

**U.S. Army Center for Health Promotion
and Preventive Medicine**

**Hazardous Material/Hazardous Waste
Management Guidance for
Maneuver Units
During Field and Deployment Operations**

Technical Guide 217

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PREFACE

This Technical Guide (TG) was developed to assist tactical units in properly managing hazardous material (HM) and hazardous waste (HW) during field and contingency operations. Proper management practices will safeguard the health of soldier and protect the environment. Additionally, these measures will ease logistical burdens, and produce cost savings through waste minimization and pollution prevention. These guidelines are intended to assist soldiers in developing unit and operation-specific standard operating procedures (SOPs) for HM/HW management in any area of operation. Although the focus of this TG is the maneuver brigade and battalion operations, the information provided can be adapted to apply to company and platoon sized units during any field or deployment operation.

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LIST OF ACRONYMS

<i>AO</i>	Area of Operation
<i>BSA</i>	Brigade Support Area
<i>CARC</i>	Chemical Agent Resistant Coating
<i>CoC</i>	Chain of Command
<i>CONUS</i>	Continental United States (Inside)
<i>DEH</i>	Directorate of Engineering and Housing
<i>DRMO</i>	Defense Reutilization and Marketing Office
<i>DS2</i>	Decontaminating Agent
<i>HEMTT</i>	Heavy Expanded Mobile Tactical Truck
<i>HM</i>	Hazardous Material
<i>HW</i>	Hazardous Waste
<i>LRP</i>	Logistics Re-supply Point
<i>MSDS</i>	Material Safety Data Sheet
<i>NCOIC</i>	Non-Commissioned Officer in Charge
<i>NSN</i>	National Stock Number
<i>OCONUS</i>	Outside the Continental United States
<i>OIC</i>	Officer in Charge
<i>OPCON</i>	Operational Control
<i>POL</i>	Petroleum, Oils, and Lubricants
<i>PPE</i>	Personal Protective Equipment
<i>S-4</i>	Supply Officer/NCO
<i>STB</i>	Super Tropical Bleach
<i>UMCP</i>	Unit Maintenance Collection Point
<i>USACHPPM</i>	U.S. Army Center for Health Promotion and Preventive Medicine

CHAPTER 1: INTRODUCTION

1-1. PURPOSE.

The purpose of this document is to provide hazardous material (HM) and hazardous waste (HW) management guidance to tactical maneuver units during contingency operations in the field or on major deployments.

1-2. APPLICABILITY.

This document applies to all personnel assigned or attached to or under operational control (OPCON) of a maneuver brigade during field and contingency operations.

1-3. REFERENCES:

- (1) Army Regulation 200-1, Environmental Protection and Enhancement, 21 February 1997.
- (2) Title 40 Code of Federal Regulations, Parts 260-264, and 279.
- (3) Overseas Environmental Baseline Guidance Document, Oct 92.
- (4) Applicable state and local regulations regarding HM usage and waste management.

1-4. DEFINITIONS.

a. Hazardous Material (HM).

A hazardous material is any material that, based on either chemical or physical characteristics (e.g. corrosive, explosive, flammable, reactive, toxic), is capable of posing an unreasonable risk to human health or the environment if improperly disposed of, handled, stored, or transported. Any material regulated by Host Nation authorities as hazardous is also considered a hazardous material.

b. Hazardous Waste (HW).

A hazardous waste is any discarded hazardous material (solid, liquid, or gas) that has no further value to the user, cannot be reused or recycled, or is potentially harmful to human health or the environment because of its quantity, concentration, or biological, chemical, or physical characteristics.

RESPONSIBILITIES.

a. Commander.

- (1) Maintains overall responsibility for proper management of HM/HW.
- (2) Appoints brigade and battalion-level HW managers.

b. Brigade/Battalion Hazardous Waste Manager.

- (1) Coordinates all aspects of HW management, to include HW collection, transportation, storage, and disposal.
- (2) Develops site-specific procedures for proper management of HM/HW during each field and contingency operation.
- (3) Completes appropriate HW turn-in documents.
- (4) Ensures that applicable Material Safety Data Sheets are available during field and contingency operations.
- (5) Conducts daily inspections of HM/HW storage areas.

c. Brigade/Battalion S-4.

- (1) Monitors the amount of HM on-hand to ensure that subordinate units are not stockpiling HM.
- (2) Procures appropriate containers for collection and disposal of HW.

d. Support Platoon, Maneuver Battalion.

- (1) Supplies HM down to the company-level.
- (2) Retrogrades HW from company-level operations to battalion storage area.
- (3) Maintains a log of all HW stored within the battalion storage area.

- (4) Coordinates with the forward support battalion support platoon for final storage and disposal of HW.

e. Support Platoon, Forward Support Battalion (FSB).

- (1) Supplies HM down to the maneuver battalions.
- (2) Retrogrades HW from the battalion storage areas to the brigade storage area.
- (3) Maintains a log of all HW stored in the brigade storage area.
- (4) Assists the brigade HW manager in completing appropriate turn-in documents for HW generated within the brigade.
- (5) Coordinates with the brigade HW manager for final transport or disposal of HW.

f. Unit Maintenance Officers/NCOICs.

- (1) Ensures that maintenance personnel properly manage HM and HW.
- (2) Ensures that sufficient HW collection containers are available.
- (3) Coordinates with the support platoon for removal of HW containers in a timely and safe manner.

g. Dining Facility OIC/NCOIC.

