



**FORT GORDON
HAZARDOUS WASTE
MANAGEMENT PLAN**

Prepared by:

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Aberdeen Proving Ground, Maryland 21010-5403

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SECTION 1

INTRODUCTION

1.1 PURPOSE

This Hazardous Waste Management Plan (HWMP) was developed to provide guidance to all Fort Gordon personnel who work with hazardous waste (HW). The plan incorporates regulatory requirements covering HW by the U.S. Environmental Protection Agency (EPA), Georgia's Environmental Protection Division (GAEPD), the Army, and local regulations. This plan establishes procedures for properly managing HWs, and is intended to ensure a safe and healthy environment for personnel living and working at Fort Gordon.

This HWMP provides detailed guidance pertaining to the identification, characterization, accumulation, collection, transportation, storage, planning, emergency response, record keeping, monitoring, responsibilities, and training operations of HWs. Step-by-step procedures are provided to manage HW in a safe and compliant manner. The plan will be kept current to reflect regulatory changes or changes with waste activities at Fort Gordon. This plan also addresses management of certain non-HWs regulated under specific conditions, such as used oil, used lamps, and used batteries, to include lead-acid batteries. At a minimum, this HWMP will be reviewed annually by the Fort Gordon Environmental and Natural Resources Management Office (ENRMO) and updated as needed.

1.2 REGULATORY BACKGROUND

The passage of the Resource Conservation and Recovery Act (RCRA) of 1976 and subsequent amendments, as well as the Federal Facilities Compliance Act of 1992, made it mandatory for the Department of Defense (DOD) to adopt more effective methods for managing HW. The primary objectives of RCRA are to protect human health and the environment, and conserve valuable material and energy resources. The most important aspect of RCRA that affects Fort Gordon is its establishment of "cradle-to-grave" management and tracking of HW, from point of generation to point of disposal. This HWMP is a tool that will help Fort Gordon in meeting regulatory compliance with Federal and State of Georgia HW laws, as well as applicable DOD, Army, and local Fort Gordon regulations.

1.3 FINES AND VIOLATIONS

The Installation Commander (IC) is considered to be the "owner/operator" of Fort Gordon's HW generating facilities and is responsible for all violations that occur on Fort Gordon and its properties. Violations are punishable by fines, injunctions, and in some cases, imprisonment. Activities that generate waste are held accountable for proper handling and management of HW in accordance with applicable Federal, State, Army,

and local Fort Gordon regulations. Fort Gordon ENRMO personnel assist generators in their efforts to properly manage their HW.

1.4 APPLICABILITY

The HWMP applies to all units/activities physically located on Fort Gordon properties. All military, civilian, and contract personnel working for Fort Gordon are subject to the policies and standing operating procedures (SOPs) outlined in this HWMP. The implementation of this plan is consistent with Federal and State HW requirements.

1.5 DEFINITIONS AND ACRONYMS

A list of definitions and acronyms can be found in [Appendix A](#).

1.6 REFERENCES

A list of references, forms, and labels can be found in [Appendix B](#).

1.7 TECHNICAL ASSISTANCE

A list of technical assistance points of contact with addresses and phone numbers is available in [Appendix C](#).

SECTION 2

RESPONSIBILITIES

In order to meet Federal and State requirements, supervisors and commanders at Fort Gordon are responsible for providing command emphasis and guidance to all persons working with HW. To help prevent personal injury or harm to public health and the environment, concerted efforts must be made by all Fort Gordon personnel to ensure safe handling, control, storage, and disposal of HW. Below is a detailed listing of specific responsibilities related to HW management.

2.1 INSTALLATION COMMANDER (IC)

- Considered to be the “owner/operator” of a waste generating facility, the IC is responsible for all violations that occur on Fort Gordon
- Approves and signs the HWMP
- Chairs or appoints a chairperson for the Environmental Quality Control Committee (EQCC)
- Ensures that the ENRMO has sufficient personnel and resources to carry out the mission
- Ensures that storage, treatment, and disposal of non-DOD hazardous material on the installation complies with 10 U.S. Code (USC) 2692

2.2 ENVIRONMENTAL QUALITY CONTROL COMMITTEE (EQCC)

- Reviews compliance with hazardous waste management (HWM) procedures
- Develops overall HWM policies including, but not limited to, HW accumulation, on-site inspections, on-site storage, and turn-in procedures
- Provides input to the HW Manager as Fort Gordon HW operations change
- Provides input to reduce costs, streamline efficiency, reduce the quantity, volume, and toxicity of HW, and introduce viable pollution prevention (P2) opportunities
- Meets at least quarterly, or as necessary, to discuss HW issues, policy, regulations and addresses any changes or areas of concern

2.3 UNIT COMMANDERS/CIVILIAN SUPERVISORS

- Provides command emphasis regarding environmental compliance
- Ensures that the Hazardous Material Control Center (HMCC) is informed of all hazardous materials (HM) purchased by the unit/activity and that the HM is bar coded and entered into the Hazardous Substance Management System (HSMS) database by the HMCC
- Ensures that the HMCC is given a minimum of 15 days notice when requisitioning HM for deployment purposes
- Appoints, in writing, a unit Environmental Compliance Coordinator (ECC)
- Ensures that the ECC has sufficient personnel and resources to carry out the unit's environmental compliance mission
- Ensures that resources are available to train ECCs
- Responsible for ensuring that all personnel comply with all Federal, State, and local laws pertaining to the handling of HM and HW
- Appoints a unit/activity HM custodian
- Ensures Occupational Safety and Health Administration (OSHA) requirements are met for personnel involved in the implementation of this plan

2.4 ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT OFFICE (ENRMO) (includes Environmental Protection Specialist)

- Develops, maintains, implements, updates, and distributes Fort Gordon's HWMP
- Maintains a liaison between activities on Fort Gordon and Federal, State, and local authorities on meeting their standards for collection, storage, and disposal of HWs
- Enforces regulations pertaining to the storage, handling, and disposal of HW
- Coordinates, inspects, and manages all aspects of installation actions regarding the handling of HW
- Reviews contracts for compliance with environmental regulations and policies
- Provides technical expertise to activities

- Inspects HW operations and initiates corrective measures including recommending equipment for the handling and storage of HW
- Notifies generating activities/units of deficiencies identified during site inspections and provides guidance as required to correct deficiencies
- Maintains audit trail of HW from point of generation to disposal
- Performs annual waste characterization of each potential waste by a generating unit/activity
- Signs HW manifests
- Maintains installation-wide HM/HW inventory and provides a copy to the Fort Gordon Fire Department
- Conducts biennial reporting requirements and files required reports to the GAEPD
- Attends training in accordance with (IAW) DOD and Department of Transportation (DOT) requirements
- Serves as a member of the EQCC
- Coordinates availability of spill response and prevention materials and emergency supplies
- Identifies items in the Fort Gordon supply system that can become HW after use
- Ensures items procured in the Fort Gordon supply system include their respective Material Safety Data Sheets (MSDSs)
- Initiates processes to replace all HM with less hazardous or non-HMs
- Receives notification from the Defense Reutilization and Management Office (DRMO) of HW disposal pick-ups at all 90-day storage sites and the permitted storage area
- Ensures that information pertaining to new HW policies and procedures are communicated to the unit ECCs

2.5 TRAINING COORDINATOR, ENRMO

- Coordinates the HW training schedule
- Provides training to personnel identified as ECCs by their activities

- Coordinates development of on-line training

2.6 DEPARTMENT OF LOGISTICS (DOL)

- Monitors installation-wide use of HM
- Provides a quarterly progress report on HW minimization to ENRMO
- Provides semiannual progress reports to the IC that covers the reduction and toxicity of HM use on post
- Prepares and maintains records and reports including HW manifests
- Coordinates with the ENRMO to certify which wastes meet the Federal, State, and local regulatory definition of a HW

2.7 HAZARDOUS MATERIALS CONTROL CENTER (HMCC)

- Monitors installation-wide use of HM for all units except post housing and Dwight D. Eisenhower Army Medical Center (DDEAMC)
- Tracks all HM and HW
- Assists in HM reutilization
- Promotes P2 initiatives
- Maintains HSMS
- Advises waste generating activities of proper requirements for packaging, labeling, and shipping of HW to ensure that off-post transportation complies with Federal, State, and local regulations
- Approves HM for use by all units, activities, and contractors
- Inducts units into HM tracking program
- Develops program to advertise functions and responsibilities of HMCC
- Provides MSDSs for all HM offered

2.8 DIRECTORATE OF PLANNING, TRAINING AND MOBILIZATION (DPTM)

- Serves as a member of the EQCC

2.9 DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO), FORT JACKSON, SOUTH CAROLINA

- Operates under guidelines promulgated by the Defense Logistics Agency (DLA) and DOD
- Determines marketability of all DOD-owned HM/HW for proper sale, reuse, or disposal
- Disposes of and/or arranges to dispose of government property to include HW
- Provides unit disposal costs for each HW stream
- Contracts for HW disposal in accordance with DOD 4160.21-M, Chapter XI and DLAM 6050.1 and complies with all Federal, State, and local regulations
- Issues instructions regarding HW turn-in for generating activities

2.10 DIRECTORATE OF CONTRACTING

- Coordinates with Fort Gordon ENRMO to review contracts for the handling of any HW that may be generated while a contractor works on post
- Serves as a member of the EQCC
- Ensures that contracts for outside services include provisions for the proper management of HW
- Provides the necessary contract support to obtain equipment or services required by the HWMP

2.11 SIGNAL SAFETY DIVISION

- Serves as a member of the EQCC
- Ensures OSHA requirements are met for personnel involved in the implementation of this plan
- Assists the ENRMO with the implementation of this plan
- Incorporates this plan into the Command Safety Program to schedule routine inspections of HW storage and handling facilities

- Provides the ENRMO with any findings or deficiencies found during safety inspections
- Ensures MSDSs are available

2.12 FORT GORDON FIRE DEPARTMENT

- Ensures training is provided for firefighter/emergency response personnel to maintain proficiency in responding to HM/HW accidents/incidents
- Responds to HM/HW incidents
- Assists in the training of personnel as requested by ENRMO
- Maintains technical library (e.g., MSDSs, chemical hazards)
- Maintains installation-wide HM/HW inventory, as provided by the ENRMO

2.13 DWIGHT D. EISENHOWER ARMY MEDICAL CENTER (DDEAMC) PREVENTIVE MEDICINE SERVICE

- Conducts periodic health monitoring for military and civilian personnel responsible for carrying out official duties at oil and hazardous substance spill sites
- Provides for the disposal for non-RCRA medical, dental, and veterinary supplies and biomedical waste IAW AR 40-5, U.S. Army Medical Command (MEDCOM) Regulation 40-35, Federal, State, and local laws and regulations
- Provides the ENRMO with the solid and HWM implications of new and revised DDEAMC practices for review and concurrence
- Prepares and maintains a management plan for the handling and disposal of biomedical waste
- Provides technical assistance in the identification of wastes created at DDEAMC and outlying clinics

2.14 ENVIRONMENTAL COMPLIANCE COORDINATORS (ECC)

- Submits appointment letter to the ENRMO
- Attends ECC meetings held twice per quarter
- Understands and applies the U.S. Army Signal Center and Fort Gordon (USASC & FG) Regulation 200-2, Environmental and Natural Resources Management

- Ensures appropriate documentation is completed for all unit/activity environmental actions
- Ensures that all personnel comply with all Federal, State, and local laws that pertain to the handling of HM and HW
- Ensures personal protective equipment (PPE) is available for soldiers and civilians
- Develops SOPs as needed to overcome frequent turnover of personnel
- Ensures that all Satellite Accumulation Points (SAPs) are properly managed
- Ensures that all personnel are properly trained and that all training is documented
- Ensures SAP managers are trained within 6 months of assignment
- Ensures that all spill prevention and response procedures are followed IAW existing policies and regulations
- Ensures PPE and spill kits are maintained at all SAPs

2.15 UNIT SATELLITE ACCUMULATION POINT MANAGERS

- Ensures the site is managed in compliance with all laws, regulations, and operating instructions
- Ensures the site is neat, clean, and orderly at all times
- Coordinates turn-in of HW, including completing proper turn-in documentation ([Section 6](#) and [Section 7](#), HW Profile Sheets)
- Ensures the proper marking/labeling procedures are used on all HW containers ([Section 3](#) and [Section 4](#))
- Ensures that waste streams are accumulated in separate containers and are not mixed together ([Section 4](#) and [Appendix D](#))
- Ensures the quantity of HW at each site does not exceed 55 gallons or that acutely HW does not exceed 1 quart
- Ensures an appropriate spill kit is maintained ([Section 14](#) and Installation Spill Contingency Plan)

- Ensures proper containers are used for the accumulation of used products and ensures compatibility ([Section 4](#))
- Ensures the containers are kept closed except when being filled or emptied
- Performs periodic inspections, maintains written records, and resolves discrepancies noted during inspections ([Section 5](#))
- Maintains a record keeping system for Hazardous Waste Profile Sheets, copies of turn-in documents, and training
- Ensures all spills are properly reported ([Section 14](#) and Installation Spill Contingency Plan)
- Ensures constant observation of personnel that have not yet received training during performance of duties involving HW

SECTION 3

HAZARDOUS WASTE CHARACTERIZATION AND IDENTIFICATION

3.1 HAZARDOUS WASTE DETERMINATION

Each activity is responsible for determining if the waste it generates is hazardous according to Title 40, Code of Federal Regulations (CFR), Part 261.3. Determinations may be based on generator knowledge, commonly taken from MSDSs. If a determination cannot be made using generator knowledge/MSDSs, the waste may require chemical analysis. A generator **MUST** know whether or not a waste is classified as a HW because:

- **IT IS THE LAW.** Federal and Georgia regulations require any person who generates waste to determine if it is a “hazardous waste” as defined by the regulations.
- Management of HW is subject to numerous regulatory requirements. Violations of these requirements can result in notices of violations (NOVs) and fines. Information about the identity of a waste is needed to comply with regulatory requirements concerning labeling, storage, and disposal.
- Improper identification can result in health, safety, and environmental problems.

For assistance in determining if wastes are hazardous, contact the Fort Gordon ENRMO at:

Environmental and Natural Resources Management Office
Building 14600, 15th Street
Fort Gordon, GA 30905-5040
Telephone - 706-791-2511

After the waste is identified, the ENRMO will develop a Hazardous Waste Profile (HWP). The HWP will accompany all waste turned-in to the DRMO the first time waste is turned-in or if the profile has been modified and/or updated. An example hazardous waste profile sheet (HWPS) (DRMS Form 1930) and instructions for completion are supplied in [Section 7](#). Additionally, generators will keep a copy of the HWPS on file. For the turn-in of expired, unused, unopened HM, the required supporting documentation for turning in the material is an MSDS.

ANY CHANGES TO THE PROCESSES CREATING A WASTE STREAM REQUIRES THE WASTE PROFILE TO BE REVIEWED AND MODIFIED AS NEEDED.

3.2 HAZARDOUS WASTE DEFINED

The EPA defines HW in 40 CFR 261.3 and divides HW into the following types:

- A ‘P,’ ‘U,’ ‘K,’ or ‘F’ listed waste in Subpart D of 40 CFR 261(2)

- A solid waste mixed with a P, U, K, or F listed waste found in Subpart D of 40 CFR 261
- Ignitable, reactive, corrosive, or toxic as identified in Subpart C of 40 CFR 261

A solid waste, as defined in 40 CFR 261.2, is essentially any discarded material in any physical state (solid, liquid, gas, or sludge).

3.2.1 LISTED HAZARDOUS WASTES

The EPA established four types of listed HW, which are grouped into three categories: Non-specific Source Wastes, Specific Source Wastes, and discarded Commercial Chemical Products. Wastes included on these four lists will always be a HW. In addition, mixing wastes from these lists with any material or other waste will cause the entire mixture to be a HW.

3.2.1.1 “F” LISTED WASTE

“F” listed wastes are generated from non-specific sources and include such wastes as spent solvents used in degreasing, metal plating wastes that contain cyanides, electroplating by-products, and other metal cleaning type wastes. These wastes are assigned an EPA HW number beginning with F.

3.2.1.2 “K” LISTED WASTE

“K” listed wastes are generated from specific industry processes such as wood preserving, explosive manufacturing, and pesticide production. A common DOD K-listed waste is pink water from TNT manufacture. These wastes are assigned an EPA HW number beginning with a K.

3.2.1.3 “P” & “U” LISTED WASTES

The last two lists are the “P” and “U” lists that are discarded commercial chemical products that have not been used, off-specification products, container residues, and spill residues of these chemicals. The “P” list are those determined by EPA to be acutely HWs and the “U” list consists of toxic wastes. These wastes are assigned an EPA HW number beginning with a P or U.

3.2.2 CHARACTERISTIC HAZARDOUS WASTES

Wastes that are not listed (or mixed with a listed waste) are a HW if they exhibit a HW characteristic. The four characteristics of a HW are described below.

3.2.2.1 IGNITABILITY

A material is considered *ignitable* if a representative sample has any of the following properties:

- It is a liquid other than an aqueous solution containing less than 24 percent alcohol by volume and has a closed cup flash point less than 60°C (140°F);
- It is not a liquid and is capable under pressure of causing fire through friction, absorption of moisture or spontaneous chemical changes, and when ignited burns so vigorously and persistently it creates a hazard;
- It is an ignitable compressed gas;
- It is an oxidizer.

An ignitable waste is assigned an EPA HW number of D001. Examples of D001 wastes include: fuel filters, paint thinners, spent alcohols, and contaminated fuel.

3.2.2.2 CORROSIVITY

A material exhibits *corrosivity* if a representative sample of the material has any of the following properties:

- It is aqueous and has a pH less than or equal to 2 (strong acid) or greater than or equal to 12.5 (strong base);
- It is a liquid that corrodes steel at a rate greater than 6.35 mm (0.250 inches) per year at a test temperature of 53°C (130°F).

A corrosive waste is assigned an EPA HW number of D002. Examples of D002 wastes are sulfuric acid and sodium hydroxide.

3.2.2.3 REACTIVITY

A material is considered *reactive* when a representative sample of the material has any of the following properties:

- It is normally unstable and readily undergoes violent change without detonating;
- It reacts violently with water;
- It forms potentially explosive mixtures with water;
- When mixed with water, it generates toxic gases, vapors, or fumes in a quantity sufficient to present danger to human health or the environment;
- It is a cyanide or sulfide-bearing material which when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment;

- It is capable of detonation or explosive reaction under circumstances outlined in DOT 49 CFR 173.

A reactive waste is assigned an EPA HW number of D003. A common example of a D003 waste is lithium batteries.

3.2.2.4 TOXICITY

A material exhibits the characteristics of *toxicity* if the representative sample of the material contains any of the elements in 40 CFR 261.24 at a concentration greater than that specified in [Table 3-1](#). A waste that exhibits toxicity as a result of a chemical test called the Toxicity Characteristic Leaching Procedure (TCLP) is assigned the EPA HW number that corresponds to the contaminant in the TCLP table. Examples of this type of characteristic waste are lead in paint scrapings and silver-bearing wastes from photographic processes.

The TCLP table, which includes the hazardous constituent, the designated EPA HW number, and the regulatory limits for each constituent follows.

Table 3-1
Maximum Concentrations of Contaminants for the Toxicity Characteristic

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

3.3 ITEMS REQUIRING CHARACTERIZATION

The following items are commonly overlooked as HWs; however, they must be also characterized and properly managed.

3.3.1 Aerosol Cans

Aerosol cans that have become clogged or otherwise unserviceable should be disposed of as a HW since the contents remain under pressure and the excess propellants used may be considered an EPA D001 flammable gas (consult 40 CFR 261.21). Used aerosol cans may also contain residual amounts of product and propellant. In some cases, an aerosol can may have contained a P-listed waste found in the toxic material lists in 40 CFR 261.33. The EPA considers these compounds acutely toxic and the entire container should be disposed of as a HW. All unserviceable and used aerosol cans will be managed as a HW. Collect the cans in an appropriate container. The container must have a properly completed HW label that identifies the contents. Turn the container in to the HMCC when it is three quarters full. **Empty aerosol paint cans** are not required to be managed as a HW. These cans should be collected and turned-in to the HMCC as they are generated. No paperwork is required to drop off empty aerosol paint cans at the HMCC. The HMCC will process the empty aerosol paint cans for recycling as scrap metal.

3.3.2 Flameless Ration Heaters (FRHs)

Meals, Ready-to-Eat (MREs) come with a heating unit that contains a small amount of elemental magnesium. When this magnesium comes into contact with water, it causes a chemical reaction that gives off heat. Unused FRHs are therefore considered reactive and when disposed of, they must be properly managed as a D003 HW.

To decrease the amount of waste generated by unused FRHs, it is recommended that each individual soldier activate the FRH **in the field at the time the field ration is opened** even if it is not to be used. Activation of FRHs at locations other than the **area of use** may be considered treatment by environmental regulators and must **not** be done. Inactivated FRHs must be returned to the issue point for proper management. Do not dispose of unused FRHs in the trash as solid waste collection and management operations could damage the pouch, allow moisture to activate the FRH, and cause a fire or other hazard in dumpsters, trash collection vehicles and landfills. Turn-in any excess FRHs to the HMCC.

3.3.3 Parts Washers

Parts-washing units remove dirt, oil, and grease from various types of small parts (automotive and weapons) using petroleum-based cleaning solvents, water-based solvents or hot water. The type of parts washer used and how it is used determine the types of HWs generated. Spent solvent, used filters, and sludge are common wastes. Regardless of the type of parts washers used, wastes must be characterized as outlined in [Section 3](#) and a HWPS will be completed for all HW turned-in to the HMCC. The majority of parts washers are maintained by contract with the company from which the unit was purchased/leased. If this is the case, HW disposal is

commonly taken care of by the contractor. Ensure that this is the case when new parts washers are purchased/leased. Additionally, if new parts washers are to be purchased/leased, consider those that create less HW overall. Aqueous parts washers and hot water washers do not use chemical solvents and commonly the only HW generated are the filters used to clean the solutions and the sludge. Contacting other units on Fort Gordon who perform similar activities to your own is an excellent way to obtain product information.



The majority of parts washers on Fort Gordon are managed by contract. The activity utilizing the parts washer **is** the generator and **is** responsible for ensuring that any waste created by a parts washer is properly characterized and managed. Prior to purchasing/leasing a parts washer, coordinate with the ENRMO to ensure waste is properly characterized, manifested, and included in the biennial report. Such coordination ensures that the contracting company responsible for maintenance properly handles and disposes of any HW. If maintenance of parts washers is not done by contract, the unit/activity is responsible for proper characterization, handling, and disposal of any waste streams.

