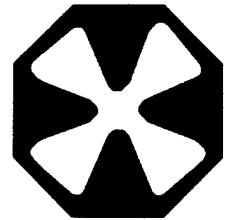




**US Army Corps
of Engineers**
Construction Engineering
Research Laboratories



U.S. Forces, Korea



Eighth U.S. Army

Environmental Compliance Assessment System (ECAS)

Republic of Korea

The number of environmental laws and regulations continues to grow in the United States and throughout the world, making compliance with regulations increasingly more complex. Environmental assessments have become a way to evaluate compliance with applicable environmental regulations. The U.S. Army has adopted a compliance program that identifies compliance problems before they are cited as violations of regulatory or other standards.

Beginning in 1985, Major Army Commands (MACOMs) were required to conduct comprehensive environmental assessments at all installations using one unified, Army-wide assessment mechanism. The system combines relevant environmental regulations, other guidance, and good management practices into a series of checklists that detail both legal/regulatory requirements and specific items or operations to review.

The ECAS manual for Korea integrates information from the *Environmental Governing Standards* published by Headquarters, U.S. Forces, Korea in October 1996, relevant Department of Defense (DOD) documents, and Army regulations with good management practices. The manual will be updated to address new environmental compliance issues.

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FOREWORD

The research was performed for the United States Forces, Korea (USFK) and Eighth Army (EUSA), under Military Interdepartmental Purchase Request (MIPR) number MIPR-5-084, dated 5 May 1995. The technical monitor was Ms. Yi, Song-chu (FKEN-EVE).

The research was performed by the Planning and Management Laboratory, Environmental Processes Division of the U.S. Army Construction Engineering Research Laboratories (USACERL). The Principal Investigator was Dr. David A. Krooks, Environmental Processes Division (PL-N). L. Jerome Benson is Acting Division Chief (PL-N).

COL James T. Scott is Commander, USACERL. Dr. Michael J. O'Connor is Director.

Table of Contents

INTRODUCTORY SECTION

Title	Page
Program Background	v
Governing Policy	v
Manual Objectives	vii
Environmental Evaluation Process	vii
Manual Approach	viii
Manual Introduction	x
Previsit Questionnaire	xiii
Finding Sheet	xxix
Major Activities/Operations	xxvii
Contact/Location Codes	xli

PROTOCOL SECTION

Section	Title	Page
1	Management	1-1
2	Air Emissions	2-1
3	Drinking Water	3-1
4	Wastewater	4-1
5	Hazardous Materials	5-1
6	Hazardous Waste	6-1
7	Solid Waste	7-1
8	Medical Waste Management	8-1
9	Petroleum, Oil, and Lubricants (POL)	9-1
10	Noise	10-1
11	Pesticides	11-1
12	Historic and Cultural Resources	12-1
13	Endangered Species and Natural Resources	13-1
14	Polychlorinated Biphenyls	14-1
15	Asbestos	15-1
16	Radon	16-1
17	Environmental Effects Abroad of Major Federal Actions	17-1
18	Spill Prevention and Response Planning	18-1
19	Underground Storage Tanks (USTs)	19-1



PROGRAM BACKGROUND

The goal of the Environmental Compliance Assessment System (ECAS) is to help all Army Installations, both Continental United States (CONUS) and outside Continental United States (OCONUS), to attain and sustain compliance with applicable environmental laws and regulations.

The objectives of ECAS are to:

1. assist Installation Commanders in identifying environmental compliance deficiencies
2. identify corrective actions to address those deficiencies
3. identify the resources necessary to implement the corrective actions
4. track the execution of corrective action.

The compliance assessments are designed to identify the resources required to correct the areas that are out of compliance and provide necessary feedback to commanders for organizing, directing, and controlling environmental protection activities.

GOVERNING POLICY

The Department of Defense has developed a series of baseline guidance standards for environmental compliance in Korea (*United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996). Additional policy concerning environmental compliance at overseas military communities is contained in the following:

1. Executive order (EO) 12088
2. EO 12114
3. Department of Defense (DOD) 5100.50
4. DOD Directive 6050.7
5. AR 200-1, Chapter 14.

- EO 12088, *Federal Compliance with Pollution Control Standards*, requires the following:

1-801. The head of each executive agency that is responsible for the construction or operation of Federal facilities outside the United States shall ensure that such construction or operation complies with the environmental pollution control standards of general applicability in the host country or jurisdiction.

1-802. Nothing in this order shall create any right or benefit, substantive or procedural, enforceable at law by a party against the United States, its agencies, its officers, or any person.

- EO 12114, *Environmental Effects Abroad of Major Federal Actions*, requires every Federal agency with major Federal actions that significantly affect the environment of a foreign nation to use the following documents in connection with actions, as applicable:

1. environmental impact statements
2. environmental study
3. environmental review.

- USFK EGS, 7 October 1996, identifies implementation guidance, procedures, and criteria for environmental compliance at DOD installations outside the United States, its territories, and possessions.
- DOD Directive 5100.50, *Protection and Enhancement of Environmental Quality*, requires DOD components at locations outside the United States to conform at all times to the environmental quality standards of the host country, international agreements, and Status of Forces Agreement (SOFA) and, to the extent practical, to:
 1. comply with the spirit, as well as the letter, of the *National Environmental Policy Act (NEPA)* and all other Federal environmental laws, executive orders, and regulations
 2. demonstrate leadership in environmental pollution abatement and enhancement of the environment.
- DOD Directive 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*, implements the requirements of EO 12114 by providing policy and procedures to enable DOD officials to be informed and take account of environmental considerations when authorizing or approving certain major Federal actions that do significant harm to the environment in places located outside the United States.
- AR 200-1, *Environmental Protection and Enhancement*, para 14-2, states that the U.S. Army in foreign nations will comply with environmental standards defined by the following documents:
 - 1) applicable international agreements such as treaties, Status of Forces Agreements (SOFAs), supplementary or other bilateral and multilateral agreements
 - 2) country-specific Final Governing Standards (FGS), or in the absence of FGS, the Overseas Environmental Baseline Guidance Document
 - 3) Executive Order (EO) 12088.

MANUAL OBJECTIVES

The ECAS manual for OCONUS military communities is intended to serve as the primary tool for conducting environmental compliance evaluations at Army installations and facilities outside of the United States. The objectives of the manual are to:

1. compile applicable DOD and Army environmental regulations associated with Army operations and activities
2. synthesize requirements into consistent and easy to use checklists
3. serve as an aid during the evaluation process.

This particular ECAS manual is based on the USFK EGS, a document published in October 1996 by the United States Forces - Korea (USFK). USFK EGS was developed on the basis of a comparison between the requirements of the *Overseas Environmental Baseline Guidance Document* (OEBGD) and those of Korean environmental laws. The more protective of any two given requirements was then incorporated in the USFK EGS. Throughout DOD, once EGSs are promulgated they take precedence over the OEBGD in the countries for which they were written; for that reason the OEBGD is not cited anywhere in this manual.

ENVIRONMENTAL EVALUATION PROCESS

The ECAS program management process described above can be divided into three distinct phases:

1. pre-evaluation activities
2. site evaluation activities
3. post-evaluation activities.

The ECAS manual deals with the first two phases of the program management process. For detailed information on the post-evaluation phase of the process, refer to the ECAS policy. Brief descriptions of the pre-evaluation and site evaluation activities are presented below.

- Pre-evaluation Activities - Five key activities should be completed before an evaluation team begins the evaluation activities.
 1. Complete Previsit Questionnaire (external evaluations only). The purpose of the previsit questionnaire is to collect information that will familiarize the evaluation team with the military community and its operations so that the evaluation team can review the applicable regulations and prepare a detailed evaluation schedule. (A sample previsit questionnaire has been included as Attachment 1.)
 2. Define Evaluation Scope and Team Responsibilities. The military community or major command may wish to place special emphasis on certain protocols or to review additional areas not covered in the manual. These goals must be clearly stated so that the evaluation can be properly planned. Additionally, the duration of the evaluation, appointment of team members, and handling of tenants and remote sites must be addressed. Finally, responsibilities for each protocol must be assigned to one of the team members.
 3. Review Relevant Regulations. Once the evaluation scope and responsibilities are known, the evaluators should undertake a thorough review of the requirements in the FGSs, other DOD Directives, and Major Army Command (MACOM) regulations. If the MACOM has implemented U.S. Federal standards, the evaluator needs to use the appropriate section of the most

recent version of *The Environmental Assessment and Management (TEAM) Guide* as part of the assessment.

4. Develop Evaluation Schedule. The team should develop a detailed evaluation schedule that includes the activities planned for each day.
 5. Review Evaluation Protocols. Each evaluator should know the regulatory requirements and schedule and be familiar with the evaluation checklists that will be used.
- Site Evaluation Activities - Information will be collected regarding environmental compliance and other matters. This information will be obtained through record searches, interviews, and site surveys. The data collected should be sufficient, reliable, and relevant so as to provide a sound basis for evaluation findings and recommendations. The format and content of ECAS evaluation reports is covered in the ECAS policy. To assist evaluators in gathering the needed information during the evaluation, a finding sheet form has been included on page xxix. A finding sheet should be completed for each finding during the evaluation.

MANUAL APPROACH

Military communities engage in many operations and activities that can cause environmental impacts on public health and the environment if not controlled or properly managed. Many of these activities and operations are regulated by the FGSs, other DOD directives, and U.S. Army directives/regulations.

After a review of these activities at military communities, it was apparent that there were major categories of environmental compliance into which most environmental regulations and military community activities could be grouped.

This manual is divided into 19 major sections; Sections 2 through 18 correspond to the chapter headings of the USFK EGS, and Section 1 presents the Management Protocol. These are the section headings in the manual:

- 1 Management
- 2 Air Emissions
- 3 Drinking Water
- 4 Wastewater
- 5 Hazardous Materials
- 6 Hazardous Waste
- 7 Solid Waste
- 8 Medical Waste Management
- 9 Petroleum, Oil, and Lubricants (POL)
- 10 Noise
- 11 Pesticides
- 12 Historic and Cultural Resources
- 13 Endangered Species and Natural Resources
- 14 Polychlorinated Biphenyls
- 15 Asbestos
- 16 Radon
- 17 Environmental Effects Abroad of Major Federal Actions
- 18 Spill Prevention and Response Planning
- 19 Underground Storage Tanks (USTs)

Each section is organized in the same format, as follows:

A. Applicability

This section provides guidance on the major activities and operations included in the protocol and a broad description of the protocol's applicability.

B. DOD Regulations

This section identifies any DOD directives/instructions that address requirements associated with the specific compliance category.

C. Army Regulations (ARs)

This section identifies any ARs that address requirements associated with the specific compliance category.

D. Responsibility for Compliance

This section identifies and summarizes the individual organizations at a military community that are responsible for maintenance, operation, or environmental monitoring of activities associated with the environmental category.

E. Key Compliance Definitions

This section of each protocol presents definitions for those key terms associated with the environmental category.

F. Assessment Checklist

The final section of each protocol contains evaluation procedures composed of statements of requirements or guidelines that serve as indicators to point out possible environmental problems, as well as practices, conditions, and situations that could indicate potential problems. They are intended to focus attention on the key questions and issues that should be investigated. Instructions are provided to direct the evaluator to the appropriate action, reference, or activity that corresponds to the specific requirement or guideline.



MANUAL INTRODUCTION

The protocol portion of the ECAS manual is divided into two columns. The first of these is a statement of a requirement, which may be based on USFK EGS, a DOD Directive, or an AR, or it may be a requirement that is considered to be a good management practice (MP). MPs are not specifically mandated by regulation.

The next column gives instructions to help conduct the evaluation. These instructions are intended to be specific action items that should be accomplished by the investigator. Some of the instructions may be a simple documentation check taking a few minutes, while others may require physical inspection of some part of a military community. Contact/location information in parentheses is intended to give guidance on the department or location at the military community where action items are applicable. The contact/location code is keyed to a legend at the bottom of the page.

The evaluation procedures are designed as an aid and should not be considered exhaustive. Proper use of the guide requires the evaluator to use his/her good judgement in determining the focus and extent of further investigation.

SUPPLEMENTAL INFORMATION

Any findings discovered through the use of this guidance manual by internal assessors must be validated by the Environmental Coordinator and Judge Advocate.

Any change or suggestion for improving this guidance manual should be forwarded by mail to USACERL, P.O. Box 9005, Champaign, IL 61826-9005, ATTN: Dr. David A. Krooks, or made by telephone (217)352-6511, ext. 7314, or by e-mail to krooks@cecer.army.mil.

Attachment 1
Previsit Environmental Management Questionnaire

This questionnaire will provide background information necessary to plan and conduct an environmental compliance assessment.

MACOM: _____

Name of Installation: _____

Environmental POC: _____

Telephone Number: _____

Has the MACOM implemented a policy of adopting any U.S. Federal environmental regulations? If yes, list which ones:

Attachment 1 Previsit Environmental Management Questionnaire

This questionnaire will provide background information necessary to plan and conduct an environmental compliance assessment.

Name of Installation: _____

Section 1. Management

YES NO N/A

1. Has the installation recently prepared, or is it in the process of preparing, an environmental study or an environmental review for:

a. Current mission? _____

b. Future master plan? _____

2. Is the Environmental Officer actively involved in project/work order reviews? _____

3. Is the installation engaged in any construction, renovation, or demolition? _____

4. Is the installation engaged in any real property transaction? _____

5. Is there currently an understaffing problem? _____

Total authorized: _____

Total recognized: _____

Total vacancies: _____

Required number of positions needed over and above the Tables of Distribution and Allowances (TDA) authorization: _____

6. What is the total number of programs currently required to manage the entire environmental program (i.e., Air, Hazardous Waste/Material, Groundwater, Surface Water, Solid Waste, Noise, Training, POL, Archeology, Asbestos, etc.)? _____

7. Is the Environmental Program Manager an active participant in the budgetary process of the installation? _____

	YES	NO	N/A
8. Does the Environmental Management Office receive adequate support or cooperation from:			
a. Preventive Medicine Activity	___	___	___
b. Safety Office	___	___	___
c. Inspector General	___	___	___
d. Manpower Survey Activity of Resource Management Directorate	___	___	___
e. Civilian Personnel Office (i.e., Recruitment/Placement and Position/Classification)	___	___	___
f. Staff Judge Advocate	___	___	___
g. Directorate of Plans, Training, Mobilization, and Security Range Control, Aviation, Maintenance)	___	___	___
h. Directorate of Logistics (maintenance, supply, and services)	___	___	___
i. Directorate of Contracting or Procurement	___	___	___
j. Directorate of Engineering and Housing (i.e., DEH, DDEH, Operations and Maintenance (O&M) Divisions, Engineering Plans and Services (EP&S), etc.)	___	___	___
k. Mobilization and Training Equipment Site (MATES), Union Training Equipment Site (UTES), ECS Area Maintenance Support Activities (AMSAs), etc.	___	___	___
l. Major garrison military units	___	___	___
m. Transient troop units (i.e., U.S. Army Reserve (USAR), Army National Guard (ARNG), and active Army components special training exercises)	___	___	___
n. Director of Personnel and Community Activities (DCPA) (auto craft, arts and crafts, photo labs, outdoor recreation)	___	___	___
o. Other tenant activities (i.e., Army/Air Force Exchange Services (AAFES), Defense Reutilization and Marketing Office (DRMO), U.S. Air Force (USAF))	___	___	___
9. Is required support being provided to environmental training? List separately:			
a. Environmental staff (is professional development staying current)	___	___	___
b. Civilian staff personnel (to include within DEH)?	___	___	___
c. Military units/military personnel/unit commander?	___	___	___

Section 2. Air

YES NO N/A

1. Does installation operate a fuel burner?
- a. Central steam plant?
- b. Hot water?
- c. Approximate size of plant(s)? _____, _____, _____

2. Are any hazardous or toxic air pollutants present in the installation's air emissions (e.g., beryllium, asbestos, mercury, and vinyl chloride)?

3. Is the installation subject to any of the following air emission standards:
- a. Particulates?
- b. NO_x?
- c. Sulfur dioxide?
- d. Volatile organic compounds?
- e. Carbon monoxide?
- f. Toxic air pollutants?

If yes, please specify:

4. Does the installation operate any incinerators (i.e., for classified documents, medical waste, solid waste, etc.)? Please list type, capacity, and number.

Type / Capacity	Quantity
_____	_____
_____	_____
_____	_____

5. Does the installation engage in:
- a. Open burning?
- b. Firefighter training?
6. Does the installation use any solvent degreasers?
7. Does the installation have a dry cleaning facility?