- (1) Ensures that M-2 burner operations are conducted in a manner that safeguards human health and the environment.
- (2) Ensures food wastes are containerized and disposed of in a manner that prevents rodent infestations.
- (3) Safeguards food stores and food wastes to minimize looting or rummaging by local nationals.

h. Company/(Battalion) Executive Officer/First Sergeant (Sergeant Major).

- (1) Ensures that company level soldiers have a basic understanding of the policies and procedures for proper management of HM/HW.
- (2) Oversees waste turn-in procedures to higher echelon logistical functions.

i. Defense Reutilization and Marketing Office (DRMO).

Provides assistance regarding all aspects of hazardous waste disposal during field and contingency operations.

j. Directorate of Public Works (DPW).

Provides technical guidance in the areas of HM/HW management and spill response procedures.

k. Preventive Medicine.

Provides technical guidance in the areas of HW management and disposal.

1-6. TECHNICAL ASSISTANCE.

Technical assistance and guidance can be obtained from one of the following U.S. Army Centers for Health Promotion and Preventive Medicine (USACHPPM):

a. CONUS.

Commander, USACHPPM, Hazardous and Medical Waste Program, Aberdeen Proving Ground-Edgewood Area, Maryland 21010, DSN (312)-584-3651, Commercial 1-(410)-671-3651, FAX extension 5237.

b. OCONUS-Europe (EUR).

Commander, USACHPPM-EUR, Environmental Health Engineering Division, CMR 402, APO AE 09180 (Landstuhl, Germany), DSN (314)-486-8556, Commercial 011-49-6371-86-8556, FAX extension 7198.

c. OCONUS-Pacific (PAC)

Commander, USACHPPM-PAC, Environmental Health Engineering Division, Unit 45008, APO AP 96343 (Sagami, Japan), DSN (315)-268-4831, Commercial 011-81-3117-68-4831, FAX extension 4367.

1-7. DISTRIBUTION.

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CHAPTER 2: Overview Of Management Program

2-1. Importance of HM/HW Management.

Proper management of HM/HW during field and contingency operations is critical in protecting human health and the environment. Without a management program that is backed by command emphasis, soldiers and the environment are at risk of potential exposure to HM/HW. Severe injuries or irreparable environmental damage could result from improper HM/HW management. In addition to protecting human health and the environment, proper management of HM/HW produces cost savings through waste minimization and pollution prevention. A portion of the funds used for clean-up procedures due to mismanagement of HM/HW comes from unit training budgets, impacting soldier readiness.

2-2. HM/HW Management Plans.

The keys to a successful management program are planning and informing. Hazardous Material/Hazardous Waste Management Plans need to be specific for the given field or contingency operation, and commanders need to place an emphasis on the program to ensure that all personnel are aware of the requirements. Plans may alter based on the mission or tactical situation, but informing the command of proper procedures is critical in maintaining a successful program.

2-3. Key Aspects of HM/HW Management.

There are several important aspects in HM/HW management. At a minimum, soldiers need to know how to properly handle, transport and store HM/HW and how to properly collect and dispose of HW. Proficiency in these management practices will ensure that neither personal safety nor the environment are jeopardized during field and contingency operations.

2-4. Use of Supply Channels.

Hazardous material and hazardous waste need to be managed through the unit supply channels. Support platoons within the maneuver and forward support battalions supply hazardous material to tactical units at designated logistics re-supply points (LRPs) and should, at the same time, retrograde hazardous waste to the rear for proper storage and disposal. Hazardous material and hazardous waste storage areas should be consolidated and co-located in the support platoon areas of operation (AOs) to maximize control and accountability of hazardous chemicals. Under no circumstances should HM or HW be stored at the company or platoon-level.

2-5. Spill Response Plans.

Emergency plans to respond to a HM/HW spill must be prepared prior to any field or contingency operation. These plans must address all aspects of spill response, to include site-specific response procedures and spill response equipment requirements for each major HM/HW operation. The plans should be distributed throughout the maneuver brigade prior to any field or contingency operation.

2-6. Battalion-Level Operations.

For field or contingency operations that involve a maneuver battalion or a battalion-sized task force, battalion personnel must assume the responsibilities of the brigade counterparts described in paragraph 1-5 of this document.

CHAPTER 3: General Management Practices

3-1. HM/HW Handling.

a. Identifying the Hazard.

The most important aspect of HM/HW handling is identifying the hazard(s) associated with each individual chemical. Once appropriate hazards are identified, steps can be taken to minimize exposure to soldiers and the environment. Hazardous characteristics can be found on the Material Safety Data Sheets (MSDSs) for each chemical.

b. Material Safety Data Sheets (MSDSs).

MSDSs provide critical information for safeguarding human health and protecting the environment. This information includes the hazardous characteristic(s) of the substance, the appropriate personal protective equipment (PPE), spill response procedures, signs and symptoms of overexposure, and first aid procedures. MSDSs can be obtained through the unit supply channels and should be maintained at the following operations: HM/HW storage areas, tactical refueling operations, maintenance operations, and medical treatment facilities. It is important to note that MSDSs are material and manufacturer-specific, which means that each brand name of a chemical has a different MSDS. The HW managers need to ensure that the appropriate MSDSs are available during field and contingency operations.

c. Personal Protective Equipment (PPE).