SECTION 4

SATELLITE ACCUMULATION POINT/ 90-DAY STORAGE SITE MANAGEMENT

The EPA and the GAEPD strictly regulate HW accumulation and storage procedures. Improper HW accumulation and storage deficiencies are the most frequently cited HW violations. Good inventory management practices, such as using older product before new product, checking expiration dates, purchasing only what is required for the mission, or using/purchasing a less hazardous or non-HM to perform the mission are ways that can reduce HW generation and disposal costs.

4.1 SATELLITE ACCUMULATION POINTS (SAP)

4.1.1 Quantity Limitations/Accumulation Time

The quantity of non-acutely HW allowed per SAP is 55 gallons of total waste or 1 quart of acutely HW. Generators on post may have more than one SAP at each point of generation. Each SAP will have a designated number and sign. Once a container is full (allowing for required head space) or no more waste is to be added to the container, the generator must fill in the Accumulation Start Date on the HW label. Within 72 hours (3 days), the container of HW **must** be turned-in to the HMCC.

4.1.2 Labeling of Waste Containers

An example of a HW label is provided in [Figure 4-1](#). The generator information and the proper shipping name of the HW with the DOT United Nations (UN) ID number are REQUIRED. The Accumulation Start Date is to be filled in when the container is closed for turn-in to the HMCC (either when full or no additional waste will be added to the container.) Do not use Julian dates.

4.1.3 Required Signage

- “SATELLITE ACCUMULATION POINT # _____” with a 24-hour contact number for the POC. These signs are available from the ENRMO.
- “NO SMOKING”
- “IN CASE OF SPILL CALL 911” next to the phone
- A sign indicating the location for fire extinguishers and the spill kit and if present, fire alarm.

4.1.4 Required Equipment

- Fire Extinguisher
- Telephone
- Spill Kit

4.1.5 Site Requirements

Satellite accumulation points must be located at or near any point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste.

4.1.6 Secondary Containment Requirements

There is no secondary containment requirement for SAPs. Secondary containment is recommended for storage areas where there is a possibility for spills to enter the environment and cause harm. Contact your ECC or the ENRMO for advice on this matter.

4.1.7 Inspections

Inspections must be conducted in accordance with the Fort Gordon “Satellite Accumulation Point Management Guide.” Instructions for inspections and a sample inspection form can be found in [Section 5](#), Inspections, [Figure 5-1](#). Inspection forms must be kept on site for 3 years.

4.2 90-DAY STORAGE SITES

Fort Gordon has two 90-day storage sites operated by the HMCC and the DDEAMC, respectively.

4.2.1 Quantity and Time Limitations

There are no quantity limitations for 90-day storage sites.

At Fort Gordon, HW may be stored for up to 90 days without a permit from the State of Georgia. The 90-day count begins from the Accumulation Start Date as shown on the HW label.

4.2.2 Labeling of Waste Containers

An example of a HW label is provided in [Figure 4-1](#). The generator information and the proper shipping name of the HW with the DOT UN ID number are REQUIRED. The Accumulation Start Date is to be filled in when the container is closed for turn-in to the HMCC (either when full or no additional waste will be added to the container.). Do not use Julian dates.

4.2.3 Required Signage

- “NO SMOKING”
- “Hazardous Waste 90-day Storage Site”
- Name and phone number of contact person and their alternate
- “IN CASE OF SPILL CALL 911” next to the phone
- A sign indicating the location for fire extinguishers and the spill kit and if present, fire alarm.

4.2.4 Required Equipment

- Fire Extinguisher
- Telephone
- Spill Kit

4.2.5 Site Requirements

Hazardous waste storage areas (HWSAs) are located such that accidental spills and discharges do not flow into sanitary sewers or stormwater runoff systems. Storage areas are on concrete, asphalt, or other material that is impervious to leaks and spills.

4.2.6 Secondary Containment Requirements

The 90-day storage sites must have secondary containment of sufficient capacity to contain 10 percent of the volume of all containers stored, or the volume of the largest container, whichever is greater.

4.2.7 Inspections

Inspections must be conducted in accordance with Federal regulations. Instructions for inspections and a sample inspection form can be found in [Section 5](#), Inspections, [Figure 5-2](#). Inspection forms must be kept on site for 3 years.

4.3 CONTAINER MANAGEMENT REQUIREMENTS

- A properly completed “Hazardous Waste” label will be placed on a container on receipt of the first drop of HW.
- Labels and markings will be replaced if they become damaged or lost.

- Labels no longer applicable to the contents will be removed or painted over to make them unreadable.
- Containers will be stored in such a manner so that labels are easily visible. Containers should not have to be moved in order to read labels.
- If a container holding waste is not in good condition (signs of bulging, pitting, and/or rusting) or begins to leak, the contents will be transferred to a serviceable, approved container.

Figure 4-1 – 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

GENERATOR INFORMATION:

NAME _____

ADDRESS _____ PHONE _____

CITY _____ STATE _____ ZIP _____

EPA ID NO. / MANIFEST DOCUMENT NO. _____

ACCUMULATION START DATE _____ EPA WASTE NO. _____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

Containers will be inspected for leaks, corrosion, rust, and open containers. A inspection log will be maintained to document inspection. Sample inspection logs can be found in [Section 5](#), Inspections, [Figures 5-1](#) through [5-3](#).

- A container will always be kept closed except when adding or removing waste.

- If funnels are used for adding waste to containers, they must be removed immediately after use and the container closed. Funnels and other fill devices must not be left in container openings.
- A container will not be opened, handled, or stored in a manner that may rupture the container or cause it to leak.
- Incompatible wastes will not be placed in the same container.
- Containers will be compatible with the wastes they contain, e.g., do not place acids in metal containers.
- Aisle space around each container should be at least three (3) feet to allow unobstructed movement of personnel or the use of fire protection, spill control, and decontamination equipment.
- Closed-top (bunghole) type containers should be used to accumulate liquid wastes. Open-top containers can be used to accumulate solid wastes such as rags. Containers used for storing waste will not be overfilled. Six (6) inches of free space will be left at the top of each container to allow for expansion/contraction due to temperature fluctuations.
- Containers will not be stacked more than two (2) high.
- Containers at the HWSA should be placed on impervious surfaces such as concrete or asphalt. Containers must not be placed on dirt, sand, grass, or gravel surfaces.
- Storage within a covered area or with any means of coverage is required to protect the area and containers from inclement weather conditions such as rain. The HW containers being stored inside facilities or buildings should not be located near floor drains that lead to a sanitary sewer.
- Containers storing ignitable or reactive wastes must be located at least 50 feet from sources of ignition or spark-producing equipment and processes. "No Smoking" signs are required in these areas. These containers must also be located at least 50 feet from the installation boundary.
- Drums accumulating flammable wastes must be grounded when stored at the HWSA.

Open-Top Drum for solids**Closed-Top Drum (Bunghole) for liquids**

4.4 COMPATIBILITY

Many HWs, when mixed with other wastes or materials, can produce effects that are harmful to human health and the environment. Effects include: (1) heat or pressure, (2) fire or explosion, (3) violent reaction, (4) toxic dust, mists, fumes, or gases, or (5) flammable fumes or gases.

Incompatible wastes must never be stored in the same container. Additionally, containers holding wastes that are incompatible with wastes stored in nearby containers will be separated or protected from each other by means of a wall, berm, or other device to prevent mixing.

[Appendix D](#) contains an HW storage compatibility chart to assist in determining waste compatibility.

4.5 UNKNOWN/ABANDONED WASTES

ALL UNKNOWN OR ABANDONED CONTAINERS MUST BE HANDLED WITH CAUTION!!! DO NOT ASSUME THAT A LABEL ACCURATELY REFLECTS THE CONTENTS OF THE CONTAINER!

On discovery of an unknown or abandoned container, immediately call the Fort Gordon ENRMO or the facility fire department.

SECTION 5

INSPECTIONS

5.1 SATELLITE ACCUMULATION POINT INSPECTIONS

All SAPs will be inspected periodically and inspections documented. An inspection checklist is provide as [Figure 5-1](#).

The SAP Inspection checklist may be downloaded from:
http://gordon.army.mil/dpw/enrmo/sop/satellite_turnin.html

5.2 90-DAY STORAGE SITE INSPECTIONS

The 90-day storage sites will be inspected weekly and inspections documented. The HMCC supervisor will inspect the HMCC 90-day storage site. The Environmental Science Officer will inspect the 90-day storage site at DDEAMC weekly ([Figure 5-2](#)).

5.3 PERMITTED STORAGE AREA INSPECTIONS

The permitted storage area will be inspected weekly and inspections documented by operating personnel. The Fort Gordon ENRMO will conduct periodic compliance inspections. The DRMS Form 1713 will be used as the inspection checklist ([Figure 5-3](#)).

5.4 UNIVERSAL WASTE STORAGE AREA INSPECTIONS

Areas where universal wastes are stored will be inspected and inspections documented. An inspection checklist can be found at [Figure 5-4](#).

Figure 5-1
SATELLITE ACCUMULATION POINT INSPECTION CHECKLIST

GENERATOR _____ **BLDG #** _____

DATE _____ **INSPECTOR** _____

1. Are containers in good condition and free from leaks/damage?
(Circle one) Yes No
2. Are adequate spill clean-up supplies (absorbent/containers, etc.) available?
(Circle one) Yes No
3. Are emergency numbers posted by the phone?
(Circle one) Yes No
4. Are required signs posted?
(Circle one) Yes No
5. Are containers UN approved for DOT transportation?
(Circle one) Yes No
6. Are controls in place to prevent mixing of waste streams?
(Circle one) Yes No
7. Are wastes compatible with containers?
(Circle one) Yes No
8. Are all containers securely closed?
(Circle one) Yes No
9. Are incompatible wastes kept in separate areas?
(Circle one) Yes No
10. Do filled containers have at least 6 inches of space left for expansion?
(Circle one) Yes No
11. Do all containers have required labels?
(Circle one) Yes No
12. Are all filled containers turned-in within 72-hours?
(Circle one) Yes No
13. Is the total quantity of hazardous waste less than 55-gallons? (If acutely HW less than 1 quart?)
(Circle one) Yes No
14. Is required documentation current?
(Circle one) Yes No

State corrective actions for all "no" answers

**Figure 5-2
90-DAY STORAGE SITE INSPECTION LOG**

March 2003

Fort Gordon HWMMP

INSPECTION LOG							
DATE/TIME	AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)					SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
Face Shield & Chemical Goggles	Broke, dirty or missing						Weekly
Protective clothing	Holes, worn, missing						Weekly
Absorbents (e.g., sorb-all Vermiculite)	Saturated, contaminated, below minimum quantity						Weekly
Empty drums/containers	Corrosion, structural damage, securely stored						Weekly
Emergency eyewash/shower	Water pressures, leaking, flushed						Weekly
Ventilation systems	Not operating, blocked						Weekly
Shovel non-sparking	Missing, damaged						Weekly
Fire Extinguishers	Not charged, not mounted, missing						Monthly
Fire alarm system	Not operating						Monthly
Telephone system	Not operating						Monthly
First Aid equipment & supplies	Items out of stock, outdated, expired supplies						Monthly
Non-sparking bung wrench	Missing, damaged						Weekly
Push broom	Missing, damaged						Weekly
Warning signs	Illegible, missing						Weekly
Security lights	Not operating						Weekly

INSPECTION LOG

INSPECTION LOG							
DATE/TIME	AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)					SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
Building doors, locks, fence and gates	Locks missing, unlocked, signs of tampering						Weekly*
BUILDING LOAD/UNLOAD AREA							
General debris & refuse	Orderliness, obstructions, general housekeeping						Weekly*
Odor, fumes	Detectable by smell, eye or nose irritation						Weekly*
Bases or foundation, containment trenches, ramps roof, walls	Wet spots from containers, evidence of leaking						Weekly*
	Structural integrity, e.g., erosion, uneven settlement cracks, etc.						Monthly
Battery charging area	Well ventilated, identified, located outside flammable storage area						Monthly
CONTAINER STORAGE AREA							
Containers	Corrosion, structural defects, serious dents						Weekly*
Sealing of containers	Open lids, leaking contents						Weekly
Labeling of containers	Improper						Weekly

INSPECTION LOG

DATE/TIME		AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)				SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
	identification, date or label missing, not intact, not readable						
Housekeeping	Aesthetics, obstruction						Weekly*
Containment area coating/sealant	Cracks, worn spots, presence of accumulated liquids						Weekly*
Load/unload area and valves	Leaks, incorrect position, spots indicating spills						Weekly*
Container placement and stacking	Insufficient aisle space, heights of stacks excessive						Weekly
Segregation of incompatible wastes	Incompatible wastes in same area. Improper distance between barriers						Weekly
Pallets	Damaged (e.g., broken wood, warping, nails missing)						Weekly
Containment system coating/sealant	Present, cracks, worn spots, presence of liquid						Weekly*
Identification of storage area (rooms)	Signs posted (e.g., Flammable, Acid, Toxic)						Weekly*
Lighting	Bulbs missing, burned out, broken fixtures						Weekly
Breaks	Worn pad, rotors,						**PTEU

INSPECTION LOG

DATE/TIME		AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)				SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
	bands						
Hydraulics	Leaking						**PTEU
Lights-running emergency	Not operational						**PTEU
Horns/sirens	Not operational						**PTEU
Battery	Not operational						**PTEU
Lubrication (oil, grease)	Low level, lack of						**PTEU
Tires	Worn, low pressure						**PTEU
Safety equipment	Not operational, missing						**PTEU
Instruments	Not operational, missing						**PTEU
General condition	Deficiencies						**PTEU
Lift, shift, tilt, control mechanisms	Not functional, loose, worn						**PTEU
Accessories	Missing, inoperative						**PTEU
Fire extinguishers	Missing, serviceable						**PTEU
Rated for area of use	DY, EE, EX for flammable storage areas						**PTEU
Overhead protection (forklifts)	Missing, damaged						**PTEU
							**PTEU
							Priotr to each use but not more than once per day

**Figure 5-3
PERMITTED STORAGE FACILITY INSPECTION LOG**

March 2003

INSPECTION LOG (Prescribing Authority: DRMS-I 6050.1)							
DATE/TIME	AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)					SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
Face Shield & Chemical Goggles	Broke, dirty or missing						Weekly
Protective clothing	Holes, worn, missing						Weekly
Absorbents (e.g., sorb-all Vermiculite)	Saturated, contaminated, below minimum quantity						Weekly
Empty drums/containers	Corrosion, structural damage, securely stored						Weekly
Emergency eyewash/shower	Water pressures, leaking, flushed						Weekly
Ventilation systems	Not operating, blocked						Weekly
Shovel non-sparking	Missing, damaged						Weekly
Fire Extinguishers	Not charged, not mounted, missing						Monthly
Fire alarm system	Not operating						Monthly
Telephone system	Not operating						Monthly
First Aid equipment & supplies	Items out of stock, outdated, expired supplies						Monthly
Non-sparking bung	Missing, damaged						Weekly

5-7

Fort Gordon HWMF

INSPECTION LOG (Prescribing Authority: DRMS-I 6050.1)							
DATE/TIME	AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)					SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
wrench							
Push broom	Missing, damaged						Weekly
Warning signs	Illegible, missing						Weekly
Security lights	Not operating						Weekly
Building doors, locks, fence and gates	Locks missing, unlocked, signs of tampering						Weekly*
BUILDING LOAD/UNLOAD AREA							
General debris & refuse	Orderliness, obstructions, general housekeeping						Weekly*
Odor, fumes	Detectable by smell, eye or nose irritation						Weekly*
Bases or foundation, containment trenches, ramps roof, walls	Wet spots from containers, evidence of leaking						Weekly*
	Structural integrity, e.g., erosion, uneven settlement cracks, etc.						Monthly
Battery charging area	Well ventilated, identified, located						Monthly

INSPECTION LOG (Prescribing Authority: DRMS-I 6050.1)							
DATE/TIME	AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)					SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
	outside flammable storage area						
							* Daily when in use
CONTAINER STORAGE AREA							
Containers	Corrosion, structural defects, serious dents						Weekly*
Sealing of containers	Open lids, leaking contents						Weekly
Labeling of containers	Improper identification, date or label missing, not intact, not readable						Weekly
Housekeeping	Aesthetics, obstruction						Weekly*
Containment area coating/sealant	Cracks, worn spots, presence of accumulated liquids						Weekly*
Load/unload area and valves	Leaks, incorrect position, spots indicating spills						Weekly*

INSPECTION LOG (Prescribing Authority: DRMS-I 6050.1)							
DATE/TIME	AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)					SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
Container placement and stacking	Insufficient aisle space, heights of stacks excessive						Weekly
Segregation of incompatible wastes	Incompatible wastes in same area. Improper distance between barriers						Weekly
Pallets	Damaged (e.g., broken wood, warping, nails missing)						Weekly
Containment system coating/sealant	Present, cracks, worn spots, presence of liquid						Weekly*
Identification of storage area (rooms)	Signs posted (e.g., Flammable, Acid, Toxic)						Weekly*
Lighting	Bulbs missing, burned out, broken fixtures						Weekly
MATERIAL HANDLING EQUIPMENT							
Breaks	Worn pad, rotors, bands						**PTEU
Hydraulics	Leaking						**PTEU
Lights-running	Not operational						**PTEU

INSPECTION LOG (Prescribing Authority: DRMS-I 6050.1)							
DATE/TIME	AREA/BLDG (Specify when HM/HW is stored off-site of DRMO)					SIGNATURE OF INSPECTOR	
ITEM	TYPE OF PROBLEM	SAT	UNSAT	NA	LOCATION AND PROBLEMS OBSERVED	DATE & NATURE OF CORRECTIVE ACTIONS	FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT							
emergency							
Horns/sirens	Not operational						**PTEU
Battery	Not operational						**PTEU
Lubrication (oil, grease)	Low level, lack of						**PTEU
Tires	Worn, low pressure						**PTEU
Safety equipment	Not operational, missing						**PTEU
Instruments	Not operational, missing						**PTEU
General condition	Deficiencies						**PTEU
Lift, shift, tilt, control mechanisms	Not functional, loose, worn						**PTEU
Accessories	Missing, inoperative						**PTEU
Fire extinguishers	Missing, serviceable						**PTEU
Rated for area of use	DY, EE, EX for flammable storage areas						**PTEU
Overhead protection (forklifts)	Missing, damaged						**PTEU
							** PTEU – Prior to each use but not more often than once per day

**Figure 5-4
UNIVERSAL WASTE STORAGE AREA INSPECTION SHEET**

	Week 1 Date	Week 2 Date	Week 3 Date	Week 4 Date	Week 5 Date
	Inspector	Inspector	Inspector	Inspector	Inspector
QUESTION APPLICABLE TO ALL UNIVERSAL WASTE STORAGE AREAS					
Are containers kept closed except when adding or removing waste?					
Are containers properly labeled?					
Are containers dated from the date waste was first placed in the container?					
Are incompatible wastes kept apart?					
Are appropriate spill kits available?					
Is waste accumulated less than 1 year?					
Are there any cracks in the floor, catch basin or berm in the storage area?					
Is an inventory of universal waste and the date it began accumulating kept on site?					
Is adequate aisle space provided?					
Have all spills or releases been cleaned up, disposed of and reported properly?					
BATTERIES:					
Are batteries sorted by type?					
Has removed electrolyte been characterized for HW determination?					
Are batteries that show evidence of leakage, spillage or damage that could cause leaks contained?					
PESTICIDES:					
Are containers structurally sound and compatible with the pesticide?					
Are containers free of cracks leaks or spills?					
MERCURY THERMOSTATS:					

Are thermostats that show evidence of leakage, spillage or damage that could cause leaks properly contained?					
UNIVERSAL WASTE LAMPS					
Are containers that hold lamps structurally sound and adequate to prevent breakage?					
Describe discrepancies and list resolution activities performed and the date performed.					
Week No: _____ ; _____					
Week No: _____ ; _____					
Week No: _____ ; _____					

SECTION 6

WASTE TURN-IN PROCEDURES

6.1 TURN-IN PROCEDURES FROM A SAP

When the HW container is three-quarters full, the SAP manager or ECC will coordinate turn-in to the HMCC, **by appointment only**, by calling 706-791-9824/9825. If an appointment cannot be made within 3 days, you should contact the ENRMO immediately. To turn-in HW, the generator must:

- Ensure the container is packaged, marked, and labeled in accordance with the DOT 49 CFR 107-185
- Complete a Disposal Turn-in Document (DTID) DD Form 1348-1A (sample and instructions follow in [Figure 6-1](#))
- The generator must ensure that Hazardous Waste Profiles (HWP) accompany any waste stream being turned-in the first time. A HWP number will be referenced on DD Form 1348-1A for all subsequent turn-ins. HWPs are prepared by the ENRMO to identify hazardous constituents, HW codes, proper shipping name, and other required information. HWPs are updated annually. A HWP sheet and instructions are provided in [Section 7](#), Hazardous Waste Profile Sheet, [Figure 7-1](#).

IF THE QUANTITY OF HW AT A SAP EXCEEDS 55 GALLONS, THE EXCESS WASTE MUST BE DATED AND TURNED-IN TO THE HMCC WITHIN 3 DAYS TO MAINTAIN COMPLIANCE WITH FEDERAL REGULATIONS.

6.2 SPECIFIC ISSUES REGARDING HW TURN-IN

The Fort Jackson DRMO will not accept compressed gas cylinders that are not completely empty. All activities/units are responsible for ensuring that all compressed gas cylinders scheduled for turn-in are completely empty. For additional information on this matter contact the HMCC or the ENRMO.

