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ENVIRONMENTAL CONSIDERATIONS FOR OVERSEAS CONTINGENCY OPERATIONS

DEPARTMENT OF THE AIR FORCE

BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE HANDBOOK 10-222 VOLUME 4

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Operations

ENVIRONMENTAL CONSIDERATIONS FOR OVERSEAS CONTINGENCY OPERATIONS

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This handbook contains guidance on environmental considerations for Air Force (AF) civil engineer (CE) personnel, including Air National Guard and Air Force Reserve personnel deployed in support of contingency operations outside the United States (U.S.) and its territories and possessions. It outlines strategies for use in minimizing negative impacts on the mission resulting from environmental health and safety hazards and environmental neglect. These practices can help avoid or mitigate adverse impacts to human health and the environment during contingencies. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using AF Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through Major Command (MAJCOM) publications/forms managers. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) at https://www.my.af.mil/afrims/afrims/afrims/rims.cfm. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES: This publication has been substantially revised and must be completely reviewed. It includes additional guidance not available during the last revision and new guidance on use of open-air burn pits during contingency operations.

Preface

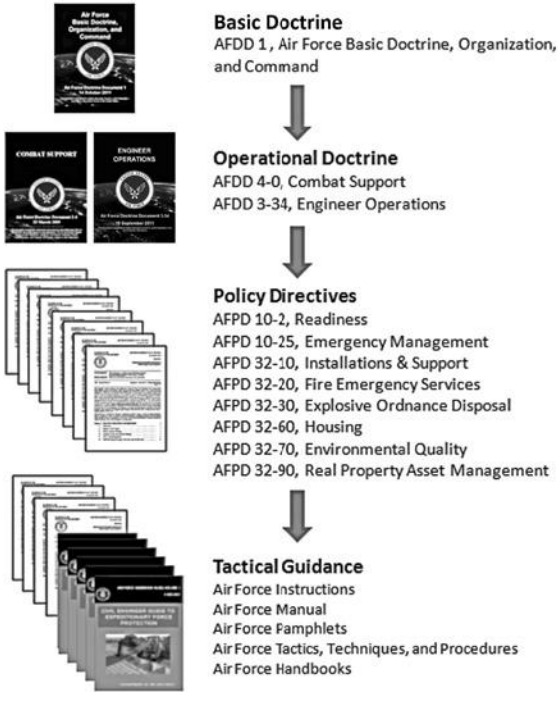
The United States Air Force (USAF) is committed to maintaining environmental quality to ensure long-term access to the air, land and water needed to protect U.S. interests abroad. Although a high level of environmental quality can be difficult to achieve during contingency operations, this goal is becoming less of an option and more of a mandate in successfully accomplishing the mission. By their very nature, contingency operations are rapid and time-constrained. Time is not always available to conduct comprehensive environmental planning prior to entering foreign countries when confronting enemies, conducting disaster relief or performing humanitarian operations. During initial stages of a conflict, the focus will be on accomplishing the mission and preserving human life. However, we must recognize failure to maintain basic environmental standards could result in illnesses, diseases and even death. An unacceptable disease and non-battle injury (DNBI) rate resulting from poor environmental conditions will most certainly impact the mission at the tactical level. We must also understand how tactical level environmental incidents impact mission support at the operational level, making it difficult to achieve U.S. strategic objectives. Contingency operations and environmental functions are interdependent. The mission is dependent upon the environment for sustainment, and the environment is dependent upon us for preservation and maintenance. We simply cannot afford to neglect environmental concerns during contingency operations without clearly understanding the risks involved.

This handbook contains guidance. It does not create any rights, duties, obligations, or causes of action, implied or otherwise, in any third parties. Nothing contained in this handbook may be construed as an admission that the USAF has not complied with any environmental law in the past during contingency operations, or intends to violate any such laws in the future.

Chapter 1
INTRODUCTION

1.1. Civil Engineer (CE) Hierarchy of Publications. This handbook supports implementation of Air Force Policy Directive (AFPD) 10-2, *Readiness*. It contains tactics, techniques, and procedures (TTPs) for civil engineers supporting overseas contingency operations. It builds upon lessons learned, doctrinal precepts outlined in Air Force Doctrine Document (AFDD) 4-0, *Combat Support* and AFDD 3-34, *Engineer Operations*, and current AF policy. This relationship is illustrated in the Air Force CE hierarchy of publications (**Figure 1.1.**). This handbook contains guidance for achieving environmental objectives at strategic, operational, and tactical levels.

Figure 1.1. CE Hierarchy of Publications.



1.2. Overview. This handbook addresses environmental considerations during contingency operations overseas. As defined in Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, a contingency operation is a military operation designated by the Secretary of Defense (SECDEF) as a contingency operation or becomes a contingency operation as a matter of law. It is designated by the SECDEF as an operation in which members of the Armed Forces are or may become involved in military actions, operations, or hostilities against an enemy of the U.S. or against an opposing force; or is created by definition of law. A contingency operation exists if a military operation results in the (1) call-up to (or retention on) active duty of members of the uniformed Services under certain enumerated statutes and (2) the call-up to (or retention on) active duty of members of the uniformed Services under other (non-enumerated) statutes during war or national emergency declared by the President or Congress. This handbook addresses environmental planning, actions during initial beddown, methods for maturing existing environmental functions during sustainment, and actions to prepare operating locations for closure or transfer during contingency operations. It does not address disposal of munitions or explosive residue. Guidance on disposal of waste munitions and explosive residue is covered in the Environmental Protection Agency's (EPA) Military Munitions Rule (MMR) on the Defense Environmental Network and Information Exchange (DENIX) website at **https://www.denix.osd.mil/mmrp**, DOD Manual 6055.09-M Volume 5, and AFI 32-3001, *Explosive Ordnance Disposal (EOD) Program*.

1.3. Goals. USAF environmental goals during contingencies are geared towards minimizing risks to human health and safety and preventing unnecessary damage to the environment while maximizing the natural resources available to support readiness and operational effectiveness.

1.3.1. **Protection.** Health and safety of personnel are critical in any military operation. Safe, medically assessed food and water, and means of properly disposing of waste must be ensured. Effective controls and countermeasures must be implemented to prevent loss of life due to DNBI. In addition to protecting the health of the force, protecting the environment sustains operational capability and assists commanders in accomplishing their mission and achieving national objectives.

1.3.2. **Prevention.** Prevention is the preferred means of environmental protection. Although competing priorities during contingency operations often complicate environmental management efforts, commanders should consider every means to minimize damage to the environment, conserve resources, and reduce health and safety hazards. Prevention focuses on efforts such as eliminating pollution at the source, reducing the amount of waste generated, reusing materials and recycling materials, conserving resources, product substitution, process changes, and spill prevention.

1.3.3. **Planning.** Considering the role environmental considerations play in achieving DOD operational objectives, proper environmental planning for the various stages of contingency operations is of significant importance. Plans should be developed for managing water sources, solid wastes, regulated medical wastes, wastewater, hazardous material (HM), hazardous waste (HW) (excluding munitions and explosive residue), archeological, cultural, historical and religious sites, and flora and fauna. Plans should emphasize pollution prevention to protect natural resources including water, soils, and air from contamination. In addition, identifying potential environmental impacts in the early planning stages allows commanders to evaluate potential environmental impacts and develop strategies and issue guidance to mitigate these effects on the mission, personnel, and the environment or consider alternative courses of action. Knowing what to expect also provides the insight needed to effectively prepare for hazards that could threaten personnel health and safety and determine what areas may need to be avoided altogether.

1.3.4. **Management.** Effective management techniques should be applied to environmental functions during contingencies to protect the force, protect the environment, and achieve the objectives and overall intent of the combatant commander (CCDR). Priorities include pollution prevention, solid waste management, HM/HW management, spill prevention and response, and compliance with CCDR guidance set forth in the environmental annex of the operational order (OPORD). The BCE assumes management of environmental functions and works with unit commanders, Medical, Bioenvironmental, Safety, and other key experts to provide effective environmental leadership.

1.3.5. **Mitigation.** Once it is determined a site is to be closed or transferred, mitigation of adverse environmental impacts may be required by international agreement or CCDR policy. Commanders can use environmental surveys and condition reports conducted prior to and throughout site occupation to mitigate environmental hazards that present danger to human health and safety. Make contact with the CCDR's environmental staff for guidance on site closure and environmental mitigation policies.

1.4. Environmental Policy and Key References. Overseas contingency operations are excluded from most U.S. environmental laws. Environmental guidance for contingency operations will likely come from sources such as presidential executive orders (E.O.), treaties, Status of Forces Agreements (SOFAs) and other International Agreements (IAs), multinational doctrine, DOD directives, joint doctrine, the Operational Plan (OPLAN) and/or OPORD under which military action is being executed, and DOD Guide 4715.05-G, Overseas Environmental Baseline Guidance Document (OEBGD) if adopted by the CCDR and included in the environmental annex of the OPORD. The following paragraphs describe environmental guidance and other references that may be adopted when contingency operations transition to sustainment.

1.4.1. **Treaties and International Agreements.** It is important to be aware of treaties and international agreements that could impact the conduct of military operations, whether the U.S. is party to the treaty or not. For example, the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*, is an international treaty designed to control the movement of HW between nations, and specifically, prevent transfer of hazardous wastes from developed countries to less developed countries for recovery or disposal. Another example is the May 2002 Organization for Economic Cooperation and Development (OECD) decision on transboundary movements of waste destined for recovery operations. The OECD decision applies to the U.S. and other OECD member nations and restricts cross-border movement of wastes destined for recovery within the OECD area. Standardization Agreements (STANAGs) also affect military activities. North Atlantic Treaty Organization (NATO) STANAG 7141 EP, *NATO Doctrine for Environmental Protection During NATO Led Military Activities*, outlines NATO environmental doctrine for NATO led military activities and provides guidance on environmental planning. For planning purposes, always contact the MAJCOM or CCDR's Judge Advocate (JA) for guidance on treaties and

international agreements that may affect the conduct of military operations in a particular area of responsibility (AOR).

1.4.2. **Executive Order (E.O.) 12114.** E.O. 12114, E*nvironmental Effects Abroad of Major Federal Actions,* provides policy guidance regarding environmental planning when major federal actions may have significant effect on the environment outside the geographic territory of the U.S. and its possessions. This E.O. requires responsible officials of Federal agencies to be informed of environmental considerations and take those considerations into account while making decisions on major federal actions.

1.4.3. **DOD Directive 6050.7**. DOD Directive (DODD) 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions,* implements E.O. 12114 and requires consideration of environmental effects prior to taking major federal actions that do significant harm to the environment of places outside the geographic territory of the U.S. and its possessions.

1.4.4. **Joint Publication 3-34**. Joint Publication (JP) 3-34, *Joint Engineer Operations*, provides doctrinal guidance for integrating environmental considerations into joint military operations to ensure compliance with relevant international agreements and CCDR guidance.

1.4.5. **OPLANs and OPORDs.** The CCDR's engineer staff prepares the "Environmental Considerations" annex, usually "Annex L", of the OPLAN during contingency and crisis action planning. The OPLAN is transformed into an OPORD when the CCDR sets an execution time or designates an event that triggers the operation. The environmental annex to OPLANs and OPORDs is intended to protect personnel from potential environmental hazards and minimize the impact of military operations on the environment. Once established, commanders are responsible for complying with the applicable environmental requirements established by the environmental annex, and must keep senior leadership informed of any conditions that may result in noncompliance with the annex.

1.4.6. **The OEBGD.** This document prescribes implementation guidance, procedures, criteria, and standards for environmental compliance on DOD installations outside the U.S., but does not directly apply to ships, aircraft, contingencies or deployments off DOD installations. In countries where no FGS have been established, the OEBGD outlines minimum environmental

standards and can be adopted for contingency operations if approved by the Environmental Executive Agent (EEA) in coordination with the Joint Task Force (JTF) Commander. In this case, the guidance would be included in the environmental annex of the OPORD.

1.4.7. **Final Governing Standards (FGS).** The FGS are published by the designated EEA for each host nation where DOD operates an installation and it is determined the level of DOD presence justifies establishment of FGS. For a list of EEAs, see DODI 4715.5, *Management of Environmental Compliance at Overseas Installations*. The FGS are country-specific, substantive provisions addressing limitations on wastes, discharges, etc., or a specific management practice. The standards are developed by comparing OEBGD standards to host nation (HN) laws, SOFA, and international agreements. Generally, the more protective standards are adopted and included in the FGS. The FGS once established and issued, are applicable in foreign countries where DOD maintains substantial installations. Although they are country specific standards and do not apply to contingency operations, FGS contain valuable and useful environmental guidance for planners.

1.4.8. **Armed Forces Pest Management Board - Technical Guide (TG) No. 24.** TG No. 24, *Contingency Pest Management Guide*, provides guidance on using pesticides, pesticide application equipment, and other techniques to control arthropods, vertebrate, vegetation, and other pests during contingencies. Pesticides are used in conjunction with traditional pest management methods as part of an Integrated Pest Management (IPM) program. Additional guidance on pest management during contingency operations can be found on the Armed Forces Pest Management Board website located at **http://www.afpmb.org/**.

1.5. Responsibilities. Protection of the environment is everyone's responsibility. Although contingencies present some challenges, diligence and persistence will ensure everything possible is done to protect personnel health and safety, and minimize damage to the environment.

1.5.1. **Combatant Command Environmental Staff**. The environmental staff develops combatant command environmental policy and procedures to ensure all personnel comply with current applicable guidance including CCDR policy, DOD guidance, treaties and international agreements. The staff maintains records of all surveys and assessments conducted in the AOR and provides assistance on all environmental matters.

1.5.2. **Installation Commander**. Installation Commanders guide activities of personnel under their authority and instill an environmental ethic by personal example and proactive leadership on issues that affect the environment. They ensure personnel comply with environmental guidance. During joint operations where sites may be occupied by more than one Service, a Joint Environmental Management Board (JEMB) may be established per JP 3-34. The JEMB integrates environmental protection efforts of all components under a single authority. The senior Air Force commander on site provides experienced representation to the JEMB, and ensures all personnel are aware of the environmental policies and procedures established by the JEMB.

1.5.2.1. **Judge Advocate**. The Judge Advocate (JA) provides advice relating to applicability of environmental laws, regulations, treaties, and international conventions, and assists in their interpretation. They provide legal assistance in developing the environmental annex, determining environmental analysis and impact requirements, assist in negotiating transit agreements for HW shipments, provide advice on environmental remediation issues during operations and upon closure, and assist in processing claims for environmental damage.

1.5.2.2. **Contracting.** Contracting ensures contracts comply with applicable environmental guidance, the Performance Work Statement (PWS) stipulates environmental requirements, and contract proposals include detailed plans and costs that must be addressed. The contracting officer provides continuous oversight to ensure terms of the contract are being met.

1.5.2.3. **Medical Group**. The Medical Group includes a Preventive and Aerospace Medicine (PAM) team comprised of Aerospace Medicine Specialists, Public Health (PH), Base Bioenvironmental Engineer (BEE), and Independent Duty Medical Technicians (IDMTs). This team is designed to prevent DNBI during contingency operations. The team assesses environmental and occupational health hazards and risks; evaluates safety/vulnerability of local food/water sources; performs Toxic Industrial Chemical (TIC)/Toxic Industrial Material (TIM) assessments and contributes to emergency responses involving hazardous materials; performs epidemiological risk assessments; evaluates local medical capabilities; performs vector/pest risk assessments; determines the adequacy of billeting and public facilities; and provides medical intelligence. The PAM team provides input on site layout and operations, food, waste, water quality,

billeting, and medical and sanitation facilities. The PAM team leader is considered the functional expert in casualty prevention.

1.5.2.4. **Safety**. The Safety staff assists with siting HM/HW storage areas and developing plans and procedures for proper storage and segregation, disposal, and transportation. They conduct inspections of storage and accumulation areas to ensure compliance with applicable safety guidance. To ensure the safety of personnel working with HM/HW, the Safety staff coordinates with commanders to ensure spill prevention and response procedures are adequate and equipment is on hand, approved containers and labels are used, Personal Protective Equipment (PPE) are being used, and the required Material Safety Data Sheet (MSDS) is available. The Safety staff also assists in PWS development for contracting efforts.

1.5.3. **Unit Commanders**. Unit commanders are also responsible for building an environmental ethic in their personnel and setting the tone for environmental compliance. Unit commanders should designate an individual to manage HM/HW and perform preventive tasks necessary to reduce or eliminate negative environmental impacts on human health and the environment. This individual is the Unit Environmental Coordinator (UEC).

1.5.3.1. **Unit Environmental Coordinator (UEC)**. The UEC provides support and oversight for HM/HW management activities. They work closely with commanders, environmental officers, Safety and medical personnel on a range of issues including developing unit environmental procedures, spill prevention and response plans, proper utilization and storage of HM/HW. UECs may also conduct environmental awareness training for unit members.

1.5.3.2. **Individuals.** Every individual should maintain environmental awareness. They should be aware of requirements associated with the deployed location, avoid areas declared off-limits, identify risks associated with certain tasks, immediately respond to and report HM/HW spills, provide input to reduce reliance on HM, support waste reduction, recycling and reuse efforts, and strictly comply with guidance on wear of PPE when required.

1.5.4. **Base Civil Engineer (BCE).** In conjunction with the BEE, PH, and Safety, the BCE is responsible for planning and implementing environmental functions during contingencies. The BCE appoints, guides, and supervises the environmental officer's actions throughout the deployment. The BCE ensures the environmental staff is properly resourced with dedicated individuals to

avoid deteriorating environmental conditions that threaten personnel health and safety and lead to costly, long-term action to clean up hazards that could jeopardize mission objectives. As part of the BCE organization, the Fire Department is involved in all aspects of environmental planning, particularly where HAZMAT is involved.

1.5.4.1. **Environmental Officer and Staff**. A dedicated environmental officer should be appointed in writing immediately upon deploying. This individual serves as the commander's advocate for environmental considerations throughout all phases of planning and execution. The environmental officer should contact key personnel in the AOR to obtain all available information on the beddown location, and participate in all surveys and assessments of the beddown location. Some key responsibilities include: (1) developing mitigation and preparation measures to address environmental hazards, (2) identifying required environmental knowledge/skills and conducting training, (3) obtaining needed equipment and supplies, (4) assist as required in preparing environmental annexes to support OPLANs and OPORDs, (5) developing and implementing environmental plans and site-specific operating procedures, (6) sustaining environmental standards, and (7) preparing operating locations for closure and transfer. Individuals selected to serve as environmental officers or on the environmental staff during deployments should pursue training through the Civil Engineer School at Air Force Institute of Technology (AFIT) prior to deploying. A list of courses available can be downloaded from their website at http://www.afit.edu/.

1.5.5. **Defense Logistics Agency (DLA) Disposition Services.** DLA Disposition Services provides on-site support within or near the AOR to manage disposal of HW. However, they are subject to applicable force protection and/or security concerns. DLA Disposition Services develops guidance on turn-in procedures for HW and excess HM. **Attachment 7** contains examples of documentation that may be required. Once turned in by U.S. forces, DLA Disposition Services is responsible for ensuring the HW is properly treated and disposed of in an environmentally safe manner. They determine the optimum HW treatment and disposal options for the AOR and ensure contracts achieve cost-effective disposal consistent with DOD's emphasis on environmental leadership. For additional information on DLA Disposition Services, go to http://www.dispositionservices.dla.mil/.

1.5.6. **Contractors.** Contractors providing services under a PWS must comply with DOD environmental regulations. Contractors are responsible for complying with pollution prevention, HM/HW management, solid waste disposal, waste minimization, recycling, spill response and reporting, and natural and cultural resource preservation standards included in contract statements. Contractors must include proposed methods to ensure compliance in the proposal and fully comply once the contract is initiated.

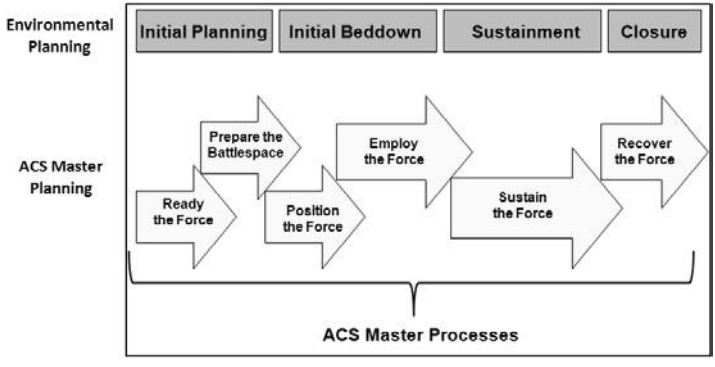
1.5.7. **Coalition Forces.** U.S. forces work closely with forces from other nations during contingencies. When the U.S. is responsible for maintaining base operations, environmental considerations are integrated into plans and coalition forces are expected to adhere to guidelines expressed in these plans to protect the environment as well as the health and safety of all personnel. Coalition forces should also be knowledgeable of environmental guidance issued by the CCDR and ensure their personnel are provided environmental awareness training prior to and throughout multi-national military operations.

Chapter 2

ENVIRONMENTAL PLANNING

2.1. Overview. Environmental factors have a significant impact on military operations and must be considered throughout all phases, from initial plans to site closure and redeployment. Planning identifies activities that pose risks to human health and safety or the environment, and provides commanders with alternatives to mitigate these effects. Although environmental considerations may not be a high priority initially, pollution prevention and environmental protection quickly takes on significance when the health of the force or local relations is adversely affected. Integrating environmental considerations is also essential to achieving U.S. strategic objectives. Past operations have shown when U.S. forces respect the environment and the local population has access to essential resources and infrastructure, they are less likely to support insurgent activities. This concern for the environment also contributes to local stability and reconstruction efforts. **Figure 2.1.** illustrates how engineers integrate environmental considerations into agile combat support (ACS) master processes (Ref: AFDD 4-0, *Combat Support*). **Chapter 2** focuses on initial environmental planning conducted by civil engineers as part of overall ACS efforts to ***ready the force*** and ***prepare the battlespace***.