	YES	NO	N/A
8. Does the installation have a:			
a. Spray painting operation?	___	___	___
b. Surface coating operation?	___	___	___
9. Have installation emissions resulted in complaints from the public due to:			
a. Odors?	___	___	___
b. Fugitive dust?	___	___	___
c. Other? _____	___	___	___
10. Does the installation use chlorofluorocarbons (CFCs)?	___	___	___
11. Does the installation operate maintenance shops?	___	___	___
12. Does the installation operate fuel dispensing facilities?	___	___	___
13. Are field fuel dispensing operations and rapid refueling operations performed?	___	___	___
14. Please list number of fuel storage areas and the fuel type.			
Fuel type Quantity Fuel type Quantity			
_____ _____ _____ _____			
_____ _____ _____ _____			
15. Does the installation have active aircraft operations?	___	___	___
16. Does the installation have active aircraft maintenance operations?	___	___	___
17. Please list any additional shop activities that generate any form of air pollution: (i.e., vehicle emission systems, ventilation systems for various operations)			

18. Does the installation have any air permits to maintain with host nation regulatory authority (i.e., boilers, pathological incinerators, paint spray booths, POL tank vents, etc.)? Inclusively, list the types and number of each.	___	___	___
Type of Permit Quantity			
_____ _____			
_____ _____			
19. Does the installation operate a rock quarry/crusher operation?	___	___	___

Section 3. Drinking Water

YES NO N/A

- 1. Does installation operate a public water system?
- 2. Does any portion of the installation's drinking water supply come from onsite wells or surface water sources?
- 3. Does the installation monitor onsite drinking water sources?

Section 4. Wastewater

- 1. Does the installation have any discharges of the following:
 - a. Storm water runoff from operational/storage area?
 - b. Storm water runoff from undeveloped area?
 - c. Dredge and fill solids drainage water?
 - d. Wastewater treatment installation effluent?
 - e. Process waste water?
 - f. Heat/Power production cooling water?
 - g. Other? _____
- 2. Does the installation discharge into a Publicly Owned Treatment Works (POTW) any of the following:
 - a. Process waste water?
 - b. Domestic (sanitary) waste water?
 - c. Wastewater treatment installation effluent?
 - d. Other? _____
- 3. Does the installation make use of an onsite waste water treatment system prior to effluent discharge?
- 4. Does the installment conduct any effluent monitoring?
- 5. Are monitoring samples analyzed by:
 - a. Installation personnel?
 - b. Offsite contractor?
- 6. Does the installation have a separate storm water runoff system?
- 7. Does the installation have vehicle washracks (or other designated vehicle wash areas)?

General Information	YES	NO	N/A
1. Does the installation contain water protection areas?	___	___	___
2. Is the installation suspected of contributing to a groundwater contamination problem?	___	___	___

Section 5. Hazardous Materials

1. Does the installation have flammable/combustible storage rooms located inside or adjacent to buildings (i.e., oils, antifreeze, paint, solvent, fuels)?	___	___	___
--	-----	-----	-----

BUILDINGS/NUMBERS

2. Does the installation have outside flammable/combustible storage areas?	___	___	___
Near which buildings? _____			
3. Does the installation have hazardous materials dispensing areas?	___	___	___
In or near which buildings? _____			
4. Does the installation store/use compressed gases (i.e., oxygen, acetylene, nitrogen, etc.)?	___	___	___
5. Does the installation have any bulk acid storage?	___	___	___
6. Does the installation store batteries and/or have a battery reclamation point?	___	___	___
7. Does the installation transport hazardous materials on public roads?	___	___	___
8. Has the installation had a release of hazardous materials?	___	___	___
9. Does the installation transport any hazardous materials off-installation?	___	___	___
10. Does the installation have a procedure to ensure the proper labeling, and packaging for hazardous materials?	___	___	___
11. Does the installation store:			
a. Acids	___	___	___
b. Caustics	___	___	___
c. Flammables	___	___	___
d. Combustibles	___	___	___
e. Compressed gases	___	___	___
f. Oxidizers	___	___	___

Section 6. Hazardous Waste

YES NO N/A

1. Does the installation produce any wastes classified as:

- a. Ignitable? YES NO N/A
- b. Corrosive? YES NO N/A
- c. Reactive? YES NO N/A
- d. Toxic? YES NO N/A
- e. Other? (Please Explain) YES NO N/A

2. Does the installation treat, store or dispose of hazardous wastes onsite? YES NO N/A

If so, please specify waste type and treatment method:

3. Does the installation accept wastes from other installations for treatment, storage or disposal? YES NO N/A

4. Does the installation engage in the transportation of hazardous wastes:

- a. On base? YES NO N/A
- b. Off base? YES NO N/A
- c. Central transport (transportation squadron)? YES NO N/A
- d. Individual unit transport? YES NO N/A

5. Does the installation monitor:

- a. Groundwater? YES NO N/A
- b. Leachate? YES NO N/A

6. Does the installation have a hazardous waste management (contingency) plan? YES NO N/A

7. Does the installation utilize other locations for the treatment, storage, or disposal of hazardous waste? YES NO N/A

Please specify:

8. Does the installation use any nonhazardous solid waste (including used oil) as a supplemental fuel source? YES NO N/A

	YES	NO	N/A
9. Does the installation have a contractor dispose of its hazardous waste?	—	—	—

Which office monitors this contract? _____

10. Does the installation use any underground storage tanks for the storage of hazardous waste?	—	—	—
---	---	---	---

If yes, where are they located, what are their capacities, how old are they, and what is stored in them?

Section 7. Solid Waste

1. Does the installation have a solid waste management facility onsite?	—	—	—
---	---	---	---

2. Does the installation have a:

a. Resource recovery facility (DRMO) on the installation?	—	—	—
---	---	---	---

b. Resource recovery facility (DRMO) off the installation?	—	—	—
--	---	---	---

c. Landfill?	—	—	—
--------------	---	---	---

d. Solid waste incinerator?	—	—	—
-----------------------------	---	---	---

e. Solid waste recycling program?	—	—	—
-----------------------------------	---	---	---

f. Construction debris landfill?	—	—	—
----------------------------------	---	---	---

3. Does the installation have any "unofficial" landfill sites that are no longer in use?	—	—	—
--	---	---	---

4. Is waste transported off-installation for disposal:

a. In landfills?	—	—	—
------------------	---	---	---

b. In incinerators?	—	—	—
---------------------	---	---	---

c. Other (specify): _____	—	—	—
---------------------------	---	---	---

5. Does the installation dispose of ash residues or sludge:

a. On post?	—	—	—
-------------	---	---	---

b. Off post?	—	—	—
--------------	---	---	---

YES NO N/A

6. Is the installation monitored for:

a. Leachate?

___ ___ ___

b. Groundwater?

___ ___ ___

7. Does the installation currently dispose of, or has it been used for the disposal of, asbestos?

___ ___ ___

Section 8. Medical Waste Management

1. Does the installation generate pathological wastes?

___ ___ ___

2. Does the installation dispose of pathological waste by on-base incineration?

___ ___ ___

Section 9. Petroleum, Oil, Lubricants (POL)

1. Does the installation have a motor pool?

___ ___ ___

How many? _____

2. Does the installation store oil in large volumes?

___ ___ ___

3. Does the installation use "fuel bladders" during field exercises?

___ ___ ___

4. Does the installation have any oil/water separators?

___ ___ ___

How many? _____

(Please have a map available for the team showing locations.)

5. Does the installation have any petroleum/fuel above ground storage tanks (including heating oil)?

___ ___ ___

If yes, where are they located, what are their capacities, and what is stored in them?

Section 10. Noise

1. Does the installation have an active runway?

___ ___ ___

2. Does the installation have any operations or maneuvers that produce environmental noise (e.g., target ranges, skeet range, helicopter pad)?

___ ___ ___

3. Does a current Installation Compatible Use Zone (ICUZ) Management Plan exist?

___ ___ ___

	YES	NO	N/A
4. Are noise contour zones reviewed for mission-training changes prior to implementation?	___	___	___

Section 11. Pesticides

1. Does the installation use pesticides in regulated quantities?	___	___	___
--	-----	-----	-----

2. Are pesticide wastes disposed of at the installation?	___	___	___
--	-----	-----	-----

3. Are pesticides stored on the installation?	___	___	___
---	-----	-----	-----

Please list locations:

4. Are medical records kept for individuals involved in the management of pesticides?	___	___	___
---	-----	-----	-----

5. Where are pesticides used at the installation?			
---	--	--	--

6. Are pesticides used at off-post satellite facilities?	___	___	___
--	-----	-----	-----

7. Does the installation maintain a pesticide/entomology shop?	___	___	___
--	-----	-----	-----

If yes, are the personnel certified and is the certification current?	___	___	___
---	-----	-----	-----

Section 12. Historic and Cultural Resources

1. Does the installation have a plan for managing its cultural resources?	___	___	___
---	-----	-----	-----

2. Does the installation have an building/area designated as a:			
---	--	--	--

a. Cultural resource?	___	___	___
-----------------------	-----	-----	-----

b. Archeological resource?	___	___	___
----------------------------	-----	-----	-----

c. Historic structure?	___	___	___
------------------------	-----	-----	-----

Section 13. Endangered Species and Natural Resources

1. Are there any endangered species on the installation?	___	___	___
--	-----	-----	-----

2. Does the installation have a plan for managing its natural resources?	___	___	___
--	-----	-----	-----

YES NO N/A

3. Are there any areas on the installation which have:

a. Wetlands?

___ ___ ___

b. Flood Plains?

___ ___ ___

Section 14. Polychlorinated Biphenyls

1. Are polychlorinated biphenyl (PCB) or PCB-contaminated oils in use or stored in the installation:

a. Transformers?

___ ___ ___

b. Capacitors?

___ ___ ___

c. Electromagnets?

___ ___ ___

d. Hydraulic systems?

___ ___ ___

e. Other? _____

___ ___ ___

2. Are there any PCB items in storage for disposal?

___ ___ ___

PCB concentration (if known)

3. Does installation dispose of PCBs or PCB items at the base?

___ ___ ___

Section 15. Asbestos

1. Has the installation conducted a complete installation-wide asbestos facility survey?

___ ___ ___

2. Does the installation have a written asbestos management plan?

___ ___ ___

3. Does the installation have a written asbestos operating plan?

___ ___ ___

4. Has the installation undergone any asbestos removal projects in the past?

___ ___ ___

5. Is there any asbestos on the installation that has been removed and is awaiting disposal at this time?

___ ___ ___

6. Will the installation have any demolition, remodeling or renovation projects underway at the time of the assessment?

___ ___ ___

Please identify those projects and buildings:

	YES	NO	N/A
7. Does the installation maintain training records for asbestos workers?	—	—	—
Location of records			
<hr/>			

Section 16. Radon

1. Does the installation monitor for radon gas?	—	—	—
2. Does a Radon Reduction Management Plan exist?	—	—	—

Section 17. Environmental Effects Abroad of Major Federal Actions

1. Are there any construction sites on the installation?	—	—	—
2. Does the installation hold any Categorical Exclusions?	—	—	—
3. Has the installation written any:			
a. Environmental Impact Statements (EIS)?	—	—	—
b. Environmental Assessments (EA)	—	—	—
4. Does the installation document decisions that EISs and EAs are unnecessary?	—	—	—

Section 18. Spill Prevention and Response Planning

1. Does the installation have a spill prevention and response plan?	—	—	—
2. Does the installation's spill plan include provisions pertaining to hazardous substances or hazardous wastes?	—	—	—
3. Does the installation conduct spill response training?	—	—	—

Section 19. Underground Storage Tanks (USTs)

YES NO N/A

1. Does the installation have any USTs?

___ ___ ___

If yes, where are they located, what are their capacities, how old are they, and what is stored in them?

2. Does the installation have an AAFES-run or other type of gas station located on it?

___ ___ ___

If yes, how many USTs are located at the gas station and what size are they?

3. Does the installation have any hazardous substance USTs?

___ ___ ___

If yes, where are they located, what are their capacities, how old are they, and what is stored in them?

4. Does the installation have any underground tanks out of service?

___ ___ ___

Signature of individual completing this form: _____

Date completed: _____

ROK ECAS Manual Edition Date: _____

ECAS INDIVIDUAL FINDING SHEET

-For Official Use Only-

Finding ID (Tenant or Host (T/H))? _____

If Tenant, give:

1) Name: _____ 2) FFID: _____

Facility/Activity Name: _____ Facility/Activity Type (See reverse): _____

Manual Section #: _____

CONDITION (Finding Description):

Question #: _____

CRITERION (What is the actual requirement?):

BASIS OF FINDING (Citation or Regulation):

Pollution Category: _____

Finding Location (Location/Facility Number): _____ IFS #: _____

Type of Finding (POS/NEG): _____

Finding Category: I II III H/S (See reverse)

Existing NOV? Y/N

Recurring NOV? Y/N

Previous ECAS Finding? Y/N

NOV Number(s) (if applicable): _____

SUGGESTED SOLUTION (s):

SAMPLING RESULTS:

Universe: _____

Sample Size: _____

Number of Discrepancies: _____

Percentage of Discrepancies: _____

PREPARED BY: _____

DATE: _____

COMMENTS: _____

FACILITY/ACTIVITY TYPES

ACTIVE ARMY	RESERVES	GUARD
17 Troop Operations and Training Facilities (Buildings/Ranges)	1. ASF	Armory
21 Maintenance	2. AFRC	OMS
22 Production	3. AMSA (G)	CSMS
30 R&D Labs/Test Facilities	4. AMSA (W)	UTES
40 Supply and Storage/Logistics	5. DS/GS	MATES
50 Hospital/Medical	6. ECS	AASF
60 Admin/Communication	7. LTA	AVCRAD
70 Housing and Community	8. OMS	LTA
80 Utilities/Ground Improvements	9. RTS-INTEL	MTA
90 Real Estate/Site Improvements Research and Testing	10. RTS-MAINT 11. RTS-MED 12. STORAGE 13. USARC 14. OTHER	STARC/HQ USP & FO

FINDING CATEGORIES:

- 1) Environmental Findings I,II, & III
- 2) Health/Safety Findings

CLASS I FINDINGS: Noncompliance with USFK EGS, an existing environmental regulation, compliance agreement, consent order, or operating/discharge permit. These may stem from local requirements.

CLASS II FINDINGS: Noncompliance with a future deadline in USFK EGS, an environmental regulation, a compliance agreement, or consent order. These may stem from local requirements.

CLASS III FINDINGS: Findings based on management practices that are not based on regulatory requirements. These include findings based on Army Regulations and DOD Directives. Class III findings may be positive or negative.

HEALTH/SAFETY FINDINGS: Findings related to Occupational Safety and Health (OSHA), Department of Transportation (DOT), and National Fire Protection Association (NFPA) as indicated in requirements column in the ECAS protocol. Most health/safety findings are in the Hazardous Materials (Section 5) of the protocol. Health/safety findings may be regulatory but are not part of the RCS 1383 reporting process and not eligible for any environmental funding. Health/safety findings are not classified I, II, or III.