Figure 6-1
Instructions for completing DD-Form 1348-1A

CC 1-3	A5J (Document Identifier Code)
Block 25	National Stock Number
CC 23-24	Unit of Issue
CC 25-29	Quantity
Block 24	DoD activity address code (DODAAC Document Number: Julian Date Serial number (assigned by Property Book office))
CC 52-53	MILSBILLS Fund Code (obtain proper code from your budget analyst)
CC 64	Disposal Authority Code - M, N, or R (from AMDF)
CC 65	Demil Code (from AMDF)
CC 70	Condition Code (as applicable)
CC 74-80	Unit Cost (acquisition cost of new product)
Block 2	Shipped from: Unit/Activity name
Block 27	POC, Phone Number
Block 3	Shipped to: DRMO, Jackson 1902 Ewell Rd Ft Jackson, SC 29207
Block 4	Mark for: HW or HM
CC 57-59	Project: HWP# or MSDS# and EPA Waste Codes (provided by ENMRO)
Block 16	DOT proper shipping name (from 49 CFR 172.101)
Block 17	Item nomenclature: noun name and known components
Block 18	Type of container
Block 19	No. of containers being turned-in
Block 20	Total weight in pounds (estimate if necessary)
Block 27	W33M8Q, Fund Citation and APC (see budget analyst) Contract Line Item No (CLIN) from ENRMO Total Disposal Cost (from ENRMO)

DD FORM 1315 (1-78) PREVIOUS EDITIONS ARE OBSOLETE

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	1. TOTAL PRICE		2. SHIP FROM		3. SHIP TO	
DOC NO		RI FROM		M OR		UNIT		QUANTITY		SUPPLEMENTARY ADDRESS		SIG		FUND		DISTRIBUTION		PROJECT		PRI		ROUTE		DATE		ADV		RI		O/P		COND		MGT		UNIT PRICE		DOLLARS		CTS		4. MARK FOR																																											
TERMS		M OR		UNIT		QUANTITY		SUPPLEMENTARY ADDRESS		SIG		FUND		DISTRIBUTION		PROJECT		PRI		ROUTE		DATE		ADV		RI		O/P		COND		MGT		DOLLARS		CTS																																																	
5. DOC DATE					6. NMFC					7. FRT RATE					8. TYPE CARGO					9. PS																																																																	
10. QTY. REC'D					11. UP					12. UNIT WEIGHT					13. UNIT CUBE					14. UFC					15. SL																																																												
16. FREIGHT CLASSIFICATION NOMENCLATURE																																																																																					
17. ITEM NOMENCLATURE																																																																																					
18. TY CONT					19. NO CONT					20. TOTAL WEIGHT					21. TOTAL CUBE																																																																						
22. RECEIVED BY															23. DATE RECEIVED																																																																						

26. FORT GORDON
 CITY 22204
 CON CODE (71)
 DIST (55-56)
 UP (74-80)

27. FORT GORDON
 CITY 22204
 CON CODE (71)
 DIST (55-56)
 UP (74-80)

PREVIOUS EDITION MAY BE USED

USAPA W101

SECTION 7

HAZARDOUS WASTE PROFILE SHEET

The HWP or the HWP number is required for turn-in of HW to the HMCC. HWPs are prepared by the ENRMO to identify the hazardous constituents and properties of each particular waste. When a new waste stream is created, the ENRMO must be contacted to develop a new profile. When HW is turned-in for the first time, the HWP must accompany the DD Form 1348-1A. A sample HWP is found at [Figure 7-1](#) and instructions follow.

7.1 EXPLANATION OF HWP SECTION B TOPICS

7.1.1 What is physical state?

Physical state refers to whether waste is a liquid, solid, or gas at room temperature.

7.1.2 What is specific gravity?

Specific gravity is the ratio or number that describes the heaviness of a substance or chemical as compared to water. For example, a liter of lead would be 7.85 times as heavy as a liter of water so its specific gravity is 7.85. Specific gravity tells us whether our substance will sink or float in water. Any substance having a specific gravity greater than 1 will sink in water.

An example of something that floats in water is motor oil. The specific gravity of 10W-30 weight motor oil is approximately 0.8. Anything with a specific gravity of less than 1 will always float.

7.1.3 What is a flashpoint?

Flashpoint is the lowest temperature at which a liquid gives off sufficient vapor to form an ignitable mixture with air near its surface or within a vessel. The lower the flashpoint, the more dangerous the substance. If a HW has a flashpoint of less than 140 °F (60 °C), it must be listed as ignitable.

7.1.4 What is pH?

The pH is a number from 1-14 that indicates corrosivity. A pH of less than 7 is acidic and a pH greater than 7 is basic or caustic. A pH of 7 is neutral. Water has a pH of 7. An example of a corrosive liquid is hydrochloric acid (pH approximately 1.1) or sodium hydroxide (pH approximately 13).

7.1.5 What is ignitable versus flammable?

Ignitable and flammable are often used interchangeably to identify a waste that will burn. An *ignitable* waste, as defined by the EPA in 40 CFR 261.21, is a solid waste that is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has a flashpoint less than 140° F (60° C). An ignitable waste may also be a solid that is capable, under standard temperature and pressure, of causing combustion and when ignited, burns so vigorously that it creates a hazard. The EPA also refers to 49 CFR 173.300 to define a compressed gas may also meet the definition of an ignitable waste.

A *flammable* material is any substance that can be ignited readily and then burns so vigorously and persistently that it creates a serious hazard. The DOT, in 49 CFR 173.120, provides the definition of a *flammable* liquid as one with a flash point \leq 141° F (60.5° C). A flammable non-liquid is one that can ignite under standard temperature and pressure (at sea level and at 68°F) through friction, moisture absorption, or spontaneous chemical changes.

The term ignitable is used to characterize wastes on the HWPS. The word flammable is generally used when completing HW manifests for transport of HW.

7.1.6 What is corrosive?

A corrosive is defined by DOT in 49 CFR 173.136 as a liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified time period.

7.1.7 What is poison/toxic?

A poison or toxic substance is defined by the DOT in 49 CFR 173.132 as a material, other than a gas, known to be so toxic to humans as to be a hazard to health.

**Figure 7-1
Hazardous Waste Profile Sheet**

HAZARDOUS WASTE PROFILE SHEET		
PART I		
A. GENERATOR INFORMATION		WASTE PROFILE NO.
1. GENERATOR NAME		NAME OF WASTE STREAM
2. FACILITY ADDRESS <i>(Street, City, State, Zip Code)</i>		TECHNICAL CONTACT
		TELEPHONE NO.
B. WASTE DESCRIPTION & CHARACTERISTICS		U.S. EPA ID NO.
1. PHYSICAL STATE		STATE ID NO.
<input type="checkbox"/> LIQUID <input type="checkbox"/> GAS (CYLINDER)	SPECIFIC GRAVITY DENSITY <input type="checkbox"/> LB/GAL <input type="checkbox"/> LB/FT ³	C. MATERIAL COMPOSITION
<input type="checkbox"/> AEROSOL <input type="checkbox"/> SOLID		
<input type="checkbox"/> SLUDGE		
2. FLASH POINT <i>(Liquid Only)</i>		COMPONENT
<input type="checkbox"/> <73° F (23° C)	<input type="checkbox"/> 73 - 140° F (23 - 60° C)	CAS NO.
<input type="checkbox"/> 142 - 200° F (61 - 93° C)	<input type="checkbox"/> >200° F (93° C) EXACT	RANGE (%)
3. PH <i>(Aqueous Solutions Only)</i>		
<input type="checkbox"/> <2	<input type="checkbox"/> 2.1 - 12.4	
<input type="checkbox"/> EXACT	<input type="checkbox"/> >12.5	
	<input type="checkbox"/> N/A	
4. HAZARDOUS CHARACTERISTICS		
GENERATING PROCESS		
TREATMENT GROUP <input type="checkbox"/> WASTEWATER <input type="checkbox"/> NON-WASTEWATER		
LAND DISPOSAL RESTRICTED WASTE <input type="checkbox"/> YES <input type="checkbox"/> NO		<i>(Attach All MSDs, Sample Analysis and Additional Information)</i> 100%
<i>(If Yes, LDR Notification/Certification Must Accompany HWPS)</i>		
EPA WASTE CODES		D. SHIPPING INFORMATION
STATE WASTE CODES		FLAMMABLE PER 49 CFR 173.121 <input type="checkbox"/> YES <input type="checkbox"/> NO
5. FUEL RECOVERY <i>(Liquid Only)</i> <input type="checkbox"/> N/A		CORROSIVE PER 49 CFR 173.136 <input type="checkbox"/> YES <input type="checkbox"/> NO
<input type="checkbox"/> >5,000 BTU/LB	<input type="checkbox"/> <15% H ₂ O BY VOLUME	POISON PER 49 CFR 173.132 <input type="checkbox"/> YES <input type="checkbox"/> NO
<input type="checkbox"/> <5% HALOGENS BY VOL		PROPER SHIPPING NAME
6. RCRA CHARACTERISTIC WASTES <input type="checkbox"/> N/A		HAZARD CLASS
<input type="checkbox"/> IGNITABLE (D001)(40 CFR 261.21)	<input type="checkbox"/> REACTIVE (D003)	U.N. OR N.A. NO.
<input type="checkbox"/> HIGH TOC	<input type="checkbox"/> WATER REACTIVE	PACKING GROUP
<input type="checkbox"/> LOW TOC	<input type="checkbox"/> CYANIDE REACTIVE	CERCLA REPORTABLE QTY (RQ)
<input type="checkbox"/> OXIDIZER PER 49 CFR 173.151	<input type="checkbox"/> SULFIDE REACTIVE	
<input type="checkbox"/> CORROSIVE (D002) (40 CFR 261.22)	<input type="checkbox"/> TOXICITY CHARACTERISTIC (40 CFR 261.24) (SEE PG 2 FOR LISTING)	
E. GENERATOR CERTIFICATION		
I HEREBY ..		
GENERATOR'S AUTHORIZED SIGNATURE		DATE

7.2 INSTRUCTIONS FOR HWPS, DRMS FORM 1930

A. GENERATOR INFORMATION

1. Generator Name – name of generating facility
2. Facility Address – Address (street, city, state and zip code) of generating facility
3. Technical Contact – Name of person who will answer technical questions about the waste
4. Telephone Number – technical contact's telephone number
5. US EPA ID No. – 12 character descriptor issued by USEPA for the installation
6. State ID No. – Descriptor issued by the state to the installation

B. WASTE DESCRIPTION AND CHARACTERISTICS

1. Physical State - solid, liquid, or gas
2. Flashpoint (40 CFR 261.21) - Enter exact flashpoint if known or take it from the MSDS
3. pH (40 CFR 261.22) – Enter exact pH measurement for aqueous forms only
4. Hazardous Characteristics –
 - a. ID process generating the waste
 - b. Check the appropriate treatment group
 - c. Identify if the material is a land disposal restricted waste. If yes, an LDR notification and/or certification in accordance with 40 CFR 268, Appendix X must accompany the HWPS. DRMS Form 1712 may satisfy this requirement.
 - d. List all applicable EPA waste codes
 - e. List all applicable state waste codes
5. FUEL RECOVERY WASTES – Check boxes as appropriate
6. RCRA CHARACTERISTIC WASTE
 - a. Identify if waste exhibits characteristic of ignitability (D001) IAW 40 CFR 261.21. Check high total organic carbons (TOC), low TOC, and oxidizer if appropriate.
 - b. Identify if waste exhibits characteristic of corrosivity (D002) IAW 40 CFR 261.22. pH measurement is listed in block B3.
 - c. Identify if waste exhibits characteristic of reactivity (D003) IAW 40 CFR 261.23. Check water, cyanide or sulfide reactive as appropriate.
 - d. Identify if waste exhibits characteristic of toxicity (D0XX, where XX is obtained from Table in 40 CFR 261.24) IAW 40 CFR 261.24. Check the appropriate box and list contaminant level.

C. MATERIAL COMPOSITION

List all organic and/or inorganic components of the waste using specific chemical names. If trade names are used, attach MSDS or other documentation, which adequately describes the composition of the waste. For each component, list the Chemical Abstract Service (CAS) number (if applicable) and estimate the range (in percent) in which the component is present. In cases of extreme pH (2 or less or 12.5 or greater), indicate specific acid or caustic species

present. This list must include any hazardous components that exceed 10,000 ppm (1 percent) of the waste.

D. SHIPPING INFORMATION

The information presented is not meant to constitute a standard DOT certificate given by a shipper offering a package to a transporter.

NOTE: If the information contained in this section is also given on a manifest or the DD Form 1348-1A at time of turn-in, there is no need to fill this block out.

Identify if the waste is a DOT flammable, IAW 49 CFR 173.121

Identify if the waste is a DOT corrosive, IAW 49 CFR 173.136

Identify if the waste is a poison, IAW 49 CFR 173.132

PROPER SHIPPING NAME - Enter the proper shipping name for this waste (49 CFR 172.101, Hazardous Material Table column 2)

HAZARD CLASS – Enter the proper hazard class (49 CFR 172.101, Hazardous Material Table column 3)

UN ID Number – Enter the UN ID Number (49 CFR 172.101, Hazardous Material Table column 4)

PACKING GROUP – Enter the proper packing group, if applicable (49 CFR 172.101, Hazardous Material Table column 5)

CERCLA REPORTABLE QUANTITY (RQ) – List RQ if applicable. (49 CFR 172.101 Appendix A)

GENERATOR CERTIFICATION

‘CHEMICAL ANALYSIS’ OR ‘USER KNOWLEDGE’ OR A COMBINATION OF BOTH IS MANDATORY AND SHOULD ACCOMPANY THE HAZARDOUS WASTE PROFILE SHEET.

User knowledge is appropriate when it can be documented (e.g., in & out logs, published information, MSDS, or process production information). An authorized employee of the generator must sign and date this certification on the completed HWP.

**INSTRUCTIONS FOR COMPLETING DRMS FORM 1712
HAZARDOUS WASTE LOG**

March 2003

Fort Gordon HWMP

The Hazardous Waste Log fulfills the operating records requirements as per 40 CFR 264.73 and Appendix I. The column headings which are shaded are EPA requirements. Unshaded headings are DRMS requirements.

This record is to be kept until closure of the facility.

DRUM NO. – Local in-house number (optional).

DTID – Turn-in document number.

NSN/LSN – National or Local stock number.

GENERATOR DATA – Turn-in activity's organization symbol, building no., individual's name, phone number.

DESCRIPTION OF CONTENTS – By common name. 40 CFR 264.73(b)(1) & Appendix I.

TYPE OF OPERATIONS – The process rendering the waste. 40 CFR 264 & Appendix I.

PHYSICAL FORM – (L) liquid, (SL) sludge, (S) solid, (G) containerized gas. 40 CFR 264 & Appendix I.

EPA HANDLING CODE – Treatment, Storage, or Disposal code as listed in 40 CFR Appendix I, Table 2 & 264.73(b)(1), normally SO1.

RECEIPT MANIFEST NO. – Document number from incoming EPA Form 8700-22. 40 CFR 264.73(b)(1) & Appendix I.

EPA HAZARDOUS WASTE NO. – Hazardous waste number as listed in 40 CFR 261, Subpart C&D. 40 CFR 264 Appendix I.

ESTIMATED/MANIFESTED – The estimated or manifest reported weight or volume or density, where applicable, in one of the units of measure specified in Table 1 of 40 CFR 264, Appendix I (use known weight if available). 40 CFR 264.73(b)(1) & Appendix I. (Number value for WT/Vol value and corresponding symbol for symbol. Density number value and symbol.)

STORAGE DATE: IN – The date of entry into storage location. 40 CFR 264.73(b)(1) & Appendix I.

OUT – The date of removal from storage location, should be date on out-going manifest. 40 CFR 264.73(b)(1) & Appendix I.

STORAGE LOCATION – Number as demonstrated by DRMS-M 4160.14. 40 CFR 264.73(b)(2).

DISPOSAL MANIFEST NO. – Outgoing document number on EPA Form 8700-22.

REQUISITION DOCUMENT NO. – The number identifying a sales or any R, T, and D action.

CONTRACT NO. – The date, letter, and following number of the disposal contract if applicable (e.g., 89-R-0001).

DELIVERY ORDER NO. – The delivery order number that the waste was disposed under (e.g., 0002).

SECTION 8

UNIVERSAL WASTE MANAGEMENT

The Federal Universal Waste Program in RCRA Part 273 allows four types of wastes (used batteries, recalled pesticides, mercury thermostats, and mercury-containing lamps) to be managed more simply than all other HWs. This reduction in regulation results in less liability and lowers the cost for disposal for all units/activities on Fort Gordon. Georgia adopted the universal waste rules in 2001.

8.1 MERCURY-CONTAINING LAMPS

A number of electric lamps contain mercury as an essential operating component, including fluorescent, mercury vapor, high-pressure sodium, and high-intensity discharge (HID) lamps. When disposed of in municipal landfills, the lamps have the potential to leach mercury into the soil and ground water. Although these electric lamps are typically three to four times more efficient than incandescent lamps, it is important to recognize the potential hazards associated with their use. In the past several years, manufacturers have reduced the amount of mercury used in electric lamps. However, EPA studies indicated that analytic test results revealed that the lamps generally exceeded the regulatory level of 0.2 mg/L for mercury. Certain lamps present an additional problem associated with their disposal. Internal connections are lead-soldered to the base of the lamp, causing the lamps to exhibit the characteristic of lead (Pb). Therefore, all fluorescent, mercury vapor, incandescent and HID lamps will be collected and managed as a universal waste. The various types of lamps cannot be co-mingled in containers. Although federal regulations allow high and low pressure sodium bulbs to be managed as universal waste, the current disposal contract does not contain a contract line item number (CLIN) for the recycling of these bulbs. Therefore, high and low pressure sodium bulbs will still be managed as HW until the contract can be modified.

8.2 MERCURY THERMOSTATS

Mercury thermostats are found in many devices that regulate or measure heat and cold or pressure. The temperature control device usually contains metallic mercury in an ampoule attached to a bimetal sensing element. The mercury-containing ampoules that have been removed from these thermostats must be properly managed. Removal of the ampoules from the

temperature control device must be done over a containing pan and in a manner that prevents breakage of the ampoules. Mercury thermostats will be collected and managed as a universal waste.



Photo Source: Purdue University, Agricultural and Biological Engineering Department. Available Online: <http://pasture.ecn.purdue.edu/~mercury/src/devicepage.htm#trs>

8.3 USED BATTERIES

DUE TO THE FACT THAT FORT GORDON IS CONSIDERED AN INDUSTRIAL OPERATIONS BASE BY THE ENVIRONMENTAL REGULATORS, USED BATTERIES CANNOT BE DISPOSED OF IN THE SOLID WASTE STREAM (regular trash).

All batteries that are HW may be managed as universal waste. This also includes lead-acid batteries that are currently regulated under Subpart G of 40 CFR 266. Although federal regulation includes magnesium batteries under the Universal Waste regulation, the Fort Gordon disposal contract does not have a CLIN for these batteries. Therefore, all batteries except lead-acid and magnesium must be managed as universal waste. Lead-acid batteries will be managed as recyclable materials under 40 CFR 266 unless damaged when they will be managed as universal waste. Magnesium batteries will still be managed as HW until the disposal contract is modified. Storing waste batteries can be as simple as designating cardboard boxes for the segregation of different types of batteries. Batteries should be stored in a noncombustible building, if available. Other HM/HWs should be appropriately segregated from the batteries. Batteries stored for disposal should be kept cool, dry, away from open flame, heat, combustibles, at least 2 inches from other batteries, and in well-ventilated areas.

NOTE: When batteries are packaged, they must be protected against external short circuiting by taping the exposed contacts or by placement in a small individual plastic bag or cardboard box, which is sealed with a non-conductive non-metallic closure, such as tape. Failure to tape exposed contacts may cause the disposal facility to reject battery shipments.

A battery direct exchange program for reimbursable customers is managed by Johnson Controls. For additional information concerning the direct exchange program, you may contact Donald Culver, Installation Maintenance Officer at 706-791-6894. All batteries used in on-post housing qualify for the household waste exclusion and are not regulated under RCRA-C.

8.4 WASTE BATTERIES

8.4.1 Alkaline Batteries

Alkaline batteries are those used in radios, flashlights, personal entertainment devices, and other electronic equipment. Alkaline batteries are not considered a HW, but they pose a potential risk. Alkaline batteries contain a potassium hydroxide electrolyte that can cause injury if damaged or mishandled. As a result, alkaline batteries cannot go into the trash and will be disposed of as a universal waste.



8.4.2 Lithium Batteries

There are two types of classification for the disposal of lithium batteries: non-hazardous solid waste (NHSW) or HW. Batteries are classified as a NHSW if they are discharged properly via the complete discharge device (CDD) and stored 5 days prior to disposal. A battery with a CDD can be identified by the presence of a removable label providing discharge instructions over the switch. Damaged batteries, batteries that vent during discharge, and batteries without a CDD are classified as HW for ignitability (D001) and reactivity (D003) and must be managed as universal waste.



8.4.3 Nickel-Cadmium Batteries (Ni-Cd) and Nickel-Metal Hydride Batteries (Ni-MH)

Cadmium is used as an electrode material, the power source of the battery. Cadmium typically accounts for 11 - 15 percent of Ni-Cd battery weight. The environmental release of cadmium poses potential health threats. Cadmium can accumulate in the environment by leaching into ground water and surface water from landfills, and it can enter the atmosphere through

incinerator smokestack emissions.¹ Nickel-cadmium and Ni-MH batteries will be collected and managed as universal waste.



8.4.4 Lead-Acid Batteries

Lead-acid batteries are used in cars, trucks, motorcycles, boats, emergency lights, alarm systems, and other motorized equipment. Improper and illegal disposal of batteries presents a threat to our health and to the environment. The average battery contains 17.5 pounds of lead, a highly toxic metal, and 1.5 gallons of sulfuric acid, a corrosive electrolyte solution. Each battery consists of a polypropylene plastic case containing lead plates immersed in a sulfuric acid electrolyte. Contact with the sulfuric acid solution may lead to irritation or burns to the skin, or irritation to the mucous membranes of the eyes or the upper respiratory system.² Lead-acid batteries should be collected and turned-in for recycling through the battery exchange program.



8.5 PESTICIDES

¹Source: Fishbein, Bette. (2002) Industry Program to Collect Nickel-Cadmium (Ni-Cd) Batteries. Available online: <http://www.informinc.org/battery.html>

² Source: California Integrated Waste Management Board. (March 2000). Fact Sheet, Lead-Acid Batteries – Hazards and Responsible Use. Available Online: <http://www.ciwmb.ca.gov/Publications/HHW/61200002.doc>

Unused pesticides that have been suspended or canceled under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), recalled, and that are collected for discard must be managed as a universal waste. Pesticides are usually powerful anti-coagulants or nerve agents that cause the targeted species to experience excessive bleeding or respiratory paralysis. Improper disposal may cause the pesticide to become ingested by an unintended victim, causing physical harm.

8.6 LABELING UNIVERSAL WASTES

Each universal waste or container holding the waste must be labeled with the words "Used XX Batteries" where XX indicates the type of battery, i.e., nickel-cadmium, lithium, etc. Universal waste pesticides must be marked "Used Pesticides" AND must also be labeled with the manufacturer's label that was on or accompanied the product as sold or distributed. All fluorescent, mercury vapor, and HID lamps will be collected and placed in separate containers marked with the words "Used XX Lamps (Mercury Containing)" where XX indicates the type of lamp, i.e., fluorescent, mercury vapor, etc. If the universal waste meets the definition of a hazardous material, the DOT proper shipping name must also appear on the label. The label in [Figure 8-1](#) may be used. Proper shipping names can be obtained from the hazardous waste profile prepared and maintained at the ENRMO. Hazard class labels, if required by DOT, must also be placed on the container.

Figure 8-1 – Universal Waste Label

**UNIVERSAL
WASTE**

CONTENTS _____

ACCUMULATION START DATE _____
SHIPPER _____
ADDRESS _____
CITY, STATE, ZIP _____

BRADY SIGNMARK DIV

8.7 STORING UNIVERSAL WASTES

Universal waste may be accumulated for 1 year from the date the waste was generated. There must be a mechanism in place to demonstrate how long the waste has been stored. This can be done by dating the container or the individual item, or maintaining an on-site inventory system. Universal wastes must be packaged in containers or packages that are structurally sound, adequate to prevent breakage, and that are compatible with the contents of the wastes. All containers of universal waste **MUST** be closed except when adding or removing waste. Universal waste storage areas will be inspected weekly and inspections documented. A sample inspection checklist is found in [Section 5](#), Inspections, [Figure 5-4](#).