PPE is the primary means of safeguarding human health when handling HM/HW. The most important aspect when choosing the appropriate PPE for a given operation is the hazardous characteristic(s) of the substance. Always refer to the manufacturer's MSDS before choosing appropriate PPE. Appendix A lists National Stock Numbers (NSNs) for PPE that is commonly used when handling HM/HW in a field environment. The primary operations that require the use of PPE are transportation and storage of HM/HW, tactical refueling operations, and maintenance operations. In the event that MSDSs are not available and cannot be obtained during a field or contingency operation, field expedient PPE should be used to help protect soldiers when handling HM/HW or in the event of a spill. Recommended field expedient PPE is listed in Table 3-1.c, below:

Table 3-1.c: Proper PPE Usage

<i>HM/HW STREAM</i>	<i>FIELD EXPEDIENT PPE</i>
1. Fuel Products	Field gloves, goggles, wet weather gear
2. Oil Products/Lubricants	Field gloves, goggles
3. Antifreeze	Field gloves, goggles
4. Lead-Acid Batteries	Double-lined field gloves, goggles, wet weather gear

NOTE: Field expedient PPE should only be used when the required PPE is not available since it will not provide the level of protection recommended by the manufacturer. Additionally, field expedient PPE that is used to handle HM/HW should not be used for normal operations after being used as PPE.

3-2. HW Collection.

Hazardous waste needs to be collected at the point of generation. The keys to proper collection are waste segregation, containerizing the waste, and labeling the waste. The HW managers need to coordinate with brigade and battalion S-4s to ensure that all units have the resources needed for proper collection.

a. Waste Segregation.

Generators of HW must ensure that waste streams remain segregated. Improper segregation of HW streams at the point of generation could result in an incompatible waste mixture that may pose a significant health risk. In addition, a mixture of hazardous and non-hazardous wastes (e.g. general trash) must be managed and disposed of as hazardous waste, drastically increasing HW disposal costs. Proper segregation at the point of generation will simplify the overall management process, protect human health and the environment, reduce disposal costs, and enhance the potential for recycling of the HW.

b. Containerizing HW.

Hazardous waste must be collected in appropriate containers. The best type of container is the original container that the material was shipped in prior to it being rendered a waste. If the original container is not available or the waste volume exceeds the capacity of the original container, use any container that is compatible with the waste stream. Appendix A lists NSNs for commonly used HW shipping and storage containers. When filling a container, ensure that adequate headspace is left to allow for expansion of the material (3-4 inches in a 55-gallon drum, 1.5-2 inches in a 5-gallon can, and 1 inch in a 1-gallon can). Only non-sparking tools should be used when containerizing a waste that is reactive or flammable.

c. Labeling.

Each waste container must be properly labeled so that personnel can identify the contents without opening the container. Hazardous waste labels must include the following (at a minimum):

- (1) Waste type (e.g. "Waste Fuel").
- (2) Waste quantity (e.g. "5 gallons").
- (3) The words "Hazardous Waste."
- (4) The hazardous characteristic(s) in words (e.g. "Flammable").
- (5) The generating unit designation or identification code (e.g. "2/68 AR").

NOTE: In most circumstances used oil will not be considered HW since it may have a secondary use; therefore, used oil containers should have the words "Used Oil" instead of "Hazardous Waste" on the label.

3-3. HM/HW Transportation.

a. Transportation Procedures.

Hazardous material is transported from the forward support battalion support platoon to the support platoons of the maneuver battalions. The maneuver battalions then supply HM down to the companies and platoons at designated LRPs. Hazardous waste needs to be loaded on the empty vehicles and retrograded to the rear through the same supply channels. Waste from the line companies and platoons should be transported to the maneuver battalion support platoon AO for proper storage, and waste from the maneuver battalions should then be transported to the forward support battalion support platoon AO prior to disposal. Units can also transport small volumes of HW to and pick-up small volumes from support platoons, if necessary.

b. Hazardous Cargo Requirements.

Hazardous materials and hazardous waste should be transported only in approved vehicles. These vehicles should have appropriate placards and manifests for the materials being transported. In addition, drivers must be certified to transport hazardous cargo. This training can be coordinated through the supporting transportation unit. The supporting transportation unit can also provide site-specific information or waive certain requirements based on the tactical situation encountered during the field or contingency operation.

c. Emergency Equipment.

Personnel transporting hazardous cargo need to be supplied with the required PPE or the field expedient PPE outlined in paragraph 3-1.c of this document for use during upload and download procedures. In addition to PPE, each vehicle approved for HM/HW transport must be supplied with a copy of the spill response plan and the spill response equipment outlined in Chapter 5 of this document.

3-4. HM/HW Storage.**a. Consolidation of Storage Areas.**

The primary HM/HW storage area for the brigade needs to be established in the AO of the forward support battalion support platoon to maximize control and accountability of hazardous chemicals. Additional storage sites need to be established at battalion-level within the AOs of the maneuver battalion support platoons. HM/HW should not be stored at the company or platoon level unless it is deemed necessary based on the tactical situation. As a general rule, a site is considered a storage area when it contains more than 55-gallons of HM or HW.

b. Location of Storage Areas.

