333/OFF BASE 451-3333
NOTIFY YOUR COMMANDER/SUPERVISOR IMMEDIATELY

d. Initial Containment Procedure - Remain in area - - - Do Not Wash Down With Water. - - - Keep Personnel Out of the Area - - - Block Runoff with Earth Materials to Prevent Spreading, when possible.

2. Response to Spill

a. Fire Department - Fire Department shall dispatch a regular fire fighting unit to the scene of a reported spill. The Base Fire Chief or his senior representative shall report to the scene as soon as possible. Dispatcher will immediately notify the Base Fire Chief or his senior representative who will perform the following duties:

(1) Assume the role of On-Scene Coordinator (OSC).

(2) Take all necessary immediate steps to contain the spill, eliminate any fire hazards and protect all personnel from exposure and request the assistance of the Base Safety Officer, if required (See page 4, Enclosure (2)).

(3) Notify the Natural Resources and Environmental Affairs Director (Telephone 5003) of the spill location and the nature and quantity of spilled materials.

(4) Evaluate the spill situation and request necessary logistical support from the Base Maintenance Officer to contain the spill and facilitate the cleanup and recovery of the spilled materials.

(5) OSC duties shall transfer to the Director, Natural Resources and Environmental Affairs upon his arrival at the scene. (See page 4, Enclosure (2) for Personnel and Public Safety Coordination).

b. Base Maintenance Officer

(1) Base Maintenance Officer shall maintain the inventory of materials and equipment as established in Appendix A of enclosure (2).

(2) Base Maintenance personnel shall respond immediately to the request of the OSC with men and equipment requested.

(a) Direct supervision shall be from the OSC.

(b) Maintenance personnel shall remain at the spill scene until authorized to depart by the OSC.

c. Natural Resources and Environmental Affairs Division

(1) The Director or his authorized representative shall proceed to the scene and assume the duties of the OSC. The duties shall include the following categories:

(a) Direct all containment and cleanup activities.

(b) Report oil spills that discharge into the inland waters or coastal waters to the following: Base Maintenance Officer; Assistant Chief of Staff, Facilities, Marine Corps Base; Marine Safety Officer, U. S. Coast Guard, Wilmington, North Carolina and the Environmental Regulatory Agencies, as required.

(c) Request U. S. Coast Guard assistance for spills into waters that cannot be contained promptly by joint efforts of the Fire Department and Base Maintenance crews.

(2) The Natural Resources and Environmental Affairs Division Director or his representative shall remain at the scene of the spill until all contaminant is properly contained and the danger of oil contamination of waterways is eliminated.

(3) At the conclusion of all cleanup operations, the official report submitted to the Environmental Protection Agency (EPA), Region IV, shall be prepared in accordance with requirements of Federal Water Pollution Control Act and EPA regulations in effect at the time. The report shall be transmitted to EPA through the directives of the Commanding General.

3. Spill Containment and Cleanup

a. Small Spills (less than one gallon)

(1) Cause: Gasoline or fuel oil spills at fueling locations occur by overfilling or blow back from the tank receiving the fuel.

(2) Reporting: This type of spill requires reporting to the Office of Natural Resources and Environmental Affairs (Phone 1-919-451-5003). The fuel spill must be promptly cleaned up by the person at the scene.

(3) Containment Procedures:

(a) DO NOT FLUSH INTO STORM SEWER OR DRAINAGE DITCH.

(b) Cover entire spill with sand or absorbent material from storage bin or container. Add material as liquid appears in the surface of the sand or absorbent material.

(c) Cleanup contaminated sand or absorbent material with broom and shovel placing it in a container (metal) for disposal or possible reuse. The container shall be labeled "Waste Oil Refuse".

(d) If storage bin of sand or absorbent material is less than one-half full after using, call Base Maintenance Department (3001) to inform them of the location needing additional material.

(e) Reapply a second coat of sand or absorbent material in a very light layer to assure all gasoline or fuel oils have been blotted up. Brush material back and forth over the area and then sweep up completely. This material can be replaced in the fresh storage bin rather than depositing it in the "Waste Oil Refuse" container.

b. Spills on Concrete Aprons (more than one gallon)

(1) Reporting: Call Base Fire Department

(2) Containment Procedures:

(a) DO NOT FLUSH INTO STORM SEWER OR DRAINAGE DITCH.

(b) The person on-site shall erect a two-to-three inch high sand or earth dam on the concrete or at the edge of the concrete below (downstream) the direction that the spill is flowing. This is the first step in containment.

(c) Apply sand or absorbent materials that are available around the perimeter of the spill until the Fire Department arrives. Keep other personnel away from the area.

(d) Fire Department shall continue abatement methods using equipment available until the Director of Natural Resources and Environmental Affairs Division or his representative arrives to determine further containment and cleanup requirements.

(e) Base Maintenance personnel shall install dams, straw barriers, pumping equipment and other abatement or cleanup equipment as directed by the OSC.

c. Spills on Ground (more than one gallon)

(1) Reporting: Call Base Fire Department

(2) Containment Procedures:

(a) DO NOT FLUSH INTO STORM SEWER OR DRAINAGE DITCH.

(b) The person on-site shall erect a minimum three-inch high sand or earth dam below (downstream) the direction that the spill is flowing. The dam should be made higher if the liquid pool behind the temporary dam rises to within two inches of the top. A trench or sump may be used in lieu of a dam. This is the first step in containment that must be taken promptly to prevent spreading into surface waters.

(c) Apply sand or absorbent materials that are available around the perimeter of the spill until the Fire Department arrives. Keep other personnel away from the area.

(d) Fire Department shall continue abatement methods using equipment available until the Director of Natural Resources and Environmental Affairs Division or his representative arrives to determine further containment and cleanup requirements.

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(e) Base Maintenance personnel shall install dams, straw barriers, adsorbents, pumping equipment and other abatement or cleanup equipment as directed by the OSC.

d. Spills Entering Storm Drainage System

(1) Reporting: Call Base Fire Department and emphasize that the liquid has entered a catch basin, manhole, drainage ditch, or any structure (pit) below ground.

(2) Containment Procedures:

(a) DO NOT ADD WATER TO FLUSH OUT STORM SEWER OR STRUCTURE.

(b) The person on-site shall attempt to erect a sand or earth dam around or cover with polyethylene or other plastic materials the manhole or catch basin to prevent further entrance of liquid into the structure. This is the first step in containment that must be taken promptly to minimize the quantity of liquid that will be discharged into surface waters.

(c) The person on-site shall apply sand or absorbent materials that may be available around the perimeter of the spill and at the manhole or catch basin until the Fire Department arrives.

(d) Base Maintenance personnel shall place oil booms across storm drains to prevent further discharge. Public Works Department will develop maps of drainage systems required for siting booms. After spill is contained, cleanup will be initiated. Action may include the following:

1 Inspect downstream manholes for evidence of oil progression toward discharge. If storm system has a very low flow, install straw barrier or absorption dam inside manhole.

2 Where practical, install plug in upstream side of manhole, to contain in the pipe system.

3 If the drainage system has an open ditch, install straw bale dams or absorption dam to collect spilled materials.

4 Isolate streets with contaminated manhole to prevent fires or explosions.

(e) The Director, Natural Resources and Environmental Affairs Division, or his representative shall determine further containment and cleanup requirements after arriving on the scene.

(f) Base Maintenance personnel shall install dams, straw barriers, adsorbents, pumping equipment and other abatement and cleanup equipment as directed by the OSC.

e. Spills Entering Surface Waters

(1) Reporting: Call Base Fire Department and emphasize that the liquid was discharged directly into the surface waters.

(2) Containment Procedure:

(a) Person at the site should check the source of discharge to be assured that no further discharge can occur. Close valves, remove hose, or isolate the source from causing any further release of materials.

(b) Do not allow boats or equipment to enter the surface waters where the spill has occurred. If surface type oil adsorbents are available, begin spreading this material wherever an oil skim is observed. Do not enter the water to apply this material until the Fire Department arrives.

(c) Fire Department shall continue abatement methods using equipment available until the Director of Natural Resources and Environmental Affairs Division, or his representative arrives to determine further containment and cleanup requirements.

(d) Base Maintenance personnel shall install booms, skimmers, pumps and other abatement or cleanup equipment as directed by the OSC.

4. Responsibilities for Ensuring Personnel and Public Safety

a. Overall responsibility for ensuring the safety of personnel involved in the containment and cleanup of hazardous material spill is assigned to the Base Fire Chief or his senior representative. The Base Fire Chief representative shall continue to monitor the situation and will provide required standby personnel and equipment. The Base Fire Chief representative will request the assistance of the Base Safety Officer as needed. The Base Fire Chief representative shall keep the OSC informed of any safety considerations affecting the containment and cleanup of the spill. In the event of imminent hazard to personnel involved in the spill cleanup or to the public, Base Fire Chief representative shall take appropriate action. The OSC shall assist the Base Fire Chief representative implement safety procedures required.

b. Base Safety shall dispatch a safety representative to the spill scene upon request from the Base Fire Chief representative. The Base Safety representative will remain at the scene until advised by the Base Fire Chief representative that assistance is no longer required. Base Safety representative will monitor all activity at or near the spill and make appropriate recommendations to the Base Fire Chief representative.

MATERIALS AND EQUIPMENT FOR OIL SPILL
CONTAINMENT AND COUNTERMEASURE

<u>Item No.</u>	<u>Description</u>	<u>Quantity</u>
1.	Gasoline engine driven (portable) trailer mounted diaphragm pump with sectional suction and discharge hose - minimum capacity 25 gallons per minute.	2
2.	Sectional aluminum oil boom	
3.	Inflatable oil barrier, Whittaker Expandi self-inflating	300 L. F.
4.	Collapsible bag for field filling of collected oil-250 gallon capacity	2
5.	Oil skimmer (portable) type for water floating oil pick-up	1
6.	Baled hay or straw with wire or nylon baling (located at strategic areas)	200 Bales
7.	Steel fence stakes (6 feet long)	50 each
8.	Woven wire mesh (chicken wire) 3ft. width 4ft. width	200 L.F. 100 L.F.
9.	Sledge hammer - 10 lb. 5 lb. 2½ lb.	3 5 5
10.	Shovels - Long handle round point Long handle flat blade Short handle round point Short handle flat point	5 5 5 5
11.	Oil Absorbent Compound - for water spill clean up	2000 lbs.
12.	Oil Absorbent Compound for ground spill clean up -- Randustrial P-218 Oil Absorbent (55-gallon drum)	25 drums
13.	Nylon rope - ½" diameter ¾" diameter 3/4" diameter	200 L.F. 400 L.F. 400 L.F.
14.	Oil Sorbent Material - 3M, Conwed or Grefco	500 lb.

HAZARDOUS WASTE SPILL AND RELATED EMERGENCY
CONTINGENCY PLAN FOR

(NAME OF FACILITY)

BLDG. #

A. IN THE EVENT THAT A HAZARDOUS MATERIAL/HAZARDOUS WASTE SPILL, FIRE, RELEASE OF TOXIC FUMES OR SIMILAR EMERGENCY OCCURS, THE FOLLOWING ACTION WILL BE TAKEN:

- FIRST, IMMEDIATELY ALERT EMPLOYEES/PERSONS IN THE IMMEDIATE AREA OF THE EMERGENCY AND BEGIN EVACUATION OF ANY PERSONS SUBJECT TO INJURY BY THE EMERGENCY. EVACUEES SHALL ASSEMBLE AT _____.
- IMMEDIATELY, NOTIFY THE BASE FIRE DEPARTMENT, EXTENSION 3333. PROVIDE THE FIRE DEPARTMENT DISPATCHER WITH THE BEST ESTIMATE/AVAILABLE KNOWLEDGE OF THE AMOUNT AND TYPE OF HAZARDOUS SUBSTANCE SPILLED; LOCATION OF THE EMERGENCY; WHETHER OR NOT ANY PERSONS HAVE BEEN OR ARE LIKELY TO BE INJURED AND ANY OTHER INFORMATION HELPFUL TO EMERGENCY RESPONSE PERSONNEL. STAY ON THE LINE WITH THE DISPATCHER AND FOLLOW DISPATCHER'S INSTRUCTIONS IF YOU CAN SAFELY DO SO. CONTINUE TO ADVISE DISPATCHER OF CHANGING CIRCUMSTANCES.
- ASSIGN ONE PERSON TO MEET THE EMERGENCY VEHICLE AND GUIDE FIRE DEPARTMENT PERSONNEL TO SPILL/EMERGENCY SITE.
- BEGIN ASSEMBLING EMERGENCY SUPPLIES AND EQUIPMENT AVAILABLE AT THE WORK SITE. A LIST OF THESE ITEMS, THEIR LOCATION AND PERSONS RESPONSIBLE FOR PROVIDING THEM ARE CONTAINED IN ATTACHMENT (A).
- IF THE CIRCUMSTANCES OF THE EMERGENCY PERMIT, BEGIN CONTAINMENT OF THE SPILL BY SHUTTING OFF VALVES, CONSTRUCTION OF EARTHEN DIKES AND APPLICATION OF ABSORBENT. ONLY PERSONNEL TRAINED AND AUTHORIZED BY THE OIC SHALL BE ALLOWED TO ENTER THE IMMEDIATE AREA OF THE SPILL. SECTION D PROVIDES A LIST OF PERSONNEL AUTHORIZED TO ENTER THE AREA AND ACTIONS THEY ARE EXPECTED TO TAKE. UPON ARRIVAL AT THE SCENE, THE FIRE DEPARTMENT WILL CONTROL ACCESS TO SITE.
- UNDER NO CIRCUMSTANCES SHALL PERSONNEL UNDERTAKE ANY ACTION WHICH WOULD EXPOSE THEM TO TOXIC CHEMICALS, FUMES AND GASES UNLESS THE PROPER TYPE(S) OF WELL MAINTAINED PERSONNEL PROTECTIVE EQUIPMENT IS USED.

B. THE LATEST REVISION OF THE BASE SPILL CONTINGENCY ORDER, BO 11090.1, IS PROVIDED AS ATTACHMENT (B). THE SENIOR FIRE DEPARTMENT OFFICIAL ON SCENE WILL SERVE AS THE NAVY ON-SCENE-COMMANDER. ALL MARINE CORPS, NAVY AND CIVILIAN PERSONNEL ON THE SCENE ARE EXPECTED TO PROVIDE AVAILABLE RESOURCES AS THE ON-SCENE-COMMANDER DEEMS NECESSARY TO ABATE THE EMERGENCY AND PROTECT LIFE AND PROPERTY.

ITEM DESCRIPTION/LOCATION/
NAME AND PHONE NO. OF
PERSON RESPONSIBLE FOR
MAINTAINING AND PROVIDING
ITEM

TYPES OF HAZARDOUS MATERIAL
AND WASTE TO BE USED ON

Inventory of available
Hazardous Material/Waste
Spill Response, and Clean-
up Equipment and Supplies

ATTACHMENT (A)



UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

BO 11090.3
MAIN/DDS/th
18 May 1982

BASE ORDER 11090.3

From: Commanding General
To: Distribution List

Subj: Operation and Maintenance of Oil Pollution Abatement Facilities

Ref: (a) NPDES Permit No. NC0003239, Marine Corps Base, Camp Lejeune (NOTAL)
(b) Clean Water Act (NOTAL)
(c) BO 11090.1B

1. Purpose. To publish responsibilities for the operation and maintenance of pollution abatement facilities required to be in compliance with federal and state water quality standards established under references (a) and (b).

2. Background

a. Reference (c) established policy and procedures regarding the prevention and abatement of pollution resulting from accidental spills or unauthorized discharge of petroleum oil and lubricants (POLs) (e.g., diesel fuel, kerosene, lube oil, etc.) and other hazardous material or waste (e.g., mogas, paint; solvents, acid, etc.). Addressees should be aware that a major part of the oil related pollutants being discharged into storm drains and streams comes from washrack runoff and from maintenance shops where leaks and spills of POLs during routine maintenance operations are not adequately controlled and cleaned up.

b. Facilities are being constructed at Camp Lejeune and Marine Corps Air Station (Helicopter), New River to provide compliance with references (a) and (b). These facilities connect oil contaminated wastewater drainage lines to the sanitary sewer. Oil/water separators, grit chambers, storm-water storage tanks and related devices are provided to reduce the amount of POLs in the wastewater and to prevent relatively small oil spills from entering and damaging the sanitary sewer and sewage treatment plants. Maintenance shops and other facilities constructed in the future must be equipped with pollution abatement devices in order to comply with reference (a).

c. Explosions, gases, fumes, etc. resulting from discharge of gasoline and other flammable or hazardous material into the sanitary sewer present a serious threat to personnel safety and may result in severe damage to facilities and equipment. Further, excessive quantity of POLs entering the sanitary sewer will have a significant impact on effective sewage treatment thus causing a violation of environmental standards. Such discharges (spills) are regulated by reference (c) and must be reported to the Base Fire Department (451-3333), immediately.

d. Washracks and related pollution abatement structures for tactical and tracked vehicles present ongoing maintenance problems due to the amount of soil washed from vehicles. Drainlines on all devices are relatively small in order to control rate of storm-water entering sewer. Keeping these drains open and flowing will require proper operation and routine maintenance.

3. Responsibilities. Operation, maintenance and repair of pollution abatement facilities:

a. Using organization will:

- (1) Train personnel to operate pollution abatement facilities located at the work site.
- (2) Ensure that cans, oil filters, rags, brushes, litter or other foreign objects are not discarded on washracks or into oil/water separators, grit chambers, storm-water bypass chambers, storm-water storage tanks, etc.
- (3) Ensure that used oil is disposed of into properly marked waste oil containers and not on the ground or into oil/water separators, grit chambers, storm-water bypass chambers, etc.
- (4) Ensure that neither gasoline nor hazardous waste (e.g., solvents, degreasers, paint, etc.) are disposed of into waste oil tanks/collection systems.
- (5) Clean up oil contaminated soil at the work site (contact Base Maintenance Division 451-2083/1690 for disposal instructions).
- (6) Notify Base Maintenance Division (451-3001) of required maintenance and repair. Marine Corps Air Station (Helicopter), New River commands will notify the Station S-4 Officer of any required maintenance and repair.
- (7) Notify Base Maintenance Division (451-5909) of waste oil containers that require emptying.

80 11090.3
18 May 1982

b. Base Maintenance Officer will:

(1) Provide periodic inspection of maintenance and operation of pollution abatement facilities and initiate action to correct maintenance discrepancies. Report operational deficiencies to the using organizational commanding officer. Close the facility when it is apparent that continued operation will immediately jeopardize the capability of the sewage treatment facility.

(2) Service used (waste) oil collection facilities to include pumping out oil storage tanks at regular intervals and initiating action required to maintain and repair tanks and related signs, funnels, gauges and drainlines.

(3) Service oil/water separators, grit chambers, storm-water bypass chambers and storm-water storage tanks to include removing oily waste and solids, unclogging drainlines and initiating action to make needed repairs.

(4) Operate, maintain and repair wastewater lift stations and related mechanical equipment.

(5) Operate, maintain and repair pollution abatement facilities associated with swimming pools, heating plants and water treatment plants.

c. Public Works Officer will:

(1) Incorporate appropriate pollution abatement devices and structures in facilities constructed aboard Camp Lejeune, as required to provide compliance with the requirements of references (a), (b) and (c).

(2) Review planned pollution abatement devices and structures with appropriate representatives of the Base Maintenance Officer in order to ensure compatibility with existing sewage collection and treatment facilities and maintenance programs.

4. Action. Commanding Officers/area commanders will take action required to assure that organizations and personnel assigned to shops and other facilities equipped with washracks, waste oil collection systems, oil/water separators and related pollution abatement structures are aware of the requirements of this Order. Commanding officers will investigate cases of unauthorized discharge (spills) of POLs or other hazardous material/waste by individuals or organizations within their cognizance and take action required to avoid recurrence of the discharge.

5. Applicability. Having received the concurrence of the Commanding Generals, 2d Marine Division, FMF; 2d Force Service Support Group, (Rein), FMFLANT; and the Commanding Officers of the Marine Corps Air Station (Helicopter), New River and tenant units; Naval Regional Medical Center; and Naval Regional Dental Center, this Order is applicable to those Commands.

J. R. Fridell
J. R. FRIDELL
Chief of Staff

DISTRIBUTION: A
8MAINO (100)



UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542-5001

BASE ORDER 5100.20

From: Commanding General
To: Distribution List

Subj: HAZARD COMMUNICATION PROGRAM

Ref: (a) 29 Code of Federal Regulations, Part 1910.1200
(b) MCO 5100.25

1. Purpose. The Hazard Communication Program is designed to ensure pertinent data concerning the safe usage of hazardous materials is made available to the users of those materials. The purpose of this Order is to establish a Hazard Communication Program at Marine Corps Base, Camp Lejeune and to set forth responsibility for administration of the program.

2. Background. The growing list of hazardous materials within the government supply system requires constant vigilance against unsafe handling, mixing, storing and disposal. Exposures to hazardous materials may cause or contribute to many serious health problems such as heart and lung disorders, kidney and liver damage, cancer, sterility, mutation and skin diseases. Some materials may also have the potential to cause fires, explosions, or other serious mishaps. It becomes imperative to protect the user, the general public, and the environment by regulating the identification, transportation, storage, handling and use of hazardous material by providing a communication program.

3. Definition. For the purpose of this Order, a hazardous material is any material which because of its quantity, concentration, physical, chemical or infectious characteristics may pose a substantial hazard to human health or the environment when used, released or spilled into the environment. This Order does not apply to any consumer products. A consumer product is any product with which department heads/organizational commanders/directors can demonstrate is used in the workplace in the same manner as normal consumer usage. Workers such as office workers, bank tellers, etc., who encounter hazardous materials only in non-routine, isolated instances are not covered by the provisions of this Order. This Order includes but is not limited to:

- a. Labeling of hazardous materials.
- b. Material Safety Data Sheets (MSDS) requirements.
- c. Personnel information and training, including training for non-routine tasks.
- d. Hazardous material inventory.
- e. Hazardous material information for contractors working aboard Marine Corps Base, Camp Lejeune.

4. Labeling

a. Hazardous material must be clearly identified throughout its history with particular emphasis on identification for the end user. The affixing of appropriate warning labels to containers is the most practical means of accomplishing this objective.

b. Manufacturers, importers, and distributors are required by reference (a) to ensure that each container of hazardous material shipped to the user is labeled with the identity of the hazardous chemical, appropriate hazard warning, and the name and address of the chemical manufacturer or importer.

c. Existing manufacturers labels on containers of hazardous materials shall not be removed or defaced unless the containers are immediately marked with the required label information as included in paragraph 4.b.

d. Upon removal from original shipping containers, the individual unit of packages of all hazardous materials must be immediately labeled as required in paragraph 4.b. Hazard labels shall be provided on each container prior to issue.

5. Material Safety Data Sheets (MSDS)

a. The MSDS is written or printed material which is designed to be a source of detailed information on chemical and physical hazards of material used in the workplace. The MSDS includes information on the specific identity of the hazardous product, its physical and chemical characteristics, known acute and chronic health effects and related health information, exposure limits, whether the material is considered to be a carcinogen, precautionary measures for handling, emergency first aid procedures, and the identification of the organization responsible for preparing information. Manufacturers are required to develop a MSDS for each hazardous material they produce and to furnish the appropriate MSDS to purchasers of the hazardous material.

b. Material Safety Data Sheets for all hazardous materials used must be readily available to personnel during each work shift.

c. Shop supervisors shall maintain copies of MSDS's covering hazardous materials used in their shops in a file or manual available to shop workers on all shifts. In addition to manufacturers MSDS's, the Assistant Chief of Staff, Logistics will have available the Hazardous Material Information System (HMIS) microfiche for hard print information on hazardous materials that are procured by national stock number.

6. Training

a. References (a) and (b) outline the basic operation and requirements for the Occupational Safety and Health Training Program. The objective of the training program is to reduce the incidence of job-related hazardous material exposure and delineate necessary protective measures. Reference (a) more specifically requires that personnel be provided with information and training on hazardous material in their work areas at the time of initial assignment and whenever a new hazard is introduced into the work area.

b. Hazardous material training must cover, at a minimum, information on the requirements of reference (a); the availability and details of this Order, including an explanation of the labeling requirements; an explanation of the MSDS, and how personnel may obtain and use the hazard information; the physical and health hazards of specific materials used in the work area; measures personnel can take to protect themselves, including personal protective equipment (PPE), engineering controls of the process, appropriate work practices, and emergency procedures; and methods that may be used to detect the presence or release of a hazardous material in the work area. Personnel must also be informed of the hazards of non-routine tasks that may take place in their work area.

c. Supervisory personnel will receive a minimum of two hours of documented formal training annually as required by reference (b) and as established by this Order. The training will be designed to prepare supervisors in complying with the labeling, MSDS, and inventory requirements of reference (a), as well as to assist them in ongoing subordinate personnel training.

d. All personnel involved in the handling or use of hazardous material must receive at a minimum one hour initial documented formal hazardous material training. Training must be updated when personnel are assigned to new areas or when shop processes change to introduce new chemical hazards to the work area. Shop supervisors will ensure that initial training is provided to personnel newly assigned to their areas. Updates of training due to process changes will be accomplished as necessary by shop supervisors during weekly standup safety meetings. Informal training and updating provided by the supervisor must be documented quarterly on a cumulative basis

and reported to the Civilian Personnel Division and Nonappropriated Fund Personnel Division quarterly for inclusion in the Official Personnel Folder. Training records for military personnel will be retained at the unit level.

7. Hazardous Material Inventory

a. A complete inventory of all hazardous materials used must be developed and maintained for each shop. This inventory will serve as a tool in the process of providing hazardous material information to personnel. The updated inventory listing will be printed at least quarterly and will include location and chemical or common name for each hazardous material, matching that found on appropriate corresponding MSDS's.

b. Maintenance personnel are frequently called upon to perform repair operations in areas where hazardous materials are present. They must have information about such materials and the potential dangers before they enter these areas in order to take the necessary precautions to protect themselves. Before assigning jobs in high hazard areas, maintenance supervisors should contact the Industrial Hygienist, extensions 5707/2/07, and Base Safety, extensions 3891/5725, for an evaluation of the hazards and requirements for work precautions. Supervisors of the Base Maintenance Division should contact the Base Maintenance Industrial Hygienist, extension 3046, for an evaluation and recommendations prior to job assignment in high hazard areas. High hazard areas include but are not limited to, areas in and around process and storage tanks, confined spaces, ventilation duct work and piping for chemical tanks, and storage compounds for hazardous materials.

8. Action

a. Department Heads/Commanders and Directors

(1) Appoint in writing a Hazardous Material Safety Officer (HMSO) for those units engaged in industrial operations, i.e., Facilities, Logistics, Special Services, the Dependent Schools Maintenance Section, etc. The HMSO may appoint in writing a Hazardous Material Safety Coordinator(s) (HMSC) to serve in the absence of and to assist the HMSO in order to provide continuity at the using unit level for hazardous material information, training, inventory, and MSDS control.

(2) Provide the Base Safety Manager, Industrial Hygienist and Base Fire Protection Division with updated list of HMSO's and HMSC's.

(3) Ensure that supervisors and HMSO's are trained in the use and interpretation of MSDS's to enable them to effectively provide the required training for subordinate personnel. MSDS training for HMSO's/HMSC's and supervisors is available through the Base Safety Office.

b. Assistant Chief of Staff, Logistics

(1) Implement procedures to ensure acquisition and distribution of MSDS's for all hazardous materials purchased, to include open purchase, BPA, etc.

(2) Maintain the HMIS and provide hard print copies of MSDS's to all Marine Corps Base and HMSO's and the Base Safety Manager upon request.

(3) Implement procedures to ensure that all containers of hazardous materials are labeled in accordance with reference (a) prior to issue.

c. Assistant Chief of Staff, Morale, Welfare and Recreation

(1) Implement procedures to ensure acquisition and distribution of MSDS's for all hazardous materials purchased by Morale, Welfare and Recreation Department.

(2) Coordinate with Assistant Chief of Staff, Logistics to obtain MSDS information from the Marine Corps HMIS.

(3) Forward copies of MSDS's received to Assistant Chief of Staff, Logistics to ensure inclusion of MSDS's in MSDS file.

g. Base Safety Manager

(1) Maintain on file MSDS's for all locally purchased, non-standard stock hazardous items, i.e., those procured in small quantities for local use, Blanket Purchase Agreements (BPA's), open purchase, etc., in support of the Hazardous Material Safety Training Program.

(2) Monitor the overall Hazard Communication Program by adequate inspections and surveys.

(3) Upon request, provide technical assistance to Marine Corps Base units in developing Hazardous Communication Program procedures.

(4) Provide support to the Civilian Personnel Division, Training Branch and Non-Appropriated Fund Personnel Division (NAFPD) by making available specific information and instructions on hazardous materials.

(5) Provide assistance to Department Heads/Commanders and Directors for training shop supervisors, and HMSO's.

e. Hazardous Material Safety Officer (HMSO)

(1) Hazardous Material Safety Officers will serve as the unit point of contact for all matters relating to hazardous materials.

(2) Compile and maintain a comprehensive inventory of hazardous materials utilized in each respective workplace.

(3) Ensure MSDS's are on file and current for each hazardous item identified on the unit inventory. Ensure acquisition of MSDS's on all nonstandard, nonstocked hazardous materials which are procured by open purchase. Copies of such MSDS's shall be forwarded to the Base Safety Manager.

(4) Ensure that safety and health education training is presented to all personnel working with hazardous materials to include awareness of the potential hazards involved, relevant systems of exposure, emergency treatment, precautions for safe use and disposal as well as PPE and controls appropriate to the situation. Information contained in MSDS's form the basis for this training.

(5) Maintain an adequate supply of "GENERIC" (fill in the blank) hazard labels to be affixed to any container into which a hazardous chemical is transferred from its original container. The label must contain the chemical name, hazard warning, and protection required.

f. Civilian Personnel Division/Director, Non-Appropriated Fund Personnel Division

(1) Provide training support in the development and implementation of a training program for all personnel who handle and use hazardous materials.

(2) Will maintain the training records for personnel as required by current directives.

g. Supervisors

(1) Will familiarize themselves with the hazards presented by each hazardous material used or stored in their cognizant area. This will be accomplished by frequent review and study of relevant MSDS's. The supervisor will be aware of material hazards, adverse effects, characteristics and protective measures required for each hazardous material encountered in their work area.

(2) Ensure that subordinate personnel are trained in accordance with references (a) and (b) as well as paragraph 6 of this Order.

(3) Provide and enforce the use of PPE needed to protect personnel from known or potentially adverse effects of hazardous materials.

(4) Ensure that all containers of hazardous material issued to and used in the shop are clearly marked with the identity of the contents and appropriate hazard warnings.

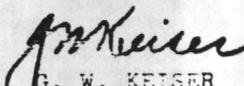
(5) Ensure that all process tanks, equipment and portable containers are clearly labeled with the name of the contents and appropriate hazard information.

(6) Ensure that all personnel read and understand all hazardous material labels, MSDS's, and other hazard information appropriate to the work area.

(7) Ensure that a copy of this Order is readily available to personnel upon request.

h. Resident Officer-in-Charge of Construction. Ensure all service and construction contracts under ROICC cognizance require a meeting between the contractor, a Base Safety representative and the affected shop supervisor prior to the contractor initiating work within the facility. The meeting will be scheduled for the purpose of informing the contractor of hazardous materials which their personnel may encounter and of appropriate work precautions and protective equipment. Ensure contracts also specify the contractor furnish the Base Safety Office, Industrial Hygienist and Base Fire Protection Division with a MSDS for each hazardous material the contractor will introduce into facility workplaces occupied by Marine Corps Base personnel and, further, ensure the contractor complies with the requirements of reference (a) for such materials.

10. Concurrence. This Order has been coordinated and concurred in by the Director, East Coast Commissary Complex.


G. W. KEISER
Chief of Staff

DISTRIBUTION: A





UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542-5001

BO 4555.1C
LOG
3 Aug 39

BASE ORDER 4555.1C

From: Commanding General
To: Distribution List

Subj: RECLAMATION AND UTILIZATION OF PRECIOUS METALS FROM SCRAP AND WASTE MATERIALS

Ref: (a) MCO 4555.3C

Encl: (1) Silver-Bearing and Gold-Bearing Scrap Descriptions
(2) DD 1348-1 Sample Turn-in Document

1. Purpose. To provide information and instructions in establishing an effective Precious Metals Recovery Program within Marine Corps Base, Camp Lejeune, North Carolina 28542.

2. Cancellation. BO 4555.1B.

3. Background. The reference requires activity commanders to designate a local Precious Metals Recovery Coordinator to internally implement, monitor, and coordinate the activity's Precious Metals Recovery Program as prescribed therein.

4. Information. While the Printing Plant, Photographic Laboratory, Medical and Dental Facilities are the most probable sources for recovery of silver from solutions used in processing photographic and x-ray film (fixing baths), there are other sources where silver bearing material is generated. Enclosure (1) contains a list of silver and gold bearing scrap descriptions.

5. Policy

a. Maximum participation in the Precious Metals Recovery Program is required by all Marine Corps activities, including photographic, medical laboratories, printing plants, etc. Expenses incurred by activities participating in the program are not reimbursable.

b. Generating activities are responsible for the transportation of precious metals scrap (film, recovery cartridges) and harvested silver to the local Defense Reutilization Marketing Office (DRMO). Transportation costs are not reimbursable.

c. The DRMO is responsible for accepting all excess and surplus precious metal or precious metal-bearing materials, including scrap or harvested silver generated by the military services.

6. Action

* a. In accordance with instructions contained in the reference, the Operations Officer, Assistant Chief of Staff, Logistics is designated as the Base Coordinator for the Precious Metals Recovery Program for commands located on Marine Corps Base, Camp Lejeune. All generating activities will provide the Base Coordinator a point of contact for their command. The Base Coordinator, guided by the instructions contained in the reference, will establish an effective Precious Metals Recovery Program for Marine Corps Base, Camp Lejeune and tenant commands. Tenant Commanders should also designate a precious metals coordinator to consolidate and monitor the precious metal recovery effort within their Commands (appointment shall be in writing and be an E-6 or above). Addressees are enjoined to cooperate with the Base Coordinator to the extent necessary to ensure that Marine Corps Base, Camp Lejeune, has an effective Precious Metals Recovery Program.

b. Those activities turning in precious metal bearing materials to DRMO (Building 906) will identify on the turn-in document (DD 1348-1) the type of metals being turned in and the precious metal content. The turn-in document will be prepared as shown on enclosure (2). After turn-in of material, DRMO will provide a receipted copy of the 1348-1 to the generating unit and the Base Coordinator.

* c. Activities generating precious metals bearing material (i.e, hyposolution) but not having a recovery unit at their activities will obtain written permission from the Base Coordinator Office prior to the transporting of any precious metals material to a recovery site. Once permission has been obtained, the owning activity will observe proper change of custody between the owning activity and the receiving activity. Change of custody should reflect the following information:

- (1) Date and Time.
- (2) Owing Activity/Name of Individual/Rank.
- (3) Receiving Activity/Name of Individual/Rank.
- (4) Name of Items being transferred.
- (5) Quantity, number gallons, pound, etc.

* d. All generating and/or processing (recovery) activities should have complete accounting records of all precious metals activity in their commands. The above procedure can be conducted utilizing a log book entry.

e. The DRMO will provide generating activities technical assistance, as required, to ensure visibility of precious metal generations, collection/recovery training requirements, and adequacy of collection/recovery methods, system, and equipment.

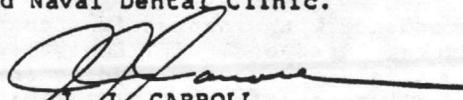
7. Summary of Revision. This directive has been revised and contains the following major changes:

a. Paragraph 6a. All precious metals coordinators will be appointed in writing (an E-6 or above).

b. Paragraph 6c. Permission must be obtained from the Base Precious Metals Coordinator prior to transporting hyposolution.

c. Paragraph 6d. A log record of all precious metals recovery should be maintained.

8. Concurrence. This Order has been coordinated and concurred in by the Commanding Generals, II Marine Expeditionary Force, 2d Marine Division, FMF, 2d Marine Expeditionary Brigade, FMF, 6th Marine Expeditionary Brigade, FMF, 2d Force Service Support Group, FMF and the Commanding Officers, 2d Surveillance Reconnaissance and Intelligence Group, Naval Hospital, and Naval Dental Clinic.


J. J. CARROLL
Chief of Staff

DISTRIBUTION: A

SILVER-BEARING AND GOLD-BEARING SCRAP DESCRIPTIONS

1. Silver-Bearing Scrap Designations

<u>Class</u>	<u>Estimated Silver Percentage</u>
CLASS A	90 (13.13) <u>1/</u>
Consists of used anodes, drillings from anodes and grain silver, wire for welding or brazing, silver flakes, silver extracted from spent hyposolution by the electrolytic process, and all other silver of a purity content of 90 percent or better.	
CLASS B	49 (7.15) <u>1/</u>
Consists of silver foil battery plates separated by magnesium plates and silver chloride sheets (primarily MK 61-0 and 67-1 batteries).	
CLASS C (Reserved)	
CLASS D	1 (1.15) <u>1/</u>
X-ray film, exposed industrial film and aerial film, millimeter film, and all types of shredded or cut-up film.	
CLASS E	1.5 (2.22) <u>1/</u>
Battery cell sections consisting of a plastic container (approximately 1/8 inch thick); some cells containing a silver chloride solution (primarily MK 53-0), 42-0, 58-0, and 66-0 batteries).	
CLASS F (Reserved)	
CLASS G (Reserved)	
CLASS H (Reserved)	
CLASS K	33 (4.81) <u>1/</u>
Silver-bearing amalgam.	
CLASS L	8 (1.14) <u>1/</u>
Silver-bearing plated electrical components, such as leads, capacitors, and other silver-plated or bonded materials.	
CLASS M	31 (4.47) <u>1/</u>
Silver sludge and silver-bearing ash.	

<u>Class</u>	<u>Estimated Silver Percentage</u>
CLASS N	10 (1.46) <u>1/</u>
Silver-bearing missile batteries encapsulated in epoxy-type plastic with metal cases and attachments.	
CLASS P	8 (1.14) <u>1/</u>
Silver recovery cartridge consisting of a spun metallic filter through which the spent hyposolution has been filtered.	
CLASS R	24 (3.50) <u>1/</u>
Desalter kits.	

1/ Conversion factors shown in parentheses when used as multipliers applied to the number of avoirdupois pounds of scrap will produce a reasonably accurate estimate of the silver content equated to troy ounces.

2. Gold-Bearing Scrap Designations

<u>Class</u>	<u>Description</u>	<u>Est. Gold % by Weight</u>
A	Dental Scrap	40.00% (5.8332)
A-1	Metallic (foil, leaf, wire, casting, and brazing alloy)	65.00% (9.4790)
A-2	Dental sweepings	15.00% (2.1875)
B	Electronic scrap (plated or washed)	0.40% (0.0583)
B-1	Integrated circuits/assembly and pins (not boards or transistors) (pins are ferro magnetic)	12.00% (1.7500)
B-2	Electronic circuits/assembly and strips	6.50% (0.9479)
B-3	Electronic hardware, pins and connectors	0.60% (0.0875)
B-4	Rivets (gold-plated)	0.50% (0.0729)
B-5	Electronic chassis parts	0.20% (0.0292)
C	Eyeglass frames (gold-filled)	4.00% (0.5833)
D	Buttons	0.90% (0.1313)

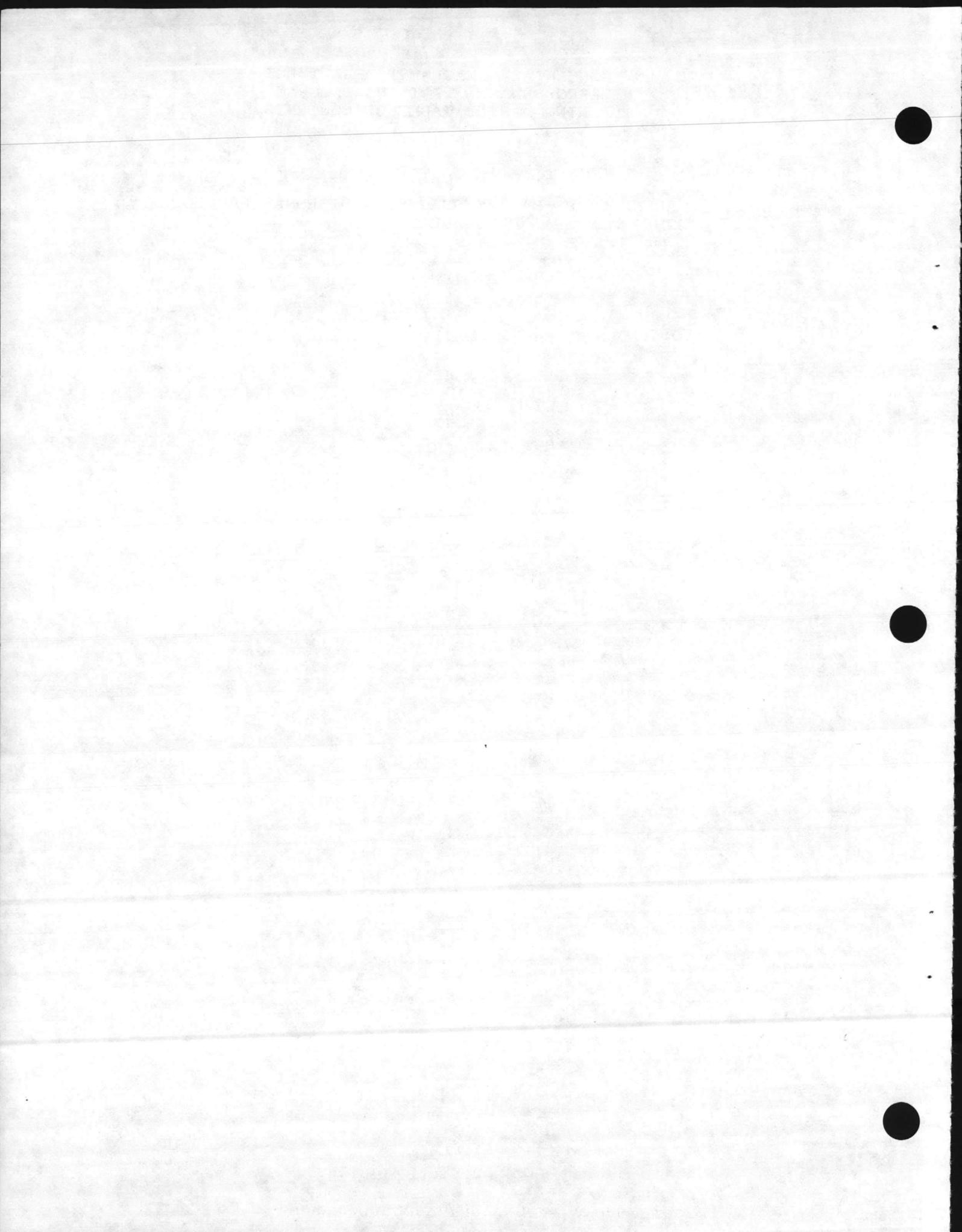
14

<u>Class</u>	<u>Description</u>	<u>Est. Gold % By weight</u>
E	Insignia and medals	0.10% (0.0146)
F	Gold solutions, 8.3 pounds per gallon (.7 troy ounces per gallon)	0.60% (0.0875)

ENCLOSURE (1)

ENVIRONMENTAL MANAGEMENT DEPARTMENT
HAZARDOUS WASTE TRAINING PROGRAM
TRAINING MANUAL TABLE OF CONTENTS

Section 2. MARINE CORPS BASE MESSAGES ON DISPOSAL PROCEDURES/
OTHER DISPOSAL PROCEDURES 79 -105





UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542-5001

IN REPLY REFER TO:

6240/3

NREAD

From: Commanding General, Marine Corps Base, Camp Lejeune

Subj: PROCEDURES FOR DISPOSAL/CONTAINERIZATION OF BATTERIES

Ref: (a) RCRA, part (b) permit, MCB, Camp Lejeune
(b) Code of Federal Regulations, title 49
(c) BO 6240.5A
(d) CG, MCB 0216212 Dec 87

Encl: (1) Mercury Batteries
(2) Nickel Cadmium Batteries
(3) Lithium Batteries

1. Enclosures (1), (2) and (3), establish procedures for containerizing and packaging several types of batteries which must be disposed of through the Defense Reutilization and Marketing Office (DRMO), as a hazardous waste, per references (a), (b), (c) and (d). These instructions do not address problems involving vented or damaged batteries which should be handled on a case by case basis per guidance of cognizant Hazardous Material Disposal Officer (HMDO) and Safety Officials.

2. Any method of packaging the subject batteries other than that shown in the enclosures, must have written approval from cognizant Hazardous Material Disposal Coordinator (HMDC), prior to packaging any depleted batteries. HMDC shall coordinate with DRMO and transportation officials.

3. Addresses are requested to provide the information contained in the enclosures to all units under their cognizance routinely generating the subject batteries.

4. Point of contact for this matter is Mr. Sammy Gwynn, Natural Resources and Environmental Affairs Divison, at extensions 2083/1690.