8.8 TURN-IN PROCEDURES FOR UNIVERSAL WASTE

When the universal waste container is full or the waste has been on site for 8 months, complete a DD1348-1A, turn-in document as outlined in [Section 6](#), Waste Turn-in Procedures, [Figure 6-1](#). Contact the HMCC for a turn-in appointment. Transport the universal waste to the HMCC in a government vehicle. Maintain copies of the turn-in documents for 3 years.

SECTION 9

NON-RCRA REGULATED WASTE MANAGEMENT

9.1 NON-HAZARDOUS REGULATED WASTES

Non-HW can be stored at 90-day storage sites and SAPs. Quantity and time limitations are not applicable, but all other management practices are required. A sample non-RCRA regulated waste label is provided in [Figure 9-1](#) below.

Figure 9-1 – Non-RCRA Regulated Waste Label



9.2 EXAMPLES OF NON-RCRA REGULATED WASTES

9.2.1 Used Oil

Most activities generating used oil participate in the Army Oil Analysis Program (AOAP). The AOAP provides analytical support to the vehicle preventive maintenance requirements. Through the AOAP, oil changes occur when they are needed and not because they are scheduled.

Units not participating in the Defense Supply Center, Richmond's (DSCR) Closed Loop Re-refined Oil Program (CLOP) must collect used oil in drums that have been properly labeled as "Non-RCRA Regulated Waste." The label information must be filled out to reflect that the drum contains "Used Oil." The used oil is ultimately re-refined for reuse.

Do not mix used oil with other petroleum, oils, and lubricants (POLs), as the re-refining equipment is designed to remove only commonly found contaminants from the used oil. Keep used oil in appropriate containers marked "Used Oil." Keep the container closed except when adding or removing used oil. Do not put other POLs in the same container. When the container is full, make an appointment with the HMCC for turn-in.

Re-refined motor oil, an environmentally preferable alternative to virgin motor oil, is now available from the Defense Logistics Agency through the DSCR. The DSCR's CLOP began in 1998 and is available only in the continental United States. This program offers the delivery of packaged and bulk re-refined oil along with the pickup of used oil for re-refining. The cost of the delivery and pickup of the used oil is included in the price of the oil. There are small minimum order requirements under this program. Administrative commercial, heavy-duty diesel commercial, and tactical military specification motor oils are available in quarts, 5-gallon containers, 55-gallon drums, and bulk deliveries. More information about the CLOP can be found at <http://www.dscr.dla.mil/products/pol/polintro.htm>.

9.2.2 Other POL Products

Hydraulic fluid, transmission fluid, lubricating oils, and grease are other POLs that may require management to avoid adverse environmental impacts. Collect these used materials separately from used oil and used antifreeze. Keep used POL in appropriate containers marked, for example, "Used transmission fluid" or "Used hydraulic fluid." Keep the container closed except when adding or removing used POL. Do not put other POLs in the same container. When the container is full, make an appointment with the HMCC for turn-in.

9.2.3 Shop Rags

Paper and cloth shop rags that are laden with grease, oil, and solvents should be managed appropriately. Store dirty rags in a metal, covered container away from ignition sources. Cloth shop rags may be laundered using a contractual shop laundering service. Dirty shop rags should be characterized to determine if they are a HW. Rags contaminated with solvents may require management as a HW. If analysis determines that the contaminated shop rags are not HW, they should be disposed of as non-RCRA regulated waste through the HMCC. If the rags are a HW, manage them IAW the instructions found in [Section 4](#), Satellite Accumulation Point/90-day Storage Site Management.

SECTION 10

TRAINING

10.1 REQUIRED TRAINING

All personnel who handle HW/HM require training IAW Federal, State, and local regulations. Type and duration of training depend on one's position with regard to HW/HM handling. Personnel who manage a SAP require different training than personnel managing a 90-day storage site. Training must be completed within 6 months of assignment to a position where duties include the handling or management of HW/HM. Trained personnel will supervise untrained personnel until the required training is completed. Training is outlined according to position.

10.1.1 Satellite Accumulation Point Managers

The following required training is offered by the ENRMO:

Initial Hazardous Waste Management Course – 16 hours, must be completed within 6 months of assignment as a SAP manager

Hazardous Waste Management Course Refresher – 4-hour course (Annually)

** HAZMAT Awareness (Computer-Based Training) – 4 hours (Annually)

**HAZWOPER Awareness (Computer-Based Training) – 8 hours (Every 2 years)

** Available as of August 2002. All Computer-Based Training users must request access to the courses through the training coordinator.

10.1.2 Environmental Compliance Coordinators

ECCs must attend the following courses offered by the ENRMO:

Initial Hazardous Waste Management Course – 16 hours, must be completed within 6 months of assignment. (**Prerequisite course for the 24-hour ECC Course**)

Hazardous Waste Management Course Refresher – 4-hour course (Annually)

“Environmental Compliance Coordinators Course” – 24 hours (Every 2 years)

Environmental Compliance Coordinators Meeting – 2 hours

These meetings are mandatory for all ECCs, and are held every 2 months in Building 14600.

10.1.3 HMCC Technicians and ESO/Manager of DDEAMC 90-Day Storage Site

Hazardous Materials Incidence Response Operations – 40 hours.

10.1.4 Unit Commanders/Managers (including HMCC Manager)

Environmental Management Course Part 1 & 2 - 16 hours (Computer-Based Training)

This course meets training requirements outlined in AR 200-1 for supervisors and managers. Areas covered are regulatory requirements, P2, enforcement and liabilities, environmental management, Natural and Cultural Resources management, and environmental awareness and training.

10.2 SOURCES OF TRAINING

The ENRMO provides all training except for the Hazardous Materials Incidence Response Operations. Training information can be obtained by calling the training coordinator at 706-791-6278 or at http://gordon.army.mil/dpw/enrmo/Course_Catalog_2002.html.

10.3 TRAINING DOCUMENTATION

The requirement for training documentation can be found in [Section 12](#), Record Keeping and Reporting.

SECTION 11

INVESTIGATION-DERIVED WASTES

11.1 DEFINITION

Investigation-derived waste (IDW) is generated during field investigations conducted on post IAW with Fort Gordon's HW permit. These wastes are created at sites undergoing restoration and commonly consist of soil and water from drilling, soil sampling, the installation of wells to conduct ground-water sampling etc. Liquid and solid wastes are created, sometimes in large amounts. IDW includes:

- Ground water generated from well development/well purging
- Cleaning fluids and rinse water from decontamination activities
- Soil from soil boring or the drilling of monitoring wells
- Personal protective equipment (PPE) such as coveralls, gloves, booties, respirator canisters, splash suits.
- Disposable equipment – plastic ground and equipment covers, aluminum foil, piping, sampling equipment, Teflon® tubing tape, etc.

11.2 MANAGING INVESTIGATION DERIVED WASTES

Investigation-derived wastes are managed under the Fort Gordon Investigation Derived Waste Management Plan, Installation Restoration Program, finalized July 13, 1999 and updated November 17, 2002. A copy of this plan is available from the ENRMO and compliance is mandatory. Non-compliance can result in Notices of Violations and fines from the GAEPD.

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SECTION 12

RECORD KEEPING AND REPORTING

12.1 GENERAL

Important documents and record keeping information must be maintained to document all aspects of HWM. Records will be organized and maintained by all relevant activities and personnel. Documentation required by Federal, State, and local regulation is stated below.

12.2 RECORD KEEPING REQUIREMENTS

12.2.1 Inspection Sheets

Completed weekly inspection forms will be maintained by the unit/activity in charge of a SAP/90-day storage site. These records must be maintained for 3 years. Many Federal and State violations are due to missing or incomplete inspection forms. Units must maintain a successful inspection system. A system must be in place so inspections will not be missed during changes in personnel, winter/holiday breaks, or other occasions. Additionally, inspections must be performed even when a SAP or 90-day storage site has no HW. If the site does not contain any HW, the SAP manager or ECC will annotate this aspect on the inspection form and will ensure that relevant requirements such as having a phone and fire extinguisher present are still inspected.

12.2.2 Training Records

Training records for ENRMO personnel, SAP managers, ECCs, HMCC technicians, and any other personnel requiring training will be maintained on site for 3 years from the date the person last worked with HM or HW at that particular activity/unit/facility.

Training records must contain the following information:

- The job title and name of each employee who deals with HWM
- A written job description for each employee who deals with HWM
- A written description of the type, amount, and dates of initial and annual review training

12.2.3 Disposal Turn-in Documents, DD Form 1348-1A

All documents will be maintained for at least 3 years.

12.2.4 Hazardous Waste Profiles (WHPs)

HWPs will be developed by the ENRMO. The original documents will be maintained at the ENRMO and copies will be maintained at the activity/unit level. HWPs will be updated annually and will be kept on file for 3 years.

12.2.5 Waste Analysis

Test results, waste analyses, and other determinations conducted to characterize HW must be kept on file for at least 3 years IAW 40 CFR 262.40. These records will be maintained at the ENRMO.

12.2.6 Transportation and Shipping Documentation

Transportation and shipping documents, such as manifests, manifest exception reports, and land disposal restriction forms are maintained at the ENRMO. These documents will be kept on file for at least 3 years.

12.2.7 Spill Reports

Documents of significant spills and releases will be kept on file for at least 10 years. These records will be maintained at the ENRMO.

12.3 REPORTING

As a large quantity generator, Fort Gordon is required to submit a biennial Hazardous Waste Generation Report outlining all HW generated to the State of Georgia. This report is developed by the ENRMO. This report will be kept on file for 3 years from the date of the report.

SECTION 13

RECYCLABLE WASTES AND WASTE REDUCTION

13.1 COMMON RECYCLABLES

Paper, plastic, glass, aluminum cans, and small arms brass are accepted at the Fort Gordon Recycling Center. Recycling reduces the amount of trash that goes to the landfill as well as the costs associated with trash disposal.

13.2 POLS

The main reasons to recycle used POLs are to reduce the cost of purchasing new products, to reduce the cost of disposing of used POLs, and to conserve resources. In addition, State and local governing agencies are enacting increasingly stricter regulations regarding the handling and disposal of substances such as ethylene glycol (a major component of most antifreeze used today). As a result, recycling and reuse will help ease the regulatory burdens associated with using and disposing of POLs.

13.3 USED ANTIFREEZE

The HMCC provides on-site antifreeze recycling. Keep used antifreeze in appropriate containers marked "Used Antifreeze." When the container is full, make an appointment with the HMCC for recycling or turn-in.

Do not mix used antifreeze with POLs as the recycling equipment is designed to remove only commonly found contaminants from the used antifreeze.

13.4 PHOTO/RADIOLOGY PROCESSING OPERATIONS

Several waste streams are associated with photo/radiology processing operations that have the potential to be regulated under the RCRA. These waste streams include spent fixer, spent cartridges, expired film, and silver flake. Confusion often exists when managing these wastes because they are exempt from some parts, but not all, of RCRA. Information pertaining to these wastes is provided below in an attempt to clarify their regulatory status.

13.4.1 Silver Recovery Units

Silver recovery units are used to reclaim the silver from the used fixer waste stream. The two main types of recovery units are active (with electricity) and passive (without electricity). The active unit uses electricity to plate silver onto an electrode. The passive unit uses a chemical reaction between steel wool and silver to plate out most of the silver from solution. Neither method removes all of the silver.

13.4.2 Used Silver Recovery Unit Cartridges

Spent silver recovery unit cartridges are managed at Fort Gordon as solid waste.

13.4.3 Spent Fixer Management

All spent fixer from photographic and radiological procedures will be collected for silver recovery. The spent fixer collection container will be labeled "spent fixer" or "used fixer." The container must be kept closed except when adding or removing spent fixer. When full, the spent fixer containers will be taken to DDEAMC, Logistics Division, for processing through the silver recovery unit. For further information and procedures, please contact DDEAMC, Logistics Division at 706-787-6246.

13.4.4 Expired Film

Most types of film manufactured today do not exhibit any of the characteristics of HWs and therefore are not regulated under RCRA. Numerous companies purchase scrap film to extract the silver and recycle the plastic. If your activity generates expired or used film, collect the film and contact the DDEAMC Preventive Medicine Office at 706-787-1215 for instructions on recycling.

13.5 DENTAL ACTIVITY RECYCLABLES

13.5.1 Lead Foil

Manufacturers seal dental bite-wing x-ray film in lead foil wrappers to protect the film from unintentional exposure. These lead foil wrappers must be collected and disposed of as scrap metal through the HMCC at least once per year. Mark the collection container "Used lead foil." Contact the DDEAMC Preventive Medicine Office at 706-787-1215 for instructions on recycling.

13.5.2 Amalgam Waste

Dental amalgam is an alloy of silver, tin, and copper in varying amounts used to repair teeth. The alloy is mixed with mercury at the time of use. Waste dental amalgam consists of old amalgam and pieces of fresh amalgam from procedures used to replace deteriorated fillings. Bits and pieces of old and new amalgam are picked up by the suction tubes in dental operatories and collected in traps. At routine intervals, the traps are cleaned out. The amalgam solids found in the traps along with any excess amalgam should be collected and turned-in for recycling. This waste stream is not classified as a biomedical waste. The Defense Reutilization and Marketing Service will accept amalgam for recycling as a recyclable scrap metal only if it is stored dry. Waste amalgam should not be stored under a liquid such as photographic fixer. Contact the DDEAMC Preventive Medicine Office at 706-787-1215 for instructions on recycling.

13.6 MUNITIONS

Spent military munitions are managed under RCRA by the Military Munitions Rule that allows for the recovery of recyclable materials that have been rendered safe by qualified personnel. All munitions for the training ranges are issued by and turned-in to the Ammunition Supply Point (ASP) at Building 8250. The M5 Smoke Pots, M81 Fuse Ignitors, M766 Fuse Ignitors, and A602-M858 50-caliber cartridges were analyzed and found to be HW. All M5 smoke pots, M81 fuse ignitors, M766 fuse ignitors, and A602-M858 50-caliber cartridges must be collected after use and returned to the ASP manager for proper management and disposal. Range residues, i.e., ammunition boxes, pallets, clips, small arms brass, will be collected and returned to the ASP on completion of training for reconciliation and disposition.

SECTION 14

SPILL RESPONSE

Fort Gordon maintains a Spill Prevention Control and Countermeasures Plan (SPCCP) and Installation Spill Contingency Plan (ISCP) as required by Federal, State, and local regulations. The SPCCP outlines those areas that are at risk for spills of HMs/HWs that could cause harm to human health and the environment. The SPCCP also lists those measures that have been taken to reduce or eliminate the risk of potential contamination in the event of a spill. The ISCP provides information for personnel to respond to potential spills.

Copies of the SPCCP and ISCP are available from the ENRMO.

No cleanup or sampling actions will be done unless workers are properly trained and have adequate PPE in addition to the proper spill response materials.

SECTION 15

HAZARDOUS MATERIALS CONTROL CENTER

15.1 SCOPE

15.1.1 The procedures for HM receipts apply to all military and civilian organizations formally inducted into the HMCC. However, all HW produced on the installation will be processed through the HMCC. This includes all activities whether inducted or not.

15.1.2 The HMs pharmacy concept or HMCC is a system that provides units with materials on an as-needed basis, so the volume of materials stored at maintenance locations is reduced. Units may be required to store operational and basic loads of POL in the event of deployment.

15.1.3 The HMCC receives all HMs and assigns a bar code identifier to each unit of issue. When a unit needs HM, personnel are issued the item from the HMCC in a quantity sufficient to complete the mission. The unit is responsible for returning the empty container or unused portion to the HMCC. The HMCC concept allows the installation activities to receive the advantages of bulk purchases without having to acquire unnecessary materials that may, if unused for extended periods, generate a waste. The bar code identifier provides a tracking mechanism to allow HMCC and ENRMO personnel to manage HMs from “cradle to grave.”

15.2 MISSION

The mission of the HMCC is to track all HM and HW, monitor HM use, assist in HM reutilization, look for efficiencies, and promote P2 and HM/HW minimization. The DDEAMC and Post Housing are mission-exempt.

15.3 PURPOSE

The purpose of the HMCC is to improve regulatory compliance and inventory management procedures for all HM consumed by the Fort Gordon Community. This goal shall be achieved by the tracking of HM received and HW produced by each HMCC customer. This “cradle to grave” management will be accomplished through the utilization of the Hazardous Substance Management System (HSMS) database. This goal can be accomplished with the help of the Fort Gordon Community. Everyone must ensure that all HMs purchases and the depletion of those materials are reported to the HMCC. This includes HM purchased on IMPAC cards or any method other than normal supply channels. Benefits to be gained from the operation of the HMCC include: reduced HM inventories, reduced HM usage, reduced HW generation, a safer work environment through the introduction of authorized environmentally benign products, and procurement savings.

15.4 HOURS OF OPERATION

15.4.1 Normal hours of operation are Monday through Friday from 0800-1530 hours. After duty hours, in case of emergency, customers must notify the Customer Assistance Office or Emergency Service Order Desk at 706-791-2550/4575/6468. Contingency, deployments, and Emergency Deployment/ Readiness Exercises (EDRE) are considered emergencies. Hazardous waste turn-ins will only be considered an emergency at the discretion of the ENRMO.

15.4.2 Telephone numbers for the HMCC: 706-791-9824 or 706-791-9825.
FAX: 706-791-9837

HMCC Supervisor: 706-791-2421 or 791-7419

Directorate of Public Works (DPW) points of contact are: Environmental Protection Specialist, 706-791-2511 or Supply, 706-791-6820.

15.5 HAZARDOUS MATERIALS CONTROLLED BY THE HMCC

The term “hazardous material” can refer to a variety of substances (including paints, POL products, pesticides, light bulbs, and asbestos, to name a few). The following is an example of Federal Stock Classes (FSCs) that contain HM, but this list is far from conclusive:

6240 Fluorescent light bulbs

6810 Chemicals

6850 Miscellaneous chemical specialties

8010 Paints, dopes, varnishes, and related products

8030 Preservatives and sealing compounds

8040 Adhesives

9150 Oils and grasses

Non-HMs in these FSCs will not be processed, tracked, or bar coded. However, all material meeting the criteria for DOT hazard classes and divisions must be tracked regardless of the FSC.

15.6 CUSTOMER INDUCTION PROCEDURES

15.6.1 Units/organizations on the installation that have not been inducted into the Hazardous Material Management Program may request induction by a memorandum through the DPW, ENRMO. The Commander and his/her staff and/or Civilian Managers will be briefed on HMCC goals and operational intentions. Staff personnel to be briefed should include those responsible for environmental compliance, supply, and safety; maintenance personnel and managers;

purchase card holders; and others who may have a special interest or may provide useful information on implementation of the HMCC concept in their areas.

15.6.2 Each commander and/or civilian supervisor should appoint a unit Hazardous Material (HAZMAT) Custodian who will be the point of contact (POC) for HMCC personnel. The unit/activity is responsible for notifying the HMCC of changes of POCs. The determination of garrison and contingency needs is the responsibility of the unit/activity. Every activity/organization that uses HM and/or generates HW must be identified.

15.6.3 The organization's HM will be jointly inventoried by the HMCC staff and the activity being inducted. The HMCC will generate bar codes and collect the units extra HM for storage at the HMCC building. This excess material will be processed and made available for FREE ISSUE to any customer with a need for the material. When material is not issued to another customer prior to the shelf life expiration date (and shelf life cannot be extended), the original organization will be responsible for the HW disposal costs.

15.6.4 Customer organizations will not receive credit for material turned-in to the HMCC. However, the HMCC will reissue turned-in material free of charge.

15.6.5 The DDEAMC and the Post Housing Area will not be inducted into the HMCC and are exempt from the requirements of the Hazardous Material Management Program.

15.7 GARRISON CONTINGENCY REQUIREMENTS

15.7.1 Organizations with go-to-war requirements may store their war stock at the HMCC. When stored at the HMCC, the HMCC personnel will be responsible for ensuring that all stock is available within a specified time. That time period shall be specified by mutual agreement with the unit during the induction process.

15.7.2 While working with the HMCC staff, units must determine their contingency needs for war stocks, field exercises, and/or special deployments. Unit commanders or designated personnel (i.e., HAZMAT Custodians) may request, in writing, a change at any time to contingency stock or garrison stock inventory levels. Deploying organizations are required to provide manpower to load contingency stocks during load-outs for deployments.

15.7.3 HMCC personnel will keep an inventory of those agreed-upon supplies and will assist with each unit's contingency load(s) and preparation for shipment. The HMCC will provide inventory information and the current MSDS for each item in the war stock maintained at the HMCC building.

15.7.4 For scheduled deployments, units will give the HMCC a minimum notice of 15 days. For those deployments where a 15-day notification is not possible, HMCC personnel will be available to meet unit needs as directed by the government.

15.7.5 All HM will be inventoried by the HMCC staff prior to deployment and again on return. After deployment operations, arrangements must be made with the HMCC staff for turn-in of all

excess HM, war stock, and/or generated HW. During recovery operations or within 72 hours of recovering from a deployment, the unit must call the HMCC to set up a turn-in appointment. It is recommended that all equipment services be performed prior to turning in of the contingency stock.

15.8 HM REQUISITIONED THROUGH STANDARD ARMY RETAIL SUPPLY SYSTEM (SARSS)

15.8.1 When requisitioning through the SARSS, the material will be received at the Central Receiving Point (CRP). CRP/HMCC personnel will process data into the HSMS and apply bar codes to the items prior to being placed at the supply issue point for customer pickup.

15.8.2 Material Safety Data Sheets should be received from the manufacturer with the shipment. However, if an MSDS is not received, customers may contact the HMCC, who will assist in obtaining the appropriate MSDS. The law requires employers to maintain a copy of an MSDS for each HM and ensure they are readily accessible to employees at their workplace during each shift.

15.9 HM PURCHASED OTHER THAN THROUGH SARSS

When HMs are purchased by any method other requisitioning through the supply system (IMPAC card or contracts for direct delivery) the customer **must** notify the HMCC personnel at the time of receipt. This material must be processed into the HSMS and bar coded. This may be accomplished by taking the material by the HMCC (Bldg. 10604) or by calling HMCC personnel for further instructions.

15.10 HM WHICH HAS BEEN DEPLETED

Customers must notify the HMCC when the HM has been depleted. The bar code labels of empty containers should be removed (when possible) and returned to the HMCC. This notification will complete the tracking process and keep an accurate inventory. Notification may be accomplished in one of the following ways:

15.10.1 Detach the bar code label and place it on form FG 8046-R-E ([Figure 15-1](#)) and hand carry the form to the HMCC (Bldg. 10604), or

15.10.2 Write the information on form FG 8046-R-E; however, the information must be legible and contain all the required information.