Storage sites need to be identified during the pre-deployment phase of the operation or as soon as the brigade sets up its areas of operation. Support platoon personnel, in coordination with the HW managers, should set up HM/HW storage areas at least 100 meters downwind and down-gradient of troop billeting and dining facility operations. Eight-digit grid coordinates of the storage areas need to be maintained in the event that the support platoon must rapidly evacuate the area.

c. Security of Storage Areas.

Storage areas need to be properly secured within the support platoon AO to prevent unauthorized access from both US and Host Nation personnel. The material stored may be considered valuable to the local population and scavengers. Concertina wire may be necessary to properly secure the storage area.

d. Segregation.

Storage sites must be segregated into four general categories or sections: reactives, flammables/ignitables, corrosives, and toxics. Further segregation may be required based on the compatibility of individual materials (reference MSDSs for each material to identify appropriate storage

sections). Each storage section must be separated by a distance of six feet or a physical barrier to prevent incompatible materials from mixing and producing an adverse chemical reaction or toxic fumes. A recommended storage segregation chart for materials commonly used during field and contingency operations can be found in Appendix B. Containers that hold reactive or flammable materials or waste should be grounded during storage and only non-sparking tools should be used when handling these containers.

e. Secondary Containment.

Secondary containment is designed to protect human health and the environment in the event of a leak or spill. Proper secondary containment includes, but is not limited to, hardstands, tarps, plastic liners and sand bags. For storage of materials on a hardstand, ensure that the containers are placed on a pallet with a sand bag perimeter for containment of spilled liquids. If a hardstand is not available, place all materials within each category on a tarp or plastic liner with sand bags surrounding the containers for secondary containment. Secondary containment should be large enough to contain 10% of the overall volume or 100% of the volume of the largest container of HM or HW stored, whichever is larger. An additional tarp or plastic liner should be available to cover the tops of the containers during adverse weather conditions. Figure 1, Appendix D, illustrates how to provide appropriate secondary containment.

f. Containers.

All containers must be kept closed at all times. Supervisors should not permit open funnels or tubes to be attached to containers. Containers must be maintained in good condition. Rusty or residue-covered containers are unacceptable.

g. Storage of Fuel Cans.

Five-gallon fuel cans are usually scattered throughout a maneuver brigade during field and contingency operations. They should be consolidated within each company or platoon AO, placed on a tarp or piece of plywood, and surrounded by a soil berm or sand bags for secondary containment, if possible. This will prevent spills from adversely affecting soldiers or the environment. Figure 2, Appendix D, illustrates how to properly store fuel cans. When filling fuel cans, soldiers must ensure that 1.5-2 inches of headspace is left to allow for vapor expansion.

h. Battery Storage.

Batteries must be stored inside a building, tent, or vehicle or inside a 55-gallon drum with a piece of plywood separating each battery.

i. Emergency Equipment.

Figures 3 and 4, Appendix D, illustrate the emergency equipment needed for HM/HW storage operations. More information is provided below:

- (1) Fire Fighting. Each storage area containing flammable materials or waste must be supplied with an ABC fire extinguisher.
- (2) Emergency Eye-Wash. Potable water must be readily available for emergency eye-washing. This will help in providing first aid measures on-site in the event of a leak or spill.
- (3) Personal Protective Equipment. Two sets of the PPE must be readily available at each storage area. Reference the MSDSs for required PPE or reference paragraph 3-1.c of this document for field expedient PPE.
- (4) Spill Response. A copy of the spill response plan and spill response equipment outlined in Chapter 5 of this document must be readily available at each storage area.

j. Record Keeping.

Detailed HW records should start at the HW storage areas. A log should be kept of the type of waste received, the quantity received, the date received, and the information on the unit that generated the waste. This log should be kept at all storage areas at brigade and battalion-level. The brigade-level HW manager is responsible for filling out the appropriate turn-in documentation, DD 1348-1 and applicable local forms, once the waste is retrograded from the maneuver battalion storage areas to the brigade storage area. Appendix C contains information on how to properly fill out the DD 1348-1. A plan for the closure of the storage areas should be prepared at the brigade-level. This plan should detail how all waste and waste residues will be removed from the storage areas when they are no longer needed or in use.

k. Inspections.

HW managers should conduct daily inspections of the HM/HW storage areas to ensure that all requirements described above are being met and that containers are in good condition.

3-5. HW Disposal.

There are two primary disposal options for HW that can be implemented in any theater of operation: disposal through a locally approved contract or retrograding HW back to CONUS. Units must not incinerate or bury any HW unless explicitly approved by both US and Host Nation authorities. Commanders must determine the most viable means of approved HW disposal prior to entering the

theater of operations by contacting an agent of the supporting Defense Reutilization and Marketing Office (DRMO) or an agent of the US Army Center for Health Promotion and Preventive Medicine (USACHPPM).

3-6. Supply Actions.

Supply officers need to have a system in place to monitor the amount of HM on-hand to ensure that units are not stock-piling hazardous materials. Excess HM storage can lead to unnecessary personal or environmental exposure. Supply and logistics personnel should coordinate among themselves and with the various environmental agencies to identify available alternative products that can reduce the overall HW production.

CHAPTER 4: HM/HW OPERATIONS

4-1. Tactical Refueling Operations.

a. General Operations.

POL section personnel within the forward support and maneuver battalion support platoons should conduct tactical refueling operations at a designated LRP. Conducting tactical refueling operations in a unit's AO should be avoided due to the safety hazards associated with maneuvering a fuel tanker or heavy expanded mobile tactical truck (HEMTT) and conducting grounding operations at each vehicle. POL section personnel should conduct the actual refueling whenever possible.

b. Secondary Containment.