J. I. WOOTEN
By direction

Distribution:
HMDC, 2D MARDIV
HMDC, 2D FSSG
HMDC, II MAF
HMDC, 6TH MAB
HMDC, MCB
CO, MCAS, New River
AC/S, FAC

PROCEDURES FOR DISPOSAL/CONTAINERIZATION OF MERCURY BATTERIES:

1. Effective immediately, the following process/procedures will be undertaken when preparing depleted batteries for transfer to DRMO:

a. Units will ensure turn in documents (DD 1348-1) are processed per reference (c) and time limitations imposed in reference (d).

b. Units will process a packaging and preservation work request (form MCBCL 4030), stating the number and nomenclature of batteries.

c. Units will receive the appropriate number and sized inner "DOT" approved fiberboard box and outer wood overpack.

d. Upon receipt of these boxes, units will ensure depleted mercury batteries are packaged as follows:

MATERIAL	HM/HW	EPA WASTE NUMBER	DOT SHIPPING NAME	HAZARD CLASS
Mercury Batteries	HW	D009	Hazardous Waste, solid, N.O.S.	ORM-E

*Caution: Depleted mercury batteries continue to vent hydrogen gas after use, "DO NOT" individually package batteries in plastic bags.

Packaging Requirements

- tape terminals, vents with electrical tape
- place batteries into the PP&P provided fiberboard box
- place fiberboard box into the PP&P provided wood overpack box
- TMO must transport

NOTE: all free space within the inner fiberboard box or between the inner fiberboard box and outer wood box should be taken up by using suitable non-combustible packaging material.

PROCEDURES FOR DISPOSAL/CONTAINERIZATION OF NICKEL CADMIUM BATTERIES

1. Effective immediately, the following process/procedures will be undertaken when preparing depleted batteries for transfer to DRMO:

a. Units will ensure turn in documents (DD 1348-1) are processed per reference (c) and time limitations imposed in reference (d).

b. Units will process a packaging and preservation work request (form MCBCL 4030), stating the number and nomenclature of batteries.

c. Units will receive the appropriate number and sized inner "DOT" approved fiberboard box and outer wood overpack.

d. Upon receipt of these boxes, units will ensure depleted nickel cadmium batteries are packaged as follows:

MATERIAL	HM/HW	EPA WASTE NUMBER	DOT SHIPPING NAME	HAZARD CLASS
Nickel Cadmium Batteries	HW	D003/D006	Waste, nickel cadmium batteries for disposal	ORM-E

Packaging Requirements

- tape terminals, vents with electrical tape
- place individual batteries into non-porous plastic bag and tape shut with non-metallic tape
- place batteries into the PP&P provided fiberboard box
- place fiberboard box into the PP&P provided wood overpack box
- TMO must transport

NOTE: all free space within the inner fiberboard box or between the inner fiberboard box and outer wood box should be taken up by using suitable non-combustible packaging material.

PROCEDURES FOR DISPOSAL/CONTAINERIZATION OF LITHIUM BATTERIES

1. Effective immediately, the following process/procedures will be undertaken when preparing depleted batteries for transfer to DRMO:

a. Units will ensure turn in documents (DD 1348-1) are processed per reference (c) and time limitations imposed in reference (d).

b. Units will process a packaging and preservation work request (form MCBCL 4030), stating the number and nomenclature of batteries.

c. Units will receive the appropriate number and sized inner "DOT" approved fiberboard box and outer wood overpack.

d. Upon receipt of these boxes, units will ensure depleted lithium batteries are packaged as follows:

MATERIAL	HM/HW	EPA WASTE NUMBER	DOT SHIPPING NAME	HAZARD CLASS
Lithium Sulfur Dioxide Batteries	HW	D003	Waste, lithium batteries for disposal	ORM-C

Packaging Requirements

- tape terminals, vents with electrical tape
- place individual batteries into non-porous plastic bag and tape shut with non-metallic tape
- place batteries into the PP&P provided fiberboard box
- place fiberboard box into the PP&P provided wood overpack box
- TMO must transport

NOTE: all free space within the inner fiberboard box or between the inner fiberboard box and outer wood box should be taken up by using suitable non-combustible packaging material.

GENERAL BATTERY SURVEY (HW Only)

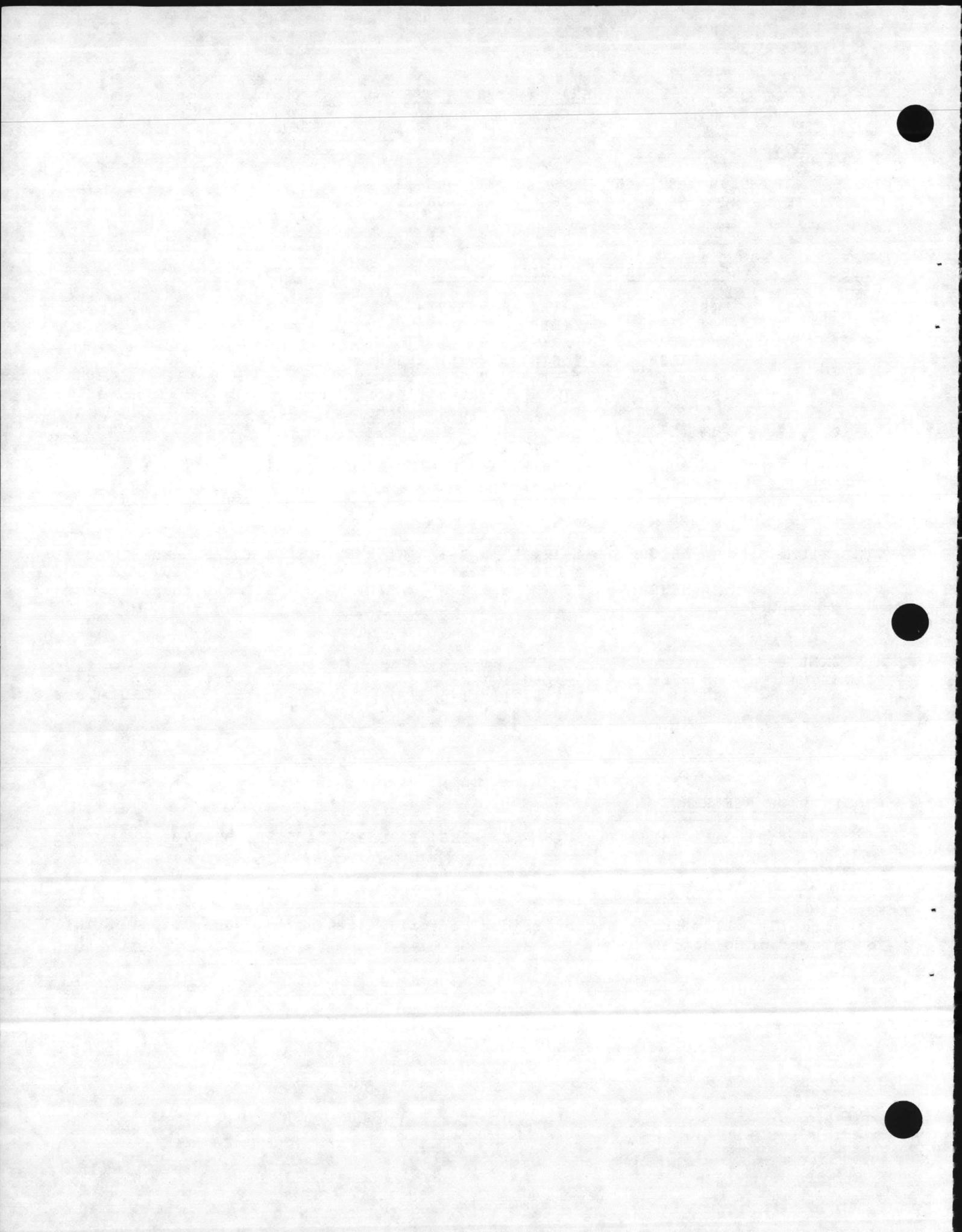
<u>BOX</u>	<u>BOX SIZE</u>	<u>NSN</u>
(A)	- 10" x 8" x 6"	8115-00-183-9497
(B)	- 22 5/8" x 10" x 16"	8115-00-190-4865

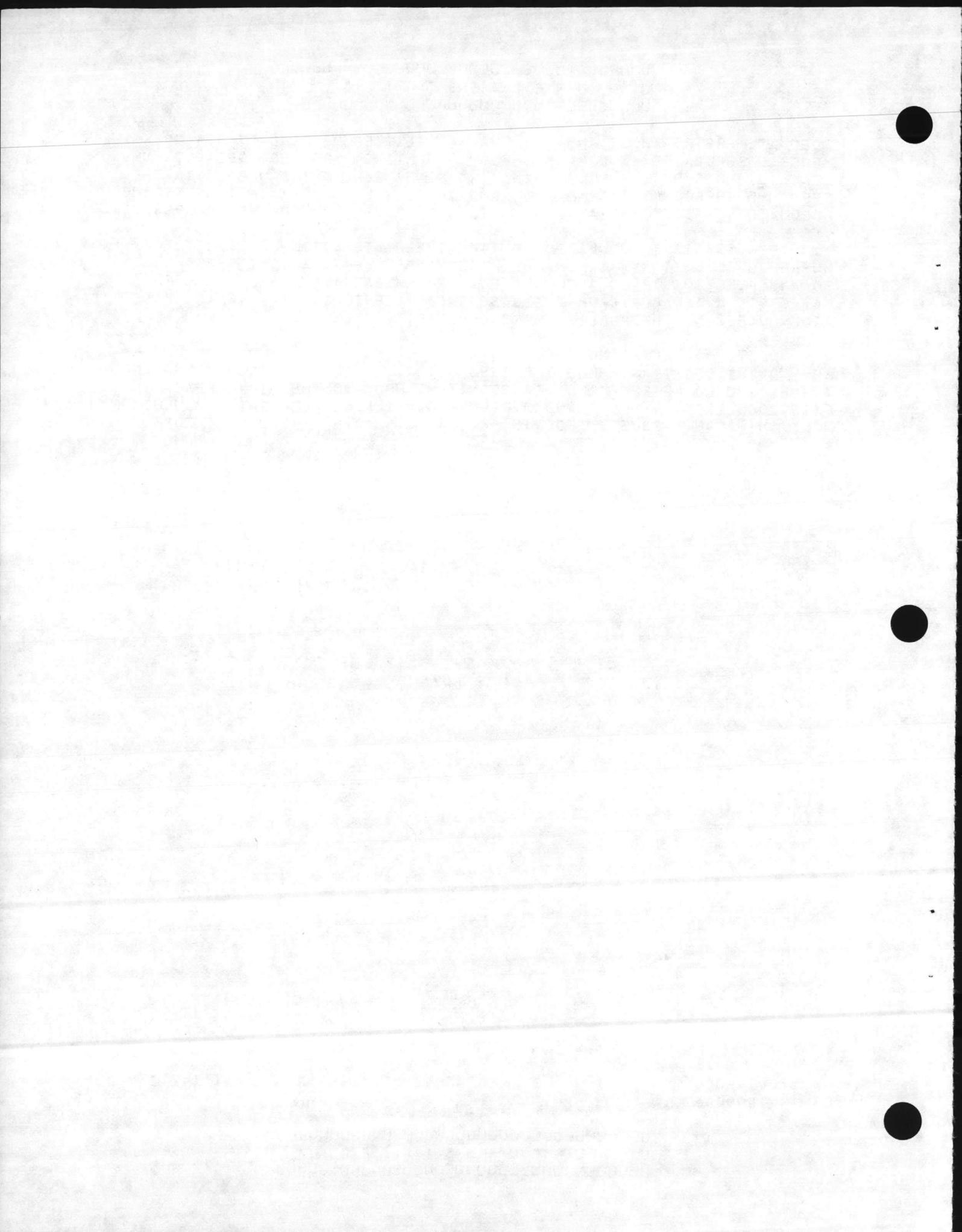
<u>TYPE</u>	<u>NOMENCLATURE</u>	<u>SIZE (INCHES)</u>	<u>SUGGESTED BOX</u>
(MERCURY)	TR 164	1-1/4(L) x 1/2(W)	A
	BA 1372	2(L) x 1(W)	A
	MG 803	1/2(W) x 4 (L) x 3(H)	A
	BA 1100	1.5(W) x 4 (L) x 3(H)	A
	BA 1312	1.5(W) x 2.2(H) x 4(L)	A
	BA 1567	1(W) x .7(H) x 1/3(L)	A
	BA 3553		A
	BA 1546	2.7(W) x 4.5(H)	A
	BA 1568	1.06(W) x 3(H)	A
	BA 1381	.64(W) x 1.04(H)	A
(LITHIUM)	BA 5590	4-1/4(L) x 2-3/4(W) x 5"(H)	A (more than 6 - use
	BA 5598	4.7(L) x 3.6(W) x 2.1(H)	A "
	BA 5588	3.5(L) x 1.2(W) x 5(H)	A (more than 8 - use
(NICKEL CADIUM)	BB 590	4-1/4(L) x 2-3/4(W) x 5"(H)	A (more than 6 - use
	BB 516	1-1/8(W) x 1-1/8(W) x 3-5/8(H)	A (more than 10 - use

*POINTS OF REFERENCE

Box (B) will hold 46 to 48 - BA 4386, BA 5590, BA 5598, BB 590

** Normally all mercury batteries due to small size and low generation, can be placed into Box (A)







From: Commanding General, Marine Corps Base, Camp Lejeune

Subj: OILY RAGS DISPOSAL

Ref: (a) MCC-6280.3
(b) BO 6240.5A

Encl: (1) Oily Rags Disposal/Recycle Cost Review

1. Reference (a) directs Marine Corps Base, Camp Lejeune, to reduce waste streams by various methods, including recycling. The use of a contract shop rag cleaning service would greatly reduce the oily rags waste stream. Manpower requirements associated with containerization, documentation and disposal of oily rags through DRMO would be significantly reduced.
2. Most individual units within this activity currently purchase rags for shop use from Self Service. Used rags are then accumulated in 55 gallon drums for disposal through DRMO as non-RCRA or special waste. A few units have contracted to have Rental Uniform Service, Wilson, NC, supply clean shop rags. Soiled shop rags are picked up by the service company and replaced with clean ones on a weekly basis.
3. Funding for activities utilizing shop towels will be the responsibility of the generating unit.
4. The enclosure compares the current disposal costs of disposing of oily rags through DRMO, to the costs of utilizing a contract service for shop rags.
5. It is requested that tenant command hazardous material disposal coordinators (HMDCs) and base hazardous material disposal officer (HMDO) appointed per reference (b) initiate appropriate action to procure contract services for shop rags where feasible. Please provide requisitions to the base Purchasing and Contracting Officer through established channels and procurement procedures.
6. Mr. Douglas Piner, Environmental Control Specialist, Environmental Management Department, extension 5093, is available to assist with this matter.

J. I. Wooten
J. I. WOOTEN
By direction

OILY RAGS DISPOSAL, RECYCLE

1. Current Disposal Cost Review (DRMO Disposal)

a. Estimated volume/year = 80,000 (pounds)

DRMO Disposal cost per pound = \$.60

Subtotal \$48,000

b. Quantity of 55 gallon drums = 242 (required to retain
item 3.1)

Cost per drum \$65

Subtotal \$15,730

c. Purchase price of rags = \$.08 (per pound)

Estimated volume/year = 80,000

Subtotal \$ 6,400

d. Cost for disposal of drums = \$5808.00

Total cost per year \$75,938

2. Rag Cleaning Service Cost Review

a. Estimated volume/year = 1,064,000 (rags)
(Based on 13.3 rags per pound)

Cost of cleaning service = \$.05 (per rag)

Total \$53,200

- Notes:
- o 18" x 18" ABSORBENT COTTON RAGS ARE SUPPLIED BY VENDOR
 - o VENDOR PICKS UP DIRTY RAGS FROM INDIVIDUAL UNITS ON WEEKLY BASIS AND REPLACES WITH CLEAN RAGS

Enclosure (1)



DEFENSE LOGISTICS AGENCY
DEFENSE REUTILIZATION AND MARKETING OFFICE-LEJEUNE
LOUIS ROAD, BUILDING 908
CAMP LEJEUNE, NC 28542-5000

IN REPLY
REFER TO

DRMO-ZWM (N. Hensley/5652/srs)

25 July 1991

Subject: Container Condition Certification of Hazardous Property
for Turn-in

TO: Commanding General
ATTN: Environmental Management Department
Marine Corps Base
Camp Lejeune, NC 28542

1. Reference:

- a. DoD 4160.21-M, Chapter IX, paragraph D4
- b. DRMS-M 4160.14

2. Effective 1 Aug 91, the following information shall be annotated on DTID
1348-1 for turn-in of hazardous property:

a. A container certification must be provided, in triplicate, by the
turn-in activity for hazardous property turned in in the original military
container. The following reference specifically addresses hazardous materials,
but the certification applies to hazardous waste as well.

b. DoD 4160.21-M states that when hazardous materials turned in for disposal
are packaged in the original military containers (marked hazardous), the
reporting activity will provide the property disposal activity with a certi-
fication in triplicate as to true condition/reliability of the containers. The
certification will contain one of the following statements:

(1) The hazardous material is packaged in containers as prescribed in
the Department of Transportation Hazardous Materials Regulation (Title 49, CFR,
Parts 170-189).

(2) The hazardous material is packaged in containers of equal or
greater strength or efficiency as prescribed in the Department of Transportation
Hazardous Materials Regulation (Title 9, CFR, Parts 170-189).

(3) The hazardous material is packaged in containers that are sub-
standard to the Department of Transportation Hazardous Materials Regulation
(Title 49, CFR, Parts 170-189).

DRMO-ZWM

PAGE 2

25 July 1991

SUBJECT: Container Condition Certification of Hazardous Property
for Turn-in

3. One of the above certifications must accompany the DTID or be provided on the DTID. Statement 2b(3) is not acceptable for turn-in of hazardous waste.
4. Point of contact is Mr. Ken Warren, phone 451-5816.

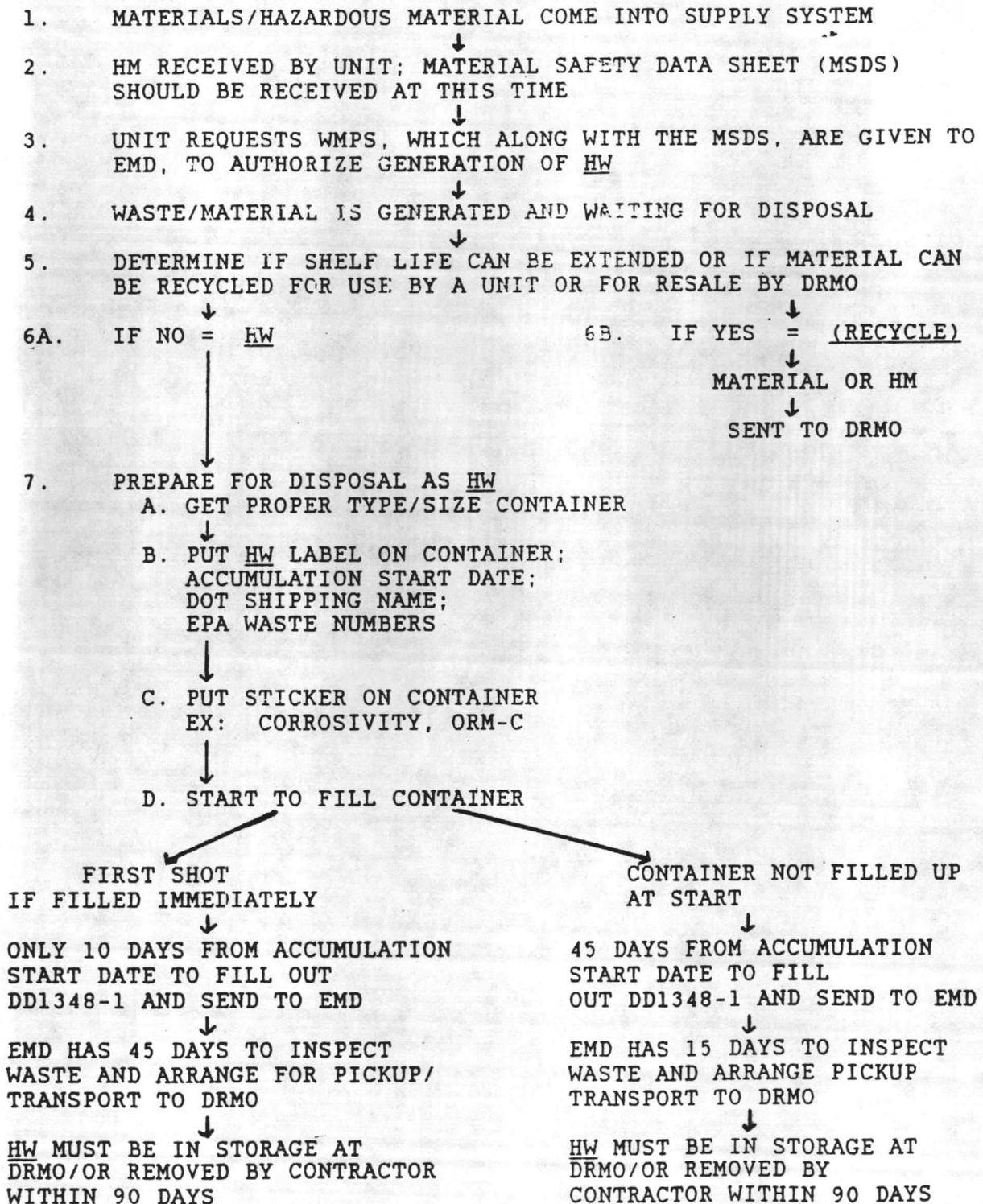
Nadine Hensley
Nadine Hensley
Chief, Defense Reutilization
and Marketing Office

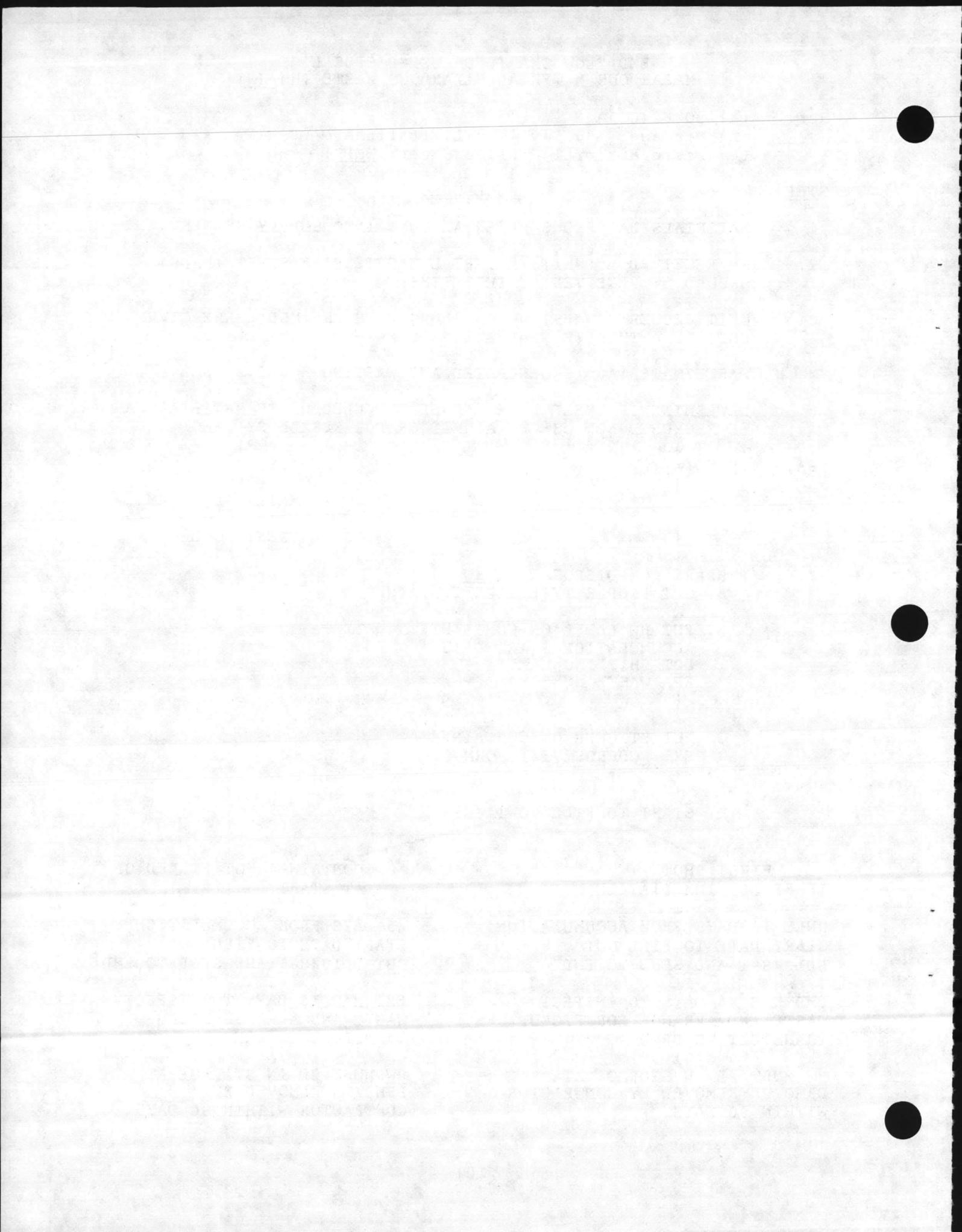
EMD FLOW CHART FOR USE/DISPOSAL OF
HAZARDOUS MATERIAL/HAZARDOUS WASTE (HM/HW)

Ref: (a) BO 6240.5A
(b) Message: 90 Day Time Limitations
(c) Waste Material Profile Sheet (WMPS)

STEP

PROCEDURES





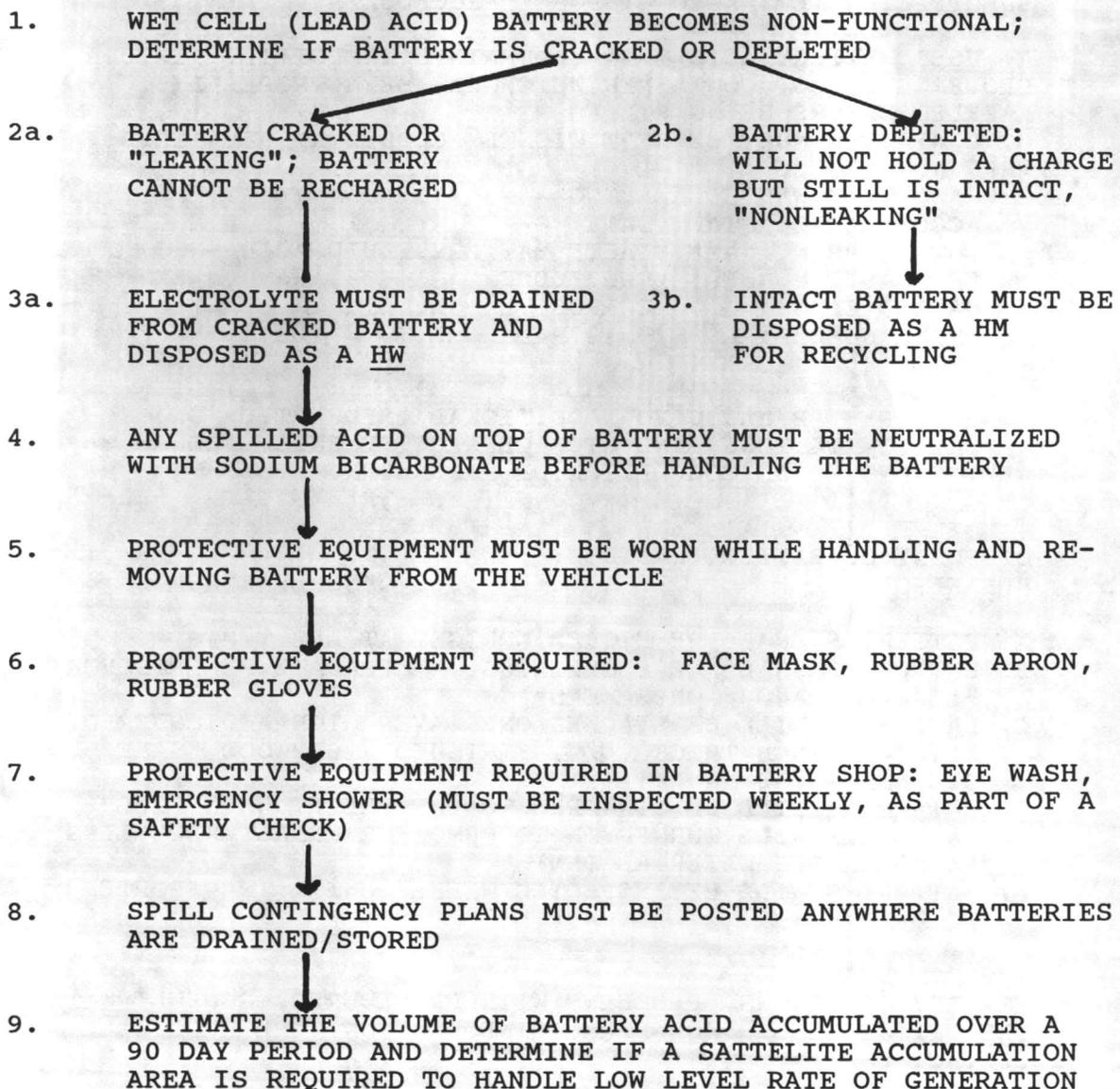
EMD FLOW CHART FOR PROPER DISPOSAL PROCEDURES

SUBJ: DISPOSAL OF USED WET CELL BATTERIES AND RELATED ELECTROLYTE (USED BATTERY ACID)

- Ref: (a) BO 6240.5B
(b) Message: 90 Day Time Limitations
(c) EMD Flow Chart for Use/Disposal of Hazardous Material/ Hazardous Waste (HM/HW)
(d) Waste Material Profile Sheet (WMPS) for Used Electrolyte
(e) DD1348-1 for Used Electrolyte
(f) Video: EMD #1, Acid Batttery Disposal Procedures

STEP

PROCEDURES



EMD FLOW CHART FOR PROPER DISPOSAL PROCEDURES

SUBJ: DISPOSAL OF USED WET CELL BATTERIES AND RELATED ELECTROLYTE (USED BATTERY ACID)

STEP

PROCEDURES

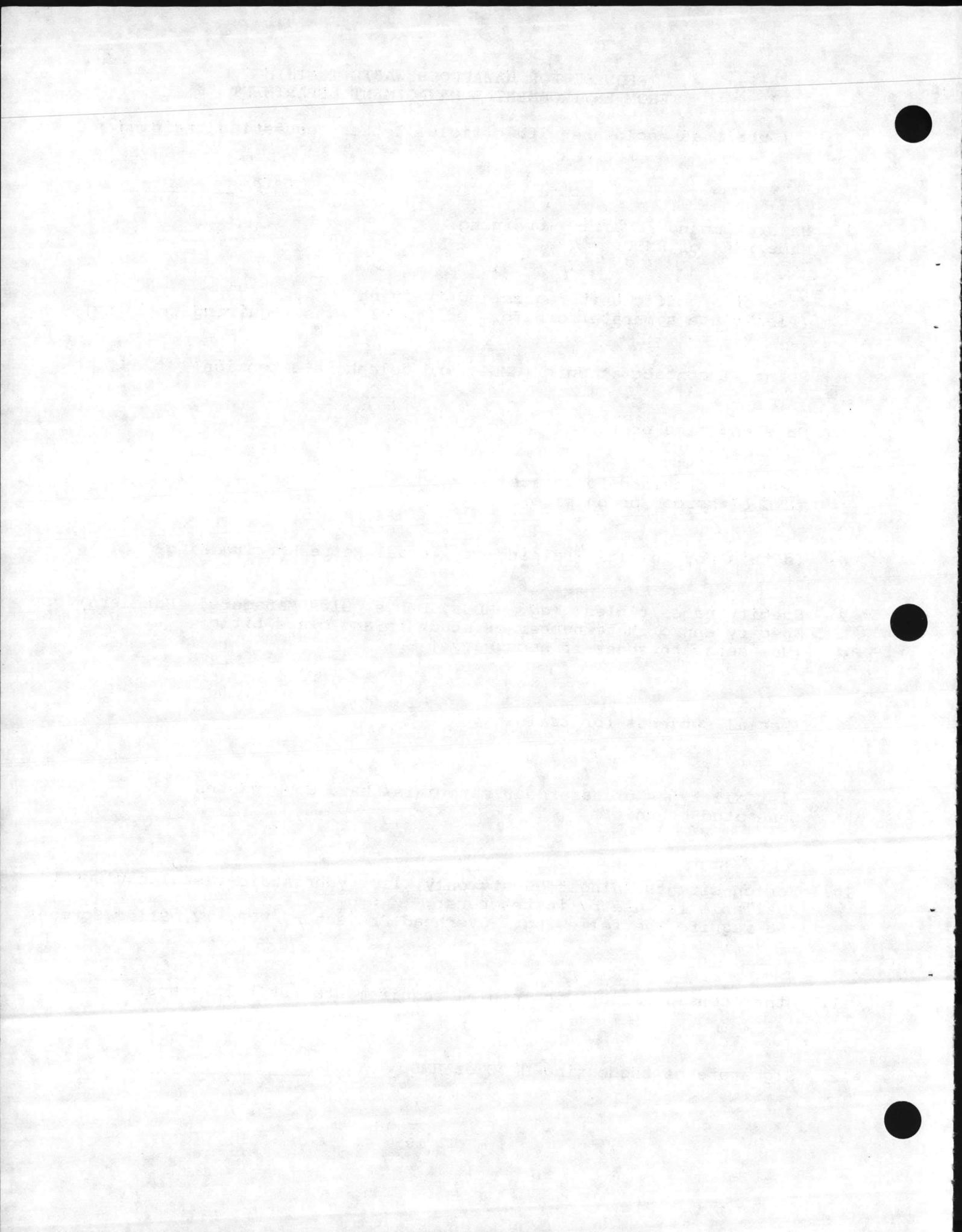
- 10a. IF REGULAR ACCUMULATION: DISPOSE IN ACCORDANCE WITH 90 DAY STORAGE LIMITATIONS, REF B AND F
- 10b. IF LOW LEVEL ACCUMULATION: LOOK TO CONSOLIDATION OF SITES OR APPLY TO EMD FOR A SATELLITE ACCUMULATION AREA, REF A
11. SPECIFIC BATTERY ACID DISPOSAL PROCEDURES:
- A. USED BATTERY ACID MUST BE DRAINED IMMEDIATELY INTO A PROPER SIZE DOT CONTAINER WHICH HAS BEEN PROPELRLY LABELED BEFORE BEING FILLED
 - B. CONTAINER MUST BE KEPT TIGHTLY CLOSED AT ALL TIMES WHEN NOT IN USE
 - C. HAZARDOUS WASTE LABELING
 - ACCUMULATION START DATE:
 - DOT SHIPPING NAME: WASTE BATTERY FLUID ACID
 - EPA WASTE NUMBER: D002/D008
 - HAZARD CLASS: CORROSIVE
 - UN/UA NUMBER: UN 2796
12. CONSULT REF. B and C FOR ADDITIONAL INFORMATION ON 90 DAY LIMITATIONS, AND STORAGE REQUIREMENTS. CONSULT REF. D AND E FOR COMPLETION OF PAPERWORK.
13. DISPOSAL OF BATTERY CASINGS:
- 13a. "LEAKERS"
- A. BATTERIES SHALL BE STORED UPRIGHT AT ALL TIMES.
 - B. BATTERIES SHALL BE SEGREGATED ON SEPARATE PALLETS FOR "LEAKERS" AND "NONLEAKERS"
 - C. BATTERIES WILL BE STACKED ONE LAYER HIGH AND COVERED WITH $3/4$ INCH THICK ($3/4$ FINISHED) PLYWOOD, SAME DIMENSIONS AS PALLET
 - D. BATTERIES WILL BE STRAPPED TO THE PALLET WHEN FULL
 - E. BATTERIES WILL TURNED IN TO DRMO FOR RESALE/RECYCLING AS HAZARDOUS MATERIAL (HM)
 - F. BATTERIES WILL BE INSPECTED WEEKLY UNTIL TRANSPORTED TO DRMO
- 13b. "NONLEAKERS"
14. FOR ANY QUESTIONS, PROBLEMS WITH PROCEDURES, CONSULT WITH THE UNIT'S HMDO. FOR PERMIT INFORMATION, THE HMDO WILL CONTACT EMD.

REQUEST FOR HAZARDOUS WASTE TRAINING
FROM ENVIRONMENTAL MANAGEMENT DEPARTMENT

(Submit as enclosure with official letter requesting training.)

Date _____

1. Major Command requiring training:
Name/rank of HMDC:
2. Name of specific Unit requesting training:
(Please use separate form for additional Units requiring training)
3. Point of contact at Unit (HMDO) and telephone extension:
4. Date and time preferred:
5. Location provided for class:
(EMD classroom or on site)
6. Is this for Initial Training or Annual Refresher Training?
7. Specify names/titles (eg. HMDCs, HMDOs, Site Managers, Handlers):
Specify approximate number of students and class title:
(Use separate sheet if necessary.)
8. Special subjects for training:
9. List all types of hazardous materials/ hazardous wastes generated by unit:
10. For on-site training requests only, list your Audio-visual equipment available for use by instructors:
(We require the following: Overhead Projector, VCR, TV, Slide Screen)
11. Other considerations or special requirements for this class:
12. Signature of requesting HMDC or HMDO _____



ENVIRONMENTAL MANAGEMENT DEPARTMENT
HAZARDOUS WASTE TRAINING PROGRAM
TRAINING MANUAL TABLE OF CONTENTS

Section 3.	IDENTIFICATION/LABELING/CONTAINERIZATION OF HAZARDOUS WASTE AND MATERIALS	109 - 128
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ENVIRONMENTAL MANAGEMENT DEPARTMENT
GLOSSARY OF TERMINOLOGY IN BO 6240.5-

1. HAZARDOUS WASTE - (Sect 240.101) - A waste or combination of wastes which pose a substantial present or potential hazard to human health or living organisms because such wastes are non-degradable or persistent in nature or because they can be biologically magnified, or because they can be lethal, or because they may otherwise cause or tend to cause detrimental cumulative effect and whose disposal is regulated by RCRA.
2. HAZARDOUS MATERIAL - A material which has a hazardous or toxic constituent or characteristic. The material may be used, or when finished use, because it may be resold or recycled, is not a hazardous waste for disposal. All hazardous wastes were originally hazardous materials.
3. GENERATION SITE - Physical location within a Unit where Hazardous Waste is generated.
4. GENERATOR - The organization commander responsible for the function which generated the Hazardous Waste.
5. 90 DAY STORAGE SITE - A site authorized by the CG, MCB, for the temporary storage of hazardous waste for not more than 90 days. All containers in this area will have Hazardous Waste labels with Accumulation Start Dates.
6. LONG TERM STORAGE FACILITY - DRMO maintains the only long term storage facility at TP-451/TP-463 complex.
7. SATELLITE ACCUMULATION AREA - An area authorized by the CG, MCB, for the accumulation of hazardous waste over the standard permitted 90 days. The waste container must have a hazardous waste label, but no Accumulation Start Date will be placed on the label at this time. No larger than a 55 gallon drum is permitted in this area. When the container is filled, a date must be placed on the HW label, and the drum removed to the 90 day storage area within 72 hours.
8. RECYCLED - A material is recycled if it is used, reused, or reclaimed.
9. WASTE OIL - Any used oil or related petroleum compound which has any contaminants or constituents which could render it a hazardous waste, ie. lead. In North Carolina, waste oil is not considered a hazardous waste, but a special waste, if it can be recycled or sold. Presence of solvents in waste or used oil will render it a hazardous waste.
10. LAND BAN (LAND DISPOSAL RESTRICTIONS) - 40 CFR 268 - RCRA LAND BANS - Prohibitions of specific toxic materials from disposal in landfills under RCRA. The entire set of restrictions are now in effect.

GLOSSARY OF HAZARDOUS WASTE TERMINOLOGY

11. MINIMIZATION (HAZMIN PROGRAM) - The process by which the total volume of hazardous waste is reduced. The requirement is in BO 6280.8 to minimize the volume and toxicity of hazardous waste through avoidance of generation by best management procedures, etc., and the reuse or treatment of the hazardous waste that is generated to reduce it to a nonhazardous state.
12. WASTE STREAM - The process through which a material becomes a hazardous waste, either by contamination during use, or if a hazardous material, by being disposed of with no means for further use or reclamation.
13. EMPTY CONTAINER - A container, often a paint can, in which the contents have been used up. Only one inch or less of dried substance may remain, or the contents and propellant both have been completely discharged.
14. SPILL - The release of a hazardous substance or waste into the environment.
15. HAZARDOUS WASTE PROFILE SHEET - A document required for the disposal of hazardous waste by HQ DRMS. It contains information for the identification of physical, chemical, hazardous composition of disposal wastes. Analysis for TCLP (toxicity) also required where applicable.
16. TURN IN DOCUMENT DD-1348-1 - A form required by the Department of Defense for the turn in to DRMO of used, waste, hazardous, unwanted, surplus, etc. materials. DRMO then disposes of/recycles/sells the materials as appropriate.
17. MANIFEST (UNIFORM HAZARDOUS WASTE MANIFEST) - A form required by the EPA for the turn in and disposal of hazardous waste off site to an authorized disposal or treatment facility. A manifest is also required by Department of Transportation when hazardous wastes are hauled on a public highway.
18. SPILL CONTINGENCY PLAN - A plan which must be contained in the Desk Top Procedures and posted in the affected areas. It identifies the who, what, where and why of handling and reporting, and personnel authorized to work in the areas where hazardous wastes are generated. It is a requirement in RCRA.
19. MATERIAL SAFETY DATA SHEET - A form required by OSHA and "The Right to Know Act" which provides 10 different types of information on the composition, physical characteristics, hazards, health and safety precautions and toxicity characteristics of materials which have hazardous constituents. Must be provided along with a DD 1348-1 for the disposal of HM.