15.10.3 Form FG 8046-R-E should be forwarded to the HMCC at least weekly, even if only one item is on the form.

15.10.4 This form/information may be faxed to 706-791-9837; hand carried to the HMCC (Bldg. 10604); e-mailed to one of the HMCC personnel; or sent through distribution.

Whichever method is used, please ensure that the information reaches the HMCC.

15.11 CUSTOMER SERVICE

The HMCC personnel can provide the following services on request:

- Copies of MSDSs
- Assistance in the identification of environmentally friendlier materials
- Inventory management reports and shelf life status
- Research and determine if shelf-life dates can be or have been extended. HMCC personnel will need a full description of the product – National Stock Number (NSN), noun, unit of issue, quantity, lot/batch, manufacture date, and test date. If the expiration date has been extended, a copy of the extension will be provided to the customer.

15.12 ANTIFREEZE RECYCLING PROGRAM

The Army Hazardous Waste Minimization (HAZMIN) policy mandates that all Army installations, including National Guard units, must reduce the quantity and toxicity of HWs generated by antifreeze products. Three main reasons for recycling used antifreeze, which are beneficial to HMCC customers, are:

- Conserve our natural resources
- Reduce the cost of new antifreeze purchases
- Reduce both the cost and problems associated with used antifreeze disposal

The HMCC (Bldg. 10604) is designated as the Fort Gordon antifreeze recycling point. It is recommended that Fort Gordon unit/activities utilize this program to the fullest.

15.12.1 Recycled antifreeze must be stored in a suitable size **PLASTIC** container. *****HMCC personnel will only recycle into a clean plastic container.***** Storing antifreeze in metal containers will deplete the corrosion protection of the coolant and may cause engine failures. The customer is responsible for providing a plastic drum for their recycled antifreeze.

15.12.2 Call HMCC for an appointment. Once the antifreeze has been recycled, the customer will be notified of availability of pickup.

15.12.3 Customers must notify HMCC personnel of all possible contamination of the used antifreeze to avoid clogging of the recycling unit. Also, contamination needs to be kept to a minimum level to avoid additional cost of disposal. There may be times when the product is too heavily contaminated and cannot be recycled. At these times, the customer will be responsible for the cost of disposal.

15.13 90-DAY STORAGE SITE – HAZARDOUS WASTE FOR TURN-IN

15.13.1 The HMCC will operate a 90-day storage site for Fort Gordon HW. All HW generated on the post, as well as HM that cannot be reissued, will pass through the HMCC prior to transfer to DRMO.

15.13.2 Customers must make an appointment for the turn-in of HW. The following information is needed when making a turn-in appointment:

- Proper shipping name of the waste
- Number of shipping containers
- Size of the shipping container

15.13.3 When the customer arrives at the HMCC, the HMCC staff will compare the customer-supplied DD Form 1348-1A with the appropriate HWPS. The customer is responsible for the correction of discrepancies. **HMCC PERSONNEL WILL NOT OPEN THE CONTAINER TO VERIFY THE CONTENTS.**

15.13.4 Once the HMCC personnel have ensured the HW and its container satisfy all applicable regulations and have weighed the container, they will annotate the weight on the container. The weight, contract line item number (CLIN), cost per pound, and total cost will be annotated to the DD Form 1348-1A. This information is required by the budget personnel prior to providing the fund cite to be annotated on the DD Form 1348-1A.

15.13.5 The customer is then responsible for obtaining the fund appropriation from their budget personnel. Once the fund cite is obtained, the customer will return to the HMCC for the completion of the turn-in.

15.13.6 Units/activities are responsible for ensuring drums are correctly labeled IAW 49 CFR 172.

15.13.7 The gross container weight cannot exceed six hundred (600) pounds. HMCC staff will not accept containers exceeding this weight restriction.

Absolutely no UNIDENTIFIED waste will be accepted, received, or stored by the HMCC!

15.14 RESERVE UNITS ON TRAINING EXERCISES

15.14.1 Reserve personnel must ensure a Military Interdepartmental Purchase Request, DD Form 448, (MIPR) is provided to the Director of Resource Management Office (DRM). This MIPR must contain funds appropriated for the disposal of HM/HW. Reserve personnel are responsible for providing a copy of their MIPR to the HMCC.

15.14.2 The gross container weight cannot exceed six hundred (600) pounds. All containers exceeding the weight limit will be refused. When containers are refused, the customers are responsible for placing excess waste into additional containers.

SECTION 16

OTHER WASTES

16.1 REGULATED MEDICAL WASTE

Dwight David Eisenhower Army Medical Center personnel will handle biomedical waste issues. Contact the Logistics Division at 706-787-6167 for assistance.

16.2 RADIOACTIVE WASTE

The Fort Gordon Safety Office, Radiological Officer, will handle radioactive waste issues IAW the current Nuclear Regulatory Commission (NRC) permit. Contact 706-791-2906 for assistance.

16.3 WASTE GENERATED DURING FIELD EXERCISES, WEAPONS QUALIFICATION, AND TRAINING

All wastes generated during field exercises and training will be managed IAW the Fort Gordon ENRMO Field Waste SOP. Such wastes may include ammunition, explosives and dangerous articles (AEDA), obscurant (smoke pots and generators), empty shell casings, ammunition boxes, pallets, targets, and other range residue as well as solid waste, FRHs, and vehicle maintenance wastes. Guidance may also be found in DOD 4160.21M.

16.4 NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) AGENT-RELATED WASTE

Many of the wastes generated from NBC equipment and training must be managed as HW. Such wastes may include decontamination solution, ASC³ filters (activated charcoal filters) from protective masks, and chemical agent test kits. Therefore, all wastes from NBC-related materials will be managed according to specific guidance outlined in the ENRMO Field Waste SOP. Guidance may also be found in DOD 4160.21M.

³ ASC is not an acronym, but a specific designator for activated carbon that has been impregnated with a solution that is a mixture of copper, chromium, and silver and must be managed as a HW (D007, chromium)

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APPENDICES

APPENDIX A**DEFINITIONS & ACRONYMS**

Accumulation Start Date	The date that the first drop of hazardous waste (HW) is put into a container at a Satellite Accumulation Point (SAP).
Acutely Hazardous Waste	Hazardous waste the EPA has determined may present a more extreme hazard to health and the environment if improperly managed. The list of acutely HW codes is contained in RCRA regulations 40 CFR 261.31 the “F” waste codes (H code) and 40 CFR 261.33(e), the “P” waste codes.
Biomedical Waste	Pathological waste, biological waste cultures and stock of infectious agents and associated biologicals, contaminated animal carcasses (body parts, their bedding and other wastes from such animals), sharps, chemotherapy waste, discarded medical equipment and parts, not including expendable supplies and materials which have not been decontaminated as further defined in Rule 391-3-.15 of the GAEPD.
EPA Identification Number (EPA ID)	The number assigned by EPA to each HW generator, HW transporter, or HW treatment facility.
Generator	Any person, by site, whose act or process produces HW identified in 40 CFR 261 or whose act first causes a HW to become subject to regulation.
Generating Unit/Activity	Any unit or activity that generates a waste identified, as a HW is held accountable by the IC to ensure proper handling and management of this waste. Generating units/activities designate Unit Environmental Compliance Coordinators to manage their HW.
Hazardous Material	A chemical or mixture of chemicals or natural products whose presence or use is a health or a physical hazard and is identified as hazardous by the Occupational Safety and Health Administration (OSHA) or the EPA.
Hazardous Waste	A solid waste which is either listed as being hazardous or is hazardous by characteristics it may display such as reactivity, corrosivity, ignitability, or Toxic Characteristic

	Leaching Procedure (TCLP) toxicity, as defined by 40 CFR 261-270, and 279.
Land Disposal Restrictions	Restrictions prohibiting the placement of HWs into landfills.
90-Day Storage Site	A designated area where HW is collected and stored for 90 days or less depending on the unit's generator status.
Non-RCRA Regulated Waste	A solid waste that is not regulated as a RCRA HW; however, because of its hazardous properties, it requires special storage and disposal precautions.
Material Safety Data Sheet	A document prepared by the manufacturer listing a product's hazardous chemicals, physical properties, chemical properties, health effects, and appropriate safety precautions.
Permitted Storage Area	Storage area that conforms to the requirements of a permit issued by the State of Georgia for storage of HW.
Radioactive Waste Material	Any solid, liquid or gas that emits ionizing radiation which has no immediate or foreseeable use.
Recyclable	A material that can be transformed into a new product.
Satellite Accumulation Point	The designated location at a facility where HW is generated.
Sludge	The accumulated semiliquid suspension of settled solids deposited from wastewater or other fluids in tanks or basins.
Solid Waste	Any discarded material (solid, liquid, semi-solid, gaseous)
Universal Waste	Any HW that is managed under the universal waste requirements of 40 CFR 273. Waste batteries are described in 40 CFR 273.2, pesticides are described in 40 CFR 273.3, thermostats are described in 40 CFR 273.4, and lamps are described in 40 CFR 273.5.

ACRONYMS AND ABBREVIATIONS

AOAP	Army Oil Analysis Program
AR	Army Regulation
ASP	Ammunition Supply Point
CDD	Complete Discharge Device
CFR	Code of Federal Regulations
CLIN	Contract Line Item Number
CLOP	Closed Loop Oil Program
CRP	Central Receiving Point
DDEAMC	Dwight D. Eisenhower Army Medical Center
DLA	Defense Logistics Agency
DOD	Department of Defense
DOT	Department of Transportation
DPW	Directorate of Public Works
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Service
DSCR	Defense Supply Center - Richmond
ECC	Environmental Compliance Coordinator
EDRE	Emergency Deployment Readiness Exercise
ENRMO	Environmental and Natural Resources Management Office
EPA	U.S. Environmental Protection Agency
EQCC	Environmental Quality Control Committee
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act

FSC	Federal Stock Class
GA	Georgia
GAEPD	Georgia Environmental Protection Division
HM	Hazardous Material
HMCC	Hazardous Material Control Center
HSMS	Hazardous Substances Management System
HW	Hazardous Waste
HWM	Hazardous Waste Management
HWMP	Hazardous Waste Management Plan
HWP	Hazardous Waste Profile
HWPS	Hazardous Waste Profile Sheet
HWSA	Hazardous Waste Storage Area
IAW	in accordance with
IC	Installation Commander
IDW	Investigation-Derived Waste
IMPAC	International Merchant Purchase Authorization Card
ISCP	Installation Spill Contingency Plan
LDR	Land Disposal Restrictions
MIPR	Military Interdepartmental Purchase Request
MSDS	Material Safety Data Sheet
NBC	Nuclear, Biological and Chemical
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission

NSN	National Stock Number
OSHA	Occupational Safety and Health Administration
P2	Pollution Prevention
POC	Point of Contact
POL	Petroleum, Oils and Lubricants
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
SAP	Satellite Accumulation Point
SARSS	Standard Army Retail Supply System
TCLP	Toxicity Characteristic Leaching Procedure
TSDF	Treatment, Storage, and Disposal Facility
USC	United States Code

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APPENDIX B

REFERENCES, FORMS, AND LABELS

PUBLICATIONS

1. Title 40, Code of Federal Regulations (CFR), Parts 260-273 and 279, Resource Conservation and Recovery Act of 1976 (RCRA) and subsequent amendments (<http://www.gpo.gov/nara/cfr/index.html>)
2. Title 49, Code of Federal Regulations (CFR), Parts 107-185, Hazardous Materials Transportation (<http://www.gpo.gov/nara/cfr/index.html>)
3. 10 U.S. Code 2692, Storage, Treatment, And Disposal Of Non-Defense Toxic And Hazardous Materials
4. Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-11, Hazardous Waste Management (http://www.ganet.org/dnr/envIRON/rules_files/exist_files/391-3-11.pdf)
5. DOD 4160.21M, Defense Materiel Disposition Manual (<http://www.drms.dla.mil/pubs/toc.htm>)
6. DLAM 6050.1, DLA Environmental Protection Manual (<http://131.70.202.105/pubs/search.htm>)
7. AR 40-5, Preventive Medicine (<http://www.usapa.army.mil>)
8. AR 200-1, Environmental Protection and Enhancement (<http://www.usapa.army.mil>)
9. DA Pam 200-1, Environmental Protection and Enhancement (<http://www.usapa.army.mil>)
10. TM 38-410, Storage and Handling of Hazardous Materials (<https://www.denix.osd.mil/denix/Public/Policy/policy.html#army-guide> or <https://www.denix.osd.mil> Then Publications, Policy, Army, Guidance) copy these links to URL
11. U.S. Army Medical Command Regulation 40-35, Management of Regulated Medical Waste (<http://chppm-www.apgea.army.mil/hmwp/> then Document Library)
12. U.S. Army Signal Center and Fort Gordon Regulation 200-2, Environmental and Natural Resources Management (<http://www.gordon.army.mil/dpw/enrmo/>)
13. Fort Gordon Satellite Accumulation Point Management Guide, 27 Sep 00 (<http://www.gordon.army.mil/dpw/enrmo/>)

14. HMCC External Standard Operating Procedures, Fort Gordon, GA, December 2001

FORMS

1. DD Form 448, Military Interdepartmental Purchase Request (<http://www.usapa.army.mil>)
2. DD Form 1348-1A, Issue Release/Receipt document (http://www.drms.dla.mil/newenv/html/turn-in_services.html)
3. DRMS Form 1712, Hazardous Waste Log
4. DRMS Form 1713, Inspection Log
5. DRMS 1930, Hazardous Waste Profile Sheet (http://www.drms.dla.mil/newenv/html/turn-in_services.html)
6. Fort Gordon Form 8046-R-E, Bar-Coded Item Disposal

LABELS

1. Hazardous Waste Label
2. Non-RCRA Regulated Waste Label
3. Universal Waste Label

APPENDIX C
TECHNICAL ASSISTANCE

Environmental and Natural Resources Management Office
Building 14600, 15th Street
Fort Gordon, GA 30905-5040
706-791-2511

U.S. Environmental Protection Agency (EPA)
EPA “Hotline” Assistance Numbers
RCRA: 1-800-424-9346
<http://www.epa.gov/epaoswer/osw/index.htm>
TSCA
<http://www.epa.gov/opptintr/pcb/>

EPA Region 4
Sam Nunn Atlanta Federal Center
61 Forsythe Street, SW
Atlanta, GA 30303
404-562-9900
800-241-1754
<http://www.epa.gov/region4/divisions/index.html>

United States Army Center for Health Promotion and Preventive Medicine (USACHPPM)
Hazardous and Medical Waste Program
ATTN: MCHB-TS-EHM
Aberdeen Proving Ground – Edgewood Area, MD 21010-5403
DSN: 584-3651/3652
(410) 436-3651/3652
<http://chppm-www.apgea.army.mil>

USACHPPM MIDI
Military Item Disposal Instructions (CD or Web-based)
ATTN: MCHB-TS-EHM
Aberdeen Proving Ground – Edgewood Area, MD 21010-5403
1-800-276-MIDI (6434)
<http://chppm-www.apgea.army.mil/newmidi/>

APPENDIX D

STORAGE COMPATIBILITY

BACKGROUND: When some hazardous materials come in contact with each other, they may react producing heat, corrosion, toxic vapors, fires, explosions, or other problems. These reactions are called incompatible reactions and the reacting chemicals incompatible materials.

SEGREGATION OF INCOMPATIBLE HAZARDOUS MATERIAL. Incompatible hazardous materials must be segregated or isolated from each other to minimize the danger of accidents. Segregation or isolation includes both maintaining distance between incompatible groups of hazardous materials and preventing spilled materials from mixing. Incompatible materials should be isolated by some type of containment system. For large amounts, an arrangement of sections or compartments each isolated by curbs, berms, or sloping floors can provide containment. For small amounts, hazardous materials can be contained in plastic tubs, cabinets with spill wells, or boxes with non-reactive absorbents.

Consult a technical expert when constructing or renovating a storage area, especially if the hazardous materials may emit vapors or are extremely unstable.

Hazardous Waste (HW) Compatibility Chart Method. This chart was developed by the California Department of Health Services as part of a research study conducted for the EPA Solid and Hazardous Waste Research Division.

The purpose of this method is to aid people involved in generating, transporting, processing, and disposing of hazardous waste. It can also be used for hazardous materials. The method basically compares chemical groups to determine if an incompatible reaction may occur. To develop a manageable method, a number of assumptions were used -- (a) waste interactions are due to reactions of pure chemicals in the wastes, (b) chemicals react at ambient temperature and pressure, (c) only basic chemical reactions are covered, and (d) the reactions are not influenced by concentration, synergistic, and antagonistic effects. The method cannot predict all reactions or all hazardous wastes/materials, but with reasonable precaution it can be useful in determining general incompatibilities. The primary advantage of this method is that compatibility can be determined based on a chemical name.

The method involves two parts--Reactivity Group Numbers (RGN) and a [Compatibility Chart](#). The [RGN table](#) (pages D-6 through D-67) is a list of pure chemicals known or expected to be present in hazardous waste and material. It is not inclusive, but based on a literature review. It contains most chemicals commonly encountered in Army operations. The chemicals are classified under 41 different groupings based on chemical reactivity and similar chemical type. Each group is assigned a number (i.e., RGN). The [Compatibility Chart](#) (page D-5) lists the 41

reactivity groups/numbers and the basic types of reactions that can occur between two incompatible hazardous materials.

To determine if two hazardous materials are compatible, first determine their RGNs (pages D-6 through D-67). Then follow the procedure for using the chart outlined on page D-4.

A [practical exercise](#) to learn how to use the EPA Compatibility Chart is found at the end of this appendix starting on page D-68.

HAZARDOUS WASTES COMPATIBILITY CHART

The [Compatibility Chart](#) is the central part of the EPA method for determining compatibility. The Compatibility Chart is a quick and ready reference for determining the compatibility reactions of most binary combinations of hazardous wastes. It is used in conjunction with the [RGN table](#) that starts on page D-6.

The 41 reactivity group classifications of hazardous wastes are presented on the chart. Also, the Reaction Codes (RCs) are listed in the legend in the upper right-hand corner of the chart. The RCs represent a reaction between binary combinations of wastes that are *NOT COMPATIBLE*. RCs describe the following undesirable and hazardous consequences:

<u>RC</u>	<u>Reaction Consequences</u>
H	Generates heat by chemical reaction.
F	Produces fire from extremely exothermic reactions, ignition of reaction mixtures or of the reaction products.
G	Generates innocuous gases such as nitrogen (N ₂) or carbon dioxide (CO ₂) but can cause pressurization and rupture of closed containers.
GT	Generates toxic gases such as hydrogen cyanide (HCN) or hydrogen disulfide (H ₂ S).
GF	Generates flammable gases such as hydrogen (H ₂) or acetylene (C ₂ H ₂).
E	Produces explosion due to extremely vigorous reactions or reactions producing enough heat to detonate unstable reactants or products.
P	Produces violent polymerization resulting in the generation of extreme heat and sometimes toxic and flammable gases.
S	Solubilizes toxic substances including metals.

U Waste combinations are believed to be incompatible but no sufficient supporting data have been found in the literature.

For many binary combinations, multiple RCs are used to denote the reaction consequences. The order in which these letter codes appear corresponds to the order in which the consequences can occur. For example, in RC reaction HFE, the first letter denotes the initial or primary hazardous consequence of a binary reaction, which in this case is HEAT generation. The second and third letters denote the resulting secondary consequences of the production of FIRE and EXPLOSION from the heat generated by the primary reaction. In some cases the third letter code refers to a resulting tertiary consequence such as the evolution of a toxic gas from a fire caused by excessive HEAT generation (HFGT). Where the codes ^{GT}_{GF} appear, the GASES evolved are TOXIC and FLAMMABLE such as hydrogen sulfide, hydrogen cyanide, and carbon disulfide. The relative positions of the letter codes to one another in this case bear no significance.

DESCRIPTION OF THE CHART

The first column of the chart lists the reactivity groups by RGN. The first 34 RGN (based on chemical classes or molecular functional groups) are listed consecutively from 1 to 34. The last 7 RGN (based on general chemical reactivities) are listed consecutively from 101 to 107. The second column lists the corresponding reactivity group names. The first 34 group names are each followed by a number of reaction squares equal to their respective RGN. In other words, RGN 1 is followed by 1 square, RGN 2 by 2 squares, and so on. The group names designated by RGN 101 to 107 are followed by 34, 36, 37, 38, 39, 40 and 41 squares, respectively. The squares form rows as well as columns of squares on the chart. A terminal square of a row represents a binary combination of one reactive group with itself and is labeled with its RGN. The terminal squares serve as headings for the columns of squares and as a whole appear as a diagonal row of squares on the chart. An additional bottom row of squares is correspondingly labeled as the diagonal row of squares. The RGN on the first column of the chart and those on the diagonal and bottom rows of squares provide the reference coordinates for locating the potential hazardous reaction consequences of any binary combinations of the wastes reactivity groups.

The rest of the squares on the chart are either blackened or filled in with the RC. The RCs are identified in the legend on the upper hand of the chart. When a square is blackened, the wastes in the binary combination represented by that square are compatible. Conversely, any RCs specified in the squares indicate potential incompatible reactions. The predicted reactions are based on the combinations of the most reactive chemicals in the respective reactivity groups.

PROCEDURES FOR USING THE CHART

Step 1: For the combination of any two hazardous materials, first locate the higher Reactivity Group Number (RGN) on the column of the chart.

Step 2: Locate the lower RGN on the bottom row of the chart.

Step 3: Find the intersecting reaction square for the two RGNs.

Step 4: Note the Reaction Code(s) (RC) in the square. When no RC is found on the reaction square, the two groups of wastes are compatible. When any RC is noted on the square, the wastes are incompatible when mixed or allowed to come in contact with one another.

Step 5: Refer to the legend on the chart for the explanation of the RC.

Example: Determine if you should store [Acetic Acid](#) with [Acetyl Azide](#).

(1) Find the RGN for [Acetic Acid](#) and [Acetyl Azide](#) from the RGN table (page D-6 through D-67). The RGN for Acetic Acid is 3. The RGN for Acetyl Azide is 102.

(2) Use the [Compatibility Chart](#) (page D-5). Compare a 102 (reading across) with a 3 (reading up), and you'll find the letters "H" and "E". From the key, "H" stands for "heat" and "E" stands for explosion. Acetic Acid and Acetyl Azide are incompatible and should be stored separately.

Note that in the RGN Table more than one RGN may be listed. If a hazardous material has more than one RGN, check each RGN against all the other RGNs to determine compatibility. If **any** combination indicates incompatibility, the hazardous materials should be segregated.

Example: Determine if you should store [Acetone Cyanohydrin](#) with [Acrylic Acid](#).