During refueling operations, secondary containment (e.g. large drip pans) should be placed under the vehicle and under the fuel hoses. When refueling 5-gallon fuel cans, the fuel cans should be placed inside of the drip pans used for secondary containment. This will prevent small volume fuel spills from accumulating and contaminating the soil. The spilled fuel should be transferred to a labeled 5-gallon waste fuel container and disposed of as HW. Figures 5 and 6, Appendix E, illustrate appropriate secondary containment for refueling operations.

c. Emergency Equipment.

Figures 7 and 8, Appendix E, illustrate the emergency equipment needed for tactical refueling operations. More information is provided below:

- (1) Fire Fighting. Each refueling vehicle must be supplied with a minimum of two fire extinguishers. The fire extinguishers should be set up on each side of the tanker or HEMTT during refuel operations to expedite emergency response measures.
- (2) Emergency Eye-Wash. Potable water must be readily available for emergency eye-washing. This will help in providing first aid measures on-site in the event that a spill or leak occurs during refueling operations.
- (3) Personal Protective Equipment. Each refueling vehicle needs two sets of PPE. Reference the MSDSs for required PPE or reference paragraph 3-1.c of this document for field expedient PPE. The gloves and goggles must be worn whenever conducting refueling operations, and the aprons or wet weather gear should be available to respond to a spill or repair a leak.

- (4) Spill Response. A copy of the spill response plan and spill response equipment outlined in Chapter 5 of this document must be readily available to each support platoon POL section.

4-2. Field Maintenance Operations.

a. General Operations.

Maintenance operations in the Brigade Support Area (BSA), field trains, and unit maintenance collection point (UMCP) should be conducted on a hard stand, tarp, or plastic liner. If a hard stand is not available, each vehicle within the brigade must have its own tarp or plastic liner for use by maintenance personnel. Maintenance personnel will be required to supply their own PPE, spill response equipment, potable water for emergency eye-washing, and liquid waste containers.

b. Management of drained fluids.

All drained fluids must either be returned to the vehicle or placed in an appropriate waste container for recycling or disposal as a HW. Maintenance areas should be supplied with two labeled 55-gallon liquid waste containers for each of the following waste streams: used oil, waste fuel, waste anti-freeze, and POL-contaminated solids. HW managers can coordinate turn-in of waste containers and acquire empty 55-gallon liquid waste containers from the appropriate support platoon. Figure 9, Appendix F, illustrates how to properly conduct maintenance operations and manage drained fluids.

c. Emergency Equipment.

Figures 10 and 11, Appendix F, illustrate the emergency equipment needed for field maintenance operations. More information is provided below:

- (1) Fire Fighting. Each maintenance area must be supplied with appropriate fire extinguishers.
- (2) Emergency Eye-Wash. Potable water must be readily available for emergency eye-washing. This will help in providing first aid measures on-site in the event of a spill or leak during maintenance operations.
- (3) Personal Protective Equipment. Appropriate PPE must be available to each mechanic during field and contingency operations. Reference the MSDSs for required PPE or reference paragraph 3-1.c of this document for field expedient PPE.

- (4) Spill Response. A copy of the spill response plan and spill response equipment outlined in Chapter 5 of this document must be readily available at each maintenance area.

4-3. Dining Facility Operations.

a. General Operations.

Dining facility personnel utilize M-2 burners that operate on MOGAS during field and contingency operations. The major safety and environmental issues are fuel storage, filling, and lighting operations.

b. Fuel Storage.

Five-gallon fuel cans need to be stored as outlined in paragraph 3-4.f of this document.

c. Filling Operations.

Filling operations need to be conducted on a tarp or plastic liner with a soil berm or sand bag perimeter for secondary containment in the event of a spill. Spilled fuel must be collected immediately using an absorbent material. The used absorbent material should be placed in a plastic bag and disposed of as HW through the battalion support platoon.

d. Lighting Operations.

Lighting operations must be conducted at least 50 feet away from fuel storage and M-2 burner filling operations. The lighting operations should be conducted on open soil so that any residual fuel will freely burn during the operation.

4-4. Stationary Equipment.

a. Use of Drip Pans and Belly Plates on parked vehicles.

All wheeled vehicles within the brigade AO need to have drip pans and all tracked vehicles need to have belly plates. Collected fluids must be placed in appropriate waste containers and disposed of as HW through the maneuver battalion support platoons. Each company-sized unit needs to have one labeled 5-gallon containers for drip pan waste.

b. Sandbagging to Protect POLs and Fuels.

Stationary equipment such as generators and parked vehicles should be protected from hostile indirect fire by using sandbags or entrenchment to minimize the hazards of secondary explosions, fire, and spills from the fuels and POLs contained within the equipment. Additional walls and berms should be used to segregate individual pieces of equipment from each other should such an incident occur. Although this procedure is time-consuming and labor intensive, it should be done during training events as it is done in times of real war. Sandbag structures and entrenchments should be adequate to protect equipment from likely enemy threats, as well as capable of containing fires, explosions, and spills from all POL, fuel, and HMs normally contained on the protected vehicles.