DOT

=

FLAMMABLE/COMBUSTIBLE LIQUID CLASSIFICATION (NFPA)

(NFPA)

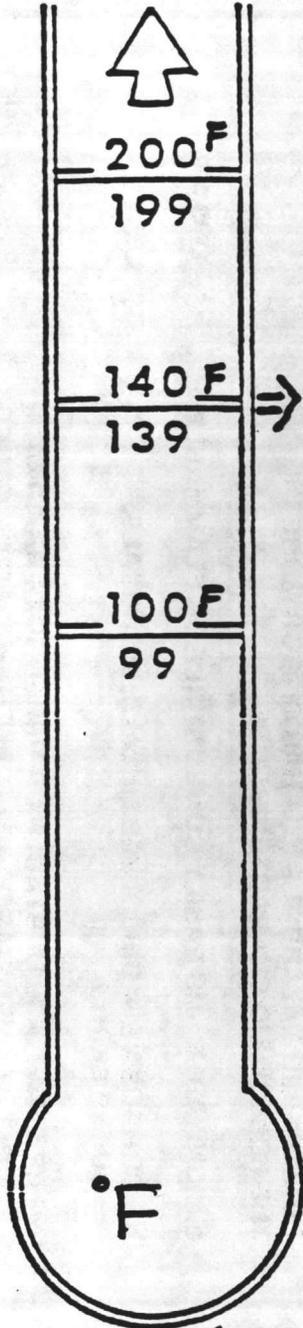
DOT:

BELOW 100°F
= FLAMMABLE

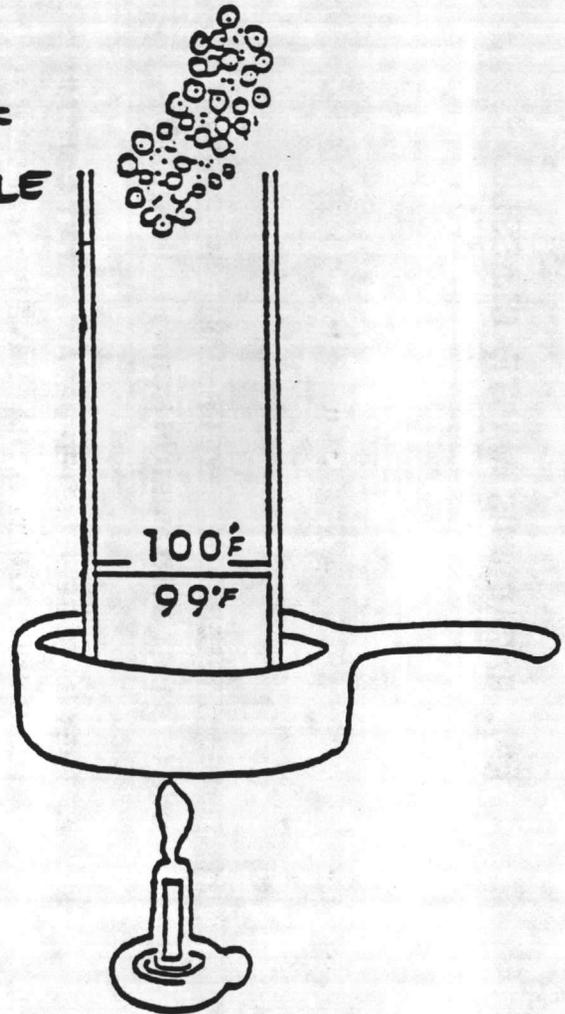
100 - 200°F
= COMBUSTIBLE



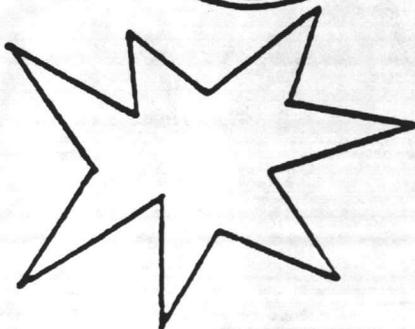
COMBUSTIBLE
FLAMMABLE



EPA =
BELOW
140°F =
IGNITABLE



BOILING POINT



FLASH POINT

TERMINOLOGY

EPA HAZARDOUS WASTE CLASSES

1. **LISTED WASTE** - IF YOUR WASTE APPEARS ON ANY ONE OF 4 LIST CONTAINED IN RCRA REGULATIONS

U, K, P, F

- a. THEY HAVE BEEN LISTED BECAUSE THEY CONTAIN TOXIC CONSTITUENTS THAT HAVE BEEN SHOWN TO BE HARMFUL TO HEALTH OR ENVIRONMENT.

ex. F001 → F005 SOLVENTS

2. **CHARACTERISTIC WASTE** - EVEN IF A WASTE DOES NOT APPEAR ON ONE OF THE EPA "HIT" LIST, IT IS CONSIDERED HAZARDOUS IF IT HAS ONE OR MORE OF THE FOLLOWING CHARACTERISTICS:

D

- a. **IGNITABLE** - IS EASILY COMBUSTIBLE OR FLAMMABLE
- b. **CORROSIVE** - DISSOLVES METALS, MATERIALS, BURNS SKIN
- c. **REACTIVE** - IS UNSTABLE OR UNDERGOES RAPID OR VIOLENT CHEMICAL REACTION WITH WATER OR OTHER MATERIALS
- d. **TCLP METALS/** - WASTE IS TESTED, CONTAINS HEAVY METALS/
ex. lead or others as insecticides

= D001

= D002

= D003

= D004 → D043

APPENDIX B

EPA Characteristic Wastes = D004 - D043
Toxicity Characteristic Leachate Potential

* denotes new parameter

EPA HW Number	Contaminant	Regulatory Level (mg/L)
D004	Arsenic	5.0
D005	Barium	100.0
D018 *	Benzene	0.5
D006	Cadmium	1.0
D019 *	Carbon tetrachloride	0.5
D020 *	Chlordane	0.03
D021 *	Chlorobenzene	100.0
D022 *	Chloroform	6.0
D007	Chromium	5.0
D023 *	o-Cresol	200.0
D024 *	m-Cresol	200.0
D025 *	p-Cresol	200.0
D026	Cresol	200.0
D016	2,4-D	10.0
D027 *	1,4-Dichlorobenzene	7.5
D028 *	1,2-Dichloroethane	0.5
D029 *	1,1-Dichloroethylene	0.7
D030 *	2,4-Dinitrotoluene	0.13
D012	Endrin	0.02
D031 *	Heptachlor (and its hydroxide)	0.008
D032 *	Hexachlorobenzene	0.13
D033 *	Hexachloro-1,3-butadiene	0.5
D034 *	Hexachloroethane	3.0
D008	Lead	5.0
D013	Lindane	0.4
D009	Mercury	0.2
D014	Methoxychlor	10.0
D035 *	Methyl ethyl ketone	200.0
D036 *	Nitrobenzene	2.0
D037 *	Pentachlorophenol	100.0
D038 *	Pyridine	5.0
D010	Selenium	1.0
D011	Silver	5.0
D039 *	Tetrachloroethylene	0.7
D015	Toxaphene	0.5
D040 *	Trichloroethylene	0.5
D041 *	2,4,5-Trichlorophenol	400.0
D042 *	2,4,6-Trichlorophenol	2.0
D017	2,4,5-TP (Silvex)	1.0
D043 *	Vinyl chloride	0.2

Examples of EPA Listed Wastes = F; K; P; U
TABLE 2

EPA HAZARDOUS WASTE NUMBER	HAZARD CODE	HAZARDOUS WASTE
F001	T	The following spent halogenated solvents used in degreasing: tetrachloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004 and F005 and still bottoms from the recovery of these spent solvents.
F002	T	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, and trifluoromethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F003	I	The following spent non-halogenated solvents: xylene, acetone, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F004	T	The following spent non-halogenated solvents: cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F005	I, T	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, and pyridine; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) or one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F006	T	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.
F007	R, T	Spent cyanide plating bath solutions from electroplating.
F008	R, T	Plating bath sludges from the bottom of plating baths from electroplating operations where cyanides are used in the process.
F009	R, T	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.
F010	R, T	Quenching bath sludge from oil baths from metal heat treating operations where cyanides are used in the process.
F011	R, T	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.
F012	T	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.
F019	T	Wastewater treatment sludges from the chemical conversion coating of aluminum.
F020	H	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	H	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	H	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.

Examples of EPA Listed Wastes = F;K;P;U

EPA
HAZARDOUS
WASTE
NUMBER

HAZARD
CODE

HAZARDOUS WASTE

EPA HAZARDOUS WASTE NUMBER	HAZARD CODE	HAZARDOUS WASTE
F023	H	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 on for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.)
F024	T	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.
F025	T	Light ends, spent filters and filter aids, and spent Jessicant wastes from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes.
F026	H	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	H	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulation containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.)
F028	T	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.
<u>Wood Preservation</u>		
K001	T	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.
<u>Inorganic Pigments</u>		
K002	T	Wastewater treatment sludge from the production of chrome yellow and orange pigments.
K003	T	Wastewater treatment sludge from the production of molybdate orange pigments.
K004	T	Wastewater treatment sludge from the production of zinc yellow pigments.
K005	T	Wastewater treatment sludge from the production of chrome green pigments.
K006	T	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).
K007	T	Wastewater treatment sludge from the production of iron blue pigments.
K007	T	Oven residue from the production of chrome oxide green pigments.
<u>Organic Chemicals</u>		
K009	T	Distillation bottoms from the production of acetaldehyde from ethylene.
K010	T	Distillation side cuts from the production of acetaldehyde from ethylene.
K011	R,T	Bottom stream from the wastewater stripper in the production of acrylonitrile.
K013	R,T	Bottom stream from acetonitrile column in the production of acrylonitrile
K014	T	Bottoms from the acetonitrile purification column in the production of acrylonitrile.
K015	T	Still bottoms from the distillation of benzyl chloride.
K016	T	Heavy ends or distillation residues from the production or carbon tetrachloride.
K017	T	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.
K018	T	Heavy ends from the fractionation column in ethyl chloride production.
K019	T	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.
K020	T	Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.
K021	T	Aqueous spent antimony catalyst waste from fluoromethanes production.
K022	T	Distillation bottom tars from the production of phenol/acetone from cumene.
K023	T	Distillation light ends from the production of phthalic anhydride from naphthalene.
K024	T	Distillation bottoms from the production of phthalic anhydride from naphthalene.
K093	T	Distillation light ends from the production of phthalic anhydride from ortho-xylene
K094	T	Distillation bottoms from the production of phthalic anhydride from ortho-xylene.
K025	T	Distillation bottoms from the production of nitrobenzene by the nitration of benzene.
K026	T	Stripping still tails from the production of methyl ethyl pyridines.
K027	T	Centrifuge and distillation residues from toluene diisocyanate production.

CONVERSION TABLE

PARTS PER	LITERS	MILLILITERS	MICROLITERS	KILOGRAMS	GRAMS
THOUSAND	g/l	mg/ml	ug/ul	g/kg	mg/g
MILLION	mg/l	ug/ml	ng/ul	mg/kg	ug/g
BILLION	ug/l	ng/ml	pg/ml	ug/kg	ng/g
TRILLION	ng/l	pg/ml		ng/kg	pg/g

g=gram

l=liter

1 oz = 28.349 g

1 gal = 3.785 l

1% = 10,000ppm

1ppm = 0.0001%

1ppm = 1000ppb

WORKSHEET FOR DD1348-1A

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1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50		51		52		53		54		55		56		57		58		59		60		61		62		63		64		65		66		67		68		69		70		71		72		73		74		75		76		77		78		79		80	
DOC. IDENT		RI FROM		M & S		FSC		STOCK NUMBER		ADD		QUANTITY		DOCUMENT NUMBER		REQUISITIONER		DATE		REFINAL		CLASS		ITEM		NOMEN		ALPHAB		TYPE		DISTR		ORIGIN		PCU		FCT		KEY		MOD		DPL		DATE		SOURCE		IN		UNIT PRICE		EXPLANS		CIS																																																																																																							
SHIPPED FROM												SHIP TO												MARKS												PROJECT												TOTAL PRICE												EXPLANS												CIS																																																																																							
A WAREHOUSE LOCATION						B TYPE OF CARGO		C UNIT PACK		D UNIT WEIGHT		E UNIT CUBE		F U F C		G N M F C		H FREIGHT RATE		I EXCLUSION DATE		J MAT		K QUANTITY		L		M		N		O		P		Q		R		S		T		U		V		W		X		Y		Z																																																																																																									
SUBSTITUTE DATA (ITEM ORIGINALLY REQUESTED)												FREIGHT CLASSIFICATION NOMENCLATURE												ITEM NOMENCLATURE												REMARKS																																																																																																																											
1 SELECTED BY AND DATE						2 TYPE OF CONTAINER(S)						3 TOTAL WEIGHT						4 RECEIVED BY AND DATE						5 INSPECTED BY AND DATE																																																																																																																																							
7 PACKED BY AND DATE						8 NO. OF CONTAINERS						9 TOTAL CUBE						10 WAREHOUSE(S) BY AND DATE						11 WAREHOUSE LOCATION																																																																																																																																							
13 TRANSPORTATION CHARGEABLE TO						14 DATING, AWB, OR RECEIVER'S SIGNATURE (AND DATE)						15 RECEIVING DOCUMENT NUMBER						16																																																																																																																																													

WORKSHEET FOR HAZARDOUS WASTE LABEL

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE, OR
PUBLIC SAFETY AUTHORITY, OR THE
U.S. ENVIRONMENTAL PROTECTION AGENCY

PROPER D.O.T.
SHIPPING NAME _____ UN OR NA# _____

GENERATOR INFORMATION:

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

EPA ID NO. _____ EPA WASTE NO. _____

ACCUMULATION START DATE _____ MANIFEST DOCUMENT NO. _____

HANDLE WITH CARE!
CONTAINS HAZARDOUS OR TOXIC WASTES

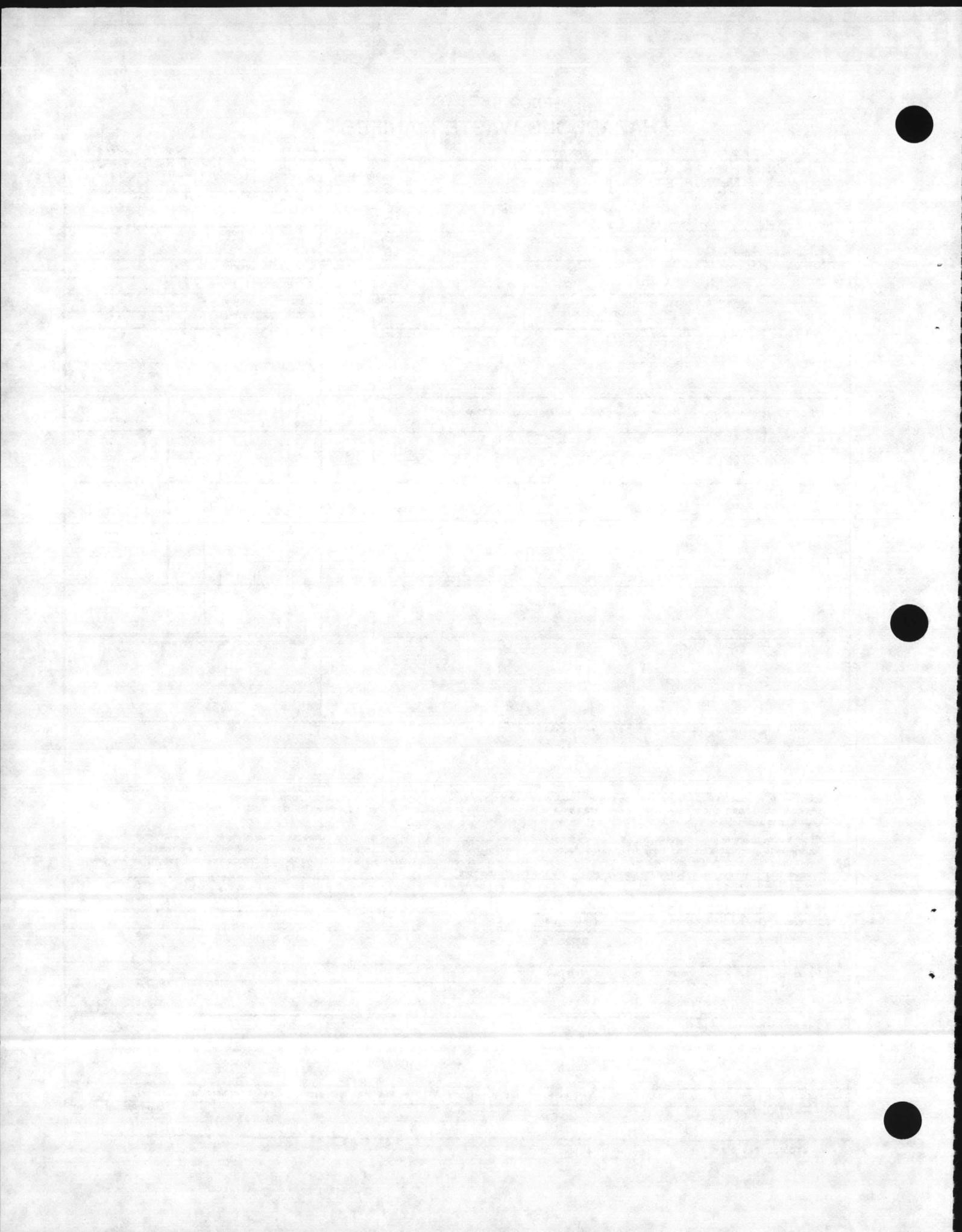
STYLE WM-4

WORKSHEET FOR HAZARDOUS WASTE MANIFEST

Use print or type (Form designed for use on elite (12-pitch) typewriter.)

Form Approved OMB No 2050-0035 Expires 9-30-88

UNIFORM HAZARDOUS WASTE MANIFEST		1 Generator's US EPA ID No 	Manifest Document No 	2 Page 1 of	information in the shaded areas is not required by Federal law
3 Generator's Name and Mailing Address				A State Manifest Document Number	
4 Generator's Phone ()				B State Generator's ID	
5 Transporter 1 Company Name		6 US EPA ID Number 		C State Transporter's ID	
7 Transporter 2 Company Name		8 US EPA ID Number 		D Transporter's Phone	
9 Designated Facility Name and Site Address		10 US EPA ID Number 		E State Transporter's ID	
				F Transporter's Phone	
				G State Facility's ID	
				H Facility's Phone	
11 US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12 Containers No Type		13 Total Quantity 	
a				14 Unit Wt Vol	
b				L Waste No	
c					
d					
Additional Descriptions for Materials Listed Above				K Handling Codes for Wastes Listed Above	
15 Special Handling Instructions and Additional Information					
<p>16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.</p> <p>If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.</p>					
Printed/Typed Name			Signature		Month Day Year
17. Transporter 1 Acknowledgement of Receipt of Materials					
Printed/Typed Name			Signature		Month Day Year
18. Transporter 2 Acknowledgement of Receipt of Materials					
Printed/Typed Name			Signature		Month Day Year
19. Discrepancy Indication Space					
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20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19					
Printed/Typed Name			Signature		Month Day Year



SATELLITE ACCUMULATION AREA (SAA)
HAZARDOUS WASTE AND POLLUTION CONTROL DIVISION
STORAGE PERMIT

BUILDING #: _____

SAA LOCATION DESCRIPTION: _____

DESIGNATED HAZARDOUS WASTE STORAGE SITE: _____

NAME OF WASTE STREAM** : _____

RESPONSIBLE UNIT: _____

APPROVED BY: _____
(HMDO)

DATE: _____

APPROVED BY: _____
(HMDC)

DATE: _____

APPROVED BY: _____
(HWPCD)

DATE: _____

INSTRUCTIONS

1. The SAA storage container must be properly labeled with a hazardous waste label. Leave Accumulation Start Date blank.

2. The maximum permitted gallons is _____ gallons.

3. This permit is to be displayed at the container storage location within SAA so as to be visible to personnel placing wastes in the container.

4. When container reaches maximum permitted gallons:

a. Seal the container and enter Accumulation Start Date on Hazardous Waste Label. Ensure that the container is properly labeled and placarded.

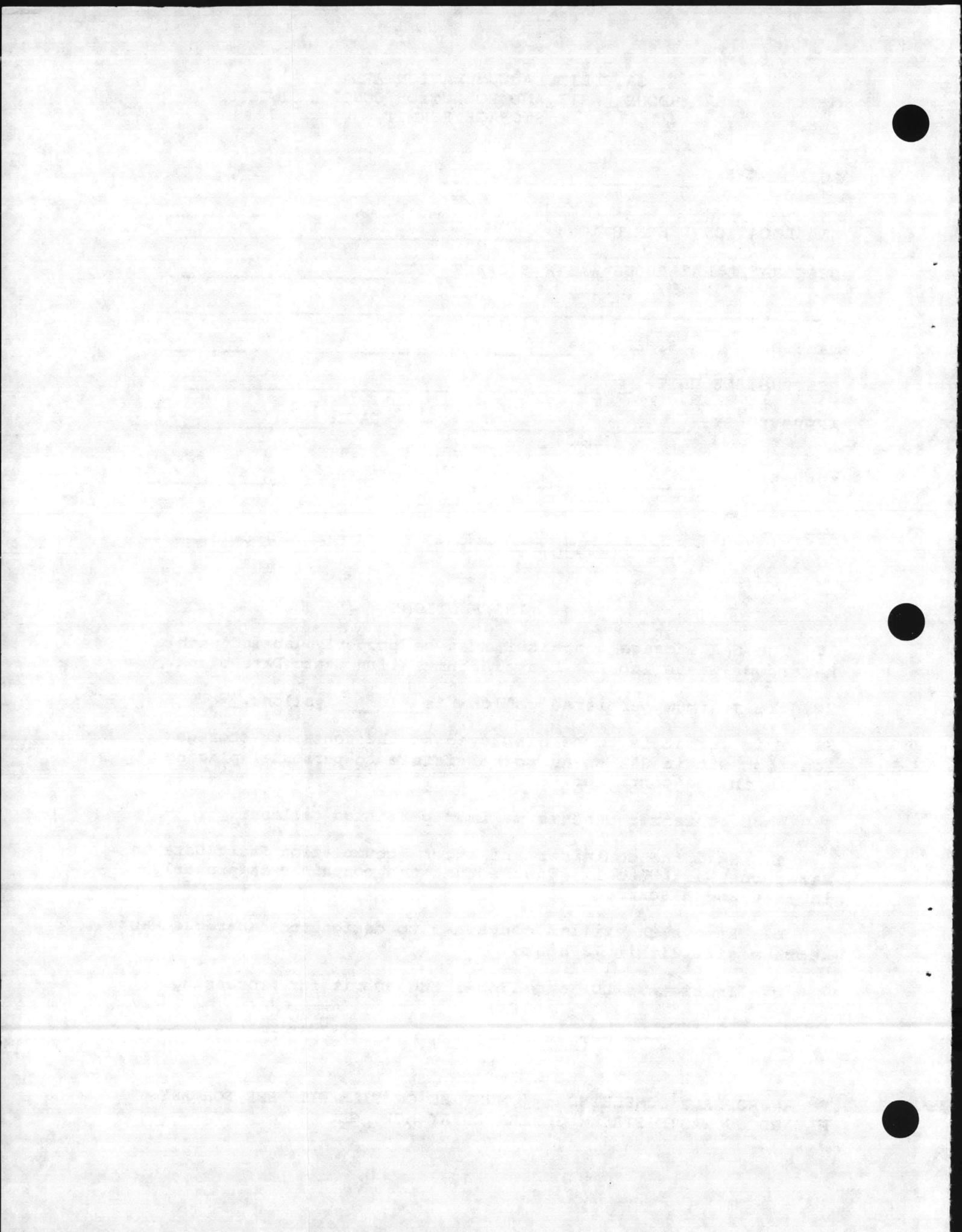
b. Remove the filled container to designated hazardous waste storage site within 72 hours.

c. Initiate a DD Form 1348-1 and submit for processing.

ACKNOWLEDGMENT: _____
(SITE MANAGER)

DATE: _____

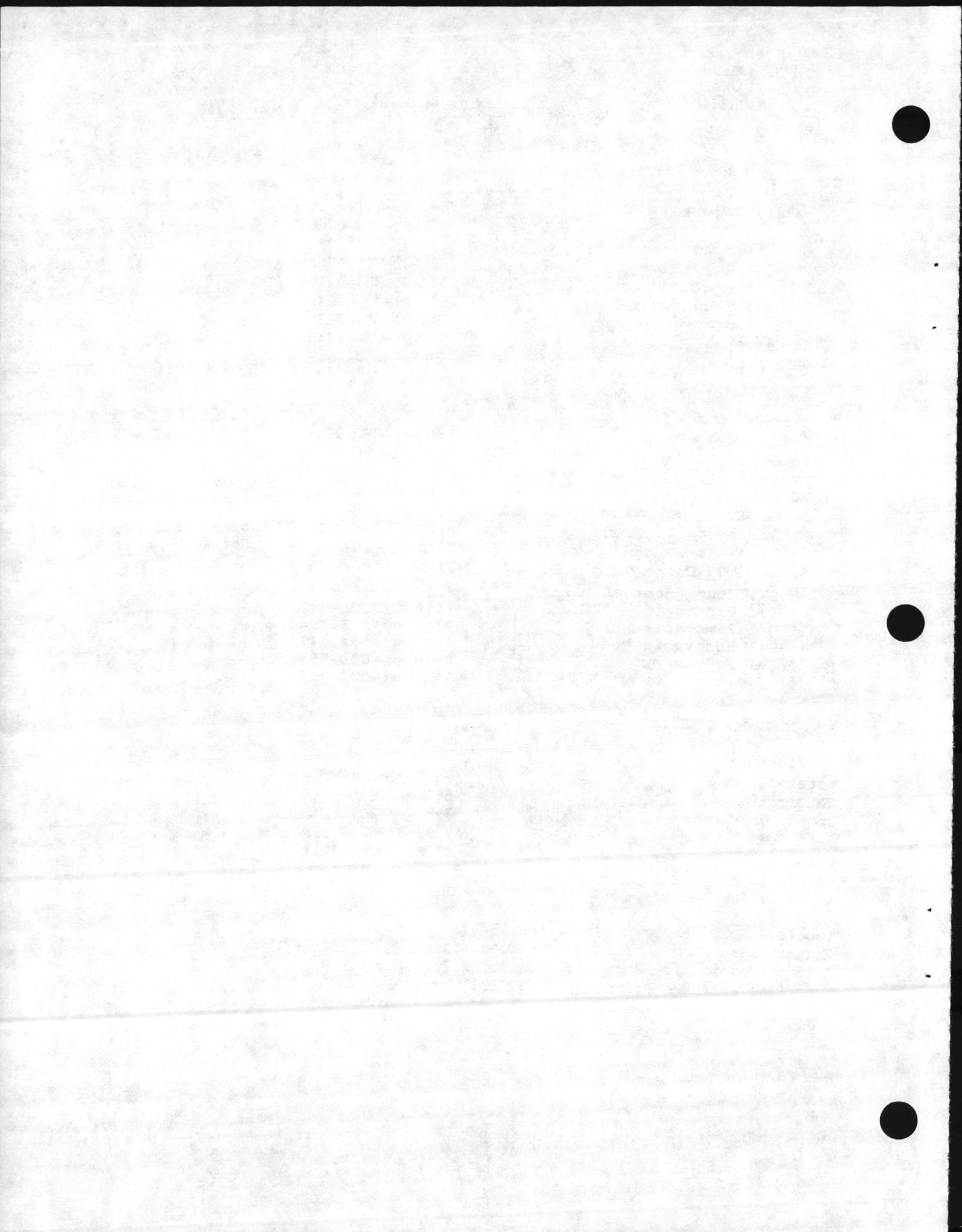
** A PROPERLY COMPLETED HWPS MUST BE ON FILE WITH EMD FOR ANY HAZARDOUS WASTE STREAM GENERATED AT MCB, CL.



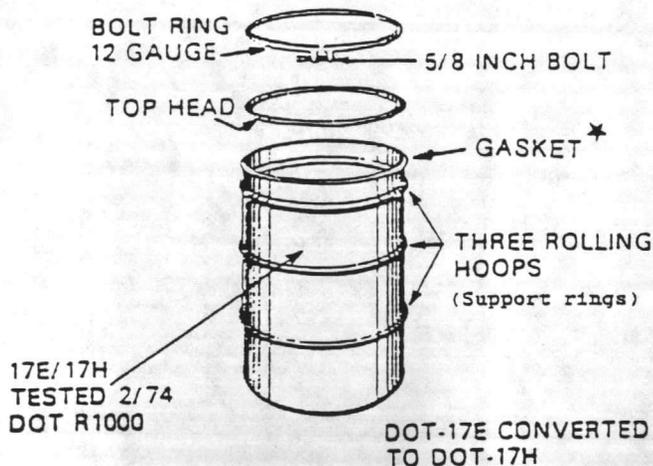
NSN REFERENCE LIST

<u>ITEM</u>	<u>U/I</u>	<u>NSN</u>
Labels		
Hazardous Waste	EA	7690-01-241-0508
ORM-E (liquid)	PG	7690-01-C00-0062
ORM-E (solid)	PG	7690-01-C00-0061
ORM-C	PG	7690-01-C00-0068
Flammable Liquid	PG	7540-01-054-7241
Flammable Solid	PG	7540-01-054-7242
Corrosive	PG	7540-01-054-7251
Oxidizer	PG	7540-01-054-7243
Radioactive	PG	7690-01-054-7248
Containers		
55 Gal Drum w/bung		8110-00-292-9783 ✓
55 Gal Drum, Removable Head (LINED)		8110-01-C00-0438 *
		8110-00-030-7780 ✓
30 Gal Drum w/bung (DOT-17E)		8110-01-C00-9917 ✓
30 Gal Drum, Removable Head		8110-00-030-7779 ✓
85 Gal Overpack, Steel		8110-01-101-4056 ✓ 4055 Overpack situation only
85 Gal Overpack, Poly		8110-01-C00-0277 * Not to be used
50 Gal Poly Drum w/bung (DOT-34)		8110-01-C00-9919 *
55 Gal Drum, Removable Head		8110-01-268-3007
20 Gal w/bung (DOT-17E)		8110-01-COD-9928
19 Gal Removable Head		8110-00-753-4643
16 Gal Removable Head		8110-00-254-5717
15 Gal Poly w/bung (DOT-34)		8110-01-COD-9918
5 Gal Poly w/bung (DOT-34)		8110-01-COD-9920
* Shop Stores, CLNC		
Matting	BE	9330-01-C00-9924
Vermiculite	BG	5640-00-801-4176
Speedy Dry	BG	7930-00-269-1272
Safe Step	BG	9390-00-282-4161
Boom	EA	9330-01-C00-0293

Labels - Self Service ext. 1667/3497
 Containers - Shop Stores (Lumber-Open Storage- Lot 201) ext. 1625
 Matting/Vermiculite/Boom - (Issue Point 70, Bldg. 1302) ext. 5105
 Safe Step - (Issue Point 65, Bldg. 1301) ext. 1975



SELECTION/PARTS OF DOT CONTAINERS

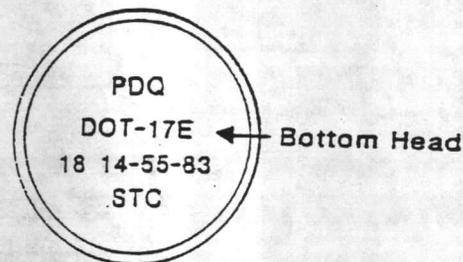
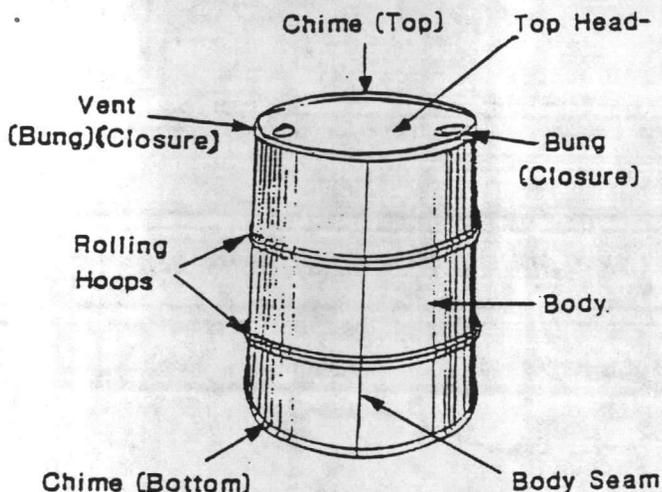


DOT 17H:

- Solids and Lab Packs (Overpack)
- Capacity - 57 gallons 90% full

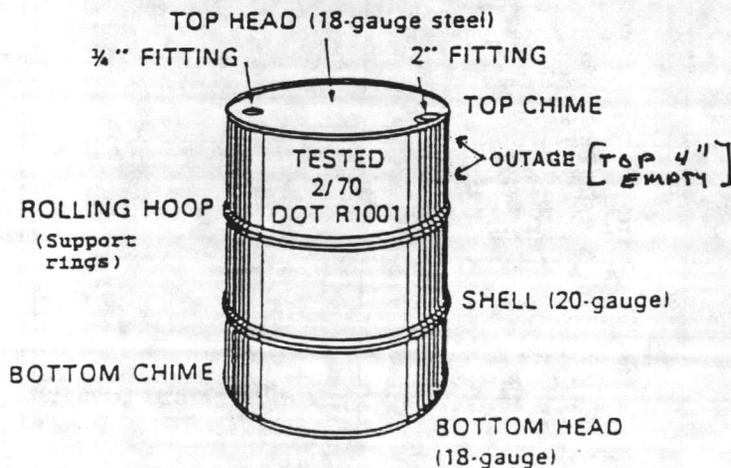
* Not required by DOT

Specification 17E: Steel Drum, Single Trip Container



Explanation of Markings
 PDQ—Symbol of Manufacturer
 DOT 17E—Specification Number
 18—Gauge Removable Bottom Head
 14—Gauge Body and Bottom Head
 55—Capacity in Gallons
 83—Year of Manufacture
 STC—Single Trip Container

Tight-head 20/18-gauge 55-gai. drum



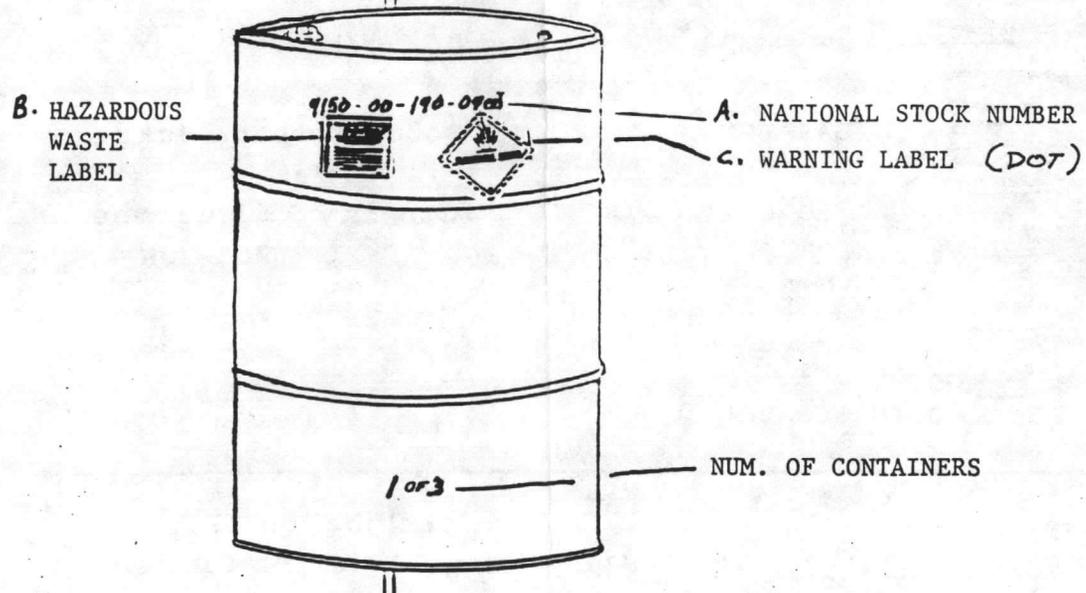
DOT 17E:

- Liquids
- Capacity - 57 gallons 2" for outage

(Note: Working capacity of 57 gallon drum is 55 gallons.)

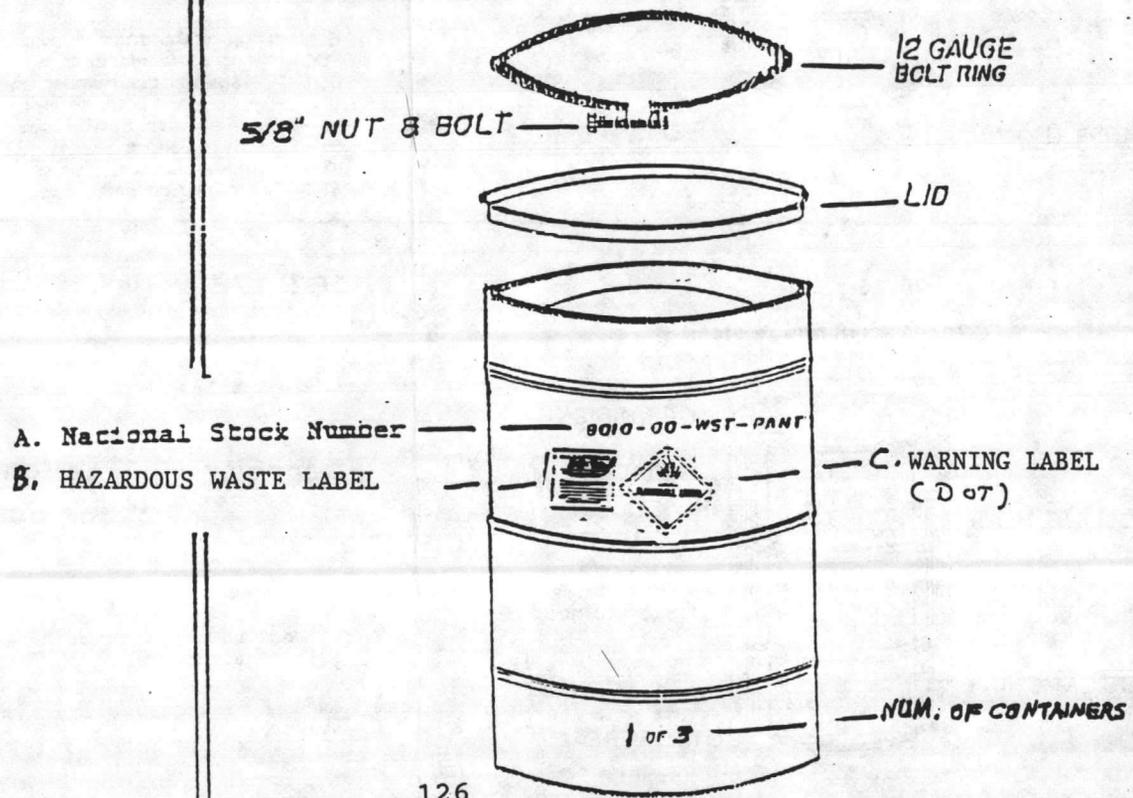
OUTAGE = SPACE LEFT BETWEEN THE TOP OF THE CONTAINER AND THE LIQUID

PROCEDURES FOR MARKING DRUMS OF HAZARDOUS WASTE



EXAMPLE: DOT APPROVED 17E 55 GAL. DRUM

PROCEDURES FOR MARKING DRUMS OF HAZARDOUS WASTE



EXAMPLE: DOT APPROVED 17H 55 GAL.

INSPECTION CHECKLIST
FOR
DRUMS AND CANS OF HAZARDOUS WASTE

1. Insure all seams (sides, tops and bottoms) on drums and cans are not damaged in any way nor can they be extremely rusty.
2. Insure there are no bulged tops on containers of hazardous waste.
3. Insure gaskets on the bungs are serviceable and the bungs are tightened in order to prevent seepage.
4. Insure your containers are DOT approved for the different types of hazardous waste you generate.
5. Insure containers are filled no more than 4 inches from the top, this allows for the expansion of the contents.
6. Do not put liquid in an overpack drum. The liquid goes into a container first and then in an overpack drum. further, insure the drum inside the overpack is properly packed with absorbent to prevent damage to containers as well as absorb any possible leaks.
7. Insure tops of drums and cans are covered to prevent rust in inclement weather. Insure cover can be removed in order for EMD personnel to inspect.
8. Have drums or cans on pallet, unbanded, when EMD personnel inspects and signs for the waste, then they are to be banded to the pallet for TMO to transport.
9. Insure the pallets are standard size (40" X 48") and in serviceable condition.
10. When banding to a pallet, insure the band is not tight enough to damage the containers. Banding is transporters option. It is not required by DRMO.
11. Insure battery acid as well as all corrosives are stored in plastic containers and that metal bungs are not used.
12. Insure cleaning solvents are not stored in plastic containers.
13. Insure you have the right hazardous waste label on the containers (i.e. Flammable, Corrosive, etc) and completely filled out.
14. Insure you have the correct NSN, Document number and waste name on the container.
15. Lithium batteries should be stored inside. If they are stored outside DRMO personnel will sign for them in place only. The turn-in document should contain a statement "These batteries are balanced or unbalanced" and be signed by generator.

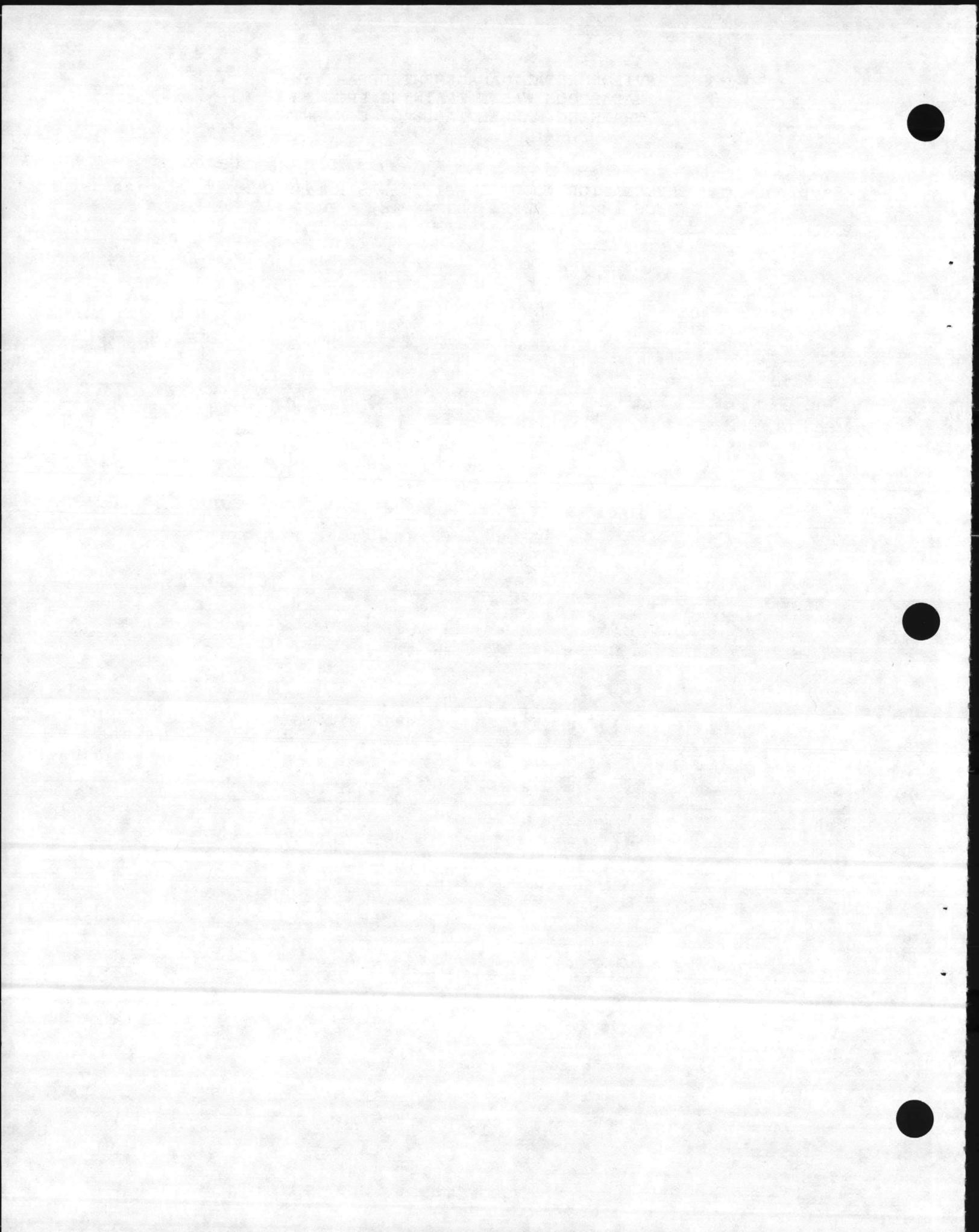


WORKSHEET: MATERIALS FOR DISPOSAL
IDENTIFICATION OF MATERIALS AND DISPOSAL METHODS

<u>Item</u>	<u>HM/HW/Special</u>	<u>Describe disposal method</u>
Hydraulic fluid		
Brake fluid		
Betadine		
Waste (used) oil		
Waste (used) oil with solvents		
Anti-freeze		
DS2, leaking		
Used battery acid/ electrolyte		
Wet cell batteries		
Filters (oil/fuel)		
Contaminated fuels (mogas/kero/diesel)		
Degreasers		
Dry sweep with oil		
Paint waste (oil base with thinners)		
Paint waste (latex)		
Paint waste (dried)		
Paint waste (C.A.R.C.)		

ENVIRONMENTAL MANAGEMENT DEPARTMENT
HAZARDOUS WASTE TRAINING PROGRAM
TRAINING MANUAL TABLE OF CONTENTS

Section 4. INFORMATION ABOUT SPECIFIC WASTE STREAMS 137 - 186
(MSDS, HMIS, HWPS, DD1348-1s)



WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

WASTE PROFILE NO. 001-

1. GENERATOR NAME _____

2. FACILITY ADDRESS _____

3. GENERATOR USEPA ID _____

4. GENERATOR STATE ID _____

5. ZIP CODE _____

6. TECHNICAL CONTACT _____

7. TITLE _____

PHONE
()

Electrolyte Battery acid

B. 1. NAME OF WASTE _____

2. USEPA/STATE I.D. NO.(S) D002, D008

3. PROCESS GENERATING WASTE electrolyte drained from damaged lead acid batteries

4. PROJECTED ANNUAL VOLUME/UNITS _____ / _____ 5. MODE OF COLLECTION poly containers

6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F026, F027, OR F028)? YES NO

7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO

HAS AN EXEMPTION BEEN GRANTED? YES NO

DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION

PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER _____

ODOR: NONE HIGH STRONG

DESCRIPTION acidic

COLOR clear to dirty water

DENSITY 1.1-1.8 BTU/LB <1000

FLASH POINT (F) >200° ASH CONTENT <1%

TOTAL SOLIDS <1% pH <1.0

LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
sulfuric acid		30-40%
water		60-70%
dissolved lead		5-500 ppm
TOTAL	<u>100</u>	<u>100%</u>

2. CHEMICAL COMPOSITION

HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L).

ARSENIC <5.0 MERCURY <0.2 ZINC 100

BARIUM <100.0 SELENIUM <1.0 CHROMIUM-HEX NA

CADMIUM <5.0 SILVER <5.0 (OTHER) _____

CHROMIUM <5.0 COPPER <100

LEAD 5-500 NICKEL <100

(OTHER) _____ (OTHER) _____

OTHER COMPONENTS (PPM)

CYANIDES NA VOLATILE ORGANICS NA

SULFIDES NA TOTAL HALOGENS NA

PCBS NA PHENOLICS NA

(OTHER) _____

5. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? YES NO

PROPER SHIPPING NAME waste battery fluid, acid

HAZARD CLASS corrosive material U.N. or N.A. NO. UN2796

ADDITIONAL DESCRIPTION _____

METHOD OF SHIPMENT BULK DRUM OTHER: _____

CERCLA REPORTABLE QUANTITY (RQ) 1 lb

EMERGENCY RESPONSE GUIDE PAGE _____

DOT PUBLICATION 5800.4 PAGE NO. 39 EDITION (YR) 1987

SPECIAL HANDLING INFORMATION causes severe skin burns

3. HAZARDOUS CHARACTERISTICS

REACTIVE PYROPHORIC SHOCK SENSITIVE

EXPLOSIVE WATER REACTIVE RADIOACTIVE

ETIOLOGICAL NONE OF THE ABOVE

TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING)

OTHER _____

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMO.

6. GENERATOR CERTIFICATION

I, _____, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE _____

DATE _____

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input checked="" type="checkbox"/> LEAD	D008	5-500
<input type="checkbox"/> CADMIUM	D006	_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLOROBENZENE	D021	_____	<input type="checkbox"/> METHYL ETHYL KETONE	D035	_____
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input type="checkbox"/> CHROMIUM	D007	_____	<input type="checkbox"/> PENTRACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,45-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDS. Handle in accordance with current safety guidelines. Contact unit safety officer for additional information.