(1) Find the RGN for [Acetone Cyanohydrin](#) and [Acrylic Acid](#) from the RGN table (pages D-6 through D-67). The RGNs for Acetone Cyanohydrin are 4 and 26, while Acrylic Acid has RGNs of 3 and 103.

(2) Use the [Compatibility Chart](#) (page D-5). Compare RGN 4 to both RGN 3 and 103, and then compare the RGN 26 to both RGN 3 and 103. RGN 103 is compatible with both 4 and 26, **but** RGN 3 is not compatible with either (gives an "H" and "P" = heat generation and violent polymerization). Acetone Cyanohydrin and Acrylic Acid are incompatible and should be stored separately. Had you just compared the first combination you might have stored them together. Check all combinations of RGNs.

TABLE D-1 - REACTIVITY GROUP NUMBERS (RGN) BY CHEMICAL NAME

This table lists chemical substances that may be found in hazardous wastes. The list is not inclusive but represents the data compiled through a literature survey and examination of hazardous waste management practices.

The table 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. A compound may be assigned more than one RGN.

The table is used to obtain the RGN of waste constituents when known specifically. The RGN is used with the Compatibility Chart to predict the compatibility of wastes.

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 served as the starting reference.

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Abate*		32
Acenaphthene		16
Acetamide		6
Acetaldehyde		5
Acetic acid		3
Acetic anhydride		107
Acetone	Dimethyl ketone	19
Acetone cyanohydrin	Hydroxyisobutyronitrile	4, 26
Acetonitrile	Methyl cyanide	26
Acetophenone		19
Acetoxybutane	Butyl acetate	13
Acetoxypentane	Amyl acetate	13
Acetyl acetone		19
Acetyl azide		102

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Acetyl benzoyl peroxide		30
Acetyl bromide		17, 107
Acetyl chloride		17, 107
Acetylene		28
Acetyl nitrate		27, 102
Acetyl peroxide		30
Acrolein	Aqualin	5, 103
Acrylic acid		3, 103
Acrylonitrile		26, 103
Adipic acid		3
Adiponitrile		26
Agallol	Methoxyethylmercuric chloride	24
Agaloaretan	Methoxymethylmercuric chloride	24
Aldicarb	Temik*	9, 20
Aldrin		17
Alkyl aluminum chloride		107
Alkyl resins		101
Allene		28
Allyl alcohol	2-Propene-1-ol	4
Allyl bromide	Bromopropene	17
Allyl chloride	Chloropropene	17
Allyl chlorocarbonate	Allyl chloroformate	13, 17
Allyl chloroformate	Allyl chlorocarbonate	13, 17
Allyl trichlorosilane		107
Aluminum		22, 23
Aluminum aminoborohydride		107

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Aluminum borohydride		105, 107
Aluminum bromide		107
Aluminum carbide		105
Aluminum chloride		107
Aluminum diethyl monochloride	Diethylaluminum chloride	105, 107
Aluminum fluoride		15, 107
Aluminum hydride		105
Aluminum hypophosphide		107
Aluminum phosphide		107
Aluminum tetraazidoborate		8
Aminobenzene	Aniline	7
Aminobutane	Butylamine	7
Aminochlorotoluene	Chlorotoluidine	7, 17
Aminodiphenyl		7
Aminoethane	Ethylamine	7
Aminoethanol		4, 7
Aminoethanolamine		7
Aminohexane	Hexylamine	7
Aminomethane	Methylamine	7
Aminopentane	Amylamine	7
Aminophenol		7, 31
Aminopropane	Isopropyl amine	7
Amino propionitrile		7, 26
Aminothiazole		7, 8
Aminotoluene	Toluidine	7
Ammonia		10

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Ammonium arsenate		24
Ammonium azide		102
Ammonium bifluoride		15
Ammonium chlorate		102, 104
Ammonium dichromate		24, 102
Ammonium fluoride		15
Ammonium hexanitrocobaltate		24, 102
Ammonium hydroxide		10
Ammonium hypophosphide		105
Ammonium molybdate		24
Ammonium nitrate		102
Ammonium nitridoosmate		24, 104
Ammonium nitrite		102
Ammonium perchlorate		104
Ammonium periodate		102, 104
Ammonium permanganate		24, 102, 104
Ammonium persulfate		104
Ammonium picrate		102
Ammonium sulfide		33, 105
Ammonium tetrachromate		24, 104
Ammonium tetraperoxychromate		24, 102, 104
Ammonium trichromate		24, 104
Amyl acetate	Acetoxy pentane	13
Amyl alcohol		4
Amyl chloride	Chloropentane	17
Amyl cyanide		26
Amylamine	Aminopentane	7

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Amylene	Pentene	28
Amyl mercaptan	Pentanethiol	20
Aniline		7
Animert* V-101	Tetrasul	20
Anisole		14
Anisole chloride		107
Anthracene		16
Antimony		23, 24
Antimony chloride	Antimony trichloride	107
Antimony fluoride	Antimony trifluoride	24, 107
Antimony nitride		24, 25
Antimony oxychloride		24
Antimony oxide	Antimony trioxide	24
Antimony pentachloride		24
Antimony pentafluoride		24
Antimony pentasulfide		24, 33, 105
Antimony perchlorate		24, 104
Antimony potassium tartrate		24
Antimony sulfate	Antimony trisulfate	24
Antimony sulfide	Antimony trisulfide	24, 33, 105
Antimony tribromide		24, 107
Antimony trichloride	Antimony chloride	24, 107
Antimony trifluoride	Antimony fluoride	24, 107
Antimony triiodide		24, 107
Antimony trioxide	Antimony oxide	24
Antimony trisulfate	Antimony sulfate	24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Antimony trisulfide	Antimony sulfide	24, 33
Antimony trivinyl		24, 107
Aqualin	Acrolein	5, 103
Aqueous solutions & mixtures		106
Aretan*	Methoxyethylmercuric chloride	24
Aroclor*	Polychlorinated biphenyl	17
Arsenic		24
Arsenic bromide	Arsenic tribromide	24, 107
Arsenic chloride	Arsenic trichloride	24, 107
Arsenic disulfide	Arsenic sulfide	24, 33, 105
Arsenic iodide	Arsenic triiodide	24, 107
Arsenic oxide	Arsenic pentoxide	24
Arsenic pentaselenide		24
Arsenic pentasulfide		24, 33
Arsenic pentoxide	Arsenic oxide	24
Arsenic sulfide	Arsenic disulfide	24, 33, 105
Arsenic tribromide	Arsenic bromide	24, 107
Arsenic trichloride	Arsenic chloride	24, 107
Arsenic trifluoride		24
Arsenic triiodide	Arsenic iodide	24, 107
Arsenic trisulfide		24, 33, 105
Arsine		24, 105
Askarel	Polychlorinated biphenyl	17
Asphalt		101
Azidocarbonyl guanidine		8, 102
Azido-s-triazole		8
Azinphos ethyl		32

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Aziridine	Ethyleneimine	7, 103
a,a'-Azodiisobutyronitrile		8, 26
Azodrin*	Monocrotophos	32
Bakelite*		101
Banol	Carbanolate	9
Barium		21, 24, 107
Barium azide		24, 102
Barium bromate		24, 104
Barium carbide		24, 105, 107
Barium chlorate		24, 104
Barium chloride		24
Barium chromate		24, 104
Barium fluoride		15, 24
Barium fluosilicate		24
Barium hydride		24, 105
Barium hydroxide		10, 24
Barium hypophosphide		24, 105
Barium iodate		24, 104
Barium iodide		24
Barium monoxide	Barium oxide	10, 24, 107
Barium nitrate		24, 104
Barium oxide	Barium monoxide	10, 24, 107
Barium perchlorate		24, 104
Barium permanganate		24, 104
Barium peroxide		24, 104
Barium phosphate		24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Barium stearate		24
Barium sulfide		24, 33, 105, 107
Barium sulfite		24
Bassa*	BPMC	9
Bayer 25141	Fensulfothion	32
Baygon*		9
Benzadox	Topcide*	6
Benzal bromide		17
Benzal chloride		17
Benzaldehyde		5
Benz-a-pyrene		16
Benzene		16
Benzene diazonium chloride		8, 102
Benzene phosphorus dichloride		107
Benzidine		7
Benzoic acid		3
Benzonitrile		26
Benzophenone		19
Benzoquinone	Quinone	19
Benzotriazole		8, 102
Benzotribromide		17
Benzotrichloride		17
Benzotrifluoride	Trifluoromethylbenzene	17
Benzoyl chloride		107
Benzoyl peroxide	Dibenzoyl peroxide	30, 102
Benzyl alcohol		4
Benzylamine		7

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Benzyl benzene	Diphenylmethane	16
Benzyl bromide	Bromotoluene	17
Benzyl chloride	Chlorotoluene	17
Benzyl chlorocarbonate	Benzyl chloroformate	17
Benzyl chloroformate	Benzyl chlorocarbonate	17
Benzyl silane		105, 107
Benzyl sodium		105
Beryllium		24
Beryllium copper alloy		24
Beryllium fluoride		15, 24
Beryllium hydride		24, 105, 107
Beryllium hydroxide		10, 24
Beryllium oxide		24
Beryllium sulfide		33, 105
Beryllium tetrahydroborate		24, 105, 107
Bidrin*		32
Bismuth		22, 23, 24
Bismuth chromate		24
Bismuthic acid		24
Bismuth nitride		24, 25, 102
Bismuth pentafluoride		24, 107
Bismuth pentaoxide		24
Bismuth sulfide		24, 33, 105
Bismuth tribromide		24
Bismuth trichloride		24
Bismuth triiodide		24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Bismuth trioxide		24
Bismuth trisulfide		24, 33, 105
Blada-fum*	Sulfotepp	32
Blue vitriol	Copper sulfate	24
Bomyl		32
Borane		24, 107
Bordeaux arsenites		24
Boric acid		1
Boron arsenotribromide		24, 105
Boron bromodiiodide		24, 107
Boron dibromoiodide		24, 107
Boron nitride		24, 25
Boron phosphide		24, 107
Boron triazide		24, 102
Boron tribromide		24, 107
Boron trichloride		24, 107
Boron trifluoride		24, 107
Boron triiodide		24, 107
Boron trisulfide		24, 33, 105
BPMC	Bassa*	9
Brass		23
Bromic acid		2
Bromine		104
Bromine azide		102
Bromine cyanide	Cyanogen bromide	11
Bromine monofluoride		104, 107
Bromine pentafluoride		104, 107

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Bromine trifluoride		104, 107
Bromoacetylene		17
Bromobenzoyl acetanilide		6, 19
Bromobenzyl trifluoride		17
Bromdiborane		105
Bromodiethylaluminum		107
Bromodimethoxyaniline		14
Bromoform	Tibromomethane	17
Bromomethane	Methyl bromide	17
Bromophenol		17, 31
Bromopropene	Allyl bromide	17
Bromopropyne		17
Bromosilane		105
Bromotoluene	Benzyl bromide	17
Bromotrichloromethane		17
Bromotrifluomethane		17
Bromoxynil	3,5-dibromo-4 hydroxybenzotrile	17, 26, 31
Bronze		23
Buna-N*		101
Bunker fuel oil		101
Butacarb		9
Butadiene		28, 103
Butadiyne	Diacetylene	28
Butanal	Butyraldehyde	5
Butane		29
Butanediol		4

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Butanethiol	Butyl mercaptan	20
Butanetriol trinitrate		102
Butanol	Butyl alcohol	4
Butanone	Methyl ethyl ketone	19
Butenal	Crotonaldehyde	5
Butene		28
Butene-2-one	Methyl vinyl ketone	19
Butyl acetate	Acetoxybutane	13
n-Butyl acrylate		13, 103
Butylamine	Aminobutane	7
Butyl alcohol		4
t-Butyl azidoformate		
Butyl benzene	phenylbutane	16
Butyl benzyl phthalate		13
Butyl cellusolve*		4
Butyl dichloroborane		105
Butyl ether	Dibutyl ether	14
Butyl formate		13
Butyl fluoride		17
Butyl glycidyl ether		34
Butyl hydroperoxide		30
t-Butyl hypochlorite		102, 104
n-Butyl lithium		105, 107
Butyl mercaptan	Butanethiol	20
Butyl peroxide		30
Butyl peroxyacetate	t-Butyl perbenzoate	30

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Butyl peroxybenzoate		30
Butyl peroxy-pivalate		30
t-Butyl perbenzoate	Butyl peroxyacetate	30
t-Butyl-3-phenyl oxazirane		34
Butyl trichlorosilane		107
Butyramide		6
Butyraldehyde	Butanol	5
Butyric acid		3
Butyronitrile		26
Bux*		9
Cacodylic acid	Dimethylarsenic acid	24
Cadmium		23, 24
Cadmium acetylide		24, 105, 107
Cadmium amide		24, 10, 107
Cadmium azide		24, 102
Cadmium bromide		24
Cadmium chlorate		24, 104
Cadmium chloride		24
Cadmium cyanide		11, 24
Cadmium fluoride		15, 24
Cadmium hexamine chlorate		24, 102
Cadmium hexamine perchlorate		24, 102
Cadmium iodide		24
Cadmium nitrate		24, 102, 104
Cadmium nitride		24, 25, 102
Cadmium oxide		24
Cadmium phosphate		24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Cadmium sulfide		24, 33, 105
Cadmium trihydrazine chlorate		24, 102
Cadmium trihydrazine perchlorate		24, 102
Calcium		24, 102
Calcium arsenate		24
Calcium arsenite		24
Calcium bromate		104
Calcium carbide		105, 107
Calcium chlorate		104
Calcium chlorite		104
Calcium fluoride		15
Calcium hexammoniate		105
Calcium hydride		105, 107
Calcium hydroxide	Hydrated lime	10
Calcium hypochlorite	Calcium oxychloride	104
Calcium hypophosphide		105
Calcium iodate		104
Calcium-maganese-silicon alloy		23
Calcium nitrate	Lime nitrate, nitrocalcite	104
Calcium oxide	Slaked lime	10, 107
Calcium oxychloride	Calcium hypochlorite	104
Calcium perchromate		104
Calcium permanganate		104
Calcium peroxide		104
Calcium phosphide		107
Calcium sulfide		33, 105

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Camphor oil		101
Capric acid		3
Caproic acid	Hexanoic acid	3
Caprylic acid		3
Caprylyl peroxide	Octyl peroxide	30
Carbacrol		31
Carbaryl		9
Carbetamide		6
Carbanolate	Banol	9
Carbofuran	Furadan*	9
Carbolic acid	Phenol	31
Carbolic oil		31
Carbon, activated, spent		101
Carbon bisulfide	Carbon disulfide	20
Carbon disulfide	Carbon bisulfide	20
Carbon tetrachloride	Tetrachloromethane	17
Carbon tetrafluoride		17
Carbon tetraiodide		17
Castrix	Crimidine	7
Catechol		31
Caustic potash	Potassium hydroxide	10
Caustic soda	Sodium hydroxide	10
CDEC		12
Cellulose		101
Cellulose nitrate	Nitro cellulose	27, 102
Cerium		22
Cerium hydride		105

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Cerium trisulfide		33, 105
Cerous phosphide		105
Cesium		21
Cesium amide		107
Cesium azide		102
Cesium carbide		105
Cesium fluoride		15
Cesium hexahydroaluminate		105
Cesium hydride		105, 107
Cesium phosphide		107
Cesium sulfide		33, 105
Chloral hydrate	Trichloroacetaldehyde	5
Chlordane		17
Chlorestol	Polychlorinated biphenyl	17
Chlorfenvinphos		32
Chloric acid		2, 104
Chlorine		104
Chlorine azide		102
Chlorine dioxide		102, 104, 107
Chlorine fluoroxide		102, 104
Chlorine monofluoride		104, 107
Chlorine monoxide		104
Chlorine pentafluoride		104, 107
Chlorine trifluoride		104, 107
Chlorine trioxide		102, 104
Chloroacetaldehyde		5, 17

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Chloroacetic acid	Monochloroacetic acid	3, 17
Chloroacetone	Monochloroacetone	17, 19
Chloroacetophenone	Phenyl chloromethyl ketone	17, 19
Chloroacetyl chloride		107
Chloroacetylene		102
Chloroacrylonitrile		17, 26
Chloroazodin		8, 17
Chlorobenzene		17
Chlorobenzotriazole		8, 17
Chlorobenzoyl peroxide		17, 30
Chlorobenzylidene malononitrile		17, 26
Chlorobutyronitrile		17, 26
Chloro chromic anhydride	Chromyl chloride	24, 104, 107
Chlorocreosol		17, 31
Chlorodiborane		105
Chlorodiisobutyl aluminum		105, 107
Chlorodimethylamine diborane		105
Chlorodinitrobenzene	Dinitrochlorobenzene	17, 27
Chloro dinitrotoluene		17, 27
Chlorodipropyl borane		105
Chloroethane	Ethyl chloride	17
Chloroethanol		4, 7
Chloroethylenimine		17
Chloroform	Trichloromethane	17
Chlorohydrin		17
Chloromethane	Methyl chloride	17
Chloromethyl methyl ether		17

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Chloromethyl phenoxyacetic acid		3, 17
Chloronitroaniline		17, 27
Chloronitrobenzene	Nitrochlorobenzene	17, 27
Chloropentane	Amyl chloride	17
Chlorophenol		31
Chlorophenyl isocyanate		17, 18, 107
Chloropicrin	Chlorpicrin, Trichloronitromethane	17, 27, 102
Chloropropane	Isopropyl chloride	17
Chloropropene	Allyl chloride	17
Chloropropylene oxide	Epichlorohydrin	17, 34
Chlorosilane		105
Chlorosulfonic acid		1
Chlorothion*		17, 32
Chlorotoluene	Benzyl chloride	17
Chlorotoluidine		7, 17
Chlorotrinitrobenzene	Picryl chloride	17, 27, 102
B-Chlorovinylchloroarsine	Lewisite	24
Chlorpicrin	Trichloronitromethane	17, 27, 102
Chromic acid	Chromic anhydride, Chromium trioxide	2, 24, 104
Chromic anhydride	Chromium trioxide, Chromic acid	2, 24, 104
Chromic chloride	Chromium trichloride	24
Chromic fluoride	Chromium trifluoride	15, 24
Chromic oxide		24
Chromic sulfate	Chromium sulfate	24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Chromium		23, 24
Chromium sulfate	Chromium sulfate	24
Chromic sulfide		24, 33, 105
Chromium trichloride	Chromic chloride	24
Chromium trifluoride	Chromic fluoride	15, 24
Chromium trioxide	Chromic acid, Chromic anhydride	2, 24, 104
Chromyl chloride	Chloro chromic anhydride	24, 104, 107
Chrysene		16
CMME	Methyl chloromethyl ether	14, 17
Coal oil		101
Coal tar		31
Cobalt		22, 23, 24
Cobalt bromide	Cobaltous bromide	24
Cobalt chloride	Cobaltous chloride	24
Cobalt nitrate	Cobaltous nitrate	24, 104
Cobaltous bromide	Cobalt bromide	24
Cobaltous chloride	Cobalt chloride	24
Cobaltous nitrate	Cobalt nitrate	24, 104
Cobaltous resinate	Cobalt resinate	24
Cobaltous sulfate	Cobalt sulfate	24
Cobalt resinate	Cobaltous resinate	24
Cobalt sulfate	Cobaltous sulfate	24
Collodion	Pyroxylin	27
Copper		23, 24
Copper acetoarsenite	Paris Green	24
Copper acetylide		24, 102, 105, 107

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Copper arsenate	Cupric arsenate	24
Copper arsenite	Cupric arsenite	24
Copper chloride	Cupric chloride	24
Copper chlorotetrazole		24
Copper cyanide	Cupric cyanide	11, 24
Copper nitrate	Cupric nitrate	24, 104
Copper nitride		24, 25
Copper sulfate	Cupric sulfate, Blue vitriol	24
Copper sulfide		23, 33, 105
Compound 1836	Diethyl chlorvinyl phosphate	17, 32
Coroxon*		32
Coumafuryl	Fumarin	19
Coumatetralyl		19
Cresol		31
Cresol glydicyl ether		34
Cresote		31
Crimidine	Castrix	7
Crotonaldehyde	Butenal	5
Crotyl alcohol		4
Crotyl bromide		17
Crotyl chloride		17
Cumene	Isopropyl benzene	16
Cumene hydroperoxide	Dimethylbenzyl hydroperoxide	30
Cupric arsenate	Copper arsenate	24
Cupric arsenite	Copper arsenite	24
Cupric chloride	Copper chloride	24
Cupric cyanide	Copper cyanide	11, 24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Cupric nitrate	Copper nitrate	24, 104
Cupric sulfate	Copper sulfate	24
Cupriethylenediamine		7, 24
Cyanoacetic acid	Malonic nitrile	3, 26
Cyanochloropentane		17, 26
Cyanogen		26
Cyanogen bromide	Bromine cyanide	11
Cyanophenphos	Surecide*	26, 32
Cyanuric triazide		102
Cycloheptane		29
Cyclohexane		29
Cyclohexanol		4
Cyclohexanone		19
Cyclohexanone peroxide		30
Cyclohexylamine		7
Cyclohexenyl trichlorosilane		107
Cyclohexyl phenol		31
Cyclohexyl trichlorosilane		107
Cyclopentane		29
Cyclopentanol		4
Cyclopentene		28
Cyclopropane		29
Cyclotrimethylene trinitraamine	RDX	27, 102
Cymene		16
Cyolan*	Phospholan	20, 32
2,4-D	Dichlorophenoxyacetic acid	3, 17

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Dasanit*	Fensulfothion	32
DBCP	Dibromochloropropane	17
DCB	Dichlorobenzene	17
DDD		17
DDNP	Diazodinitrophenol	8, 27, 102
DDT		17
DDVP	Dichlorovos, Vapona*	17, 32
DEAC	Diethylaluminum chloride	105, 107
Decaborane		107
Decahydronaphthalene	Decalin	29
Decalin	Decahydronaphthalene	29
Decane		29
Decanol		4
Decene		28
Decyl benzene		16
Delnav*	Dioxanthion	32
Demeton-s-methyl sulfoxid	Metasystox R*	32
Diacetone alcohol		4, 19
Diacetyl		19
Diacetylene	Butadiyne	28
Diamine	Hydrazine	8, 105
Diaminobenzene	Phenylene diamine	7
Diaminohexane	Hexamethylenediamine	7
Diazidoethane		8, 102
Diazinon		32
Diazodinitrophenol	DDNP	27, 102
Dibenzoyl peroxide	Benzoyl peroxide	30, 102