ROK ECAS Manual Edition Date: _____

ECAS INDIVIDUAL FINDING SHEET

-For Official Use Only-

Finding ID (Tenant or Host (T/H))? _____

If Tenant, give:

1) Name: _____

2) FFID: _____

Facility/Activity Name: _____

Facility/Activity Type (See reverse): _____

Manual Section #: _____

CONDITION (Finding Description):

Question #: _____

CRITERION (What is the actual requirement?):

BASIS OF FINDING (Citation or Regulation):

Pollution Category: _____

Finding Location (Location/Facility Number): _____ IFS #: _____

Type of Finding (POS/NEG): _____

Finding Category: I II III H/S (See reverse)

Existing NOV? Y/N

Recurring NOV? Y/N

Previous ECAS Finding? Y/N

NOV Number(s) (if applicable): _____

SUGGESTED SOLUTION (s):

SAMPLING RESULTS:

Universe: _____

Sample Size: _____

Number of Discrepancies: _____

Percentage of Discrepancies: _____

PREPARED BY: _____

DATE: _____

COMMENTS: _____

FACILITY/ACTIVITY TYPES

ACTIVE ARMY	RESERVES	GUARD
17 Troop Operations and Training Facilities (Buildings/Ranges)	1. ASF	Armory
21 Maintenance	2. AFRC	OMS
22 Production	3. AMSA (G)	CSMS
30 R&D Labs/Test Facilities	4. AMSA (W)	UTES
40 Supply and Storage/Logistics	5. DS/GS	MATES
50 Hospital/Medical	6. ECS	AASF
60 Admin/Communication	7. LTA	AVCRAD
70 Housing and Community	8. OMS	LTA
80 Utilities/Ground Improvements	9. RTS-INTEL	MTA
90 Real Estate/Site Improvements Research and Testing	10. RTS-MAINT 11. RTS-MED 12. STORAGE 13. USARC 14. OTHER	STARC/HQ USP & FO

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Table 2
Major Activities and Operations at Army Installations and Related Protocols

Protocols

Major Activities/ Operations	Management	Air Emissions	Drinking Water	Wastewater	Hazardous Materials
	1	2	3	4	5
1. Incinerators		•			
2. Heat/Power Production		•			
3. Medical Treatment Facility					
4. Aircraft Operations	•	•			•
5. Aircraft Maintenance		•		•	•
6. Fuel Storage		•		•	•
7. Sludge Disposal		•			
8. Sanitary/Industrial Wastewater				•	
9. Stormwater Runoff				•	
10. POL Dispensing		•		•	•
11. Wastewater Treatment				•	
12. Vehicle Maintenance		•			•
13. Shop Activities		•		•	•
14. Solid Waste Generation	•				
15. Water Supply			•		
16. Toxic/hazardous Materials Use	•	•			•
17. PCB Electrical Equipment					
18. Pesticide/Herbicide Use					•
19. Emergency Planning	•				•
20. Asbestos Removal		•			
21. Underground Storage Tanks				•	•
22. Renovation/Demolition Activities	•	•			
23. New Construction Activities	•				
24. Indoor Firing Range		•			
25. Marine Operations				•	•
26. Ongoing IRP Program	•				
27. Training Ranges/Impact Areas	•				•
28. Deicing/Salt Activities				•	•
29. Open Burning/Detonation		•			•

Table 2 (continued)
Major Activities and Operations at Army Installations and Related Protocols

Protocols

Major Activities/ Operations	Hazardous Waste 6	Solid Waste 7	Medical Waste Mngmt. 8	Petroleum, Oil, and Lubricants 9	Noise 10
1. Incinerators		•			
2. Heat/Power Production	•				
3. Medical Treatment Facility	•	•	•		
4. Aircraft Operations	•			•	•
5. Aircraft Maintenance	•	•		•	
6. Fuel Storage				•	
7. Sludge Disposal	•	•		•	
8. Sanitary/Industrial Wastewater	•				
9. Stormwater Runoff				•	
10. POL Dispensing	•			•	
11. Wastewater Treatment		•			
12. Vehicle Maintenance	•	•		•	
13. Shop Activities	•	•		•	•
14. Solid Waste Generation		•			
15. Water Supply					
16. Toxic/hazardous Materials Use	•			•	
17. PCB Electrical Equipment					
18. Pesticide/Herbicide Use	•			•	
19. Emergency Planning	•			•	
20. Asbestos Removal		•			
21. Underground Storage Tanks	•			•	
22. Renovation/Demolition Activities		•			
23. New Construction Activities		•			
24. Indoor Firing Range					•
25. Marine Operations	•			•	
26. Ongoing IRP Program	•	•		•	
27. Training Ranges/Impact Areas	•	•			•
28. Deicing/Salt Activities	•	•			
29. Open Burning/Detonation	•	•			

Table 2 (continued)
Major Activities and Operations at Army Installations and Related Protocols

Protocols

Major Activities/ Operations	Pesticides 11	Historic and Cultural Resources 12	End.Spe- cies & Nat.Res. 13	Polychlor- inated Bi- phenyls 14	Asbestos 15
1. Incinerators				•	
2. Heat/Power Production					
3. Medical Treatment Facility					
4. Aircraft Operations			•		
5. Aircraft Maintenance					
6. Fuel Storage					
7. Sludge Disposal					
8. Sanitary/Industrial Wastewater					
9. Stormwater Runoff					
10. POL Dispensing					
11. Wastewater Treatment					
12. Vehicle Maintenance					
13. Shop Activities	•				
14. Solid Waste Generation					•
15. Water Supply					
16. Toxic/hazardous Materials Use	•		•		
17. PCB Electrical Equipment				•	
18. Pesticide/Herbicide Use	•				
19. Emergency Planning	•				
20. Asbestos Removal					•
21. Underground Storage Tanks					
22. Renovation/Demolition Activities		•			•
23. New Construction Activities			•		•
24. Indoor Firing Range					
25. Marine Operations					
26. Ongoing IRP Program		•			
27. Training Ranges/Impact Areas		•	•		
28. Deicing/Salt Activities					
29. Open Burning/Detonation		•	•		

Table 2 (continued)
Major Activities and Operations at Army Installations and Related Protocols

Protocols

Major Activities/ Operations	Radon 16	Environ- mental Effects 17	Spill Prev. & Response Planning 18	USTs 19	
1. Incinerators		•			
2. Heat/Power Production					
3. Medical Treatment Facility					
4. Aircraft Operations		•	•		
5. Aircraft Maintenance			•		
6. Fuel Storage			•	•	
7. Sludge Disposal		•			
8. Sanitary/Industrial Wastewater		•			
9. Stormwater Runoff					
10. POL Dispensing			•	•	
11. Wastewater Treatment					
12. Vehicle Maintenance			•		
13. Shop Activities			•		
14. Solid Waste Generation					
15. Water Supply					
16. Toxic/hazardous Materials Use			•		
17. PCB Electrical Equipment					
18. Pesticide/Herbicide Use		•	•		
19. Emergency Planning			•		
20. Asbestos Removal		•			
21. Underground Storage Tanks		•	•	•	
22. Renovation/Demolition Activities	•	•			
23. New Construction Activities		•			
24. Indoor Firing Range					
25. Marine Operations					
26. Ongoing IRP Program		•			
27. Training Ranges/Impact Areas		•			
28. Deicing/Salt Activities					
29. Open Burning/Detonation		•			

CONTACT/LOCATION CODES

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (4) Safety and Health Officer
- (5) Fire Department
- (6) Director of Logistics (DOL)
- (7) Fuels Management Officer (DOL/DEH)
- (8) Transportation/Maintenance Officer (DOL)
- (9) Chief of Operations and Maintenance (O&M)
- (10) Range Control (DPTMSEC)
- (11) Aviation Commander (DPTMSEC)
- (12) Director of Plans, Training, Mobilization, and Security (DPTMSEC)
- (13) Engineering, Plans, & Services (EP&S)
- (14) Wastewater Treatment Plant Supervisor (O&M)
- (15) Land Management Officer (DEH)
- (16) Building and Grounds Division (DEH)
- (17) Entomology Shop (DEH)
- (18) TSDF Operators (DEH, DOL, DRMO)
- (19) Shop Activity Supervisor
- (20) Director of Contracting (DOC)
- (21) Public Affairs Office (PAO)
- (22) Staff Judge Advocate (SJA)
- (23) Defense and Reutilization Marketing Office (DRMO)
- (24) Utilities Division (Interior Electric Shop)
- (25) Utilities Division (Exterior Electric Shop)
- (26) Master Planner (DEH)
- (27) Inspector General (IG)
- (28) School Principal
- (29) Installation Commander (IC)
- (30) Army and Air Force Exchange Service (AAFES)
- (31) Directorate of Personnel and Community Activities (DPCA)
- (32) Directorate of Resource Management (DRM), Internal Control
- (33) Golf Course Pesticide Shop
- (34) Civilian Personnel Office (CPO)

Acronyms List

Acronym	Meaning
AAFES	Army/Air Force Exchange Service
A/E	architect/engineer
ACM	asbestos-containing material
ACofS	Assistant Chief of Staff
ACWM	asbestos-containing waste material
AFPMB	Armed Forces Pest Management Board
AMSA	Area Maintenance Support Activity
ANSI	American National Standards Institute
API	American Petroleum Institute
AR	Army Regulation
ARNG	Army Reserve National Guard
AST	aboveground storage tank
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AVGAS	aviation gas
AWP	Annual Work Plan
AWWA	American Waterworks Association
BOD	biochemical oxygen demand
CC	Command Center
CDC	Centers for Disease Control and Prevention
CEMS	continuous emissions monitoring system
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CMH	Chief of Military History
COB	Command Operating Budget
COD	chemical oxygen demand

Acronym	Meaning
COE	Corps of Engineers
CONUS	Continental U.S.
COR	Contracting Officer's Representative
CPO	Civilian Personnel Office
CSMS	Command Support Maintenance Shop
CT	Concentration/Time
CWS	Community Water System
CX	categorical exclusion
DA	Department of the Army
DAF	dissolved air flotation
DASA	Department of the Army/Security Agency
DEH	Directorate of Engineering and Housing
DLA	Defense Logistics Agency
DOC	Director of Contracting
DOD	Department of Defense
DODAAC	Department of Defense Activities Account Code
DODD	Department of Defense Directive
DODDS	Department of Defense Dependents School
DOL	Directorate of Logistics
DOT	Department of Transportation
DPCA	Directorate of Personnel and Community Activities
DPTMSEC	Director of Planning, Training, and Mobilization Section
DRM	Director of Resource Management
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Services
DSH	Directorate of Safety and Health
DWS	drinking water source
DWWTP	domestic wastewater treatment plant
EA	environmental analysis
EA	environmental assessment

Acronym	Meaning
EC	Environmental Coordinator
ECAS	Environmental Compliance Assessment System
ECR	Environmental Considerations Report
EIS	Environmental Impact Statement
EO	Executive Order
EPO	Environmental Programs Office
EP&S	Engineering, Plans, and Services
EPR	Environmental Program Requirements [Report]
EQCC	Environmental Quality Control Committee
ER	Environmental Review
ES	Environmental Study
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GSA	General Services Administration
GOCO	government-owned, contractor operated
GWUDISW	groundwater under direct influence of surface water
HAP	hazardous air pollutant
HAZMIN	Hazardous Waste Minimization (Goals)
HAZWOPER	Hazardous Waste Operations and Emergency Response
HMIS	Hazardous Materials Information System
HQDA	Headquarters, Department of the Army
HW	hazardous waste
HWAP	hazardous waste accumulation point
HWPS	Hazardous Waste Profile Sheet
HWSA	hazardous waste storage area
IAG	Inter-Agency Agreement
IATA	International Air Transportation Association
IC	Installation Commander
ICUZ	Installation Compatible Use Zone
IG	Inspector General

Acronym	Meaning
IMA	Installation Medical Authority
IMO	International Maritime Organization
IOSC	Installation On-Scene Coordinator
IPMP	Installation Pest Management Plan
IRT	Installation Response Team
ISWM	Integrated Solid Waste Management
IWWTP	industrial wastewater treatment plant
LFM	Liquid Fuel Maintenance (Shop)
LPG	liquified petroleum gas
MACOM	Major Army Command
MATES	Mobilization and Training Equipment Site
MCA	Military Construction Army
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MEDCEN	Medical Center
MEDDAC	Medical Department Activity
MOE	Ministry or Minister of Environment
MOGAS	motor gas
MP	Management Practice
MSDS	material safety data sheet
MSHA	Mine Safety and Health Administration
MSW	municipal solid waste
MSWMF	Municipal Solid Waste Management Facility
MTR	Military Training Route
MUSARC	Major U.S. Army Reserve Command
NACE	National Association of Corrosion Engineers
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act

Acronym	Meaning
NLR	Noise Level Reduction
NOV	Notice of Violation
NPL	National Priorities List
NPWS	nonpublic water system
NTNC	nontransient, noncommunity
O&M	Operations & Maintenance
OCONUS	outside continental United States
ODS	ozone depleting substance
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
PAO	Public Affairs Office
PAS	Preliminary Assessment Screening
PASI	Preliminary Assessment/Site Investigation
PCB	Polychlorinated Biphenyl
PEL	permissible exposure limit
PM	particulate matter
PMC	Pest Management Consultant
POE	point-of-entry
POL	Petroleum, Oil, and Lubricant
POTW	Publicly-Owned Treatment Works
POU	point-of-use
PPE	personal protective equipment
PPMP	Professional Pest Management Personnel
PVNTMED	Preventive Medicine (Personnel)
PWS	public water system
QAE	Quality Assurance Evaluator
QA/QC	Quality Assurance/Quality Control
QRP	Qualifying Recycling Program
RA	Remedial Action
RACM	regulated asbestos-containing material

Acronym	Meaning
RCRA	Resource Conservation and Recovery Act
RCS	Requirements Control Symbol
RDTE	Research, Development, Test and Evaluation
REC	Records of Consideration
RDF	refuse-derived fuel
RMW	Regulated medical waste
ROD	Records of Decision
RPMA	real property maintenance activity
RQ	reportable quantity
SCMA	special counter measure area
SEL	Sound Exposure Level
SI	Site Investigation
SJA	Staff Judge Advocate
SOFA	Status of Forces Agreement
SOP	Standing Operating Procedure
SWDA	Solid Waste Disposal Act
TB	Technical Bulletin
TDA	Tables of Distribution and Allowances
THM	trihalomethane
TIM	Technical Information Memorandum
TM	Technical Manual
TNC	transient, noncommunity
TRC	Technical Review Committee
TSS	total suspended solid
TSDF	Treatment, Storage, and Disposal Facility
TTO	total toxic organic
UFR	Unfinanced Requirements Report
UIC	underground injection control
UL	Underwriters' Laboratories
USAEHA	U.S. Army Environmental Hygiene Agency

Acronym	Meaning
USAF	U.S. Air Force
USAR	U.S. Army Reserve
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency (now U.S. Army Environmental Center (USAEC))
USC	U.S. Code
USE	Used Solvent Elimination (Program)
USEPA	U.S. Environmental Protection Agency
USFK	U.S. Forces - Korea
USFK EGS	United States Forces, Korea Environmental Governing Standards
UST	underground storage tank
UTES	Union Training Equipment Site
VHAP	volatile hazardous air pollutant
VOC	volatile organic compound
VOL	volatile organic liquid
WQP	water quality parameter

SECTION 1

MANAGEMENT

Korea ECAS

SECTION 1

MANAGEMENT

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to all Army facilities. Currently, this section contains checklist items for assessing environmental program management activities, including the Environmental Program Requirements (EPR) Report, formerly known as the 1383 Report. The Environmental Program Management protocol is written in response to the Department of Defense (DOD) directives/instructions, and Army regulations (ARs) applicable to the conduct of activities involving these programs. This section is designed to evaluate and examine the interaction within the Environmental Office and the Directorate of Engineering and Housing (DEH), the interface with other Directorates/Installation Activities, and relationships with the applicable Major Army Command (MACOM).

This protocol also addresses pollution prevention.

B. DOD Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 1 explains the general principles that underlie the environmental compliance program in the ROK. It also contains provisions relevant to compliance assessments and waivers for noncompliance or deviations.
- DOD Instruction (DODI) 4715.4, *Pollution Prevention*, 18 June 1996, implements policy, assigns responsibility, and prescribes procedures for implementation of pollution prevention programs throughout the DOD. Only those portions of the Instruction that are applicable outside the United States are included here.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, includes requirements for environmental compliance, auditing, reports, and the establishment of Environmental Quality Control Committees (EQCCs). The AR also requires installations to develop a pollution prevention program and a pollution prevention plan.

D. Responsibility for Compliance

- Installation Commanders (ICs) and activity and unit commanders are actively involved in and maintain awareness of environmental programs, activities, critical issues, EPR Report submissions, Command Operating Budget (COB) environmental entries, and results and updates of the US ECAS reports (assessment report and corrective action management plan). The IC ensures that other directorates, tenant activities, coordinators and unit commanders, cooperate with the DEH on environmental responsibilities.

The IC also conducts Environmental Quality Control Committee meetings on a scheduled periodic basis to maintain community awareness and support critical issues; and conducts initial and follow-up ECAS assessments (ECAS program).

- The DEH prepares and provides input into the Annual Work Plan (AWP), COB, and other budgetary documents. In addition, the DEH prepares the EPR.
- The Public Affairs Office (PAO) maintains the Public Affairs Plan by establishing the necessary support to the DEH and interfacing with the public.