Figure 2.1. Environmental Planning and ACS Master Planning.



2.2. Site Selection and Survey. The site selection and survey processes are critical aspects of planning. Site selection decisions are usually made at the operational level. AFI 10-404, *Base Support and Expeditionary Site Planning*, governs the Expeditionary Site Planning (ESP) process. Once sites are selected, the Expeditionary Site Survey Process (ESSP), a subset of ESP, is used to guide the survey effort. A great deal of information on a proposed site may already be available as a result of previous deployments to the area. Aerial or space-based imagery may also be available. This data can be used as a starting point for the site survey. Site survey teams can be sourced from different organizations or AF Contingency Response Groups (CRGs) may be tasked. These units can be augmented by functional experts from other areas including Safety, Security Forces, Civil Engineer, Medical, Contracting, Communications, Fuels, Munitions, Legal, and Weather. The environmental officer should make every effort to be a part of the survey team to identify potential hazards and ensure environmental considerations are integrated into site layout and beddown planning. Key environmental factors should be addressed during the survey. Topography, hydrology, climate, cultural and historic resources, flora and fauna, natural resources, water sources and supplies, drainage, and water tables are examples of the factors to be considered (see EBS sample at **Attachment 2**). Industrial facilities located nearby should be examined to determine if operations could pose a health and safety hazard such as noise or pollution. This type of information is used to determine where to set up industrial activities, airfield support, storage, dining, billeting, etc., and what force health protection countermeasures need to be developed to address potential hazards associated with the environment. While planning, anticipate and designate potential expansion areas to allow for safe distances between airfield operations and personnel work and living areas. Also consider space needed to attain and maintain minimum force protection standoff distances. Existing resources that can be used to achieve environmental standards should be identified. This is also an opportunity to begin developing a list of equipment and supplies that will be needed (i.e., spill kits, drums, tarps, concertina wire, etc.) to manage HM/HW until resupplies begin to arrive or approval is granted to procure such items locally (see **Attachment 5**). The remainder of this chapter covers environmental aspects that should be considered during planning.

2.3. Geospatial Information Systems. GIS can be a force multiplier in conducting environmental planning and assessments if information is available for the proposed deployment location. GIS data saves commanders a considerable amount of time since all of the information needed to effectively plan does not have to be obtained through ground surveillance or from other potentially unreliable sources. The need to deploy reconnaissance forces into potentially dangerous areas to obtain information can be eliminated in some cases if GIS information is available. Keep in mind, however, GIS data analysis alone cannot suffice for a full-blown site survey where air, water, and soil sampling is conducted along with the identification of numerous other potential health threats. Satellite imagery can assist commanders with critical tasks such as terrain analysis and water source identification. The National Geospatial-Intelligence Agency (NGA) provides satellite imagery (usually classified), often accompanied by reports outlining a variety of environmental factors for a particular location. These reports may also include historical data that will assist with site planning. GeoReach, an expeditionary site mapping tool, compiles all expeditionary site survey data into a single view. Contact the combatant command environmental staff to determine if this information is available for a particular site or region. The Air Force Special Operations Command (AFSOC) has developed a GIS tool that assesses risks at forward operating locations. The Global Situational Awareness Tool (GSAT) is an assessment model that aids the site selection process, unit basing, and troop movement planning. It integrates a variety of environmental, geographical, and epidemiological information with user-defined areas of interest to assess suitability, safety, and occupational health risks and provides alternatives for mitigating risks where possible. GSAT is designed to work with existing mapping and expeditionary basing tools, such as GeoReach, to provide risk reports and scalable effects maps of areas on surrounding airfields, encampments, and movement areas. It provides detailed reports, maps, and data that can be used to assess risks to personnel, health and readiness that might result from factors such as weather, flooding, soil composition, pests, industrial discharges, nuclear contamination, and endemic diseases. Contact the AFSOC Environmental Office or Command Surgeon to gain access to this information.

2.4. Air Force Contract Augmentation Program (AFCAP). AFCAP is also a force multiplier. This contract option is used to augment civil engineer capabilities, principally in lesser contingencies and sustainment operations, when it is expected an operation will continue for an extended period of time (**Figure 2.2.**). AFCAP support generally cannot be used during initial beddown in high-threat environments. However, once combat operations begin to stabilize, AFCAP support can be used to help transition from initial facility and utility beddown standards to temporary or semi-permanent facilities and infrastructure. Contractors employed under this option will have access to any commercially available equipment (i.e., generators, HVAC equipment, vehicles, tools, etc.) and can assume management of critical functions such as Petroleum, Oils, and Lubricants (POL) storage and distribution, solid waste (SW) management, HM Storage Area (HMSA), HW Storage Area (HWSA), pest and vegetation control, and limited cleanup activities. Employing AFCAP support increases the commander's ability to integrate environmental considerations into day to day activities, reduce health, fire, and other safety hazards associated with environmental neglect, and improve the chances for mission success. The environmental officer should consider this option during the earliest stages of planning. Requests for AFCAP support are channeled through the MAJCOM Civil Engineer. For more information on AFCAP support capabilities, access the AFCESA website at: http://www.afcesa.af.mil/.

Figure 2.2. Providing Electrical Support at Deployed Location.

2.5. Environmental Plans. To ensure environmental considerations are continually addressed, site-specific environmental plans, or SOPs should be developed to include methods and procedures to address operations that can affect the environment and pose safety, fire, and health risks. AF 10-219 series pamphlets and 10-222 series handbooks cover many of the field expedient methods to address environmental concerns and much of the equipment that will be used during contingencies. Plans should reinforce higher level guidance and instruct personnel on accomplishing routine tasks in an environmentally safe manner. In developing plans, the Environmental Annex of the OPLAN or OPORD should always be used as a source of reference unless the CCDR specifies use of other guidance. Ideally, the Environmental Annex is developed using the EBS conducted on the area. If it was not used, planners will need both documents since the EBS describes existing infrastructure and environmental challenges and constraints. Use all data gathered on the deployed location to develop strategies to eliminate or mitigate the adverse effects military operations may have on personnel and the environment. Assumptions may need to be made when site data is lacking, however, this should be avoided if possible. Once plans are developed, personnel must be organized, trained, and equipped to perform assigned duties prior to deploying. Following are some plans that should be included in Standard Operating Procedures (SOPs):

- Plan for preventing the contingency site from being polluted
- Plan for producing, testing, and managing field water supplies
- Plan and methods treating, reusing, and disposing of wastewater
- Plan for safe and proper disposal of non-hazardous SW
- Plan to handle, transport, segregate, store, label and issue HM
- Plan to handle, collect, segregate, store, label and dispose of HW
- Plan to store, secure, issue petroleum, oils, and lubricants (POL)
- Plan for storing, segregating, treating, disposing of medical waste
- Plan to store, secure, utilize and dispose of pesticides/equipment
- Plan for spill prevention, response, containment, and cleanup
- Plan to minimize the impact of storm water on water resources
- Plan to minimize air pollution resulting from military activities
- Plan to protect/preserve natural, cultural, and historical sites
- Plan to protect and preserve flora and fauna within the region

2.6. Planning Considerations. Many factors are considered in developing environmental plans. Some examples include: (1) the operational threat environment, (2) locally available resources, and (3) local support available. Lack of a functioning government affects planning also since this contributes to environmental degradation due to environment laws or standards not being enforced. Planners should address many factors and develop workarounds for limiting factors that could affect the mission. Plans should address how units will adhere to applicable environmental requirements, international agreements, and guidance issued by the CCDR. This is also the time to develop a site closure plan that addresses any areas where some cleanup may be needed and HM/HW turn-in procedures. If contract support will be available, generic performance work statements can be developed for the support needed and tailored for the site and location once initial beddown actions have been completed. Following are some considerations for environmental planners:

- Level of support from local population (hostile, cooperative, etc.)
- Applicable international agreements, CCDR environmental guidance
- Climate conditions of the region, including seasonal weather hazards
- Safe and adequate water resources, location, and means of protection
- Soil type/percolation rates on construction and waste management
- Potential impact of natural and/or cultural resources on the mission
- Potential impact of regional precipitation and flood plains
- Impact of vectors and poisonous or dangerous rodents and animals
- Potential for existence of unexploded ordnance or depleted uranium
- Potential for site contamination from previous occupation/activities
- Potential for contamination from off-base/local industrial plants
- Potential for water source contamination from storm water runoff
- Potential for air pollution from the site or nearby industrial activities
- Potential for noise pollution from the site or nearby local activities
- Resources needed/available to support HM/HW management
- Resources needed/available to support wastewater management
- Resources needed/available to support SW management
- Resources needed/available to support medical waste management
- Resources needed to close site as described in the site closure plan

2.7. Risk Management. Risk Management is an effective method for ensuring all environmental concerns are addressed and should be integrated into all planning activities. Environmental risk management can be used to identify when, where, and how health and safety of personnel might be affected by environmental conditions and identify those activities that may cause damage to the environment and to what extent. These factors could be addressed during the Environmental Impact Analysis Process (EIAP) or Environmental Baseline Survey (EBS), discussed later in this chapter. With this knowledge, commanders can quantify the risks, detect problem areas, and adjust plans or put in place controls to minimize adverse effects on personnel and the environment without jeopardizing the mission. Further guidance on risk management can be found in AFTTP 3-2.34, *Risk Management*.

2.8. Environmental Training. Prior to deploying, individuals should receive training on environmental health hazards and ways to protect themselves and the environment. Training should include all protective measures outlined in environmental annexes, international treaties, SOPs, job-related hazards, spill prevention and response, use of MSDSs, first aid procedures, HM/HW storage, handling, and transportation, field sanitation, and personal health and hygiene. Those who will have duties requiring them to certify HM/HW shipments should also attend HM/HW certification courses. In addition the BCE environmental officer and staff may require additional training on environmental considerations during contingencies and HM/HW operations and emergency response actions. Courses are available through the **AFIT**, USAF School of Aerospace Medicine (**USAFSAM**), and U.S. Army Environmental Command (**USAEC**).

2.9. Effective Documentation. The key to effective environmental planning is documentation. Planners need to obtain all information available on proposed beddown locations. In many cases the combatant command environmental staff and the servicing Logistics Plans office may already have survey data. There are also automated tools and databases that may contain needed data. If no information has been previously collected, surveys, photos, Geospatial Information Systems (GIS) information, Global Positioning System (GPS) data, and local interviews are some methods planners can use to collect and record environmental data throughout the course of planning.

2.10. Surveys and Reports. Several surveys and reports are usually required when assessing potential beddown locations. Many surveys have already been conducted over multiple regions of the world, as well as past and potential beddown locations. This information is typically available at the Major Command (MAJCOM), Field Operating Agency, or Direct Reporting Unit level and can be used for environmental planning. Following are surveys and reports conducted and prepared to assist the headquarters environmental staff in determining the adequacy of proposed beddown locations.

2.10.1. **Occupational and Environmental Health Site Assessment (OEHSA).** The OEHSA is normally the first report prepared for a potential deployment location. It is usually prepared by AF Bioenvironmental Engineers or the U.S. Army Public Health Command (USAPHC). The OEHSA is conducted in accordance with AFMAN 48-154. The purpose of the OEHSA is to identify any contaminants present, disease vectors, or environmental conditions that may pose health risks. During the assessment, medical personnel identify areas of concern where deployed personnel may become exposed to hazards such as radiological or other hazardous waste burial or storage sites, known contamination and pollution affecting the air, soil and/or water sources, climate conditions, etc. The report will contain results from soil, air, surface water, and drinking water sampling. In addition, industrial facilities such as chemical or power plants located near the potential site are examined to determine if current operations or accidental releases could result in catastrophic risk to deployed personnel.

Figure 2.3. Medical Personnel Conduct Air Sampling.

2.10.2. **Environmental Assessments, Impact Statements, Studies, and Reviews.** Executive Order (E.O.) 12114, *Environmental Effects Abroad of Major Federal Actions,* requires environmental impacts to be considered when planning federal actions outside U.S. territory. DOD Directive (DODD) 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions,* implements E.O. 12114 and requires preparation of an environmental assessment prior to a major federal action that will significantly affect the environment of the global commons (i.e., geographic areas outside the jurisdiction of any nation, such as the oceans outside territorial limits, outer space, and Antarctica). The assessment is used to determine if an environmental impact statement is required. For major actions that will significantly affect the environment of a foreign nation or protected global resource, the DODD requires preparation of an environmental study or environmental review. The E.O. and DODD exempt certain actions from their EIAP requirements. The exemptions include actions taken at the direction of the President or SECDEF in the course of armed conflict or when either national security or national interest is involved. If a proposed action is covered by an exemption, the proponent should document the exemption status before taking the actions. An AF Form 813, memorandum for record, or other signed written statement can be used to document the exemption. The exemptions also include disaster and emergency relief actions. Procedures for analysis of environmental actions abroad are contained in 32 CFR Part 989, *Environmental Impact Analysis Process* and DODD 6050.7. This directive provides comprehensive policies, definitions, and procedures for implementing E.O. 12114. The JA, MAJCOMs, and CCDR's environmental staff can assist in determining environmental requirements.

2.10.2.1. Engineer planners assist in performing a risk analysis to include an assessment of military actions that may result in unnecessary damage or destruction to the environment and/or pose imminent and substantial danger to the health of U.S. forces or the local population. Limiting unnecessary environmental damage can increase the overall chance of mission success.

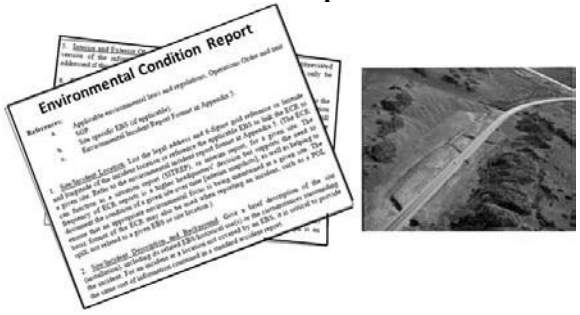
2.10.2.2. Engineers can assist operational planners by providing an assessment of potential consequences of targeting certain infrastructure such as industrial or chemical plants that may result in hazards that threaten personnel health and safety. Planners also consider time and effort required to repair infrastructure for use by friendly forces or in support of stability operations.

2.10.3. **Environmental Baseline Survey (EBS).** The EBS is a multi-disciplinary survey of air, soil, surface water, and groundwater sources at potential beddown locations. It should be conducted prior to deploying, along with the initial site reconnaissance. If this is not possible, it must be conducted immediately upon arrival. Its purpose is to document existing environmental conditions, determine the potential for past and present site contamination, and identify environmental hazards that may affect personnel health and safety. Potential hazards could include existing problems with quality of air, water, soils, terrain, weather, presence of HM/HW, sensitive cultural sites, or threats from animals, insects, or plants. Planners assess the risks associated with hazards and develop solutions or strategies to eliminate or mitigate the effects. In addition to protecting personnel health, the EBS can help commanders identify type and scope of contamination caused by U.S. forces. In conducting an EBS, use of all available tools such as satellite imagery and aerial photography should be considered. Surveyors address environmental data such as pollution, geography, water sources, soil characteristics (**Figure 2.4.**), previous use, and local population. Field Manual (FM) 3-100.4, *Environmental Considerations in Military Operations,* contains guidance on preparing the EBS for contingency operations. Instructions are also provided in **Attachment 2**. However, always review the environmental annex of the OPORD and check with the CCDR's environmental staff for specific guidance on preparing and staffing the EBS.

Figure 2.4. Soil Samples Being Collected for Analysis.

2.10.4. **Environmental Condition Report (ECR).** The ECR is a concise summary of environmental conditions at a site, supported by maps, ground and aerial photographs, and backup documents (**Figure 2.5.**). An ECR can be prepared periodically to document existing site conditions or when a potentially significant environmental incident such as a spill occurs. It provides "interim snapshots" of site conditions over a period of time and documents the types of HM/HW stored at the site. The ECR can be used as a situation report, and should be used as a reference document to complete the site closure report. Along with the EBS and closure reports, the ECR can help defend the U.S. from pressure to remediate or pay for environmental damages at sites used by U.S. forces during contingency operations. See **Attachment 3** for the ECR format.

Figure 2.5. Environmental Condition Report.



2.10.5. **Closure Report.** The closure report is prepared upon notification that a site is to be abandoned. It is used to document post-occupation environmental conditions at a particular site. This report is compared to the EBS prepared upon initial occupation to determine what contamination resulted from activities conducted by U.S. forces at the beddown location. The closure report can protect the U.S. against unsubstantiated claims of environmental damage. The report should include photographs and detailed information on all environmental factors (e.g. quality and condition of air, water, soils, natural resources, and cultural and historic properties) considered during the initial EBS. Every topic covered in the EBS should be covered in the closure report. Contact the combatant command environmental staff for specific requirements, report formats, and timelines.

2.11. Pollution Prevention (P2). Without proper emphasis on P2, it won't take long before bad habits lead to extensive environmental degradation (**Figure 2.6.**). P2 is the preferred means of protecting the environment and complying with applicable environmental laws, international agreements, military orders, and guidance during contingencies. Early planning efforts should focus on training and resources needed to prevent or minimize environmental degradation and exposure to environmental hazards. Leaders should place strong emphasis on ensuring every individual is aware of their responsibilities to prevent pollution, and provide the resources needed to support this effort. One of the goals of P2 is to reduce the amount of hazardous and non-hazardous waste generated at the source. To achieve this objective, environmental planners should focus on practicable solutions such as waste-to-energy technology, product substitution, procedural changes, conservation, reuse, and recycling. Identifying effective pollution prevention requirements early ensures commanders are able to minimize the impact of military activities on the environment and personnel health and safety, and lessens the need to expend valuable time and resources for costly site cleanup activities. Requisition equipment and supplies (**Attachment 5**) during initial planning and ship the items with the operational equipment. If the site is already occupied by U.S. or coalition forces, contact the personnel involved with environmental functions to get as much information as possible. This will help determine what will be needed immediately upon arrival.

Figure 2.6. Polluted Forest Area.

2.12. Water Sources. A safe and adequate supply of water must be available for deployed personnel. Planners must ensure all water sources identified are approved by the BEE, and develop a plan for purifying, storing, testing, transporting, and distributing potable water to predetermined water points (**Figure 2.7.**). Ensure there are adequate resources for purification, storage, and distribution. Also, factor in the amount of water that will be needed to sustain any anticipated buildup. Population estimates will be needed in order to calculate the amount of potable water needed to be produced and stored to sustain the anticipated force, including contractors and local personnel directly supporting the mission. While developing estimates, it is also important to determine the effect use of natural water resources will have on the local population. Consult the BEE to ensure there will be sufficient space between water resources and other planned activities such as leach fields, retention ponds, HM\HW storage, and waste disposal activities. The BEE is also consulted to determine when and where water purification and testing can be conducted. To ensure personnel health and safety, potable water supplies must always be tested for temperature, total dissolved solids, turbidity, chlorine residual, pH, and presence of bacteria. The BEE determines the potability of drinking water. For specific guidance on establishing and maintaining a potable water production capability and testing procedures during deployments, refer to AFPAM 10-219, Volume 5, *Bare Base Conceptual Planning Guide,* and AFMAN 48-138_IP, *Sanitary Control and Surveillance of Field Water Supplies.*

Figure 2.7. Typical Water Source.

2.13. Wastewater. Wastewater generated during contingency operations can total 16 gallons per person per day. Estimates of black water (predominantly human waste) and gray water (wastewater from showers, laundry, kitchen, etc.) that will require collection, treatment, and disposal must be considered in deployment planning. Identifying expedient methods and supplies needed to manage wastewater early will minimize unsanitary and working conditions that pose significant risks to personnel health and safety. If expeditionary methods are used to manage wastewater, site latrines, dining facility (DFACs), laundry facilities, leach fields and ponds at least 30 meters (100 feet) downgradient from water sources, intakes, and surface bodies of water. Leach fields and ponds should also be downwind of living and work areas. Always consult the BEE when siting wastewater management and disposal activities. Consider use of individual waste aggregation bags for solid human waste in the very early stages, since the bags are biodegradable, spill-proof, and can be disposed of in any landfill. Plan to separate gray and black water storage and treatment areas, and consider constructing a gray water collection pond (**Figure 2.8.**) to collect and use gray water for activities not requiring potable water such as dust suppression or construction activities. Depending on usage, gray water may need to be treated (BEE makes this determination) before using it for other purposes. It's also important to minimize the impact of U.S. forces' wastewater activities on the local water supply. For details on constructing field expedient wastewater collection and treatment systems, see AFH 10-222, Volume 1, *Civil Engineer Bare Base Development,* and FM 21-10, *Field Hygiene and Sanitation.*

Figure 2.8. Gray Water Collection Pond.