2. CONTAINER AND LABELING REQUIREMENT: Corrosive material

- a. DOT/DOD CONTAINER TYPE: 34 other containers require prior approval from EMD.
- b. DOT PROPER SHIPPING NAME: waste battery fluid, acid
- c. DOT HAZARD CLASS: corrosive material
- d. UN/NA NUMBER: UN2796
- e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

WASTE PROFILE NO. 005 -

1. GENERATOR NAME _____

2. FACILITY ADDRESS _____

3. GENERATOR USEPA ID _____

4. GENERATOR STATE ID _____

5. ZIP CODE _____

6. TECHNICAL CONTACT _____

7. TITLE _____

PHONE
() _____

8. 1. NAME OF WASTE lithium batteries
 2. USEPA/or/STATE I.D. NO.(S) D003
 3. PROCESS GENERATING WASTE spent batteries from military communications equipment
 4. PROJECTED ANNUAL VOLUME/UNITS _____ / _____ 5. MODE OF COLLECTION _____
 6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)? YES NO
 7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO
 HAS AN EXEMPTION BEEN GRANTED? YES NO
 DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION

- PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER _____
 ODOR: NONE HIGH STRONG
 DESCRIPTION seals batteries, plastic casing
 COLOR green casing
 DENSITY 2.2 BTU/LB 5000
 FLASH POINT (F) > 200 ASH CONTENT 70-80%
 TOTAL SOLIDS 60-70% pH NA
 LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
plastic casing		60-70%
sulfur dioxide		25-35%
acetonitrile		10-15%
Lithium		2-8%
TOTAL	100	100%

2. CHEMICAL COMPOSITION

- HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L)
- | | | |
|--------------------------|--------------------------|------------------------|
| ARSENIC <u>< 5.0</u> | MERCURY <u>< 0.2</u> | ZINC <u>< 100</u> |
| BARIUM <u>< 100</u> | SELENIUM <u>< 1.0</u> | CHROMIUM-HEX <u>NA</u> |
| CADMIUM <u>< 1.0</u> | SILVER <u>< 5.0</u> | (OTHER) _____ |
| CHROMIUM <u>< 5.0</u> | COPPER <u>< 100</u> | |
| LEAD <u>< 5.0</u> | NICKEL <u>< 100</u> | |
| (OTHER) _____ | (OTHER) _____ | |
- OTHER COMPONENTS (PPM)
- | | |
|----------------------------------|-----------------------------|
| CYANIDES <u>NA</u> | VOLATILE ORGANICS <u>NA</u> |
| SULFIDES <u>30% as sulf diox</u> | TOTAL HALOGENS <u>NA</u> |
| PCBS <u>NA</u> | PHENOLICS <u>NA</u> |
| (OTHER) _____ | |

5. SHIPPING INFORMATION

- DOT HAZARDOUS MATERIAL? YES NO
 PROPER SHIPPING NAME waste lithium batteries for disposal
 HAZARD CLASS ORM-C U.N. or N.A. NO. None
 ADDITIONAL DESCRIPTION _____
 METHOD OF SHIPMENT BULK DRUM OTHER: _____
 CERCLA REPORTABLE QUANTITY (RQ) 100
 EMERGENCY RESPONSE GUIDE PAGE _____
 DOT PUBLICATION 5800.4 PAGE NO. 40 EDITION (YR) 1987
 SPECIAL HANDLING INFORMATION Dangerous when wet

3. HAZARDOUS CHARACTERISTICS

- REACTIVE PYROPHORIC SHOCK SENSITIVE
 EXPLOSIVE WATER REACTIVE RADIOACTIVE
 ETIOLOGICAL NONE OF THE ABOVE
 TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING)
 OTHER _____

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMO.

6. GENERATOR CERTIFICATION

I, _____, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE _____

DATE _____

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input type="checkbox"/> LEAD	D008	_____
<input type="checkbox"/> CADMIUM		_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLORO BENZENE	D021	_____	<input type="checkbox"/> METHYL ETHYL KETONE	D035	_____
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input type="checkbox"/> CHROMIUM		_____	<input type="checkbox"/> PENTRACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,45-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDS. Handle in accordance with current Safety Guidelines. Contact unit safety officer for additional information.
-
2. CONTAINER AND LABELING REQUIREMENT: Hazardous waste label only.
-
- a. DOT/DOD CONTAINER TYPE: Wooden Box, 17 H, 17 C. Other containers require prior approval from EMB.
- b. DOT PROPER SHIPPING NAME: Waste lithium batteries for disposal
- c. DOT HAZARD CLASS: ORM-C
- d. UN/NA NUMBER: NA
- e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

 WASTE PROFILE NO. 043-
1. GENERATOR NAME
2. FACILITY ADDRESS
3. GENERATOR USEPA ID
4. GENERATOR STATE ID

5. ZIP CODE

6. TECHNICAL CONTACT
7. TITLE

 PHONE
()

B. 1. NAME OF WASTE PD680 - Dry Cleaning Solvent
2. USEPA/STATE I.D. NO.(S) D001, D035, F003, F005, F001, F002
3. PROCESS GENERATING WASTE Spent solvent from parts cleaning
4. PROJECTED ANNUAL VOLUME/UNITS
5. MODE OF COLLECTION
6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)? YES NO

7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO
HAS AN EXEMPTION BEEN GRANTED? YES NO

DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION
PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER

ODOR: NONE HIGH STRONG

DESCRIPTION solvent
COLOR amber
DENSITY 0.8 - 1.0 BTU/LB 12,000-14,000
FLASH POINT (F) 100-140 **ASH CONTENT** <1%
TOTAL SOLIDS 5-15% **pH** 6-8
LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

2. CHEMICAL COMPOSITION
HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L)

ARSENIC <u><5.0</u>	MERCURY <u><0.2</u>	ZINC <u><1000</u>
BARIUM <u><100</u>	SELENIUM <u>1.0</u>	CHROMIUM-HEX <u>NA</u>
CADMIUM <u><1.0</u>	SILVER <u><5.0</u>	(OTHER) _____
CHROMIUM <u><5.0</u>	COPPER <u><1000</u>	
LEAD <u><5.0</u>	NICKEL <u><1000</u>	
(OTHER) _____	(OTHER) _____	

OTHER COMPONENTS (PPM)

CYANIDES <u>NA</u>	VOLATILE ORGANICS <u>100%</u>
SULFIDES <u>NA</u>	TOTAL HALOGENS <u>0-2%</u>
PCBS <u>NA</u>	PHENOLICS <u>NA</u>
(OTHER) _____	

3. HAZARDOUS CHARACTERISTICS

<input type="checkbox"/> REACTIVE	<input type="checkbox"/> PYROPHORIC	<input type="checkbox"/> SHOCK SENSITIVE
<input type="checkbox"/> EXPLOSIVE	<input type="checkbox"/> WATER REACTIVE	<input type="checkbox"/> RADIOACTIVE
<input type="checkbox"/> ETIOLOGICAL	<input checked="" type="checkbox"/> NONE OF THE ABOVE	
<input type="checkbox"/> TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING)		
<input type="checkbox"/> OTHER _____		

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMO.

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
Parraffinic hydrocarbons		40-60%
Naphthenic hydrocarbons		40-60
Aromatic hydrocarbons		5-10
Halogenated organics		0-2/
Grease		2-5%
TOTAL	<u>100</u>	<u>100%</u>

5. SHIPPING INFORMATION
DOT HAZARDOUS MATERIAL? YES NO

PROPER SHIPPING NAME Waste petroleum Distillates
HAZARD CLASS combustible liquid U.N. or N.A. NO. UN1268
ADDITIONAL DESCRIPTION
METHOD OF SHIPMENT BULK DRUM OTHER:

CERCLA REPORTABLE QUANTITY (RCQ) 10
EMERGENCY RESPONSE GUIDE PAGE
DOT PUBLICATION 5800.4 **PAGE NO.** 27 **EDITION (YR)** 1987
SPECIAL HANDLING INFORMATION
6. GENERATOR CERTIFICATION

I, _____, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE
DATE

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input type="checkbox"/> LEAD	D008	_____
<input type="checkbox"/> CADMIUM	_____	_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLOROBENZENE	D021	_____	<input checked="" type="checkbox"/> METHYL ETHYL KETONE	D035	200-400
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input type="checkbox"/> CHROMIUM	_____	_____	<input type="checkbox"/> PENTACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,45-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDS. Handle in accordance with current safety guidelines. Contact unit safety officer for additional information.
2. CONTAINER AND LABELING REQUIREMENT: Hazardous Waste label only.
 - a. DOT/DOD CONTAINER TYPE: 17E, 3A, 37H. Other containers require prior approval from EMD.
 - b. DOT PROPER SHIPPING NAME: Waste petroleum distillate
 - c. DOT HAZARD CLASS: combustible liquid
 - d. UN/NA NUMBER: UN1268
 - e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

WASTE PROFILE NO. 093-

1. GENERATOR NAME _____

2. FACILITY ADDRESS _____

3. GENERATOR USEPA ID _____

4. GENERATOR STATE ID _____

5. ZIP CODE _____

6. TECHNICAL CONTACT _____

7. TITLE _____

PHONE
()

- B. 1. NAME OF WASTE** Carc Paint
- 2. USEPA/ST/STATE I.D. NO.(S)** D001, D007, D035
- 3. PROCESS GENERATING WASTE** painting operation
- 4. PROJECTED ANNUAL VOLUME/UNITS** _____ / _____
- 5. MODE OF COLLECTION** _____
- 6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)?** YES NO
- 7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)?** YES NO
- HAS AN EXEMPTION BEEN GRANTED?** YES NO
- DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS?** YES NO

PART II

1. MATERIAL CHARACTERIZATION

PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER _____

ODOR: NONE HIGH STRONG

DESCRIPTION solvent

COLOR variable

DENSITY 1.24 BTU/LB 12000-13000

FLASH POINT (F) <100 **ASH CONTENT** 5-10

TOTAL SOLIDS 10-15 pH 6-8 (10% solution)

LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

2. CHEMICAL COMPOSITION

HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L)

ARSENIC <5.0 **MERCURY** <0.2 **ZINC** <10

BARIUM <1.00 **SELENIUM** <1.0 **CHROMIUM-HEX** NA

CADMIUM <1.0 **SILVER** <5.0 **(OTHER)** _____

CHROMIUM 5-50,000 **COPPER** <10

LEAD <5.0 **NICKEL** <10

(OTHER) _____ **(OTHER)** _____

OTHER COMPONENTS (PPM)

CYANIDES NA **VOLATILE ORGANICS** NA

SULFIDES NA **TOTAL HALOGENS** NA

PCBS NA **PHENOLICS** NA

(OTHER) _____

3. HAZARDOUS CHARACTERISTICS

- REACTIVE PYROPHORIC SHOCK SENSITIVE
- EXPLOSIVE WATER REACTIVE RADIOACTIVE
- ETIOLOGICAL NONE OF THE ABOVE
- TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING)
- OTHER _____

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMO.

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
Homopolymer of hexamethylene diisocyanate		40-60
Methyl isoamyl ketone		5-10
butyl Acetate		5-10
titanium dioxide		5-10
resin		10-20
chromium oxide		1-3
TOTAL	<u>100</u>	<u>100% Continued</u>

5. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? YES NO

PROPER SHIPPING NAME waste paint

HAZARD CLASS flam. liquid **U.N. or N.A. NO.** UNI263

ADDITIONAL DESCRIPTION _____

METHOD OF SHIPMENT BULK DRUM OTHER: _____

CERCLA REPORTABLE QUANTITY (RQ) 1 lb

EMERGENCY RESPONSE GUIDE PAGE _____

DOT PUBLICATION 5800.4 **PAGE NO.** 26 **EDITION (YR)** 1987

SPECIAL HANDLING INFORMATION _____

6. GENERATOR CERTIFICATION

I, _____, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE _____

DATE _____

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input type="checkbox"/> LEAD	D008	_____
<input type="checkbox"/> CADMIUM	_____	_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLOROBENZENE	D021	_____	<input checked="" type="checkbox"/> METHYL ETHYL KETONE	D035	8-80%
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input checked="" type="checkbox"/> CHROMIUM	D007	5-50,000	<input type="checkbox"/> PENTRACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,45-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDS. Handle in compliance with current safety guidelines. Contact unit safety officer for additional information.

2. CONTAINER AND LABELING REQUIREMENT: Flammable liquid

a. DOT/DOD CONTAINER TYPE: 17E, 17G, 17H. Other containers require prior approval from EMD.

b. DOT PROPER SHIPPING NAME: Waste Paint

c. DOT HAZARD CLASS: Flammable liquid

d. UN/NA NUMBER: UN 1263

e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

Part II

4. MATERIAL COMPOSITION (Continued)

extender pigment	3-5%
methyl ethyl ketone	1-8
propylenglycol monomethyl ether	5-10
ethylene glycol Monomethyl ether	10-15
xylene	5-10

MIL-P-
23377

NSN 8010-01-160-6741
 8010-00-
 229-4813
 142-9279
 935-7080
 082-2450
 01-048-6539
 00-082-2477

160-6744
 160-6745
 160-6746
 160-6742
 141-2419
 141-2416
 131-6254
 130-3347
 131-6261
 131-6254
 162-5578

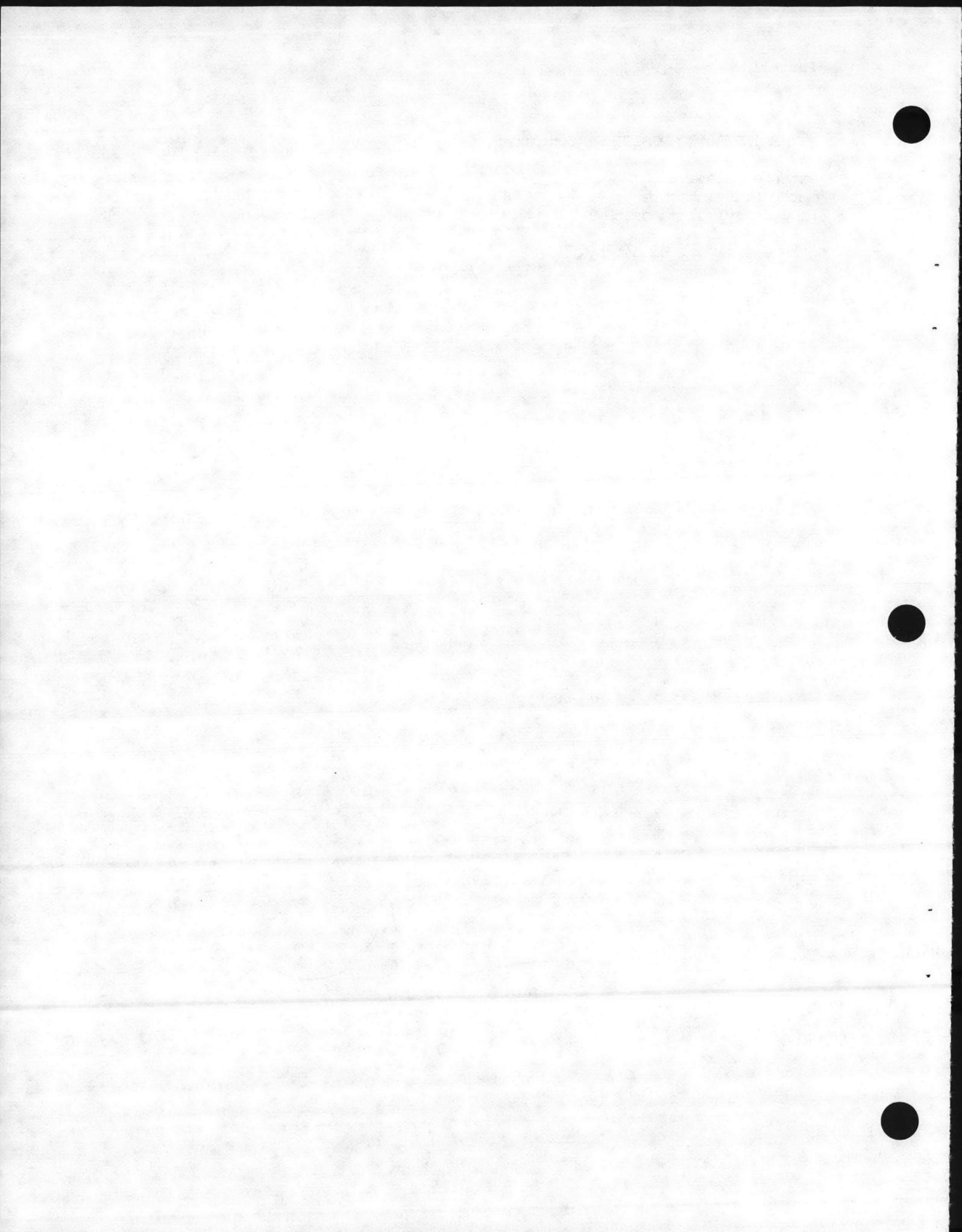
MIL-C
46168

229-7546
 229-4561
 229-7547
 229-7543
 229-7544
 229-7545
 229-7540
 229-7541
 229-7542
 234-2934
 234-2935
 235-2936
 246-0717
 246-0718
 246-0719

MIL-C
53039

218-0856
 218-7354

MIL-P-
85582



WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

WASTE PROFILE NO. 105-

1. GENERATOR NAME _____

2. FACILITY ADDRESS _____

3. GENERATOR USEPA ID _____

4. GENERATOR STATE ID _____

5. ZIP CODE _____

6. TECHNICAL CONTACT _____

7. TITLE _____

PHONE
() _____

B. 1. NAME OF WASTE paint enamel/alkyd

2. USEPA/STATE I.D. NO.(S) D001, D007, D008, D035

3. PROCESS GENERATING WASTE painting operations

4. PROJECTED ANNUAL VOLUME/UNITS _____ / _____ 5. MODE OF COLLECTION _____

6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)? YES NO

7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO

HAS AN EXEMPTION BEEN GRANTED? YES NO

DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION

PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER _____

ODOR: NONE HIGH STRONG

DESCRIPTION solvent

COLOR various green, sand, brown, black, drab

DENSITY 0.88 BTU/LB 12000

FLASH POINT (F) < 100 ASH CONTENT < 5%

TOTAL SOLIDS 2.5% pH 6-8 (10% solution)

LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
ethyl alcohol		1-5
butyl alcohol		1-5
acetone		1-5
methyl ethyl ketone		1-5
xylene		1-5
VM&P Naptha		20-30%
lead chromate		1-5
TOTAL	100	100%

2. CHEMICAL COMPOSITION

HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L).

ARSENIC <u>45.0</u>	MERCURY <u>40.2</u>	ZINC <u>5-20000</u>
BARIUM <u>4100</u>	SELENIUM <u>< 1.0</u>	CHROMIUM-HEX <u>NA</u>
CADMIUM <u>41.0</u>	SILVER <u>< 5.0</u>	(OTHER) _____
CHROMIUM <u>5-20000</u>	COPPER <u>410</u>	_____
LEAD <u>5-20000</u>	NICKEL <u>410</u>	_____
(OTHER) _____	(OTHER) _____	_____

OTHER COMPONENTS (PPM)

CYANIDES <u>NA</u>	VOLATILE ORGANICS <u>20-30%</u>
SULFIDES <u>NA</u>	TOTAL HALOGENS <u>NA</u>
PCBS <u>NA</u>	PHENOLICS <u>NA</u>
(OTHER) _____	_____

5. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? YES NO

PROPER SHIPPING NAME waste paint

HAZARD CLASS flamm. liquid U.N. or N.A. NO. Un1263

ADDITIONAL DESCRIPTION

METHOD OF SHIPMENT BULK DRUM OTHER: _____
 CERCLA REPORTABLE QUANTITY (RQ) 1 lb chromium and lead
 EMERGENCY RESPONSE GUIDE PAGE _____
 DOT PUBLICATION 5800.4 PAGE NO. 26 EDITION (YR) 1987
 SPECIAL HANDLING INFORMATION _____

3. HAZARDOUS CHARACTERISTICS

REACTIVE PYROPHORIC SHOCK SENSITIVE
 EXPLOSIVE WATER REACTIVE RADIOACTIVE
 ETIOLOGICAL NONE OF THE ABOVE
 TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING)
 OTHER _____

*NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMO.

6. GENERATOR CERTIFICATION

I, _____, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE _____

DATE _____

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input checked="" type="checkbox"/> LEAD	D008	5-20000
<input type="checkbox"/> CADMIUM	D006	_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLORO BENZENE	D021	_____	<input checked="" type="checkbox"/> METHYL ETHYL KETONE	D035	1-5%
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input checked="" type="checkbox"/> CHROMIUM	D007	5-20000	<input type="checkbox"/> PENTRACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLORO BENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,46-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLORO BENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: wear respirator with organic vapor cartridge when handling. refer to MSDS. Handle in compliance with current safety guidelines. Contact unit safety officer for additional information

2. CONTAINER AND LABELING REQUIREMENT: Flammable Liquid

a. DOT/DOD CONTAINER TYPE: 17H, 17C, 17E. Other containers require EMD approval.

b. DOT PROPER SHIPPING NAME: waste paint

c. DOT HAZARD CLASS: Flammable liquid

d. UN/NA NUMBER: UN1263

e. ADDITIONAL REQUIREMENTS:

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

 WASTE PROFILE NO. 007-
1. GENERATOR NAME
2. FACILITY ADDRESS
3. GENERATOR USEPA ID
4. GENERATOR STATE ID
5. ZIP CODE
6. TECHNICAL CONTACT
7. TITLE
PHONE
()

B. 1. NAME OF WASTE Nicad Batteries (Dry)
2. USEPA/ST/STATE I.D. NO.(S) D006
3. PROCESS GENERATING WASTE Discarded batteries from military operations
4. PROJECTED ANNUAL VOLUME/UNITS / **5. MODE OF COLLECTION**
6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)? YES NO

7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO

HAS AN EXEMPTION BEEN GRANTED? YES NO

DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION
PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER

ODOR: NONE HIGH STRONG

DESCRIPTION batteries sealed in plastic green
COLOR
DENSITY 2 **BTU/LB** <1000
FLASH POINT (F) <200° **ASH CONTENT** 70-80%
TOTAL SOLIDS 100% **pH** NA
LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
Plastic and metal casing		50-70
Cadmium Salts		5-15
Nickel Salts		5-15
Potassium hydroxide		10-20
Inert		0-10
TOTAL	<u>100</u>	<u>100%</u>

2. CHEMICAL COMPOSITION
HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L)

ARSENIC <u>45.0</u>	MERCURY <u><0.2</u>	ZINC <u>100-100,000</u>
BARIUM <u>4100</u>	SELENIUM <u><1.0</u>	CHROMIUM-HEX <u>NA</u>
CADMIUM <u>1-10,000</u>	SILVER <u>45.0</u>	(OTHER) _____
CHROMIUM <u>45.0</u>	COPPER <u>100</u>	
LEAD <u>45.0</u>	NICKEL <u>100-100,000</u>	
(OTHER) _____	(OTHER) _____	

OTHER COMPONENTS (PPM)

CYANIDES <u>NA</u>	VOLATILE ORGANICS <u>NA</u>
SULFIDES <u>NA</u>	TOTAL HALOGENS <u>NA</u>
PCBS <u>NA</u>	PHENOLICS <u>NA</u>
(OTHER) _____	

5. SHIPPING INFORMATION
DOT HAZARDOUS MATERIAL? YES NO

PROPER SHIPPING NAME Waste battery, electric storage dry containing potassium hydroxide solid.
HAZARD CLASS corrosive material **U.N. or NA NO.** NA1813
ADDITIONAL DESCRIPTION
METHOD OF SHIPMENT BULK DRUM OTHER:

CERCLA REPORTABLE QUANTITY (RQ) 11b
EMERGENCY RESPONSE GUIDE PAGE
DOT PUBLICATION 5800.4 **PAGE NO.** 60 **EDITION (YR)** 1987
SPECIAL HANDLING INFORMATION
3. HAZARDOUS CHARACTERISTICS

- | | | |
|--|---|--|
| <input type="checkbox"/> REACTIVE | <input type="checkbox"/> PYROPHORIC | <input type="checkbox"/> SHOCK SENSITIVE |
| <input type="checkbox"/> EXPLOSIVE | <input type="checkbox"/> WATER REACTIVE | <input type="checkbox"/> RADIOACTIVE |
| <input type="checkbox"/> ETIOLOGICAL | <input checked="" type="checkbox"/> NONE OF THE ABOVE | |
| <input type="checkbox"/> TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING) | | |
| <input type="checkbox"/> OTHER _____ | | |

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMD.

6. GENERATOR CERTIFICATION

I, _____, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE
DATE

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input type="checkbox"/> LEAD	D008	_____
<input checked="" type="checkbox"/> CADMIUM	D006	1-10,000	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLOROBENZENE	D021	_____	<input type="checkbox"/> METHYL ETHYL KETONE	D035	_____
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input type="checkbox"/> CHROMIUM	_____	_____	<input type="checkbox"/> PENTRACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,45-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDs. Handle in compliance with current safety guidelines. Contact unit safety officer for additional information.

2. CONTAINER AND LABELING REQUIREMENT: Corrosive material

a. DOT/DOD CONTAINER TYPE: Wooden box, other containers require prior approval from EMD.

b. DOT PROPER SHIPPING NAME: Waste battery electric storage dry (containing potassium hydroxide solid)

c. DOT HAZARD CLASS: Corrosive Material

d. UN/NA NUMBER: NA1813

e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

MARINE CORPS BASE, CAMP LEJEUNE

WASTE PROFILE NO.

020-
1. GENERATOR NAME
2. FACILITY ADDRESS

NORTH CAROLINA

 5. ZIP CODE
28542

3. GENERATOR USEPA ID

NC6170022580

4. GENERATOR STATE ID

SAME

6. TECHNICAL CONTACT
7. TITLE

HMDO

PHONE

(919) 451-

- B. 1. NAME OF WASTE** DS-2
2. USEPA/STATE I.D. NO.(S) D002
3. PROCESS GENERATING WASTE NBC decontamination discarded product
4. PROJECTED ANNUAL VOLUME/UNITS 1 gallons **5. MODE OF COLLECTION** drum or 5 gallon can
6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)? YES NO
7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO
HAS AN EXEMPTION BEEN GRANTED? YES NO
DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION

PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER
ODOR: NONE HIGH STRONG
 DESCRIPTION NA
 COLOR milky
 DENSITY 0.98 BTU/LB 2000-4000
 FLASH POINT (F) 175 ASH CONTENT <1
 TOTAL SOLIDS <1% pH >12.5
 LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

2. CHEMICAL COMPOSITION

HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L)
 ARSENIC <5.0 MERCURY <0.2 ZINC <10
 BARIUM <100 SILVER <1.0 CHROMIUM-HEX NA
 CADMIUM <1.0 SILEN <5.0 (OTHER)
 CHROMIUM <5.0 COPPER <10
 LEAD <5.0 NICKEL <10
 (OTHER) (OTHER)

OTHER COMPONENTS (PPM)

CYANIDES NA VOLATILE ORGANICS 25-30
 SULFIDES NA TOTAL HALOGENS NA
 PCBs NA PHENOLICS NA
 (OTHER)

3. HAZARDOUS CHARACTERISTICS

- REACTIVE PYROPHORIC SHOCK SENSITIVE
 EXPLOSIVE WATER REACTIVE RADIOACTIVE
 ETIOLOGICAL NONE OF THE ABOVE
 TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING)
 OTHER

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMO.

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
Diethylene triamine		65-75%
ethylene glycol monoethyl ether		25-30
sodium hydroxide		1-4
TOTAL	<u>100</u>	100%

5. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? YES NO
 waste alkaline liquid NOS
 PROPER SHIPPING NAME (diethylene triamine ethylene glycol monoethyl sodium hydroxide)
 HAZARD CLASS corrosive material U.N. or N.A. NO. NA 1719
 ADDITIONAL DESCRIPTION
 METHOD OF SHIPMENT BULK DRUM OTHER:
 CERCLA REPORTABLE QUANTITY (RQ) 100
 EMERGENCY RESPONSE GUIDE PAGE 60 EDITION (YR) 1987
 DOT PUBLICATION 5800.4 PAGE NO. EDITION (YR)
 SPECIAL HANDLING INFORMATION

6. GENERATOR CERTIFICATION

I, Bob Wassmann, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE

DATE

Bob Wassmann
11/23/70

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input type="checkbox"/> LEAD	D008	_____
<input type="checkbox"/> CADMIUM		_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLOROBENZENE	D021	_____	<input type="checkbox"/> METHYL ETHYL KETONE	D035	_____
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input type="checkbox"/> CHROMIUM		_____	<input type="checkbox"/> PENTACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,45-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDS. Handle in compliance with current safety guidelines. Contact unit safety officer for additional information.

2. CONTAINER AND LABELING REQUIREMENT: Corrosive material

- a. DOT/DOD CONTAINER TYPE: Lined 17E, 171, 174, 31 other containers require prior approval from EMD.
- b. DOT PROPER SHIPPING NAME: waste alkaline liquid, NOS (diethylene triamine, ethyleneglycol monomethyl ether, sodium dioxide) hydretide
- c. DOT HAZARD CLASS: Corrosive material
- d. UN/NA NUMBER: NA 1719
- e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

WASTE MATERIAL PROFILE SHEET

PART I

A. GENERAL INFORMATION

WASTE PROFILE NO. 023-

MARINE CORPS BASE, CAMP LEJEUNE

1. GENERATOR NAME
2. FACILITY ADDRESS

NORTH CAROLINA

5. ZIP CODE
28542

3. GENERATOR USEPA ID

NC6170022580

4. GENERATOR STATE ID

SAME

5. TECHNICAL CONTACT

SSGT JOHNSTON

7. TITLE

HMDO

PHONE

619 451

B. 1. NAME OF WASTE M-258 Al Decon KIT M-258

2. USEPA/STATE I.D. NO.(S) none D602

3. PROCESS GENERATING WASTE discarded decontamination kit

4. PROJECTED ANNUAL VOLUME/UNITS _____

5. MODE OF COLLECTION drum

6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)? YES NO

7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO

- HAS AN EXEMPTION BEEN GRANTED? YES NO

DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION

PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER

ODOR: NONE HIGH STRONG

DESCRIPTION vials containing liquids

COLOR variable

DENSITY _____ BTU/LB 5-8000

FLASH POINT (F) 100-140 ASH CONTENT 41%

TOTAL SOLIDS 1% pH 6-8

LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

2. CHEMICAL COMPOSITION

HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L)

ARSENIC < 5.0

MERCURY < 0.2

ZINC < 10

BARIUM < 100

SELENIUM < 1.0

CHROMIUM-HEX NA

CADMIUM < 1.0

SILVER < 5.0

(OTHER) _____

CHROMIUM < 5.0

COPPER < 10

LEAD < 5.0

NICKEL < 10

(OTHER) _____

(OTHER) _____

OTHER COMPONENTS (PPM)

CYANIDES NA

VOLATILE ORGANICS 40-50%

SOLFIDES NA

TOTAL HALOGENS NA

PCBS NA

PHENOLICS NA

(OTHER) _____

(OTHER) _____

3. HAZARDOUS CHARACTERISTICS

- REACTIVE PYROPHORIC SHOCK SENSITIVE
 EXPLOSIVE WATER REACTIVE RADIOACTIVE
 ETIOLOGICAL NONE OF THE ABOVE
 TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING)
 OTHER _____

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMD.

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
PADI Ethyl Alcohol (Isopropyl)		40-50%
Zinc chloride		4-6
water		45-50
PADI:		
ethyl Alcohol		70-80%
phenol		8-12%
ammonia		0-1
sodium hydroxide		2-5%
TOTAL	100	100%

5. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? YES NO
waste flammable liquid, corrosive
 PROPER SHIPPING NAME NOS (alcohol mixture & sodium hydroxide) mixture

HAZARD CLASS flammable liq U.N. or N.A. NO. UN2924

ADDITIONAL DESCRIPTION _____
 METHOD OF SHIPMENT BULK DRUM OTHER: _____
 CERCLA REPORTABLE QUANTITY (RQ) 100
 EMERGENCY RESPONSE GUIDE PAGE _____
 DOT PUBLICATION 5800.4 PAGE NO. 29 EDITION (YR) 1987
 SPECIAL HANDLING INFORMATION _____

6. GENERATOR CERTIFICATION

I, Bob Wassmann, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE

DATE

Bob Wassmann

11/28/90

PART III

TOXICITY CHARACTERISTIC LIST
EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CNTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input type="checkbox"/> LEAD	D008	_____
<input type="checkbox"/> CADMIUM		_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLOROBENZENE	D021	_____	<input type="checkbox"/> METHYL ETHYL KETONE	D035	_____
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D035	_____
<input type="checkbox"/> CHROMIUM		_____	<input type="checkbox"/> PENTRACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,4,5-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDS. Handle in compliance with current safety guidelines. Contact Unit Safety Officer for additional information.

2. CONTAINER AND LABELING REQUIREMENT: Flammable liquid, corrosive

- a. DOT/DOD CONTAINER TYPE: 17E,17H other containers require prior approval from EMD.
- b. DOT PROPER SHIPPING NAME: waste flammable liquid corrosive NOS (alcohol sodium hydroxide mixture)
- c. DOT HAZARD CLASS: flammable
- d. UN/NA NUMBER: UN2924
- e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

Part II

4. MATERIAL COMPOSITION

Ampoule w/pad II⁻
Chloramine B & container packaging



WASTE MATERIAL PROFILE SHEET

PART I

GENERAL INFORMATION

MARINE CORPS BASE, CAMP LEJEUNE

 WASTE PROFILE NO. 108-
1. GENERATOR NAME
2. FACILITY ADDRESS

NORTH CAROLINA

 5. ZIP CODE
28542

3. GENERATOR USEPA ID

NC6170022580

4. GENERATOR STATE ID

SAME

6. TECHNICAL CONTACT
7. TITLE

HMDO

PHONE

919 451-8579

8. 1. NAME OF WASTE Aerosol Paint cans

 2. USEPA or STATE I.D. NO.(S) D001, D007, D008, D035

 3. PROCESS GENERATING WASTE Spray painted

 4. PROJECTED ANNUAL VOLUME/UNITS 1, lbs

 5. MODE OF COLLECTION drum

 6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 (e.g., F020, F021, F022, F023, F0226, F027, OR F028)? YES NO

 7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? YES NO

 HAS AN EXEMPTION BEEN GRANTED? YES NO

 DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? YES NO

PART II

1. MATERIAL CHARACTERIZATION

 PHYSICAL STATE: SOLID LIQUID SEMI-SOLID
 OTHER aerosol cans, partially full

 ODOR: NONE HIGH STRONG

DESCRIPTION

 COLOR variable

 DENSITY 2.2 BTU/LB 12000-14000

 FLASH POINT (F) 460° ASH CONTENT 20-30%

 TOTAL SOLIDS 30-40% pH 6-8

 LAYERING: MULTILAYERED BILAYERED SINGLE PHASE

2. CHEMICAL COMPOSITION

 HEAVY METALS TOTAL (ppm) EXTRACTION (mg/L)

 ARSENIC <5.0 MERCURY <0.2 ZINC 5-10000

 BARIUM <100 SELENIUM <1.0 CHROMIUM-HEXNA

 CADMIUM <1.0 SILVER <5.0 (OTHER)

 CHROMIUM 5-10000 COPPER <10

 LEAD 5-10000 NICKEL <10

(OTHER) (OTHER)

OTHER COMPONENTS (PPM)

 CYANIDES NA VOLATILE ORGANICS 30-40%

 SULFIDES NA TOTAL HALOGENS NA

 PCBS NA PHENOLICS NA

(OTHER)

3. HAZARDOUS CHARACTERISTICS

- | | | |
|--|---|--|
| <input type="checkbox"/> REACTIVE | <input type="checkbox"/> PYROPHORIC | <input type="checkbox"/> SHOCK SENSITIVE |
| <input type="checkbox"/> EXPLOSIVE | <input type="checkbox"/> WATER REACTIVE | <input type="checkbox"/> RADIOACTIVE |
| <input type="checkbox"/> ETIOLOGICAL | <input checked="" type="checkbox"/> NONE OF THE ABOVE | |
| <input type="checkbox"/> TOXICITY CHARACTERISTIC (SEE REVERSE FOR LISTING) | | |
| <input type="checkbox"/> OTHER | | |

NOTE: EXPLOSIVES, SHOCK SENSITIVE, PYROPHORIC, RADIOACTIVE, AND ETIOLOGICAL WASTE NORMALLY ARE NOT ACCEPTED BY THE DRMO.

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE
metal can		40-50%
paint pigments		20-30%
methyl ethyl ketone		1-5
propane		5-10
isobutane		5-10
Xylene		2-5
toluene		1-3
methyl isobutyl ketone		1-5
resins		10-20
zinc chromate		1-3
lead chromate		1-3
TOTAL	100	100%

5. SHIPPING INFORMATION

 DOT HAZARDOUS MATERIAL? YES NO

 PROPER SHIPPING NAME Waste compressed Gas NOS

 HAZARD CLASS Flammable Gas ^{U.N.} or N.A. NO. 1954

ADDITIONAL DESCRIPTION

 METHOD OF SHIPMENT BULK DRUM OTHER:

 CERCLA REPORTABLE QUANTITY (RQ) 1 lb

EMERGENCY RESPONSE GUIDE PAGE

 DOT PUBLICATION 5800.4 PAGE NO. 22 EDITION (YR) 1987

SPECIAL HANDLING INFORMATION

6. GENERATOR CERTIFICATION

I, Bob Wassmann, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS COMPLETE AND ACCURATE. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE

DATE

Bob Wassmann
11/28/90

PART III

TOXICITY CHARACTERISTIC LIST

EFFECTIVE 25 SEP 90 - LARGE QUANTITY GENERATORS

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
<input type="checkbox"/> ARSENIC	D004	_____	<input type="checkbox"/> HEXACHLOROBUTADIENE	D033	_____
<input type="checkbox"/> BARIUM	D005	_____	<input type="checkbox"/> HEXACHLOROETHANE	D034	_____
<input type="checkbox"/> BENZENE	D018	_____	<input checked="" type="checkbox"/> LEAD	D008	5-1,000
<input type="checkbox"/> CADMIUM	_____	_____	<input type="checkbox"/> LINDANE	D013	_____
<input type="checkbox"/> CARBON TETRACHLORIDE	D019	_____	<input type="checkbox"/> MERCURY	D009	_____
<input type="checkbox"/> CHLORDANE	D020	_____	<input type="checkbox"/> METHOXYCHLOR	D014	_____
<input type="checkbox"/> CHLOROBENZENE	D021	_____	<input checked="" type="checkbox"/> METHYL ETHYL KETONE	D035	<5%
<input type="checkbox"/> CHLOROFORM	D022	_____	<input type="checkbox"/> NITROBENZENE	D036	_____
<input checked="" type="checkbox"/> CHROMIUM	D007	5-10,000	<input type="checkbox"/> PENTACHLOROPHENOL	D037	_____
<input type="checkbox"/> O-CRESOL	D023	_____	<input type="checkbox"/> PYRIDINE	D038	_____
<input type="checkbox"/> M-CRESOL	D024	_____	<input type="checkbox"/> SELENIUM	D010	_____
<input type="checkbox"/> CRESOL	D026	_____	<input type="checkbox"/> SILVER	D011	_____
<input type="checkbox"/> 2,4-D	D016	_____	<input type="checkbox"/> TETRACHLOROETHYLENE	D039	_____
<input type="checkbox"/> 1,4-DICHLOROBENZENE	D027	_____	<input type="checkbox"/> TOXOPHENE	D015	_____
<input type="checkbox"/> 1,2-DICHLOROETHENE	D028	_____	<input type="checkbox"/> TRICHLOROETHYLENE	D040	_____
<input type="checkbox"/> 1,1-DICHLOROETHYLENE	D029	_____	<input type="checkbox"/> 2,4,5-TRICHLOROPHENOL	D041	_____
<input type="checkbox"/> 2,4-DINITROTOLUENE	D030	_____	<input type="checkbox"/> 2,4,6-TRICHLOROPHENOL	D042	_____
<input type="checkbox"/> ENDRIN	D012	_____	<input type="checkbox"/> 2,4,6-TP (SILVEX)	D017	_____
<input type="checkbox"/> HEPTACHLOR (AND ITS HYDROXIDE)	D031	_____	<input type="checkbox"/> VINYL CHLORIDE	D043	_____
<input type="checkbox"/> HEXACHLOROBENZENE	D032	_____			

PART IV

1. HANDLING/SAFETY INSTRUCTIONS: Refer to MSDS. Handle in compliance with current safety guidelines. Contact unit safety officer for additional information.
2. CONTAINER AND LABELING REQUIREMENT: Flammable Gas
 - a. DOT/DOD CONTAINER TYPE: 17H Other containers require prior approval from EMD
 - b. DOT PROPER SHIPPING NAME: Waste compressed gas NOS (aerosol paint gas)
 - c. DOT HAZARD CLASS: Flammable gas
 - d. UN/NA NUMBER: UN1954
 - e. ADDITIONAL REQUIREMENTS: _____

PART V

DRMO VERIFICATION

1. DATE VERIFIED _____ BY _____

24

MATERIAL SAFETY DATA SHEETS

NICKEL CADMIUM POCKET PLATE STORAGE BATTERY

SAB NIFE INC.
Battery Manufacturing Operation
251 Industrial Blvd.
Greenville, NC 27835-5026
Information Phone # 919-752-8126

For Chemical Emergency
Spill, Leak, Fire, Exposure or Accident
CALL CHEMTREC - Day or Night
800-424-9300



EDISON™ AND AMERICAD™ BRAND NICKEL CADMIUM POCKET PLATE STORAGE BATTERIES

HMS Ratings: 3 Health 1 Flammability 2 Reactivity

1. HEALTH HAZARD INFORMATION

Effects of Overexposure

- Eye Effects:** Contact with electrolyte solution inside battery causes very rapid, severe damage. Extremely corrosive to eye tissues. May result in permanent blindness. Contact with nickel oxide and graphite may cause minor irritation.
- Skin Effects:** Contact with electrolyte solution inside battery may cause serious burns to skin tissues. Contact with graphite dust may cause minor irritation. Contact with nickel oxide may cause skin sensitization, resulting in chronic eczema or nickel itch.
- Ingestion:** Ingestion of electrolyte solution causes tissue damage to throat area and gastro/respiratory tract. Ingestion of nickel oxide causes nausea and dizziness.
- Inhalation:** During activation procedures mist generated may cause varying degrees of irritation of the nasal mucous membranes and respiratory tract tissues. May vary from mild irritation of nasal mucous membranes to damage of lung tissues proper. Inhalation of cadmium oxide may cause dry throat, cough, headache, vomiting, chest pain, chills, excessive overexposure may result in pulmonary emphysema, cor pulmonale.
- Carcinogenicity:** NIOSA recommends that nickel and cadmium be treated as occupational carcinogen.

2. EMERGENCY FIRST AID

Battery Electrolyte:

- Eye Contact:** Flush with plenty of water for at least 15 minutes. Get immediate medical attention.
- Skin Contact:** Remove contaminated clothing and flush affected areas with plenty of water for at least 15 minutes.
- Ingestion:** Do not induce vomiting. Dilute by giving water. If available give several glasses of milk. Get immediate medical attention. Do not give anything by mouth to an unconscious person.
- Inhalation:** Remove to fresh air. Give oxygen or artificial respiration if needed. Get immediate medical attention.

Graphite and Nickel Oxide:

- Skin Contact:** Wash with cold water and soap.

3. SPECIAL PROTECTION INFORMATION

Perform activation procedures in a well ventilated area. Battery operating areas must be well ventilated to remove normal gases generated.

Respiration Protection: Use NIOSH approved mist respirator if necessary during activation and actual usage.

Eye Protection: Use splash goggles or face shield whenever handling a battery.

Hand Protection: If exposed to electrolyte solution, or dried salts, use any water-insoluble non-permeable glove, i.e., synthetic rubber. DO NOT use leather or wool.

Other Protective Equipment: Rubber Boots, rubber apron or rainwear or equivalent if exposed to electrolyte solution.

4. REACTIVITY DATA

Stable under normal conditions.

CAUTION: NEVER ACTIVATE OR TOP OFF WITH ACID.

Incompatibilities: Aluminum, zinc, tin and other active metals, acid, chlorinated and aromatic hydrocarbons, nitrocarbons, halocarbons. Trichloroethylene will react with electrolyte solution to form dichloroethylene which is spontaneously combustible.

Hazardous Decomposition Products: Nickel oxide, cadmium, cadmium oxide, and potassium hydroxide. Note that normal reactions inside battery liberate flammable hydrogen gas. Do not seal battery from atmosphere.

Hazardous Polymerization will not occur.

Flash Point

Case Material	Acrylic	Polysulfone
Melting Point	210°F	374°F
Decomposition (non-violent)	550°F	
Auto Ignition	570°-580°F	1022°F (550°C)

Extinguishing Media

CO₂, Dry Chemical, Foam Water Spray

Cadmium

Cadmium Oxide

Nickel

Melting Point

321°C

1400°C

1455°C

Boiling Point

767°C

900-1000°C decomp

2900°C

Special Fire Fighting Procedures

Use self-contained breathing apparatus, protective clothing and equipment to prevent potential body contact with electrolyte solution or mixture of water and solution.

Fire and Explosion Hazards

Electrolyte solution is corrosive to all human tissues. It will react violently with many organic chemicals, especially nitrocarbons and chlorocarbons. Electrolyte solution reacts with zinc, aluminum, tin and other active materials releasing flammable hydrogen gas.

Cadmium fumes may be released when batteries are subjected to high temperatures.