E. Key Compliance Definitions

- *Excluded Materials* - excluded items may not be sold through a qualified recycling program (QRP), and the proceeds from their sale shall not be returned to a QRP. Excluded items include but are not limited to: (DODI 4715.4, Enclosure 3):
 - a. government-furnished material
 - b. precious metal bearing scrap
 - c. hazardous waste (including household hazardous waste)
 - d. ozone-depleting substances (ODS)
 - e. electrical components
 - f. unopened containers of solvents, paints, or oil
 - g. fuel
 - h. material that can be sold (as is) as a usable item
 - i. repairable items that may be used again for their original purposes or functions, e.g., used vehicles, vehicle or machine parts, etc.
 - j. ships, aircraft, weapons, and other material required to be demilitarized or mutilated, and scrap resulting from demilitarization
 - k. all Munitions List Items and Strategic List Items as defined in DOD 4160.21-M-1, except firing range expended brass and mixed metals gleaned from firing range cleanup
 - l. types of surplus personal property whose sales proceeds must be deposited to accounts other than a QRP per 32 CFR 172, Appendix B
 1. scrap generated from Defense Business Operations Fund (DBOF) activities
 2. usable personal property purchased by DBOF activities
 3. property purchased with commissary surcharge funds
 4. automatic data processing equipment owned by the General Services Administration
 5. property purchased for the Military Assistance Program or purchased with Foreign Military Sales Administrative funds
 6. Coast Guard property
 7. property owned by nonappropriated fund activities
 8. lost, abandoned, or unclaimed privately owned personal property
 9. property owned by a country or international organization
 10. bones, fats, and meat trimmings generated by a commissary.
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Other Qualified Recyclable Program Materials* - materials that fit neither the definition of recyclable materials nor the definition of excluded materials (DODI 4715.4, Enclosure 3).

- *Qualified Recycling Program* - organized operations that require concerted efforts to divert or recover scrap or waste, as well as efforts to identify, segregate, and maintain the integrity of the recyclable materials in order to maintain or enhance their marketability. If the program is administered by a DOD component, a QRP includes adherence to a control process providing accountability for all materials processed through program operations (DODI 4715.4, Enclosure 3).
- *Recyclable Materials* - recyclable materials can include, but are not limited to: high-quality paper and paper products, mixed paper, newspaper, cardboard, plastic, metal cans, glass, used oil (except when hazardous waste), batteries, and tires. In addition, scrap (including ferrous and nonferrous scrap) and firing range expended brass and mixed metals gleaned from firing range cleanup that do not require demilitarization may be included in a QRP (DODI 4715.4, Enclosure 3).
- *Recycling* - the series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of new products other than fuel for producing heat or power by combustion (DODI 4715.4, Enclosure 3).

MANAGEMENT
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	1-1 through 1-8	(1)(2)(22)
Automated Management Systems	1-9 through 1-12	(2)
Cleanup (Restoration)	1-13	(2)
Pollution Prevention	1-14 through 1-21	(2)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (5) Fire Department
- (13) Engineering, Plans, and Services (EP&S)
- (22) Staff Judge Advocate (SJA)



MANAGEMENT

Records to Review

- Record of previous environmental compliance assessments
- EPR reports
- Pollution Prevention Plan

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Fire Department
- Engineering, Plans, and Services (EP&S)
- Staff Judge Advocate (SJA)

**COMPLIANCE CATEGORY:
MANAGEMENT
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>1-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on management and pollution prevention issues should be maintained at the installation (MP).</p> <p>1-2. Each installation must have an Environmental Quality Control Committee (EQCC) (USFK EGS 1-9c(3) and AR 200-1, paras 14-3f and 15-11).</p> <p>1-3. Installations must develop and conduct training/education programs to instruct all personnel in the environmental aspect of their jobs (USFK EGS 1-9c(2) and AR 200-1, para 14-9b).</p>	<p>Verify that copies of the following regulations are maintained on the installation: (1)(2)</p> <ul style="list-style-type: none"> - USFK EGS, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - DODI 4715.4, <i>Pollution Prevention</i>, 18 June 1996. <p>Verify that the installation has an EQCC. (1)(2)</p> <p>(NOTE: In overseas areas, the EQCC may be organized at the community level.)</p> <p>Verify that the EQCC includes major and subinstallations and tenant activities. (1)(2)</p> <p>Verify that the EQCC consists of members representing the following interests: (1)(2)</p> <ul style="list-style-type: none"> - operational - engineering - planning - resource management - legal - medical - safety. <p>Verify that the installation has developed and conducts training/education programs to instruct all personnel in the environmental aspect of their jobs. (1)(2)</p> <p>(NOTE: AR 200-1 recommends the development of written training plans that identify persons and positions requiring environmental management and/or operational training.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (5) Fire Department (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate (SJA) (31) Directorate of Personnel and Community Activities (DPCA) (34) Civilian Personnel Office (CPO)

**COMPLIANCE CATEGORY:
MANAGEMENT
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>1-4. Installation personnel involved in environmental affairs should receive the necessary environmental training (MP).</p> <p>1-5. Environmental compliance assessments must be undertaken in accordance with USFK EGS and Army regulation (USFK EGS 1-11c and 1-11d; AR 200-1, paras 14-4b and 15-9).</p>	<p>Verify that appropriate training is being conducted, including: (1)(2)</p> <ul style="list-style-type: none"> - types of personnel who should receive training: <ul style="list-style-type: none"> - environmental staff members - command staff members - troops (garrison units, AT-USAR/ARNG) - types of training: <ul style="list-style-type: none"> - specialist certification training - respirator training. <p>Verify that troop units incorporate environmental training in the routine training plans. (2)</p> <p>Verify that the installation authorizes an external environmental compliance audit at least once every 3 yr or when directed by USCINCPAC. (1)(2)</p> <p>Verify that the installation develops a corrective action plan to correct the deficiencies identified in the external assessment and that the plan is updated annually (see Appendix 1-1). (1)(2)</p> <p>Verify that the installation performs an internal assessment EPR report each calendar year. (1)(2)(22)</p> <p>(NOTE: No internal audit is performed in years when there is an external audit. Internal assessments may be conducted by in-house staff or contracted but must be conducted per this manual.)</p> <p>Verify that a management and funding plan is developed to correct the deficiencies identified in external assessments. (2)</p> <p>Verify that appropriate environmental funding requirements are included in the installation's EPR report. (2)</p> <p>Verify that the management and funding plan is reviewed and updated annually. (2)</p> <p>Verify that internal assessments, as a minimum: (2)</p> <ul style="list-style-type: none"> - review and follow up on the corrective action and funding plan resulting from the last external assessment - review actions relating to regulatory violations received since the last assessment (internal or external) - assess compliance with any new regulatory requirements - address any special emphasis areas specified by higher command. <p>Verify that any new environmental requirements identified during the internal assessment are included in the installation's EPR report. (2)</p>

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**COMPLIANCE CATEGORY:
MANAGEMENT
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>1-6. Installations must have waivers for non-compliance with or deviation from the provisions of USFK EGS (USFK EGS 1-13).</p> <p>1-7. The Inspector General (IG) and the Internal Control Section of DRM should be proactively involved in environmental affairs (MP).</p> <p>1-8. The organization should have a document control system and record retention policy (MP).</p>	<p>Verify that the installation has waivers for noncompliance with or deviation from the provisions of USFK EGS. (1)(2)</p> <p>Verify that EC is familiar with the environmental activities of the IG and the Internal Control Section. (2)</p> <p>Verify that the IG assists the EO (during routine visits) in elevating environmental awareness by following up on other activities the installation may have initiated to correct noncompliance issues. (2)</p> <p>Verify that the organization has a formal record retention policy that covers environmental compliance and other related environmental information. (2)</p> <p>Verify that individual employees are aware of the record retention policy. (2)</p> <p>Verify that the organization ensures that required environmental reports are routinely submitted in a timely manner. (2)</p> <p>Verify that the installation has adequate information controls that provide for archiving of required historical environmental documents. (2)</p>
<p>AUTOMATED MANAGEMENT SYSTEMS</p> <p>1-9. Each installation must program and budget for resources through the EPR report process in order to execute environmental programs (AR 200-1, paras 1-27a(4), 13-5, 14-10, 15-9b(5), and 15-9d).</p>	<p>Verify that programming and budgeting includes, at a minimum, funding for Class I, Class II High, hazardous waste disposal projects, and adequate personnel and program management. (2)</p> <p>Verify that adequate projects and programs are described in EPR reports to justify funding submissions. (2)</p> <p>Verify that the funding submissions will in fact bring the installation into compliance. (2)</p> <p>Verify that the EPR report includes appropriate funding requirements from the external environmental compliance assessment. (2)</p> <p>Verify that the installation submits the EPR report through MSC to MACOM. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (5) Fire Department (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate (SJA) (31) Directorate of Personnel and Community Activities (DPCA) (34) Civilian Personnel Office (CPO)

**COMPLIANCE CATEGORY:
MANAGEMENT
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>CLEANUP (RESTORATION)</p> <p>1-13. Installations must not spend U.S. funds for environmental restoration beyond the minimum necessary to eliminate known imminent and substantial dangers to human health and safety (AR 200-1, para 14-6b).</p> <p>POLLUTION PREVENTION</p> <p>1-14. Installations must develop and execute a Pollution Prevention Management Plan (AR 200-1, para 14-5b and DODI 4715.4, para F2(c)(2)).</p> <p>1-15. Army installations in foreign nations must consider cost-effective pollution prevention in all its activities (AR 200-1, para 14-5b).</p> <p>1-16. Army installations in foreign nations must consider methods to reduce pollution at the source (AR 200-1, para 14-5a).</p>	<p>Verify that the installation does not spend U.S. funds for environmental restoration beyond the minimum necessary to eliminate known imminent and substantial dangers to human health and safety. (2)</p> <p>(NOTE: This prohibition does not apply if such expenditure is required by applicable U.S. law, treaty, or international agreement.)</p> <p>(NOTE: This does not override the obligation to provide emergency response and corrective action for oil or hazardous substance releases, such as spill contingencies and UST removal actions.)</p> <p>Verify that the installation has developed and implemented a pollution prevention plan. (2)</p> <p>Verify that the plan is updated periodically. (2)</p> <p>Verify that the plan identifies goals and cost-effective management processes or technologies to eliminate or reduce the use and disposal of hazardous materials.</p> <p>Verify that the installation considers cost-effective pollution prevention in all its activities. (2)</p> <p>Verify that the plan is updated periodically. (2)</p> <p>Verify that the installation considers methods to reduce pollution at the source. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (5) Fire Department (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate (SJA) (31) Directorate of Personnel and Community Activities (DPCA) (34) Civilian Personnel Office (CPO)

**COMPLIANCE CATEGORY:
MANAGEMENT
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>1-17. Army installations in foreign nations must consider methods to recycle wastes and by-products that cannot be prevented (AR 200-1, para 14-5a).</p>	<p>Verify that the installation considers methods to recycle wastes and by-products that cannot be prevented. (2)</p>
<p>1-18. Installations must establish recycling programs and procedures, if cost-effective (DODI 4715.4, para F2(c)(3)).</p>	<p>Verify that, if cost-effective, the installation has a recycling program and procedures in place that: (2)</p> <ul style="list-style-type: none"> - ensure the installation has or participates in a QRP - ensure installation recycling programs are available to serve all host and tenant organizations that occupy space on the installation, including leased space - ensure QRP procedures address recyclable materials, excluded materials, and other qualified recycling program materials - divert recyclable materials from the non-hazardous solid waste stream if economically feasible - establish controls to ensure excluded materials are not sold through a QRP - authorize ICs, as appropriate, to sell directly recyclable and other QRP materials or to consign them to DRMS for sale - ensure that distribution of recycling proceeds is consistent with 10 USC 2577. <p>(NOTE: Installations should require participation by contractors operating government-owned or leased facilities overseas where recycling programs are available.)</p>
<p>1-19. Army installations in foreign nations must consider methods to treat pollutants that cannot be recycled to minimize environmental hazards (AR 200-1, para 14-5a).</p>	<p>Verify that the installation considers methods to treat pollutants that cannot be recycled to minimize environmental hazards. (2)</p>
<p>1-20. Army installations in foreign nations must employ disposal or other release to the environment only as a last resort (AR 200-1, para 14-5a).</p>	<p>Verify that the installation employs disposal or other release to the environment only as a last resort. (2)</p>

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**COMPLIANCE CATEGORY:
MANAGEMENT
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

1-21. Installations must maintain inventory management and control processes that minimize the use of hazardous materials (DODI 4715.4, para F2(c)(1)).

Verify that the installation maintains inventory management and control processes that minimize the use of hazardous materials, as appropriate, in the most economical manner. (2)

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (5) Fire Department (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate (SJA) (31) Directorate of Personnel and Community Activities (DPCA) (34) Civilian Personnel Office (CPO)

INSTALLATION:	COMPLIANCE CATEGORY: MANAGEMENT Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 2

AIR EMISSIONS

Korea ECAS

SECTION 2

AIR EMISSIONS

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol includes regulations, responsibilities, and compliance requirements associated with air pollution emissions at military communities. The major sources of air pollution emissions at military communities are:

- particulates, sulfur dioxide (SO₂), and nitrogen oxides (NO_x) from fuel burning at steam and hot water generation plants and boilers
- criteria pollutant and hazardous air pollutant (HAP) emissions from the operation of incinerators (e.g., municipal waste, medical and veterinary waste, classified material, and hazardous waste units)
- particulate, carbon monoxide (CO), metals, and toxic air pollutant emissions from open burning and open detonation operations
- CO emissions from mobile (vehicular) sources
- volatile organic compound (VOC) emissions and HAP emissions from the storage and transfer of hydrocarbon-based fuels, solvent applications, and degreasing operations
- fugitive particulate emissions from training activities and construction/demolition operations.

Most military communities have air emissions sources in most of these categories. Therefore, this protocol is applicable to some extent at all military communities.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 2 outlines performance standards for fossil fuel fired steam generators, hot water generating plants, electric utility steam generators, and incinerators. Additionally, motor vehicles, ozone-depleting substances, and VOCs are also addressed.

C. Army Regulations (ARs)

- AR 40-5, *Preventive Medicine*, 15 October 1990, requires that an emission inventory be conducted.
- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no OCONUS-applicable requirements that relate directly to the management of air emissions.
- AR 420-49, *Heating, Energy Selection and Fuel Storage, Distribution, and Dispensing Systems*, 22 June 1990, establishes policy, criteria, and procedures for operation, maintenance, and repair of boiler plants and heating systems.

D. Responsibility for Compliance

- The Installation Commander (IC) is responsible for compliance.
- The Directorate of Engineering and Housing (DEH) is responsible for the maintenance of incinerators, fuel handling, and storage equipment, as well as the operation and maintenance of all fuel burners (boilers). The heating/boiler plant fuel burners are the responsibility of the Operations and Maintenance (O&M) Division.
- The Hospital or Installation Clinic is responsible for the operation of any medical/pathological incinerators located in its facility.
- The Fuels Management Branch of the Directorate of Logistics (DOL) is responsible for the operation of all fuel handling, transportation (tanks and/or pipelines), and storage facilities. It is also responsible for insuring that all fuels satisfy specifications. DOL is responsible for the operations of the Military Service Station, which dispenses leaded or unleaded fuel.
- The Vehicle Maintenance Branch of the DOL is responsible for vehicle emission testing and maintenance.
- The various maintenance facilities at the installation are responsible for the operation of degreasers and other industrial processes that are regulated or may require operating permits.
- The Army/Air Force Exchange System (AAFES) operates a service station that dispenses fuels and is subject to the host nation's requirements. The service station is normally operated by a contractor, but the labeling and nozzle size regulations still apply. The installation where the service station is located is responsible for compliance, but the contractor may also be responsible, depending on the wording of the contract.
- The DEH Environmental Management Division is responsible for monitoring ambient air quality and preparing the installation air emission inventory.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Air Pollutants* - those gases, particulate matter, which increase environmental or health risk or offensive odor upon emission into the air (see Appendix 2-1) (USFK EGS, Chapter 2, Definitions).
- *Annual Capacity Factor* - the ratio between the actual heat input to a steam generating unit from an individual fuel or combustion of fuels during a period of 12 consecutive calendar months and the potential heat input to the steam generating unit from all fuels, had the steam generating unit been operated for 8700 h during that 12-mo period at the maximum design heat input capacity.
- *Automobile Emissions Standards* - these concern the following substances discharged from automobiles: CO, HC, smoke (USFK EGS, Chapter 2, Definitions)

- *British Thermal Unit (Btu)* - the quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit (USFK EGS, Chapter 2, Definitions).
- *Bulk Gasoline Terminal* - any gasoline facility that receives gasoline by pipeline, ship, or barge, and has a gasoline throughput greater than 75,700 L/day [\approx 20,000 gal/day].
- *Clean Fuel* - gaseous fuel such as liquid natural gas or liquid petroleum gas that does not emit significant quantities of air pollutants (USFK EGS, Chapter 2, Definitions).
- *Closed-vent System* - a system that is not open to the atmosphere and is composed of piping, connections, and, if necessary, flow inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.
- *Coal Refuse* - waste products of coal mining, cleanings, and coal preparation operations (e.g., culm, gob, etc.), containing coal, matrix material, clay, and other organic and inorganic material (USFK EGS, Chapter 2, Definitions).
- *Continuous Emissions Monitoring System (CEMS)* - a monitoring system for continuously measuring the emissions of a pollutant from an affected facility.
- *Diesel Fuel* - any fuel sold and suitable for use in diesel motor vehicles and diesel motor vehicle engines, and commonly or commercially known or sold as diesel fuel.
- *Dual-Fuel Plant* - a heating unit, boiler, or power plant that has been completely and permanently equipped to use either of two energy sources at any time with only minor operational changes required to switch from one energy source to the other. One energy source will be designated as the "primary fuel" and the second as the "alternate fuel" (AR 420-49, Glossary, Section II).
- *Dryer* - a machine, used to remove petroleum solvent from articles of clothing or other textile or leather goods after washing and removing excess petroleum solvent, together with the piping and duct work used in the installation of this device.
- *Dust* - particulate matter that floats, scatters, or descends in the air (USFK EGS, Chapter 2, Definitions).
- *Electric Utility Steam Generating Unit* - any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam to generate electricity (USFK EGS, Chapter 2, Definitions).
- *Existing* - any facility, source, or project in use or under construction before 1 October 1997, unless it is subsequently substantially modified (USFK EGS 1-6a(2)).
- *Flying Dust* - emissions from the following activities: (USFK EGS, Chapter 2, Definitions)
 1. manufacturing or processing cement, lime, plaster, or cement-related products
 2. mining, manufacturing, or processing non-iron substances
 3. manufacturing primary irons
 4. construction.
- *Fossil Fuel* - natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such materials for the purpose of creating useful energy (USFK EGS, Chapter 2, Definitions).