2.14. Solid Waste. During contingency operations, expeditionary bases can generate 9 to 12 pounds of SW per person per day. At this rate, it won't be long before piles of garbage begin to threaten the health and safety of personnel. DOD policy requires operational commanders to develop and approve a SW Management Plan (SWMP) for each contingency operation. This SWMP should be developed as early as possible, particularly when plans indicate a relatively high base population and the duration of the operation is unknown. If determined by previous site surveys that local contracting might be available, coordinate these efforts as soon as possible, including force protection requirements. If the local contract option is not available, engineers will have to implement expedient methods to manage SW disposal consistent with the SWMP. Expedient methods include landfills, incinerators, and burn pits; although DOD policy imposes restrictions on the use of burn pits (reference DODI 4715.19, *Use of Open-Air Burn Pits in Contingency Operations*). DODI 4715.19 states open-air burn pits are designated for the purpose of disposing of solid waste by burning in the outdoor air at a location with more than 100 attached or assigned personnel and that is in place longer than 90 days. SW plans should include provisions to transition to a more acceptable means of disposal. This becomes particularly important as bases mature and populations surge. Landfills can be constructed to dispose of SW and/or ash created by burn pits and incinerators. Whatever method(s) used, SW disposal activities should be sited in the predominate downwind direction and a safe horizontal distance from personnel and water sources, probable inversion layers, away from areas with high water tables, channels, creeks, and areas significantly impacted by storm water runoff (always consult the BEE when siting these activities). Consider soil characteristics; look at topography, soil permeability, potential for runoff, etc. Keep in mind SW activities attract rodents, snakes, etc., and must be considered in pest management plans and coordinated with the Public Health (PH) staff.

Figure 2.9. Burn Pits and Incinerators.

2.15. Hazardous Material/Hazardous Waste. HM include any material, based on chemical or physical characteristics (i.e., corrosive, explosive, flammable, reactive, toxic) that pose a threat to human health and/or the environment if improperly disposed of, handled, stored, labeled, or transported. As described in the OEBGD, HW are discarded material that may be solid, semi-solid, liquid, or contained gas and exhibits a hazardous characteristic (i.e., ignitability, corrosivity, toxicity or reactivity). Ignitable wastes are any liquids having a flashpoint less than 140°F; any non-liquids capable of causing a fire through friction, absorption of moisture; or any ignitable compressed gas (reference 40 CFR 261.21 and Appendix 1 of the OEBGD). Corrosive wastes consist of acids and bases with a pH less than 2 or greater than 12.5. Toxic wastes, such as polychlorinated biphenyls (PCBs), asbestos, and lead-based paint contain certain levels of specific materials that are harmful to living organisms. Reactive wastes include unstable materials such as munitions and other explosive components. Proper management of HM/HW will reduce personnel injuries and help to protect valuable resources and the environment. Some HM used extensively during contingencies include POL, batteries, antifreeze, bleach, grease, solvents, and paints. During planning, HM/HW storage areas (**Figure 2.10.**), supplies, and equipment (i.e. containers, spill kits, PPE, etc.) needed immediately upon arrival must be identified (always consult the fire dept and BEE when siting these activities). Planners also develop SOPs for HM/HW management, including procedures and training on spill prevention and response (see **paragraph 3.8**.) for personnel who will handle or be exposed to HM/HW. Information on managing HM/HW can be downloaded from the **DENIX** website and the Air Force Center for Engineering and the Environment website at: **http://www.afcee.af.mil**.

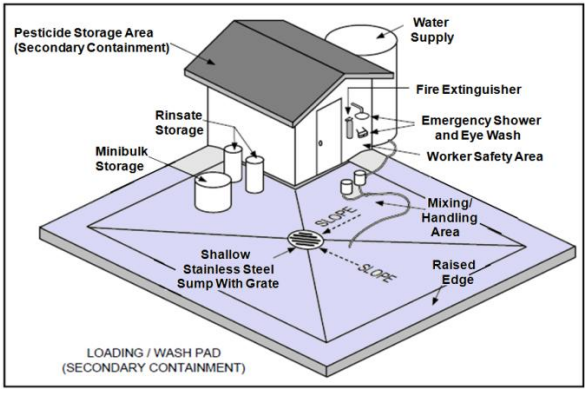
Figure 2.10. Expedient Storage Area.

2.16. Regulated Medical Waste (RMW). RMW (also referred to as infectious medical waste) are those wastes generated from medical and dental treatment of human beings or animals that are potentially capable of causing disease. RMW includes cultures and stocks of infectious agents; pathological wastes including human tissues, organs, amputated limbs or other body parts; blood, blood products, or body fluids; contaminated animal carcasses and body parts; and sharps, including needles, syringes, scalpels, and blades. RMW must be separated from general waste at the point of origin since handling, storage, and disposal procedures differ significantly from other types of wastes. Plan to store RMW near medical units and make sure these areas can be secured (**Figure 2.11.**). For pathological wastes, factor in space for power generators and refrigeration units needed for storage. Also plan for space needed to store supplies, including spill and cleanup kits, medical storage bags, sharps containers, storage drums, PPE, etc. If contract disposal will not be immediately available, plan to set aside an area near the SW disposal facility to set up an incinerator. Also ensure equipment will be available to construct a berm or fence around the area to prevent unauthorized access. For additional information on RMW, refer to U.S. Army Technical Guide 177, *A Commander's Guide to Regulated Medical Waste Management*.

Figure 2.11. RMW Expedient Storage/Disposal Area.

2.17. Pest Management. Historically, DNBI accounts for the majority of battlefield admission to medical facilities. Planners must focus on identifying entomological hazards in the deployment region. Of primary concern are vector-borne diseases carried by arthropods such as mosquitoes, ticks, and mites. Additional hazards include biting/stinging arthropods (fire ants, spiders, scorpions, etc.), rodents, snakes, bats, birds, and poisonous plants. Although initial protection will rely on personal protective measures such as repellants and netting, a vector management plan for use of pesticides should be developed in consultation with BEE and PH, and integrated into the applicable OPORD. Once the plan is developed, review the AFPMB contingency pesticide list at: http://www.afpmb.org/content/dod-standard-pesticides-and-pest-control-equipment to obtain equipment and supplies needed prior to deploying. TG 24 contains information on emergency procurement of pesticides and equipment. Consider space needed for mixing pesticides (**Figure 2.12.**), storage of safety equipment/supplies, secondary containment, conducting pest management activities far from personnel and water sources, etc. Plan for fencing to control access and storm water retention areas to control contamination runoff. Plan to treat leach fields, ponds, and storm water retention areas. Designate an area adjacent to the SW disposal area to incinerate and/or bury pests found on the site. Remember to consult the Fire Department, Safety, BEE and PH when planning to site pest management facilities. The **AFPMB** maintains a wealth of information on controlling pests and disease vectors during contingency operations.

Figure 2.12. Pesticide Storage and Mixing Area.



2.18. Storm Water. Planning for storm water is critical to determining the amount of equipment and supplies that may be needed immediately upon arrival. Storm water is precipitation that runs off impervious surfaces and does not naturally infiltrate the soil. As a result, it eventually flows into lakes, rivers, streams, and other bodies of water. This happens either naturally or by conveyance as a means to prevent flooding and eliminate standing water in certain areas (**Figure 2.13.**). Storm water can carry contaminants, such as suspended solids, plastic bags, detergents, heavy metals, chemicals, biological contaminants, and other pollutants, directly into natural water resources. These pollutants can come from several sources including HM/HW storages areas, maintenance facilities, fuel points, construction sites, and landfills. Additionally, water pooling in areas that can become breeding grounds for disease-carrying insects is another health concern. During planning, consider factors such as soil permeability and natural features that minimize the impact of storm water runoff. Although these and other factors should be considered during site selection, the flexibility to avoid certain areas during contingencies may not always be available. Plans must be made to minimize the impact of storm water runoff on natural water sources and in camp areas.

Figure 2.13. Storm Water Being Conveyed.

2.19. Air Pollution. In the U.S., where strict environmental laws are in place to govern activities that contribute to air pollution, safe air to breathe might be taken for granted. For military operations in foreign countries, the quality of air is of significant importance. Military operations suffer if DNBI rates caused by air pollution in foreign countries begin to take a toll on personnel. This potential hazard must be considered by civil engineer, safety, BEE, and PH personnel during planning and site selection. The EBS and OEHSA will provide crucial information concerning the quality of air in the proposed region of deployment. If these reports were previously prepared, they will be invaluable for planning. All of the information gathered about the site should be used to develop strategies to minimize the impact of air pollution on the health of deployed personnel. Nearby industrial plants (**Figure 2.14.**) that use toxic industrial chemicals (TICs) in their processes could pose a significant health risk to personnel and must be considered during planning. **Chapter 3** contains information that can help minimize air pollution during initial stages of contingency operations. **Chapter 4** provides additional information and guidance focused on integrating environmental practices into daily operations and further protecting the environment and the health of deployed personnel.

Figure 2.14. Industrial Plant Air Pollution.

2.20. Historical and Cultural Resources. Historical and cultural resources (including archeological sites and assets) are preserved for the inspiration and benefit of the country's citizens. The National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on resources included on the World Heritage List or the host nation's equivalent of the National Register of Historic Places. Because of their value to the country or international community, these assets could restrict beddown plans and limit certain military activities. While planning, research all sources of information available on the region, contact personnel in the AOR, and query the local population during the site survey, if feasible, to obtain information about such assets in the region. Map these areas (i.e., districts, sites, buildings, miscellaneous structures, etc.) in relation to proposed beddown locations. Attempt to site military activities at least 50 meters (165 feet) from these areas. Consider developing a plan to protect these areas by making personnel aware of these assets and developing SOPs that can be integrated into official environmental guidance applicable to the military operation. If any operation may result in damage or destruction to these assets, commanders must be made aware and given the opportunity to make adjustments to plans and/or balance this factor against the need to maintain operational capability. Since engineers may be tasked to provide targeting or basing recommendations during operational planning, they should also be familiar with international laws such as the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict. This convention provides planners with a good base of reference for use in balancing military necessity with the need to protect these assets to the greatest extent possible.

"If we have to choose between destroying a famous building and sacrificing our own men, then our men's lives count infinitely more, and buildings must go. But the choice is not always so clear-cut as that. In many cases, the monuments can be spared without detriment to operational needs. Nothing can stand against the argument of military necessity. That is an accepted principle. But the phrase 'military necessity' is sometimes used where it would be more truthful to speak of military convenience or even of personal convenience. I do not want it to cloak slackness or indifference."

General Dwight D. Eisenhower

2.21. Natural Resources. Natural resources includes those naturally occurring resources such as air, land, lakes, streams, rivers, oceans, flood plains, marshlands, fossil fuels, rock, mineral resources, and forestry (**Figure 2.15.**). Natural resources also include raw materials such as natural gas, petroleum, coal, gold, copper, lead, iron ore and salt. These resources are essential for human survival, possess significant value, and can sometimes cause conflicts between nations. In addition to a means of survival, the abundance or lack of natural resources can also determine a nation's wealth and prosperity. To avoid loss of support and alienating or angering the local population, these resources must be respected to the greatest extent possible during contingencies. Two ways to accomplish this is by focusing on conservation and preservation. Conservation involves sustainable use of natural resources. If natural resources are renewable the focus would be on ensuring they are not consumed faster than they can be replaced. For nonrenewable natural resources such as fossil fuels, the focus would be on ensuring these resources are available for future use. Preservation focuses on maintaining natural resources and not affecting them at all (e.g. wetlands). Conserving and preserving natural resources should always be a key consideration. Unnecessary damage, depletion, or exploitation of natural resources could threaten the livelihood of local populations, destabilize the country, and make it difficult to achieve U.S. strategic objectives.

Figure 2.15. Band-e-Amir National Park - Afghanistan

2.22. Flora and Fauna. Flora and fauna include all plant and animal life found in a particular region (**Figure 2.16.**). Although mission needs take precedence during contingencies, care must be taken to avoid unnecessary damage or destruction to flora and fauna significant to the country's pride and culture. Implement plans to eliminate or minimize the impact of military operations on these assets to ensure continued local support and access to strategically important areas. Efforts should be made to avoid conducting noncritical military operations and siting risky activities such as HM/HW storage and fueling points near sensitive areas, particularly endangered species habitats. Military personnel should also be aware of international and U.S. laws governing wildlife trade. The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), U.S. Endangered Species Act, and the Defense Travel Regulation (DTR) prohibit military personnel from purchasing or transporting products made from or containing parts of threatened or endangered species. Planners should research flora and fauna for the deployment region, consider potential environmental impacts of activities in or near these areas, advise commanders, and develop appropriate plans. The International Union for Conservation of Nature (IUCN) maintains the world's most comprehensive inventory of the global conservation status of plant and animal species, referred to as the "Red List". This is a good place to start research on flora and fauna for a particular country or region. The IUCN website can be accessed at **http://www.iucn.org/**.

Figure 2.16. Endangered Snow Leopard in Afghanistan.

Chapter 3
INITIAL BEDDOWN

3.1. Overview. Initial beddown actions by engineers underpin ACS efforts to **position the force** and **employ the force**. This stage is usually characterized by austere facilities and limited supplies and equipment which could complicate environmental protective efforts. This chapter covers actions that can be taken during initial beddown to ensure personnel health and minimize degrading effects on the environment. The Environmental Officer (with assistance from FES, EM, BEE, and PH) should begin conducting awareness training. As a minimum, everyone should be familiar with: (1) environmental guidance issued by the CCDR; (2) the site environmental SOP; (3) handling hazardous materials/waste; (4) use of PPE; (5) spill response and reporting; (6) maneuver restrictions, (7) vector hazards; (8) endangered species; (9) cultural and historic assets; and (10) applicable international agreements and treaties. Personnel regularly working with or exposed to HM or appointed to respond during emergencies such as spills should receive advanced training (e.g., HAZCOM, HAZWOPER). Following are some key tasks for integrating environmental considerations during initial beddown:

- Establish environmental continuity (SOPs, contacts, file plans, etc.)
- Appoint trained personnel to manage HMSA and HWSA
- Appoint UECs to manage and oversee unit environmental activities
- Appoint spill teams and conduct spill prevention/response training
- Appoint trained personnel to manage burn pit and landfill operations
- Establish plan to manage SW, potable water, gray water, black water
- Requisition any additional sustainment equipment/supplies needed
- Assess whether proposed site layout might threaten personnel health or safety, or the environment, and make necessary recommendations
- Focus on pollution prevention; begin monitoring site activities
- Research ideas for SW/HM/HW substitution, reduction, recycling
- Initiate research on disposal options via DLA or local contract
- Site industrial facilities and noisy equipment away from high use facilities, billeting, and work, construct barriers to minimize noise

3.2. Pollution Prevention. The preferred means of protecting human health and the environment is through P2. During initial beddown, the operational tempo is high and the focus is primarily on generating the mission. However, force protection (including environmental health and safety) should always underpin all military activities. If environmental considerations are not immediately integrated, the environment will become degraded very quickly, personnel health will begin to suffer, and safety problems will escalate. Individuals should understand the difficulties in relying on a contaminated and polluted environment to maintain health and accomplish the mission. Following are some considerations for minimizing the impact of pollution on personnel health and safety during initial beddown:

- Conduct pollution prevention training for all personnel on site
- Identify pollution sources; develop goals for reduction/elimination
- Develop site-specific P2 plan in conjunction with PH, BEE, Safety
- Establish HMSA/HWSA; appoint trained personnel to manage
- Ensure HMSA/HWSA located away from billeting and work areas
- Ensure liners and secondary containment used at HMSA/HWSA
- Resist stockpiling, particularly HM; maintain only what is needed
- Appoint and train spill prevention/response team; conduct exercises
- Assist HW generators to establish HW accumulation points
- Encourage recycling/conservation; focus on HM/HW/SW/water
- Strongly encourage reuse of hazardous and non-hazardous materials
- Prohibit wastes from being improperly dumped/buried on site
- Establish SW activities downwind/downgradient of water sources
- Properly site burn pits/landfills; research SW disposal alternatives
- Separate RMW at point of generation and consult BEE on disposal
- Properly site latrines; ensure treatment and disposal of human waste
- Construct leach fields at a lower elevation, far from water sources
- Construct holding ponds at a lower elevation, far from living areas
- Maintain native vegetation if possible to reduce erosion, control dust
- Collect, treat, and reuse gray water for vegetation and dust control

3.3. Water Sources. Very few activities will take on more importance than establishing a safe supply of potable water during initial beddown. If this is not done immediately, the entire operation could be in jeopardy. Water sources must be identified and approved by medical personnel with assistance from civil engineers during planning and while conducting pre-deployment site surveys. Considering these sources may be scarce and demand is usually high during contingencies, engineers must work closely with BEE, PH, Safety, Fire Department, and Security personnel to ensure water sources are adequate to support the expected population and are protected from intentional or unintentional contamination. Refer to AFMAN 48-138_IP for details on managing field water supplies. Following are key points to consider in managing water resources during the early stages of deployments:

- Develop site-specific SOP for managing water supplies/resources
- Test several water sources to determine the sources of higher quality
- Ensure all water sources have been approved by medical personnel
- Ensure all treated water is certified as potable by medical personnel
- Establish water storage and water points; include alternate locations
- Routinely test water supply points (tanks, trailers, bladders, etc.)
- Frequently test water sources and water supplies for contamination
- Protect source from contamination from soil erosion/storm water
- Plan to secure and protect water sources from intentional sabotage
- Designate a secure and covered area to store bottled water supplies
- Ensure control/surveillance of water supplies per AFMAN 48-138
- Test distribution points (showers, laundry, etc.) for contamination
- Use local support for water requirements if agreed upon and approved
- Absent local support, establish in-house water purification operation
- Ensure waste disposal activities are downgradient of water sources
- Ensure refueling operations are as far from water sources as possible
- Minimize refueling operations over raw water sources if possible
- Closely monitor quantity of water purification equipment/supplies
- Clean and disinfect water storage/distribution equipment regularly
- Encourage water conservation based on resource availability

3.4. Wastewater. Wastewater is typically separated into different types, including gray water and black water (human waste). Although it is preferable to connect to existing wastewater treatment and disposal facilities or use portable latrines or holding tanks with local service support, the operational environment or existing infrastructure may make this difficult. Upon arrival at the deployed site, technicians may need to immediately begin employing expedient methods to manage wastewater for kitchen, shower, and latrine facilities. Examples of expedient methods include use of BEAR assets, burnout latrines, pipe urinals, sewage treatment lagoons, gray water lagoons, evaporation ponds, and soakage pits or trenches. In addition to guidance in **Chapter 2**, detailed guidance for managing wastewater during contingencies can be downloaded from the USAF School of Aerospace Medicine (**USAFSAM**) or the **USAPHC** website.

Figure 3.1. Field Expedient Latrine.

3.4.1. **Gray Water.** Gray water is the by-product of activities such as showers, laundries and kitchens. It is captured in a variety of ways for treatment/reuse or disposal. Due to limited supply of potable water in field environments, it may be necessary to treat and reuse gray water for activities that do not demand potable water. Gray water from showers and laundry facilities can be treated and reused for washing vehicles, vegetation, fire fighting, dust suppression, construction activities, etc. This reduces the volume of wastewater requiring disposal. If current expeditionary assets cannot be configured for this purpose, commercial plumbing assets can be used to direct gray water into collection areas, or it can be stored in bladders or tanks, then pumped out and transported to collection areas for treatment. There may be some restrictions on gray water reuse. For example, medical authorities may only allow gray water from showers and laundries to be recycled back to the generating activities. Requirements for treating and reusing gray water can be found on the **USAFSAM** and **USAPHC** websites. Gray water produced from kitchen activities such as food preparation and sanitation is heavily contaminated with food particles, cooking oils, grease, detergents, and other cleaning agents, and usually cannot be reused for other non-potable purposes. For disposal, gray water should be conveyed to evaporation or absorption pits, or evaporation lagoons via transport, plumbing, trenches, etc. Following are considerations for managing gray water during initial beddown:

- Erect field expeditionary assets for use in managing wastewater
- Designate areas for soakage pits and trenches for gray water disposal
- Perform soil percolation test on areas designated for pits/trenches
- Use grease traps to remove fats, oil, grease from kitchen wastewater
- Construct soakage pits near DFAC to avoid transporting wastewater
- Provide two pits to allow a rest period for each pit every other day
- Use trenches if the groundwater table is too high for soakage pits
- Use evaporation beds in hot/dry climates with bad soil percolation
- Build enough evaporation beds to flood each one on successive days
- Inspect areas for standing water; could indicate bad soil percolation
- Locate gray water collection areas downstream of water sources
- Devise a method to convey gray water to collection areas
- Collect, treat, reuse nonpotable gray water for approved activities
- Include gray water collection areas in pest management program

3.4.2. **Black Water (Human Waste).** Black water refers to latrine water containing human waste. If not properly handled, this waste can become extremely hazardous to human health. Black water must be collected and disposed of in a manner that best protects personnel health under the existing operational environment. Effective treatment and disposal will prevent the spread of disease and ensure the site does not become infested with flies, rats, and other vermin that cause diseases such as dysentery (amoebic and bacillary), typhoid, paratyphoid, and cholera. Preferred methods include use of existing sanitary latrines, sewers, and treatment plants, BEAR assets, or locally serviced chemical latrines. When these options are unavailable or not feasible, expedient methods are employed using, evaporation ponds, sewage treatment lagoons, or package wastewater treatment plants. Additional guidance on managing human waste during contingencies can be found in TB MED 593, the Environmental Annex of OPLANs, or specific guidance issued by the CCDR. Following are some considerations for managing black water during contingencies:

- Consider connecting to a local wastewater treatment system
- Consider portable facilities with local servicing support
- Consider on-site packaged wastewater treatment plant
- Recover/transport waste to on-site or off-site disposal facility
- Determine if any applicable guidance prohibits expedient latrines
- Base type of latrines on location, duration, climate, legal restrictions
- Site latrines at least 100ft downhill and downwind of DFAC, water sources, and billeting areas
- Coordinate with the PAM team (BEE, PH) on the amount, type, and proposed location of expedient latrines
- Build 1 commode/urinal per 25 males; 1 commode per 17 females
- Construct separate latrine facilities for urination/defecation
- Construct screens around latrines to prevent filth fly breeding
- Conduct open burning of human waste downwind of populated areas
- Ensure field hand washing devices are located adjacent to latrines
- Include all latrine areas in pest management program
- Construct lagoons for physical, biological, chemical treatment
- Locate sewage lagoons at least ½ mile from populated centers
- Include black water collection areas in pest management program

3.5. Solid Waste. Considering that expeditionary sites can generate 9-12 lbs of SW per person per day, SW buildup can quickly become a health hazard during contingency operations, attracting dangerous animals and disease-carrying insects. Examples of solid wastes include construction debris, aluminum, paper, cardboard, packing materials, plastic bottles, food waste, and scrap wood. Under ideal conditions, a local contract could be acquired and a property holding area (PHA) established to manage SW generated by military operations. However, support from the local population may not be integrated into operations until the region is stabilized, and local contracting may not be an option if the infrastructure cannot support the site's SW disposal requirements or the operational environment makes this option impractical. Initially, engineers will have to implement expedient methods to manage SW disposal. Expedient methods used to dispose of SW can include burn pits, landfills, and incinerators. However, plans should consider initiatives such as waste minimization, reuse, recycling, and composting to reduce the amount of SW requiring disposal. Composting operations should not be located within 1,200 feet of aircraft operations and should not include food wastes that could attract wildlife. Additional information on managing SW during contingencies can be found in TB MED 593, *Guidelines for Field Waste Management*, or downloaded from the **USAFSAM** or **USAPHC** website. Following are considerations for SW management during initial beddown:

- Develop site SOP for collecting/disposing of non-hazardous SW
- Maintain an estimate of SW generated daily based on population
- Coordinate local methods and assistance in disposing of SW
- Coordinate plans for burn pits with BEE, PH, Safety, FES
- Locate landfill operations downstream, far from water sources
- Use liners in landfills to prevent leachate release into groundwater
- Cover landfill area daily with soil to control insect/rodent infestation
- Designate space for the PHA and develop a plan to secure the area
- Separate hazardous solid waste in PHA; do not allow it to be burned
- Extract items that can be recycled/reused to reduce the waste stream
- Coordinate with other units for access to, or purchase an incinerator
- Monitor contracts approved by CCDR's environmental staff

3.5.1. **Burn Pits.** During initial stages of contingencies, burn pits are an expedient method for thermal destruction of large quantities of SW generated. Although DOD policy imposes restrictions on using burn pits to manage SW during contingency operations, this may be the only option available initially. Because burn pits, even properly segregated may produce fumes that can affect the health of personnel, they are a short-term solution for SW disposal and must be replaced by more appropriate means of disposal, particularly as the site matures and the population increases. The following paragraphs describe DOD policy and guidance on use of open-air burn pits, planning, construction, and operations.