4-5. Operation of Heaters and Generators.**a. Heaters.**

Soldiers that use field heaters need to ensure that the fuel supply (usually a 5-gallon fuel can) has secondary containment in the event of a leak or spill. The best way to provide this secondary containment is to elevate the fuel supply on a tripod or back of a vehicle and place a drip pan under the fuel hose to collect any spilled fuel. The overflow fuel line also needs to have secondary containment, and all leaking fuel lines need to be repaired or replaced. Collected fluids must be placed in appropriate waste containers and disposed of as HW through the maneuver battalion support platoons. Each company-sized unit needs to have one labeled 5-gallon container for waste fuel from the operations of heaters.

b. Generators.

Generators need to be operated in a manner that protects the environment from potential contamination. In order to provide this protection, operate generators on a piece of plywood and completely surround the generator with a soil berm or sand bag perimeter. This will prevent leaking fuel from contaminating the surrounding soil. Another alternative is to operate generators on a trailer and ensure that all spilled fuel is collected and placed in appropriate waste containers; each company-sized unit needs to have one labeled 5-gallon container for waste fuel from the operation of generators. In addition, soldiers need to conduct preventive maintenance checks and ensure that all leaking generators are repaired or replaced.

CHAPTER 5: Spill Response

5-1. Spill Response Plan.

A Spill Response Plan must be available for each field or contingency operation. The major operations that need to have a copy of this plan are tactical refueling, maintenance, and HM/HW storage and transportation. The plan should address, at a minimum, site-specific response procedures and spill response equipment requirements for each major operation.

5-2. Spill Response Procedures.

In the event of a HM/HW spill, the procedures listed below must be implemented immediately by trained personnel within the unit. Personal safety must never be compromised during the response. Should the situation exceed unit capabilities, evacuate the area, inform the chain of command (CoC), and contact the local Hazardous Material Spill Response Team or Range Control. Emergency telephone numbers or radio frequencies should be obtained and distributed throughout the brigade before the field or contingency operation begins.

a. Protect Yourself.

Use the required PPE specified in the MSDS for the spilled material or the field expedient PPE outlined in paragraph 3-1.c of this document and evacuate all non-essential personnel from the immediate area.

b. Stop the Flow.

The flow of HM/HW must be stopped at the source in order to control the spill. This may be as simple as placing the container up right or closing a valve. In the event of a spill of flammable material, use only non-sparking tools and ensure that metal-to-metal contact is avoided since a spark could ignite the material.

c. Contain the Spill.

Proper containment includes placing drip pans where the material contacts the soil, placing soil berms or sand bags around the contaminated area, placing absorbent material in the area of the spill, etc. The purpose of this step is to prevent the spread of contamination.

d. Report the Spill.

Notify the CoC and unit HW manager immediately. The local Hazardous Material Spill Response Team or Range Control should be notified if additional assistance is needed.

e. Clean the Spill.

Equipment used to clean a spill must be chosen carefully. Use only non-sparking tools if the material is flammable or explosive. For corrosive materials, use equipment that will not corrode or deteriorate (e.g. non-metallic equipment). Collect used absorbent and contaminated soil in plastic bags, and transfer the plastic bags into a labeled sturdy container to be disposed of as HW.

f. Replace Spill Response Equipment.

Obtain replacement spill response equipment through the unit supply channels to ensure that personnel can properly respond in the event of another spill.

5-3. Spill Response Equipment.

Spill response equipment is essential in protecting the environment in the event of a HM/HW spill. The type and amount of spill response equipment needed is dependent upon the operation. Appendix A lists NSNs for commonly used spill response equipment. Units may also need to acquire hydrophobic absorbent materials for operations conducted in areas susceptible to large amounts of precipitation. Spill response equipment required for specific operations is discussed below:

a. Tactical Refueling Operations.

Tactical refueling operations are limited to the handling of fuel products, such as diesel and MOGAS. The extent of the operations and load-carrying capabilities of fuel tankers and HEMTTs restrict the amount and type of spill response equipment needed. In the event of a major spill during refueling operations, personnel primarily need two non-sparking picks and two non-sparking shovels to excavate contaminated soil and several large plastic bags to contain the excavated soil for disposal as HW. Approximately ten pounds of absorbent and several small plastic bags are sufficient to respond to small volume spills on a hardstand. Non-sparking tools should also be readily available. Additional resources can be obtained through the supply channels as required.

b. Field Maintenance Operations.

Field maintenance operations deal with all Class III items. Repeated small volume spills are indicative of field maintenance operations. Approximately twenty-five pounds of absorbent, two non-sparking shovels, two brooms, and several small plastic bags for contaminated absorbent are sufficient to maintain field maintenance operations during field and contingency operations. Additional resources can be obtained through the supply channels as required.

c. HM/HW Storage.

Hazardous material and hazardous waste storage operations deal with all Class III items. Leaking containers and small volume spills are indicative of field HM/HW storage operations. Approximately fifteen pounds of absorbent, two non-sparking shovels, two brooms, and several small plastic bags for contaminated absorbent are needed at each storage area. Additional resources can be obtained through the supply channels as required.

d. HM/HW Transportation.

Hazardous material and hazardous waste transportation operations deal with all Class III items. Leaking containers and small volume spills are indicative of HW transportation operations; however, the potential exists for large volume spills in the event of an accident. Each approved vehicle for HM/HW transportation should have approximately twenty-five pounds of absorbent, two picks, two shovels, one broom, and several small and large plastic bags for contaminated soil. Additional resources can be obtained through the supply channels if deemed necessary.