- *Fuel Additives* - chemical substances, excluding those composed of carbon and hydrogen only, which improve the function of automobiles or decrease automobile emission, including additives to improve octane value, to rinse parts, to clean parts by dispersion, to suppress smoke, to improve fluidity, and other multipurpose additives, for emission gas control (USFK EGS, Chapter 2, Definitions).
- *Fuel Pretreatment* - a process that removes a portion of the sulfur in a fuel before combustion of the fuel in a steam generating unit.
- *Fugitive Emissions* - air pollutants entering into the atmosphere from other than a stack chimney, vent, or other functionally equivalent opening (e.g., vapors, dust, or fumes).
- *Gas* - gaseous substances generated during burning, synthesizing, analyzing, or generated by the physical properties of materials (USFK EGS, Chapter 2, Definitions).
- *Gasoline Carrier* - any distributor who transports or stores, or causes the transportation or storage of gasoline or diesel fuel without taking title to or otherwise having any ownership of the gasoline, and without altering either the quality or quantity of the gasoline or diesel fuel.
- *Heating Installations and Plants* - plants generating steam, hot water, or warm air that may consist of one or more furnaces, boilers, or hot water generators. The designation includes all such units in the plant, building, or room (e.g., three 100 Million British thermal units (MBtu) boilers, either in a separate heating plant or in a mechanical room in a building, constitute a 300 MBtu heating plant) (AR 420-49, Glossary, Section II).
- *High Pressure Boiler Plants* - plants operating at pressures in excess of 15 pounds per square inch (psi) steam or 30 psi water with an output capacity of 3.5 MBtu or more per hour (AR 420-49, para 2-6f).
- *Incinerator* - any furnace used in the process of burning solid or liquid waste for the purpose of reducing the volume of the waste by removing combustible matter, including equipment with heat recovery systems for either hot water or steam generation (USFK EGS, Chapter 2, Definitions).
- *In VHAP Service* - a piece of equipment that either contains or contacts a fluid (liquid or gas) that is, at least, 10 percent by weight a volatile hazardous air pollutant (VHAP).
- *In VOC Service* - in the context of fugitive emissions, a piece of equipment that contains or contacts a process fluid that is at least 10 percent VOC by weight and that is not in heavy liquid service.
- *Low-sulfur Fuel* - fuel that contains not more than 0.2% sulfur by weight. Use of low-sulfur fuel is required in certain circumstances (USFK EGS, Chapter 2, Definitions).
- *Management Practice (MP)* - a practice that, although not mandated by law, is encouraged to promote safe operating procedures.
- *Maximum Heat Input Capacity of a Steam Generating Unit* - determined by operating the facility at maximum capacity for 24 h and using the heat loss method described in Sections 5 and 7.3 of the American Society of Mechanical Engineers (ASME) *Power Test Codes* 4.1 no later than 180 days after initial start-up of the facility and within 60 days after reaching maximum production rate at which the facility will be operated.
- *MBtu* - million Btu, 1,000,000 Btu output (AR 420-49, Glossary, Section II).

- *Micron* - a unit of length equal to one-millionth (10^{-6}) of a meter (USFK EGS, Chapter 2, Definitions).
- *MOE* - the Korean Ministry of Environment (USFK EGS, Chapter 2, Definitions).
- *Nanogram* - one billionth (10^{-9}) of a gram (USFK EGS, Chapter 2, Definitions).
- *New* - any facility, source, or project with a construction start date on or after 1 October 1997 (USFK EGS 1-6a(1)).
- *Nontactical Vehicles* - commercially available vehicles that are adapted for military use (USFK EGS, Chapter 2, Definitions).
- *Offensive Odor* - unpleasant smell produced from hydrogen sulfide, mercaptans, amines, and other irritating gaseous substances (USFK EGS, Chapter 2, Definitions).
- *Opacity* - the degree to which emissions reduce the transmission of light and obscure the view of an object in the background.
- *Ozone-Depleting Substances (ODS)* - those substances listed in Appendix 2-2 (USFK EGS, Chapter 2, Definitions).
- *Particulate Matter* - minute solid or liquid particles of material that are generated by cutting, grading, heaping, reheaping, or any other mechanical treatment or by combustion, synthesis, or decomposition of materials (USFK EGS, Chapter 2, Definitions).
- *Particulate Matter Emissions* - any airborne, finely divided solid or liquid material, except uncombined water, emitted to the ambient air.
- *Petroleum Dry Cleaner* - a dry cleaning facility that uses petroleum solvent in a combination of washers, dryers, filters, stills, and settling tanks.
- *PM₁₀* - particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (μm).
- *Power Plants* - plants generating steam or high temperature water for the production of electric power or compressed air (AR 420-49, Glossary, Section II).
- *Publication Rotogravure Printing* - any number of rotogravure printing units capable of printing simultaneously on the same continuous web or substrate and that includes any associated device for continuous cutting and folding the printed web, where the following sellable paper products are printed: catalogues; direct mail advertisements; display advertisements; magazines; miscellaneous advertisements including brochures, pamphlets, catalogue sheets, circular folders, and announcements; newspapers; periodicals; and telephone and other directories.
- *Refuse-derived Fuel (RDF)* - processed refuse and waste suitable for use as a primary or secondary fuel in soil-fuel boilers (AR 420-49, Glossary, Section II).
- *Reid Vapor Pressure* - the absolute vapor pressure of volatile crude oil and volatile nonviscous petroleum liquids except liquefied petroleum gases as determined by the American Society for Testing and Materials, Part 17, 1973, D-323-72 (reapproved 1977).

- *Seoul Metropolitan Area* - the area including the Seoul capital area, Inchon, Suwon, Kwacheon, Seongnam, Kwangmyung, Anyang, Uijongbu, Ansan, Uiwang, Kunpo, Siheung, Kuri, and Koyang City (USFK EGS, Chapter 2, Definitions).
- *Smoke* - minute particulate matter generated by combustion and composed mainly of free carbon (USFK EGS, Chapter 2, Definitions).
- *Soot* - particulate matter composed of carbon generated by combustion, each particle of which has a diameter of 1 micron (μ) or more (USFK EGS, Chapter 2, Definitions).
- *Special Counter Measure Area (SCMA)* - area of special concern where significant environmental contamination or marked ecosystem changes are noticed and where MOE may establish more rigid permissible emission standards for non-DOD newly built facilities emitting air pollutants (USFK EGS, Chapter 2, Definitions).
- *Special Hazardous Air Pollutants* - air pollutants that are likely to become directly or indirectly hazardous to the public health or property or to the growth of animals and/or plants (see Appendix 2-1) (USFK EGS, Chapter 2, Definitions).
- *Steam Generating Unit* - any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam, including fossil fuel fired generators associated with the combined cycle of gas turbines; nuclear steam generators are not included (USFK EGS, Chapter 2, Definitions).
- *Substantial Modification* - any modification the cost of which exceeds one million dollars, regardless of funding source (USFK EGS 1-6a(3)).
- *True Vapor Pressure* - the equilibrium partial pressure exerted by a petroleum liquid, as determined in accordance with methods described in American Petroleum Institute Bulletin 2517, *Evaporation Loss From Floating Roof Tanks*, 1962.
- *Very Low Sulfur Oil* - an oil that contains no more than 0.5 weight percent sulfur or that, when combusted without SO₂ emission control, has a SO₂ emission rate equal to or less than 215 ng/J (0.5 lb/MBtu) heat input.
- *Volatile Hazardous Air Pollutant (VHAP)* - a substance regulated under 40 CFR 61, Subpart V, for which a standard for equipment leaks of the substance has been proposed and promulgated. Benzene and vinyl chloride are VHAPs.
- *Volatile Organic Compound (VOC)* - any compound of carbon, excluding CO, CO₂, carbonic acid, metallic carbides, or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity: methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,1-trichloro-2,2,2-trifluoroethane (CFC-113); trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (CFC-22); trifluoromethane (FC-23); 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114); chloropentafluoro-ethane (CFC-115); 1,1,1-trifluoro-2,2-dichloroethane (HCFC-123); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1-dichloro-1-fluoroethane (HCFC-141b); 1-chloro-1,1-difluoroethane (HCFC-142b); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane (HFC-134); 1,1,1-trifluoroethane (HFC-143a); 1,1-difluoroethane (HFC-152a); and perfluorocarbon compounds which fall into these classes:

1. cyclic, branched, or linear, completely fluorinated alkanes
 2. cyclic, branched, or linear, completely fluorinated ethers with no unsaturations
 3. cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations
 4. sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.
- *Wood Residue* - bark, sawdust, slabs, chips, shavings, mill trim, and other wood products derived from wood processing and forest management operations (USFK EGS, Chapter 2, Definitions).



AIR EMISSIONS

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESEPER- SONS OR GROUPS: (a)
All Installations	2-1 through 2-3	(1)(2)(3)(4)
Fuel Burning Facilities		
General	2-4 through 2-17	(1)(2)(3)(9)
Fuel Burning Sources	2-18 through 2-23	(1)(2)(9)
Incinerators	2-24 and 2-25	(1)(2)(3)
Open Burning	2-26	(1)(2)(9)
Gasoline Dispensing	2-27 through 2-29	(1)(6)(30)
Motor Vehicles	2-30	(1)(2)(6)(9)
VOC Emissions or Volatile Organic Liquid (VOL) Storage	2-312 through 2-34	(1)(2)(6)(9)
Fugitive Emissions	2-35 through 2-40	(1)(2)
Vapor Degreasers	2-41	(1)(2)(9)
Dry Cleaning	2-42	(1)(2)(9)
CFCs and Halons	2-43 through 2-47	(2)(6)(9)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (4) Safety and Health Officer
- (6) Director of Logistics (DOL)
- (9) Chief Operations and Maintenance (O&M)
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AIR EMISSIONS

Records to Review

- Emissions inventory
- All air pollution source permits
- Plans and procedures applicable to air pollution control
- Emission monitoring records
- Opacity records
- Instrument calibration and maintenance records
- Reports/complaints concerning air quality
- Regulatory inspection reports
- Documentation of preventive measure or action
- Results of air sampling
- Emergency episode plan
- Military Construction Army (MCA) development and construction plans for new facilities proposed and copies of air pollution abatement plans for these as well as existing sources requiring control
- Mobile source data, number of vehicles, and traffic counts for major thoroughfares, if available

Physical Features to Inspect

- All air pollution sources (fuel burners, incinerators, VOC sources, etc.)
- Air pollution monitoring and control devices
- Air emission stacks
- Air intake vents

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer
- Safety and Health Officer
- Director of Logistics (DOL)
- Chief of Operations and Maintenance (O&M)
- Army and Air Force Exchange Service (AAFES)

**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>2-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on air emissions should be maintained at the installation (MP).</p> <p>2-2. Preventive Medicine personnel at each installation must inspect stationary air pollution sources periodically to assess compliance with applicable standards (AR 40-5, para 11-4b).</p> <p>2-3. The circumstances associated with any particulate matter excursion caused by facility malfunction and a corrective action plan must be documented and approved in writing by the IC (USFK EGS 2-3d(1)).</p>	<p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)(2)(3)(4)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - DOD Instruction 4120.14, <i>Environmental Pollution Prevention, Control, and Abatement</i>, 30 August 1977 - AR 40-5, <i>Preventive Medicine</i>, 15 October 1990 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 420-49, <i>Heating, Energy Selection, and Fuel Storage, Distribution, and Dispensing Systems</i>, 23 July 1990 - Technical Bulletin (TB) MED 502, <i>Occupational and Environmental Health: Respiratory Protection Program</i> - Technical Manual (TM) 5-815, <i>Air Pollution Control Systems for Boilers</i>. <p>Verify that Preventive Medicine personnel inspect stationary air sources periodically to assess compliance. (3)</p> <p>Verify that the circumstances associated with any particulate matter excursion caused by facility malfunction and a corrective action plan are documented and approved in writing by the IC. (2)(9)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>FUEL BURNING FACILITIES</p> <p>General</p> <p>2-4. Installations that operate coal-fired, multi-grade oil, or dual-fuel systems must periodically review their operations to ensure that the most economical fuel is being used, consistent with air pollution criteria (AR 420-49, para 2-6a).</p> <p>2-5. All fuel burning facilities must be equipped with air pollution abatement equipment or must use the type of fuel necessary to achieve environmental pollution abatement (AR 420-49, para 2-2a).</p>	<p>(NOTE: Emissions limitations and percent reduction requirements are determined on a 30-day rolling average.)</p> <p>(NOTE: Particulate matter emission criteria do not apply during periods of start-up, shutdown, and malfunction.)</p> <p>(NOTE: SO₂ emission criteria do not apply during periods of start-up, shutdown, and when the IC has declared a life/safety emergency.)</p> <p>Determine whether the installation operates coal-fired, multi-grade oil, or dual-fuel systems. (2)(3)</p> <p>Verify that a periodic review of any such operation is conducted. (2)(3)</p> <p>Determine whether the installation has any fuel burning facilities. (2)(3)</p> <p>Verify that fuel burning facilities are either equipped with pollution abatement equipment or are operating with the cleanest possible fuel. (2)(3)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-6. Piping and valves (and critical equipment) in central boiler and heating plants, building mechanical rooms, outside distribution systems, and the main distribution systems in buildings must be marked with color banding and/or titles to indicate their contents or purpose (AR 420-49, para 2-6e).</p>	<p>Verify that piping and valves (and critical equipment) are properly marked. (2)(3)</p>
<p>2-7. Operating engineers must be certified (AR 420-49, para 2-6b).</p>	<p>Verify that operating engineers in central heating plants are certified according to AR 420-15. (2)(3)</p> <p>Verify that operators of smaller boilers and heating equipment possess a valid Department of Army (DA) Form 3941 (Certificate of Proficiency) or local equivalent certification approved by the DEH. (2)(3)</p>
<p>2-8. All high pressure steam boilers (above 15 psi) and all high temperature water boilers (above 250 °F [≈120 °C]) in active use must be inspected (AR 420-49, paras 2-12 and 2-13).</p>	<p>Determine whether the installation operates any high pressure steam boilers or high temperature water boilers. (2)(3)</p> <p>Verify that high pressure boilers are inspected semiannually both internally and externally. (2)(3)</p> <p>Verify that high temperature water boilers are externally inspected annually while under operation. (2)(3)</p> <p>Verify that high temperature water boilers are inspected internally the first and second year of operation. (2)(3)</p> <p>(NOTE: If, after the second year of operation, the internal inspection shows no adverse conditions, the amount of make-up water is negligible, and effective chemical treatment is under control, the next inspection may be extended to 3 yr.)</p>
<p>2-9. Operating logs must be maintained for each high pressure boiler plant (AR 420-49, para 2-6f).</p>	<p>Verify that the operating logs at a high pressure boiler plant include the following: (2)(3)</p> <ul style="list-style-type: none"> - DA Form 3995, <i>Daily Boiler Plant Operating Log</i> - DA Form 4367, <i>Repairs and Utilities Operating Log</i> - DA Form 3967, <i>Facilities Engineering Operating Log</i> - or equivalent computer documentation.