3.5.1.1. **DOD Burn Pit Policy.** DOD guidance indicates burn pits are a short-term solution to SW disposal where no other alternative is feasible. For the longer term, incinerators, engineered landfills, or other accepted solid waste management practices should be used for SW disposal. DODI 4715.19, *Use of Open-Air Burn Pits in Contingency Operations*, was issued to protect personnel health and safety to the greatest extent possible when burn pits are used. The policy states when used, open-air burn pits shall be operated in a manner that prevents or minimizes risks to human health and safety of DOD personnel and, where possible, harm to the environment. It requires the operational commander to establish a solid waste management plan (SWMP) for contingency operations. Use of open-air burn pits shall not be allowed unless included in the SWMP. It also establishes policy to prohibit the disposal of covered waste in open-air burn pits during contingency operations except when the CCDR determines no alternative disposal method is feasible. Covered waste includes tires, treated wood, batteries, compressed gas cylinders (unless empty with valves removed), fuel containers (unless completely evacuated of contents), aerosol cans, polychlorinated biphenyls, petroleum, oils, and lubricant products (other than waste fuel for initial combustion), asbestos, mercury, and foam tent material. If the CCDR determines there is no alternative to burn pits for disposing of covered wastes, the determination must be sent to USD(AT&L) within 15 days for congressional notification. Justification for continued disposal of covered waste must be made every 180 calendar days thereafter. Justification packages shall include a detailed health risk assessment IAW paragraph 6.2 of DODI 6490.03, *Deployment Health*. These assessments can take months, and should be initiated as soon as possible for burn pits having a probability of operating over 180 days to meet the 180-day notification to congressional committees.

In no case are munitions or explosives allowed to be disposed of in burn pits with any other wastes (see DOD 6055.09-M for guidance on destruction of munitions and explosives). Engineers should always consult the Fire Department, BEE and PH in determining items that can be burned.

3.5.1.2. **Burn Pit Planning and Construction.** Engineers coordinate with medical personnel to site burn pits downwind and as far away from living, dining, and work areas as operational considerations permit. They are also located where burning or presence of garbage will not pose an unsafe attraction to birds or other wildlife that may interfere with safe air operations and air traffic control. Weather personnel track wind speed and direction to help establish typical or prevailing wind data to best orient burn operations to keep the path of plumes away from other activities as much as possible. Solid waste generation estimates are used to determine the size of burn pits, taking into consideration possible future expansion. Aboveground pits may be needed in areas with high water tables. Construct several pits to allow one to burn while others collect waste. Pits should be far apart to allow equipment to maneuver. Optimally, design each pit to hold a week's estimated waste. High density liners can be used to minimize soil contamination. Use earthen berms and fencing to restrict access. Designate space adjacent to the burn area to establish a PHA for segregating and items not being burned.

3.5.1.3. **Burn Pit Operations**. Burn pits are operated in a manner that: (1) is safe and secure for operators; (2) minimizes attraction for wildlife and disease vectors; (3) prevents or minimizes risks to human health and safety and the environment. Personnel should be trained in offloading, segregating, igniting, and observing operations from a safe distance. They should have proper PPE as determined by the BEE. The best time to operate burn pits is 3 hours after sunrise to 3 hours before sunset. Before conducting burns, coordinate with the FES, BEE, Safety, and PH. An ash disposal plan should be developed. Ash samples are taken and characterized as either hazardous or non-hazardous. If ash is determined to be hazardous, inspect the waste stream to identify and remove the source of hazardous ash. Store hazardous ash securely near the burn pit until HW disposal methods are established. Non-hazardous ash can be disposed of in a landfill. A system should be established (by the BEE) to monitor for high pollution emissions (reference DODI 6055.05, *Occupational and Environmental Health [OEH]*, and DODI 6490.03). Sources of high levels of pollutants are identified and quickly resolved. Pits are inspected often for compliance with CCDR and DOD guidance. If burn pit operations are

contracted, engineers should work with contracting officials to ensure performance work statements reflect the most current DOD and theater guidance, particularly any restrictions.

3.5.2. **Thermal Destruction.** During contingency operations, disposal methods should transition to thermal destruction as the site matures and population increases. When acquiring incinerators, make sure they are certified where manufactured. Also ensure they are operated according to the manufacturer's instructions. Work with medical and weather personnel to site incinerators as far as possible from populated areas in a manner where prevailing winds take smoke away from these areas. Emissions should be routinely monitored by BEE personnel for high levels of pollutants and causes identified and quickly resolved. Do not burn materials that give off hazardous pollutants such as POL products, rubber, tar paper, asphalt, shingles, tires, treated wood, batteries of any type, aerosol cans, compressed gas cylinders, plastic, paint, paint thinner and strippers, pesticides, pesticide containers, asbestos, appliances and electrical equipment, and electrical wires. These should be recycled or disposed of as hazardous waste. Also, do not place ammunition or explosives in incinerators. Thermal destruction equipment should be used only for their intended purpose (e.g., HW, SW, RMW).

3.5.3. **Landfill Operations.** Landfill operations attract large birds and flocking birds that are hazardous to aircraft operations. If possible, landfills should be sited at least 10,000 feet (approximately 2 miles) from active aircraft ramps, taxiways, and runways where fixed-wing and variable geometry wing jet aircraft operate. This may not always be practicable when deployed in support of contingency operations in foreign countries. The working face of the landfill should be kept as small as possible. Use protective measures to prevent landfill leachate from contaminating local soil and ground water resources. Solid wastes should be compacted and covered daily with a minimum of six inches of soil to discourage bird activity. Units should deploy with lethal bird control and dispersal equipment along with trained personnel. Pyrotechnics are very effective and highly recommended for bird dispersal. The use of shotguns for lethal control may be necessary to reinforce dispersal techniques. If it is impracticable to site a landfill outside of the criterion, dispersal and lethal control activities must be coordinated with air traffic control to avoid dispersing birds into the path of arriving and/or departing aircraft. Before employing lethal controls, ensure birds targeted for depredation are not

protected by local laws or international treaties. For details on landfills, see AFPAM 10-219, Volume 1.

3.6. Hazardous Material. Upon arrival at the deployed location, those units with HM may need to use whatever space is available to properly store highly volatile items, poisons, and corrosives. Supplies may also be very limited, and those supplies that are available may not be the items specified by different manufacturers for handling certain types of HM. Resourcefulness and creativity are essential traits for properly "making things happen" during initial stages of contingencies. Engineers may establish an HMSA to centrally manage all HM on site.

3.6.1. **Siting**. During initial beddown, site the HMSA in an industrial area large enough to meet anticipated needs, but not near base perimeters or other areas where they create force protection problems by becoming potential targets for enemy forces. Work with the Safety, BEE and weather personnel to ensure the HMSA is sited downwind and downgradient, and a considerable distance away from living and work areas. Also, make sure the area is not near a water source and the surface is level. The site should be near service roads for access by vehicles and potential contractors. Do not site HM storage in areas prone to flooding (**Figure 3.2.**), particularly if equipment and supplies needed to construct overhead cover and ensure secondary containment are not yet available. Use all available data including topography, geology, weather data, aerial photography and geospatial information in siting HM storage.

Figure 3.2. Flooded Storage Area.

3.6.2. **Construction**. Employ whatever techniques and materials are available to prevent pollution and properly manage HM storage. Excess tent parts can be used for expedient storage, and expired fuel bags and sandbags can be used temporarily as liners for containment. Wooden pallets can be used for flooring and scrap wood, and camouflage netting can be used to build cover for storage areas. Ensure the storage area has proper ventilation and enough space to segregate incompatible materials (reactives, ignitables, corrosives, oxidizers, and toxics) to prevent fire or explosions. Also provide some type of emergency eyewash and shower. Construct berms around HMSA storage areas to contain leaks, and fencing to prevent unauthorized access to the area. As soon as possible, the area should be upgraded to include concrete flooring that can serve as secondary containment. Although not generally applicable to contingency operations, UFC 4-442-01N, *Design: Covered Storage,* can provide planners with basic requirements for constructing covered storage facilities for HM, considering resources available and operational constraints. The UFC can be downloaded from the Whole Building Design Guide (**WBDG**) website.

3.6.3. **Procedures**. The Environmental Officer, in conjunction with the FES, BEE, Safety, and PH should develop a site-specific environmental SOP which includes HM management and spill prevention/response. The SOP should address how the site will manage, issue, and track HM. AFI 32-7086, paragraph 2.6 should be used as a reference in developing this SOP. However, keep in mind environmental guidance in applicable international agreements or the relevant OPLAN/OPORD (CCDR's guidance) takes precedent over guidance provided in Service instructions and other policy. Everyone involved with managing HM must be trained and equipped with proper protective equipment, and know what to do in the event of a spill, fire, or explosion. They should ensure materials are properly containerized, labeled, segregated, and stored, and MSDSs are available for each HM stored. Procedures are established to conduct periodic inventories to maintain accountability. Personnel should avoid stockpiling HM, and reduce the HM stored and HW generated through reuse, recycling, or product substitution. The Environmental Officer, FES, Safety, and BEE should conduct periodic inspections of HMSA to detect and correct any existing or potential hazards. If HMAPs will be set up, establish procedures to periodically inspect these areas as well.

3.7. Hazardous Waste. The primary means of disposing of HW during contingencies is through DLA Disposition Services in country (if the proper disposal facilities and capabilities exist) or retrograding it back to the U.S. for disposal. Another option could be transit agreements and arrangements to transport HW to nearby countries with acceptable disposal facilities. However, these options may not be immediately available. Until that time, HW must be properly managed. Initially, commanders appoint trained personnel to manage HW during contingencies. These individuals can establish a centralized HWSA to consolidate all wastes until proper turn-in procedures can be established locally or through DLA Disposition Services

3.7.1. **Siting.** Engineers work closely with medical, safety, and weather personnel to locate the HWSA far from and downwind of living areas, work areas, or other highly populated areas to minimize the risk and impact of accidental spills or releases of vapors. The storage area should be large enough to meet anticipated needs, and be near a road that is accessible by material handling equipment (**Figure 3.3.**). Keep in mind there also needs to be enough space available to segregate ignitables, reactives, flammables, and corrosives (See **Attachment 6**). Since the HWSA could become a target for intentional sabotage, it should be far enough inside the camp boundary so that it is not easily accessible by the local population. Also, make sure it is downwind and downgradient of water sources and in an area not prone to frequent flooding. Prevailing wind data should also be used in siting to minimize the impact of accidental releases of toxic fumes on populated areas or the mission.

Figure 3.3. Hazardous Waste Storage Area.

3.7.2. **Construction.** The HWSA must have enough space to segregate incompatible wastes, allow for unobstructed movement, store spill response and decontamination equipment, and provide secondary containment. The area should be graded to provide a level surface, and under cover to minimize the impact of runoff from flooding. Equip the HWSA with fire extinguishers, first aid kits, emergency eyewash, and a shower in case of accidents, spills or other emergencies. A berm or fence should surround the area to control entry. Post warning signs (i.e., "Danger, Unauthorized Personnel Keep Out," "No Smoking," etc.) in both English and the language predominant for the area. Although not generally applicable to contingency operations, UFC 4-451-10N, *Design: Hazardous Waste Storage*, can provide planners with basic requirements for constructing a HWSA, considering resources available and other operational constraints. It can be downloaded from the **WBDG** website.

3.7.3. **Procedures.** Key aspects of HW management include collection, storage, transportation, treatment, and disposal. The Environmental Officer, in conjunction with the FES, BEE, Safety, and PH should develop a site-specific environmental SOP covering all these areas including spill prevention/response. A HWSA staff should be appointed, trained, and equipped with proper PPE. These individuals must know what to do in the event of a spill, fire, or explosion. They ensure materials are properly containerized, labeled, segregated, and stored. They ensure HW turned in is accompanied by a HW profile sheet (DRMS Form 1930) and DD 1348-1A (Issue Release/Issue Receipt Document). The HWSA staff also assists HW generators in setting up Hazardous Waste Accumulation Points (HWAPs) at or near the point of generation and under the control of the HW generator (keep in mind HWAPs cannot store more than 55 gallons of HW or 1 quart of acute HW per waste stream before it must be transferred to the HWSA). Periodic inspections of the HWSA and HWAPs are conducted to ensure accountability is being maintained and to detect and correct any existing or potential hazards (see **Attachment 4**). Refer to TG 217, *Hazardous Material/Hazardous Waste Management Guide for Maneuver Units During Field and Deployment Operations*, and additional guidance on HW management located on the **DENIX** website.

3.8. Identification and Storage of Unknowns. During contingency operations, unknown chemicals and other substances may be discovered that are not labeled or otherwise properly identified. These items are usually quarantined and BEE and/or Emergency Management personnel are immediately notified. Such unknown items should always be handled as potentially dangerous. If tests can identify these chemicals or other substances, they should be sealed for proper storage.

3.8.1. Consider establishing a separate facility for unknown chemicals or substances. Locate the facility away from all others, downwind of the camp, and preferably in a bunker-type location. Ideally, this facility should be capable of being secured to prevent items from being dropped off without coordination. All unknown chemicals can then be taken to this location for testing. While exercising extreme caution, tests can be taken to attempt to identify the chemical or substance (**Figure 3.4.**). If a proper identification is not possible, the item should remain in storage.

3.8.2. Unknown chemicals or substances not generated by U.S. personnel cannot be disposed of through normal U.S. channels. For this reason, it is important to keep these items separate. Keep in mind it is possible to have some U.S.-generated unknown chemicals or substances. If these can be identified by any means of investigation, the waste must be disposed of through normal U.S. channels.

Figure 3.4. Testing Unknown Substance.

3.9. Spill Prevention and Response. Although U.S. forces should focus on P2, during fast-paced, large-scale military operations involving a vast array of vehicles and equipment, spills are likely. In preparation, the spill prevention and response plan developed prior to deploying should be tailored for the site and maintained anywhere spills might likely occur, particularly the HMSA, HWSA, HWAPs, and refueling points (**Figure 3.5.**). The plan should include emergency contact information, notification and evacuation procedures, and local methods and procedures for preventing and responding to spills, fire, and explosions.

3.9.1. **Prevention**. Spill prevention involves strict adherence to guidance, proper use of supplies and equipment, and frequent inspections. Some actions that can be taken to prevent or contain spills include:

- Secondary containment at HMSA/HWSA, HWAPs, refuel points
- Locate HM/HW storage areas on existing paved surfaces
- Provide overhead cover for HM/HW storage to prevent runoff
- Empty any water accumulated in secondary containment; test and dispose of as HW if necessary
- Use proper containers/lids, ensure containers are in good condition
- Conduct frequent inspections of containers; checks for leaks
- Turn in full containers as soon as possible for proper disposal
- Use spill containment liners for parked vehicles and equipment
- Ensure use of liners and secondary containment at refueling points
- Devise methods to prevent spills from overflowing secondary containment and reaching soil, drains, ditches, etc.
- Ensure all HM/HW transported on vehicles comply with combatant command guidance and spill kits are readily available

Figure 3.5. Secondary Containment for Refueling Vehicle.

3.9.2. **Response**. The spill response team (**Figure 3.6.**) is appointed and trained prior to deploying to ensure they are immediately prepared to safely stop or contain spills and execute cleanup actions. To remain proficient, the team frequently practices procedures outlined in the SOP to detect and correct deficiencies. Team members must be trained on the dangers of HM/HW they may be exposed to, safety precautions, use of emergency apparatus such as alarms, fire extinguishers and emergency eyewash, first aid procedures, use of MSDSs and PPE, and be adequately equipped with supplies and equipment needed for spill response (see **Attachment 5**). Following are some actions that should be taken in response to spills:

- Responders should approach spills from the upwind direction
- Evacuate area if necessary based on amount/type of material spilled
- If spill poses danger to the site, notify/warn all personnel
- Identify spill material and follow MSDS guidance
- If material is flammable, shutdown electrical and notify FES
- Ensure proper PPE is being worn and used based on MSDS
- Ventilate the area to allow any toxic fumes to escape
- Use spill kit to safely stop or contain the spill IAW SOP
- Contact key personnel outlined in SOP to report the spill
- Qualified personnel clean up spill and properly dispose of wastes
- Replace equipment and supplies used to clean up the spill
- Ensure proper vehicular transport of HM/HW and availability of spill response kits/supplies to quickly clean up any spills

Figure 3.6. Spill Response Team.

3.10. Landfarming. Spills are likely to occur in the contingency environment due to the rapid pace of beddown and mission priorities. When they do occur, contaminated soil must be removed to protect human health. Most spills tend to be POL-related; accidents usually occur during fueling, de-fueling, transport, transfer and maintenance activities. Contaminated soil should be removed and placed in a designated area for aeration and/or microbe treatment (**Figure 3.7.**). This is referred to as landfarming, a bioremediation treatment process. The contaminated soil is mixed with healthy soil containing microorganisms that will metabolize the waste contents of the contaminated soil. Once the site is designated, construct a bermed area and install liners to contain the contaminant. This is where the contaminated soil will be mixed with healthy soil. Have a plan to turn the soil (aeration) and keep it moist (spraying or other means) to enhance biodegradation. The soil may have to be covered to keep it moist. There is no set timeframe for this process. Once landfarming has begun, the soil will have to be tested periodically to determine the remaining level of contamination. Detailed information on landfarming is outlined in Unified Facilities Guide Specifications (UFGS) 02 54 20, *Bioremediation of Soils Using Landfarming Systems*. It can be downloaded from the **WBDG** website.

Figure 3.7. Landfarming.

3.11. Regulated Medical Waste. As stated earlier, RMW includes those wastes with the potential for causing infection and for which special precautions are prudent. The medical unit generating RMW is responsible for proper storage, handling and disposal; however, engineer assistance is usually required. During initial beddown, expedient methods may need to be employed to construct a storage area for managing RMW until medical waste incinerators or local support can be obtained. Storage areas should be marked with the universal biohazard symbol and the word "BIOHAZARD" in both English and the local language. Expedient disposal methods can include open-burning and burying (as a last resort, after treatment). Medical personnel are familiar with specific procedures, unique equipment and supplies, and HN laws governing RMW disposal. To ensure proper disposal, RMW is separated from other wastes at the point of origin. Personnel involved must wear appropriate PPE (skin, eye, and respiratory protection). If SW is mixed with RMW, it is handled and disposed of as RMW. Following are some considerations for managing RMW during contingencies:

- Become familiar with site-specific RMW disposal SOP
- Ensure all personnel involved in handling RMW are trained
- Wear proper PPE for handling, transporting, disposing of RMW
- Use "red bags" or any uniquely identified or marked bags for RMW
- Use sharps containers/closed metal pails for syringes, needles, etc.
- Do not snip or cut needles; discard items intact into containers
- If 55-gallon drums are used for storage, do not add fuel to the drums
- Research option of having RMW picked up/disposed of via contract
- If contracted, state specific requirements for proper disposal
- If possible, dispose of RMW via incineration (preferred method)
- Consider retrograding sharps to a location with a waste incinerator
- Consider constructing inclined-plane incinerator (ref: FM 21-10-1)
- Obtain approval to use inclined-plane incinerator to burn wastes
- Ensure any burning takes place downwind of work and living areas
- Store medical waste ash in a drum to be retrograded back to the U.S.
- Consider steam sterilization to treat sharps (use autoclave bags)
- Bury sharps when no other method medical waste disposal available
- Sterilize sharps and other RMW to remove pathogens before burying
- If sharps must be buried, bury below scavenger depth (approx 8 ft)

3.12. Pest Management. In the field, pest management personnel have dual responsibilities: vector/pest control and proper HM/HW storage (see TG 24). During contingencies, pest management activities are focused on removing disease vectors and medical pests from the site and, later on, surveillance to evaluate the problem species and disease threat. Controlling wild animals, insects, rodents, and heavy bird populations that threaten personnel health and aircraft operations is the main focus during initial beddown. Bird/Wildlife Air Strike Hazard (BASH) mitigation measures must be coordinated with flight safety and airfield operations. Disease vectors (some species of mosquitoes, ticks, sand flies, etc.) can transmit causative agents responsible for rabies, malaria, leishmaniasis, dengue, etc. Although conventional integrated pest management (IPM) techniques that include pesticides still apply during contingencies, implementation is complicated by limited control and equipment, inadequate supplies, construction and manpower priorities, pest problems not previously encountered, and a public health infrastructure that may not yet be fully established. Pesticides (insecticides, herbicides, rodenticides) and repellents can affect personnel through direct contact, water, air, and food. Additionally, many insecticides are cholinesterase inhibitors, which may predispose personnel to chemical warfare agents, set off chemical alarms or adversely affect personnel with chemical sensitivity. Pesticides must be applied by certified applicators wearing proper PPE and in accordance with label instructions (**Figure 3.8.**).