APPENDIX A: National Stock Numbers (NSNs)

Page A-2: Personal Protective Equipment

Page A-3: Shipping and Storage Containers

Page A-4: Spill Response Equipment

PERSONAL PROTECTIVE EQUIPMENT

SAFETY GOGGLES

<i>NSN</i>	<i>DESCRIPTION</i>
4240-00-052-3776	Molded plastic flexible frame with clear plastic lenses and adjustable headband.
4240-01-055-2310	Lightweight goggles with vinyl resin frame and saddle type nose bridge.
4240-01-292-2818	Polycarbonate plastic lens with a molded plastic frame. May be worn over most prescription glasses.

GLOVES

<i>NSN</i>	<i>DESCRIPTION</i>
8415-00-266-8673	Synthetic rubber, acid and alkali resistant.
8415-00-266-8675	Synthetic rubber, acid and alkali resistant.
8415-01-138-2497	Butyl rubber, acid and alkali resistant.
8415-01-138-2498	Butyl rubber, acid and alkali resistant.

APRONS

<i>NSN</i>	<i>DESCRIPTION</i>
8415-01-189-6228	Rubber material, acid resistant.
8415-01-100-7742	Plastic material, oil resistant, and waterproof.

SHIPPING AND STORAGE CONTAINERS

<i>NSN</i>	<i>DESCRIPTION</i>
8110-00-030-7780	Steel, open-head, 55-gallon capacity.
8110-00-082-2626	Steel, open-head, 55-gallon capacity.
8110-00-292-9783	Steel, closed-head, 55-gallon capacity.
8110-00-254-5713	Steel, open-head, 5-gallon capacity.
8110-00-574-9641	Steel, closed-head, 5-gallon capacity.
8110-00-254-5713	Steel, open head, 5-gallon capacity.

SPILL RESPONSE EQUIPMENT

SWEEPING COMPOUND

<i>NSN</i>	<i>DESCRIPTION</i>
7930-00-132-5265	100 lbs container. Contents include sawdust and sand.
7930-00-633-9849	100 lbs container. Contents include sawdust and sand.
7930-01-090-9831	1 gallon container of sand.

OIL SORBANT

<i>NSN</i>	<i>DESCRIPTION</i>
9330-01-013-3105	Boom form, minimum diameter of 8 inches and minimum length of 8 feet. Reusable capability of a minimum of five times.
9330-01-308-5150	Sheet form, 100 per package. 18 inches long and 18 inches wide.
9330-01-281-0337	Boom form, 4 per package. 10 ft by 8 inches.

SHOVELS

<i>NSN</i>	<i>NSN</i>
5120-00-222-4505 ***	5120-00-188-8450
5120-00-222-4506 ***	5120-00-289-9035
5120-01-332-9954 ***	5120-01-072-3704

*** indicates non-sparking material.

APPENDIX B: Storage Segregation Chart

STORAGE SEGREGATION CHART

STORAGE SECTION A (Reactives)

<u>Material/Waste</u>	<u>Hazardous Characteristic(s)</u>
Chlorination Kits	Reactive
Empty Aerosol Cans	Reactive in Fire
Super Tropical Bleach (STB)	Reactive with DS2, Corrosive

STORAGE SECTION B (Flammables)

<u>Material/Waste</u>	<u>Hazardous Characteristic(s)</u>
CARC Paint	Flammable and Toxic
Cleaning Compounds	Flammable and Toxic
Deicing Agents	Flammable
Fuels	Flammable
Lacquers/Varnishes	Flammable, Irritant, and Noxious
Paints	Flammable and Noxious
Paint Thinners	Flammable and Noxious
Parts Cleaners	Flammable and Toxic
Sealants	Flammable and Toxic
Solvents	Flammable, Irritant, and Toxic
Windshield Cleaners	Flammable

STORAGE SECTION C (Corrosives)

<u>Material/Waste</u>	<u>Hazardous Characteristic(s)</u>
Antifreeze	Irritant and Noxious
Carbon Remover	Irritant and Toxic
DS2*	Highly Corrosive, Reactive with STB
Paint Strippers	Corrosive and Noxious
Radiator Leak Compounds	Irritant
Weapons Cleaners	Irritant and Toxic

* DS2 should have its own secondary containment since it is highly corrosive

STORAGE SECTION D (Toxins)

<u>Material/Waste</u>	<u>Hazardous Characteristic(s)</u>
Grease	Noxious
Lubricants	Noxious
Oils	Noxious
Oil-Contaminated Solids	Noxious
Paint Primers	Toxic

STORAGE SECTION E (Additional Storage Section)

Battery Acid	Corrosive and Toxic
Dry Batteries	Reactive in Fire

APPENDIX C: Example HW Turn-In Document (DD 1348-1)