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-10. New or substantially modified fossil fuel fired steam generating units with a heat input capacity of greater than 100 MBtu/h heat input must meet specific emissions limitations for particulate matter and SO₂ (USFK EGS 2-3a(1) through 2-3a(4)).</p>	<p>Determine whether the facility burns coal, oil, wood, or a combination of fuels. (1)(2)</p> <p>Verify that no flue gas discharged into the atmosphere contains particulate matter in excess of 43 ng/J heat input (0.10 lb/MBtu) derived from fossil fuel or fossil fuel and wood residue. (1)(2)</p> <p>Verify that discharged flue gases do not exhibit more than 20 percent opacity except for one 6-min period per hour of not more than 30 percent opacity. (1)(2)</p> <p>Verify that discharged flue gases do not contain SO₂ in excess of 340 ng/J heat input (0.80 lb/MBtu) derived from liquid fossil fuel or liquid fossil fuel and wood residue. (1)(2)</p> <p>Verify that discharged flue gases do not contain SO₂ in excess of 520 ng/J heat input (1.2 lb/MBtu) derived from solid fossil fuel or solid fossil fuel and wood residue. (1)(2)</p> <p>Verify that no particulate matter or SO₂ emissions exceed the permissible standards listed in Appendices 2-3 and 2-4.</p>
<p>2-11. New or substantially modified fossil fuel fired steam generating units with a heat input capacity of greater than 100 MBtu/h must meet specific emissions limitations for NO_x (USFK EGS 2-3a(5) through 2-3a(7)).</p>	<p>Verify that flue gas discharged to the atmosphere does not contain NO_x in excess of the following: (1)(2)(9)</p> <ul style="list-style-type: none"> - 86 ng/J heat input (0.20 lb/MBtu) derived from gaseous fossil fuel - 129 ng/J heat input (0.30 lb/MBtu) derived from liquid fossil fuel, liquid fossil fuel and wood residue, or gaseous fossil fuel and wood residue - 300 ng/J heat input (0.70 lb/MBtu) derived from solid fossil fuel or solid fossil fuel and wood residue - 260 ng/J heat input (0.60 lb/MBtu) derived from lignite or lignite and wood residue. <p>Verify that, if they are compatible with existing combustion configurations, low excess air/low NO_x burners are used in new construction and major modifications. (1)(2)(9)</p> <p>(NOTE: This does not apply when a fossil fuel containing at least 25 percent by weight of coal refuse is burned in combination with gaseous, liquid, other solid fossil fuel or wood residue.)</p> <p>Verify that NO_x emissions do not exceed the permissible standards listed in Appendix 2-3.</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-12. New or substantially modified fossil fuel fired steam generating units with a maximum design heat input capacity of greater than 100 MBtu/h must meet specific requirements with regard to fuel sulfur content (USFK EGS 2-3a(8)).</p>	<p>Verify that the installation conducts and records measurements of fuel sulfur content for each fuel batch. (1)(2)(9)</p> <p>Verify that the fuel sulfur content does not exceed 0.2 percent by weight. (1)(2)(9)</p>
<p>2-13. New or substantially modified fossil fuel fired steam generating units with a maximum design heat input capacity of greater than 100 MBtu/h must maintain records of ash contents and higher heating values (USFK EGS 2-3a(9)).</p>	<p>Verify that the installation maintains a record of ash contents and higher heating values for the fuel combusted in the source. (1)(2)(9)</p>
<p>2-14. New or substantially modified steam generating units or electric utility steam generating units rated greater than 100 MBtu/h heat input must operate properly calibrated and maintained continuous emissions monitoring systems for opacity, NO_x, and the O₂ or CO₂ content of flue gases (USFK EGS 2-3e).</p>	<p>Verify that the opacity of emissions is continuously monitored, except where gaseous or distillate fuels are the only fuels combusted. (1)(2)(9)</p> <p>Verify that NO_x emissions are continuously monitored. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-15. New or substantially modified electric utility steam generating units with a rated capacity of greater than 100 MBtu/h heat input must meet specific emissions limitations (USFK EGS 2-3b).</p>	<p>Verify that flue gases discharged into the atmosphere do not contain particulate matter in excess of 13 ng/J heat input (0.03 lb/MBtu) derived from the combustion of solid, liquid, or gaseous fuel. (1)(2)(9)</p> <p>Verify that no gases are discharged that: (1)(2)(9)</p> <ul style="list-style-type: none"> - exhibit greater than 20 percent opacity, except for one 6 min period per hour of not more than 30 percent opacity - contain SO₂ in excess of 520 ng/J heat input (1.2 lb/MBtu) and 10 percent of the potential combustion concentration derived from solid fuel - contain SO₂ in excess of 340 ng/J heat input (0.80 lb/MBtu) and 10 percent of the potential combustion concentration derived from liquid or gaseous fuels - contain NO_x in excess of the emissions limits listed in Appendix 2-5. <p>(NOTE: When emissions of SO₂ are less than 260 ng/J heat input (0.60 lb/MBtu), there is a limit of 30 percent of the potential combustion concentration derived from solid fuel.)</p> <p>Verify that fuel consumption and electrical steam output values are verified monthly in order to calculate boiler efficiency. (1)(2)(9)</p> <p>Verify that emissions do not exceed the permissible standards listed in Appendices 2-3 and 2-4.</p>
<p>2-16. Existing and new or substantially modified steam generating units or electric utility steam generating units rated greater than 100,000 Btu/h but less than 100 MBtu/h heat input must have an annual tune-up so that specific operation requirements are met (USFK EGS 2-3f).</p>	<p>Verify that the identified steam generating unit has an annual tune-up to ensure combustion efficiency of the unit so that the following requirements are met: (1)(2)(9)</p> <ul style="list-style-type: none"> - for natural gas, the minimum excess O₂ level at high firing rates is 0.5 percent through 3 percent - for liquid fuels, the minimum excess O₂ level at high firing rates is 2 percent through 4 percent - CO emissions are below 400 ppm by volume - the flame is stable and does not impinge on the furnace walls or burner parts - emissions do not exceed the permissible standards listed in Appendices 2-3 and 2-4.

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-17. All new or substantially modified steam generating units or electric utility steam generating units rated less than 100,000 Btu/h must undergo monitoring for O₂ and CO (USFK EGS 2-3g).</p> <p>Fuel Burning Sources</p> <p>2-18. Fuel burning facilities with greater than 250 MBtu/h heat input should meet specific emissions standards (MP).</p> <p>2-19. Fuel burning facilities with greater than 250 MBtu/h heat input should have specific types of monitoring instruments (MP).</p>	<p>Verify that such steam generating units undergo monitoring for O₂ and CO that is consistent with relevant U.S. industry standards. (1)(2)(9)</p> <p>Verify that emissions do not exceed the permissible standards listed in Appendices 2-3 and 2-4.</p> <p>Verify that: (2)(9)</p> <ul style="list-style-type: none"> - opacity emissions are less than 20 percent, except one, 6-min period of no greater than 27 percent per hour - particulate emissions are not in excess of 0.10 lb/MBtu - SO₂ emissions do not exceed levels outlined in Appendix 2-6 - NO_x emissions do not exceed levels outlined in Appendix 2-6. <p>Verify that the following monitors are in place: (9)</p> <ul style="list-style-type: none"> - NO_x continuous monitor - opacity monitor (except in gaseous fuel burners) - SO₂ monitor (except for fossil fuel fired steam generators that do not use a fuel gas desulfurization device, and gaseous fuel burners) - fuel sampling monitor when SO₂ monitor is not required - CO₂ or O₂ monitors (except when continuous monitoring systems are not required for sulfur oxides or NO_x). <p>Verify that the monitors are maintained. (1)(2)</p> <p>(NOTE: Assessors should review calibration schedules when determining compliance with this requirement.)</p> <p>Verify that, for fuel consumption and electrical steam output instruments: (9)</p> <ul style="list-style-type: none"> - instruments are correctly installed and operating - instruments are calibrated every 24 h - monitoring records are maintained for 2 yr.

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COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-22. Municipal waste combustors with a capacity greater than 225 megagrams (Mg) per day (250 tons per day) of municipal solid waste or refuse-derived fuel should meet specific operating standards (MP).</p>	<p>Verify that gases are not discharged that contain the following constituents in excess of the least stringent amount listed: (1)(2)</p> <ul style="list-style-type: none"> - dioxin/furan in excess of 30 ng per dry standard cubic meter (dscm) or 12 grains per billion dry standard cubic foot (gr/dscf), corrected to 7 percent O₂ (dry basis) - SO₂ in excess of 20 percent of the potential SO₂ emission rate, or 30 ppm by volume, corrected to 7 percent O₂ (dry basis) - hydrogen chloride in excess of 5 percent of the potential hydrogen chloride emission rate (95 percent reduction by weight or volume), or 25 ppm by volume, corrected to 7 percent O₂ (dry basis) - NO_x emissions in excess of 180 ppm by volume, corrected to 7 percent O₂ (dry basis). <p>Verify that facilities meet the operating standards for CO emissions outlined in Appendix 2-7. (1)(2)</p> <p>Verify that the following operating practices are implemented: (1)(2)</p> <ul style="list-style-type: none"> - facilities do not operate at a load level greater than 110 percent of the maximum demonstrated municipal waste combustor unit load - facilities do not operate at a temperature exceeding 17 °C [≈62 °F] above the maximum demonstrated particulate matter control device temperature.
<p>2-23. Municipal waste combustors with a capacity greater than 225 Mg/day (250 tons per day) of municipal solid waste or refuse-derived fuel should meet specific record keeping requirements (MP)</p>	<p>Verify that an operating manual that is updated yearly is at the facility and indicates: (1)(2)</p> <ul style="list-style-type: none"> - applicable standards - procedures for receiving, handling, and feeding municipal solid waste - start-up, shutdown, and malfunction procedures - operational provisions for meeting emission standards - response procedures for emergency situations - monitoring procedures - procedures for handling ash - reporting and record keeping requirements.

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-23. (continued)</p>	<p>Verify that the following records are maintained for 2 yr: (1)(2)</p> <ul style="list-style-type: none"> - emissions rates - dates when excess emissions were identified and reasons for excess emissions - operating days when the minimum numbers of hours of SO₂ or NO_x emissions or operational data have not been obtained and the reasons - identification of the times when SO₂ or NO_x emissions or operational data have been excluded from the calculation of average emission rates or parameters and the reason for exclusion - results of daily SO₂, NO_x, and CO continuous emission monitoring systems drift tests and accuracy assessments - results of all annual performance tests - continuous emissions monitoring data for opacity, SO₂, NO_x, CO, load level, and particulate matter control device temperature - names of the people who have completed the review of the operating manual - weights of municipal solid waste and other fuel combusted when being used in a cofired combustor with a municipal waste capacity greater than 225 Mg/day (250 tons/day) - the amount of nonmedical and medical waste combusted on a daily basis for combustors firing both medical waste and other municipal solid waste, unless it is assumed that the total heat input to the combustor is from municipal solid waste with a design heating value of 10,500 kilojoules per kilogram (kJ/kg) or 4500 Btu/lb.
<p>INCINERATORS</p> <p>2-24. New or substantially modified incinerators that burn more than 50 tons/day [≈45 metric tons/day] or that burn more than 10 percent sewage sludge must meet specific emissions limitations (USFK EGS 2-3h).</p>	<p>Verify that no incinerator discharges any gas into the atmosphere that contains particulate matter in excess of 0.18 g/dscm (0.08 gr/dscf) corrected to 12 percent CO₂. (1)(2)(3)</p> <p>Verify that incinerators that process beryllium-containing waste, beryllium, beryllium oxide, or beryllium alloys do not emit more than 10 g [0.02 lb] of beryllium into the atmosphere over a 24-h period. (1)(2)(3)</p> <p>Verify that emissions do not exceed the permissible standards listed in Appendices 2-3 and 2-4. (1)(2)(3)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997																		
<p>2-25. Medical waste incinerators rated at 300 lb/h must meet specific limitations for gaseous pollutants (USFK EGS 2-3i).</p>	<p>Verify that such incinerators do not exceed the following emissions limits: (1)(2)(3)(9)</p> <table border="0"> <tr> <td>PM</td> <td>0.08 g/dscf (7000 grains = 1 lb)</td> </tr> <tr> <td>CO</td> <td>100 ppm @ 7 percent O₂ (1 h average)</td> </tr> <tr> <td>HCL</td> <td>4 lb/h [≈2 kg/h] or 90 percent reduction (from incinerator outlet to stack outlet) or 50 ppm @ 7 percent O₂ (3 h average)</td> </tr> <tr> <td>SO₂</td> <td>45 ppm @ 7 percent O₂ (hourly average)</td> </tr> <tr> <td>NO_x</td> <td>210 ppm @ 7 percent O₂</td> </tr> <tr> <td>Opacity</td> <td>10 percent for 6 min in any one hour, not to exceed 30 percent at any time (Based on U.S. Environmental Protection Agency (USEPA) Method 9)</td> </tr> <tr> <td>Pb</td> <td>1.52 mg/m³</td> </tr> <tr> <td>Hg</td> <td>4.95 mg/m³</td> </tr> <tr> <td>Cd</td> <td>0.092 mg/m³</td> </tr> </table>	PM	0.08 g/dscf (7000 grains = 1 lb)	CO	100 ppm @ 7 percent O ₂ (1 h average)	HCL	4 lb/h [≈2 kg/h] or 90 percent reduction (from incinerator outlet to stack outlet) or 50 ppm @ 7 percent O ₂ (3 h average)	SO ₂	45 ppm @ 7 percent O ₂ (hourly average)	NO _x	210 ppm @ 7 percent O ₂	Opacity	10 percent for 6 min in any one hour, not to exceed 30 percent at any time (Based on U.S. Environmental Protection Agency (USEPA) Method 9)	Pb	1.52 mg/m ³	Hg	4.95 mg/m ³	Cd	0.092 mg/m ³
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Pb	1.52 mg/m ³																		
Hg	4.95 mg/m ³																		
Cd	0.092 mg/m ³																		
<p>OPEN BURNING</p> <p>2-26. Open burning is permitted only for fire fighting and infrequent vegetative debris management (USFK EGS 2-3m).</p>	<p>Verify that open burning occurs only for fire fighting activities and only infrequently as a method of managing vegetative debris. (1)(2)(9)</p> <p>Verify that installation fire protection supervisors use open burning to train fire protection department employees to fight fires only in training facilities approved in writing by the IC. (1)(2)</p> <p>Verify that the fire protection department both: (1)(2)</p> <ul style="list-style-type: none"> - coordinates all fire training employing open burning with the local environmental office - accomplishes the training in such a manner that environmental damage is minimized. <p>Verify that only clean, uncontaminated lead-free fuels are used. (1)(2)</p> <p>Verify that the following are not disposed of by open burning: (1)(2)(9)</p> <ul style="list-style-type: none"> - hazardous material - hazardous waste - petroleum, oil, and lubricant (POL) - trash. <p>(NOTE: These requirements do not prohibit the use of fireplaces and barbecues which are governed by installation-level directives.)</p>																		