6. HAZARDOUS INGREDIENTS**EXPOSURE LIMITS**

Acrylic Polymer Container

Polysulfone Container

Nickel Oxide, Solid

Lithium Hydroxide

Graphite

Electrolyte Solution

Steel

Cadmium Oxide, Solid

None Established — OSHA

None Established — OSHA

1 mg/m³ — OSHA

None Established — OSHA

15 mppcl use respirator

2 mg/m³ ACGIH CEILING-Air

None Established — OSHA

0.1 mg/m³ fume — OSHA

0.2 mg/m³ dust — OSHA

0.05 mg/m³ ACGIH Ceiling

7. PHYSICAL PROPERTIES

Boiling Point — Not Applicable

Vapor Pressure — 2 mm Hg at 68°F

Specific Gravity — 1.185 — 1.225

Solubility in Water — Electrolyte solution is completely soluble. REMAINDER — is insoluble

Melting Point — Not Applicable

Vapor Density — Not Applicable

Evaporation Rate — Not Determined

8. SPILL MANAGEMENT PROCEDURES**Electrolyte Solution Spills**

Small (up to 5 gallons): Flush with water and neutralize with dilute acid.

Large: Contain material in suitable containers or holding area. Do NOT allow material to enter sewers, streams or storm conduits. Recover material with vacuum truck and dispose of properly. Reportable Quantity: 1000 pounds. 40 CFR 117.13.

9. DISPOSAL INFORMATION

The storage battery is a hazardous waste under RCRA.

Battery is EP Toxic. Battery and electrolyte solution are corrosive. Dispose of in accordance with all federal, state and local regulations.

10. PRECAUTIONS AND COMMENTS

These cells and the batteries constructed from them may be highly active and capable of rapid generation of electrical energy. Care should be taken to handle cells properly to avoid shorting or misuse that will result in rapid uncontrolled generation of electrical, chemical, or heat energy.

Do not transport activated batteries without vent cap in place.

When removing battery from service visually inspect for leakage prior to handling. If leakage has occurred follow Spill Management Procedures.

Do not allow an exposed flame or spark to come near the cells.

Disclaimer: This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either express or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein. This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. It is the user's responsibility to satisfy himself as to the suitability and completeness of this information for his own particular use. We do not accept liability for any loss or damage that may occur, whether direct, indirect, incidental or consequential, from the use of this information nor do we offer warranty against patent infringement. Additional information is available by calling the telephone number above designated for this purpose.

Date issued: 11-1-87 Last Date Revised 11-1-87

MATERIAL SAFETY DATA SHEET

NSN 8010-00-297-0593

IDENTITY (As Used on Label or List)
Yellow Zinc Chromate Aerosol

Note: Blank Spaces are not permitted, if any item is not applicable or no information is available, the space must be marked to indicate that.

SECTION I

Manufacturer's Name Illinois Bronze Paint Company	Emergency Telephone Number 312-359-6433
Address (Number, Street, City, State, and Zip Code) 300 E. Main St. Lake Zurich, IL 60047	Telephone Number for Information 312-438-8201
	Date Prepared Dec 83 Review: 11/89
	Signature of Preparer (optional) NK

Section II - Hazardous Ingredients / Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s)) CAS#	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Toluene 108-88-3	100 PPM	100 PPM	STEL-150 PPM	8.6%
Xylene 1330-20-7	100 PPM	100 PPM	STEL-150 PPM	4.0
Methylene Chloride 75-09-2	500 PPM-C	50 PPM-A2	NK	37.3
Propellant (Propane Isobutane) 68479-85-7	NK	NK	NK	36.0
Zinc Chromate 13530-65-9	0.1 mg/m ³ C	0.05 mg/m ³	NK	5.5
Inert Resins & Pigments	NK	NK	NK	NK

Section III - Physical / Chemical Characteristics

Boiling Point	104-279°F	Specific Gravity (H ₂ O = 1)	NK
Vapor Pressure (mm Hg)	NK	Melting Point	NK
Vapor Density (Air = 1)	Air	Evaporation Rate (Butyl Acetate = 1)	Propellant - faster than ether Solvent - slower than ether
Solubility in Water	NK		
Appearance and Odor	NK		

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	NK	Flammable Limits	LEL NK	UEL NK
Extinguishing Media	Foam, CO ₂ , Dry Chemical			
Special Fire Fighting Procedures	NK			

Unusual Fire and Explosion Hazards

Cans will rupture from internal pressure at about 190°F and discharge flammable contents. When heated to decomposition toxic fumes are formed.

Section V - Reactivity Data

Stability	Unstable		Conditions to Avoid	NK
	Stable	Yes		
Incompatibility (Materials to Avoid)				
NK				
Hazardous Decomposition Byproducts				
Hydrogen Chloride, carbon monoxide, phosgene				
Hazardous Polymerization	May Occur		Conditions to Avoid	Polymerization
	Will Not Occur	No		

Section VI - Health Hazard Data

Routes(s) of Entry: LD50-0.6 Inhalation? Yes Skin? Yes Ingestion? No

Health Hazards (Acute and Chronic)
Inhalation - irritation of the respiratory tract or acute nervous system.

Carcinogenicity: NTP? Nk IARC Monographs? Nk OSHA Requested? NK

Zinc Chromate is a known carcinogen

Signs and Symptoms of Exposure
Inhalation: Anesthetic, depression characterized by headache, dizziness, staggering gait, confusion, unconsciousness or coma. Skin/eye: Primary irritant

Medical Conditions
Generally Aggravated by Exposure

NK

Emergency and First Aid Procedures
Eye: Flush immediately w/large amounts of water for 15 mins. Take to physician.
Skin: Wipe off w/towel. Wash w/soap and water. Remove contaminated clothing.

Section VII - -Precautions for Safe Handling and Use Inhalation: Remove to fresh air, restore breathing

Steps to be taken in Case Material is Released or Spilled
Remove all sources of ignition. Avoid breathing vapors. Ventilate area. Remove w/inert absorbent.

Waste Disposal Method
Dispose of in accordance w/federal, state, and local regulations: Do not incinerate closed containers.

Precautions to be taken in Handling and Storing
Do not store above 120°F. Do not puncture cans. Finger must not protrude over spray button.

Other Precautions
Do not stick pin or any sharp object into opening or top of can.

Section VIII - Control Measures

Respiratory Protection (Specify Type)
For casual use none required, provided ventilation is available.

Ventilation	Local Exhaust	Yes	Special	NK
	Mechanical (General)	Yes	Other	NK
Protective Gloves	None	Eye Protection	None	
Other Protective Clothing or Equipment	None			
Work / Hygenic Practices	NK			



SECTION 1. MATERIAL IDENTIFICATION 19

MATERIAL NAME: -SULFURIC ACID, CONCENTRATED

OTHER DESIGNATIONS: Oil of Vitriol, Hydrogen Sulfate; H₂SO₄; CAS #7664-93-9

MANUFACTURER/SUPPLIER: Available from many suppliers, including:
 Allied Corporation, PO Box 2064R, Morristown, NJ 07960; Telephone: 800 631-8050

HMS
 H:3
 F: 0
 R: 2
 PPE: *
 * See Sect. 8

R 1
 I 3
 S 4
 K 0



SECTION 2. INGREDIENTS AND HAZARDS **HAZARD DATA**

	%	
Hydrogen Sulfate (H ₂ SO ₄) Water * Material is obtained by the reaction of SO ₂ and water. Can contain low impurity levels, such as 0.02% max of iron as Fe. Properties vary with H ₂ SO ₄ content. Current OSHA standard and ACGIH (1985-86) TLV. NIOSH has a 10-hr TWA, 40-hr. work week, of 1 mg/m ³ .	93-98 Balance*	8-hr TWA: 1 mg/m ³ Human, Mist Inhalation, TCLo: 3 mg/m ³ , 24 wk. (Toxic Mouth Effects) Rat, Oral, LD ₅₀ : 2140 mg/kg

SECTION 3. PHYSICAL DATA

	93.19% H ₂ SO ₄	98.33% H ₂ SO ₄	100% H ₂ SO ₄
Boiling Point, 1 atm, deg C	ca 281	ca 338	ca 330 (dc)
Specific Gravity (60/60 F)	1.8354	1.84	1.84
Volatiles, % @ 340°C	ca 100	ca 100	ca 100
Melting Point, deg C	ca -34	ca 3	10.4
Water Solubility ... Complete Miscible Vapor Pressure, mm Hg @ 100°F ... <1 (93.19% H ₂ SO ₄); Deg. Baume ... 66 (93.19% H ₂ SO ₄) - Density of H ₂ SO ₄ is often reported in degrees Baume Be). Formula is Be=145 [145/sp gr for liquids heavier than water]. Appearance and odor: Clear, colorless, hygroscopic, oily liquid with no odor. Mists greater than 1 mg/m ³ are easily recognizable. Those at 5 mg/m ³ are distinctly objectionable.			

SECTION 4. FIRE AND EXPLOSION DATA **LOWER** **UPPER**

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air		
None - Nonflammable	NA	NA	NA	NA
Sulfuric acid is nonflammable; however, it is a strong oxidizing agent and may cause ignition by contact with combustible materials. Small fires may be smothered with suitable dry chemical. Cool exterior of storage tanks of H ₂ SO ₄ with water to avoid rupture if exposed to fire. Do not add water or other liquid to the acid! The acid, especially when diluted with water, can react with metals to liberate flammable hydrogen gas. Sulfuric acid mists and vapors from a fire area are corrosive (see sect. 5). Fire fighters must wear self-contained breathing equipment and fully protective clothing.				

SECTION 5. REACTIVITY DATA

Sulfuric acid is stable under normal conditions of use and storage. It does not undergo hazardous polymerization. It is a strong mineral acid reacting with bases and metals. The concentrated acid is also a dehydrating agent, picking up moisture readily from the air or other materials. Hydrogen gas may be generated within a H₂SO₄ container. Vent drums cautiously.

This material reacts exothermically with water. (Acid should always be added slowly to water. Water added to acid can cause boiling and uncontrolled splashing of the acid.) Sulfur oxides can result from decomposition and from oxidizing reactions of sulfuric acid.

SECTION 6. HEALTH HAZARD INFORMATION | TLV

Concentrated sulfuric acid is a strong mineral acid, an oxidizing agent, and a dehydrating agent that is rapidly damaging to all human tissue with which it comes in contact. Ingestion may cause severe injury or death. Eye contact produces severe or permanent injury. Inhalation of mists can damage both the upper respiratory tract and the lungs. Sulfuric acid is not listed as a carcinogen by the NTP, IARC, or OSHA.

FIRST AID: **EYE CONTACT:** Immediately flush eyes (including under eyelids) with plenty of running water for at least 15 minutes. Speed in diluting and rinsing out acid with water is extremely important if permanent eye damage is to be avoided.

Obtain medical help as soon as possible.* **SKIN CONTACT:** Immediately flush affected areas with water, removing contaminated clothing while under the safety shower. Continue washing with water and get medical attention.*

INHALATION: Remove to fresh air. Restore breathing. Call a physician immediately. **INGESTION:** Dilute acid immediately with large amounts of milk or water, then give milk of magnesia to neutralize. Never give anything by mouth to an unconscious person. Do not induce vomiting; if it occurs spontaneously, continue to administer fluid. Obtain medical attention as soon as possible.*

Maintain observation of patient for possible delayed onset of pulmonary edema.

* GET MEDICAL HELP = In plant, paramedic, community.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Handle major spills by a predetermined plan. Contact supplier for assistance in this planning, in meeting local regulations, and for disposing of large amounts. Notify safety personnel. Provide optimum ventilation; vapors are extremely irritating. Stop leak if you can do so without risk.

Cleanup personnel need protection against inhalation or contact. Keep upwind. Contain spill. Minor leaks or spills can be diluted with much water and neutralized with soda ash or lime. If water is not available, cover contaminated area with sand, ashes, or gravel and neutralize cautiously with soda ash or lime.

DISPOSAL: Follow Federal, state, and local regulations. Runoff to sewer may create hydrogen gas, which is a fire or explosion hazard. EPA (CWA) RQ 1000 lbs. (40 CFR 117).

SECTION 8. SPECIAL PROTECTION INFORMATION

Provide general ventilation to meet current TLV requirements in the workplace. Where mists are up to 50 mg/m³, a high-efficiency particulate respirator with full facepiece is warranted; a type-C supplier-air respirator with full facepiece operated in pressure-demand mode is used to 100 mg/m³.

Avoid eye contact by use of chemical safety goggles or face shield where splashing may occur. Acid-resistant protective clothing, such as rubber gloves, aprons, boots, and suits, is recommended to avoid body contact.

Eyewash fountain and safety showers with deluge type of heads should be readily available where this material is handled or stored.

Contact lenses pose a special hazard; soft lenses may absorb and all lenses concentrate irritants.

Comprehensive replacement and annual medical examinations with emphasis on dental erosion, cardiopulmonary system, and mucous membrane irritation and cough are indicated.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Sulfuric acid in carboys or drums should be stored in clean, ventilated storage areas having acid-resistant floors with good drainage. Keep out of direct sunlight, do not store above 89.6°F (32°C). Storage facilities are to be separate from organic materials, metallic powders, chromates, chlorates, nitrates, carbides, oxidizables; etc. Soda ash, sand, or lime should be kept in general storage or work areas for emergency use. Protect containers against physical damage. Glass bottles need extra protection. Sulfuric acid is highly corrosive to most metals, especially below 77% H₂SO₄. Avoid breathing mist or vapors. Avoid contact with skin or eyes. Do not ingest. Do not add water to concentrated acid. Drums may contain hydrogen gas, so open cautiously. Use nonsparking tools free of oil, dirt, and grit and vapor-proof electrical fixtures

DOT Classification: Corrosive Material. ID No.: UN1830 Label: Corrosive

Data Source(s) Code: 1-12, 19, 20, 24, 26, 31, 37-39, 42, 82. CK

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Approvals J. J. ... 6/86.

Indust. Hygiene/Safety J. W. G. S. C.

Medical Review

GLASS AMPOULES FILLED WITH DECON 2
SOLN & A PAD IMPREGNATED WITH
CHLORAMINE B.2,3,4ETHYL ALCOHOL
ZINC CHLORIDE
CHLORAMINE B (N-CHLORO-N-
SODIOBENZENESULFONAMIDE)

Percent: N/R45.0
5.0
N/K

OSHA PEL: N/R1000 PPM
1MG/CUM
N/K

ACGIH TLV: N/R1000 PPM
1MG/CUM
N/K

Other Recommended Limit: N/RN/R
N/R
N/K

Appearance and Odor: COLORLESS LIQUID WITH MILD ALCOHOL
ODOR.

Boiling Point: 172F/78C

Melting Point: N/K

Vapor Pressure(MM Hg/70 F): N/K

Vapor Density (Air=1): N/K

Specific Gravity: 0.962

Decomposition Temperature: N/K

Evap. Rate & Reference: N/K

Solubility in Water: COMPLETE

% Volatiles by Volume: N/K

pH: N/K

Corrosion Rate (IPY): N/K

Autoignition Temperature: N/K

Flash Point: 75F/23.9C

Flash Point Method: T.C.C

Lower Explosive Limit: N/K

Upper Explosive Limit: N/K

Extinguishing Media: USE CO*2,FOAM,DRY CHEMICALS

Special Fire Fgting Proc: USE NIOSH/MSHA APPROVED SCBA IN AN
ENCLOSED AREA.

Unusual Fire & Expl. Hzrds: SMOKE FROM FIRE WILL BE IRRITATING.
TOXIC ZNCL*2 FUMES.

Stability: YES

Cond. to Avoid(Stability): EXTREME HEAT

Materials to Avoid: OXIDIZERS

Hazardous Decomp. Products: TOXIC VAPORS/FUMES ZNCL*2,CO AND
ORCO*2,WHEN DECOMPOSED.

Hazardous Poly. Occur: NO

Conditions to Avoid(Poly): N/K

LD50-LC50 - Mixture: N/K

Route of Entry-Inhalation: YES

Route of Entry - Skin: YES

Route of Entry - Ingestion: YES

Health Hzrds-Acute&Chronic: ACUTE:EYES INJURY,IRRITATION;
SKIN IRRITATION OR BURNS;DUST
MAY CAUSE EYE AND RESPIRATORY
TRACT IRRITATION. CHRONIC:
IRRITATION,CORROSIVE ACTION.

Carcinogenity - NTP: N/K

25

Carcinogenity - IARC: N/K
Carcinogenity - OSHA: N/K
Expl. of Carcinogenity: N/K
Sgns and Sym of Oexposure: IRRITATION/INJURY OF EYES,SKIN,
RESPIRATORY TRACT OR G.I. TRACT
IRRITATION;SEE HEALTH HAZARDS
DUE TO EACH COMPONENTS OF DECON-
2.

Med. Conds. Aggr. by Exp: PRE-EXISTING CONDITIONS MAY
BE WORSEN.

Emerg. and FirstAid Procs: EYES:FLUSH EYES WITH PLENTY OF
WATER;CALL A PHYSICIAN. SKIN:
WASH THOROUGHLY WITH WATER;CALL
FOR MEDICAL HELP. INHALATION:
REMOVE TO FRESH AIR.GIVE OXYGEN,
CALL A PHYSICIAN. INGESTION:GIVE
WATER IF CONSCIOUS,CALL A
PHYSICIAN AT ONCE.

if Matl. Relsd or Sped: USE PROPER PERSONAL PROTECTION;
REMOVE ALL IGNITION SOURCES;USE
SUITABLE INERT ABSORBENT
MATERIAL AND RECOVER FOR PROPER
DISPOSAL.

Neutralizing Agent: N/R
Waste Disposal Method: DISPOSE OF COLLECTED MATERIAL IN
ACCORDANCE WITH LOCAL,STATE AND
FEDERAL REGULATIONS.

Handg and Strg Precautions: STORE IN COOL,DRY AND WELL
VENTILATED AREA.KEEP AWAY FROM
HEAT,SPARKS,FLAMES & OXIDIZERS;
DO NOT STORE AT TEMPERATURE
ABOVE 110F/43.3C.

Respiratory Protection: NONE REQUIRED WHEN THERE IS
ADEQUATE VENTILATION OR WHEN
USED AS INSTRUCTED.

Ventilation: LOCAL/GENERAL TO MAINTAIN
ADEQUATE VENTILATION.

Protective Gloves: NEOPRENE
Eye Protection: CHEMICAL GOGGLES
Other Protective Equipment: EYE WASH,SAFETY SHOWER;FULL EYES
AND SKIN PROTECTION.

Work Hygienic Practices: AVOID CONTACT WITH EYES & SKIN;
DO NOT BREATHE VAPORS/MIST;DO
NOT TAKE INTERNALLY.

Sup. Safe and Health Data: MSDS RECEIVED BY DGSC-SLM:MARCH
1,1988.ITEM IS A KIT,CONTAINING
DECON-1 AND DECON-2;THIS IS
DECON-2.KEY1:F4.

Transportation Focal Point: D
Trans. Data Rev. Date: 88091
DOT PSN Code: GIX
DOT Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
DOT Class: FLAMMABLE LIQUID
DOT Label: FLAMMABLE LIQUID
Identification Number: UN1993
IMO PSN Code: HIM
IMO Proper Shipping Name: FLAMMABLE LIQUIDS,N.O.S.
IMO Regulations Page No.: 3036-1

UN Number: 1993
UN Class: 3.1
IATA PSN Code: MBV
IATA UN ID Number: 1993
IATA Proper Shipping Name: FLAMMABLE LIQUIDS,N.O.S.
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFR 71-4 PSN Code: ELB
AFR 71-4 Proper Ship. Name: FLAMMABLE LIQUID,N.O.S.
AFR 71-4 Class: FLAMMABLE LIQUID
AFR 71-4 Label: FLAMMABLE LIQUID
AFR 71-4 ID Number: UN1993
Tech. Entry N.O.S. Ship Nm: CONTAINS 45% ETHYL ALCOHOL.
Additional Trans. Data: ITEM IS A KIT CONTAINING DECON 1
AND 2 PACKETS;THIS IS DECON 2,
DECON 2 FOIL PACKET CONTAINS
SEALED GLASS AMPOULES FILLED WITH
DECON 2 SOLUTION AND A PAD
IMPREGNATED WITH CHLORAMINE B.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																									
DOC 6135-00-LITHBAT										PH EA										STOCK EA										QUANTITY 0975										DOCUMENT NUMBER M67001										SIGNAL PX										DISTRIBUTION NA										PROJECT H										TOTAL PRICE 30.00																																												
SHIP TO FROM M12190-1282-0008 2ND MAR DIV 2ND RECON BN																									SHIP TO DRMO-LEJEUNE																									MARK FOR HW																									PROJECT																									TOTAL PRICE 29250.00																								
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PHONE EXT. 7327										SUBSTITUTE DATA (ITEM ORIGINALLY REQUESTED)										FREIGHT CLASSIFICATION NOMENCLATURE										ITEM NOMENCLATURE										(SEE ATT. LIST FOR NSN'S)																																																																																				
DOT PROPER SHIP NAME:										HAZ. CLASS: ORM-C										UJN/NA#: N/A										X BA 5590/5598/5600																																																																																														
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PROFILE#:										CC					DD					EE																																																																																																								
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WAREHOUSE USE ONLY				TYPE OF CARGO		UNIT PACK		UNIT WEIGHT		UNIT CUBE		UFC		N M F C		FREIGHT RATE		DOCUMENT DATE		MAT. CONT.		QUANTITY															
SUBSTITUTED DATA ITEMS ORIGINALLY REQUESTED				FREIGHT CLASSIFICATION		NOMENCLATURE																															
DOT PROPER SHIP. NAME				HAZ. CLASS:		UN/NA#:		E: BATTERY DRY (MAGNESIUM BATTERIES)		X: BA-4386																											
SELECTED BY AND DATE				TYPE OF CONTAINER(S)		TOTAL WEIGHT		EST. WEIGHT:		RECEIVED BY AND DATE		INSPECTED BY AND DATE																									
LABEL:				55 GL DR						WAREHOUSED BY AND DATE		WAREHOUSE LOCATION																									
PACKED BY AND DATE				NO. OF CONTAINERS		TOTAL CUBE																															
				5																																	
REMARKS:				EPA WASTE #:		PROFILE #:		COST PER POUND:																													
FIRST DESTINATION ADDRESS				ACUMULATION START DATE:		DATE SHIPPED		BILLING DODAAC:		CLIN:		TOTAL DISPOSAL COST:																									
								M 67001																													
TRANSPORTATION CHARGEABLE TO				14 BILLING, AWB, OR RECEIVER'S SIGNATURE (AND DATE)		15 RECEIVER'S DOCUMENT NUMBER																															

DD FORM 1348-1
S/N 0102 LF 013 1040

1 MAR 74

EDITION OF 1 JAN 64 MAY BE USED
UNTIL EXHAUSTED

DOD SINGLE LINE ITEM RELEASE/RECEIPT DOCUMENT

HAZARDOUS MATERIAL/WASTE DISPOSAL WORKSHEET
For DD1348-1s for 2d FSSG

NSN: _____ UNIT DOCUMENT NUMBER: M _____

ORIGINAL COST OF WASTE/MATERIAL (EA): _____ X QTY: _____ = TC: _____

UNIT OF ISSUE: _____ HMDC TRACKING NUMBER: _____

UNIT ADDRESS: _____

UNIT POC: _____ UNIT PHONE: _____ BLDG: _____

DOT SHIPPING NAME: _____ HM OR HW: _____

ITEM NOMENCLATURE: _____ UN/NA#: _____

HAZARD CLASS: _____ ESTIMATED WEIGHT: _____

LABEL: _____

NUMBER OF CONTAINERS: _____ TYPE OF CONTAINER: _____

HIN: _____ PROFILE NUMBER: _____

EPA WASTE #: _____

ACC START DATE: _____

HMDO CERTIFICATION: THIS IS TO CERTIFY THAT THE ABOVE DESCRIBED MATERIALS WERE PHYSICALLY INSPECTED BY THE UNDERSIGNED HMDO ON _____. BASED ON THIS INSPECTION AND INFORMATION PROVIDED ABOVE, THE ITEMS APPEAR TO BE IN SUITABLE CONDITION FOR TURN-IN FOR TURN-IN PER BO 6240.5_ FOR (CHECK ONE):

- (a) Reuse, donation, sale or recycling as a HM: _____
- (b) Disposal or recycling as RCRA regulated HW: _____
- (c) Disposal or recycling as non-RCRA regulated waste: _____
- (d) Disposal, neither (a), (b), or (c) above apply: _____

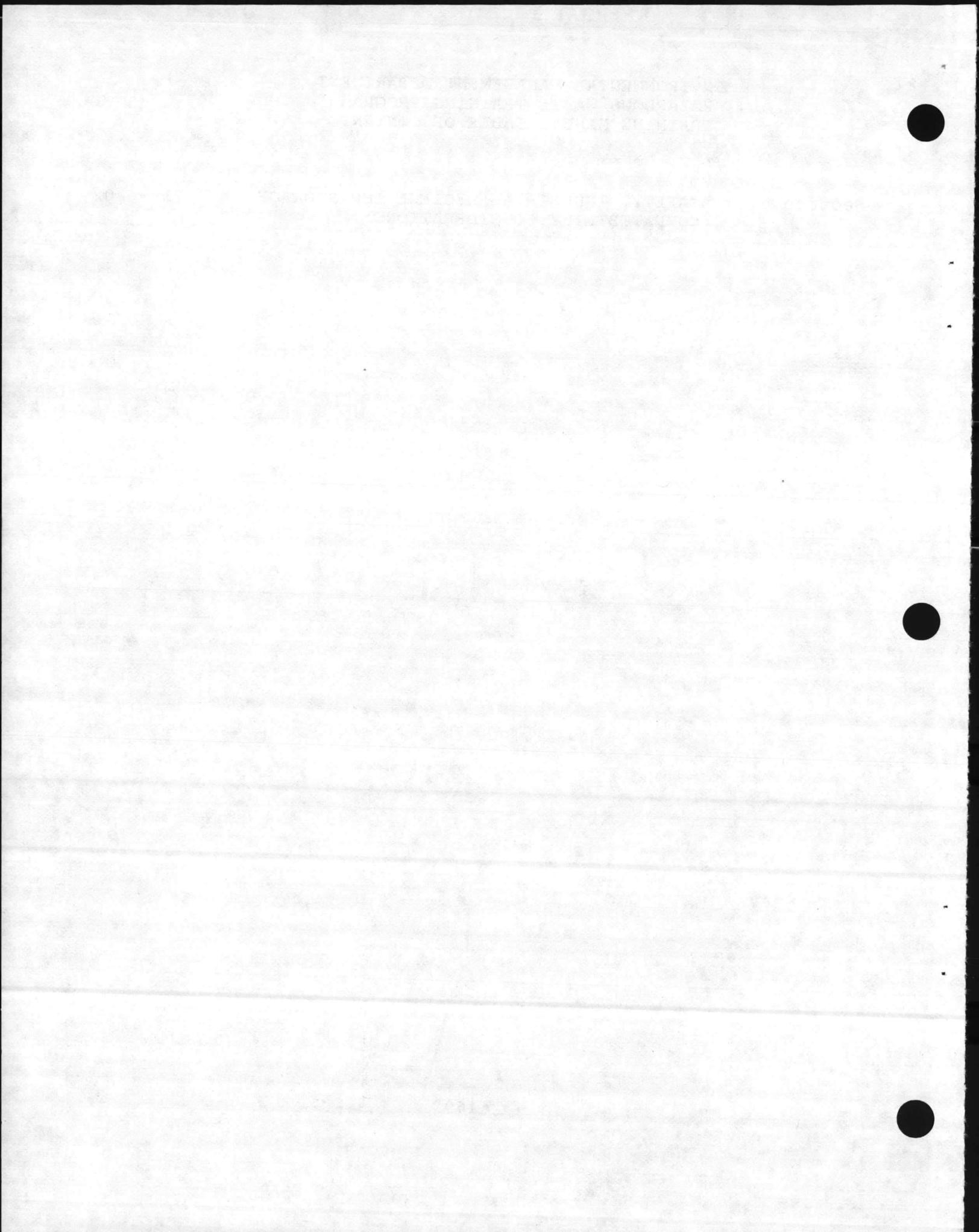
(Signature)

(Printed Name)

(Date)

ENVIRONMENTAL MANAGEMENT DEPARTMENT
HAZARDOUS WASTE TRAINING PROGRAM
TRAINING MANUAL TABLE OF CONTENTS

Section 5.	SAFETY, INDUSTRIAL HYGIENE AND STORAGE COMPATIBILITY CONSIDERATIONS	171 - 202
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Hazwoper: Bridging OSHA and EPA

Hazardous waste and emergency response personnel are protected under 29 CFR 1910.120. Some changes in the standard are expected, but its intent remains the same.

By Margaret C. Samways

Margaret C. Samways is director of training programs at NUS Corp. in Pittsburgh, Pa., where she develops environmental and occupational health and safety training programs for government and industry. She has managed the development and implementation of a nationwide PBS interactive teleconference on Right-to-Know issues, is past chair of the American Industrial Hygiene Association committee on training and communications, and lectures annually at the University of Pittsburgh Graduate School of Education. From 1972 to 1985, Ms. Samways was manager of the Health and Safety Educational Department for Gulf Oil Corp.'s 59,000 employees worldwide. She is an editorial advisor for Environmental Protection.

The Hazardous Waste Operations and Emergency Response (Hazwoper) Standard, 29 CFR 1910.120, is designed to protect the health and safety of a diverse population of employees. It addresses workers at abandoned hazardous waste site cleanups; RCRA corrective action sites; voluntary cleanups by potentially responsible parties (PRPs); routine operations at some treatment, storage or disposal (TSD) facilities; and all emergency response operations at sites where hazardous substances have been or may be released, including transportation accidents.

The final rule (54 FR 42, pp. 9294-9336) appeared on March 6, 1989, and the compliance deadline was March 6, 1990.

Occupational Safety and Health Administration (OSHA) standards are generally well understood by the time the compliance date falls due and there is a clear course of action to follow, often because there are precedents in earlier standards.

Hazwoper, however, has been a notable exception. This is particularly true for those parts of the standard that apply to workers at hazardous waste TSD facilities, to the training requirements for

emergency response operations and to the accreditation criteria proposed on Jan. 26, 1990, by OSHA (55 FR 2776).

Some sections of the standard are easily understood. Hazwoper clearly requires covered employers to develop and implement safety and health programs. These and other program details were "borrowed" from a guidance document issued jointly by four government entities (National Institute for Occupational Safety and Health, OSHA, the U.S. Coast Guard and the U.S. Environmental Protection Agency) in 1985.

But because these guidelines were applicable only to abandoned hazardous waste sites, the new Hazwoper rule was expanded to cover employees who deal with hazardous substances and hazardous wastes.

Because the parts of the standard that dealt with workplaces other than abandoned hazardous waste sites were new and untried, the standard has been and continues to be a moving target. Some interpretive shifts already have taken place; others are still being discussed.

In response to many questions and requests, OSHA



Hazardous materials technicians, protected by 29CFR 1910.120, excavate methyl bromide cylinders buried in the 1950s. Photo courtesy Earth Resources Corp.

published a number of clarifications and corrections on April 13, 1990, including a new and increased estimate of compliance costs. Despite the publication of corrections, some issues continue to be contested, and the standard will continue to evolve until it reaches a point of equilibrium satisfactory to all.

One of the major corrections issued on April 13 involves the status of TSD facilities. OSHA did not initially make it clear which of these facilities were required to comply with OSHA's requirements for programs on safety and health, hazard communication, training and emergency response.

The correction notice states that those facilities regulated by 40 CFR, parts 264 and 265, or by state law must comply. However, "conditionally exempt" small-quantity generators do not have to meet most of the requirements. Only those exempted employers who direct their employees to engage in emergency response must comply with the OSHA emergency response requirements; all those who direct their employees to evacuate the site in an emergency are now exempt.

This clarification provides a much stronger "bridge" between the language and organization of the EPA requirements for TSD facilities and the

OSHA standard.

A second major clarification issued by OSHA involves the definition of "hazardous substance" as any biological agent and other disease-causing agent as defined in Section 101(33) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. The agency specifically includes petroleum products and gases under the umbrella of hazardous substances, and, as has already been noted, was quick to apply Hazwoper training requirements at oil spill cleanup sites.

A spokesperson for the agency has reaffirmed that the hazardous substances umbrella is extremely broad, and covers anything that could or will cause adverse health effects. Because of OSHA's focus on employee health, hazardous wastes are perceived only as a subset of hazardous substances. For example, investigations of underground storage tanks (USTs) are not covered by Hazwoper unless a leak is suspected. Remediation of sites where USTs have leaked is definitely covered, since there is a potential threat to human health.

The interface between Hazwoper and OSHA's Hazard Communication Standard (29 CFR

continued on page 48

Hazw

continued from page 47

1910.1200), although not formally addressed in the corrections, has been partially clarified in conversations with agency personnel. When Hazwoper was first issued, in March 1989, the emergency response provisions of the standard were widely thought to apply to any spill or leak in the workplace, no matter how insignificant.

This interpretation appeared to escalate minor spills, already addressed in the material safety data sheets available under the Hazard Communication Standard, into major emergency response events requiring higher levels of training.

It now has been made clear by agency personnel that if employees, properly trained under the Hazard Communication Standard, can handle small, routine releases, the requirements of Hazwoper are not invoked. Two criteria characterize a Hazwoper incident: the release must pose a true emergency, and the

response must come from outside the immediate release area.

Although these criteria are helpful, the employer who has hazardous substances in the workplace and who is attempting to define Hazwoper emergency response training needs may still be faced with a problem. If the employer feels confident that no emergency releases will ever occur, and also has an effective hazard communication program, he or she might then assume that no Hazwoper training is necessary.

These assumptions will be difficult to justify, however, when the rare emergency incident occurs. Rather than run this risk of after-the-fact noncompliance with Hazwoper, many employers have opted to conduct at least the two lowest (First Responder Awareness and Operations) levels of emergency response training in their workplaces.

The Awareness level of training is often presented as a hazard communication refresher course, with additional

emphasis on steps to be taken if an employee witnesses a significant release or spill. These steps usually include hazard recognition, emergency telephone numbers, evacuation routes and other site-specific procedures.

The Operations level of emergency response training, which is a prescribed eight hours under Hazwoper, is administered to those employees who must take defensive measures to control and contain releases until the emergency response team arrives. Depending upon the nature of the workplace and the potential hazards, many employees or only a few might require this level of training. Some employers have effectively trained in-house instructors to conduct these two lowest levels of Hazwoper emergency response training on an ongoing basis for new and transferred employees.

The Hazard Communication/Hazwoper interface is not a factor in the

continued on page 70

continued from page 48

decisions that employers must make with respect to the three upper (Technician, Specialist, Incident Commander) levels of Hazwoper emergency response training. Here, the decision involves weighing the benefits of using an outside fire department or other emergency response specialists against the initiation or continuation of an in-house team.

Whichever route is selected, most companies have recognized the need to train a small cadre of in-house incident commanders, covering all work shifts, to be responsible for initiating and terminating the response, taking care of all required notifications and other

duties as defined by Hazwoper.

The Hazwoper standard, because it embraces so many different kinds of workplaces and interfaces with so many other standards and regulations, has inevitably undergone change. Further adjustments in related standards, such as the recent OSHA suggestion that material safety data sheets should follow a standardized format, will in turn have an impact on Hazwoper.

The intent of the standard, however, is clearly not subject to change. The mantle of OSHA's worker health and safety protection has been extended to all employees in operations involving hazardous substances.

LABELING

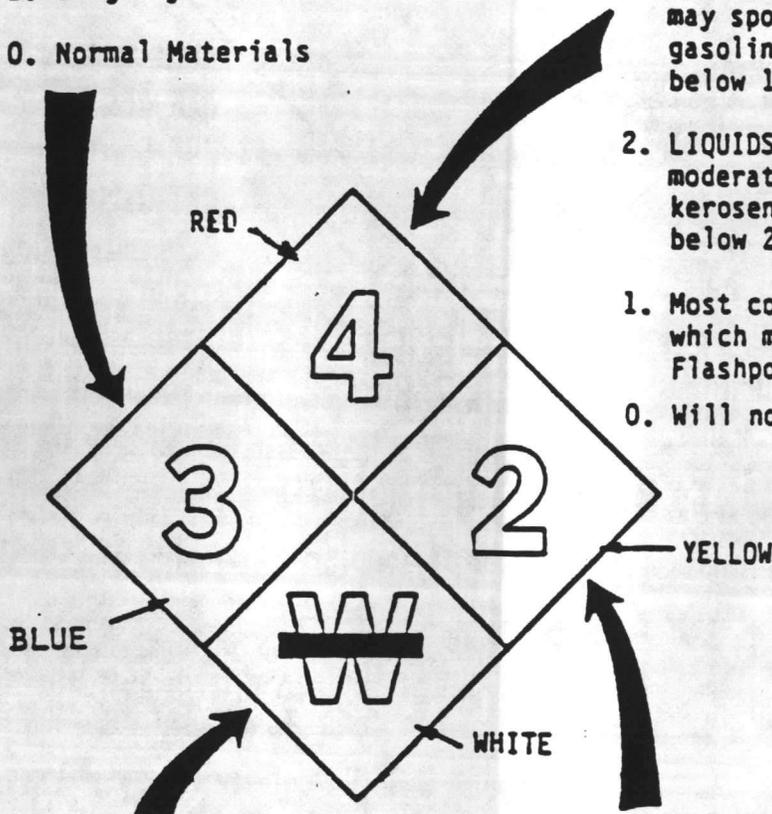
SYSTEM

HEALTH HAZARD

- 4. Deadly
- 3. Extreme Danger
- 2. Hazardous
- 1. Slightly Hazardous
- 0. Normal Materials

FIRE HAZARD

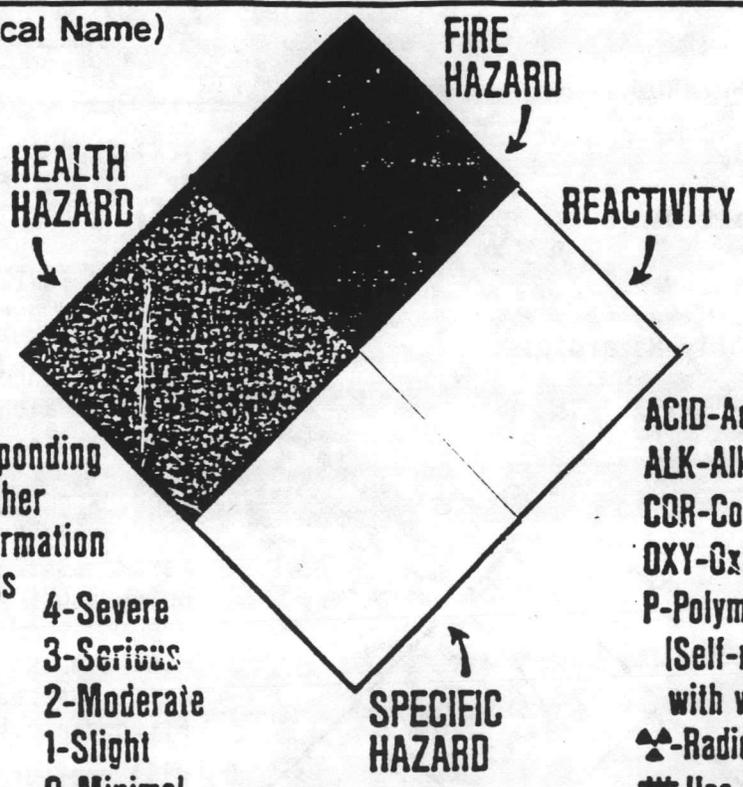
- 4. VERY FLAMMABLE - gases, dusts or mists .. Flashpoint below 73°F ether class
- 3. READILY IGNITED LIQUIDS - under normal temperature conditions. Shredded or fibrous solids which may spontaneously ignite.. gasoline-alcohol class. Flashpoint below 100°F
- 2. LIQUIDS OR SOLIDS which must be moderately heated before ignition.. kerosene - JP-4 class. Flashpoint below 200°F
- 1. Most combustibile solids. Materials which must be preheated to burn. Flashpoint above 200°F
- 0. Will not burn..



- OXIDIZER OXY
- ACID ACID
- ALKALI ALK
- CORROSIVE COR
- USE NO WATER \neq

- 4. May detonate
- 3. Shock and heat may detonate
- 2. Violent chemical change
- 1. Unstable if heated
- 0. Stable

(Fill in Chemical Name)



Consult Corresponding
MSDS for Further
Hazardous Information
and Instructions

- 4-Severe
- 3-Serious
- 2-Moderate
- 1-Slight
- 0-Minimal

- ACID-Acid
- ALK-Alkali
- COR-Corrosive
- OXY-Oxidizer
- P-Polymerization
(Self-reacting
with water)
- ☢-Radioactive
- W-Use No Water

Personal Protection

(✓ Mark Appropriate Protection Required)

<input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Apron	<input type="checkbox"/> Respirator
<input type="checkbox"/> Face Shield	<input type="checkbox"/> Boots	<input type="checkbox"/> Self Contained Air Respirator
<input type="checkbox"/> Gloves	<input type="checkbox"/> Splash Goggles	<input type="checkbox"/> Full Protection Suit
<input type="checkbox"/> OTHER	<input type="checkbox"/> OTHER	<input type="checkbox"/> OTHER

Identification of Health Hazard Color Code: BLUE		Identification of Flammability Color Code: RED		Identification of Reactivity (Stability) Color Code: YELLOW	
Type of Possible Injury		Susceptibility of Materials to Burning		Susceptibility to Release of Energy	
Signal		Signal		Signal	
4	Materials which on very short exposure could cause death or major residual injury even though prompt medical treatment were given.	4	Materials which will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or which are readily dispersed in air and which will burn readily.	4	Materials which in themselves are readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
3	Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment were given.	3	Liquids and solids that can be ignited under almost all ambient temperature conditions.	3	Materials which in themselves are capable of detonation or explosive reaction but require a strong initiating source or which must be heated under confinement before initiation or which react explosively with water.
2	Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.	2	Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.	2	Materials which in themselves are normally unstable and readily undergo violent chemical change but do not detonate. Also materials which may react violently with water or which may form potentially explosive mixtures with water.
1	Materials which on exposure would cause irritation but only minor residual injury even if no treatment is given.	1	Materials that must be preheated before ignition can occur.	1	Materials which in themselves are normally stable, but which can become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently.
0	Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material.	0	Materials that will not burn.	0	Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.

Appendix B

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only.

The information contained within Appendix B is derived from introductory explanatory material on the 704 system contained within NFPA 49, *Hazardous Chemicals Data*; and NFPA 325M, *Fire Hazard Properties of Flammable Liquids, Gases and Volatile Solids*. The following paragraphs summarize the meanings of the numbers in each hazard category and explain what a number should tell fire fighting personnel about protecting themselves and how to fight fires where the hazard exists.

Health.

In general, health hazard in fire fighting is that of a single exposure which may vary from a few seconds up to an hour. The physical exertion demanded in fire fighting or other emergency conditions may be expected to intensify the effects of any exposure. Only hazards arising out of an inherent property of the material are considered. The following explanation is based upon protective equipment normally used by fire fighters.

4 Materials too dangerous to health to expose fire fighters. A few whiffs of the vapor could cause death or the vapor or liquid could be fatal on penetrating the fire fighter's normal full protective clothing. The normal full protective

clothing and breathing apparatus available to the average fire department will not provide adequate protection against inhalation or skin contact with these materials.

3 Materials extremely hazardous to health but areas may be entered with extreme care. Full protective clothing, including self-contained breathing apparatus, coat; pants, gloves, boots, and bands around legs, arms and waist should be provided. No skin surface should be exposed.

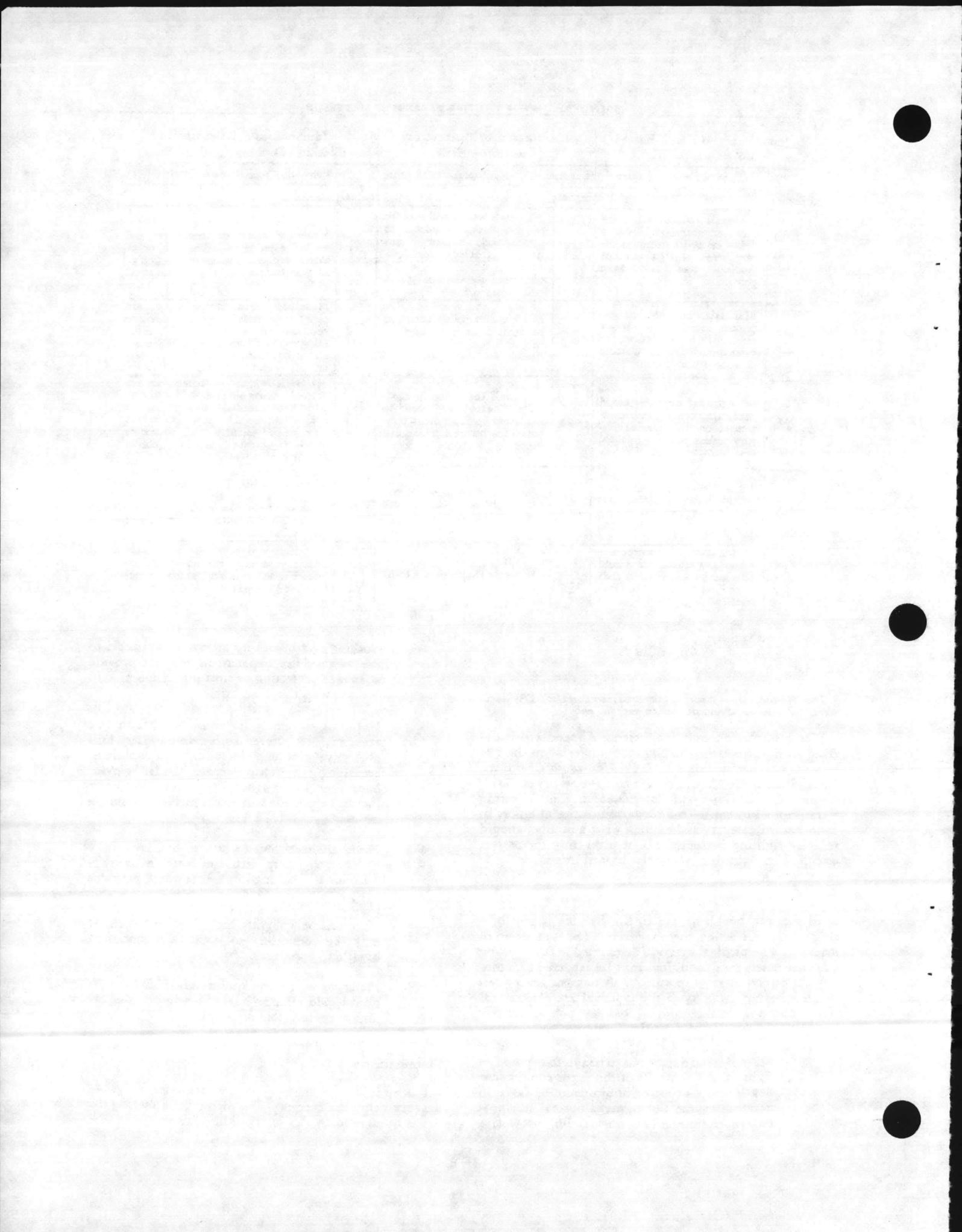
2 Materials hazardous to health, but areas may be entered freely with full-faced mask self-contained breathing apparatus which provides eye protection.