Figure 3.8. Pesticides Being Applied.

3.13. Storm Water. Storm water, while often seasonal, poses a serious hazard to contingency operations and the environment. Sites constructed on land that is relatively dry most of the year may be under water in a short period of time during the rainy season if soils become impervious and do not allow for quick drainage. This could affect terrain, vehicle movement, initial beddown options, mission generation, and efforts to bring the site to full operational capability. This is why it is important to have plans in place to minimize the impact of storm water prior to deploying. Following are some recommendations for consideration in managing storm water during initial beddown. Additional information on managing storm water can be found in UFC 3-210-10, *Low Impact Development.*

- Avoid destroying vegetation to minimize storm water runoff
- Grade/slope site in a manner to prevent flooding /standing water
- Minimize the amount of impervious surfaces to be constructed
- Construct trenches/retention ponds capable of diverting storm water
- Construct drainage/storm water collection areas to control runoff
- Use natural low-lying areas for retention ponds/collect storm water
- Ensure watershed protection is considered in construction activities
- Prohibit constructing paved surfaces near groundwater sources
- Avoid construction activities that contribute to storm water runoff
- Clear construction sites daily of trash, material scraps, debris, etc.
- Designate vehicle/equipment fueling area away from const area
- Store HM/HW on level surfaces, downgradient of all water sources
- Const berms around HM/HW storage to limit runoff contamination
- Ensure HM/HW storage/maintenance areas under protective cover
- Test storm water for POL contamination; locate/neutralize source
- Collect, treat, use storm water for fire fighting, vegetation, dust
- Collect, treat storm water contaminated from construction activities
- Upkeep vehicles/equipment to prevent leaks on impervious surfaces
- Install oil/water separators in maintenance areas; inspect regularly
- Regularly inspect septic systems; immediately make needed repairs

3.14. Air Pollution. Air pollution poses a serious threat to the health of deployed personnel. Although we cannot control natural occurrences such as the fierce sandstorms experienced in Southwest Asia exposing personnel to particulate matter, attempt to minimize sources of pollution over which we do have some degree of control. Many opportunities exist to limit sources of air pollution resulting from military operations. Much of the equipment and supplies used during military operations emit various concentrations of Volatile Organic Compounds (VOCs) and can possibly be substituted. Minimizing air pollution at the height of contingency operations can be challenging. However, it is important to focus on limiting exposure to unnecessary hazards. Civil engineers should always consult with medical and weather personnel when making determinations on siting industrial, storage, and waste management activities considered sources of air pollution. Ensure stationary sources of pollution are sited a substantial distance downwind to ensure changes in wind direction will not result in an inadvertent exposure to personnel. Where practicable, air dispersion modeling can be used to estimate concentration of pollutants and determine stack heights and safe distances for pollution sources such as incinerators. Modeling can also be used to identify cost-effective pollution control equipment. Contact the combatant command environmental staff or **AFCEE** for information on air dispersal modeling. Following are recommendations to reduce air pollution during contingencies:

- Develop site-specific SOP to minimize sources of air pollution
- Investigate any off-site sources of TIC in the near vicinity
- Establish local contracts to remove/dispose of SW if possible
- Locate burn activities downwind/far away from living/work areas
- Locate HMSA/HWSA downwind/far away from living/work areas
- Segregate SW materials; remove all hazardous SW before burning
- Reduce SW generation; recycle/reuse to maximum extent possible
- Minimize fuel jettisons during flying ops; reduce vapors if possible
- Acquire power generation equipment with newer filtration systems
- Acquire larger power units; cover more area/reduce emissions
- Locate older equipment where emission hazards are minimized
- Extend smoke stacks on older heating units above breathing zones
- Acquire modern heating units equipped with filtration systems
- Use treated gray water or soil solidification products to reduce dust
- Keep vehicles/fueling equipment well maintained and inspect often
- Replace equipment/substitute products for those emitting less VOCs

3.15. Historical and Cultural Resources. During initial beddown, civil engineers work closely with senior leadership in developing and issuing local guidance to ensure all personnel understand the importance of historical and cultural resources and their responsibilities to protect these assets to the greatest extent while focusing on the mission. Engineers thoroughly review all of the research information gathered during planning to ensure accuracy and make adjustments to plans as necessary. Make contact with key environmental personnel in the AOR and local officials to gather any additional information on historical and cultural resources that might impact the course of operations. Considering the operational environment, also look for opportunities to query the local population. If necessary, update maps developed during planning. All of this information provides commanders situational awareness with respect to historical and cultural resources that can be useful during decisionmaking. If adjustments must be made, ensure these assets are considered prior to starting construction, and military activities and maneuvers are able to remain at least 50 meters (165 feet) from these areas. As operations continue, keep commanders informed of on-going activities that may result in damage or destruction to these assets and propose alternatives that could minimize adverse effects without degrading operational capability. Following are some considerations for historical and cultural resources during initial beddown:

- Integrate CCDR's historical/cultural resource policy into site SOPs
- Maintain maps identifying environmentally sensitive areas in region
- Consider declaring environmentally sensitive areas off limits
- Query local population on locations of historical/cultural resources
- Seek to avoid areas of significant historical importance
- Seek to avoid areas of significant spiritual importance
- Seek to avoid archeological sites that may contain historical artifacts
- Construct temporary barriers to prevent entry into sensitive areas
- Post warning signs at entrances to environmentally sensitive areas
- Assess impact of required excavation on historical/cultural resources
- Avoid sensitive areas in plans for expansion or during construction
- Prohibit removal of historically or culturally significant artifacts

3.16. Natural Resources. During initial beddown, care must be taken to conserve and preserve natural resources. If not accomplished during planning, efforts should be made upon arrival to map sensitive areas and gain as much information as possible to assist commanders in decisionmaking. As an example, siting military operations in strategic locations may require clearing forests and vegetation. In this situation, the CCDR would determine if military necessity outweighs the environmental impact of this action, keeping in mind the impact on the local population and sensitivities of the country. Efforts should be made to site activities such as HM/HW storage and refueling points far from natural resources such as surface waters and wetlands. Personnel should also be educated on their responsibilities to protect and preserve natural resources while maintaining operational capabilities. The swift pace of operations during initial beddown will make it difficult to be proactive in protecting natural resources. However, if the environmental staff is keeping senior leaders informed on the potential impact of military operations and other activities on natural resources, the chances of causing significant damage to these resources should be minimized. Following are some considerations for natural resources during initial beddown:

- Develop SOP with goals for conserving/preserving natural resources
- Maintain maps/records on location/condition of natural resources
- Consider placing wetlands off-limits to preserve biodiversity
- Avoid activities that unnecessarily contribute to deforestation
- Develop plans to mitigate damage to natural resources from fires
- Develop plans to minimize damage to farming/agricultural resources
- Avoid excavating in areas known to contain valuable raw materials
- Prohibit open-dumping/burning near wetlands, lakes, rivers, streams
- Apply pesticides in manner to minimize impact on natural resources
- Manage HM/HW in manner to minimize impact on natural resources
- Determine existence of threatened or endangered species in area; develop plans to prevent destruction or minimize damage to habitats
- Determine existence of threatened or endangered flora in area; develop plans to prevent destruction or minimize damage to habitats

3.17. Flora and Fauna. Flora and fauna are environmentally sensitive issues that must be taken into consideration before initiating military operations and throughout the length of the deployment. Since flora and fauna are often sources of pride for different countries, damage or destruction of these assets could adversely affect U.S. long-term relationships with other countries. During initial beddown, plans designed to minimize impact to these assets may need to be adjusted to accommodate on-going operations (i.e., expanded camp area, adjusted site layout, excavation required, etc.). Plans should consider potential changes and different courses of action to accommodate any changes. Upon arrival, areas of significant importance to the different species' survival should be identified/marked and avoided if possible. Personnel should also be educated on prohibited actions such as wildlife trade and their responsibilities to protect and preserve flora and fauna and while maintaining operational capabilities. If adjustments must be made to initial plans, ensure environmental effects on flora and fauna is continually assessed and addressed in beddown and operational decisions. The combatant command environmental staff is also a source of information concerning flora and fauna for the particular region. Following are some elements to be considered to minimize damage to flora and fauna during initial beddown:

- Integrate JFC's policy on flora and fauna into site-specific SOPs
- Maintain maps identifying all environmentally sensitive areas
- Avoid constructing landfills or storing HM/HW near these areas
- Avoid expanding into areas inhabited by sensitive flora/fauna
- Avoid planning military maneuvers that may damage flora/fauna
- Officially declare all environmentally sensitive areas off limits
- Construct fencing or berms to prevent entry into sensitive areas
- Post warning signs to inform personnel entering sensitive areas
- Prohibit construction activities in these areas if at all possible
- Require permits prior to allowing any excavation on/near the site
- Assess the impact of all required excavation on flora and fauna
- Be aware of the seasonal behaviors of all wildlife in the region

Chapter 4

SUSTAINMENT

4.1. Overview. Once operations begin to stabilize, increased focus should be placed on environmental concerns. At this stage, environmental activities should be focused on supporting ACS efforts to ***sustain the force***. Austere facilities, utility systems, and disposal methods can be upgraded and augmented with contract support. These efforts will increase the level of protection for human health and further limit losses as a result of DNBI. Significant gains can be made in waste minimization. The model shown in **Figure 4.1.** depicts, from top to bottom, the most desirable to least desirable options of dealing with wastes. Prevention and source reduction are given the highest preference since these options can eliminate the need to handle it in the first place. Reuse and recycling helps to preserve raw materials, which reduces the amount of wastes requiring disposal. Energy recovery is an option that is increasingly being considered for the contingency environment. Treatment makes the waste less hazardous (and possibly reusable). Disposal is the least preferred option, which usually involves returning wastes to the land, air, or water (following treatment). This model can be applied to environmental processes in an effort to minimize environmental impacts. Additional information sustaining environmental resources can be located on AFCEE's Accessible kNowledge for Sustainable Resources (ANSR) website at: https://cs.eis.af.mil/a7cportal/eDASH/default.aspx.

Figure 4.1. Waste Management Hierarchy of Preference Model.

4.2. Pollution Prevention. Once initial beddown is complete and military operations become more stabilized, sustaining P2 efforts will require diligence and commitment. P2 should be continually promoted as the primary means of achieving environmental standards. The frequency and amount of education and training should be increased, particularly in areas experiencing high turnover. Adequate supplies should be available, and facility and utility infrastructure upgrades may be completed at this point. The Environmental Officer should be preparing regular ECRs to document the site's condition. This is particularly important after any known imminent and substantial endangerment has been identified or eliminated, or following a significant environmental event such as a spill. Following are some key elements for consideration to enhance and sustain P2 efforts once contingency operations shift towards sustainment:

- Revise SOP to reflect additional P2 and pollution reduction goals
- Focus on source reduction, reuse, recycling to support P2 efforts
- Focus on waste minimization; reduce SW going in to landfills
- Reduce the HM inventory through conservation and reuse initiatives
- Reduce amount of HW generated by reducing dependency on HM
- Substitute HM for those less hazardous to personnel & environment
- Require HM/HW procurement/disposal requests be documented
- Upgrade HWSA (UFC 4-451-10N can serve as a good reference)
- Establish procedures for contract disposal of HW through DLA
- Establish local contract for SW, RMW, and wastewater disposal
- Request AFCAP support to manage/handle various functions/tasks
- Transition any open-pit burning to SW incineration and/or landfills
- Construct semi-permanent facilities/systems to control pollution
- Implement energy conservation plans; identify targets of opportunity
- Consider purchasing and installing more energy-efficient equipment
- Consider purchasing, installing equipment with emission controls
- Prohibit vehicle operations in certain areas to reduce exhaust fumes
- Consider use of renewable energy in those areas where it is practical
- Compost SW to reduce waste stream; use for vegetative needs
- Reduce fuel expulsions during flight activities as much as possible
- Use gray water for construction activities, dust control, composting
- Acquire and install packaged wastewater treatment plant on site

4.3. Water Sources. An adequate supply of safe, potable water is critical to sustaining contingency operations. Once initial water supplies are established, planners need to investigate factors that could affect water production and storage. Key factors include the anticipated duration of the operation, potential changes in mission, anticipated population (including surges), and transient support the site may need to provide, and any additional water sources available. All of these factors can affect water production operations. From initial beddown to sustainment, estimates of water requirements must be reevaluated and production and storage requirements adjusted as needed. Additional resources, such as RED HORSE or AFCAP, may need to be considered if well-drilling or other requirements exceed on-hand capabilities. The site layout should be reexamined (from a perspective of sustainment rather than expediency) and decisions made on whether to relocate HW storage, SW disposal, or refueling activities to prevent water sources contamination. Following are some recommendations for managing water resources once military operations shift more towards sustainment:

- Consider adopting water quality standards and procedures in OEBGD, country-specific FGS (if available), etc.
- Update SOP; add new requirements, methods, procedures, etc.
- Investigate use of local municipal water system as a source
- Establish local contracts to provide purified water if approved
- If bottled water remains a source, consider contract bottling plant
- Ensure aggressive oversight of any contracted water activities
- Ensure AFMAN 48-138 guidance on field water supply is followed
- Continually inspect/safeguard water purification equipment
- Continually inspect, disinfect water storage/distribution equipment
- Develop schedule to test water points (tanks, trailers, bladders, etc.)
- Maintain adequate inventory of water purification chemicals/test kits
- Replace water storage bladders with fiberglass water tanks
- Replace distribution system with buried distribution lines
- Acquire chilled water trailers and install chilled water fountains
- Refine plans to control contamination via soil erosion/storm water
- Refine plans to secure water sources and protect from sabotage
- Refine emergency plans; include additional water points/locations
- Minimize or prohibit aircraft refueling over raw water sources

4.4. Wastewater. Once in the sustainment phase, begin to explore and take advantage of opportunities to improve how wastewater is managed. Some slight risks may have been taken during the initial beddown due to the urgency of the mission, operational tempo, limited personnel, resources, and equipment that need not be taken at this point. Means of adequate and safe disposal of wastewater must be achieved to sustain a military force after initial beddown has occurred. Access to an on-site or municipal wastewater treatment plant (WWTP) is preferable. Other options such as use of a local treatment system or contracting for wastewater removal usually require approval by the EEA. If the contracting option is used, the contract should specify the method of disposal to ensure wastewater removed from the site is being disposed of properly. Following are some items for consideration in managing wastewater after initial beddown has occurred:

- Consider adopting wastewater standards/procedures in OEBGD, country-specific FGS (if available), etc.
- Contract for provision/servicing of chemical latrines
- Lease sewer trucks to collect/transport waste to municipal WWTP
- Construct semi-permanent latrines with locally procured septic tanks
- Negotiate use of local facilities wastewater collect/treatment system
- Tie field expeditionary waste collection system to municipal WWTP
- Tie expedient wastewater treatment system to local sewer system
- Purchase and install package wastewater treatment plant on site
- Purchase materials locally; construct semi-permanent WWTP on site
- Install sewer lines and lift stations to convey wastewater to lagoons
- Consider designating area for composting sewage sludge if practical
- Contract to haul gray water to approved off-site treatment plant
- Use government vehicles/equip to haul gray water to off-site facility
- Consider RED HORSE to construct wastewater treatment system
- Consider AFCAP for operating and maintaining wastewater system
- Replace expedient grease traps with commercial grease traps
- Reuse gray water for dust control, firefighting, composting, etc.
- Inspect/treat gray water; sewage collect/treatment areas frequently

4.5. Solid Waste. Once initial beddown has occurred and operations stabilize, look for opportunities to more effectively manage SW, especially if the site population begins to increase. The Environmental Officer must always be thinking ahead and planning for different possible scenarios. Ways for reducing the amount and volume of SW in landfills include conservation, recycling, reuse, composting, and incineration (**Figure 4.2.**). Following are some elements to consider for improving SW disposal during sustainment:

- Consider adopting solid waste standards/procedures in OEBGD, country-specific FGS (if available), etc.
- Update SOP; include updated guidance/procedures for SW disposal
- Establish waste reduction goals via recycling, reuse, conservation
- Purchase/lease incinerators meeting CCDR standards for SW disposal
- Procure equipment to shred water bottles; reduce the volume of SW
- Transfer PHA ops to DLA for recycling, resale, redistribution
- Designate area for composting, identify types of wastes to compost
- Provide designated containers for recyclable and compost materials
- Contract for SW disposal (see sample PWS in **Attachment 8**)
- Designate SW collection/pickup points; inspect areas frequently
- Ensure containers/dumpsters are clean; have secondary containment
- Consider AFCAP support for SW collection/disposal activities

Figure 4.2. Solid Waste Incinerators.

4.6. Hazardous Material. During sustainment, focus on upgrading facilities standards (**Figure 4.3.**) and equipment, and improving processes for HM management. Several sources can be helpful in this effort. Although AFI 32-7086 is primarily applicable to permanent bases located in the U.S. or U.S. territories, paragraph 2.6 contains tailored guidance for deployments and contingency operations outside the U.S. The Hazardous Materials Information Resource System (HMIRS) located at **http://www.dlis.dla.mil/hmirs/** is a central repository for MSDSs developed and maintained by the DLA. Another valuable reference is the Military Items Disposal Instructions (MIDI) database located on the **USAPHC** website. This database provides guidance for disposal of military items. Following are some elements to be considered in managing HM during sustainment:

- Consider adopting HM management standards and procedures in OEBGD, country-specific FGS (if available), etc.
- Consider relocating HM/HW storage areas for additional security
- Properly containerize, label and segregate HM; obtain all MSDSs
- Install fire alarm and intercom sys; upgrade safety equip, spill kits
- Implement standard training program and begin refresher training
- Implement automated tracking system HM received, issued, stored
- Conduct weekly inspections of storage areas with FES and Safety
- Reduce HM dependency via substitution, conservation, and reuse
- Replace fuel bladders with steel tanks and upgrade distribution lines
- Consider contracting options available for HM management
- Requisition supplies/equipment to address areas of noncompliance
- Consider procedures for checking AF Form 3952 authorizations For units requesting HM, particularly at well established locations

Figure 4.3. Hazardous Material Storage.