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>GASOLINE DISPENSING</p> <p>2-27. Leaded gasoline should not be introduced into any motor vehicle that is labeled "unleaded gasoline only" or that is equipped with a gasoline tank filler inlet designed for introduction of unleaded gasoline (MP).</p> <p>2-28. Fuel pumps should display specific signs (MP).</p> <p>2-29. Bulk gasoline terminals that deliver liquid product into large tank trucks should meet specific operating standards (MP).</p>	<p>Determine what grades of gasoline are used and where they are dispensed. (6)</p> <p>Verify that controls are in place to ensure proper fueling of vehicles. (6)</p> <p>Verify that the installation posts signs at each pump stand stating that unleaded gas should be introduced only into vehicles designed to use unleaded gasoline. (6)(30)</p> <p>Verify that fuel pump nozzles are properly sized. (6)(30)</p> <p>Verify that each fuel pump is labeled, indicating the type of fuel (e.g., "unleaded gasoline" or "contains lead anti-knock compounds"). (6)(30)</p> <p>Verify that the bulk gasoline terminal has a vapor collection system designed to collect the total organic compound vapors displaced from tank trucks during product loading and to prevent the total organic compounds collected at the on-loading rack from passing to another loading rack. (1)(6)(30)</p> <p>Verify that emissions from the vapor collection system do not exceed 35 mg of total organic compound per liter of gasoline loaded. (1)(6)(30)</p> <p>Verify that the following loading procedures are followed: (1)(6)(30)</p> <ul style="list-style-type: none"> - vapor tightness documentation is available for each gasoline tank truck - the tank identification number is recorded as each gasoline tank truck is loaded - each tank identification number is cross-checked with the file of tank vapor tightness documentation within 2 weeks after the tank is loaded - steps are taken to ensure that only vapor-tight tanks are loaded and that vapor collection systems are operational. <p>Verify that the vapor collection and liquid loading equipment is designed and operated to prevent gauge pressure in the delivery tank from exceeding 4500 Pa (450 mm of water) during product loading. (1)(6)(30)</p> <p>Verify that pressure vacuum vents in the vapor collection system do not open at a system pressure of less than 4500 Pa (450 mm of water). (1)(6)(30)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-29. (continued)</p>	<p>Verify that the installation conducts monthly inspections of the vapor collection system, the vapor processing system, and each loading rack that handles gasoline. (1)(6)(30)</p> <p>Verify that the above inspections are conducted when loading is in progress. (1)(6)(30)</p> <p>Verify that the installation establishes inspection records and keeps them on file for 2 yr. (1)(6)(30)</p> <p>Verify that leaks are repaired within 15 calendar days after detection. (1)(6)(30)</p> <p>Verify that records of all replacements or additions of components performed on existing vapor processing systems are kept for at least 3 yr. (1)(6)(30)</p>
<p>MOTOR VEHICLES</p> <p>2-30. Installations must maintain USFK-owned, nontactical vehicles and USFK-registered privately owned vehicles so as to prevent excessive emissions (USFK EGS 2-3L).</p>	<p>Verify that emission testing to assess compliance with the standards listed in Appendix 2-8 occurs at least every 2 yr. (1)(2)(6)(9)</p> <p>Verify that all vehicles are visually inspected according to manufacturer and military maintenance instruction schedules to ensure that all factory-installed emission control equipment is intact and operational. (1)(2)(6)(9)</p> <p>Verify that only unleaded gasoline is used in vehicles designed for unleaded gasoline. (1)(2)(6)(9)</p> <p>Verify that light duty and heavy duty engines meet the relevant standards contained in Appendix 2-8 according to the year of vehicle manufacture. (1)(2)(6)(9)</p> <p>Verify that vehicles using gasoline, liquefied petroleum gas (LPG), or gas meet the standards contained in Appendix 2-8 for CO and hydrocarbon emissions from the exhaust pipe. (1)(2)(6)(9)</p> <p>Verify that vehicles using diesel fuel meet the standards contained in Appendix 2-8 for smoke and soot. (1)(2)(6)(9)</p>
<p>VOC EMISSIONS OR VOL STORAGE</p> <p>2-31. Publication roto-gravure printing presses, except for proof presses, should meet specific standards for VOC emissions (MP).</p>	<p>Determine whether the installation operates any publication roto-gravure printing presses. (1)(2)</p> <p>Verify that gases are not being discharged that contain VOCs in amounts greater than or equal to 16 percent of the total mass of VOC solvent and water used at that facility during any one performance averaging period. (1)(2)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-31. (continued)</p>	<p>(NOTE: Each performance averaging period is 30 consecutive calendar days.)</p> <p>Verify that, if the installation uses waterborne ink systems or solvent-borne ink systems with solvent recovery systems, it records: (1)(2)(6)</p> <ul style="list-style-type: none"> - the amount of solvent and water used - the amount of solvent recovered - an estimated emission percentage for each calendar month. <p>Verify that the installation maintains these records for 2 yr. (1)(2)(6)</p>
<p>2-32. Storage vessels for petroleum liquids with a storage capacity greater than 151,600 L (40,000 gal) should meet specific standards (MP).</p>	<p>Determine whether the installation has any liquid petroleum storage vessels with a capacity greater than 151,600 L (40,000 gal). (1)(2)</p> <p>Determine the true vapor pressure of the liquids stored. (1)(2)</p> <p>Verify that vessels storing petroleum liquid with a true vapor pressure equal to or greater than 1.5 psia [10.3 kPa absolute] but less than 11.1 psia [76.5 kPa absolute] are equipped with one of the following: (1)(2)</p> <ul style="list-style-type: none"> - an external floating roof - a fixed roof with an internal floating type cover equipped with a continuous closure device between the tank wall and edges - a vapor recovery system that collects all VOC vapors and gases discharged from the storage vessel and a vapor return or disposal system to process the VOC vapors and gases to reduce emissions by at least 95 percent by weight - an equivalent, approved system. <p>Verify that vessels storing petroleum liquids with a vapor pressure greater than 11.1 psia [76.5 kPa absolute] are equipped with a vapor recovery system that collects all VOC vapors and gases and a vapor return or disposal system that is designed to process the VOC vapors to reduce emissions by at least 95 percent by weight. (1)(2)</p> <p>Verify that the installation takes the following measurements: (1)(2)</p> <ul style="list-style-type: none"> - gap measurement for primary seals of external floating roofs, at least once every 5 yr - gap measurement for secondary seals of external floating roofs, at least once annually. <p>Verify that the following records are kept: (1)(2)</p> <ul style="list-style-type: none"> - gap measurement, for at least 2 yr following the date of measurement - the petroleum liquid stored, the period of storage, and the maximum true vapor pressure during the storage, unless the storage vessel has a vapor recovery and return or disposal system.

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-33. Storage vessels for volatile organic liquids (VOLs) with a capacity of greater than or equal to 40 m³ [≈10,600 gal] should meet specific standards (MP).</p> <p>2-34. Storage vessels for VOLs with a capacity of greater than or equal to 40 m³ [≈10,600 gal] should meet specific inspection and documentation standards (MP).</p>	<p>Determine whether any of the storage vessels on the installation meet these parameters. (1)(2)(6)</p> <p>Determine what the vapor pressure is of the liquids being stored in the vessels. (1)(2)(6)</p> <p>Verify that storage vessels with a design capacity greater than or equal to 151 m³ [≈39,890 gal] containing VOL with a vapor pressure equal to or greater than 5.2 kPa [0.75 psia], but less than 76.6 kPa [11.1 psia], or storage vessels with a capacity greater than or equal to 75 m³ [≈19,800 gal], but less than 151 m³ [≈39,890 gal], containing VOL that has a maximum vapor pressure equal to or greater than 5.2 kPa [0.75 psia], but less than 76.6 kPa [11.1 psia], are equipped with one of the following: (1)(2)(6)</p> <ul style="list-style-type: none"> - a fixed roof in combination with an internal floating roof - an external floating roof - a closed vent system and control device that reduces emissions by 95 percent by weight - an approved equivalent system. <p>Verify that storage vessels with a design capacity greater than or equal to 75 m³ [≈19,800 gal] containing a VOL with a maximum true vapor pressure greater than or equal to 76.6 kPa [11.1 psia] are equipped with one of the following: (1)(2)(6)</p> <ul style="list-style-type: none"> - a closed vent system and control device that reduces emissions by 95 percent by weight - an approved equivalent alternative method. <p>Verify that the accumulated area of gaps between the tank wall and the primary seal does not exceed 212 cm² per meter [10 in.²/ft] of tank diameter and that the width of any portion of any gap does not exceed 3.81 cm [1.5 in.]. (1)(2)(6)</p> <p>Verify that the accumulated area of gaps between the tank wall and the secondary seal does not exceed 21.2 cm² per meter [1 in.²/ft] of tank diameter and that the width of any portion of any gap does not exceed 1.27 cm [0.5 in.]. (1)(2)(6)</p> <p>Verify that the installation inspects internal floating roofs, primary seals, and secondary seals for holes, tears, or defects before filling the tank. (1)(2)(9)</p> <p>Verify that the installation conducts visual inspections of the internal floating roof and primary or secondary seals of vessels with a liquid-mounted or mechanical shoe primary seal at least once every 12 mo after the initial fill. (1)(2)(9)</p> <p>Verify that the installation either repairs vessels or removes them from service within 45 days of discovering problems. (1)(2)(9)</p>

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COMPLIANCE CATEGORY:**SECTION TITLE****Republic of Korea ECAS****REGULATORY REQUIREMENTS:****REVIEWER CHECKS:
June 1997****2-34. (continued)**

Verify that the installation inspects vessels with double-seal systems at least once every 5 yr. (1)(2)(9)

Verify that the installation inspects internal floating roofs, primary seals, secondary seals, gaskets, slotted membranes, and sleeve seals each time the storage vessel is emptied and degassed. (1)(2)(9)

Verify that, when control equipment is installed, gap areas are measured at least (1)(2)(9):

- once every 5 yr for gaps between the tank wall and the primary seal
- once a year for gaps between the tank wall and the secondary seal.

Verify that, for vessels with a design capacity greater than or equal to 151 m³ [≈39,890 gal], storing a liquid with a maximum true vapor pressure greater than or equal to 3.5 kPa [0.5 psia], or with a design capacity greater than or equal to 75 m³ [≈19,800 gal], but less than 151 m³ [≈39,890 gal], storing a liquid with a true vapor pressure greater than or equal to 15.0 kPa [2.2 psia], the installation keeps a record of the following: (1)(2)

- the VOL stored
- the period of storage
- the maximum true vapor pressure of that VOL during the storage period.

(NOTE: This requirement does not apply to vessels that store a waste mixture of indefinite or variable composition or vessels equipped with a closed vent system and control device.)

FUGITIVE EMISSIONS

2-35. Installations should manage the emission of VHAPs in accordance with specific requirements (MP).

Determine where the installation operates sources in VHAP service. (1)(2)

Verify that when a leak is detected: (1)(2)

- weatherproof and readily visible identification marked with the equipment identification number, is attached to the leaking equipment
- the identification is removed only after no leak has been detected for 2 mo or the leak is repaired
- leaks detected for pumps, compressors, pressure-relief devices in liquid service, and flanges are recorded in a log that is maintained for 2 yr at a readily accessible location.

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COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-35. (continued)</p>	<p>Verify that the following records are maintained: (1)(2)</p> <ul style="list-style-type: none"> - a list of identification numbers of all equipment to which a standard applies - a list of equipment designated for no detectable emissions - dates of compliance tests - a list of identification numbers for equipment in vacuum service - information and data used to demonstrate that a piece of equipment is not in VHAP service. <p>(NOTE: VHAPs include vinyl chlorides and benzene from pumps, compressors, pressure relief devices, sampling connection systems, flanges and other connectors, and product accumulator vessels operating in VHAP service.)</p>
<p>2-36. Installations should monitor and control the emission of VHAPs from pumps in VHAP service (MP).</p>	<p>Determine where the installation operates pumps in VHAP service. (1)(2)</p> <p>Verify that the installation visually inspects such pumps weekly for leaks. (1)(2)</p> <p>Verify that the installation monitors pumps monthly for leaks, using standard test methods. (1)(2)</p> <p>Verify that leaks are repaired within 15 days of their discovery. (1)(2)</p>
<p>2-37. Installations should monitor and control the emission of VHAPs from compressors in VHAP service (MP).</p>	<p>Determine where the installation operates compressors in VHAP service. (1)(2)</p> <p>Verify that compressors are equipped with a seal system that includes a barrier fluid system and prevents leakage of process fluids. (1)(2)</p> <p>Verify that the seal system: (1)(2)</p> <ul style="list-style-type: none"> - operates with the barrier fluid at a pressure greater than the compressor stuffing box pressure, or - operates with the barrier fluid at a pressure greater than the compressor stuffing box pressure, or is equipped with a barrier fluid system that is connected by a closed-vent system to a control device, or - is equipped with a system that purges the barrier fluid into a process stream with zero VHAP emissions - contains barrier fluid that is not in VHAP service. <p>Verify that barrier fluid systems are equipped with a sensor to detect the failure of the seal system, barrier fluid system, or both. (1)(2)</p> <p>Verify that sensors are checked daily or have an audible alarm, unless the compressor is located within the boundary of an unmanned plant site. (1)(2)</p> <p>Verify that leaks are repaired within 15 days. (1)(2)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-38. Installations should monitor and control the emission of VHAPs from pressure relief devices, sampling connection systems, flanges and other connectors, and product accumulator vessels operating in VHAP service (MP).</p>	<p>Determine where the installation operates such sources in VHAP service. (1)(2)</p> <p>Verify that, except during pressure releases, pressure relief devices in gas/vapor service are operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background. (1)(2)</p> <p>Verify that, after a pressure release, the device is returned to a state of no detectable emissions within 5 days. (1)(2)</p> <p>Verify that sampling connectors are equipped with a closed-purge system or closed-vent system that either: (1)(2)</p> <ul style="list-style-type: none"> - returns the purged process fluid directly to the process line, or - collects and recycles the purged process fluid, or - is designed and operated to capture and transport all purged process fluid to a control device. <p>Verify that pressure relief devices in liquid service and flanges and other connectors are monitored within 5 days if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method and repaired within 15 days. (1)(2)</p> <p>Verify that product accumulator vessels are equipped with a closed-vent system capable of capturing and transporting any leakage from the vessel to a control device. (1)(2)</p>
<p>2-39. Valves and lines in VHAP service should be operated according to specific procedures (MP).</p>	<p>Determine what valves and lines at the installation, including those exposed to vinyl chlorides and benzene, are in VHAP service. (1)(2)</p> <p>Verify that open-ended valves or lines are equipped with a cap, blind flange, or second valve that seals the open end at all times, except during operations requiring process fluid flow through the valve or line. (1)(2)</p> <p>Verify that open-ended valves or lines with a second valve are operated so that the valve on the process fluid end is closed before the second valve is closed. (1)(2)</p>
<p>2-40. Systems and devices used to control VHAP emissions should be operated according to specific standards (MP).</p>	<p>Verify that vapor recovery systems are designed and operated to recover the organic vapors vented to them with 95 percent efficiency or greater. (1)(2)</p> <p>Verify that enclosed combustion devices are designed and operated to reduce the VHAP and benzene emissions vented to them with an efficiency of 95 percent or greater or provide a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C [1400 °F]. (1)(2)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>2-40. (continued)</p>	<p>Verify that closed-vent systems: (1)(2)</p> <ul style="list-style-type: none"> - have no detectable emissions - are monitored annually - and have leaks repaired within 15 days. <p>Verify that closed-vent systems are operated at all times when emissions may be vented to them. (1)(2)</p> <p>Verify that the installation maintains in a readily accessible location the following records pertaining to closed-vent systems and control devices: (1)(2)</p> <ul style="list-style-type: none"> - detailed schematics - dates and descriptions of any changes to the system - periods when they are not operating - dates of start-ups and shutdowns.
<p>VAPOR DEGREASERS</p> <p>2-41. Vapor degreasers in use after 30 September 1996 must incorporate systems that minimize the direct release of VOCs to the atmosphere (USFK EGS 2-3k).</p>	<p>Verify that vapor degreasers in use after 30 September 1996 use systems such as covered or refrigerated systems to minimize direct release of VOCs to the atmosphere. (1)(2)(9)</p>
<p>DRY CLEANING</p> <p>2-42. Petroleum solvent dry cleaning dryers, washers, filters, stills, and settling tanks at petroleum dry cleaning plants with a total manufacturer's rated dryer capacity equal to or greater than 38 kg (84 lb) should meet specific operating standards (MP).</p>	<p>Verify that dryers are solvent recovery dryers. (1)(2)(9)</p> <p>Verify that the petroleum solvent filters are cartridge filters that are drained in their sealed housing for at least 8 h before their removal. (1)(2)(9)</p> <p>Verify that a clearly visible label regarding fire protection and inspection is posted on the dryer. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
SECTION TITLE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>CFCs AND HALONS</p> <p>2-43. Installations must meet specific standards during the servicing of equipment that contains CFCs or halons (USFK EGS 2-3j(2) and 2-3j(3)).</p> <p>2-44. In order to minimize atmospheric emissions of ODS, specific practices should be instituted at the installation (MP).</p> <p>2-45. Installations must maximize the recycling of ozone depleting refrigerants during equipment servicing or disposal (USFK EGS 2-3j(4)).</p> <p>2-46. Installations must develop and implement plans to eliminate Class I ODSs from facility applications (USFK EGS 2-3j(5)).</p> <p>2-47. Installations must meet specific training criteria for personnel who use refrigerant recycling equipment (USFK EGS 2-3j(2)).</p>	<p>Verify that all repairs or service to nontactical vehicle air conditioners use commercially available refrigerant recycling equipment, operated by trained personnel. (2)(6)(9)</p> <p>Verify that no activity intentionally vents any Class I or Class II CFC refrigerant in the process of maintaining, servicing, repairing, or disposing of an appliance or an industrial process refrigeration unit. (2)(6)(9)</p> <p>(NOTE: See Appendix 2-2 for a list of Class I and Class II substances.)</p> <p>Verify that ODS are procured only in the absence of suitable alternatives. (2)(6)(9)</p> <p>Verify that there is no disposal of ODS by direct release to the atmosphere. (2)(6)(9)</p> <p>Verify that ODS are recycled. (2)(6)(9)</p> <p>Verify that service practices are used that maximize recycling of ozone depleting refrigerants on evacuation of refrigerant during servicing or disposal of equipment. (2)(6)(9)</p> <p>Verify that the installation develops and implements a plan for the removal of Class I ODSs from facility applications by 30 September 2003. (2)(6)(9)</p> <p>Verify that training is consistent with the recommendations of the equipment manufacturer. (2)(6)(9)</p> <p>Verify that training is conducted by personnel who are experienced in the operation of the recycling equipment. (2)(6)(9)</p> <p>Verify that training is conducted prior to the assumption of duties. (2)(6)(9)</p>