1 Materials only slightly hazardous to health. It may be desirable to wear self-contained breathing apparatus.

0 Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material.

Flammability.

Susceptibility to burning is the basis for assigning degrees within this category. The method of attacking the fire is influenced by this susceptibility factor.



Guidelines for Safe Practices and Procedures
In CARC Painting Operations

I. Introduction.

A. The Marine Corps has been changing their painting operations to include the use of CARC (Chemical Agent Resistant Coating) paints, primers, and epoxy enamels. Use of these coatings is expected to reduce operating costs over the life of a vehicle due to less touch-up painting and not having to repaint vehicles after decontamination procedures.

B. The purpose of this report is to explain the health hazards associated with the use of CARC and to provide recommendations on the proper procedures to follow and personal protective equipment to use.

II. Chemical Components. Hazardous constituents of CARC change depending on whether a primer, epoxy enamel, or polyurethane paint is in use. This section will explain the different chemical compositions of these products and the health hazards involved.

A. Cellosolve Acetate - A solvent which has been linked as a suspected teratogen. A teratogen is a chemical which may cause birth defects in children of exposed parents. The main route of entry is through the skin, so solvent resistant gloves and barrier creams are important for use. The vapors are also an eye irritant and present an unpleasant odor. This chemical is found in some paints and thinners.

B. Hexamethylene Diisocyanate - Isocyanates irritate the respiratory tract and can act as a sensitizer causing a similar reaction to asthma. The sensitization may cause coughing, wheezing, tightness in the chest, and shortness of breath. Repeat exposures may cause chronic impairment of pulmonary function. Once an individual has been sensitized, the asthmatic condition can occur after very short repeat exposures. This chemical is found in component B of the polyurethane paint (PUP).

C. Solvents - There are different types of solvents contained in CARC coatings. These include: Methyl Ethyl Ketone (MEK), toluene, methyl amyl ketone, butyl alcohol, methyl isobutyl ketone, isopropanol, and xylene. These solvents may cause headaches, dizziness, nausea, drying of the skin, and eye/respiratory irritation.

III. Operations. There are numerous requirements for conducting CARC painting operations. These requirements involve the safe application and removal of CARC, use of personal protective equipment, training, and medical surveillance.

A. References state that units authorized as an organizational maintenance capability, may conduct touch-up painting operations with a paint brush only. Second Marine Division is not authorized to conduct any spray painting.

B. Painting with CARC for cosmetic purposes is not authorized.

C. Personnel should receive training in the health hazards associated with the use of CARC paint. Training should be provided at initial entry into the job and annually thereafter.

D. Touch-up painting should be conducted outdoors in a well-ventilated area.

E. Personal protective equipment to be worn during painting includes the following:

- (1) Coveralls (preferably disposable type made of poly laminated tyvek).
- (2) Solvent resistant gloves made of silicone rubber.
- (3) Barrier creams for use under the gloves to afford total skin protection.
- (4) Goggles.
- (5) Safety boots.

Note: Contact lenses will not be worn during painting operations.

F. Material Safety Data Sheets (MSDS) for all types of CARC paint should be acquired from the respective paint manufacturers. All MSDSs' shall be available to employees at their worksite. Training shall be provided on the content and use of MSDSs'.

G. Welding and Cutting: Before welding or cutting, all CARC painted surfaces should be removed to bare metal 4 inches on either side of spot to be welded. Welding and cutting on CARC material may cause significant quantities of isocyanates to be released along with other toxic substances such as carbon monoxide and carbon dioxide. Do not weld or cut on CARC painted surfaces.

H. Grinding and Sanding: During grinding and sanding operations, dust containing lead, zinc, copper, tin, or chromium VI may be produced. Personnel will wear safety goggles or a full faceshield to prevent paint chips and dust from getting into the eyes.

I. CARC paint will not be applied to manifolds, exhaust pipes, turbo chargers, mufflers, and any other area where temperatures may reach 400 F or above.

J. Painting: Personnel painting with CARC shall conduct brush touch-up only and will use only one (1) quart per person per day. Painting will be conducted outdoors.

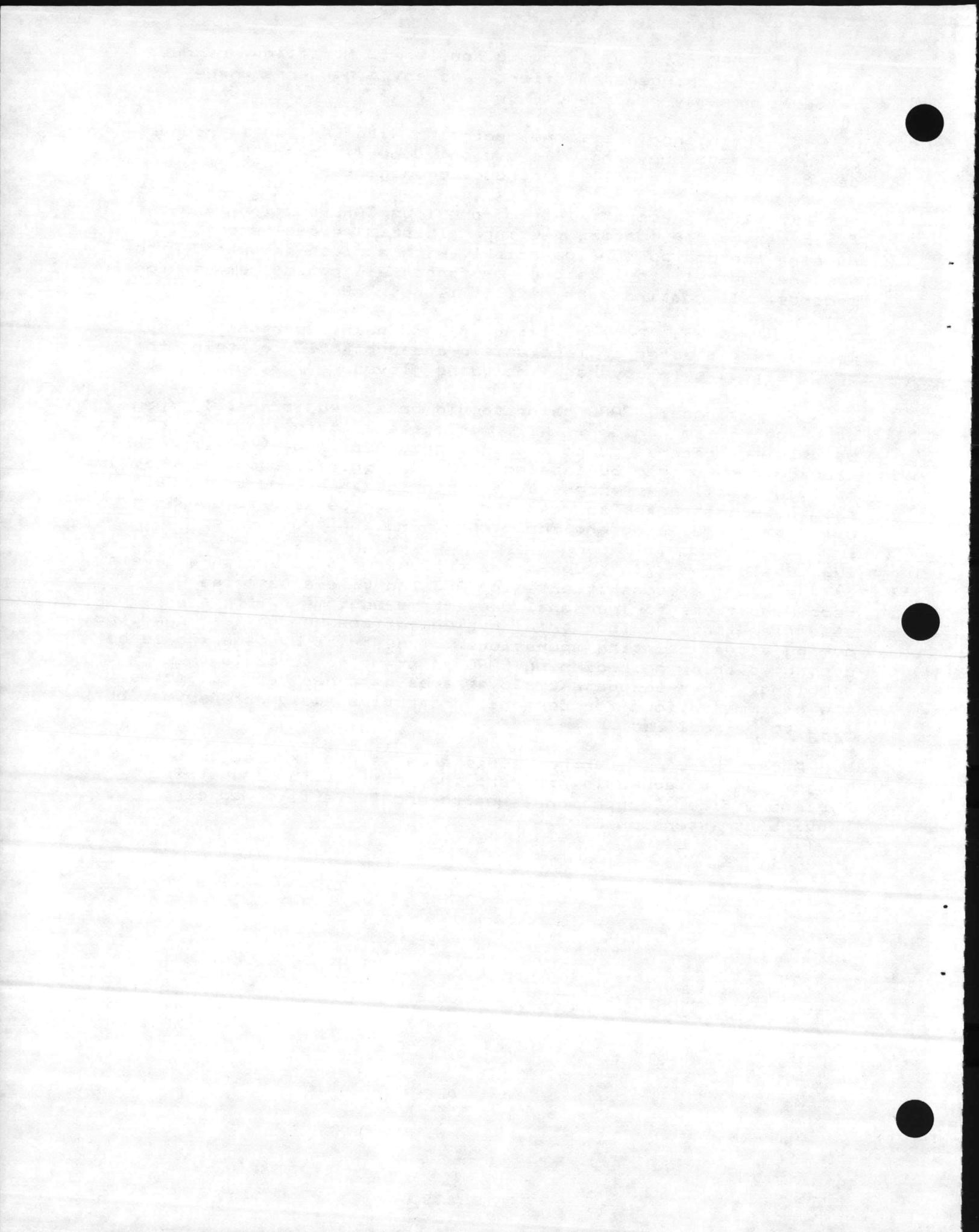
K. If no record exists of previous CARC coating, use the field method for coating testing. This is accomplished by rubbing the coated surface briskly with a cloth saturated with acetone, methyl ethyl ketone, or fingernail polish remover for 20 seconds. If coating rubs off, it is not CARC.

L. Mixing: During mixing of CARC paint, personnel must wear safety glasses or face shield and protective clothing to provide full skin coverage including gloves.

M. Storage: CARC paint should be stored separately from other paints so personnel will not mistake it for paint which can be used for general purpose painting such as embark boxes. The storage area should be labeled as CARC, controls should be set up as to who will have access to the storage area, and personnel should be instructed to read the labels to be assured of which paint they are using and the proper handling procedures.

IV. Evaluation. In order to establish employee exposure levels to the chemical constituents in CARC and to evaluate the recommendations for personal protective equipment, it is essential that the Industrial Hygiene office conduct air sampling during actual painting operations. Industrial Hygiene should be contacted prior to beginning CARC painting to schedule this sampling. When adequate employee/area data has been collected, the recommendations for personal protective equipment use may be able to be modified.

V. Assistance. If further assistance is required on this subject and to schedule air sampling, contact the Industrial Hygiene Office, Occupational Health and Preventive Medicine Service at extension 2707.



ASBESTOS

Work Practice Procedures for the Handling of Asbestos Containing Brakes and Clutches

I. Prior to Beginning Work:

1. Isolate the asbestos brake/clutch work area.
2. Allow only authorized personnel into the work area.
3. Designate a specific work space with minimum traffic flow for asbestos brake or clutch work.
4. Ensure only personnel with a job-related need are allowed in the shop area.

II. INSPECTION AND REMOVAL OF BRAKES/CLUTCHES:

1. Provide for the collection of residual asbestos waste and dust.
 - a. Position disposable drop cloth under the wheel assembly or clutch housing prior to removal to catch dust.
 - b. If present, use a high efficiency particulate air (HEPA) filter vacuum source with a brake enclosure or chamber.
 - c. Use a low pressure wet method to first dampen then clean off loose brake dust.

III. LOW PRESSURE WET METHOD:

1. Is recommended by OSH for controlling airborne asbestos/brake dust generation.
2. Use a water mist to minimize asbestos fiber release from brake dust (EPA recommends a concentration of one ounce polyoxyethylene ester per 5 gallons of water. Brakekleen may also be used).
3. Keep brake assembly as damp as possible throughout the work period to ensure that any brake dust is wet, and remains wet, until final disposal.
4. Wetted rags and spray bottle can be used. The liquid spray must be kept at a very low pressure to avoid scattering the brake dust.

IV. USE OF PERSONAL PROTECTIVE EQUIPMENT:

1. If wet method or HEPA vacuum is used, respirators are not required.

2. DISPOSABLE DUST RESPIRATORS (i.e., 3M 8710 or 9920) ARE NOT AUTHORIZED FOR USE DURING ANY ASBESTOS OPERATION. Disposable respirators do not provide adequate protection against asbestos fibers.

3. A half-face air purifying respirator equipped with HEPA cartridges is authorized for protection against asbestos when engineering controls are not available and wet method is not used.

4. If personnel use respirators, they must be in the unit respiratory protection program.

5. To bypass all respirator costs and program requirements, utilize wet methods or the HEPA brake vacuum system.

6. Personnel should wear safety glasses or face shields when required to protect against falling or flying debris.

V. CLEANUP/HOUSEKEEPING

1. Debris which falls from the drum or clutch onto the floor must be removed. Cleanup is to be performed after each job. Use a plastic sheet to catch all debris.

2. Personnel should not eat, smoke, drink or use tobacco products around brake or clutch work, or around asbestos containing storage areas.

3. Personnel who work or handle asbestos or asbestos containing material should wash their hands prior to eating, drinking or smoking.

VI. DISPOSAL - Asbestos Labelled Bags Disposed According to Approved Methods (i.e. as asbestos waste)

VII. PROHIBITED METHODS

1. Dry sweeping.

2. Dry brushing to clean brakes.

3. Using compressed air to clean brakes.

VIII. WORKER EXPOSURE MONITORING

1. Sampling of all areas where repetitious asbestos work is performed shall be conducted by the Industrial Hygiene Department annually.

2. In those areas where exposures exceed the action limit of 0.1 fibers per cubic centimeter (f/cc), exposure monitoring will be conducted every 6 months and other requirements of 29 CFR 1910.1001 including medical surveillance, respirator use, and other procedures will be observed.

IX. EMPLOYEE NOTIFICATION

1. Within 15 working days after receipt, the unit shall notify affected workers of the results of any personnel monitoring in writing, either individually or by posting results in an appropriate location accessible by all personnel.

2. The unit shall maintain all records of air monitoring for at least 30 years.

X. TRAINING. The unit shall provide annual training for personnel who are performing job operations which offer the potential for exposure to airborne concentrations of asbestos. Assistance in training is provided by the Industrial Hygiene Department. Please contact either E. M. Holland or ENS Gieseke at extension 2707.

COMPATIBILITY OF HAZARDOUS WASTE CATEGORIES

	Acid	Caustic	Organics	Oxidizers	Reactive	General
Acid	--	NC	NC	NC	NC	NC
Caustic	NC	--	NC	C	NC	NC
Organics	NC	NC	--	NC	NC	NC
Oxidizers	NC	C	NC	--	NC	C
Reactive	NC	NC	NC	NC	--	NC
General	NC	NC	NC	C	NC	--

C - Compatible, NC - Not Compatible

Note: Even though wastes may be compatible by generic type as stated above, specific wastes may not be compatible within that type. Wastes should always be reviewed individually for compatibility and, if incompatible, should not be stored together.

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	Acid	Caustic	Organics	Oxidizers	Reactive	General
Acid	--	NC	NC	NC	NC	NC
Caustic	NC	--	NC	C	NC	NC
Organics	NC	NC	--	NC	NC	NC
Oxidizers	NC	C	NC	--	NC	C
Reactive	NC	NC	NC	NC	--	NC
General	NC	NC	NC	C	NC	--

C - Compatible, NC - Not Compatible

Note: Even though wastes may be compatible by generic type as stated above, specific wastes may not be compatible within that type. Wastes should always be reviewed individually for compatibility and, if incompatible, should not be stored together.

APPENDIX A

LIST OF REACTIVITY GROUP NUMBERS (RGNs) FOR CHEMICAL SUBSTANCES

This appendix lists the chemical substances that may be found in hazardous wastestreams. The list is not inclusive but represents the data compiled through a literature survey and examination of hazardous waste management practices.

The list consists of three columns. The first column lists the chemical or trade names in alphabetical order. The trade names are denoted by asterisks (*). The second column lists the synonyms or common names of the chemical substances when available. The third column lists the reactivity group numbers (RGN) assigned to the substances as derived in Appendix 2. A compound may be assigned more than one RGN.

This appendix is used to obtain the RGN of waste constituents when known specifically. The RGN is used to determine the compatibility of the combinations of wastes according to the compatibility method in Section 4.

The chemical substances listed were compiled from several sources. The list of Hazardous Wastes and Hazardous Materials and List of Extremely Hazardous Wastes and Extremely Hazardous Materials in California's Industrial Waste Law of 1972 (Ref. 44) served as the starting reference. The primary sources of information consisted of published reports (Ref. 1, 7, 12, 13, 14, 32, and 52) identifying the hazardous chemical substances in industrial wastestreams. Additional chemical entries were abstracted from the California Waste Haulers Record files (Ref. 10), California Extremely Hazardous Waste Disposal Permit files (Ref. 8), and the TRW Systems' report on recommended methods of reduction, neutralization, recovery, and disposal of hazardous wastes (Ref. 77).

RGN	Names	Synonyms
32	Abate*	
16	Acenaphthene	
6	Acetamide	
5	Acetaldehyde	
3	Acetic acid	
107	Acetic anhydride	
19	Acetone	Dimethyl ketone
4, 26	Acetone cyanohydrin	Hydroxylisobutyronitrile
26	Acetonitrile	Methyl cyanide
19	Acetophenone	
13	Acetoxybutane	Butyl acetate
13	Acetoxypentane	Amyl acetate
19	Acetyl acetone	

RGN	Names	Synonyms
107	Acetyl azide	
30	Acetyl benzoyl peroxide	
17, 107	Acetyl bromide	
17, 107	Acetyl chloride	
28	Acetylene	
27, 107	Acetyl nitrate	
30	Acetyl peroxide	
5, 103	Acrolein	Aqualin
3, 103	Acrylic acid	
26, 103	Acrylonitrile	
3	Adipic acid	
26	Adiponitrile	
	Agallol	
24		Methoxyethylmercuric chloride
	Agaloaretan	Methoxymethylmercuric chloride
24		Temik*
9, 20	Aldicarb	
17	Aldrin	
107	Alkyl aluminum chloride	
101	Alkyl resins	
28	Allene	
4	Allyl alcohol	2-Propen-1-ol
17	Allyl bromide	Bromopropene
17	Allyl chloride	Chloropropene
13, 17	Allyl chlorocarbonate	Allyl chloroformate
13, 17	Allyl chloroformate	Allyl chlorocarbonate
107	Allyl trichlorosilane	
22, 23	Aluminum	
107	Aluminum amino borohydride	
103, 107	Aluminum borohydride	
107	Aluminum bromide	
103	Aluminum carbide	
107	Aluminum chloride	
103, 107	Aluminum diethyl monochloride	Diethylaluminum chloride
13, 107	Aluminum fluoride	
103	Aluminum hydride	
107	Aluminum hypophosphide	
107	Aluminum phosphide	
8	Aluminum tetraazidoborate	
7	Aminobenzene	Aniline
7	Aminobutane	Butylamine
7, 17	Aminochlorotoluene	Chlorotoluidine
7	Aminodiphenyl	
7	Aminoethane	Ethylamine
4, 7	Aminoethanol	
7	Aminoethanolamine	
7	Aminohexane	Hexylamine
7	Aminomethane	Methylamine
7	Aminopentane	Amylamine
7, 31	Aminophenol	

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
7	Aminopropane	Isopropyl amine	24	Antimony sulfate	Antimony trisulfate
7, 26	Amino propionitrile		24, 33, 103	Antimony sulfide	Antimony trisulfide
7, 8	Aminothiazole		24, 107	Antimony tribromide	
7	Aminotoluene	Toluidine	24, 107	Antimony trichloride	Antimony chloride
10	Ammonia		24, 107	Antimony trifluoride	Antimony fluoride
24	Ammonium arsenate		24, 107	Antimony triiodide	
102	Ammonium azide		24	Antimony trioxide	Antimony oxide
13	Ammonium bifluoride		24	Antimony trisulfate	Antimony sulfate
102, 104	Ammonium chlorate		24, 33	Antimony trisulfide	Antimony sulfide
24, 102	Ammonium dichromate		24, 107	Antimony trivinyl	
13	Ammonium fluoride		5, 103	Aqualin	Acrolein
24, 102	Ammonium hexanitrocobaltate		106	Aqueous solutions & mixtures	
10	Ammonium hydroxide			Aretan*	Methoxyethylmercuric chloride
103	Ammonium hypophosphide		24		Polychlorinated biphenyl
24	Ammonium molybdate		17	Aroclor*	
102	Ammonium nitrate		24	Arsenic	
24, 104	Ammonium nitridoosmate		24, 107	Arsenic bromide	Arsenic tribromide
102	Ammonium nitrite		24, 107	Arsenic chloride	Arsenic trichloride
104	Ammonium perchlorate		24, 33, 103	Arsenic disulfide	Arsenic sulfide
102, 104	Ammonium periodate		24, 107	Arsenic iodide	Arsenic triiodide
24, 102, 104	Ammonium permanganate		24	Arsenic oxide	Arsenic pentoxide
104	Ammonium persulfate		24	Arsenic pentaselenide	
102	Ammonium picrate		24, 33	Arsenic pentasulfide	
33, 103	Ammonium sulfide		24	Arsenic pentoxide	Arsenic oxide
24, 104	Ammonium tetrachromate		24, 33, 103	Arsenic sulfide	Arsenic disulfide
24, 102, 104	Ammonium tetraperoxychromate		24, 107	Arsenic tribromide	Arsenic bromide
24, 104	Ammonium trichromate		24, 107	Arsenic trichloride	Arsenic chloride
13	Amyl acetate	Acetoxy pentane	24	Arsenic trifluoride	
4	Amyl alcohol		24, 107	Arsenic triiodide	Arsenic iodide
17	Amyl chloride	Chloropentane	24, 33, 103	Arsenic trisulfide	
26	Amyl cyanide		24, 103	Arsine	
7	Amylamine	Aminopentane	17	Askarel	Polychlorinated biphenyl
28	Amylene	Pentene	101	Asphalt	
20	Amyl mercaptan	Pentanethiol	8, 102	Azidocarbonyl guanidine	
7	Aniline		8	Azido-s-triazole	
20	Animert* V-101	Tetrasul	32	Azinphos ethyl	
14	Anisole		7, 103	Aziridine	Ethyleneimine
107	Anisole chloride		8, 26	a,n'-Azodiisobutyronitrile	
16	Anthracene		32	Azodrin*	Monocrotophos
23, 24	Antimony		101	Bakelite*	
24, 107	Antimony chloride	Antimony trichloride	9	Banol	Carbanolate
24, 107	Antimony fluoride	Antimony trifluoride	21, 24, 107	Barium	
24, 23	Antimony nitride		24, 102	Barium azide	
24	Antimony oxychloride		24, 104	Barium bromate	
24	Antimony oxide	Antimony trioxide	24, 103, 107	Barium carbide	
24	Antimony pentachloride		24, 104	Barium chlorate	
24	Antimony pentafluoride		24	Barium chloride	
24, 33, 103	Antimony pentasulfide		24, 104	Barium chromate	
24, 104	Antimony perchlorate		13, 24	Barium fluoride	
24	Antimony potassium tartrate		24	Barium fluosilicate	

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
24, 105	Barium hydride		10, 24	Beryllium hydroxide	
10, 24	Barium hydroxide		24	Beryllium oxide	
24, 105	Barium hypophosphide		33, 105	Beryllium sulfide	
24, 104	Barium iodate		24, 105, 107	Beryllium tetrahydroborate	
24	Barium iodide		32	Bidrin*	
10, 24, 107	Barium monoxide	Barium oxide	22, 23, 24	Bismuth	
24, 104	Barium nitrate		24	Bismuth chromate	
10, 24, 107	Barium oxide	Barium monoxide	24	Bismuthic acid	
24, 104	Barium perchlorate		24, 25, 102	Bismuth nitride	
24, 104	Barium permanganate		24, 107	Bismuth pentafluoride	
24, 104	Barium peroxide		24	Bismuth pentaoxide	
24	Barium phosphate		24, 33, 105	Bismuth sulfide	
24	Barium stearate		24	Bismuth tribromide	
24, 33, 105, 107	Barium sulfide		24	Bismuth trichloride	
24	Barium sulfite		24	Bismuth triiodide	
9	Bassa*		24	Bismuth trioxide	
32	Bayer 25141	BPMC	24, 33, 105	Bismuth trisulfide	
9	Baygon*	Fensulthion	32	Blada-fum*	Sulfotepp
6	Benzadox		24	Blue vitriol	Copper sulfate
17	Benzal bromide	Topcide*	32	Bomyl	
17	Benzal chloride		24, 107	Borane	
5	Benzaldehyde		24	Bordeaux arsenites	
16	Benz-a-pyrene		1	Boric acid	
16	Benzene		24, 105	Boron arsenotribromide	
8, 102	Benzene diazonium chloride		24, 107	Boron bromodiodide	
107	Benzene phosphorus dichloride		24, 107	Boron dibromodiodide	
7	Benzidine		24, 25	Boron nitride	
3	Benzolic acid		24, 107	Boron phosphide	
26	Benzonitrile		24, 102	Boron triazide	
19	Benzophenone		24, 107	Boron tribromide	
19	Benzoquinone	Quinone	24, 107	Boron trichloride	
8, 102	Benzotriazole		24, 107	Boron trifluoride	
17	Benzotribromide		24, 107	Boron tritelluride	
17	Benzotrichloride		24, 107	Boron trisulfide	
17	Benzotrifluoride	Trifluoromethylbenzene	24, 33, 105	BPMC	Bassa*
107	Benzoyl chloride		9	Brass	
30, 102	Benzoyl peroxide	Dibenzoyl peroxide	23	Bromic acid	
4	Benzyl alcohol		2	Bromine	
7	Benzylamine		104	Bromine azide	
16	Benzyl benzene	Diphenylmethane	102	Bromine cyanide	Cyanogen bromide
17	Benzyl bromide	Bromotoluene	11	Bromine monofluoride	
17	Benzyl chloride	Chlorotoluene	104, 107	Bromine pentafluoride	
17	Benzyl chlorocarbonate	Benzyl chloroformate	104, 107	Bromine trifluoride	
17	Benzyl chloroformate	Benzyl chlorocarbonate	17	Bromoacetylene	
105, 107	Benzyl silane		6, 19	Bromobenzoyl acetanilide	
105	Benzyl sodium		17	Bromobenzyl trifluoride	
24	Beryllium		105	Bromodiborane	
24	Beryllium copper alloy		107	Bromodiethylaluminum	
15, 24	Beryllium fluoride		14	Bromodimethoxyaniline	
24, 105, 107	Beryllium hydride		17	Bromoform	Tribromomethane

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
17	Bromomethane	Methyl bromide	6	Butyramide	
17, 31	Bromophenol		5	Butyraldehyde	Butanol
17	Bromopropene	Allyl bromide	3	Butyric acid	
17	Bromopropyne		26	Butyronitrile	
105	Bromosilane		9	Bux*	
17	Bromotoluene	Benzyl bromide	24	Cacodylic acid	Dimethylarsenic acid
17	Bromotrifluoromethane		23, 24	Cadmium	
17	Bromotrifluoromethane		24, 105, 107	Cadmium acetylde	
17	Bromoxynil	3,5-Dibromo-4-hydroxy benzonitrile	24, 10, 107	Cadmium amide	
17, 26, 31	Bronze		24, 102	Cadmium azide	
23	Buna-N*		24	Cadmium bromide	
101	Bunker fuel oil		24, 104	Cadmium chlorate	
101	Butacarb		24	Cadmium chloride	
9	Butadiene		11, 24	Cadmium cyanide	
28, 103	Butadiene	Diacetylene	15, 24	Cadmium fluoride	
28	Butadiyne	Butyraldehyde	24, 102	Cadmium hexamine chlorate	
5	Butanal		24, 102	Cadmium hexamine perchlorate	
29	Butane		24	Cadmium iodide	
4	Butanediol		24, 102, 104	Cadmium nitrate	
20	Butanethiol	Butyl mercaptan	24, 25, 102	Cadmium nitride	
102	Butanetriol trinitrate		24	Cadmium oxide	
4	Butanol	Butyl alcohol	24	Cadmium phosphate	
19	Butanone	Methyl ethyl ketone	24, 33, 105	Cadmium sulfide	
5	Butenal	Crotonaldehyde	24, 102	Cadmium trihydrazine chlorate	
28	Butene		24, 102	Cadmium trihydrazine perchlorate	
19	Butene-2-one	Methyl vinyl ketone	24, 102	Calcium	
13	Butyl acetate	Acetoxybutane	24	Calcium arsenate	
13, 103	n-Butyl acrylate		24	Calcium arsenite	
7	Butylamine	Aminobutane	104	Calcium bromate	
4	Butyl alcohol	Butanol	105, 107	Calcium carbide	
8	t-Butyl azidoformate		104	Calcium chlorate	
16	Butyl benzene	Phenylbutane	104	Calcium chlorite	
13	Butyl benzyl phthalate		15	Calcium fluoride	
4	Butyl cellulose*		105	Calcium hexammoniate	
105	Butyl dichloroborane		105, 107	Calcium hydride	
14	Butyl ether	Dibutyl ether	10	Calcium hydroxide	Hydrated lime
13	Butyl formate		104	Calcium hypochlorite	Calcium oxchloride
17	Butyl fluoride		105	Calcium hypophosphide	
34	Butyl glycidyl ether		104	Calcium iodate	
30	Butyl hydroperoxide		23	Calcium manganese-silicon alloy	
102, 104	t-Butyl hypochlorite		104	Calcium nitrate	Lime nitrate, nitrocalcite
105, 107	n-Butyl lithium		10, 107	Calcium oxide	Slaked lime
20	Butyl mercaptan	Butanethiol	104	Calcium oxchloride	Calcium hypochlorite
30	Butyl peroxide		104	Calcium perchromate	
30	Butyl peroxyacetate	t-Butyl perbenzoate	104	Calcium permanganate	
30	Butyl peroxybenzoate		104	Calcium peroxide	
30	Butyl peroxyvalate		107	Calcium phosphide	
30	t-Butyl perbenzoate	Butyl peroxyacetate	33, 105	Calcium sulfide	
34	t-Butyl-3-phenyl oxazirane		101	Camphor oil	
107	Butyl trichlorosilane		3	Capric acid	

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
3	Caproic acid	Hexanoic acid	5, 17	Chloroacetaldehyde	
3	Caprylic acid		3, 17	Chloroacetic acid	Monochloroacetic acid
30	Caprylyl peroxide	Octyl peroxide	17, 19	Chloroacetone	Monochloroacetone
31	Carbacrol		17, 19	Chloroacetophenone	Phenyl chloromethyl ketone
9	Carbaryl		107	Chloroacetyl chloride	
6	Carbetamide		102	Chloroacetylene	
9	Carbanolate	Banol	17, 26	Chloroacrylonitrile	
9	Carbofuran	Furadan*	8, 17	Chloroazodin	
31	Carbolic acid	Phenol	17	Chlorobenzene	
31	Carbolic oil		8, 17	Chlorobenzotriazole	
101	Carbon, activated, spent		17, 30	Chlorobenzoyl peroxide	
20	Carbon bisulfide	Carbon disulfide	17, 26	Chlorobenzylidene malononitrile	
20	Carbon disulfide	Carbon bisulfide	17, 26	Chlorobutyronitrile	
17	Carbon tetrachloride	Tetrachloromethane	24, 104, 107	Chloro chromic anhydride	Chromyl chloride
17	Carbon tetrafluoride		17, 31	Chlorocreosol	
17	Carbon tetraiodide		105	Chlorodiborane	
7	Castrix	Crimidine	105, 107	Chlorodiisobutyl aluminum	
31	Catechol		105	Chlorodimethylamine diborane	
10	Caustic potash	Potassium hydroxide	17, 27	Chlorodinitrobenzene	Dinitrochlorobenzene
10	Caustic soda	Sodium hydroxide	17, 27	Chloro dinitrotoluene	
12	CDEC		105	Chlorodipropyl borane	
101	Cellulose		17	Chloroethane	Ethyl chloride
27, 102	Cellulose nitrate	Nitro cellulose	4, 7	Chloroethanol	
22	Cerium		17	Chloroethylenimine	
105	Cerium hydride		17	Chloroform	Trichloromethane
33, 105	Cerium trisulfide		17	Chlorohydrin	
105	Cerous phosphide		17	Chloromethane	Methyl chloride
21	Cesium		17	Chloromethyl methyl ether	
107	Cesium amide		3, 17	Chloromethyl phenoxyacetic acid	
102	Cesium azide		17, 27	Chloronitroaniline	
105	Cesium carbide		17, 27	Chloronitrobenzene	Nitrochlorobenzene
15	Cesium fluoride		17	Chloropentane	Amyl chloride
105	Cesium hexahydroaluminate		31	Chlorophenol	
105, 107	Cesium hydride		17, 18, 107	Chlorophenyl isocyanate	
107	Cesium phosphide			Chloropicrin	Chloropicrin, Trichloronitromethane
33, 105	Cesium sulfide		17, 27, 102	Chloropropane	Isopropyl chloride
5	Chloral hydrate	Trichloroacetaldehyde	17	Chloropropene	Allyl chloride
17	Chlordane		17, 34	Chloropropylene oxide	Epichlorohydrin
17	Chlorestol	Polychlorinated biphenyl	105	Chlorosilane	
32	Chlorfenvinphos		1	Chlorosulfonic acid	
2, 104	Chloric acid		17, 32	Chlorothion*	
104	Chlorine		17	Chlorotoluene	Benzyl chloride
102	Chlorine azide		7, 17	Chlorotoluidine	
102, 104, 107	Chlorine dioxide		17, 27, 102	Chlorotrinitrobenzene	Picryl chloride
102, 104	Chlorine fluoroxide		24	β -Chlorovinyl dichloroarsine	Lewisite
104, 107	Chlorine monofluoride		17, 27, 102	Chloropicrin	Trichloronitromethane
104	Chlorine monoxide			Chromic acid	Chromic anhydride, Chromium trioxide
104, 107	Chlorine pentafluoride		2, 24, 104		
104, 107	Chlorine trifluoride				
102, 104	Chlorine trioxide				

RGN	Names	Synonyms	RGN	Names	Synonyms
	Chromic anhydride	Chromium trioxide, Chromic acid	5	Crotonaldehyde	Butenal
2, 24, 104	Chromic chloride	Chromium trichloride	4	Crotyl alcohol	
15, 24	Chromic fluoride	Chromium trifluoride	17	Crotyl bromide	
24	Chromic oxide		17	Crotyl chloride	
24	Chromic sulfate	Chromium sulfate	16	Cumene	
23, 24	Chromium		30	Cumene hydroperoxide	Isopropyl benzene Dimethylbenzyl hydroperoxide
24	Chromium sulfate	Chromic sulfate	24	Cupric arsenate	Copper arsenate
24	Chromic sulfide		24	Cupric arsenite	Copper arsenite
24, 33, 105	Chromium trichloride	Chromic chloride	24	Cupric chloride	Copper chloride
24	Chromium trifluoride	Chromic fluoride	24	Cupric cyanide	Copper cyanide
15, 24	Chromium trioxide	Chromic acid, Chromic anhydride	11, 24	Cupric nitrate	Copper nitrate
2, 24, 104	Chromyl chloride	Chloro chromic anhydride	24, 104	Cupric sulfate	Copper sulfate
24, 104, 107	Chrysene		24	Cupric sulfite	
16	CMME	Methyl chloromethyl ether	7, 24	Cupriethylenediamine	
14, 17	Coal oil		3, 26	Cyanoacetic acid	Malonic nitrile
101	Coal tar		17, 26	Cyanochloropentane	
31	Cobalt		26	Cyanogen	
22, 23, 24	Cobalt bromide	Cobaltous bromide	11	Cyanogen bromide	Bromine cyanide
24	Cobalt chloride	Cobaltous chloride	26, 32	Cyanophenphos	Surecide*
24	Cobalt nitrate	Cobaltous nitrate	102	Cyanuric triazide	
24, 104	Cobaltous bromide	Cobalt bromide	29	Cycloheptane	
24	Cobaltous chloride	Cobalt chloride	29	Cyclohexane	
24	Cobaltous nitrate	Cobalt nitrate	4	Cyclohexanol	
24, 104	Cobaltous resinate	Cobaltous resinate	19	Cyclohexanone	
24	Cobaltous sulfate	Cobalt sulfate	30	Cyclohexanone peroxide	
24	Cobalt resinate	Cobaltous resinate	7	Cyclohexylamine	
24	Cobalt sulfate	Cobaltous sulfate	107	Cyclohexenyl trichlorosilane	
24	Collodion	Pyroxylin	31	Cyclohexyl phenol	
27	Copper		107	Cyclohexyl trichlorosilane	
23, 24	Copper acetoarsenite	Paris Green	29	Cyclopentane	
24	Copper acetylide		4	Cyclopentanol	
24, 102, 105, 107	Copper arsenate	Cupric arsenate	28	Cyclopentene	
24	Copper arsenite	Cupric arsenite	29	Cyclopropane	
24	Copper chloride	Cupric chloride	27, 102	Cyclotrimethylene trinitramine	RDX
24	Copper chlorotetrazole		16	Cymene	
11, 24	Copper cyanide	Cupric cyanide	20, 32	Cyolan*	Phospholan
24, 104	Copper nitrate	Cupric nitrate	3, 17	2,4-D	Dichlorophenoxyacetic acid
24, 25	Copper nitride		32	Dasanit*	Fensulfothion
24	Copper sulfate	Cupric sulfate, Blue vitriol	17	DBCP	Dibromochloropropane
24, 33, 105	Copper sulfide		17	DCB	Dichlorobenzene
17, 32	Compound 1836	Diethyl chlorvinyl phosphate	17	DDD	
32	Coroxon*		8, 27, 102	DDNP	Diazodinitrophenol
19	Coumafuryl	Funarin	17	DDT	
19	Coumatetralyl		17, 32	DDVP	Dichlorovos, Vapona*
31	Cresol		105, 107	DEAC	Diethylaluminum chloride
34	Cresol glydicyl ether		107	Decaborane	
31	Cresote		29	Decahydronaphthalene	Decalin
7	Crimidine	Castrix	29	Decalin	Decahydronaphthalene
			29	Decane	
			4	Decanol	
			28	Decene	

RGN	Names	Synonyms
16	Decyl benzene	
32	Delnav ^a	Dioxathion
32	Demeton-s-methyl sulfoxid	Metasystox R ^a
4, 19	Diacetone alcohol	
19	Diacetyl	
28	Diacetylene	Butadiyne
8, 105	Diamine	Hydrazine
7	Diaminobenzene	Phenylene diamine
7	Diaminohexane	Hexamethylenediamine
8, 102	Diazoethane	
32	Diazinon ^a	
27, 102	Diazodinitrophenol	DDNP
30, 102	Dibenzoyl peroxide	Benzoyl peroxide
105, 107	Diborane	Diboron hexahydride
105, 107	Diboron hexahydride	Diborane
14	Dibutyl ether	Butyl ether
13	Dibutyl phthalate	
17, 26, 31	3,5-Dibromo-4-hydroxybenzotrile	Bromoxynil
17	Dibromochloropropane	DBCP, Fumazone ^a , Nemagon ^a
17	Dibromoethane	Ethylene dibromide
17, 19	Dichloroacetone	
104	Dichloroamine	
17	Dichlorobenzene	DCB
7, 17	Dichlorobenzidine	
107	Dichlorodimethylsilane	Dimethyl dichlorosilane
17	Dichloroethane	Ethylene dichloride
17	Dichloroethene	Dichloroethylene
14, 17	Dichloroether	Dichloroethyl ether
24, 107	Dichloroethylarsine	
107	Ethyl dichlorosilane	
14, 17	Ethyl ether	Dichloroether
104	Dichlorosocyanuric acid	Dichloro-s-triazine-2,4,5-trione
17	Dichloromethane	Methylene chloride
17	Dichlorophene	
17, 31	Dichlorophenol	
3, 17	Dichlorophenoxyacetic acid	2,4-D
17	Dichloropropane	Propylene dichloride
4, 17	Dichloropropanol	
17	Dichloropropene	Dichloropropylene
17	Dichloropropylene	Dichloropropene
104	Dichloro-s-triazine-2,4,5-trione	Dichloroisocyanuric acid
17, 32	Dichlorovos	DDVP
30	Dicumyl peroxide	
28	Dicyclopentadiene	
17	Dieldrin	
4, 7	Diethanolamine	
105, 107	Diethyl aluminum chloride	Aluminum diethylmonochloride, DEAL
7	Diethylamine	
16	Diethyl benzene	

RGN	Names	Synonyms
17, 32	Diethyl chlorovinyl phosphate	Compound 1836
107	Diethyl dichlorosilane	
14	Diethylene dioxide	Dioxane
27, 102	Diethylene glycol dinitrate	
13	Diethylene glycol monobutyl ether acetate	
7	Diethylene triamine	
14	Diethyl ether	
19	Diethyl ketone	
6	Diethyltoluamide	
24, 105, 107	Diethyl zinc	Zinc ethyl
101	Diesel oil	
1	Difluorophosphoric acid	
34	Diglycidyl ether	Bis(2,3-epoxypropyl) ether
28	Diisobutylene	
19	Diisobutyl ketone	
4, 17	Diisopropanolamine	
30	Diisopropylbenzene hydroperoxide	
24, 104, 107	Diisopropyl beryllium	
14	Diisopropyl ether	Isopropyl ether
30	Diisopropyl peroxydicarbonate	Isopropyl percarbonate
32	Dimecron ^a	Phosphamidon
6, 32	Dimelox	Hanane ^a
28	Dimethyl acetylene	
7	Dimethyl amine	
7, 8	Dimethylamino azobenzene	Methyl yellow
24	Dimethyl arsenic acid	Cacodylic acid
30	Dimethylbenzyl hydroperoxide	Cumene hydroperoxide
29	Dimethyl butane	Neohexane
28	Dimethyl butyne	
107	Dimethyl dichlorosilane	Dichlorodimethylsilane
32	Dimethyldithiophosphoric acid	
14	Dimethyl ether	
19	Dimethyl formal	
6	Dimethyl formamide	
30	Dimethylhexane dihydroperoxide	
8	Dimethyl hydrazine	UDMH
19	Dimethyl ketone	Acetone
105, 107	Dimethyl magnesium	
27	Dimethylnitrobenzene	Nitroxylene
7, 27	Dimethylnitrosoamine	N-Nitrosodimethyl amine
20	Dimethyl sulfide	Methyl sulfide
32	Dimeton	
27	Dinitrobenzene	
17, 27	Dinitrochlorobenzene	Chlorodinitrobenzene
27, 31	2,4-Dinitro-6-sec-butyl phenol	Dinoseb
27, 31	Dinitrocresol	DNOC, Elgetol 30
27, 31	Dinitrophenol	
8, 27	Dinitrophenyl hydrazine	
27	Dinitrotoluene	

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
27, 31	Dinoseb	2,4-Dinitro-6-sec-butylphenol	32	Ethion ^a	Nialate
9	Dioxacarb		4, 14	Ethoxyethanol	
14	Dioxane	Diethylene dioxide	13	Ethyl acetate	
32	Dioxathion	Delnav ^a	28	Ethyl acetylene	
27, 102	Dipentaerythritol hexanitrate		13, 103	Ethylacrylate	Ethanol
28	Dipentene		4	Ethyl alcohol	Aminoethane
6	Diphenamide		7	Ethylamine	Phenylethane
16	Diphenyl	Phenylbenzene	16	Ethyl benzene	Ethyl butyrate
16	Diphenyl acetylene		13	Ethyl butanoate	Ethyl butanoate
7	Diphenylamine		13	Ethyl butyrate	Chloroethane
7, 24	Diphenylamine chloroarsine	Phenarsazine chloride	17	Ethyl chloride	
16	Diphenyl ethane		13, 17	Ethyl chloroformate	Dichloroethylarsine
16	Diphenyl ethylene	Stilbene	24, 107	Ethyl dichloroarsine	
16	Diphenyl methane	Benzylbenzene	107	Ethyl dichlorosilane	
18, 107	Diphenylmethane diisocyanate		14	Ethyl ether	Diethyl ether
14	Diphenyl oxide		28	Ethylene	
7, 27, 102	Dipicryl amine	Hexanitrodiphenylamine	24, 104	Ethylene chromic oxide	
7	Dipropyl amine		4, 17	Ethylene chlorohydrin	
32	Disulfoton	Disyston ^a	4, 26	Ethylene cyanohydrin	Hydroxypropionitril
1	Disulfuric acid		7	Ethylene diamine	
25, 102	Disulfur dinitride		17	Ethylene dibromide	Dibromoethane
107	Disulfuryl chloride		17	Ethylene dichloride	Dichloroethane
32	Disyston ^a	Disulfoton	4	Ethylene glycol	
12	Dithane ^a M-45		27, 102	Ethylene glycol dinitrate	Glycol dinitrate
32	Dithione ^a	Sulfotepp	4, 14, 17	Ethylene glycol monomethyl ether	
27, 31	DNOC	Dinitrocresol	7, 103	Ethyleneimine	Aziridine
28	Dodecene		34, 103	Ethylene oxide	Epoxyethane
16	Dodecyl benzene		13	Ethyl formate	
107	Dodecyl trichlorosilane		13, 103	2-Ethylhexyl acrylate	Ethanethiol
9	Dowco-139 ^a	Mexacarbate	20	Ethyl mercaptan	
31	Dowicide I	o-Phenyl phenol	27, 102	Ethyl nitrate	
16	Dowtherm		27, 102	Ethyl nitrite	
16	Durene		13	Ethyl propionate	
32	Dyfonate ^a	Fonolos	107	Ethyl trichlorosilane	Endothion
101	Dynes Thinner		32	Exothion	
27, 31	Elgetol 30	Dinitrocresol	31	Eugenol	Bayer 25161, Das:
17, 20	Endosulfan	Thiodan ^a	32	Fenulfothion	
3	Endothall		12	Ferbam	
32	Endothion	Exothion	24	Ferric arsenate	
17	Endrin		33	Ferric sulfide	Iron arsenate
32	EPN		24	Ferrous arsenate	
17, 34	Epichlorohydrin	Chloropropylene oxide	33, 103	Ferrous sulfide	
34	Epoxybutane		16	Fluoranthrene	
34	Epoxybutene		16	Fluorene	
34, 103	Epoxyethane	Ethylene oxide	104, 107	Fluorine	
34	Epoxyethylbenzene		102	Fluorine azide	
34	Bis(2-3-Epoxypropyl) ether	Diglycidyl ether	104, 107	Fluorine monoxide	Oxygen difluoride
29	Ethane		6, 17	Fluoroacetanilide	
20	Ethanethiol	Ethyl mercaptan	3	Fluoroacetic acid	
4	Ethanol	Ethyl alcohol	1, 13	Fluoroboric acid	