4.7. Hazardous Waste. Once contingency operations stabilize, DLA Disposition Services will most likely be the disposal agent for HW. Nevertheless, the focus should be on improving overall HW management and bringing site activities more in line with environmental compliance if more stringent standards are adopted or applied to the operation. At this point it will probably be useful to consult the CCDR's environmental staff on developing a HW management plan (HWMP). Following are some considerations for managing HW during sustainment:

- Consider adopting HW management standards and procedures in OEBGD, country-specific FGS (if available), etc.
- Apply Waste Management Hierarchy of Preference model
- Revise HW SOP to reflect updated procedures for managing HW
- Ensure full-time, dedicated, trained environmental staff is in place
- Consider relocating HWSA if needed to expand the access perimeter
- Requisition supplies/equipment needed to address noncompliance
- Construct semi-permanent facilities with segregated storage areas
- Consider upgrading HWSA to UFC 4-451-10N standards
- Request FES make recommendations on smoke/fire alarm systems
- Construct access roads to facilitate HW transport to collection areas
- Focus on projects needed to secure area (i.e., fencing, alarms, etc.)
- Ensure HW warning signs are posting on the facility and fencing
- Ensure appropriate containers, labels, testing equipment are on hand
- Acquire additional safety equipment, PPE, first aid kits for HWAPs
- Develop guidance; conduct frequent inspections of HWSA/HWAPs
- Require periodic reports from HWAPs; conduct frequent inspections
- Install automated inventory/tracking system for accurate accounting
- Increase contact with other units in to expand reuse/recycle efforts
- Establish contract to dispose of HW off-installation
- Turn over HWSA management to DLA; update site-specific SOPs

4.8. Regulated Medical Waste. The medical facility coordinator will most likely be managing RMW activities during sustainment with assistance from the BEE, but may also require assistance from civil engineer environmental personnel. If the scope of contingency operations begins to expand, additional equipment (i.e., generators, refrigeration units, etc.) may be required to ensure RMW can be properly stored/managed. Storage facilities may need to transition from temporary to semi-permanent standards with additional safety equipment and security. Specialized medical waste incinerators meeting more stringent standards may need to be installed. Engineers assist in all of these efforts. Information, including fact sheets on managing RMW during contingencies can be found on the **USAPHC** website. Following are some considerations and recommendations for managing RMW during sustainment:

- Consider adopting RMW management standards and procedures in OEBGD, country-specific FGS (if available), etc.
- Revise site SOP; incorporate lessons learned from initial beddown
- Ensure RMW disposal techniques consistent CCDR's standards
- Acquire additional equipment/supplies needed to manage RMW
- Ensure RMW separated from other waste at point of generation
- Ensure RMW containers marked with universal biohazard symbol
- Ensure containers labeled "BIOHAZARD"; identifies generator
- Establish controls to prevent unauthorized access to RMW
- Purchase RMW incinerators meeting DOD or CCDR standards
- Determine if RMW incineration ash is hazardous or nonhazardous
- Dispose of hazardous ash from RMW incineration as HW
- Use steam sterilization to decontaminate RMW; maintain logs
- Use chlorine solution for sharps containers for biological organisms
- Consider transporting RMW to nearest installation for disposal
- Consider contracting with medical waste facility for RMW disposal
- Consider local contract/AOR contract for RMW incineration
- Ensure contractor oversight for proper RMW management
- Purchase/install commercial medical waste treatment system
- Consider retrograding RMW to U.S. for treatment and disposal if in-country or in-theater disposal not practicable

4.9. Pest Management. Some key areas to place additional emphasis on during sustainment include training, pest surveillance, and IPM. Site personnel should continuously be made aware of threats from pests and disease vectors, and ways they can contribute to minimizing these threats with good field hygiene and sanitation practices. Training should be part of in-processing, since personnel will likely be rapidly rotating in and out and transiting through the site. Pest surveillance should begin as soon as possible. In a general sense, this involves determining the presence and estimating the density of pest and vector species, determining the health risk they pose, and implementing IPM techniques to reduce the population to an acceptable level. Medical personnel usually lead pest surveillance efforts. IPM is aimed at preventing pests and disease vectors from threatening personnel health and safety or causing unacceptable damage to property. This is accomplished through a variety of methods including habitat modification, biological control, regulatory control, and judicious use of least-hazardous pesticides. Details on IPM can be found in TG 24. Following are some considerations for pest management activities during sustainment:

- Consider adopting pest management standards and procedures in OEBGD, country-specific FGS (if available), etc.
- Along with BEE, develop aggressive awareness/training program
- Begin pest surveillance efforts to identify and respond to threats
- Implement IPM plan in coordination with BEE and PH
- Reduce pesticide usage while increasing other IPM measures
- Record pesticide use on DD Form 1532, Pest Management Report, and DD Form 1532-1, Pest Management Maintenance Record
- Ensure safety and other guidance on pesticide labels are followed
- Ensure herbicides are applied as approved in pest management plan
- If necessary get assistance on airfield wildlife control problems from CCDR's environmental staff or BASH team at AF Safety Center
- Follow manufacturer and CCDRs guidance on managing HM/HW
- Increase spill response capability (e.g. equipment, and supplies)
- Upgrade pesticides storage area; ensure secondary containment
- Dedicate clearly marked vehicles for transporting pesticides
- Consider contract option for IPM; ensure strong oversight

4.10. Storm Water. Once initial beddown is complete, the environmental officer should begin focusing on upgrading expedient methods used to manage storm water to higher construction standards, particularly if there is indication of a surge in site population or it appears the site will be occupied for an extended period. A Storm Water Pollution Prevention Plan (SWPPP) can be developed at this point to identify sources of pollution, guide design and construction activities, and prescribe methods and treatment to minimize soil and groundwater contamination. An analysis of the site can reveal areas where ponding tends to occur, attracting mosquitoes and other disease causing vectors, and migratory birds that could be hazardous to flying operations. These areas can then be graded (sloped) or filled in. A network of drains and ditches can be constructed to direct storm water away from the camp, construction areas, HM/HW storage areas, vehicle refueling points, and potential water sources. Retention ponds can be constructed to capture and treat storm water for nonpotable uses. Following are some considerations for managing and minimizing the effects of storm water during sustainment:

- Incorporate lessons learned from initial beddown into a SWPPP
- Require watershed protection to be considered during construction
- Require written approval for any activities that destroy vegetation
- Purchase tanks to collect/treat/store storm water for non-potable use
- Use compost to prevent storm water from reaching water sources
- Relocate HM/HW storage downgradient of water sources if needed
- Construct berms around HM/HW, POL and pesticide storage areas
- Focus on grading areas to minimize the impact of storm water
- Install catch basins and oil/water separators in maintenance areas
- Ensure oil/water separators are working properly; clean as needed
- Ensure waste collection containers have lids and are leak free
- Designate level areas with cover for waste collection containers
- Provide secondary containment for waste collection containers
- Ensure toxic or hazardous substances are not placed in dumpsters
- Have solid waste picked up frequently and keep containers clean
- Regularly inspect septic systems and immediately repair any leaks
- Regularly inspect all storm water management efforts and maintain best management practices to continually improves these efforts

4.11. Air Pollution. During sustainment, efforts to minimize air pollution should become more focused. If the site population increases, so will the sources and amount of pollution. The environmental officer should have knowledge of the sources of pollution at this stage. Focus on sources of particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead; particulate matter is usually generated from factories, power plants, incinerators, vehicles, equipment, burn pits, burn-out latrines, construction activities and fugitive dust. The BEE will analyze occupational health and environmental health exposure pathways and monitor for pollutants as necessary. The environmental staff should be aware of these sources and involved in minimization efforts. Following are some recommendations for minimizing the impact military operations have on the quality of air and personnel health. Additional information concerning air pollution during contingencies can be found on the **USAPHC** website.

- Update SW management procedures from lessons learned
- Reassess impact of nearby industrial plans and the effect of TICs
- Establish local contracts to remove and dispose of SW if possible
- Eliminate open burning for SW; purchase high-quality incinerators
- Establish procedures to routinely sample emissions from incinerators
- Minimize fuel jettisons during flight activities to reduce vapors
- Minimize refueling at hottest part of day; reduce VOC emissions
- Acquire modern power generation equipment with filtration systems
- Acquire larger units to cover more area and reduce overall emissions
- Establish guidance to prevent intentional/accidental release of ozone depleting substances
- Avoid demolition/renovation activities that would disturb asbestos
- Locate older equipment where it poses the least hazard to personnel
- Extend the stack on older heating units well above breathing zones
- Acquire heating units equipped with modern filtration systems
- Upgrade exhaust systems on vehicles; limit traffic in certain areas
- Use gray water; soil solidification products to reduce air particulates
- Issue PPE (i.e., goggles, cravats, etc.) to protect against dust, sand
- Focus education and training efforts on product recycling and reuse
- Substitute HM products with those less harmful to environment

4.12. Historical and Cultural Resources. Although initial phases of military operations are typically conducted without knowing exactly where all of these sites and resources are located, they are often discovered when activities shift more towards sustainment. As an example, pottery, bones, graveyard markers, religious sites, or other sensitive areas might be discovered during excavation or other types of construction activities. At that time, all activities should stop. Although operations might be temporarily affected, destruction of a national asset will seriously impede long-term diplomatic and peacekeeping efforts. One way to reduce the possibility of destroying or degrading these assets is by requiring permits coordinated by environmental officials to be accomplished prior to any activity. Permits can also prevent personnel from unknowingly damaging existing electrical or communication lines, water, sewage, POL distribution systems or underground storage equipment. Following are some considerations for managing efforts to protect and preserve historical and cultural resources during sustainment:

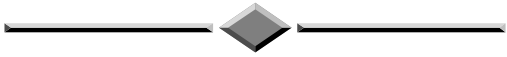
- Continually update the SOP as additional resources are discovered
- Maintain list of historical and cultural resources in the area
- Advise leadership of potential impact of missions on resources
- Maintain location of all sensitive areas on maps and other diagrams
- Conduct training to make personnel aware of assets and policies
- Declare sensitive areas off-limits if operational mission is unaffected
- Conduct training and military maneuvers away from these areas
- Construct fencing, berms, signage to protect areas; warn personnel
- Establish policy requiring coordination with BCE environmental staff prior to digging
- Require leadership approval for activities near these resources
- Relocate HM/HW storage areas hastily sited during initial beddown
- Relocate refueling/maintenance areas hastily sited during beddown
- Minimize effects of demolition/munitions activities near these areas

4.13. Natural Resources. During sustainment, additional efforts can be placed on protecting, conserving, and sustaining natural resources. Time should be available to reassess actions taken during initial beddown to ensure site plans and activities take into consideration impact on natural resources. The environmental staff will need to continually focus on education and awareness training as personnel rotate in and out, particularly for transient personnel and units who will only occupy the site for a short period of time. The CCDRs policy on management of local natural resources should become part of normal in-processing procedures during sustainment. Along with the policy and a map of the area indicating sensitive habitats and other areas that should be avoided, a list of protected plants, animals, and other species can be provided to individuals upon arrival. Following are some considerations for managing natural resources during sustainment:

- Update SOP goals for protecting/conserving natural resources
- Advise leaders of potential impact of missions on natural resources
- Increase training on protecting and conserving natural resources
- Consider placing certain areas off-limits to military activities
- Periodically prepare ECRs indicating condition of natural resources
- Increase air sampling capability; minimize pollutant emissions
- Increase spill response capability; explore landfarming options
- Increase efforts to protect surface waters from storm water runoff
- Establish policy requiring coordination with BCE environmental staff prior to removing vegetation
- Establish policy requiring coordination with BCE environmental staff prior to excavating
- Reduce the number of HWAPs to reduce risks of accidental spills
- Implement IPM program to minimize amount of pesticides used
- Limit impact maneuvers and refueling activities on natural resources
- Relocate HM/HW storage areas hastily sited during initial beddown
- Minimize demolition/munitions activities near natural resources
- Explore opportunities to recycle/reuse to conserve natural resources
- Explore renewable energy to reduce demand for natural resources
- Limit local contracting efforts that deplete scarce natural resources

4.14. Flora and Fauna. During sustainment, efforts to avoid or minimize damage to flora and fauna should remain a high environmental priority. As contingency operations begin to stabilize, there may be a tendency to expand and explore areas further outside of the initial camp boundaries. This could be caused by a surge in operations to achieve certain CCDR objectives, such as reducing insurgent activities supporting stability operations. Care should be taken not to encroach upon areas inhabited by environmentally sensitive flora and fauna and/or threatened or endangered species. The environmental officer must continually advise leadership on operational plans that could damage or destroy these assets so informed decisions can be made. Following are some additional recommendations to consider when planning for the protection of flora and fauna during contingency operations:

- Consider adopting standards and procedures in OEBGD or country-specific FGS (if available) to protect flora and fauna
- Integrate commander's policy into SOPs affecting daily operations
- Officially declare environmentally sensitive areas off limits
- Construct fencing or berms to prevent entry into sensitive areas
- Post signs warning personnel about environmentally sensitive areas
- Continually update maps identifying sensitive areas as discovered
- Prohibit construction activities in these areas if at all possible
- Establish policy requiring coordination with BCE environmental staff prior to construction activities
- Establish policy requiring coordination with BCE environmental staff prior to vegetation removal
- Enforce CITES and DTR to protect threatened/endangered species
- Assess the impact of mission-essential excavation on flora and fauna
- Be aware of the seasonal behavior of wildlife in the deployed region
- Seek to avoid areas inhabited by sensitive flora and fauna
- Avoid habitats of endangered and threatened species
- Expand training efforts on laws governing wildlife trade



Chapter 5

SITE CLOSURE/REDEPLOYMENT

5.1. Overview. Once it is determined a site occupied by U.S. forces will be closed and forces redeployed, ACS efforts shift to those actions needed to ***recover the force***. In addition to necessary logistical and administrative actions, environmental activities will be driven largely by international agreements, combatant command (to include subordinate unified command) policy, and the environmental annex of the OPORD.

5.2. Closure Survey. Upon notification of site closure, the environmental function should conduct a thorough environmental survey of the site. This survey is conducted IAW international agreements and/or guidance issued by the CCDR via the environmental staff. The purpose of the survey is to identify critical environmental issues that must be resolved prior to departure. The environmental officer, BEE, PH, and Safety personnel should conduct the survey together. It is important to compare the results of this survey with the EBS, conducted upon initial occupancy of the site, to assess the effectiveness of environmental initiatives and also determine what remedial actions might be required. The list is not all-inclusive, but it can provide a good starting point to develop a site environmental closure plan. Maintain all documentation to prepare the final closure report prior to redeployment.

5.3. Site Environmental Closure Plan. The site environmental closure plan is developed to ensure all tasks necessary to properly close the site are identified. **Attachment 9** contains a checklist that may be useful. It might be helpful to use backwards planning if a reasonably firm date for redeployment has been established. Start with the redeployment date and work backwards, establishing timelines for every action required to properly close the site. At a minimum, address procedures for turn-in and accountability of HW and excess HM, remediation and documentation of POL spills, emptying and cleaning POL tanks and separators, and POL waste turn-in. Stay in contact with the combatant command environmental staff and maintain all documentation. This will assist in preparing the final closure report prior to redeployment.

5.3.1. **Determine Contract Support.** At this point in contingency operations, DLA Disposition Services will likely be established within or near the AOR to oversee proper disposition of excess HM and HW. This resource, as well as any local contracts established (e.g., SW removal, medical waste collection

and disposal, etc.) should be considered in the closure plan. Coordinate with these resources to establish timelines for cleanup and disposal activities and address terminating any contracts no longer required.

5.3.2. **Shut Down Disposal Sites.** The closure plan should also address timelines and procedures for cleaning, clearing, and closing disposal sites, including burn pits, landfills, lagoons, latrines, etc.

5.4. Closing Standards. Ensure closure actions are consistent with applicable guidance (e.g., international agreement, combatant command [to include subordinate unified command] policy, OPORD). Key areas include:

5.4.1. **Equipment Retrograde**. When retrograding supplies or equipment upon closing a site, planners must be aware of E.O. 13112, which directs federal agencies to prevent introduction of invasive species into the natural ecosystems of the U.S. Use of wash racks for thorough cleaning helps ensure equipment pass inspection by Customs and the Department of Agriculture.

5.4.2. **Medical Supplies.** Serviceable medical supplies should be collected and retrograded through medical channels. Medical waste will be removed and disposed of with guidance from medical personnel.

5.4.3. **Pesticides.** Serviceable pesticides will be collected and reissued within the AOR or retrograded to home station.

5.4.4. **Solid Waste.** Collect and dispose of all solid waste through existing means. Also make sure any contractor-provided equipment is removed from the site IAW contract provisions. Collect serviceable metals and scrap (e.g., drums, concertina wire, vehicle parts, etc.) for turn-in/ reissue.

5.4.5. **Pits and Latrines.** Cover and mark the date of closure and unit designation on all urine, soakage, SW, and burn pits. Empty burn-out latrines.

5.4.6. **Recycling.** Wood and cardboard products should be collected and turned in through supply channels for recycling if this option is available.

5.4.7. **Fuel Equipment.** Fuel bladders, liners, and fuel distribution equipment should be thoroughly cleaned for retrograde or disposed of as appropriate.

5.5. Disposition of Hazardous Materials and Hazardous Waste.

5.5.1. **Reissue.** Turn in excess HM to the established supply function for transfer to main supply points or other units in the AOR that may require the material for continued operations.

5.5.2. **Recycling.** This alternative can be used for select HW if consistent with local practices and medical personnel determine there is no risk to human health and safety and the environment. Approval should be obtained from the combatant command environmental staff.

5.5.3. **Retrograde.** If necessary, HM or HW can be transported back to home station. In this case, make sure containers are properly packaged, labeled, and prepared for transportation and shipped according to combatant command guidance and Department of Transportation (DOT) requirements. Also, comply with 40 CFR Part 262 and consider international agreements (i.e., SOFA, transit, and disposal agreements) and the laws of all countries involved with transporting the HM or HW from its origin to destination.

5.5.4. **Disposal.** HM that cannot be reissued to other units in the AOR, or for which it has been determined to be impractical to transport back to home station, can be disposed of as HW. If DLA Disposition Services is established in or near the AOR, they will be assisting in proper disposal. Any HM/HW not disposed of via DLA Disposition Services should be reported through the chain of command to the combatant command environmental staff.

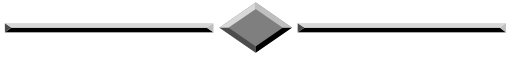
5.5.5. **Local Contract.** Disposing of HM/HW via local contract is allowed if done in a manner protective of human health and safety and the environment. Obtain approval from the combatant command environmental staff.

5.5.6. **Abandonment.** If authorized by international agreements and combatant command (to include subordinate unified command) policy, and the OPORD, HM/HW may be abandoned if senior leaders determine it is necessary under combat or other hostile conditions. If this becomes necessary, note the quantity, type, and location so it can be recovered as soon as practicable upon cessation of hostile conditions.

5.6. Site Remediation. Upon determination to close a site, forces may be required by international agreement or combatant command policy to address environmental contamination caused by U.S. forces during the course of operations. Guidance for conducting site cleanup at non-permanent DOD

installations overseas is usually issued by the combatant command or may be contained in the Environmental Considerations Annex of the applicable OPORD.

5.7. Closure Report. The purpose of the closure report is to document the environmental conditions of the site at the time of redeployment. This report should be prepared by the environmental officer with assistance from BEE, PH, and Safety after all closure activities are completed. The report is used to document the condition of water sources, soil, natural and cultural resources, air quality, and other environmental conditions as compared to the initial EBS. The closure report can also be used to help the U.S. defend against pressure to remediate or pay for environmental damage not caused by U.S. activities at the contingency site. Ensure the report includes maps, photos, and grid coordinates for all areas where activities potentially harmful to the environment are located (e.g., maintenance functions, burn pit, HWSA, medical facilities, landfills, latrines, etc.). Contact the combatant command environmental staff for complete guidance on preparing the closure report. Once completed, a copy of the closure report should be forwarded to the combatant command environmental staff or as directed in the Environmental Annex of the OPORD.



BURTON M. FIELD, Lt. General, USAF
DCS/Operations, Plans, and Requirements (A3/5)

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

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40 CFR Part 262, Standards Applicable to Generators of Hazardous Waste, 24 January 2012

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Prescribed Forms

None

Adopted Forms

AF Form 813, *Request for Environmental Impact Analysis*.

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DD Form 1348-1A, *Issue Release/Receipt Document.*

DD Form 1532, *Pest Management Report.*

DD Form 1532-1, *Pest Management Maintenance Record*.

DRMS Form 1930, *Hazardous Waste Profile Sheet.*

Abbreviations and Acronyms:

AFI—Air Force Instruction
AFCAP—Air Force Contract Augmentation Program

AFCEE—Air Force Center for Engineering and the Environment
ACS—Agile Combat Support
AFCAP—Air Force Contract Augmentation Program
AFCESA—Air Force Civil Engineer Support Agency
AFDD—Air Force Doctrine Document
AFIT—Air Force Institute of Technology
AFMAN—Air Force Manual
AFPMB—Armed Forces Pest Management Board
AFSOC—Air Force Special Operations Command
AOR—Area of Responsibility
BASH—Bird/Wildlife Air Strike Hazard
BEAR—Basic Expeditionary Airfield Resources
BEE—Bioenvironmental Engineering
CCDR—Combatant Commander
CE—Civil Engineer
CFR—Code of Federal Regulations
CITES—Convention on International Trade in Endangered Species of Wild Flora and Fauna
CLIN—Contract Line Item Number
COCOM—Combatant Command
COR—Contracting Officer Representative
CRG—Contingency Response Group
DENIX—Defense Environmental Network and Information Exchange
DFAC—Dining Facility
DLA—Defense Logistics Agency
DNBI—Disease and Non-battle Injury
DOD—Department of Defense
DODAAC—Department of Defense Activity Account/Address Code
DODD—Department of Defense Directive
DODI—Department of Defense Instruction
DOT—Department of Transportation
DTID—Defense Turn In Document
DTR—Defense Travel Regulation
EBS—Environmental Baseline Survey
ECR—Environmental Condition Report
EEA—Environmental Executive Agent
EIAP—Environmental Impact Analysis Program
EM—Emergency Management

E.O.—Executive Order
EPA—Environmental Protection Agency
ESP—Expeditionary Site Planning
ESSP—Expeditionary Site Survey Process
FES—Fire Emergency Services
FGS—Final Governing Standards
FM—Field Manual
GIS—Geospatial Information System
GPS—Global Positioning System
GSAT—Global Situational Awareness Tool
HAZCOM—Hazards Communications
HAZMAT—Hazardous Materials
HAZMART—Hazardous Material Pharmacy
HAZWOPER—Hazardous Waste Operations
HMIRS—Hazardous Materials Information Resource System
HM—Hazardous Materials
HN—Host Nation
HW—Hazardous Waste
HWMP—Hazardous Waste Management Plan
HWPS—Hazardous Waste Profile Sheet
HMSA—Hazardous Material Storage Area
HWSA—Hazardous Waste Storage Area
IAW—In Accordance With
IDMT—Independent Duty Medical Technician
IPM—Integrated Pest Management
IUCN—International Union for Conservation of Nature
JFC—Joint Forces Commander
JTF—Joint Task Force
MAJCOM—Major Command
MIDI—Military Items Disposal Instructions
MILSBILLS—Military Standard Billing System
MMR—Military Munitions Rule
MSDS—Material Safety Data Sheet
NGA—National Geospatial-Intelligence Agency
OEBGD—Overseas Environmental Baseline Guidance Document
OEHSA—Occupational and Environmental Health Site Assessment
OPLAN—Operation Plan
OPORD—Operational Order

PAM—Preventive and Aerospace Medicine
PCB—Polychlorinated Biphenyl
P2—Pollution Prevention
PH—Public Health
PHA—Property Holding Area
POL—Petroleum, Oils, and Lubricants
PPE—Personal Protective Equipment
PWS—Performance Work Statement
QAP—Quality Assurance Personnel
RA—Risk Assessment
RMW—Regulated Medical Waste
SECDEF—Secretary of Defense
SOFA—Status of Forces Agreement
SOP—Standard Operating Procedures
SRP—Spill Response Plan
SW—Solid Waste
SWMP—Solid Waste Management Plan
SWPPP—Storm Water Pollution Prevention Plan
TB—Technical Bulletin
TIC—Toxic Industrial Chemical
TIM—Toxic Industrial Material
T.O.—Technical Order
TTP—Tactics, Techniques, and Procedures
USCENTCOM—U.S. Central Command
UEC—Unit Environmental Coordinator
UFC—Unified Facilities Criteria
USAEC—U.S. Army Environmental Command
USAPHC—U.S. Army Public Health Command
USAF—U.S. Air Force
USAFSAM—USAF School of Aerospace Medicine
U.S.—United States
UXO—Unexploded Ordnance
VOC—Volatile Organic Compound
WWTP—Wastewater Treatment Plant

Attachment 2

ENVIRONMENTAL BASELINE SURVEY INSTRUCTIONS

A2.1. Purpose of EBS. State reason(s) for the EBS, the site/location where the survey was/is being conducted, and include the date(s) of the survey.