Sample DD 1348-1

<u>REQUIRED INFORMATION</u>	<u>SECTION</u>
1. NSN (or LSN with appropriate part number and manufacturer)	8-22
2. Nomenclature (use percentage of constituents for LSN items)	Block 'X'
3. Unit Quantity (i.e. 'ea,' 'dr,' 'cn,' 'bx,' etc)	23-24
4. Quantity (5 digit, i.e. 00001)	25-29
5. Document Number (DoDAAC, Julian Date, and Serial Number)	30-43
6. Disposal Authority Code ('M,' 'N,' or 'R': ref: DoD 4000.25-1)	64
7. Demilitarization Code ('A' for HW turn-in)	65
8. Supply Condition Code ('H' for HW, 'F' for recyclable oil)	71
9. Unit Price (do not adjust cost)	74-80
10. Generator address, phone number, and POC	Block 'A'
11. Receiving Agency address (i.e. DRMO)	Block 'B'
12. Insert 'HW' or 'HM' as appropriate	Block 'C'
13. Markings for Special Hazardous Property (i.e. batteries, asbestos, bulk fuels, compressed gas)	Block 'D'
14. Total Weight (in lbs)	Blocks 3 & 6
15. Type of Container (i.e. 5-gallon can, 55-gallon drum, etc)	Block 2
16. Number of Containers	Block 5

APPENDIX D: HM/HW Storage Illustrations

Figure 1: Secondary Containment

Figure 2: Storage of Fuel Cans

Figure 3: Personal Protective Equipment

Figure 4: Emergency Equipment

HM/HW STORAGE

SECONDARY CONTAINMENT



Figure 1: Secondary containment illustrated above consists of a tarp and sand bag perimeter large enough to contain 10% of the overall volume or 100% of the volume of the largest container stored. This is designed to protect human health and the environment in the event of a leak or spill. To maximize containment, the underlying tarp can be wrapped around the outside perimeter of the sand bags and folded back into the storage area.

HM/HW STORAGE

STORAGE OF FUEL CANS



Figure 2: Fuel cans need to be consolidated and properly stored within each company or platoon AO. Proper storage consists of a piece of plywood and a sand bag perimeter large enough to hold 10% of the overall volume stored, as illustrated above. A tarp or plastic liner can also be used in place of the plywood.

HM/HW STORAGE

PERSONAL PROTECTIVE EQUIPMENT



Figure 3: Personal protective equipment is the primary means of safeguarding human health when handling HM/HW. Appropriate field expedient PPE for HM/HW storage sites consists of field or butyl rubber gloves, goggles, and wet weather gear, as illustrated above. More appropriate PPE can be obtained by referencing MSDSs.

HM/HW STORAGE

EMERGENCY EQUIPMENT



Figure 4: Emergency equipment is essential for properly responding to HM/HW incidents. As illustrated above, the appropriate equipment for HM/HW storage operations consists of an ABC fire extinguisher, potable water for emergency eye-washing, and absorbent, shovels, brooms, and plastic bags for spill response.

APPENDIX E: Tactical Refueling Illustrations

Figure 5: Vehicle Refueling

Figure 6: Refueling of Fuel Cans

Figure 7: Personal Protective Equipment

Figure 8: Emergency Equipment

TACTICAL REFUELING

VEHICLE REFUELING



Figure 5: When refueling vehicles, POL section personnel need to ensure that appropriate secondary containment is placed under the fuel tank as illustrated above. Caution must be taken when filling vehicles to ensure that the tank does not overflow and jeopardize personal safety or the environment. All spilled fuel must be immediately transferred to a "Waste Fuel" collection container for proper disposal.

TACTICAL REFUELING

REFUELING OF FUEL CANS



Figure 6: POL section personnel need to ensure that 5-gallon fuel cans are placed inside of an appropriate secondary containment device as illustrated above. When filling the fuel cans, 1.5-2 inches of headspace is required to allow for vapor expansion. All spilled fuel must be immediately transferred to a "Waste Fuel" collection container for proper disposal.

TACTICAL REFUELING

PERSONAL PROTECTIVE EQUIPMENT



Figure 7: Personal protective equipment is the primary means of safeguarding human health when conducting tactical refueling operations. Goggles and butyl rubber gloves must be worn when conducting filling operations, and aprons or wet weather gear must be readily available to respond to a spill or repair a leak. More appropriate PPE can be obtained by referencing MSDSs.

TACTICAL REFUELING

EMERGENCY EQUIPMENT



Figure 8: Emergency equipment is essential in responding to refueling incidents. As illustrated above, the appropriate equipment for tactical refueling operations consists of fire extinguishers, potable water for emergency eye-washing, and absorbent, pick, shovels, and plastic bags for spill response.

APPENDIX F: Field Maintenance Illustrations

Figure 9: Management of Drained Fluids

Figure 10: Personal Protective Equipment

Figure 11: Emergency Equipment

FIELD MAINTENANCE
MANAGEMENT OF DRAINED FLUIDS



Figure 9: Properly managing drained fluids from field maintenance operations is critical in safeguarding human health and protecting the environment. All fluids need to be collected in drip pans, or similar secondary containment devices, and either returned to the vehicle or placed in appropriate disposal containers.

FIELD MAINTENANCE

PERSONAL PROTECTIVE EQUIPMENT



Figure 10: Personal protective equipment is the primary means of safeguarding human health when conducting maintenance operations. As illustrated above, the appropriate field expedient PPE consists of field gloves, goggles, coveralls, and wet weather gear. More appropriate PPE can be obtained by referencing MSDSs.

FIELD MAINTENANCE
EMERGENCY EQUIPMENT



Figure 11: Emergency equipment is essential for properly responding to HM/HW incidents while conducting field maintenance operations. As illustrated above, the appropriate equipment consists of a fire extinguisher, potable water for emergency eye-washing, and absorbent, shovels, brooms, and plastic bags for spill response.