RGN	Names	Synonyms
1, 107	Fluosulfonic acid	Fluosulfonic acid
1, 107	Fluosulfonic acid	Fluosulfonic acid
1, 15	Fluosilicic acid	
32	Fonofos*	Dylonate*
5	Formaldehyde	Methanal
6	Formamide	
6	Formetanate hydrochloride	
3	Formic acid	Methanoic acid
32	Fostlon*	Prothoate
17	Freon*	
3	Fumaric acid	
19	Fumarin	Coumafuryl
17	Fumazone*	Dibromochloropropane
9	Furadan*	Carbofuran
14	Furan	Furfuran
5	Furfural	
14	Furfuran	
101	Gas oil, cracked	
101	Gasoline	
33, 105	Germanium sulfide	
5	Glutaraldehyde	
4	Glycerin	
34	Glycidol	
13	Glycol diacetate	
27, 102	Glycol dinitrate	Ethylene glycol dinitrate
14	Glycol ether	
3	Glycolic acid	
27, 102	Glycol monolactate trinitrate	
26	Glycolonitrile	
105, 107	Gold acetylde	
102	Gold cyanate	Gold fulminate
102	Gold fulminate	Gold cyanate
33, 105	Gold sulfide	
101	Grease	
31	Guaiacol	
8, 102	Guanyl nitrosaminoguanilydene hydrazine	
27, 104	Guanidine nitrate	
27, 102	Gun cotton	Nitrocellulose
32	Guthion*	
22	Hafnium	
6, 32	Hanane*	Dimefox
16	Itemimellitene	
17	Heptachlor	
29	Heptane	
5	Heptanal	
4	Heptanol	
19	Heptanone	
28	Heptene	
105	Hexaborane	
17	Hexachlorobenzene	

RGN	Names	Synonyms
107	Hexadecyl trichlorosilane	
32	Hexaethyl tetraphosphate	
1, 15	Hexalluorophosphoric acid	
105, 107	Hexahydride diborane	Diborane
16	Hexamethyl benzene	
7	Hexamethylenediamine	Diaminohexane
7	Hexamethylenetetraamine	
5	Hexanal	
7, 27, 102	Hexanitrodiphenylamine	Dipicrylamine
4	Hexanol	
3	Hexanoic acid	Caproic acid
28	Hexene	
7	Hexylamine	Aminohexane
107	Hexyl trichlorosilane	
28	Hexyne	
102	HIMX	
9	Hopcide*	
10	Hydrated lime	Calcium hydroxide
8, 105	Hydrazine	Diamine
8, 102	Hydrazine azide	
102	Hydrazoic acid	Hydrogen azide
1	Hydriodic acid	Hydrogen iodide
1, 107	Hydrobromic acid	Hydrogen bromide
1	Hydrochloric acid	Muriatic acid
1, 11	Hydrocyanic acid	Hydrogen cyanide
1, 15	Hydrofluoric acid	Hydrogen fluoride
102	Hydrogen azide	Hydrazoic acid
1, 107	Hydrogen bromide	Hydrobromic acid
1, 11	Hydrogen cyanide	Hydrocyanic acid
1, 15	Hydrogen fluoride	Hydrofluoric acid
1	Hydrogen iodide	Hydroiodic acid
104	Hydrogen peroxide	
105	Hydrogen phosphide	Phosphine
24, 105	Hydrogen selenide	
33, 105	Hydrogen sulfide	
31	Hydroquinone	
19, 31	Hydroxyacetophenone	
3, 17	Hydroxydibromobenzoic acid	
31	Hydroxydiphenol	
31	Hydroxyhydroquinone	
19, 31	Hydroxyacetophenone	
4, 26	Hydroxyisobutyronitrile	Acetone cyanohydrin
105	Hydroxyl amine	
4, 26	Hydroxypropionitrile	Ethylene cyanohydrin
2	Hypochlorous acid	
16	Indene	
22, 23, 24	Indium	
17	Inerteen	Polychlorinated biphenyl
107	Iodine monochloride	
104	Iodine pentoxide	

RGN	Names	Synonyms
23	Iron	
24	Iron arsenate	Ferrous arsenate
29	Isobutane	
4	Isobutanol	
13	Isobutyl acetate	
13, 103	Isobutyl acrylate	
28	Isobutylene	
13	Isodecyl acrylate	
16	Isodurene	
31	Isoeugenol	
29	Isohexane	
29	Isooctane	Trimethylpentane
28	Isooctene	
29	Isopentane	Methylbutane
19	Isophorone	
28, 103	Isoprene	Methyl butadiene
4	Isopropanol	
13	Isopropyl acetate	
28	Isopropyl acetylene	
7	Isopropylamine	Aminopropane
16	Isopropyl benzene	Cumene
17	Isopropyl chloride	Chloropropane
14	Isopropyl ether	Diisopropyl ether
20	Isopropyl mercaptan	
9	N-Isopropylmethylcarbamate	
17, 32	α -Isopropyl methylphosphoryl fluoride	Diisopropyl peroxydicarbonate
30	Isopropyl percarbonate	
101	Isotactic propylene	
101	J-100	
101	Jet oil	
101	Kerosene	
101	Lacquer thinner	
9	Landrin*	
9, 20	Lannate*	Methomyl
30	Lauroyl peroxide	
23, 24	Lead	
24	Lead acetate	
24	Lead arsenate	Lead orthoarsenate
24	Lead arsenite	
24, 102	Lead azide	
24	Lead carbonate	
24, 104	Lead chlorite	
11, 24	Lead cyanide	
24, 27, 102	Lead dinitroresorcinate	
24, 27, 102	Lead mononitroresorcinate	
24, 104	Lead nitrate	
24	Lead orthoarsenate	Lead arsenate
24	Lead oxide	
24, 27, 102	Lead styphnate	Lead trinitroresorcinate
24, 33, 104	Lead sulfide	

RGN	Names	Synonyms
24, 27, 102	Lead trinitroresorcinate	Lead styphnate
24	Lewisite	β -Chlorovinyl dichloroarsine
104	Lime nitrate	Calcium nitrate
17	Lindane	
21, 107	Lithium	
105, 107	Lithium aluminum hydride	
10, 107	Lithium amide	
107	Lithium ferrosilicon	
105, 107	Lithium hydride	
10	Lithium hydroxide	
104	Lithium hypochlorite	
25	Lithium nitride	
104, 107	Lithium peroxide	
107	Lithium silicon	
33, 105	Lithium sulfide	
24	London purple	
10	Lye	Sodium hydroxide
21, 22	Magnesium	
24	Magnesium arsenate	
24	Magnesium arsenite	
104	Magnesium chlorate	
15	Magnesium fluoride	
104	Magnesium nitrate	
104	Magnesium perchlorate	
104	Magnesium peroxide	
33, 105	Magnesium sulfide	
32	Malathion	
3	Maleic acid	
3, 26	Malonic nitrile	Cyanoacetic acid
12	Maneb	
22, 23, 24	Manganese	
24	Manganese acetate	
24	Manganese arsenate	Manganous arsenate
24	Manganese bromide	Manganous bromide
24	Manganese chloride	Manganous chloride
24	Manganese methylcyclopentadienyl-tricarbonyl	
24	Manganese nitrate	Manganous nitrate
24, 104	Manganese sulfide	
24, 33, 105	Manganous arsenate	Manganese arsenate
24	Manganous bromide	Manganese bromide
24	Manganous chloride	Manganese chloride
104	Manganous nitrate	Manganese nitrate
27, 102	Mannitol hexanitrate	Nitromannite
9	Matacil*	
24	Mayer's reagent	
13, 27	Medinoterb acetate	Mercuric potassium iodide
9	Meobal	
8, 20	Mercaptobenzothiazole	
4, 20	Mercatoethanol	

RGN	Names	Synonyms	RGN	Names	Synonyms
32	Mercurbam		4	Methanol	
24	Mercuric acetate		9, 20	Methoxyl	Methyl alcohol Lannate*
24	Mercuric ammonium chloride	Mercury ammonium chloride	24	Methoxyethylmercuric chloride	Agallolaretan*
24	Mercuric benzoate	Mercury benzoate	13	Methyl acetate	
24	Mercuric bromide		101	Methyl acetone	
24	Mercuric chloride	Mercury chloride	28	Methyl acetylene	Methyl butyne
11, 24	Mercuric cyanide	Mercury cyanide	13, 103	Methyl acrylate	
24	Mercuric dioxysulfate	Mercuric subsulfate	4	Methyl alcohol	Methanol
24	Mercuric iodide	Mercury iodide	105, 107	Methyl aluminum sesquibromide	
24, 104	Mercuric nitrate	Mercury nitrate	105, 107	Methyl aluminum sesquichloride	
24	Mercuric oleate	Mercury oleate	7	Methylamine	Aminomethane
24	Mercuric oxide		13	Methyl amyl acetate	
11, 24, 102	Mercuric oxycyanide		7	N-Methyl aniline	
24	Mercuric potassium iodide	Mayer's reagent	7	Methyl aziridine	Propyleneimine
24	Mercuric salicylate	Salicylated mercury	16	Methyl benzene	Toluene
24	Mercuric subsulfate	Mercuric dioxysulfate	17	Methyl bromide	Bromomethane
24	Mercuric sulfate	Mercury sulfate	28, 103	Methyl butadiene	Isoprene
24, 33, 105	Mercuric sulfide		29	Methyl butane	Isopentane
24	Mercuric thiocyanate	Mercury thiocyanide	28	Methyl butene	
24	Mercuric thiocyanide	Mercury thiocyanate	14	Methyl butyl ether	
24	Mercuriol	Mercury nucleate	19	Methyl t-butyl ketone	
24	Mercurous bromide		28	Methyl butyne	Isopropyl acetylene
24	Mercurous gluconate		13	Methyl butyrate	
24	Mercurous iodide		17	Methyl chloride	Chloromethane
24, 104	Mercurous nitrate		13, 17	Methyl chlorocarbonate	Methyl chloroformate
24	Mercurous oxide		17	Methyl chloroform	
24	Mercurous sulfate	Mercury bisulfate	13, 17	Methyl chloroformate	Methyl chlorocarbonate
24	Mercury		14, 17	Methyl chloromethyl ether	CMME
22, 24	Mercury (vapor)		26	Methyl cyanide	Acetonitrile
24	Mercury acetate	Mercuric acetate	29	Methyl cyclohexane	
24	Mercury ammonium chloride	Mercuric ammonium chloride	24	Methyl dichloroarsine	
24	Mercury benzoate	Mercuric benzoate	107	Methyl dichlorosilane	
24	Mercury bisulfate	Mercurous sulfate	17	Methylene chloride	Dichloromethane
24	Mercury chloride	Mercuric chloride	18, 107	Methylene diisocyanate	
11, 24	Mercury cyanide	Mercuric cyanide	7, 17	4,4-Methylene bis(2-chloroaniline)	
24, 102	Mercury fulminate		17	Methyl ethyl chloride	
24	Mercury iodide	Mercuric iodide	14	Methyl ethyl ether	
24, 104	Mercury nitrate	Mercuric nitrate	19	Methyl ethyl ketone	Butanone
24	Mercury nucleate	Mercuriol	30	Methyl ethyl ketone peroxide	
24	Mercury oleate	Mercuric oleate	7	Methyl ethyl pyridine	
24	Mercury sulfate	Mercuric sulfate	13	Methyl formate	
16	Mesitylene	1,3,5-trimethylbenzene	8	Methyl hydrazine	Monomethyl hydrazine
19	Mesityl oxide		17	Methyl iodide	
9	Mesuroi*		19	Methyl isobutyl ketone	
32	Metasystox-R	Demeton-S-methyl sulfoxid	18, 107	Methyl isocyanate	
12	Metham		19	Methyl isopropenyl ketone	
5	Methanal	Formaldehyde	105, 107	Methyl magnesium bromide	
29	Methane		105, 107	Methyl magnesium chloride	
20	Methanethiol	Methyl mercaptan	105, 107	Methyl magnesium iodide	
3	Methanoic acid	Formic acid	20	Methyl mercaptan	Methanethiol

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
13, 103	Methyl methacrylate	
16	Methyl naphthalene	
32	Methyl parathion	
13	Methyl pentanoate	Methyl valerate
13	Methyl propionate	
19	Methyl n-propyl ketone	
28, 103	Methyl styrene	
20	Methyl sulfide	Dimethyl sulfide
107	Methyl trichlorosilane	
13	Methyl valerate	Methyl pentanoate
19	Methyl vinyl ketone	Butene-2-one
7, 8	Methyl yellow	Dimethylamino azobenzene
32	Mevinphos	Phosdrin ^a
9	Mexacarbate	Dowco-139 ^a
101	Mineral spirits	
32	Mintacol ^a	Paraoxon
9	Mipcin ^a	
9	Mobam ^a	
32	Mocap ^a	
22, 23, 24	Molybdenum	
24	Molybdenum anhydride	Molybdenum trioxide
24, 33, 103	Molybdenum sulfide	
24	Molybdenum trioxide	Molybdenum anhydride
24	Molybdic acid	
17, 19	Monochloroacetone	Chloroacetone
3, 17	Monochloroacetic acid	Chloroacetic acid
32	Monocrotophos	Azodrin ^a
4, 7	Monoethanol amine	
1	Monofluorophosphoric acid	
4, 7	Monoisopropanolamine	
8	Monomethyl hydrazine	Methyl hydrazine
7	Morpholine	
101	Municipal solid waste	Refuse
1	Muriatic acid	Hydrochloric acid
12	Nabam	
21, 107	Nack	Sodium-potassium alloy
21, 107	Nak	Sodium-potassium alloy
101	Naptha	
16	Naphthalene	
31	Naphthol	
7	Naphthylamine	
20	Naphthyl mercaptan	
27, 102	Naphthite	Trinitronaphthalene
17	Nemagon ^a	Dibromochloropropane
29	Neohexane	Dimethyl butane
27	4-NBP ^a	Nitrobiphenyl
12	Niacide ^a	
32	Nialate	Ethion
22, 24	Nickel	
24	Nickel acetate	

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
24, 107	Nickel antimonide	
24	Nickel arsenate	Nickelous arsenate
24	Nickel arsenite	Nickelous arsenite
24	Nickel carbonyl	Nickel tetracarbonyl
24	Nickel chloride	Nickelous chloride
11, 24	Nickel cyanide	
24, 104	Nickel nitrate	Nickelous nitrate
24	Nickelous arsenate	Nickel arsenate
24	Nickelous arsenite	Nickel arsenite
24	Nickelous chloride	Nickel chloride
24, 104	Nickelous nitrate	Nickel nitrate
24	Nickel selenide	
24, 33, 103	Nickel subsulfide	
24	Nickel sulfate	
24	Nickel tetracarbonyl	Nickel carbonyl
7, 27	Nitraniline	Nitroaniline
2	Nitric acid	
7, 27	Nitroaniline	Nitraniline
27	Nitrobenzene	Nitrobenzol
27	Nitrobenzol	Nitrobenzene
27	Nitrobiphenyl	4-NBP ^a
104	Nitrocalcic	Calcium nitrate
27, 102	Nitrocellulose	Cellulose nitrate, gun cotton
17, 27	Nitrochlorobenzene	Chloronitrobenzene
104	Nitrogen dioxide	
27, 102	Nitromannite	Mannitol hexanitrate
7, 17	Nitrogen mustard	
104	Nitrogen tetroxide	
27, 102	Nitroglycerin	Trinitroglycerin
2	Nitrohydrochloric acid	
27, 31	Nitrophenol	
27	Nitropropane	
7, 27	Nitrosodimethylamine	Dimethylnitrosamine
27, 102	Nitrosoguanidine	
27, 102	Nitrostarch	Starch nitrate
27	Nitroxylene	Nitroxylol, Dimethylnitrobenzene
27	Nitroxylol	Nitroxylene, Dimethylnitrobenzene
7, 27	N-Nitrosodimethylamine	Dimethylnitrosoamine
31	Nonyl phenol	
107	Nonyl trichlorosilane	
29	Nonane	
28	Nonene	
19	Nonanone	
5	Nonanal	
6	Nonanol	
107	Octadecyl trichlorosilane	
28	Octadecyne	
6, 32	Octamethylpyrophosphoramidate	Schradan
5	Octanal	
29	Octane	

RGN	Names	Synonyms	RGN	Names	Synonyms
19	Octanone		31	Phenol	Carbolic acid
4	Octanol		3	Phenyl acetic acid	
28	Octene		26	Phenyl acetonitrile	
30	Octyl peroxide	Caprylyl peroxide	16	Phenyl acetylene	
107	Octyl trichlorosilane		7	Phenylaniline	Diphenylamine
101	Oil of bergamot		16	Phenylbenzene	Diphenyl
1	Oil of vitriol	Sulfuric acid	16	Phenylbutane	Butylbenzene
2, 24	Oleum	Sulfuric acid	17, 19	Phenylchloromethyl ketone	Chloroacetophenone
101	Orris root		24	Phenyl dichloroarsine	
31	Orthozenol	o-Phenyl phenol	7	Phenylene diamine	Diaminobenzene
23, 24	Osmium		16	Phenylethane	Ethylbenzene
24, 104	Osmium amine nitrate		8	Phenyl hydrazine hydrochloride	
24, 104	Osmium amine perchlorate		31	o-Phenyl phenol	Orthozenol, Dovicide 1
9	Oxamyl		107	Phenyl trichlorosilane	
3	Oxalic acid		26	Phenyl valerylnitrile	
104, 107	Oxygen difluoride		16	Phenylpropane	Propylbenzene
17	PCB	Polychlorinated biphenyl	31	Phloroglucinol	
101	Paper		32	Phorate	Thimet*
32	Paraoxon	Mintacol*	32	Phosdrin*	Mevinphos
32	Parathion		32	Phosphamidon	Dimecron*
24	Paris green	Copper acetoarsenite	105	Phosphine	Hydrogen phosphide
12	PETD	Polyram combi*	20, 32	Phospholan	Cyolan*
	PETN	Pentaerythrityl tetranitrate, Pentaerythritol tetranitrate	105, 107	Phosphonium iodide	
27, 102	Pentaborane		1	Phosphoric acid	
105	Pentachlorophenol		107	Phosphoric anhydride	Phosphorus pentoxide
17, 31	Pentachlorophenol		33, 105, 107	Phosphoric sulfide	Phosphorus pentasulfide
27, 102	Pentaerythritol tetranitrate	Pentaerythrityl tetranitrate, PETN	105, 107	Phosphorus (Amorphous red)	
16	Pentamethyl benzene		105	Phosphorus (White-Yellow)	
29	Pentane		33, 105	Phosphorus heptasulfide	
20	Pentanethiol	Amyl mercaptan	104, 107	Phosphorus oxybromide	Phosphoryl bromide
5	Pentanal	Valeraldehyde	104, 107	Phosphorus oxychloride	Phosphoryl chloride
19	Pentanone		107	Phosphorus pentachloride	Phosphoric chloride
28	Pentene	Amylene	33, 105, 107	Phosphorus pentasulfide	Phosphoric sulfide
7	Pentylamine		107	Phosphorus pentoxide	Phosphoric anhydride
28	Pentyne		33, 105, 107	Phosphorus sesquisulfide	Tetraphosphorus trisulfide
3, 30	Peracetic acid	Peroxyacetic acid	107	Phosphorus tribromide	
2	Perbromic acid		107	Phosphorus trichloride	
2	Perchloric acid		33, 105, 107	Phosphorus trisulfide	
17	Perchloroethylene	Tetrachloroethylene	104, 107	Phosphoryl bromide	Phosphorus oxybromide
17, 20	Perchloromethyl mercaptan	Trichloromethylsulfenylchloride	104, 107	Phosphoryl chloride	Phosphorus oxychloride
2	Perchlorous acid		3	Phthalic acid	
104	Perchloryl fluoride		7, 27, 102	Picramide	Trinitroaniline
2	Periodic acid		27, 31, 102	Picric acid	Trinitrophenol
1	Permonosulfuric acid		7	Picridine	
3, 30	Peroxyacetic acid	Peracetic acid	17, 27, 102	Picryl chloride	Chlorotrinitrobenzene
12	rETD	Polyram combi*	7	Piperidine	
101	Petroleum naphtha		9	Pirimicarb	
101	Petroleum oil		14	Polyglycol ether	
16	Phenanthrene		101	Polyamide resin	
7, 24	Phenarsazine chloride	Diphenylamine chloroarsine	17	Polybrominated biphenyl	

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
28	Polybutene		13	Propiolactone	
17	Polychlorinated biphenyls	PCB, Askarel, Arochlor [®] , Chlorextol, Inerteen	5	Propionaldehyde	Propanal
17	Polychlorinated triphenyls		6	Propionamide	
101	Polethylene		3	Propionic acid	Propanoic acid
101	Polyester resin		26	Propionitrile	
101	Polymeric oil		13	Propyl acetate	Propanol
18, 107	Polyphenyl polymethylisocyanate		4	Propyl alcohol	
28, 101	Polypropylene		7	Propylamine	Phenyl propane
12	Polyram combi [®]	PETD	16	Propyl benzene	Dichloropropane
20, 101	Polysulfide polymer		17	Propylene dichloride	
101	Polystyrene		4	Propylene glycol	
101	Polyurethane		4, 14	Propylene glycol monomethyl ether	
101	Polyvinyl acetate		34, 103	Propylene oxide	Methyl aziridine
101	Polyvinyl chloride		7	Propyleneimine	
27, 102	Polyvinyl nitrate		14	Propyl ether	
32	Potasan		13	Propyl formate	Propanethiol
21, 107	Potassium		20	Propyl mercaptan	
15	Potassium acid fluoride	Potassium fluoride	107	Propyl Trichlorosilane	
10	Potassium aluminate		32	Prothoate	Fostion [®]
24	Potassium arsenate		16	Pseudocumene	1,2,4 trimethylbenzene
24	Potassium arsenite		7	Pyridine	
15	Potassium bifluoride	Potassium fluoride	31	Pyrogallol	
24, 104	Potassium bichromate	Potassium dichromate	107	Pyrosulfuryl chloride	Disulfuryl chloride
104	Potassium bromate		27	Pyroxylin	Collodion
10	Potassium butoxide		19	Quinone	Benzoquinone
11	Potassium cyanide		22	Raney nickel	
104	Potassium dichloroisocyanurate		27, 102	RDX	Cyclotrimethylene trinitramine
24, 104	Potassium dichromate	Potassium bichromate	101	Refuse	Municipal solid waste
27, 102	Potassium dinitrobenzofuroxan		101	Resins	
15	Potassium fluoride	Potassium acid fluoride	31	Resorcinol	
105, 107	Potassium hydride		21	Rubidium	
10	Potassium hydroxide	Caustic potash	24	Salicylated mercury	Mercuric salicylate
102, 104	Potassium nitrate	Saltpeter	31	Salligenin	
25	Potassium nitride		102, 104	Saltpeter	Potassium nitrate
104	Potassium nitrite			Schradan	Octamethyl pyrophosphoramide, OMPA
107	Potassium oxide		6, 32	Selenious acid	Selenous acid
104	Potassium perchlorate		1, 24	Selenium	
24, 104	Potassium permanganate		22, 23, 24	Selenium	
104, 107	Potassium peroxide		12, 24	Selenium diethyldithiocarbamate	
33, 105	Potassium sulfide		15, 24	Selenium fluoride	
9	Promecarb		1, 24	Selenous acid	Selenious acid
5	Propanal	Propionaldehyde	107	Silicochloroform	Trichlorosilane
29	Propane		107	Silicon tetrachloride	
20	Propanethiol	Propyl mercaptan	15, 107	Silicon tetrafluoride	
3	Propanoic acid	Propionic acid	24, 102, 105, 107	Silver acetylide	
4	Propanol	Propyl alcohol	24, 102	Silver azide	
17	Propargyl bromide		11, 24	Silver cyanide	
17	Propargyl chloride		24, 104	Silver nitrate	
4	2-Propen-1-ol	Allyl alcohol	24, 25, 102	Silver nitride	
			24, 27, 102	Silver styphnate	Silver trinitroresorcinate

<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
24, 33, 105	Silver sulfide		24, 33, 105	Sodium sulfide	
24, 102	Silver tetrazene		105	Sodium thiosulfate	
24, 27, 102	Silver trinitroresorcinate	Silver styphnate	24, 107	Stannic chloride	Tin tetrachloride
10, 107	Slaked lime	Calcium oxide	33, 105	Stannic sulfide	
102	Smokeless powder		27, 102	Starch nitrate	Nitrostarch
10, 107	Sodamide	Sodium amide	16	Stilbene	Diphenyl ethylene
104	Soda niter	Sodium nitrate	101	Stoddard solvent	
21, 105, 107	Sodium		24	Strontium	
15	Sodium acid fluoride	Sodium fluoride	24	Strontium arsenate	
10, 105	Sodium aluminate		24, 104	Strontium dioxide	Strontium peroxide
105, 107	Sodium aluminum hydride		24, 33, 105	Strontium monosulfide	
10, 107	Sodium amide	Sodamide	24, 104	Strontium nitrate	
24	Sodium arsenate		104	Strontium peroxide	Strontium dioxide
24	Sodium arsenite		24, 33, 105	Strontium tetrasulfide	
102	Sodium azide		27, 31, 102	Styphnic acid	Trinitroresorcinol
24, 104	Sodium bichromate	Sodium dichromate	16, 28, 103	Styrene	Vinylbenzene
15	Sodium bifluoride	Sodium fluoride	3	Succinic acid	
104	Sodium bromate		30	Succinic acid peroxide	
24	Sodium cacodylate	Sodium dimethylarsenate	107	Sulfonyl chloride	Sulfonyl chloride
10	Sodium carbonate		107	Sulfonyl fluoride	
104	Sodium carbonate peroxide		32	Sulfotep	Dithione*, Blada-Fum*
104	Sodium chlorate		107	Sulfur chloride	Sulfur monochloride
104	Sodium chlorite		101	Sulfur (elemental)	
24	Sodium chromate		2, 107	Sulfuric acid	Oil of Vitriol, Oleum
11	Sodium cyanide		104, 107	Sulfuric anhydride	Sulfur trioxide
104	Sodium dichloroisocyanurate		107	Sulfur monochloride	Sulfur chloride
24, 104	Sodium dichromate	Sodium bichromate	20	Sulfur mustard	
24	Sodium dimethylarsenate	Sodium cacodylate	107	Sulfur oxochloride	Thionyl chloride
15	Sodium fluoride	Sodium acid fluoride	15, 107	Sulfur pentaffluoride	
105, 107	Sodium hydride		104, 107	Sulfur trioxide	Sulfuric anhydride
10	Sodium hydroxide	Caustic soda, Lye	107	Sulfonyl chloride	Sulfonyl chloride
10, 104	Sodium hypochlorite		107	Sulfonyl fluoride	Sulfonyl fluoride
105	Sodium hyposulfite	Sodium thiosulfate	32	Supracide*	Ultracide*
10, 107	Sodium methylate	Sodium methoxide	32	Surecide*	Cyanophenphos
10, 107	Sodium methoxide	Sodium methylate	101	Synthetic rubber	
24	Sodium molybdate		14, 17	TCDD	Tetrachlorodibenzo-p-dioxin
10, 107	Sodium monoxide	Sodium oxide	32	TEDP	Tetraethyl dithionopyrophosphate
104	Sodium nitrate	Soda niter	24	TEL	Tetraethyl lead
25	Sodium nitride		6, 32	TEPA	Tris-(1-aziridinyl) phosphine oxide
104	Sodium nitrite		32	TEPP	Tetraethyl pyrophosphate
10, 107	Sodium oxide	Sodium monoxide	14	THF	Tetrahydrofuran
31	Sodium pentachlorophenate		7	TMA	Trimethylamine
104	Sodium perchlorate		24	TML	Tetramethyl lead
24, 104	Sodium permanganate		27, 102	TNB	Trinitrobenzene
104, 107	Sodium peroxide		27, 102	TNT	Trinitrotoluene
31	Sodium phenolsulfonate		101	Tall oil	
27, 102	Sodium picramate		101	Tallow	
101	Sodium polysulfide		101	Tar	
21, 107	Sodium potassium alloy	Nak, Nack	15, 24	Tellurium hexafluoride	
24	Sodium selenate		9, 20	Temik*	Aldicarb

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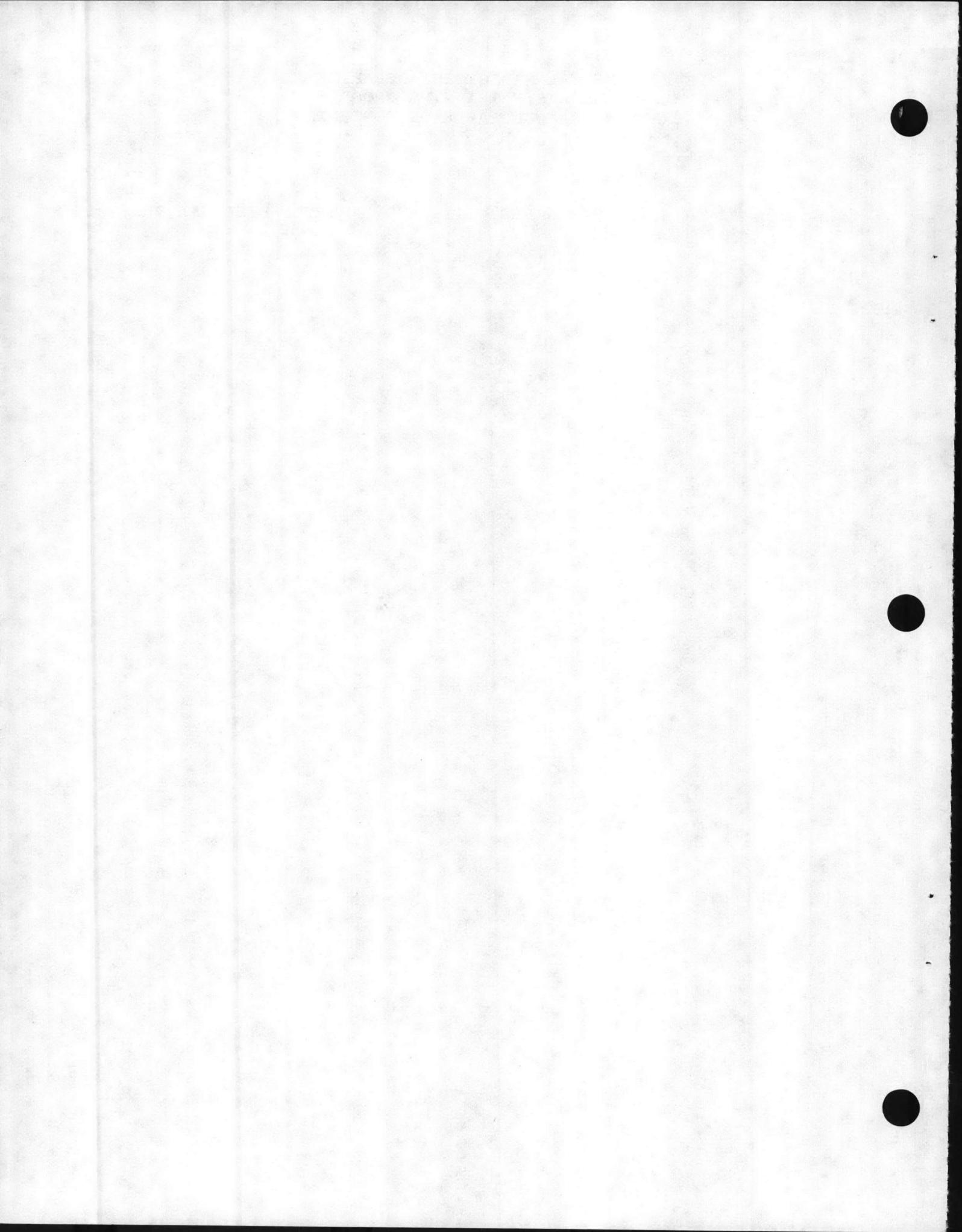
<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>	<u>Names</u>	<u>Synonyms</u>
105	Tetraborane		7	Toluidine	Aminotoluene
14, 17	Tetrachlorodibenzo-p-dioxin	TCDD	16	Toluol	Toluene, Methylbenzene
17	Tetrachloroethane		6	Topcide*	Benzadox
17	Tetrachloroethylene	Perchloroethylene	9, 26	Tranid*	
17	Tetrachloromethane	Carbon tetrachloride	6, 32	Triamplos	Wepsyn* 155
17, 31	Tetrachlorophenol		17	Tribromomethane	Bromoforn
14, 17	Tetrachloropropyl ether		107	Tri-n-butylaluminum	
28	Tetradecene		24, 25	Tricadmium dinitride	
32	Tetraethyl dithionopyrophosphate	TEDP	25	Tricalcium dinitride	
24	Tetraethyl lead	TEL	24, 25	Tricesium nitride	
32	Tetraethyl pyrophosphate	TEPP	5, 17	Trichloroacetaldehyde	Chloral hydrate
14	Tetrahydrofuran	THF	107	Trichloroborane	
7	Tetramethylenediamine		17	Trichloroethane	
24	Tetramethyl lead	TML	17	Trichloroethene	Trichloroethylene
26	Tetramethyl succinonitrile		104	Trichlorolsocyanuric acid	
27, 102	Tetranitromethane		17	Trichloromethane	Chloroform
16	Tetraphenyl ethylene		17, 20	Trichloromethyl sulfenyl chloride	Perchloromethyl mercaptan
33, 105, 107	Tetraphosphorus trisulfide	Phosphorus sesquisulfide	17, 27, 102	Trichloronitromethane	Chloropicrin
24, 25, 102	Tetraselenium tetranitride		3, 17	Trichlorophenoxyacetic acid	
20	Tetrasul	Animert* V-101	17	Trichloropropane	
25, 102	Tetrasulfur tetranitride		107	Trichlorosilane	Silcochloroform
8, 102	Tetrazene		28	Tridecene	
24	Thallium		4, 7	Triethanolamine	
24, 25, 102	Thallium nitride		105, 107	Triethyl aluminum	
24, 33, 105	Thallium sulfide		24, 105, 107	Triethyl antimony	Triethylstibine
24	Thallous sulfate		24, 107	Triethyl arsine	
32	Thimet*	Phorate	24	Triethyl bismuthine	
107	Thionyl chloride	Sulfur oxychloride	7	Triethylamine	
107	Thiocarbonyl chloride	Thiophosgene		Triethylene phosphoramidate	Tris(1-aziridinyl) phosphine oxide
17, 20	Thiodan*	Endosulfan	6, 32	Triethylene tetraamine	
32	Thionazin	Zinophos*	7	Triethyl stibine	Triethyl antimony
107	Thionyl chloride	Sulfur oxychloride	24, 105, 107	Trifluoroethane	
107	Thiophosgene	Thiocarbonyl chloride	17	Trifluoromethylbenzene	Benzotrifluoride
107	Thiophosphoryl chloride		105, 107	Trisobutyl aluminum	
12	Thiram		24, 25, 102	Trilead dinitride	
22, 23, 24	Thorium	Stannic chloride	24, 25, 102	Trimercury dinitride	
24, 107	Tin tetrachloride	Titanium tetrachloride	105, 107	Trimethyl aluminum	
24, 107	Titanic chloride		7	Trimethylamine	TMA
22, 23, 24	Titanium		24, 105	Trimethyl antimony	Trimethylstibine
24, 33, 105	Titanium sesquisulfide		24, 107	Trimethyl arsine	
24	Titanium sulfate		16	1,2,4-Trimethylbenzene	Pseudocumene
24, 33, 105	Titanium sulfide		16	1,3,5-Trimethylbenzene	Mesitylene
24, 107	Titanium tetrachloride	Titanic chloride	24	Trimethyl bismuthine	
7	TMA	Trimethylamine	29	Trimethyl pentane	Isooctane
27, 102	TNB	Trinitrobenzene	24, 105, 107	Trimethylstibine	Trimethyl antimony
27, 102	TNT	Trinitrotoluene	105, 107	Tri-n-butylborane	
5	Tolualdehyde		7, 27, 102	Trinitroaniline	Picramide
16	Toluene	Toluol, Methylbenzene	14, 27	Trinitroanisole	Trinitrophenylmethyl ether
18, 107	Toluene diisocyanate		27, 102	Trinitrobenzene	TNB
3	Toluic acid				

RGN	Names	Synonyms
3, 27, 102	Trinitrobenzoic acid	
27, 102	Trinitroglycerin	Nitroglycerin
27, 102	Trinitronaphthalene	Naphtite
27, 31, 102	Trinitrophenol	Picric acid
14, 27	Trinitrophenyl methyl ether	Trinitroanisole
27, 31, 102	Trinitrosorcinol	Styphric acid
27, 102	Trinitrotoluene	TNT
105, 107	Trioctyl aluminum	
16	Triphenyl ethylene	
16	Triphenyl methane	
7	Tripopylamine	
24, 107	Tripopyl stibine	
24, 107	Trisilyl arsine	
6, 32	Tris-(1-aziridinyl) phosphine oxide	TEPA, Triethylene phosphoramidate
32	Trithion	
24, 25	Trithorium tetranitride	
24, 107	Trivinyl stibine	
9	Tsumacide*	
24	Tungstic acid	
101	Turpentine	
8	UDMH	Dimethyl hydrazine
32	Ultracide*	Supracide*
28	Undecene	
101	Unisolve	
24, 104	Uranium nitrate	Uranyl nitrate
24, 33, 105	Uranium sulfide	
24, 104	Uranyl nitrate	Uranium nitrate
5	Urea formaldehyde	
27, 102, 104	Urea nitrate	
17, 103	VC	Vinylidene chloride
5	Valeraldehyde	Pentanal
6	Valeramide	
3	Valeric acid	
24	Vanadic acid anhydride	Vanadium pentoxide
24	Vanadium oxytrichloride	
24	Vanadium pentoxide	Vanadic acid anhydride
24	Vanadium sulfate	Vanadyl sulfate
24	Vanadium tetroxide	
24, 107	Vanadium trichloride	
24	Vanadium trioxide	
24	Vanadyl sulfate	Vanadium sulfate
32	Vapona*	DDVP
13, 103	Vinyl acetate	
102	Vinyl azide	
16, 28, 103	Vinylbenzene	Styrene
17, 103	Vinyl chloride	
26, 103	Vinyl cyanide	
14	Vinyl ethyl ether	
17	Vinyl isopropyl ether	

RGN	Names	Synonyms
17, 103	Vinylidene chloride	VC
28, 103	Vinyl toluene	
107	Vinyl trichlorosilane	
20, 32	VX	
106	Water	
101	Waxes	
6, 32	Wepsyn* 155	Triamphos
101	Wood	
9	Zectran*	Dowco 139*
22, 23, 24	Zinc	
24, 105, 107	Zinc acetylde	
24, 104	Zinc ammonium nitrate	
24	Zinc arsenate	
24	Zinc arsenite	
24	Zinc chloride	
24, 102, 104, 107	Zinc dioxide	Zinc peroxide
24, 105, 107	Zinc ethyl	Diethyl zinc
11, 24	Zinc cyanide	
24, 15	Zinc fluoborate	
24, 104	Zinc nitrate	
24, 104	Zinc permanganate	
24, 102, 104, 107	Zinc peroxide	Zinc dioxide
24, 107	Zinc phosphide	
12, 24	Zinc salts of dimethyl dithiocarbamic acid	
24	Zinc sulfate	
24, 33, 105	Zinc sulfide	
12, 24	Zineb*	
20	Zinophos*	Thioazin
12, 24	Ziran*	
22, 23, 24	Zirconium	
24	Zirconium chloride	Zirconium tetrachloride
24, 104	Zirconium picramate	
24	Zirconium tetrachloride	Zirconium chloride

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Section 6. GUIDANCE ON RECYCLING AND LANDFILL DISPOSAL 205- 208
 LANDBAN





THE BENEFITS OF RECYCLING

- **Saves Energy, Timber, Minerals**
- **“Cleans” Waste Stream for Incineration**
- **Provides Revenue** 
- **Extends Useful Life of Landfill**
- **Facilitates Compliance With Regulations**
- **Provides Waste Management Services Desired by Residents**

Glass Recycling Made Easy

Acceptable

Glass food and beverage containers can be easily recycled by glass container plants. Generally speaking, metal caps and lids should be removed but labels can remain.



Soda Bottles



Beer Bottles



Juice Containers



Ketchup Bottles



Wine and
Liquor Bottles



Food Containers

Not Acceptable

The following materials are not recycled by glass container plants and should not be mixed in with container glass.



Mirrors



Ceramic Cups
and Plates



Clay Flower
Pots



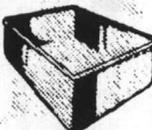
Crystal



Light Bulbs



Window Glass



Heat Resistant
Ovenware



Drinking Glasses

SOME MATERIALS PROHIBITED IN BASE LANDFILL

ITEM

Oils/petroleum products

Lead acid batteries

Ni-cad batteries

Hazardous Waste

Liquid paints

PCBs

Solvents

Whole tires

Dry sweep with oil/solvents

Over 50 fluorescent light fixtures

Infections/untreated medical wastes

White goods (eg. appliances, refrigerators,
air conditioners)

DECOMPOSITION TIMES FOR REFUSE/LITTER

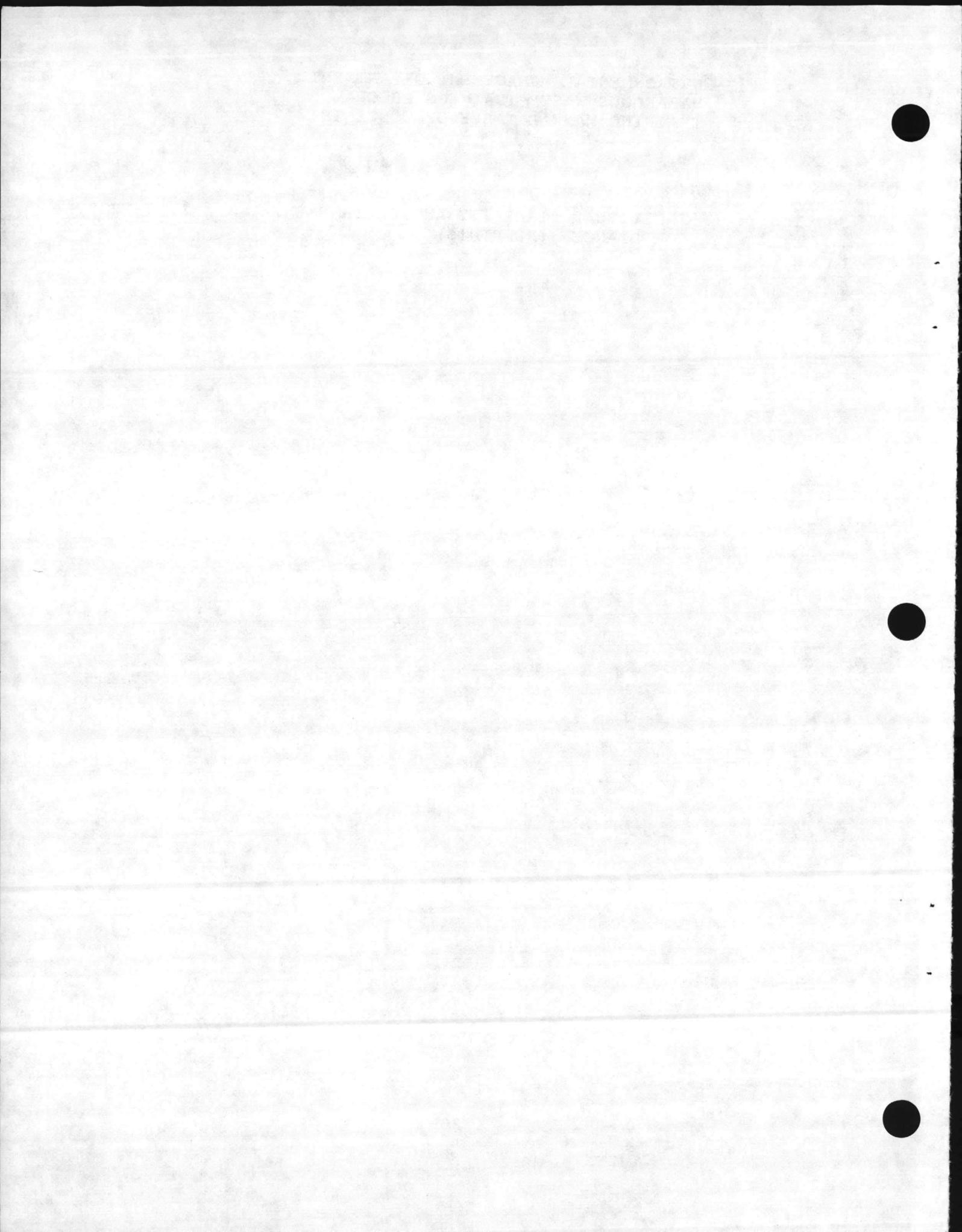
(Time depends on sunlight, oxygen, and rainwater.)