A2.1.1. The primary reasons are to identify environmental, health, and safety conditions that pose a potential health threat to deployed personnel and to alert personnel to existing contamination at a site prior to a deployment.

A2.1.2. The EBS is also used to document environmental conditions during initial occupancy. It captures predeployment environmental damages and serves as a basis for comparing post-deployment environmental conditions to determine the extent, if any, of damage caused by U.S. personnel.

A2.2. Survey Methodology. State the methods, procedures, and techniques used to gather and analyze the information.

A2.2.1. Methods, procedures, and techniques usually involve searching for and analyzing existing surveys, inspection reports, HWMPs, spill plans, utility drawings, previous EBS, etc. Other sources include maps, titles, and deeds that can be used to determine locations of tanks/equipment.

A2.2.2. Sample collections can be taken to determine water quality, quality of surface and ground water supply, radon levels, presence of PCBs or lead paint, and sources of contamination.

A2.2.3. Interviews with personnel familiar with the site/location or persons who live nearby are useful in gathering information to complete the EBS. Interpreters may be needed if interviewers do not speak the local language.

A2.3. Findings. Describe the history, current use and condition.

A2.3.1 History.

A2.3.1.1. Contact the combatant command environmental staff to obtain relative data, review chain of title records if available and accessible, and analyze any reports that can be obtained locally. In addition, conduct interviews with persons in the area who are familiar with the site/location.

A2.3.1.2. Attempt to identify specific chemicals and/or materials associated with the site, and determine whether any spills or cleanup actions took place.

A2.3.1.3. Evaluate aerial images to help determine past uses or to provide indications of previous beddowns, HM usage and storage, HW storage and/or disposal, storage tanks, landfill areas, etc.

A2.3.2. Current Use. Identify current use and each facility therein.

A2.3.2.1. Describe the land area, all structures, roads, and utilities.

A2.3.2.2. If there are training areas, describe how they are used.

A2.3.2.3. Interview individuals on the site/location and those nearby.

A2.3.2.4. Describe areas adjacent to the site/location; include past use and determine for what purpose the adjacent property is currently being used.

A2.3.2.5. Describe proposed site usage including expected duration, activities to take place and equipment to be used. Determine possible effect activities might have on the health and safety of deployed personnel and the locals.

A2.3.3. Environmental Condition.

A2.3.3.1. Check for problems with air quality in all facilities on the site.

A2.3.3.2. Identify water source(s), capacities, and the condition of water supply lines (check for corrosion, leaks, lead pipes, etc.). Determine if samples were taken and if medical personnel inspected water sources. Check supply lines; assess vulnerability of water source to tampering or contamination.

A2.3.3.3. Identify sources of wastewater and describe the capacity and condition of existing wastewater systems (pits, catch basins, dry wells, lagoons, etc.). Describe how wastewater is collected, treated, discharged or reused, and how it will be done under the proposed usage.

A2.3.3.4. Determine if HW was stored at the location. Check for hazardous substances and petroleum products. Check aboveground and underground storage tanks, wells, and drums for HM or HW. Look for vent pipes, fill pipes, or other indicators of underground storage tanks. Look for signs of spills, leakage or contamination (stained soil, distressed vegetation, dead/diseased wildlife). Determine the effect on the proposed usage.

A2.3.3.5. Identify SW disposal areas. Check for signs of dumping. Try to determine what materials were dumped. Look for areas where SW may have been burned or buried. Determine if disposal contracts or other agreements

exist and describe how deployed forces will handle SW, including proposed layout of storage areas in relation to beddown areas.

A2.3.3.6. Identify sources of medical/biohazard wastes, accumulation and disposal areas. Check for signs of dumping. Look for areas where medical waste may have been buried. Describe how deployed forces might handle medical waste, including proposed collection and disposal areas and their relation to beddown areas, food service areas, and water sources.

A2.3.3.7. Determine if any fixed petroleum distribution points exist and look for ground contamination. Look for signs of aboveground or underground storage tanks and check for leaks, spills, and/or contamination. Determine if the tanks are still in use; if not, attempt to determine when they were taken out of service. Look for petroleum storage areas and document the conditions.

A2.3.3.8. Determine if any areas at the location or areas adjacent to the site might present a noise hazard that may need to be avoided. Also, based on proposed activities at the site, determine if any areas might pose restrictions on deployed forces based on the noise produced by the proposed activities.

A2.3.3.9. Describe pesticide and herbicide storage and use. Try to determine what chemicals were stored, used, where and how often. Look for indications that pesticides or herbicides may have been dumped or buried. Apply the same criteria to adjacent areas to determine the impact these activities might have on deployed forces, water sources, beddown areas, etc.

A2.3.3.10. Determine cultural or historical areas or facilities and what restrictions might be placed on deployed forces or activities as a result.

A2.3.3.11. Look for species of threatened or endangered plants or animals, wetlands or wildlife habitats. Describe these resources in detail, and determine what restrictions might be placed on deployed forces or activities as a result.

A2.3.3.12. Identify electrical sources. Inspect transformers, substations, power lines, hydraulic systems, voltage regulators, circuit breakers, etc. Characterize the equipment's condition and age, determine presence of any PCBs.

A2.3.3.13. Check all areas for asbestos and lead paint. Note the exact location of suspected asbestos or lead paint. Comment on the condition of asbestos (i.e., friable or non-friable), take photos, and coordinate with BEE for risk assessment.

A2.3.3.14. Check facilities with basements for airflow. Make sure basements are aired out prior to use to prevent radon exposure.

A2.4. Soil Type and Land Cover. Provide a description of the soil type, condition, and land cover. Describe how well the soil drains. Attach a map of the area and take photos if possible.

A2.5. Topographic, Hydrologic, and Geologic Features. Describe the topography, state whether there are rivers and streams in the area, and determine if the area might be prone to flooding (look for indications of past flooding). State if there is geologic activity that could affect operations.

A2.6. Unexploded Ordnance (UXO). Provide type(s) and grid coordinates of any UXOs in the area.

A2.7. Sanitary Waste Disposal. Note any available facilities and locations.

A2.8. Radiological Hazards. Identify any sources of radiation that could be harmful. Provide a listing to BEE.

A2.9. Heating and Ventilation Systems. Provide the type, location(s), source of power, type of fuel, and storage tank(s) locations.

A2.10. Electrical Hazards. Provide the size and location of high-power lines and transformers.

A2.11. Fire Protection Systems. Identify type, location, and condition of fire protection systems.

A2.12. Site Survey Maps. Include maps, sketches, and proposed site layout plan, if applicable.

A2.13. Photographs. Cross-reference photos of land areas, facilities, and equipment to maps.

A2.14. Samples. Include results of samples and state whether further sampling is required. Provide photos of where additional sampling needs to be done. Cross-reference the photos with maps, plans, or sketches.

A2.15. Related Documents. List other documents used to conduct the survey.

A2.16. Outside Sources Assisting on Documentation. List point of contact for other agencies that provided information used to produce the EBS report.

A2.17. Environmental Requirements. List laws, agreements, regulations, guidance, and standards deployed forces adhere to during the course of the operation (e.g., SOFA, environmental annex to OPORD, OEBGD, FGS).

A2.18. References Used. List references used to conduct the EBS.

A2.19. Images. This section can be used to catalog photographs and provide date/time photographs were taken, angle or location of photographer, etc.

EBS – EXAMPLE CHECKLIST

1. Document Title: Environmental Baseline Survey of _____		
2. Survey Administrative Data		
a. Date of survey:	b. Assessment performed by:	
Name/Grade	Duty Position	Contact Information
3. Document Date:		
4. Site Survey Data:		
a. Description of the site:		
Installation(s)		
(1) Installation Name:		
(2) Installation Number:		
(3) Facility Identification:		
(4) Street Address:		
(5) City/Town:		
(6) State/Province:		
(7) Zip Code:		
(8) Command Jurisdiction:		
Facility Type		
(9) Description and Condition of Property:		
(10) Description of Training Areas:		
(11) Description of Adjacent Land Usage:		
b. Description of Proposed Site Usage:		
c. Current Environmental Conditions:		
Survey of Site Conditions		
Air Quality:	Drinking Water:	Waste Water:
Hazardous Materials:	Hazardous Waste:	Solid Waste:
Medical Waste:	Petroleum:	Noise:
Pesticides:	Historic and Cultural Resources:	Natural Resources/Endangered Species:
Polychlorinated Biphenyls (PCBs)	Asbestos:	Radon:
5. Soil Type and Land Cover:		
6. Topographic, Hydrologic, and Geologic Features:		
7. Unexploded Ordnance:		
8. Sanitary Waste Disposal:		
9. Heating and Ventilation Systems:		
10. Electrical Associated Hazards:		
11. Fire Protection Services:		
12. Radiological Hazards:		
13. Site Survey Maps:		
14. Photographic:		
15. Samples:		
16. Related Documents:		
17. Outside Agency Assisting on Documentation:		
18. References Used:		
a.	b.	c.
d.	e.	f.
19. Satellite Imagery and Aerial Photographs:		

Attachment 3

ENVIRONMENTAL CONDITIONS REPORT

A3.1. Installation Description and Background: Give a brief (one-half to one page) description of the installation, including its historical use. Reference the EBS. Information should be geared to events and operational history that may bear on environmental problems and their causes.

A3.2. Include all spill records in the report.

A3.3. Layout map or plan view of installation should identify storage of hazardous substances (HW accumulation points, fuel storage and retail points and HM storage sites).

A3.4. Summary of Environmental Conditions. List significant incidents at the site. State significant findings for all areas of concern in bottom-line terms.

A3.5. Findings and Determinations. Describe whether or not significant environmental impacts will occur as a result of turnover/return of the site. Base findings on applicable environmental guidance. Following are some example statements that might be used:

A3.5.1. "Turnover of this site will not result in environmental impacts significant enough to warrant additional environmental actions."

A3.5.2. "Turnover of this site will result in environmental impacts significant enough to warrant additional environmental actions. If required by international agreement, some environmental actions or projects may continue after transfer of this site due to imminent threat to human health or safety. Impacts of concern are:" followed by a list of impacts.

Attachment 4

ACCUMULATION POINT INSPECTION CHECKLIST

A4.1. Are appointment letters for HWAP managers on file?

A4.2. Are HWAP managers and supervisors trained?

A4.3. Does the HWAP display appropriate hazard warning placards?

A4.4. Is the HWAP protected to prevent unauthorized entry?

A4.5. Are portable fire extinguishers available?

A4.6. Are spill kits on hand?

A4.7. Is appropriate PPE on hand and being used?

A4.8. Are eyewash and/or shower facilities available and working?

A4.9. Is the HWAP at or near the point of generation, and is there no more than 208 L (55 gals) of HW or 1 L (1 qt) of acute HW?

A4.10. Is the HWAP manager prepared to move HW to the HWSA when accumulation limits are reached?

A4.11. Is the HWAP designed to segregate incompatible waste streams?

A4.12. If any waste streams are turned in for energy recovery, is there applicable data to state it is suitable for energy recovery?

A4.13. Are unregulated rags recycled/reused?

A4.14. Are "Danger/Warning" signs and emergency contact information posted in both English and the local and/or predominant language?

A4.15. Is there sufficient space for movement of emergency responders in the event of an emergency?

A4.16. Are containers placed so as not to obstruct the exits?

A4.17. When waste is being handled, is there immediate access to an internal alarm or emergency communication through visual or voice contact with another person?

A4.18. Are containers in good condition, free from severe rusting, bulging, gouging or structural defects?

A4.19. Are containers carefully handled to prevent ruptures or leaks?

A4.20. Are containers (including overpacks) used to store hazardous waste compatible with the materials stored?

A4.21. Do containers remain closed during storage, except when adding or removing waste?

A4.22. Are containers holding hazardous waste marked with bilingual hazardous waste markings?

A4.23. Are containers properly marked as per applicable transportation regulatory packaging requirements?

A4.24. Are incompatible wastes stored in separate containers and separated by a berm, dike, wall, or other device?

A4.25. Is the HWAP flooring and/or secondary containment impervious to the HW material to prevent spills or leaks from reaching the ground?

A4.26. Is containment sufficient to contain 10% of the volume of all containers or the volume of the largest container (whichever is greater)?

A4.27. Is secondary containment inspected at least weekly and after rains to ensure holding capacity is not compromised from accumulated precipitation?

A4.28. Are liquids accumulated in secondary containment being tested for the presence of contaminants prior to being released into the environment?

A4.29. Are oil/water separator valves closed at all times except when draining rain water and spill residue?

A4.30. Are containers elevated or protected from contact with accumulated liquid?

A4.31. Are areas used to store containers holding ignitable or reactive waste at least 50 feet inside the installation's boundary?

A4.32. Is an HW disposal log being maintained?

A4.33. Are the contents of HW containers indicated?

A4.34. Are HW logs readily available to emergency personnel in the event of a fire or spill, and are they being maintained until site closure?

A4.35. Are waste analysis and characterization records being retained until five years after closure of the hazardous waste accumulation point?

A4.36. Does the continuity book contain the following: HWAP manager appointment letter, training documentation, inspection schedule, waste stream inventory, waste characterization forms, HWAP inspection checklist, and spill response plan?

Attachment 5

ENVIRONMENTAL SUPPLIES

A5.1. National Stock Number (NSN) Environmental Supplies.

NSN	Item
8105-00-848-	Bag, Polyolefin, 5ml., 36 x 54 in
8125-00-174-	Bottle, Plastic 1 gal.
8125-00-731-	Bottle, Plastic, 13 gal.
8125-00-888-	Bottle, Plastic, 5 gal.
8110-00-254-	Drum, Steel, 1 gal.
8100-00-128-	1 gal. Steel Drum (open top container)
8110-00-254-	4 gal. Steel Drum (open top container)
8110-00-282-	5 gal. Steel Drum (DOT 17C) (open top container)
8110-00-254-	6 gal. Steel Drum w/ring (open top container)
8110-01-204-	Pail, Shipping, Steel, 5 gal. (DOT 17E) (open top container)
8110-00-519-	10 gal. Steel Drum (DOT 17C) (open top container)
8110-00-735-	19 gal. Steel Drum (17C) (open top container)
8110-00-366-	30 gal. Steel Drum (17C) (open top container)
8110-00-030-	30 gal. Steel Drum (open top container)
8110-00-823-	55 gal. Steel Drum (17M) (open top container)
8110-00-030-	55 gal. Steel Drum (bung & vent) (DOT 17E) (open top
8110-01-282-	Drum, Polyethylene, 55 gal (open top container)
8110-01-101-	85 gal. Steel Disposal Drum (no lining) (open top container)
8110-01-101-	85 gal. Steel Recovery Drum (epoxy phenolic lining)/(open
8110-01-101-	Drum, Hazardous Material (open top container)
9330-01-431-	6 lb. Bag Oclansorb
9330-01-431-	18 lb. Bag Oclansorb
9330-01-391-	2’x4’ Sorb Sox

A.5.1. NSN Environmental Supplies (Continued).

9330-01-391-2050	10'x8' Boom
9330-01-391-2052	Peat Pads
9330-01-417-1958	Ultra Granules
9330-01-417-1959	Absorbent Sheets
7930-00-296-1272	Clay, Ground
7510-01-V55-0756	Super Absorbent
1939-01-154-7001	Non Skid Absorbent
5640-00-801-4176	Insulation, Thermal Vermiculite (packaging
4235-01-423-1466	Loose Absorbent, 1CF bag
4235-01-423-0711	Loose Absorbent, 2 CF bag
4235-01-423-1463	Pads, 18"x18"x3"
4235-01-423-1465	Socks, 4"x8'
4235-01-423-1467	Socks, 2"x10'
4235-01-423-2787	Boom, w/clamps, 10"x10'
9330-01-391-3113	Spill Kit, 14 gal.
9330-01-391-3110	Spill Kit, 55 gal.
9330-01-391-2047	Spill Kit, 55 gal. Bulk Filled
4235-01-420-0905	Small Camo Spill Kit
4235-01-420-0895	Large Camo Spill Kit
4235-01-432-7909	Spill Kit, Complete, Small
4235-01-432-7912	Spill Kit, Complete, 25 gal. drum
4235-01-423-7214	Spill Kit, Complete, 55 gal. drum
4235-01-423-7221	Spill Kit, Complete, 55 gal. drum
6850-01-420-3081	Micro-Blaze, 5 gal. container

A5.2. Non-NSN Environmental Supplies.

Including commercially available products does not constitute endorsement of any particular brand or product. These items are shown merely as examples of the types of supplies that may be needed to establish an effective environmental function.

4-Drum Pallet

2-Drum Pallet

Battery Pallet

Acid Spill Kit

Oil Spill Kit

Overpack Drum

Acid Cabinet

Flammable Cabinet

Cage Cylinder Storage

A5.3. Non-NSN Environmental Supplies (Continued)

.

Grounding and Bonding

Drum Cable

Can Puncture Kit

Bulb Crusher

Filter Crushers

Rag/Sock Wringer

Oil and Corrosive Material Containers

Attachment 6

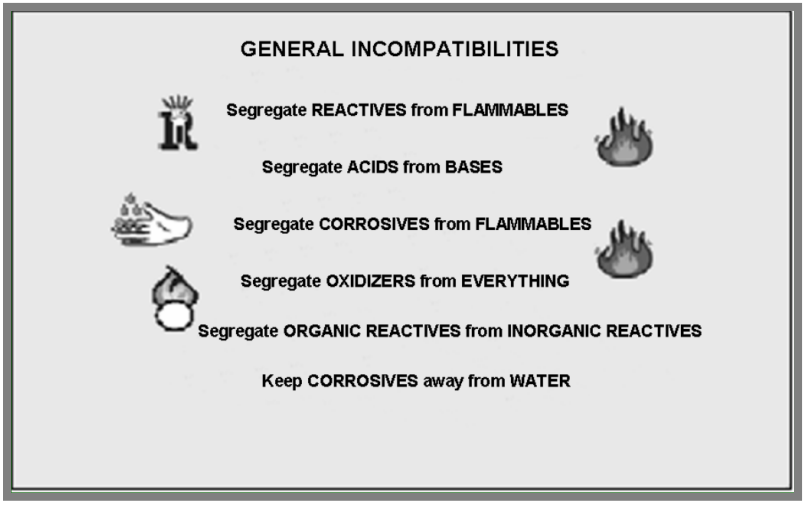
STORAGE SEGREGATION

A6.1. Generators of HW must ensure 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.

A6.2. If hazardous wastes and non-hazardous wastes are mixed, the wastes must be managed and disposed of as hazardous waste. This will drastically increase the cost of disposal.

A6.3. Proper segregation at the point of generation simplifies overall management and goes a long way towards protecting human health and the environment, reducing disposal costs, and enhancing recycling potential.

Figure A6.1. General Incompatibilities.



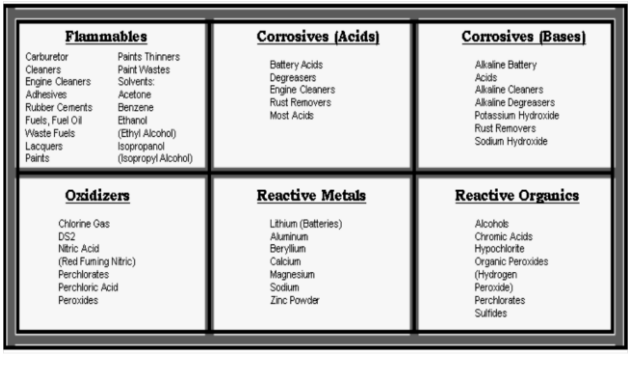
A6.4. Segregate storage into general categories (i.e., reactives, flammables/ignitables, corrosives, toxics, etc.).

A6.5. Further segregation may be required based on the compatibility of individual materials. Reference the MSDS for each material to identify appropriate storage.

A6.6. Storage sections should be separated by a distance of six feet or a physical barrier to prevent incompatible materials from mixing and producing chemical reactions or toxic fumes (see charts below).

A6.7. 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.

Figure A6.2. Guide for Segregating Materials.