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Diborane	Diboron hexahydride	105, 107
Diboronhexahydride	Diborane	105, 107
Dibutyl ether	Butyl ether	14
Dibutyl phthalate		13
3,5-Dibromo-4-hydroxybenzotrile	Bromoxynil	17, 26, 31
Dibromochloropropane	DBCP, Fumazone*, Nemagon*	17
Dibromoethane	Ethylene dibromide	17
Dichloroacetone		17, 19
Dichloroamine		104
Dichlorobenzene	DCB	17
Dichlorobenzidine		7, 17
Dichlorodimethylsilane	Dimethyl dichlorosilane	107
Dichloroethane	Ethylene dichloride	17
Dichloroethene	Dichloroethylene	17
Dichlorether	Dichloroethyl ether	14, 17
Dichlorethylarsine		24, 107
Ethyl dichlorosilane		107
Ethyl ether	Dichloroether	14, 17
Dichloroisocvanuric acid	Dichloro-s-triazine-2,4,5-trione	104
Dichloromethane	Methylene chloride	17
Dichlorophene		17
Dichlorophenol		17, 31
Dichlorophenoxyacetic acid	2,4-D	3, 17
Dichloropropane	Propylene dichloride	17
Dichloropropanol		17
Dichloropropene	Dichloropropylene	17

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Dichloropropylene	Dichloropropene	17
Dichloro-s-triazine-2,4,5-trione	Dichloroisocyanuric acid	104
Dichlorovos	DDVP	17, 32
Dicumyl peroxide		30
Dicyclopentadiene		28
Dieldrin		17
Diesel oil		101
Diethanolamine		4, 7
Diethyl aluminum chloride	Aluminum diethylmonochloride DEAL	105, 107
Diethylamine		7
Diethyl benzene		16
Diethyl chlorovinyl phosphate	Compound 1836	17, 32
Diethyl dichlorosilane		107
Diethylene dioxide	Dioxane	14
Diethylene glycol dinitrate		27, 102
Diethylene glycol monobutyl ether acetate		13
Diethylene triamine		7
Diethyl ether		14
Diethyl ketone		19
Diethyltoluamide		6
Diethyl zinc	Zinc ethyl	24, 105, 107
Difluorophosphoric acid		1
Diglycidyl ether	Bis(2,3 epoxypropyl) ether	34
Diisobutylene		28

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Diisobutyl ketone		19
Diisopropanolamine		4, 17
Diisopropylbenzene hydroperoxide		30
Diisopropyl beryllium		24, 104, 107
Diisopropyl ether	Isopropyl ether	14
Diisopropyl peroxydicarbonate	Isopropyl percarbonate	30
Dimecron*	Phosphamidon	32
Dimefox	Hanane*	6, 32
Dimethyl acetylene		28
Dimethyl amine		7
Dimethylamino azobenzene	Methyl yellow	7, 8
Dimethyl arsenic acid	Cacodylic acid	24
Dimethylbenzyl hydroperoxide	Cumene hydroperoxide	30
Dimethyl butane	Neohexane	29
Dimethyl butyne		28
Dimethyl dichlorosilane	Dichlorodimethylsilane	107
Dimethyldithiophosphoric acid		32
Dimethyl ether		14
Dimethyl formal		19
Dimethyl formamide		6
Dimethylhexane dihydroperoxide		30
Dimethyl hydrazine	UDMH	8
Dimethyl ketone	Acetone	19
Dimethyl magnesium		105, 107
Dimethylnitrobenzene	Nitroxylene	27
Dimethylnitrosoamine	N-Nitrosodimethyl amine	7, 27
Dimethyl sulfide	Methyl sulfide	20

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Dimeton		32
Dinitrobenzene		27
Dinitrochlorobenzene	Chloronitrobenzene	17, 27
2,4-Dinitro-6-sec-butylphenol	Dinoseb	27, 31
Dinitrocresol	DNOC, Elgetol 30	27, 31
Dinitrophenol		27, 31
Dinitrophenyl hydrazine		8, 27
Dinitrotoluene		27
Dinoseb	2,4-Dinitro-6-sec-butylphenol	27, 31
Dioxacarb		9
Dioxane	Diethylene dioxide	14
Dioxathion	Delnav*	32
Dipentaerythritol hexanitrate		27, 102
Dipentene		28
Diphenamide		6
Diphenyl	Phenylbenzene	16
Diphenyl acetylene		16
Diphenylamine		7
Diphenylamine chloroarsine	Phenarsazine chloride	7, 24
Diphenyl ethane		16
Diphenyl ethylene	Stilbene	16
Diphenyl methane	Benzylbenzene	16
Diphenylmethane diisocyanate		18, 107
Diphenyl oxide		14
Dipicryl amine	Hexanitrodiphenylamine	7, 27, 102
Dipropyl amine		7

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Disulfoton	Disyston*	32
Disulfuric acid		1
Disulfur dinitride		25, 102
Disulfuryl chloride		107
Disyston*	Disulfoton	32
Dithane* M-45		12
Dithione*	Sulfotepp	32
DNOC	Dinitrocresol	27, 31
Dodecene		28
Dodecyl benzene		16
Dodecyl trichlorosilane		107
Dowco-139*	Mexacarbate	9
Dowicide I	o-Phenyl phenol	31
Dowtherm		16
Durene		16
Dyfonate*	Fonofos	32
Dynes Thinner		101
Elgetol 30	Dinitrocresol	27, 31
Endolsulfan	Thiodan*	17, 20
Endothall		3
Endothion	Exothion	32
Endrin		17
EPN		32
Epichlorohydrin	Chloropropylene oxide	17, 34
Epoxybutane		34
Epoxybutene		34
Epoxyethane	Ethylene oxide	34, 103

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Epoxyethylbenzene		34
Bis(2-3-Epoxypropyl)ether	Diglycidyl ether	34
Ethane		29
Ethanethiol	Ethyl mercaptan	20
Ethanol	Ethyl alcohol	4
Ethion*	Nialate	32
Ethoxyethanol		4, 14
Ethyl acetate		13
Ethyl acetylene		28
Ethylacrylate		13, 103
Ethyl alcohol	Ethanol	4
Ethylamine	Aminoethane	7
Ethyl benzene	Phenylethane	16
Ethyl butanoate	Ethyl butyrate	13
Ethyl butyrate	Ethyl butanoate	13
Ethyl chloride	Chloroethane	17
Ethyl chloroformate		13, 17
Ethyl dichloroarsine	Dichloroethylarsine	24, 107
Ethyl dichlorosilane		107
Ethyl ether	Diethyl ether	14
Ethylene		28
Ethylene chromic oxide		24, 104
Ethylene chlorohydrin		4, 17
Ethylene cyanohydrin	Hydroxypropionitrile	4, 26
Ethylene diamine		7
Ethylene dibromide	Dibromoethane	17

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Ethylene dichloride	Dichloroethane	17
Ethylene glycol		4
Ethylene glycol dinitrate	Glycol dinitrate	27, 102
Ethylene glycol monomethyl ether		4, 14, 17
Ethyleneimine	Aziridine	7, 103
Ethylene oxide	Epoxyethane	34, 103
Ethyl formate		13
2-Ethylhexyl acrylate		13, 103
Ethyl mercaptan	Ethanethiol	20
Ethyl nitrate		27, 102
Ethyl nitrite		27, 102
Ethyl propionate		13
Ethyl trichlorosilane		107
Exothion	Endothion	32
Eugenol		31
Fensulfothion	Bayer 25141, Dasanit*	32
Ferbam		12
Ferric arsenate		24
Ferric sulfide		33, 105
Ferrous arsenate	Iron arsenate	24
Ferrous sulfide		33, 105
Fluoranthrene		16
Fluorene		16
Fluorine		104, 107
Fluorine azide		102
Fluorine monoxide	Oxygen difluoride	104, 107
Fluoroacetanilide		6, 17

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Fluoroacetic acid		3
Fluoroboric acid		1, 15
Fluorosulfonic acid	Fluosulfonic acid	1, 107
Fluosulfonic acid	Fluorosulfonic acid	1, 107
Fluosilicic acid		1, 15
Fonofos*	Dyfonate*	32
Formaldehyde	Methanal	5
Formamide		6
Formetanate hydrochloride		6
Formic acid	Methanoic acid	3
Fostion*	Prothoate	32
Freon*		17
Fumaric acid		3
Fumarin	Coumafuryl	19
Fumazone	Dibromochloropropane	17
Furadan*	Carbofuran	9
Furan	Furfuran	14
Furfural		5
Furfuran		14
Gas oil, cracked		101
Gasoline		101
Germanium sulfide		33, 105
Glutaradehyde		5
Glycerin		4
Glycidol		34
Glycol diacetate		13

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Glycol dinitrate	Ethylene glycol dinitrate	27, 102
Glycol ether		14
Glycolic acid		3
Glycol monolactate trinitrate		27, 102
Glycolonitrile		26
Gold acetylide		105, 107
Gold cyanate	Gold fulminate	102
Gold fulminate	Gold cyanate	102
Gold sulfide		33, 105
Grease		101
Guaiacol		31
Guanyl nitrosaminoguanilydene hydrazine		8, 102
Guanidine nitrate		27, 104
Gun cotton	Nitrocellulose	27, 102
Guthion*		32
Hafnium		22
Hanane*	Dimefox	6, 32
Hemimellitene		16
Heptachlor		17
Heptane		29
Heptanal		5
Heptanol		4
Heptanone		19
Heptene		28
Hexaborane		105
Hexachlorobenzene		17

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Hexadecyl trichorosilane		107
Hexaethyl tetraphosphate		32
Hexafluorophosphoric acid		1, 15
Hexahydride diborane	Diborane	105, 107
Hexamethyl benzene		16
Hexamethylenediamine	Diaminohexane	7
Hexamethylenetetraamine		7
Hexanal		5
Hexanitrodiphenylamine	Dipicrylamine	7, 27, 102
Hexanol		4
Hexanoic acid	Caproic acid	3
Hexene		28
Hexylamine	Aminohehexane	7
Hexyl trichlorosilane		107
Hexyne		28
HMX		102
Hopcide*		9
Hydrated lime	Calcium hydroxide	10
Hydrazine	Diamine	8, 105
Hydrazine azide		8, 102
Hydrazoic acid	Hydrogen azide	102
Hydriodic acid	Hydrogen iodide	1
Hydrobromic acid	Hydrogen bromide	1, 107
Hydrochloric acid	Muriatic acid	1
Hydrocyanic acid	Hydrogen cyanide	1, 11
Hydrofluoric acid	Hydrogen fluoride	1, 15
Hydrogen azide	Hydrazoic acid	102

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Hydrogen bromide	Hydrobromic acid	1, 107
Hydrogen cyanide	Hydrocyanic acid	1, 11
Hydrogen fluoride	Hydrofluoric acid	1, 15
Hydrogen iodide	Hydroiodic acid	1
Hydrogen peroxide		104
Hydrogen phosphide	Phosphine	105
Hydrogen selenide		24, 105
Hydrogen sulfide		33, 105
Hydroquinone		31
Hydroxyacetophenone		19, 31
Hydroxydibromobenzoic acid		3, 17
Hydroxydiphenol		31
Hydroxyhydroquinone		31
Hydroxyacetophenone		19, 31
Hydroxyisobutronitrile	Acetone cyanohydrin	4, 26
Hydroxyl amine		105
Hydroxypropionitrile	Ethylene cyanohydrin	4, 26
Hypochlorous acid		2
Indene		16
Indium		22, 23, 24
Inerteen	Polychlorinated biphenyl	17
Iodine monochloride		107
Iodine pentoxide		104
Iron		23
Iron Arsenate	Ferrous arsenate	24
Isobutane		29

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Isobutanol		4
Isobutyl acetate		13
Isobutyl acrylate		13, 103
Isobutylene		28
Isodecyl acrylate		13
Isodurene		16
Isoeugenol		31
Isohexane		29
Isooctane	Trimethylpentane	29
Isooctene		28
Isopentane	Methylbutane	29
Isophorone		19
Isoprene	Methyl butadiene	28, 103
Isopropanol		4
Isopropyl acetate		13
Isopropyl acetylene		28
Isopropylamine	Aminopropane	7
Isopropyl benzene	Cumene	16
Isopropyl chloride	Chloropropane	17
Isopropyl ether	Diisopropyl ether	14
Isopropyl mercaptan		20
N-Isopropylmethylcarbamate		9
a-Isopropyl methylphosphoryl fluoride		17, 32
Isopropyl percarbonate	Diisopropyl peroxydicarbonate	30
Isotactic propylene		101
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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Jet Oil		101
Kerosene		101
Lacquer thinner		101
Landrin*		9
Lannate*	Methomyl	9, 20
Lauroyl peroxide		30
Lead		23, 24
Lead acetate		24
Lead arsenate	Lead orthoarsenate	24
Lead arsenite		24
Lead azide		24, 102
Lead carbonate		24
Lead chlorite		24, 104
Lead cyanide		11, 24
Lead dinitroresorcinate		24, 27, 102
Lead mononitroresorcinate		24, 27, 102
Lead nitrate		24, 104
Lead orthoarsenate	Lead arsenate	24
Lead oxide		24
Lead styphnate	Lead trinitroresorcinate	24, 27, 102
Lead sulfide		24, 33, 104
Lead trinitroresorcinate	Lead styphanate	24, 27, 102
Lewisite	B-Chlorovinylchloroarsine	24
Lime nitrate	Calcium nitrate	104
Lindane		17
Lithium		21, 107
Lithium aluminum hydride		105, 107

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Lithium amide		10, 107
Lithium ferrosilicon		107
Lithium hydride		105, 107
Lithium hydroxide		10
Lithium hypochlorite		104
Lithium nitride		25
Lithium peroxide		104, 107
Lithium silicon		107
Lithium sulfide		33, 105
London purple		24
Lye		10
Magnesium	Sodium hydroxide	21, 22
Magnesium arsenate		24
Magnesium arsenite		24
Magnesium chlorate		104
Magnesium fluoride		15
Magnesium nitrate		104
Magnesium perchlorate		104
Magnesium peroxide		104
Magnesium sulfide		33, 105
Malathion		32
Maleic acid		3
Malonic nitrile	Cyanoacetic acid	3, 26
Maneb		12
Manganese		22, 23, 24
Manganese acetate		24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
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	Maganese bromide	24
Manganous chloride	Manganese chloride	24
Manganous nitrate	Manganese nitrate	104
Mannitol hexanitrate	Nitromannite	27, 102
Matacil*		9
Mayer's reagent	Mercuric potassium iodide	24
Medinoterb acetate		13, 27
Meobal		9
Mercaptobenzothiazole		8, 20
Mercatoethanol		4, 20
Mercarbam		32
Mercuric acetate		24
Mercuric ammonium chloride	Mercury ammonium chloride	24
Mercuric benzoate	Mercury benzoate	24
Mercuric bromide		24
Mercuric chloride	Mercury chloride	24
Mercuric cyanide	Mercury cyanide	11, 24
Mercuric dioxysulfate	Mercuric subsulfate	24
Mercuric iodide	Mercury iodide	24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Mercuric nitrate	Mercury nitrate	24, 104
Mercuric oleate	Mercury oleate	24
Mercuric oxide		24
Mercuric oxycyanide		11, 24, 102
Mercuric potassium iodide	Mayer's reagent	24
Mercuric salicylate	Salicylated mercury	24
Mercuric subsulfate	Mercuric dioxysulfate	24
Mercuric sulfate	Mercury sulfate	24
Mercuric sulfide		24, 33, 105
Mercuric thiocyanate	Mercury thiocyanide	24
Mercuric thiocyanide	Mercury thiocyanate	24
Mercuriol	Mercury nucleate	24
Mercurous bromide		24
Mercurous gluconate		24
Mercurous iodide		24
Mercurous nitrate		24, 104
Mercurous oxide		24
Mercurous sulfate	Mercury bisulfate	24
Mercury		24
Mercury (vapor)		22, 24
Mercury acetate	Mercuric acetate	24
Mercury ammonium chloride	Mercuric ammonium chloride	24
Mercury benzoate	Mercuric benzoate	24
Mercury bisulfate	Mercurous sulfate	24
Mercury chloride	Mercuric chloride	24
Mercury cyanide	Mercuric cyanide	11, 24
Mercury fulminate		24, 102

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Mercury iodide	Mercuric iodide	24
Mercury nitrate	Mercuric nitrate	24, 104
Mercury nucleate	Mercuriol	24
Mercury oleate	Mercuric oleate	24
Mercury sulfate	Mercuric sulfate	24
Mesitylene	1,3,5-trimethylbenzene	16
Mesityl oxide		19
Mesurol*		9
Mestastox-R	Demeton-S-methyl sulfoxid	32
Metham		12
Methanal	Formaldehyde	5
Methane		29
Methanethiol	Methyl mercaptan	20
Methanoic acid	Formic acid	3
Methanol	Methyl alcohol	4
Methomyl	Lannate*	9, 20
Methoxyethylmercuric chloride	Agallolaretan*	24
Methyl acetate		13
Methyl acetone		101
Methyl acetylene	Methyl butyne	28
Methyl acrylate		13, 103
Methyl alcohol	Methanol	4
Methyl aluminum sesquibromide		105, 107
Methyl aluminum sesquichloride		105, 107
Methylamine	Aminomethane	7
Methyl amyl acetate		13

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
N-Methyl aniline		7
Methyl aziridine	Propyleneimine	7
Methyl benzene	Toulene	16
Methyl bromide	Bromomethane	17
Methyl butadiene	Isoprene	28, 103
Methyl butane	Isopentane	29
Methyl butene		28
Methyl butyl ether		14
Methyl t-butyl ketone		19
Methyl butyne	Isopropyl acetylene	28
Methyl butyrate		13
Methyl chloride	Chloromethane	17
Methyl chlorocarbonate	Methyl chloroformate	13, 17
Methyl chloroform		17
Methyl chloroformate	Methyl chlorocarbonate	13, 17
Methyl chloromethyl ether	CMME	14, 17
Methyl cyanide	Acetonitrile	26
Methyl cyclohexane		29
Methyl dichloroarsine		24
Methyl dichlorosilane		107
Methylene chloride	Dichloromethane	17
Methylene diisocyanate		18, 107
4,4-Methylene bis(2-chloroaniline)		7, 17
Methyl ethyl chloride		17
Methyl ethyl ether		14
Methyl ethyl ketone	Butanone	19
Methyl ethyl ketone peroxide		30

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Methyl ethyl pyridine		7
Methyl formate		13
Methyl hydrazine	Monomethyl hydrazine	8
Methyl iodide		17
Methyl isobutyl ketone		19
Methyl isocyanate		18, 107
Methyl isopropenyl ketone		19
Methyl magnesium bromide		105, 107
Methyl magnesium chloride		105, 107
Methyl magnesium iodide		105, 107
Methyl mercaptan	Methanethiol	20
Methyl methacrylate		13, 103
Methyl naphthalene		16
Methyl parathion		32
Methyl Pentanoate	Methyl valerate	13
Methyl propionate		13
Methyl n-propyl ketone		19
Methyl styrene		28, 103
Methyl sulfide	Dimethyl sulfide	20
Methyl trichlorosilane		107
Methyl valerate	Methyl pentanoate	13
Methyl vinyl ketone	Butene-2-one	19
Methyl yellow	Dimethylamino azobenzene	7, 8
Mevinphos	Phosdrin*	32
Mexacarbate	Dowco-139*	9
Mineral spirits		101

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Mintacol*	Paraoxon	32
Mipcin*		9
Mobam*		9
Mocap*		32
Molybdenum		22, 23, 24
Molybdenum anhydride	Molybdenum trioxide	24
Molybdenum sulfide		24, 33, 105
Molybdenum trioxide	Molybdenum anhydride	24
Molybdic acid		24
Monochloroacetone	Chloroacetone	17, 19
Monochloroacetic acid	Chloracetic acid	3, 17
Monocrotophos	Azodrin*	32
Monoethanol amine		4, 7
Monofluorophosphoric acid		1
Monoisopropanolamine		4, 7
Monomethyl hydrazine	Methyl hydrazine	8
Morpholine		7
Municipal solid waste	Refuse	101
Muriatic acid	Hydrochloric acid	1
Nabam		12
Nack	Sodium-potassium alloy	21, 107
Nak	Sodium-potassium alloy	21, 107
Naptha		101
Naphthalene		16
Naphthol		31
Naphthylamine		7
Naphthyl mercaptan		20

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Naphtite	Trinitronaphthalene	27, 102
Nemagon*	Dibromochloropropane	17
Neohexane	Dimethyl butane	29
4-NBP	Nitrobiphenyl	27
Niacide*		12
Nialate	Ethion	32
Nickel		22, 24
Nickel acetate		24
Nickel antimonide		24, 107
Nickel arsenate	Nickelous arsenate	24
Nickel arsenite	Nickelous arsenite	24
Nickel carbonyl	Nickel tetracarbonyl	24
Nickel chloride	Nickelous chloride	24
Nickel cyanide		11, 24
Nickel nitrate	Nickelous nitrate	24, 104
Nickelous arsenate	Nickel arsenate	24
Nickelous arsenite	Nickel arsenite	24
Nickelous chloride	Nickel chloride	24
Nickelous nitrate	Nickel nitrate	24, 104
Nickel selenide		24
Nickel subsulfide		24, 33, 105
Nickel sulfate		24
Nickel tetracarbonyl	Nickel carbonyl	24
Nitraniline	Nitroaniline	7, 27
Nitric acid		2
Nitroaniline	Nitraniline	7, 27

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Nitrobenzene	Nitrobenzol	27
Nitrobenzol	Nitrobenzene	27
Nitrobiphenyl	4-NBP	27
Nitrocalcium	Calcium nitrate	104
Nitrocellulose	Cellulose nitrate, gun cotton	27, 102
Nitrochlorobenzene	Chloronitrobenzene	17, 27
Nitrogen dioxide		104
Nitromannite	Mannitol hexanitrate	27, 102
Nitrogen mustard		7, 17
Nitrogen tetroxide		104
Nitroglycerin	Trinitroglycerin	27, 102
Nitrohydrochloric acid		2
Nitrophenol		27, 31
Nitropropane		27
Nitrosodimethylamine	Dimethylnitrosiamine	7, 27
Nitrosoguanidine		27, 102
Nitrostarch	Starch nitrate	27, 102
Nitroxylene	Nitroxylol, Dimethylnitrobenzene	27
Nitroxylol	Nitroxylene, Dimethylnitrobenzene	27
N-Nitrosodimethylamine	Dimethylnitrosoamine	7, 27
Nonyl phenol		31
Nonyl trichlorosilane		107
Nonane		29
Nonene		28
Nonanone		19

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Nonanal		5
Nonanol		4
Octadecyl trichlorosilane		107
Octadecyne		28
Octamethylpyrophosphoramidate	Schradan	6, 32
Octanal		5
Octane		29
Octanone		19
Octanol		4
Octene		28
Octyl peroxide	Caprylyl peroxide	30
Octyl trichlorosilane		107
Oil of bergamot		101
Oil of vitriol	Sulfuric acid	1
Oleum	Sulfuric acid	2, 24
Orris root		101
Orthozenol	o-Phenyl phenol	31
Osmium		23, 24
Osmium amine nitrate		24, 104
Osmium amine perchlorate		24, 104
Oxamyl		9
Oxalic acid		3
Oxygen difluoride		104, 107
PCB	Polychlorinated biphenyl	17
Paper		101
Paraoxon	Mitacol*	32
Parathion		32