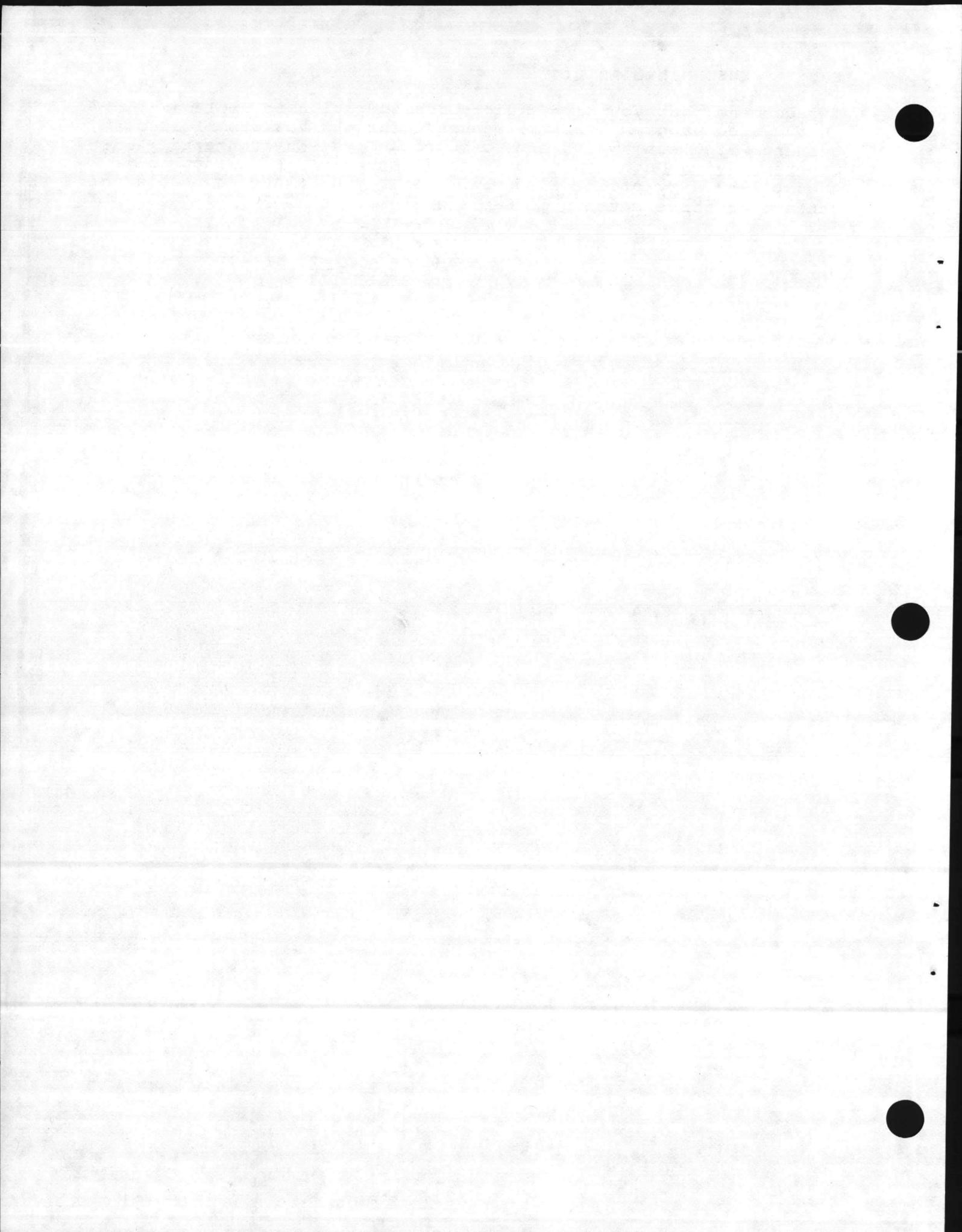
<u>ITEM</u>	<u>PERIOD REQUIRED</u>
Paper	2 to 5 months
Orange peels	6 months
Wooden stakes	4 years
Milk cartons	5 years
Filter-tips off cigarettes	10 to 12 years
Plastic bags/styrofoam cups	10 to 20 years
Leather shoes	25 to 40 years
Nylon cloth	30 to 40 years
Plastic containers	50 to 80 years
Aluminum	90 to 100 years
Tin or steel cans	100 years
Glass	NEVER
Plastic foam	NEVER
Rubber	NEVER

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Section 7. INDIVIDUAL LIABILITY AND ENVIRONMENTAL
 COMPLIANCE (REPRINTS)

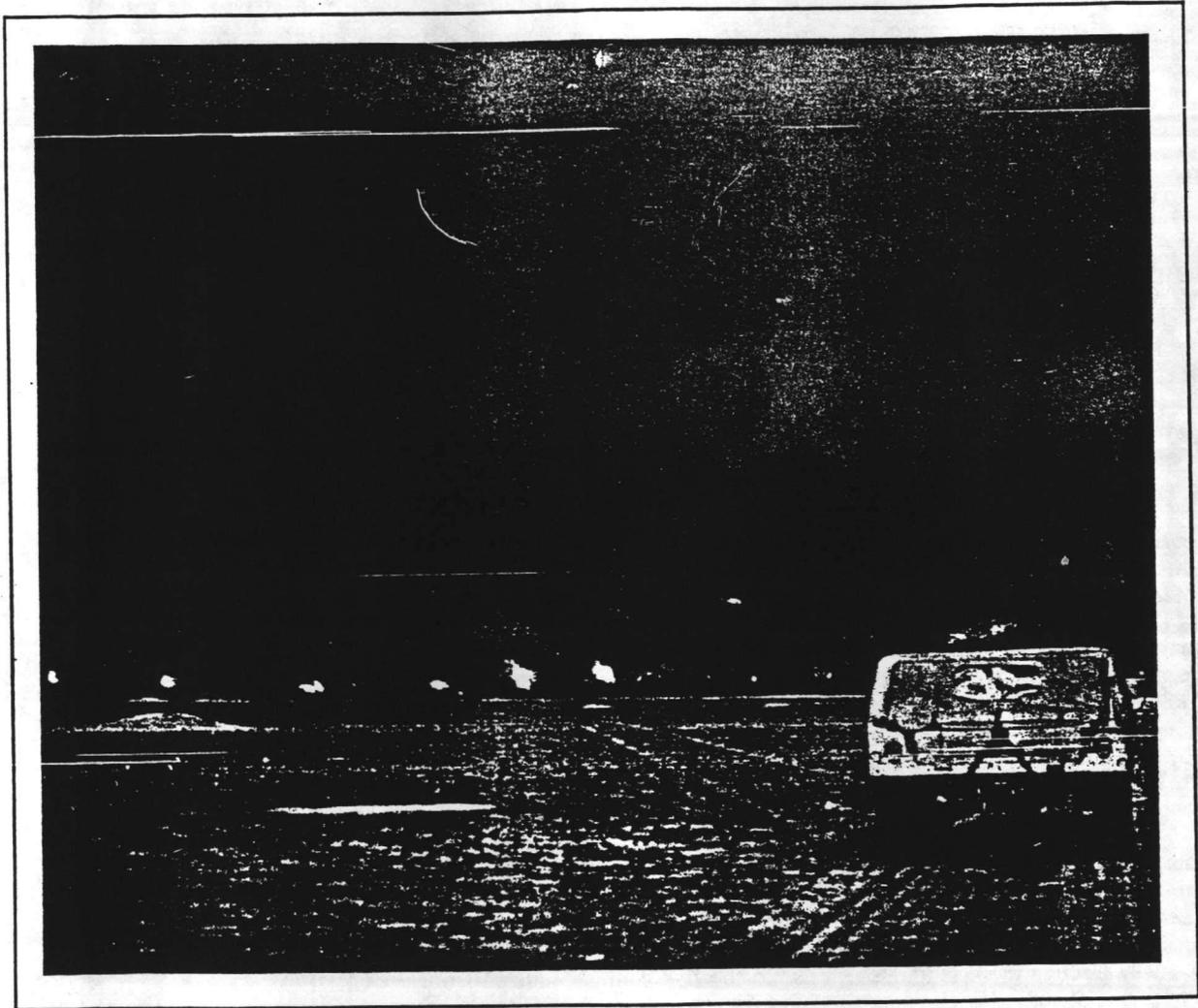
211 - 228



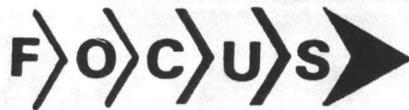


C MARINE CORPS **GAZETTE**

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on Environmental Issues

Although modern environmentalism arrived on the scene a scant three decades ago (announced by Rachel Carson's *Silent Spring*, 1962), it has grown into a major concern that is covered by a wealth of laws and regulations, and almost overnight it has acquired a full array of bureaucratic trappings. Environmental and legal experts—to say nothing of vast sums of money—are essential to meet newly defined requirements and past oversights. The environment is now a major concern of every Marine command, and Marines must give it their full attention.

Environmental Laws: Beware!

by LtCol Paul A. Wilbur

The Marine Corps has a new challenge to face—environmental laws that have the potential to affect virtually every aspect of a Marine's life. It is a challenge that must not be taken lightly.

In February 1989 a Federal court convicted three high-ranking civilian supervisors of felony hazardous waste law violations at the Army's Aberdeen Proving Ground in Maryland. Each defendant was placed on probation and required to complete 1,000 hours of community service. Under new guidelines issued by the U.S. Sentencing Commission, if trial were held today the defendants would almost certainly be sent to jail.

Of equally important note, the indictment in *United States v. William Dee, Robert Lentz, and Carl Gepp* did not allege specific individual actions. Liability arose solely through the defendants' official positions of authority. The message cannot be lost on the Marine Corps: failure to adhere to environmental laws will lead to serious consequences.

Why Aberdeen Is Relevant

In 1988 Mr. William Dee, a member of the Senior Executive Service, was the director of the Munitions Directorate of the Chemical Research Development

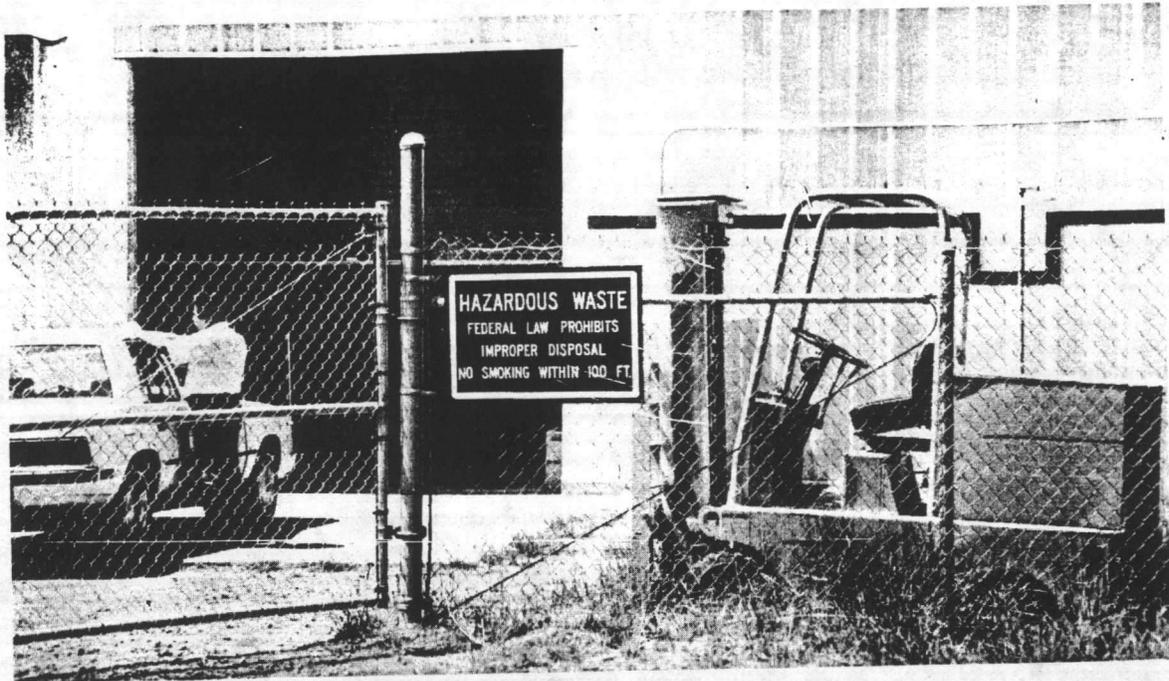
and Engineering Center (CRDEC) at Aberdeen Proving Ground. Mr. Robert Lentz, a GS-15, was chief of the Producibility Engineering and Technology Division, CRDEC. Mr. Carl Gepp, a GS-14, was chief of the Process Technology Branch. Combined, the men had accumulated more than 70 years of government service. In June 1988, they were indicted on four felony counts of violating the Resource Conservation and Recovery Act (RCRA) and one misdemeanor count of violating the Federal Water Pollution Control Act, better known as the Clean Water Act. Events giving rise to the five counts occurred from June 1983 until August 1986.

The RCRA violations dealt with illegal storage, treatment, and disposal of hazardous wastes. At CRDEC, extremely hazardous substances were dumped into sumps leading to sanitary sewers, and dangerous chemicals that had served their research purposes were stored both inside and outside the facility. The misdemeanor count alleged a spill of hydrosulfuric acid to

waters of the United States that resulted in a fish kill.

The men were tried in January and February 1989 and sentenced in May. Since prosecution was brought by the United States, the Department of Justice refused to provide counsel for their defense. They were each convicted of some of the four RCRA violations, but none was found guilty of the Clean Water Act violation.

In its case, the Government did *not* have to prove that any damage occurred to the environment. The case focused on the fact that practices used by personnel and management at CRDEC were not in compliance with environmental statutes. Two main defenses—that the defendants were unaware of the requirements of RCRA and that their superiors were aware of existing problems and had responsibility to fix them—both failed. According to the chief prosecutor, the case arose because "environmental compliance had a nonexistent priority." Further, the case was brought "to send a message to Federal employees that



there is no sovereign immunity when you're being prosecuted by the Federal Government."

A frequently asked question about the Aberdeen case is why weren't senior Army officers prosecuted? It seems that their legal responsibility for all that occurs within their cognizance would extend to vicarious criminal liability for their subordinates' behavior. The fact is, the prosecutor was unable to establish that any higher officials had knowledge of the improper activities occurring at CRDEC. According to the prosecutor, had any of the defendants informed their superiors of the

treatment, storage, and disposal practices and problems that were rampant at CRDEC, military officials would also have been prosecuted.

The Laws

Anyone involved in, or responsible for, environmental matters must be familiar with his legal obligations. There are many Marines and civilian employees who should acquire such familiarity.

The Defense Management Review in 1989 identified 77 laws that pertain to environmental matters and affect Department of Defense (DOD) installations. Only a handful of the 77 laws generally apply to most bases and stations. Most of that handful contain criminal sanctions.

The principal environmental laws bearing on the Marine Corps are the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA)), the RCRA, the Clean Water Act, the Clean Air Act, the Endangered Species Act, and the National Environmental Policy Act (NEPA).

CERCLA and SARA deal with cleanup of past hazardous waste sites. DOD, as of 30 September 1990, has identified 17,482 locations where toxic wastes have been spilled at 1,855 facilities. Each of these locations must undergo a preliminary assessment and

site investigation and, if warranted, a remedial investigation, feasibility study, remedial design, and remedial action. So far, the Environmental Protection Agency (EPA) has placed 89 DOD installations on the National Priorities List (NPL) for cleanup of past hazardous waste sites. The Marine Corps has six bases and stations on the NPL: Camp Pendleton, Camp Lejeune, Marine Corps Air Station (MCAS) El Toro, MCAS Yuma, Marine Corps Logistics Base (MCLB) Albany, and MCLB Barstow.

CERCLA contains two provisions that can result in criminal liability. First, the law requires that a person in charge of a facility give immediate notice to the National Response Center as soon as he has knowledge that there has been a release into the environment of a hazardous substance (above a "reportable quantity" threshold). Second, the law imposes criminal liability for knowingly destroying or falsifying records that the EPA requires to be kept.

While CERCLA concerns yesterday's wastes and today's spills, the RCRA deals with present waste handling. Through permits issued by either the EPA or a State, RCRA regulates generation, transportation, storage, and disposal of hazardous waste. The law contains numerous criminal provisions. It is against the law to transport hazardous waste to an unpermitted facility

	Key Acronyms
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DOD	Department of Defense
EPA	Environmental Protection Agency
MCLB	Marine Corps Logistics Base
NEPA	National Environmental Policy Act
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act of 1986
VOCs	Volatile organic compounds

Aging Facilities+Declining Funds= Environmental Problems

by Thomas E. Neven

Military Services are by and large responsive and responsible organizations—fair game for nongovernmental groups with environmental interests. The Marine Corps Combat Development Command (MCCDC), Quantico, recently had to pay \$195,000 to settle a lawsuit brought by a private citizens' group, the Natural Resources Defense Council (NRDC). The money went to pay attorney's fees, expert witness fees, and costs, although no civil penalties were assessed.

The suit stemmed from problems with the base's sewage treatment plant, which was exceeding pollution limits set by the State of Virginia's Water Control Board for effluent discharged into the Potomac River. The NRDC brought suit in the summer of 1990 stating MCCDC continued to exceed the voluntary limits, to include some instances of raw sewage leaking into the river. NRDC said it was forced to take such action because government agencies, such as the Environmental Protection Agency and the State Water Control Board, are often reluctant

to sue Federal polluters.

Penny Clark, counsel to MCCDC, said that in addition to the settlement with the NRDC, the Marine Corps has committed \$18 million over three years to improve the sewage plant, which was built in 1917. The consent agreement signed as part of the settlement requires MCCDC to create a new position for environmental compliance to be headed by a civilian of GS-13 or GS-14 rank with experience in sewage treatment and other environmental issues. The base must hire an environmental engineering firm to conduct a short-term feasibility study to upgrade the quality of the plant and a long-term study to plan for future sewage needs as the base grows. This firm would also provide on-call expertise for any environmental issues arising in the future.

MCCDC has also instituted an ongoing inspection program on a five-year cycle to inspect the base's entire sewage collection system to ensure pipes and collection points are in good working order.

USMC

ty. Also, it is a crime to treat, store, or dispose of hazardous waste without a permit, to violate a condition of a RCRA permit, or to transport any hazardous waste without a permit. Moreover, it is impermissible to knowingly endanger another person through improper handling of hazardous waste (via transport, treatment, storage, or disposal).

The Clean Water Act maintains surface water quality through National Pollutant Discharge Elimination System permits that regulate "point source" discharges. Criminal liability attaches to negligent violation of many aspects of the law. Examples include failure to comply with permit conditions or pretreatment program requirements and negligent introduction of any pollutant or hazardous substances into a sewer or publicly owned treatment works. (See accompanying box.) Knowingly endangering another person by violating provisions of the Clean Water Act is punishable by up to 15 years im-

prisonment. Failure by the person in charge of a vessel or facility to give immediate notice of a discharge of oil or a hazardous substance into waters of the United States is also a crime.

The Clean Air Act makes it a crime to knowingly violate a State implementation plan, a national emissions standard for hazardous air pollutants, or other requirements of the Act.

The Endangered Species Act protects endangered and threatened wildlife and plants and their habitats. The statute makes it unlawful to import, export, possess, take, or sell any species of wildlife or plants listed as endangered or threatened. To "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Anyone violating these prohibitions may be punished by imprisonment for one year.

One major environmental law that does not contain criminal sanctions is the National Environmental Policy

Act. Failure to abide by its provisions, however, may result in an injunction, issuance of which can disrupt military construction, operations, or training.

The Everyday Pitfalls

In everyday activities, Marines encounter many situations involving potential violation of environmental laws. Perhaps the most prominent area of environmental interest for most Marines is that concerning endangered or threatened species of wildlife. The vast reaches of Marine Corps bases are home to numerous plants and critters that enjoy special protection. Among these are the rough-leaved loosestrife, the Hawaiian stilt, the least Bell's vireo, the Atlantic loggerhead turtle, the desert tortoise, and the red cockaded woodpecker. The law prohibits harming these species or their habitats. In some cases, avoiding harm to them while driving a tracked vehicle or during troop maneuvers proves difficult, but this is what the law requires.

Also of interest for most Marines are the environmental effects of cleaning materials and petroleum products. Many such products contain substances that are categorized as hazardous waste after their primary use. Certain items, such as photographic development chemicals, some pesticides, and nuclear, biological, and chemical decontamination units, also contain substances that require special handling. Residues of these items must be segregated, containerized, and delivered to appropriate accumulation or storage points prior to disposal.

Compliance vigilance arises in other activities typical to a Marine Corps installation. For instance, many States tightly regulate air emissions of volatile organic compounds (VOCs), a common ingredient in the special paints used on most of the Marine Corps' tactical vehicles. Where an organization's paint booth is subject to a permit limiting the amount of VOCs that may be released per day, all work must stop when that limit is reached unless a variance can be obtained from the regulatory agency. Operators of industrial and domestic wastewater treatment plants must ensure that effluent outfalls do not exceed permitted limits for specified substances.

The Consequences

The environmental laws are designed to safeguard human health and

ensure a quality environment. Violation of the laws can, at worst, lead to increased health risks or loss of wildlife, plants, or their habitats. Failure to protect the environment is costly—DOD now estimates that cleaning up past hazardous waste sites will require more than \$17 billion, and DOD's bill for current compliance costs is more than \$1 billion per year. Destroying wildlife habitat, leading to loss of a species, cannot be priced out.

Environmental compliance requirements impose significant complications on the way the Marine Corps conducts its business. Commanders who disregard environmental obligations in order to accomplish their mission may well find their mission entirely aborted. Federal, State, or local regulators can halt many activities unless proper permits are obtained and their requirements fulfilled. Concern over regulators' authorities in March 1990 led to MCLB Barstow ceasing effluent discharges to its depot maintenance activity's industrial wastewater treatment plant. Surface impoundments there did not meet design and operational standards dictated by a 1984 Federal law. As a result, repair and maintenance work was crippled for more than a week until other wastewater treatment procedures could be brought on line.

For individuals, noncompliance with environmental laws can lead to prosecution. Historically, the probability of being prosecuted for environmental offenses and the chances of receiving significant punishment have been remote.

But that was then, this is now. Over the past four years, several events having great potential to affect individuals have occurred. In 1987 the Department of Justice elevated its Environmental Crimes Unit in both size and stature within the Department. In 1988 Congress passed the Powers of the Environmental Protection Agency, giving EPA criminal investigators permanent law enforcement powers. The biggest change, however, occurred in November 1987, when the U.S. Sentencing Commission issued sentencing guidelines for environmental crimes.

It is imperative to understand what has not changed—that Federal employees are subject to Federal prosecution for violation of Federal law. The environmental laws contain varying waivers of Federal sovereign immuni-

ty, a principle that normally allows a defendant to escape conviction should criminal prosecution be brought by State or local officials. The one critical fact, however, remains: the Marine or civilian employee who violates a Federal statute can be investigated, prosecuted, and jailed by Federal authorities.

With there being a more extensive prosecutorial apparatus in place, an individual should have more interest in understanding how his conduct might transgress the law. In almost all cases, it is no defense to an indictment that the defendant did not know the existence or requirements of the law. In contrast to common law offenses, in which courts normally require the defendant to have a specific intent to violate the law, environmental offenses are viewed as crimes against the public welfare. Accordingly, there is no requirement for specific knowledge of the law or, with a few exceptions, knowledge that particular actions are against the law. Thus, the prosecutor of an environmental crime has a lighter burden of proof (the standard of proof remains beyond a reasonable doubt).

The text of RCRA and some of the other major environmental statutes require "knowing" conduct by the offender. "Knowing" is a term of art. In *United States v. Ouelette* (1977) the judge explained that

the government will have to prove that the defendant knowingly [voluntarily and intentionally] made the false statement, but it will not have to prove that the defendant, in doing so, knowingly violated the law or purposely intended to violate the law.

Two other principal standards of liability exist in the environmental arena. Strict liability refers to a category of crimes that are unaccompanied by any "fault." Under CERCLA and the Clean Water Act, strict liability arises upon failure to report releases or discharges of hazardous substances from a facility. To obtain conviction, the prosecutor must first prove that the defendant knew of the release or discharge. That established, criminal liability attaches if the defendant has not notified the appropriate Federal agency. The second standard pertains to negligence. Criminal sanctions can be imposed under the Clean Water Act if the defendant is negligent, that is, if his conduct grossly deviates from the standard

of care that a reasonable person would observe under similar circumstances.

The good news is that prosecutors exercise substantial discretion whether to proceed with a case, and many cases are weeded out before getting to a criminal courtroom. Frequently, there are simple "technical" violations of a regulatory program that do not warrant criminal prosecution. Examples include failure to maintain complete training records for personnel assigned to environmental duties, failure to submit reports on time, and other relatively minor indiscretions not threatening human health or the environment. At the other end of the spectrum are events or practices that, even to a casual observer, deserve society's vilification and vindication.

The Department of Justice's *Principles of Federal Prosecution*, issued in 1980, lists seven major factors U.S. attorneys should evaluate in deciding whether to prosecute a case. These factors are:

- Federal law enforcement priorities,
- nature and seriousness of the offense,
- deterrent effect of prosecution,
- defendant's culpability in the offense,
- defendant's history regarding criminal activity,
- defendant's willingness to cooperate with law enforcers, and
- probable sentence and consequences of conviction.

As to environmental crimes, a senior Department of Justice official in 1987 stated that greatest priorities were given to cases involving illegal dumping or discharging without a permit and knowing misuse of regulatory apparatus (e.g., submitting false reports). When asked to make recommendations on whether a case should proceed to trial, the EPA looks to the seriousness of the misconduct as measured by the extent of contamination, the impact on EPA regulatory functions, and the defendant's history of noncompliance. Review of these factors sheds light on why prosecution occurred at the Aberdeen Proving Ground.

Assuming a Marine or civilian employee seriously errs and a Federal prosecutor decides that the case should proceed, will the defendant end up in jail? Nowadays, probably yes. Environmental crimes after November 1987 are subject to the guidelines issued by the U.S. Sentencing Commission. The

A Possible Solution

by Capt Phillip E. Thompson

The monetary costs associated with cleaning up our environment are enormous. It has been estimated that by 1992, the Department of Defense (DOD) will need almost \$1 billion a year to maintain its pace of cleanups and site assessments, with a total of \$11 billion to \$14 billion required over the next 25 years. These estimates may be conservative. The Marine Corps will be heavily involved in this process. A number of Marine Corps installations are currently listed on the National Priorities List, which means these installations have been targeted for environmental cleanups of old hazardous waste sites. At the same time, most of these installations are struggling to meet present requirements.

It will be incumbent on commanders to prepare for these eventualities in much the same way the Marine Corps prepares for any other threat it faces in battle. This can be accomplished by employing the Marine Corps' basic troop-leading procedures, "BAMCIS." These steps have proven successful on the real-life battlefield and can be employed for success on the environmental battlefield.

guidelines require judges to follow strict rules, within certain parameters, for designated offenses. To eliminate wildly disparate sentences among offenders, the rules remove nearly all discretion that judges once traditionally enjoyed at the sentencing stage.

The guidelines operate rather mechanically. They ascribe a "base offense level" to each type of violation. Added to or subtracted from the base offense level are certain amounts for "specific offense characteristics" such as whether the offense involved repeated discharges of pollutants or discharges without a permit. Adjustments may also be made depending on the actual or potential harm that resulted from the offense, the culpability of the particular defendant, and the defendant's remorse and acceptance of personal responsibility. Multiple counts do not arithmetically increase a sentence because the adjustments available to the base offense level already provide for instances of repetitive or

Begin Planning: As the Commandant's White Letter 2-90 stated, "Awareness of environmental protection standards is a first step towards attaining" the goal of environmental compliance. The Marine Corps must ensure that all Marines gain an appreciation for the environmental situation that will plague the Marine Corps into the next century. The environmental threat matrix, made up of Federal, State, and local governments, Federal and State agencies, as well as environmental and citizens' groups and the laws they pass and enforce, is fluid, with new rules and new players constantly entering the picture. Consequently, the Marine Corps must get on top of this situation by planning now.

A thorough analysis must be undertaken to identify the Marine Corps' environmental goals and objectives. Once identified, a comprehensive strategy for managing those goals and objectives can be developed. This strategy would outline goals, directions, priorities, and objectives. Within this framework, training prerequisites, budgetary considerations, permitting and reporting requirements, policy guidelines, and

ongoing misconduct. Once the total offense level is obtained, the judge refers to a published table that dictates a range of confinement (in months).

As a simplified example, suppose a Marine knowingly dumps half a drum of cleaning solvent that is hazardous waste behind a maintenance shed. Such conduct falls in the sentencing guidelines category of " Mishandling of Hazardous or Toxic Substances or Pesticides; Recordkeeping, Tampering, and Falsification." The base offense level is eight. In this hypothetical, the fact that it involves a discharge to the environment warrants 4 additional offense levels and that it was done without a permit warrants 4 more offense levels, bringing the total offense level to 16. The nature of the hazardous waste and the degree of cleanup effort could result in as many as four more offense levels being added. For a defendant whose conduct reaches 20 offense levels, the sentencing guidelines table *dictates* a prison

other considerations necessary to meet the Marine Corps' environmental needs could be implemented.

Arrange For: Arrangements must be made to ensure that appropriate resources are allocated to accomplish the mission. At the same time, steps to include key personnel (civilian and military) in the process should be made. Efforts to gain input from key players within the Department of the Navy (DON), DOD, other executive agencies, Congress, and the private sector must be made. Once these individuals or institutions have been identified, arrangements must be made to put the necessary information into their hands so that competent analysis and recommendation can be made. Therefore, there will be a need to gather important environmental information.

Make Reconnaissance: The Marine Corps' *Troop Leading Guide* talks about doing a careful reconnaissance of the ground over which a battle will be fought. The Commandant's White Letter says that the Marine Corps must analyze the situation to determine what needs to be done to accomplish the mission. However, reconnaissance on this issue would be similar to the collection of strategic and tactical intelligence

sentence of 33 to 41 months. Moreover, a total offense level of 20 requires imposition of a fine of not less than \$7,500 and not more than \$75,000.

The U.S. Sentencing Commission guidelines bring about other significant changes to treatment of offenders. Under the guidelines sentences are determinate, meaning that an individual serves his entire period of confinement (subject only to 54 days relief after serving the first year). Parole is abolished. A judge cannot impose a sentence and then suspend it in favor of probation. A first-time offender's background, such as community ties or record of exemplary citizenship, are less relevant than in the past. And, except in certain limited circumstances, "the court shall impose a fine in all cases."

Avoiding Trouble

Today's increased emphasis on the punitive aspects of the environmental laws requires better education of Ma-

On the strategic side, the Marine Corps must examine the forces that affect environmental policy. As stated earlier, there are forces that affect the regulatory structure—Congress, Environmental Protection Agency (EPA), States, DOD, and DON. The regulatory environment is constantly changing. Steps must be taken to stay abreast of these changes. The ability to predict and monitor changes will put the Marine Corps in a better position to contend with regulatory and budgetary challenges.

On the tactical side, the Marine Corps must take a hard look at the ground over which this battle will occur—its installations. The most practical method to “recon the ground” would be to conduct environmental audits on all Marine Corps installations. Environmental audits are similar to major inspections. However, instead of determining if a unit is combat ready, the audit team will look at an installation’s environmental situation. Audit teams would evaluate hazardous waste management procedures, waste minimization plans, sanitary treatment plans, air pollution control measures, wildlife protection programs, solid waste disposal procedures, and other standard or site-specific issues. Each installation has its own unique

problems that audit teams must take into account. The goal of these audits would not be to find fault but to find out where the Marine Corps stands environmentally. Audits will let planners know what is being done right and what is being done wrong, and make comparisons of the same.

Complete Plan: Once the reconnaissance is completed, information synthesized, and input from key players included, then a Marine Corps Environmental Master Plan could be completed. The plan’s strategic scope would act as a base for the implementation of further command and occupational field directives and initiatives. The plan would deliver the necessary information to commanders so they could ensure compliance with environmental standards.

Issue Order: This is the easy part for Marines. The alternatives are to write a Marine Corps order and issue it through the traditional channels or use more innovative methods to get the message out. Teams could be dispatched to brief selected Marines (officers and staff noncommissioned officers), then these Marines could brief their subordinates. Also, a short course on environmental issues could be taught

at boot camp, noncommissioned and staff noncommissioned officer courses, The Basic School, Amphibious Warfare School, and Command and Staff College. Eventually, an environmental course could be offered by the Marine Corps Institute. These steps would raise environmental awareness. All Marines would be briefed and would have a working knowledge of the plan and its objectives.

Supervise: The *Troop Leading Guide* states “that supervision must be continuous throughout the conduct of an operation.” Commanders must first provide an atmosphere that supports environmental compliance. All Marines must know that specific actions and activities constitute a violation of an environmental law. Leaders must also lead by example, which means they should have a thorough understanding of the Marine Corps Environmental Master Plan, especially those parts of the Plan that affect their specific activity. Awareness must be continuous, and commanders must ensure that the message is reaching everyone. The costs for making mistakes are high and will continue to rise. 

>Capt Thompson is an associate counsel at Marine Corps Logistics Base, Albany, GA.

ness and civilian employees. Yesterday’s shortcuts and ignorance, feigned or otherwise, are prescriptions for trouble. It should come as no surprise to discover that there are ways to operate within the bounds of the law and yet attain the Marine Corps’ mission.

Rule One for anyone involved in, or responsible for, environmental matters must be, “At all costs, avoid damage to the environment.” Oil and petroleum product spills and habitat destruction can be avoided through proper planning and adherence to set, safe procedures. Midnight dumping of hazardous waste, sometimes resorted to as an expedient way of reducing costs or administrative hassle, is neither necessary nor legally and environmentally acceptable.

Related to environmental protection is the vogue belief that the armed services should reduce their hazardous waste generation. Having hazardous waste on hand poses a threat of accidental release. Disposing of it consumes an increasingly expensive frac-

tion of an installation’s operations and maintenance budget. *Minimization* has become a fine-sounding watchword. A Marine who uses only one gallon of solvent instead of five gallons to clean a piece of gear can congratulate himself for his efficiency. The problem is that there remains one gallon of hazardous waste. What is needed is *prevention*. The goal should be use of products and implementation of procedures that do not generate hazardous waste.

Another way to reduce one’s chances of running afoul of environmental laws is to get to know the regulators. EPA, State, and local regulators frequently provide technical advice on what is permissible under the environmental laws. Regulators are far less prone to recommend prosecution if they are brought into a problem at an early stage. For example, in 1989 MCLB Albany realized that its industrial wastewater treatment system did not fully treat depot maintenance ac-

tivity effluent. Wastes routed to the domestic wastewater treatment system remained classified as hazardous waste but were not dealt with as such. Upon seeking the State of Georgia’s advice, the base received administrative process (a notice of violation and proposed consent order) to correct the problem. Had base personnel knowingly allowed the situation to continue unabated, a prosecution for illegal storage and disposal of hazardous waste might have been brought.

Virtually every environmentally dictated requirement brings increased costs. Unlike corporations, which can pass along to consumers their increased costs for altered processes or environmentally safer equipment, the Armed Services do not operate on a profit basis. All funding must be justified before Congress. Some commanders erroneously cling to the belief that pollution abatement funding competes with other budget demands. Congressional sentiment has been un-

mistakable: commanders must fund their environmental requirements fully. Failure to do so is viewed by regulators and prosecutors as recalcitrance or, worse yet, disregard for statutory requirements. Middle management and subordinate personnel responsible for day-to-day operations who do not initiate and follow up on funding requests for necessary equipment or construction will, like the Aberdeen defendants, be held accountable.

Finally, both general and technical environmental training for Marines and civilian employees is on the increase. Those who are more aware of their obligations and who are better trained in their duties will be less likely to commit errors that could lead to prosecution.

Marines and civilian employees who conscientiously attempt to meet environmental requirements should have

no fear of prosecution. Those who ignore their obligations under the environmental laws, who blatantly insist on predominance of mission over environmental protection, or who jeopardize human health and the environment should be prepared for significant changes in their lifestyles. At a minimum, they will spend substantial personal funds to retain private defense counsel.



Environmental 'Rules Of Engagement': Operational Requirements and Environmental Compliance

by Maj Russell J. Armentrout

The era of environmental consciousness is here to stay. While some Marines might consider the many environmental regulations as cumbersome and unnecessary, they are the law, and Marines ignore them at their peril.

The American public is becoming increasingly knowledgeable and more concerned with environmental issues. A speaker at the 1990 Marine Corps Environmental/Natural Resources Workshop referred to a 1989 study in which 47 percent of Americans polled considered global environmental problems a serious threat, while only 1 percent were equally concerned with Soviet or Chinese aggression. As the news focus begins to shift away from events in Southwest Asia, Americans are likely to concentrate their attention back to prewar concerns, such as environmental degradation.

The perception of many in Congress is that Federal facilities in general, and Department of Defense (DOD) facilities in particular, lag behind the private sector in complying with environmental laws. The Secretary of Defense and Secretary of the Navy have each indicated that their respective departments will set the standard for environmental compliance for the Nation. In the Commandant's (CMC's) White Letter 2-90 on environmental compliance, he stated that "we can, and we must, find ways to train and accomplish our mission in an environmentally acceptable manner" and that he con-

siders environmental standards to be "Rules of Engagement."

There are myriad Federal, State, and local laws covering every aspect of environmental compliance, from underground fuel storage requirements to protection of areas of historic interest. For base and station commanders, compliance with these laws requires extensive staff effort and dedication of significant resources. Fortunately, the operational commander's scope is less inclusive, but it is nevertheless just as important.

Environmental Awareness

There are two primary areas affecting the Fleet Marine Force (FMF) in the day-to-day routine of operations and training:

- *National Environmental Policy Act (NEPA) Compliance.* NEPA requires that each Federal agency, when proposing a major action (defined in MCO 11000.8B, *Real Property Facilities Manual, Volume V*), must document the environmental impacts and alternatives considered in the decision-making process. Records of this process shall be available for public review. In many instances, the government is required to publish its intentions and

expected consequences of its action for public review and comment; failure to adequately address all impacts or to fairly assess all alternatives may result in a delaying action from public interest groups.

It is important to understand that environmental impact is not limited to flora and fauna, but includes anything that affects the quality of the "total human environment." Factors to be considered include, but are not limited to, risk to public health or safety, increased noise or traffic, degradation of the local economy, impact on cultural or historic resources, and any other environmental concern likely to be the subject of controversy. The level of likely impact resulting from an action determines the extent of public review required.

NEPA does not prohibit any specific action, but as the likely environmental impact of our actions increases, so do the levels of public scrutiny and external review. Careful consideration of all available alternatives and choosing the course of action that meets our requirements with the least probable environmental impact will pay dividends in the avoided costs of litigation, penalties, restoration, mitigation,



and unnecessary delay. Failure to comply with NEPA may result in criminal or civil prosecution, loss of public trust, and ever-increasing restrictions on training.

• **Hazardous Waste Management.** Almost every unit deals with hazardous wastes of one type or another. Poor management procedures can affect units in two critical ways: First, they expose both individual Marines and their commanders to their greatest risk of prosecution for violation of environmental law. The Department of Justice (DOJ) has demonstrated its willingness to prosecute cases involving illegal dumping of hazardous wastes at Federal facilities. Several DOD sites are presently being investigated. A case at Aberdeen Proving Grounds in Maryland was tried in Federal Court, and three high-level civil service employees were found guilty (summarized in CMC White Letter 2-89). Because the violations were flagrant and the defendants received relatively light sentences, some observers opined that Federal Courts are not really very serious about enforcing environmental laws at federal facilities. Three additional facts lead to a different conclusion: (1) The DOJ has increased its staff of investigators and raised prosecution of environmental crimes to a higher priority. (2) Revisions to the Federal Sentencing Guidelines in November 1989 made the punishment for environmental crimes much stiffer and have taken much of the latitude away from judges. (3) Congress has seriously considered granting States greater authority to enforce and prosecute violations of both State and Federal environmental statutes aboard Federal facilities, includ-

ing explicitly waiving Federal sovereign immunity in these cases. Eventual passage of such amendments is considered likely.

Second, poor management procedures waste money. Sloppy practices such as improper labeling and failure to correctly segregate wastes can make disposal costs skyrocket. For example, a 55-gallon drum of waste oil may have a minor resale value or be recycled locally for reuse at your installation. However, if it becomes contaminated with other common waste products, it might cost on the order of \$750 for disposal.

Mistakes such as this are not uncommon, but until recently, disposal costs were the responsibility of the Defense Logistics Agency, and there was little incentive for individual activities to do it properly. In an effort to minimize hazardous waste costs DOD-wide, the burden of paying for disposal was shifted to the generators of the waste. As budgets are being reduced and disposal costs have risen six-fold over the past six years, proper management is vital. An adequate system will minimize additional costs resulting from errors; an exceptional system will seek to reduce costs through an active minimization program.

Rules of Engagement

As I see it, there are four elements that need to be incorporated into any plan to address operational requirements and environmental compliance:

1. *Adjustment of our decisionmaking process.* In many instances we decide where we want to train (or build) and then go through the necessary procedures to get that site approved. A bet-

ter way to proceed is to clearly define our requirements and then evaluate *all* alternatives. By avoiding sensitive areas, we can often still get the same results with much less effort. As stated earlier, NEPA does not prohibit any particular action, but much of the effort, expense, and negative public exposure resulting from a controversial or ill-advised decision may offset the value of the training benefits of a particular site.

2. *Better installation/operator coordination.* Range and training management personnel must work closely with the installation's environmental/natural resources staff. Failure to do so will undoubtedly result in short-term problems; the long-term effect may be the loss of training areas or costly remediation. Though it is normally seen as a "facilities order," *MCO P11000.8B* affects nearly every unit; operational units should be on its distribution list and training officers should familiarize themselves with it as it pertains to NEPA compliance.

Another long-standing issue that may need attention is the sometimes adversarial relationship between Marines and the "tree-huggers" of the base's environmental staff. Facing a labyrinth of environmental regulations, consultation with and consideration of their advice is in our best interest in the long run.

3. *Education.* Make Marines more aware of the issues and requirements. As with many problems, education is the key to solving it. The potential impacts of violations demand that every Marine be aware of regulations governing his daily activities. There are many opportunities available for us to improve in this area:

- The Basic School. While this is not a hard tactical skill, compliance with environmental laws will affect nearly every Marine officer during his career. A general overview advising him of applicable laws, Marine Corps policy, and the potential impact of noncompliance would be time well spent.
- Formal military occupational speciality (MOS) schools. Proper handling of hazardous wastes should be incorporated into the syllabus of every formal school for MOSs where these substances are likely to be encountered. Prime examples include engi-

neer, motor transport, aviation, armor, and communications schools.

- **Marine Corps Institute.** In most instances, the duty of the unit hazardous waste noncommissioned officer is assigned as a secondary job, often to a Marine who has had no formal training for the billet. This is a closely regulated area where even administrative errors can result in substantial penalties for the Marine and those in his chain of command. Formal training on the subject is often unavailable; at the very least, a Marine assigned this duty should have the opportunity to improve his skills by studying through a professionally prepared correspondence course.

- **Professional military education (PME).** The PME program already in effect throughout the Marine Corps provides an excellent opportunity for educating Marines on their responsibilities. Commanders should take advantage of the station environmental staff and staff judge advocate to assist in instructing these classes.

- **Advanced degree/special education programs.** The existing programs for officers to pursue graduate degrees

should be expanded to include environmental disciplines. Those earning master's degrees in environmental or civil engineering (specializing in environmental fields) could do their "payback" tour as facilities officers, where environmental management has become a matter requiring daily emphasis. Furthermore, officers with operational experience and background in environmental matters could provide a link between two communities previously considered mutually exclusive.

- **Base media coverage.** The base newspaper provides an excellent opportunity for educating base residents. By using creative approaches in these widely distributed publications, Marines and their dependents can learn more about environmental topics.

4. *Development of continuity in environmentally sensitive billets.* Establish a secondary MOS for hazardous waste specialists and assign it to Marines who have demonstrated their proficiency in the field. Currently, there is no adequate way of identifying a Marine in your unit who has had experi-

ence or received training as a hazardous waste specialist. This is a critical skill required by many organizations; we don't need to reinvent the wheel every time the unit's hazardous waste coordinator transfers. Additionally, this would assign some legitimacy to the billet. Marines who become skilled in this field are often working in nonexistent billets; assignment of a secondary MOS may assist them at promotion time.

Environmental legislation is a growth industry that we cannot afford to ignore. While many Marines may feel that some or all of these restrictions are unnecessary or excessively burdensome, *they are the law*. Failure to comply can have serious professional and personal consequences that negatively affect both the individual Marine and the Corps. As we have adapted to other changes in the past, we must adapt to these. We must rethink our game strategy so that we can best play by these "rules of engagement."



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