Acids	→	Oil/Grease		Fire
Acids	→	Caustics		Heat/Spattering
Caustics	→	Epoxies		Extreme Heat
Flammable Liquids	+	Hydrogen Peroxide	=	Fire/Explosion
Aluminum Powder		Ammonium Nitrate		Explosion
Sodium Cyanide	→	Sulfuric Acid		**Lethal Hydrogen Cyanide**
Chlorine Gas	→	Acetylene		Explosion
Ammonia	→	Bleach		Poisonous Fumes

Attachment 7

DISPOSAL DOCUMENTS AND INFORMATION

A7.1. The information provided in this Attachment will be helpful in preparing unserviceable items and waste for disposal. Additional information can be found in the following publications:

DOD 4160.21-M, *Defense Materiel Disposition Manual*
http://www.dla.mil/j-6/dlmso/elibrary/manuals/regulations.asp

DOD 4000.25-1-M, *Military Standard Requisitioning and Issue Procedures (MILSTRIP)Manual*
http://www2.dla.mil/j-6/dlmso/elibrary/manuals/milstrip/default.asp

DOD 4160.21-M-1, *Defense Demilitarization Manual*
http://www.dtic.mil/whs/directives/corres/pdf/416021m.pdf

A7.2. General Turn-in Procedures.

A7.2.1. HW containers must be labeled with contents. Drums must be stenciled or have contents listed. Containers cannot be leaking. Rusted drums with compromised container integrity will be rejected. Drums must be properly closed (bungs). No other closure is acceptable (i.e., rags stuffed in the bung hole). Drums cannot be filled to the top; allow at least 5 inches for expansion. Severely bulging drums will not be accepted.

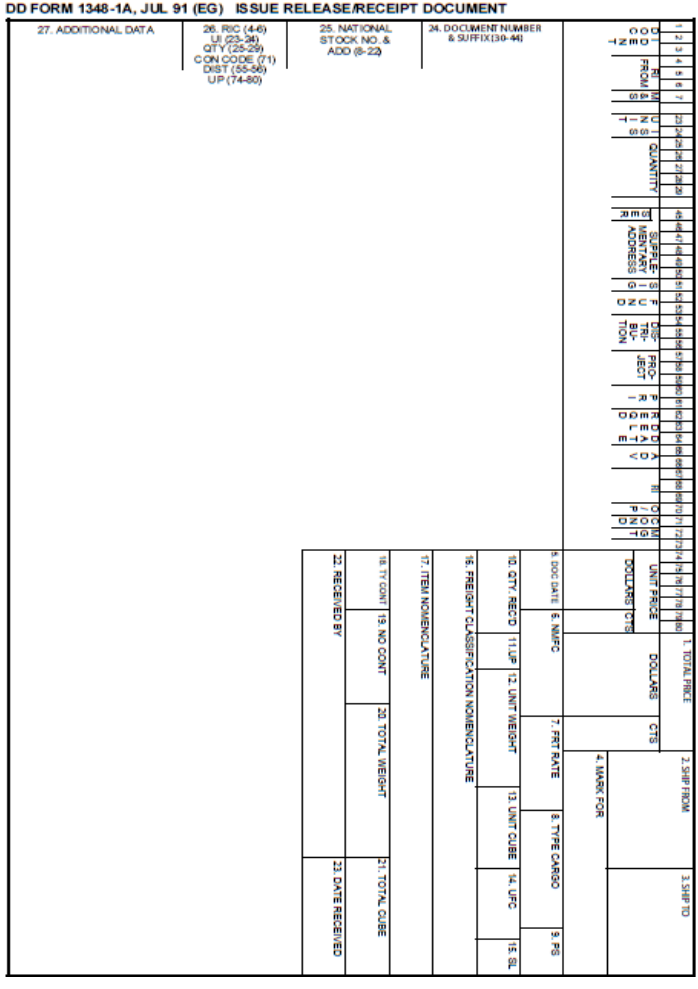
A7.2.2. A completed DD Form 1348-1A, *Issue Release/Receipt Document*, should accompany each turn-in and waste stream.

A7.2.3. Complete a Hazardous Waste Profile Sheet (HWPS) with turn-in of each initial waste stream. DRMS Form 1930, Hazardous Waste Profile Sheet, is acceptable. Fill in the data based on user's knowledge or laboratory results. Do not commingle wastes (i.e., types of batteries turned in separately).

A7.3. Instructions for Completing Documentation.

A7.3.1. DD Form 1348-1A. The following information should be provided with all turn-ins of HW:

Figure A7.1. DD Form 1348-1A.



A7.3.1.1. Unit Requesting Services (unit identification).

A7.3.1.2. Defense Turn In Document (DTID) Number. The generator's six-character DODAAC (Department of Defense Activity Account/Address Code), four-digit Julian date, and generator-provided 4-digit serial number (e.g., the DTID for NSA Bahrain: N63005 2203 NA01).

A7.3.1.3. Service Military Standard Billing System (MILSBILLS) and Fund Code. MILSBILLS is a 6-digit military billing code used to fund disposal of HW. The Fund Code is a two-character code that is service and activity/installation specific. Both codes must be included on all waste disposal transactions. (e.g., 30 = USAF, PP = USN, 21 = USA). For more information on MILSBILLS and Fund Codes, refer to the *Defense Materiel Disposition Manual*.

A7.3.1.4. Item Description. Describes type of material requiring disposal.

A7.3.1.5. Contract Line Item Number (CLIN). The CLIN identifies the type of waste, unit of measure, and cost per unit for disposal when contracted through DLA Disposition Services. It is available in the DLA Disposition Services HW contract. Contact the theater representative for a copy of the contract.

A7.3.1.6. Total Quantity (in kilograms). Waste must be ordered for disposal in kilograms (kg), including packaging; i.e., drums (not pallets).

A7.3.2. Size and Number of Containers (e.g., 200-liter drums, 10 each; 8-liter cans, 5 each; compressed gas cylinders, 5 each).

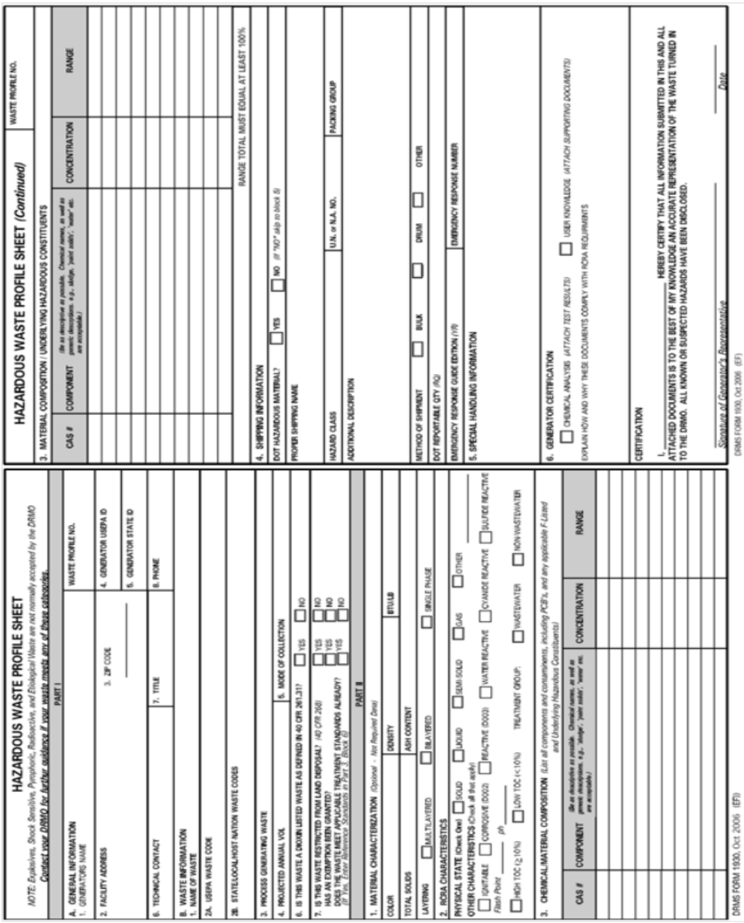
A7.3.3. Activity POC, Address and Phone Number. Provide primary POC for waste and waste removal. Include accurate address and phone number.

A7.3.4. Physical Location of the Waste. If different from the activity address, provide a building number or site location (e.g., Bldg. 1004, Deployed Forces Compound).

A7.3.5. DOD MILSTRIP information for HW as follows: DEMIL Code A, Disposal Authority Code N, Condition Code H. These codes are constant and do not change for HW transactions.

A7.3.6. DRMS Form 1930. This is a four-page form which includes two pages of instructions.

Figure A7.2. DRMS Form 1930.



HAZARDOUS WASTE PROFILE SHEET

NOTE: Explosives, Shock Sensitive, Pyrophoric, Radioactive, and Etiological Waste are not normally accepted by the DRMO
Contact your DRMO for further guidance if your waste meets any of these categories.

PART I

A. GENERAL INFORMATION
1. GENERATORS NAME
WASTE PROFILE NO.
2. FACILITY ADDRESS
3. ZIP CODE
4. GENERATOR USEPA ID
5. GENERATOR STATE ID
6. TECHNICAL CONTACT
7. TITLE
8. PHONE
B. WASTE INFORMATION
1. NAME OF WASTE
2A. USEPA WASTE CODE
2B. STATE/LOCAL/HOST NATION WASTE CODES
3. PROCESS GENERATING WASTE
4. PROJECTED ANNUAL VOL
5. MODE OF COLLECTION
6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31? ☐ YES ☐ NO
7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL? (40 CFR 268) ☐ YES ☐ NO
HAS AN EXEMPTION BEEN GRANTED? ☐ YES ☐ NO
DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS ALREADY? ☐ YES ☐ NO
(If Yes, Enter Reference Standards in Part 3, Block 6)

PART II

1. MATERIAL CHARACTERIZATION (Optional - Not Required Data)
COLOR
DENSITY
BTU/LB
TOTAL SOLIDS
ASH CONTENT
LAYERING ☐ MULTILAYERED ☐ BILAYERED ☐ SINGLE PHASE
2. RCRA CHARACTERISTICS
PHYSICAL STATE (Check One) ☐ SOLID ☐ LIQUID ☐ SEMI-SOLID ☐ GAS ☐ OTHER
OTHER CHARACTERISTICS (Check all that apply)
☐ IGNITABLE ☐ CORROSIVE (D002) ☐ REACTIVE (D003) ☐ WATER REACTIVE ☐ CYANIDE REACTIVE ☐ SULFIDE REACTIVE
Flash Point ______ ph ______
☐ HIGH TOC (≥10%) ☐ LOW TOC (<10%) TREATMENT GROUP: ☐ WASTEWATER ☐ NON-WASTEWATER
3. CHEMICAL/MATERIAL COMPOSITION (List all components and contaminents, including PCB's, and any applicable F-Listed and Underlying Hazardous Constituents)

CAS #	COMPONENT (Be as descriptive as possible. Chemical names, as well as generic descriptions. e.g., "sludge", "paint solids", "water" etc. are acceptable.)	CONCENTRATION	RANGE

DRMS FORM 1930, Oct 2006 (EF)

HAZARDOUS WASTE PROFILE SHEET (Continued)
WASTE PROFILE NO.

3. MATERIAL COMPOSITION / UNDERLYING HAZARDOUS CONSTITUENTS

CAS #	COMPONENT (Be as descriptive as possible. Chemical names, as well as generic descriptions. e.g., sludge, "paint solids", "water" etc. are acceptable.)	CONCENTRATION	RANGE

RANGE TOTAL MUST EQUAL AT LEAST 100%

4. SHIPPING INFORMATION
DOT HAZARDOUS MATERIAL? ☐ YES ☐ NO (If "NO" skip to block 5)
PROPER SHIPPING NAME
HAZARD CLASS
U.N. or N.A. NO.
PACKING GROUP
ADDITIONAL DESCRIPTION
METHOD OF SHIPMENT ☐ BULK ☐ DRUM ☐ OTHER
DOT REPORTABLE QTY (RQ)
EMERGENCY RESPONSE GUIDE EDITION (YR)
EMERGENCY RESPONSE NUMBER
5. SPECIAL HANDLING INFORMATION
6. GENERATOR CERTIFICATION
☐ CHEMICAL ANALYSIS (ATTACH TEST RESULTS) ☐ USER KNOWLEDGE (ATTACH SUPPORTING DOCUMENTS)
EXPLAIN HOW AND WHY THESE DOCUMENTS COMPLY WITH RCRA REQUIRMENTS
CERTIFICATION
I, ______________ HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN THIS AND ALL ATTACHED DOCUMENTS IS TO THE BEST OF MY KNOWLEDGE AN ACCURATE REPRESENTATION OF THE WASTE TURNED IN TO THE DRMO. ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

Signature of Generator's Representative
Date

DRMS FORM 1930, Oct 2006 (EF)

Attachment 8

SAMPLE PERFORMANCE WORK STATEMENT

A8.1. Scope of Work. The contractor shall provide all personnel, equipment, tools, materials, supervision, and other items necessary to perform refuse collection and disposal services as defined in this PWS. The contractor shall perform to the standards outlined in this contract.

A8.2. Technical Definitions Specific to this PWS.

A8.2.1. Dumpsters: large containers that can either be pulled or lifted mechanically into a service vehicle and dumped.

A8.2.2. Collection Station: locations designated on the drawing, Technical Exhibit 1, where refuse may be assembled and stored in containers for collection (also may be referred to as collection points or pick-up stations).

A8.2.3. Collection Frequency: number of times collection is provided within a given period of time.

A8.2.4. Refuse Collection Containers: cans, drums, bins or similar receptacles which can be handled easily.

A8.2.5. Refuse: includes all garbage, ashes, debris, rubbish, scrap wood, wood pallets, steel, and other similar waste material intended for disposal. Not included are explosives and incendiary waste and contaminated waste from medical and radiological processes.

A8.2.6. Refuse Collection: a system of transporting refuse from collection stations to points of disposal.

A8.3. Contractor Furnished Items and Services.

A8.3.1. General: The contractor shall furnish all materials, vehicles and labor required to perform to the standards of this PWS. All dumpsters shall be capable of holding a minimum of 6 cubic meters of refuse. Dumpsters will have non-obstructive closers to contain trash.

A8.3.2. Contractor shall provide a copy of the collection schedule to the contracting officer and civil engineer for approval. The contractor shall develop a schedule using the frequencies listed in Technical Exhibit 1.

A8.3.3. Vehicle(s): The contractor shall provide all vehicles necessary to fulfill requirements of the contract. All vehicles shall be in operable condition and meet local and base entry requirements. Vehicles shall be neat in appearance and bear the contractor's name for easy identification. Vehicles shall be operated in accordance with local and base traffic regulations. Vehicles must not leak petroleum, corrosive or waste fluids.

A8.3.4. All vehicles shall be empty upon entering the base/site/camp area. Vehicles and personnel are subject to 100% security inspection and search at any time. Vehicles shall remain on the installation at all times and will be stored at (list location). The contractor will be authorized to remove vehicles from installation for scheduled maintenance and repairs. However, this requirement shall not affect the level of service.

A8.3.5. The contractor shall be responsible for maintaining all dumpsters on the site. All dumpsters shall be clearly labeled with the contractor's name, address, and local phone number, and numbered for easy recognition.

A8.3.6. Dumpsters shall be marked with reflective material (minimum of 25-cm high and 1-meter wide) on all sides.

A8.3.7. Dumpsters shall be marked on all visible sides with clearly visible and readable text, 'No Parking Within 15 Meters (50 feet).

A8.3.8. All dumpsters shall be placed in such a manner as to maintain a professional appearance.

A8.3.9. Dumpsters should be leak-proof, waterproof, and vermin-proof, including sides, seams and bottoms, and be durable enough to withstand anticipated usage and environmental conditions without rusting, cracking or deforming. Storage containers should have functional lids.

A8.3.10. Deteriorated containers will be replaced or repaired by the contractor at no additional cost to the government.

A8.3.11. Additional dumpsters shall be added to the contract if required by the installation for unique situations such as facility or equipment repairs, demolitions, or new construction.

A8.4. Specific Tasks.

A8.4.1. Points of Collection: The contractor shall pick up refuse dumpsters according to the schedule listed in Technical Exhibit 1.

A8.4.2. Frequency of Collection: The contractor shall empty all dumpsters according to the schedule (reference paragraph A.8.3.2).

A8.4.3. Position of Containers:

A8.4.3.1. The contractor shall position the containers at collection points to best aid users in disposing of refuse and to minimize interference with adjacent parking lots, roadways, overhead utilities, and other obstructions.

A8.4.3.2. Contractor shall relocate dumpsters to other locations when directed. Request for change will come from the CE representative. One dumpster shall be made available for immediate relocation at all times. This dumpster will be placed at various locations throughout the base on an as-needed basis. Upon notification from the contracting officer (CO) and CE representative, the contractor shall move this dumpster within 24 hours.

A8.4.3.3. The contractor shall furnish replacement containers for all containers removed for cleaning, maintenance, or repair to ensure collection stations have adequate refuse containers present at all times.

A8.4.4. Spillage: The contractor shall pick up all spillage and wood pallets around bulk containers within a radius of 5 meters (15 feet).

A8.4.5. Special Collection: In addition to the regularly scheduled refuse collections, the contractor shall be required to make special collections within 24 hours of notification by the CO and CE representative.

A8.4.6. Inclement Weather Schedule: The contractor shall collect refuse during inclement weather except in case of unduly severe weather and as authorized by the contracting officer. Make-up collections shall be performed within 24 hours after the severe weather has terminated. If all make-up collections cannot be made within 24 hours, the contractor shall submit a revised schedule to the contracting officer for approval.

A8.4.7. The contractor shall dispose of all refuse on base at an approved disposal site (on-base disposal). Contractor is not responsible for separating refuse at the disposal site.

A8.5. General Information.

A8.5.1. Quality Control: The contractor shall develop and maintain a quality program to ensure services are performed in accordance with this PWS. The contractor shall develop procedures to identify, prevent, and ensure non-recurrence of defective services. The contractor is strictly prohibited from removing items from the trash. Employees found removing items from the trash will be searched and banned from the installation.

A8.5.2. Hours of Operation: Unless otherwise specified, all work shall be performed between the hours (include hours), 7 days per week, including religious holidays. Any work outside these hours shall require prior approval and notification by the contracting officer.

A8.5.3. Security Requirements: It is the responsibility of the contractor to secure and maintain all necessary clearances and passes for entry of personnel and vehicles to the installation.

A8.5.4. Contract Manager: The contractor shall designate a representative who shall be on site during the performance of all work and can speak/act for the contractor. The representative shall be able to speak, write, and understand English and shall speak with the CE representative at the start and end of each work day for updates, progress, and government concerns.

A8.5.5. Accident Reporting: Contractor shall notify the Force Protection escort of any incident and relay this information to the Contracting Officer.

A8.5.6. Environmental: The contractor shall be responsible for any spill of waste or vehicle fluids which occurs during the performance of this PWS.

A8.5.7. Theft and Damages: All theft and damages shall immediately be reported to the CO and CE representative. Damages by the contractor shall be repaired or replaced at no cost to the government.

A8.5.8. Government Furnished Fuel: Government will provide fuel for the contractor's vehicles.

A8.5.9. Maps: Maps showing location of facilities cannot be provided to the contractor. Contract or CE personnel can assist the contractor.

A8.5.10. **NOTE:** Attach Technical Exhibit 1 to the PWS. This document should indicate (at a minimum) the location and frequency of each dumpster to be collected and emptied by the contractor. Tailor the sample PWS to meet the needs of the location.

Attachment 9

SITE CLOSURE CHECKLIST

A9.1. Combatant command environmental staff contacted for guidance?

A9.2. Site closure plan developed?

A9.3. DLA Disposition Services contacted to coordinate turn-in of HM/HW?

A9.4. Environmental function providing camp closure oversight?

A9.5. Medical waste red bagged and prepared for turn-in?

A9.6. All medical waste removed from the site?

A9.7. Sufficient amount of United Nations approved shipping containers on hand?

A9.8. Containers being properly labeled and prepared for turn-in?

A9.9. Placards on hand for vehicles used to transport HM/HW?

A9.10. Used spill response equipment collected and containerized?

A9.11. Bulk turn-in points established?

A9.12. Spills at the HWSA cleaned up and all material removed?

A9.13. Maintenance HM/HW storage and HWAPs cleaned up?

A9.14. Serviceable hazardous materials in original packing containers being prepared for turn-in through the supply system?

A9.15. Expired HM/HM opened and contaminated being identified for turn-in as HW?

A9.16. Is there a plan for closing burn pit(s)?

A9.17. BEE, PH, and Safety providing guidance on burn pit closure?

A9.18. Burn pits marked with signs indicating its use, closing date, and the closing unit in English and the local language?

A9.19. All solid waste removed from the solid waste landfill (if required)?

A9.20. Is there a plan to close the landfill?

A9.21. Solid waste dumps covered over with soil?

A9.22. Is there a plan for closing expedient latrines?

A9.23. All trash and waste removed from latrines?

A9.24. Latrine pits treated for vectors, covered, and have signs placed indicating closure date and closing unit?

A9.25. All HW turned in by maintenance functions?

A9.26. All contaminated soil collected for treatment and/or disposal?

A9.287 Contamination around generators cleaned up?

A9.28 Contamination at bulk fuel storage/distribution points cleaned up?

A9.29. Maps, photos, grid coordinates of all areas with closure report?

A9.30. Unit requires assistance for spill cleanup?

A9.31. Unit requires assistance for coordinating HM/HW turn-in?

A9.32. Unit requires assistance with any environmental concerns?

A9.33. Final walkthrough/inspection with local representatives conducted and documented?

A9.34. Closure report with full documentation and references to the EBS completed?

A9.35. All environmental documentation and reports forwarded to the environmental staff, higher headquarters, and other appropriate agencies?