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Paris green	Copper acetoarsenite	24
PETD	Polyram combi*	12
PETN	Pentaerythrityl tetranitrate, Pentaerythritol tetranitrate	27, 102
Pentaborane		105
Pentachlorophenol		17, 31
Pentaerythritol tetranitrate	Pentraerythrityl tetranitrate, PETN	27, 102
Pentamethyl benzene		16
Pentane		29
Pentanethiol	Amyl mercaptan	20
Pentanal	Valeraldehyde	5
Pentanone		19
Pentene	Amylene	28
Pentylamine		7
Pentyne		28
Peracetic acid	Peroxyacetic acid	3, 30
Perbromic acid		2
Perchloric acid		2
Perchloroethylene	Tetrachloroethylene	17
Perchloromethyl mercaptan	Trichloromethylsulfenylchloride	17, 20
Perchlorous acid		2
Perchloryl fluoride		104
Periodic acid		2
Permonosulfuric acid		1
Peroxyacetic acid	Peracetic acid	3, 30
PETD	Polyram combi*	12

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Petroleum naptha		101
Petroleum oil		101
Phenanthrene		16
Phenarsazine chloride	Dephenylamine chloroarsine	7, 24
Phenol	Carbolic acid	31
Phenyl acetic acid		3
Phenyl acetonitrile		26
Phenyl acetylene		16
Phenylaniline	Diphenylamine	7
Phenylbenzene	Diphenyl	16
Phenylbutane	Butylbenzene	16
Phenylchloromethyl ketone	Chloroacetophenone	17, 19
Phenyl dichloroarsine		24
Phenylene diamine	Diaminobenzene	7
Phenylethane	Ethylbenzene	16
Phenyl hydrazine hydrochloride		8
o-Phenyl phenol	Orthozenol, Dowicide I	31
Phenyl trichlorosilane		107
Phenyl valeryl nitrile		26
Phenylpropane	Propylbenzene	16
Phloroglucinol		31
Phorate	Thimet*	32
Phosdrin*	Mevinphos	32
Phosphamidon	Dimecron*	32
Phosphine	Hydrogen phosphide	105
Phospholan	Cyolan*	20, 32
Phosphonium iodide		105, 107

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Phosphoric acid		1
Phosphoric anhydride	Phosphorus pentoxide	107
Phosphoric sulfide	Phosphorus pentasulfide	33, 105, 107
Phosphorus (Amorphous red)		105, 107
Phosphorus (White-Yellow)		105
Phosphorus heptasulfide		33, 105
Phosphorus oxybromide	Phosphoryl bromide	104, 107
Phosphorus oxychloride	Phosphoryl chloride	104, 107
Phosphorus pentachloride	Phosphoric chloride	107
Phosphorus pentasulfide	Phosphoric sulfide	33, 105, 107
Phosphorus pentoxide	Phosphoric anhydride	107
Phosphorus sesquisulfide	Tetraphosphorus trisulfide	33, 105, 107
Phosphorus tribromide		107
Phosphorus trichloride		107
Phosphorus trisulfide		33, 105, 107
Phosphoryl bromide	Phosphorus oxybromide	104, 107
Phosphoryl chloride	Phosphorus oxychloride	104, 107
Phthalic acid		3
Picramide	Trinitroaniline	7, 27, 102
Picric acid	Trinitrophenol	27, 31, 102
Picridine		7
Picryl chloride	Chlorotrinitrobenzene	17, 27, 102
Piperidine		7
Pirimicarb		9
Polyglycol ether		14
Polyamide resin		101

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Polybrominated biphenyl		17
Polybutene		28
Polychlorinated biphenyls	PCB, Askarel, Arochlor*, Chlorextol, Inerteen	17
Polychlorinated triphenyls		17
Polyethylene		101
Polyester resin		101
Polymeric oil		101
Polyphenyl Polymethylisocyanate		18, 107
Polypropylene		28, 101
Polyram combi*	PETD	12
Polysulfide polymer		20, 101
Polystyrene		101
Polyurethane		101
Polyvinyl acetate		101
Polyvinyl chloride		101
Polyvinyl nitrate		27, 102
Potasan		32
Potassium		21, 107
Potassium acid fluoride	Potassium fluoride	15
Potassium aluminate		10
Potassium arsenate		24
Potassium arsenite		24
Potassium bifluoride	Potassium fluoride	15
Potassium bichromate	Potassium dichromate	24, 104
Potassium bromate		104
Potassium butoxide		10

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Potassium cyanide		11
Potassium dichloroisocyanurate		104
Potassium dichromate	Potassium bichromate	24, 104
Potassium dinitrobenzfuroxan		27, 102
Potassium fluoride	Potassium acid fluoride	15
Potassium hydride		105, 107
Potassium hydroxide	Caustic potash	10
Potassium nitrate	Saltpeter	102, 104
Potassium nitride		25
Potassium nitrite		104
Potassium oxide		107
Potassium perchlorate		104
Potassium permanganate		24, 104
Potassium peroxide		104, 107
Potassium sulfide		33, 105
Promecarb		9
Propanal	Propionaldehyde	5
Propane		29
Propanethiol	Propyl mercaptan	20
Propanoic acid	Propionic acid	3
Propanol	Propyl alcohol	4
Propargyl bromide		17
Propargyl chloride		17
2-Propen-1-ol	Allyl alcohol	4
Propiolactone		13
Propionaldehyde	Propanoic acid	5
Propionamide		6

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Propionic acid		3
Propionitrile	Propanol	26
Propyl acetate		13
Propyl alcohol	Phenyl propane	4
Propylamine	Dichloropropane	7
Propyl benzene		16
Propylene dichloride		17
Propylene glycol		4
Propylene glycol monomethyl ether		4, 14
Propylene oxide		34, 103
Propyleneimine	Methyl aziridine	7
Propyl ether		14
Propyl formate		13
Propyl mercaptan	Propanethiol	20
Propyl Trichlorosilane		107
Prothoate	Fostion*	32
Pseudocumene	1,2,4 trimethylbenzene	16
Pyridine		7
Pyrogallol		31
Pyrosulfuryl chloride	Disulfuryl chloride	107
Pyroxylin	Collodion	27
Quinone	Benzoquione	19
Raney nickel		22
RDX	Cyclotrimethylene trinitramine	27, 102
Refuse	Municipal solid waste	101
Resins		101

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Resorcinol		31
Rubidium		21
Salicylated mercury	Mercuric salicylate	24
Saligenin		31
Saltpeter	Potassium nitrate	102, 104
Schradan	Octamethyl pyrophosphoramidate, OMPA	6, 32
Selenious acid	Selenous acid	1, 24
Selenium		22, 23, 24
Selenium diethyldithiocarbamate		12, 24
Selenium fluoride		15, 24
Selenous acid	Selenious acid	1, 24
Silicochloroform	Trichlorosilane	107
Silicon tetrachloride		107
Silicon tetrafluoride		15, 107
Silver acetylide		24, 102, 105, 107
Silver azide		24, 102
Silver cyanide		11, 24
Silver nitrate		24, 104
Silver nitride		24, 25, 102
Silver styphnate	Silver trinitroresorcinate	24, 27, 102
Silver sulfide		24, 33, 105
Silver tetrazene		24, 102
Silver trinitroresorcinate	Silver styphnate	24, 27, 102
Slaked lime	Calcium oxide	10, 107
Smokeless powder		102
Sodamide	Sodium amide	10, 107

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Soda niter	Sodium nitrate	104
Sodium		21, 105, 107
Sodium acid fluoride	Sodium fluoride	15
Sodium aluminate		10, 105
Sodium aluminum hydride		105, 107
Sodium amide	Sodamide	10, 107
Sodium arsenate		24
Sodium arsenite		24
Sodium azide		102
Sodium bichromate	Sodium dichromate	24, 104
Sodium bifluoride	Sodium flouride	15
Sodium bromate		104
Sodium cacodyloate	Sodium dimethylarsenate	24
Sdoium carbonate		10
Sodium carbonate peroxide		104
Sodium chlorate		104
Sodium chlorite		104
Sodium chromate		24
Sodium cyanide		11
Sodium dichloroisocyanurate		104
Sodium dichromate	Sodium bichromate	24, 104
Sodium dimethylarsenate	Sodium cacodylate	24
Sodium fluoride	Sodium acid fluoride	15
Sodium hydride		105, 107
Sodium hydroxide	Caustic soda, Lye	10
Sodium hypochlorite		10, 104
Sodium hyposulfite	Sodium thiosulfate	105

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Sodium methylate	Sodium methoxide	10, 107
Sodium methoxide	Sodium methylate	10, 107
Sodium molybdate		24
Sodium monoxide	Sodium oxide	10, 107
Sodium nitrate	Sodium niter	104
Sodium nitride		25
Sodium nitrite		104
Sodium oxide	Sodium monoxide	10, 107
Sodium pentachlorophenate		31
Sodium perchlorate		104
Sodium permanganate		24, 104
Sodium peroxide		104, 107
Sodium phenolsulfonate		31
Sodium picramate		27, 102
Sodium polysulfide		101
Sodium potassium alloy	Nak, Nack	21, 107
Sodium selenate		24
Sodium sulfide		24, 33, 105
Sodium thiosulfate		105
Stannic chloride	Tin tetrachloride	24, 107
Stannic sulfide		33, 105
Starch nitrate	Nitrostarch	27, 102
Stilbene	Diphenyl ethylene	16
Stoddard solvent		101
Strontium		24
Strontium arsenate		24

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Strontium dioxide	Strontium peroxide	24, 104
Strontium monosulfide		24, 33, 105
Strontium nitrate		24, 104
Strontium peroxide	Strontium dioxide	104
Strontium tetrasulfide		24, 33, 105
Styphnic acid	Trinitroresorcinol	27, 31, 102
Styrene	Vinylbenzene	16, 28, 103
Succinic acid		3
Succinic acid peroxide		30
Sulfonyl chloride	Sulfuryl chloride	107
Sulfonyl fluoride		107
Sulfotepp	Dithione*, Blada-Fum*	32
Sulfur chloride	Sulfur monochloride	107
Sulfur (elemental)		101
Sulfuric acid	Oil of Vitriol, Oleum	2, 107
Sulfuric anhydride	Sulfur trioxide	104, 107
Sulfur monochloride	Sulfur chloride	107
Sulfur mustard		20
Sulfur oxychloride	Thionyl chloride	107
Sulfur pentafluoride		15, 107
Sulfur trioxide	Sulfuric anhydride	104, 107
Sulfuryl chloride	Sulfonyl chloride	107
Sulfuryl fluoride	Sulfonyl fluoride	107
Supracide*	Ultracide*	32
Surecide*	Cyanophenphos	32
Synthetic rubber		101
TCDD	Tetrachlorodibenzo-p-dioxin	14, 17

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
TEDP	Tetraethyl dithionopyrophosphate	32
TEL	Tetraethyl lead	24
TEPA	Tris-(1-aziridiny) phosphine oxide	6, 32
TEPP	Tetraethyl pyrophosphate	32
THF	Tetrahydrofuran	14
TMA	Trimethylamine	7
TML	Tetramethyl lead	24
TNB	Trinitrobenzene	27, 102
TNT	Trinitrotoluene	27, 102
Tall oil		101
Tallow		101
Tar		101
Tellurium hexafluoride		15, 24
Temik*	Aldicarb	9, 20
Tetraborane		105
Tetrachlorodibenzo-p-dioxin	TCDD	14, 17
Tetrachloroethane		17
Tetrachloroethylene	Perchloroethylene	17
Tetrachloromethane	Carbon tetrachloride	17
Tetrachlorophenol		14, 17
Tetrachloropropyl ether		14, 17
Tetradecene		28
Tetraethyl dithionopyrophosphate	TEDP	32
Tetraethyl lead	TEL	24
Tetraethyl pyrophosphate	TEPP	32
Tetrahydro furan	THF	14

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Tetramethylenediamine		7
Tetramethyl lead	TML	24
Tetramethyl succinonitrile		26
Tetranitromethane		27, 102
Tetraphenyl ethylene		16
Tetraphosphorous trisulfide	Phosphorous sesquisulfide	33, 105, 107
Tetraselenium tetranitride		24, 25, 102
Tetrasul	Anivert* V-101	20
Tetrasulfur tetranitride		25, 102
Tetrazene		8, 102
Thallium		24
Thallium nitride		24, 25, 102
Thallium sulfide		24, 33, 105
Thallosulfate		24
Thimet*	Phorate	32
Thionyl chloride	Sulfur oxychloride	107
Thiocarbonyl chloride	Thiophosgene	107
Thiodan*	Endosulfan	17, 20
Thionazin	Zinophos*	32
Thionyl chloride	Sulfur oxychloride	107
Thiophosgene	Thiocarbonyl chloride	107
Thiophosphoryl chloride		107
Thiram		12
Thorium		22, 23, 24
Tin tetrachloride	Stannic chloride	24, 107
Titanic chloride	Titanium tetrachloride	24, 107

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Titanium		22, 23, 24
Titanium sesquisulfide		24, 33, 105
Titanium sulfate		24
Titanium sulfide		24, 33, 105
Titanium tetrachloride	Titanic chloride	24, 107
TMA	Trimethylamine	7
TNB	Trinitrobenzene	27, 102
TNT	Trinitrotoluene	27, 102
Tolualdehyde		5
Toluene	Toluol, Methylbenzene	16
Toluene diisocyanate		18, 107
Toluic acid		3
Toluidine	Aminotoluene	7
Toluol	Toluene, Methylbenzene	16
Topcide*	Benzadox	6
Tranid*		9, 26
Triamphos	Wepsyn* 155	6, 32
Tribromomethane	Bromoform	17
Tri-n-butylaluminum		107
Tricadmium dinitride		24, 25
Tricalcium dinitride		25
Tricesium nitride		24, 25
Trichloroacetaldehyde	Chloral hydrate	5, 17
Trichloroborane		107
Trichloroethane		17
Trichloroethene	Trichloroethylene	17
Trichloroisocyanuric acid		17

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Trichloromethane	Chloroform	104
Trichloromethyl sulfenyl chloride	Perchloromethyl mercaptan	17, 20
Trichloronitromethane	Chloropicrin	17, 27, 102
Trichlorophenoxyacetic acid		3, 17
Trichloropropane		17
Trichlorosilane	Silicochloroform	107
Tridecene		28
Triethanolamine		4, 7
Triethyl aluminum		105, 107
Triethyl antimony	Triethylstibine	24, 105, 107
Triethyl arsine		24, 107
Triethyl bismuthine		24
Triethylamine		7
Triethylene phosphoramidate	Tris(1-aziridinyl) phosphine oxide	6, 32
Triethylene tetraamine		7
Triethyl stibine	Triethyl antimony	24, 105, 107
Trifluoroethane		17
Trifluoromethylbenzene	Benzotrifluoride	17
Triisobutyl aluminum		105, 107
Trilead dinitride		24, 25, 102
Trimercury dinitride		24, 25, 102
Trimethyl aluminum		105, 107
Trimethylamine	TMA	7
Trimethyl antimony	Trimethylstibine	24, 105, 107
Trimethyl arsine		24, 107
1,2,4-Trimethylbenzene	Pseudocumene	16

<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
1,3,5-Trimethylbenzene	Mesitylene	16
Trimethyl bismuthine		24
Trimethyl pentane	Isoctane	29
Trimethylstibine	Trimethyl antimony	24, 105, 107
Tri-n-butylborane		105, 107
Trinitroaniline	Picramide	7, 27, 102
Trinitroanisole	Trinitrophenylmethyl ether	14, 27
Trinitrobenzene	TNB	27, 102
Trinitrobenzoic acid		3, 27, 102
Trinitroglycerin	Nitroglycerin	27, 102
Trinitronaphthalene	Naphtite	27, 102
Trinitrophenol	Picric acid	27, 31, 102
Trinitrophenyl methyl ether	Trinitroanisole	14, 27
Trinitroresorcinol	Styphnic acid	27, 31, 102
Trinitrotoluene	TNT	27, 102
Trioctyl aluminum		105, 107
Triphenyl ethylene		16
Triphenyl methane		16
Tripropylamine		7
Tripropyl stibine		24, 107
Trisilyl arsine		24, 107
Tris-(1-azirdinyl) phosphine oxide	TEPA, Triethylene, phosphoramide	6, 32
Trithion		32
Trithorium tetranitride		24, 25
Trivinyl stibine		24, 107
Tsumacide*		9

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Tungstic acid		24
Turpentine		101
UDMH	Dimethyl hydrazine	8
Ultracide*	Supracide*	32
Undecene		28
Unisolve		101
Uranium nitrate	Uranyl nitrate	24, 104
Uranium sulfide		24, 33, 105
Uranyl nitrate	Uranium nitrate	24, 104
Urea formaldehyde		5
Urea nitrate		27, 102, 104
VC	Vinylidene chloride	17, 103
Valeraldehyde	Pentanal	5
Valeramide		6
Valeric acid		3
Vanadic acid anhydride	Vanadium pentoxide	24
Vanadium oxytrichloride		24
Vanadium pentoxide	Vanadic acid anhydride	24
Vanadium sulfate	Vanadyl sulfate	24
Vanadium tetroxide		24
Vanadium trichloride		24, 107
Vanadium trioxide		24
Vanadyl sulfate	Vanadium sulfate	24
Vapona*	DDVP	32
Vinyl acetate		13, 103
Vinyl azide		102

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Vinyl benzene	Styrene	16, 28, 103
Vinyl chloride		17, 103
Vinyl cyanide		26, 103
Vinyl ethyl ether		14
Vinyl isopropyl ether		17
Vinylidene chloride	VC	17, 103
Vinyl toluene		28, 103
Vinyl trichlorosilane		107
VX		20, 32
Water		106
Waxes		101
Wepsyn* 155	Triamiphos	6, 32
Wood		101
Zectran*	Dowco 139*	9
Zinc		22, 23, 24
Zinc acetylide		24, 105, 107
Zinc ammonium nitrate		24, 104
Zinc arsenate		24
Zinc arsenite		24
Zinc chloride		24
Zinc dioxide	Zinc peroxide	24, 102, 104, 107
Zinc ethyl	Diethyl zinc	24, 105, 107
Zinc cyanide		11, 24
Zinc fluoborate		24, 15
Zinc nitrate		24, 104
Zinc permanganate		24, 104
Zinc peroxide	Zinc dioxide	24, 102, 104, 107

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<u>Names</u>	<u>Synonyms</u>	<u>RGN</u>
Zinc phosphide		24, 107
Zinc salts of dimethyl dithiocarbamic acid		12, 24
Zinc sulfate		24
Zinc sulfide		24, 33, 105
Zineb*		12, 24
Zinophos*	Thioazin	20
Ziram*		12, 24
Zirconium		22, 23, 24
Zirconium chloride	Zirconium tetrachloride	24
Zirconium picramate		24, 104
Zirconium tetrachloride	Zirconium chloride	24

Practical Exercise Using the EPA Compatibility Chart

QUESTIONS

- (1) Should you store Kerosene and Nitric Acid together?
- (2) Are Acetone and Carbon Tetrachloride compatible?

SCENARIO

You have recently been assigned to manage hazardous materials for your activity/unit. Your activity/unit has a hazardous materials storage shed that has six sections with physical separation. Right now, materials are stored as shown below. Your first job is to evaluate potential compatibility problems using the HW Compatibility Chart method.

Section 1

Nitric Acid
Formic Acid
Acetylene

Section 2

Toluene
Calcium Nitrate

Section 3

Ethylene Glycol
Hydrochloric Acid

Section 4

Trichloroethene
DS2 (70% Diethylene triamine)

Section 5

Calcium Hypochlorite
Methyl Ethyl Ketone

Section 6

Diesel Oil
Freon
Sulfuric Acid

(3) Find the reactivity group number (RGN) for each hazardous material (HM).

HM

RGN

Nitric Acid
Formic Acid
Acetylene
Toluene
Ethylene Glycol
Hydrochloric Acid
Trichloroethene
DS2 (70% Diethylene triamine)
Calcium Hypochlorite
Methyl Ethyl Ketone
Diesel Oil
Freon
Sulfuric Acid
Calcium Nitrate

(4) As these hazardous materials are stored now, what is likely to happen in each section if there is a spill?

Section 1:

Section 2:

Section 3:

Section 4:

Section 5:

Section 6:

(5) Rearrange the above chemicals so that they are stored compatibly.

Section 1

Section 4

Section 2

Section 5

Section 3

Section 6

ANSWERS

(1) Kerosene RGN is 101. Nitric Acid RGN is 2. Use the Compatibility Chart on page D-5. Intersecting 101 with 2 shows that an incompatible reaction may cause heat, fire, and toxic gas generation. Do not store together.

(2) Acetone RGN is 19. Carbon Tetrachloride is 17. Use the Compatibility Chart on page D-5. Intersecting 19 with 17 shows that these hazardous materials are compatible. You may store them together.

(3) Find the reactivity group number (RGN) for each hazardous material (HM).

<u>HM</u>	<u>RGN</u>
Nitric Acid	2
Formic Acid	3
Acetylene	28
Toluene	16
Ethylene Glycol	4
Hydrochloric Acid	1
Trichloroethene	17
DS2 (70% Diethylene triamine)	7
Calcium Hypochlorite	104
Methyl Ethyl Ketone	19
Diesel Oil	101
Freon	17
Sulfuric Acid	2, 107
Calcium Nitrate	104

(4) As these hazardous materials are stored now, what is likely to happen in each section if there is a spill?

Section 1: **2 + 3 = H – Heat**

G – Innocuous and non-flammable gas generation

2 + 28 = H – Heat

F – Fire

3 + 28 = Nothing

Section 2: **16 + 104 = H – Heat**

F- Fire

Section 3: **4 + 1 = H - Heat**

Section 4: **17 + 7 = H – Heat**

GF – Flammable Gas Generation

Section 5: **104 + 19 = H – Heat**
F- Fire

Section 6: **10 + 17 = H – Heat**
GF - Flammable Gas Generation
10 + 2 = H – Heat
10 + 107 = Never mix 107 with any other reactivity group
17 + 2 = H – Heat
GT – Toxic Gas Generation
F- Fire
17 + 107 = Never mix 107 with any other reactivity group

(5) Rearrange the above chemicals so that they are stored compatibly. Note: This is one way to store these hazardous materials. Other arrangements may be possible.

Section 1

Nitric Acid
Calcium Nitrate
Calcium Hypochlorite

Section 4

Ethylene Glycol
Acetylene
DS2 (70% Diethylene triamine)
Methyl Ethyl Ketone

Section 2

Formic Acid
Trichloroethene
Freon

Section 5

Diesel Oil

Section 3

Toluene
Hydrochloric Acid

Section 6

Sulfuric Acid