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Appendix 2-1

Air Pollutants and Special Hazardous Air Pollutants (USFK EGS, Chapter 2, Definitions)

Air Pollutants	
Particulate matter	Phosphorus and its compounds
Bromine and its compounds	Boron and its compounds
Aluminum and its compounds	Aldehyde
Vanadium and its compounds	Benzene
Manganese and its compounds	Styrene
Iron and its compounds	Acrolein
Zinc and its compounds	Cadmium and its compounds
Selenium and its compounds	Cyanide
Antimony and its compounds	Lead and its compounds
Tin and its compounds	Chromium and its compounds
Tellurium and its compounds	Arsenic and its compounds
Barium and its compounds	Mercury and its compounds
Carbon monoxide	Copper and its compounds
Ammonia	Chlorine and its compounds
Nitric oxide	Fluoride
Sulfur dioxide	Asbestos
Hydrogen sulfide	Nickel and its compounds
Methyl sulfide	Vinyl chloride
Mercaptans	Dioxane
Amines	Phenol and its compounds
Carbon tetrachloride	Beryllium and its compounds
Carbon disulfide	VOCs
Hydrocarbon	

(continued)

Appendix 2-1 (continued)

Special Hazardous Air Pollutants	
Cadmium and its compounds	Hydrogen cyanide
Lead and its compounds	PCBs
Chromium compounds	Arsenic and its compounds
Mercury and its compounds	Copper and its compounds
Chlorine and hydrogen chloride	Fluoride
Asbestos	Nickel and its compounds
Vinyl chloride	Dioxin
Phenol and its compounds	Beryllium and its compounds

Appendix 2-2

Class I and Class II ODSs* (USFK EGS Table 2-1)

Class I	
CFC-11	CFC-12
CFC-13	CFC-111
CFC-112	CFC-113
CFC-114	CFC-115
CFC-211	CFC-212
CFC-213	CFC-214
CFC-215	CFC-216
CFC-217	Halon-1211
Halon-1301	Halon-2402
Carbon Tetrachloride	Methyl Chloroform
HCFC 22B1	Methyl Bromide

Class II	
HCFC-21	HCFC-22
HCFC-31	HCFC-121
HCFC-122	HCFC-123
HCFC-124	HCFC-131
HCFC-132b	HCFC-133a
HCFC-141b	HCFC-142b
HCFC-221	HCFC-222
HCFC-223	HCFC-224
HCFC-225ca	HCFC-225cb
HCFC-231	HCFC-226
HCFC-233	HCFC-232
HCFC-235	HCFC-234
HCFC-242	HCFC-241
HCFC-244	HCFC-243
HCFC-252	HCFC-251
HCFC-261	HCFC-253
HCFC-271	

* Identical restrictions apply to products which are mixtures of regulated ODS and other materials (e.g., azeotropic CFC mixtures R-500, R-502 and R-503).



Appendix 2-3

Permissible Standards of Air Pollutant Emission Gaseous Pollutants

(USFK EGS Table 2-3)

Air Pollutant	Emitting Facility	Phase in Periods		
		Until 31 December 1994	1 January 1995 - 31 December 1998	From 1 January 1999
Carbon monoxide (CO)	a. electricity or steam generating units			
	1. facility using liquid fuel	350 ppm (4)	350 ppm (4)	350 ppm (4)
	2. facility using solid fuel	400 ppm (6)	400 ppm (6)	400 ppm (6)
	b. incinerators	600 ppm (12)	600 ppm (12)	600 ppm (12)
Sulfur oxides (SO ₂)	a. steam generating unit			
	1. facility using solid fuel			
	(a) area using low sulfuric oil	850 ppm (4)	540 ppm (4)	540 ppm (4)
	(b) other area	1950 ppm (4)	1950 ppm (4)	540 ppm (4)
	2. facility using solid fuel (including mixing liquid fuel)			
	(a) area restricted for using solid fuel	500 ppm (6)	250 ppm (6)	250 ppm (6)
	(b) other area			
	1) facility using domestic producing coals	1200 ppm (6)	700 ppm (6)	500 ppm (6)
2) facility using other solid waste	700 ppm (6)	500 ppm (6)	250 ppm (6)	
	b. other facilities	800 ppm	500 ppm	500 ppm
Nitrogen oxides (NO ₂)	a. facility using liquid fuel			
	1. electrically generating motor	1400 ppm (13)	1400 ppm (13)	950 ppm (13)
	2. other facility	250 ppm (4)	250 ppm (4)	250 ppm (4)
	b. facility using solid fuel	350 ppm (6)	350 ppm (6)	350 ppm (6)
	c. facility using gaseous fuel (only for electricity generating facility)			
	1. generating motor	1200 ppm (13)	500 ppm (13)	500 ppm (13)
	2. other generating facility	400 ppm	400 ppm	400 ppm
	d. other facility	200 ppm	200 ppm	200 ppm

(continued)

Appendix 2-3 (continued)

Air Pollutant	Emitting Facility	Phase in Periods		
		Until 31 December 1994	1 January 1995 - 31 December 1998	From 1 January 1999
Formaldehyde (HCHO)		20 ppm	20 ppm	20 ppm
Fluorine (F) compounds		5 ppm	3 ppm	3 ppm
Hydrogen Cyanide (HCN)		10 ppm	10 ppm	10 ppm
Carbon Disulfide (CS ₂)		30 ppm	30 ppm	30 ppm
Hydrogen Sulfide (H ₂ S)		15 ppm	15 ppm	15 ppm
Ammonia		200 ppm	200 ppm	100 ppm
Hydrogen chloride	a. Incinerator	80 ppm (12)	60 ppm (12)	50 ppm (12)
	b. Other facility	10 ppm	6 ppm	6 ppm
Chlorine (Cl ₂)	a. Incinerator	80 ppm (12)	60 ppm (12)	60 ppm (12)
	b. Other facility	10 ppm	10 ppm	10 ppm
Bromine (Br) compounds		5 ppm	5 ppm	5 ppm
Benzene (C ₆ H ₆) compounds		50 ppm	50 ppm	50 ppm
Phenol (C ₆ H ₅ O ₆) compounds		10 ppm	10 ppm	10 ppm
Mercury (Hg) compounds		5 mg/Sm ³	5 mg/Sm ³	5 mg/Sm ³
Arsenic (Ar) compounds		3 ppm	3 ppm	3 ppm

NOTE: Numbers in () show the percentage of standard oxygen density (% of O₂).

Appendix 2-4

Permissible Standards of Air Pollutant Emission -- Particulate Matter

(USFK EGS Table 2-4)

Air Pollutant	Emitting Facility	Phase in Periods		
		Until 31 December 1994	1 January 1995 - 31 December 1998	From 1 January 1999
Dust	a. electricity or steam generating units (1) facility using liquid fuel			
	(a) Emission gas 200,000 m ³ /hr	100 mg/Sm ³ (4)	60 mg/Sm ³ (4)	40 mg/Sm ³ (4)
	(b) 30,000 m ³ /hr ≤ Emission gas < 200,000 m ³ /hr	150 mg/Sm ³ (4)	100 mg/Sm ³ (4)	50 mg/Sm ³ (4)
	(c) 6,000 m ³ /hr ≤ Emission gas < 30,000 m ³ /hr	200 mg/Sm ³ (4)	150 mg/Sm ³ (4)	100 mg/Sm ³ (4)
	(d) Emission gas < 6,000 m ³ /hr	300 mg/Sm ³ (4)	200 mg/Sm ³ (4)	150 mg/Sm ³ (4)
	(2) facility using solid fuel (including mixing liquid fuel)			
	(a) Emission gas 30,000 m ³ /hr	250 mg/Sm ³ (6)	100 mg/Sm ³ (6)	50 mg/Sm ³ (6)
	(b) 6,000 m ³ /hr ≤ Emission gas < 30,000 m ³ /hr	250 mg/Sm ³ (6)	150 mg/Sm ³ (6)	50 mg/Sm ³ (6)
	(c) Emission gas < 6,000 m ³ /hr	300 mg/Sm ³ (6)	200 mg/Sm ³ (6)	150 mg/Sm ³ (6)
	b. Incinerators			
	(1) Emission gas 40,000 m ³ /hr	100 mg/Sm ³ (12)	80 mg/Sm ³ (12)	80 mg/Sm ³ (12)
	(2) Emission gas < 40,000 m ³ /hr	200 mg/Sm ³ (12)	100 mg/Sm ³ (12)	100 mg/Sm ³ (12)
	c. Other facilities	120 mg/Sm (12) ³	120 mg/Sm ³ (12)	120 mg/Sm ³ (12)
Cadmium (Cd) compounds		1.0 mg/Sm ³ or less	1.0 mg/Sm ³ or less	1.0 mg/Sm ³ or less
Lead (Pb) compounds		10 mg/Sm ³ or less	10 mg/Sm ³ or less	5 mg/Sm ³ or less
Chromium (Cr) compounds		1.0 mg/Sm ³	1.0 mg/Sm ³ or less	1.0 mg/Sm ³
Copper (Cu) compounds		10 mg/Sm ³ or less	10 mg/Sm ³ or less	10 mg/Sm ³ or less

(continued)

Appendix 2-4 (continued)

Air Pollutant	Emitting Facility	Phase in Periods		
		Until 31 December 1994	1 January 1995 - 31 December 1998	From 1 January 1999
Nickel (Ni) and its compounds		20 mg/Sm ³	20 mg/Sm ³	20 mg/Sm ³
Zinc (Zn) compounds	a. Incinerators b. Other emitting facilities	30 mg/Sm ³ 10 mg/Sm ³	30 mg/Sm ³ 10 mg/Sm ³	30 mg/Sm ³ 10 mg/Sm ³
Fly ash		1.5 mg/Sm ³	1.0 mg/Sm ³	0.5 mg/Sm ³
Smoke		2 degrees (Ringelmann Smoke Chart)	2 degrees (Ringelmann Smoke Chart)	2 degrees (Ringelmann Smoke Chart)

NOTE: Monitor Dust via automatic or manual stack sampler where a stack exists. Use a High volume sampler to measure Dust levels in open spaces. Numbers in () show the % of standard oxygen density (% of O₂).

Appendix 2-5

**NO_x Emission Limits for New or Substantially Modified
Electric Steam Generating Units**
(USFK EGS Table 2-2)

Type of Fuel	Nanograms per Joule	Emission Limits lb/MBtu
Gaseous Fuels:		
Coal-derived	210	0.50
Other	86	0.20
Liquid Fuels:		
Coal-derived and shale oil	210	0.50
Other	130	0.30



Appendix 2-6

Emission Limitations for Incinerators and Steam Generators of 73 MW (250 MBtu/h) or Greater (40 CFR 60)

Source Category	Fuel Type	Pollutant	Emission Level	Monitoring Requirement
<i>40 CFR 60.40 through 60.44</i>				
Steam generators (> 73 MW (250 MBtu/h)) constructed or modified after 8/17/71	Solid Fossil Fuel	Particulate	43 ng/J (0.10 lb/MBtu)	None
		Opacity	20%; 27% 6 min/h	Continuous
		SO ₂	520 ng/J (1.20 lb/MBtu)	Continuous
		NO _x (except lignite and coal refuse)	300 ng/J (0.70 lb/MBtu)	Continuous
	Liquid Fossil Fuel	SO ₂	340 ng/J (0.80 lb/MBtu)	Continuous
		NO _x	129 ng/J (0.30 lb/MBtu)	Continuous
	Gaseous Fossil Fuel	NO _x	86 ng/J (0.20 lb/MBtu)	Continuous
	Lignite	NO _x	260 ng/J (0.60 lb/MBtu)	Continuous
	Lignite mined in ND, SD, or MT, burned in a cyclone fired unit	NO _x	340 ng/J (0.80 lb/MBtu)	Continuous
<i>40 CFR 60.50 through 60.54</i>				
Incinerators > 45 metric tons (> 50 tons/day) constructed or modified after 8/17/71	Incinerators	Particulate	0.18 g/dscm (0.08 gr/dscf) corrected to 12% CO ₂	Record of daily charging rates and hours of operation



Appendix 2-7

Municipal Waste Combustor Operating Standards for CO (40 CFR 60.56a Table I)

Municipal Waste Combustor Technology	Emission Limit (ppm by volume)
Mass burn waterwall	100
Mass burn refractory	100
Mass burn rotary waterwall	100
Modular starved air	50
Modular excess air	50
RDF stoker	150
Bubbling fluidized bed combustor	100
Circulating fluidized bed combustor	100
Coal/RDF mixed fuel fired combustor	150



Appendix 2-8

Permissible Standards for Air Pollutant Emission -- Operating Automobiles (USFK EGS Table 2-5)

Fuel Used	Type of Vehicle	Manufacture Date	Carbon Monoxide	Hydrocarbon Exhaust Pipe	Smoke
Gasoline, LPG, Alcohol	passenger automobile	Manufactured Before 1 January 1988	4.5% or less	1200 ppm or less	---
		Manufactured on or after 1 January 1988	1.2% or less	220 ppm or less (gasoline alcohol-fired automobile)	---
				400 ppm or less (LPG fired automobile)	---
	light-duty, small-freight, heavy-duty automobiles	All	4.5% or less	1200 ppm or less	---
Diesel	passenger, small-freight, heavy-duty automobiles	Manufactured before 1 January 1996	---	---	40% or less (2 degree)
		Manufactured on or after 1 January 1996	---	---	35% or less (2 degree)

NOTES:

1. Gasoline fired automobiles include those which use mixed fuels (gasoline, alcohol, LPG).
2. Hydrocarbon exhaust standards do not apply to automobiles which use only alcohol fuel.

INSTALLATION:	COMPLIANCE CATEGORY: AIR EMISSIONS Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 3

DRINKING WATER

Korea ECAS

SECTION 3

DRINKING WATER

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol identifies regulations, responsibilities, and compliance requirements applicable to activities and procedures involved in the collection, treatment, storage, and distribution of drinking water.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 3 addresses standards for potable water and the management of drinking water facilities.

C. Army Regulations (ARs)

- AR 200-1, para 1-24(2), *Environmental Protection and Enhancement*, 21 February 1997, contains no OCONUS-applicable requirements that relate directly to drinking water issues. However, it does require that operators of water, wastewater, and industrial treatment plants receive necessary training and meet applicable operator certification requirements or in accordance with OCONUS requirements.
- AR 420-46, *Water Supply and Wastewater*, 1 May 1992, establishes policies, criteria, responsibilities, and procedures for the operation, maintenance, repair, and construction of distribution, collection, treatment, and disposal facilities for water supply; it also includes policies, criteria, etc., for wastewater, stormwater, and industrial waste.
- AR 40-5, *Preventive Medicine*, 15 October 1990, details specific duties with regard to swimming pools and swimming areas.

D. Responsibility for Compliance

- Directorate of Engineering and Housing (DEH) is responsible for the calibration of permanently installed meters. It also designs, constructs, and operates the water distribution system to provide sufficient drinking water to personnel. The DEH is responsible for providing adequate water treatment to ensure that drinking water does not exceed the maximum contaminant levels (MCLs) established for water for human consumption. Training of operating personnel to meet proficiency levels consistent with the operator certification requirements that apply to their location is also the responsibility of the DEH. It also maintains an up-to-date map of the complete potable water system, makes repairs, and maintains the installations water supply contract.
- The Preventive Medicine Officer is responsible for proper sample collection from drinking water systems at Army installations and for determining compliance with relevant standards.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. *Code of Federal Regulations* (CFR).

- *Action Level* - the concentration of a substance in water that determines appropriate treatment for a water system (USFK EGS, Chapter 3, Definitions).
- *Best Available Technology (BAT)* - the best technology treatment techniques, or other means that the administrator finds, examined for effectiveness under field conditions and not solely under lab conditions, that are available (taking cost into consideration). For the purposes of setting MCLs for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon.
- *Community Water System (CWS)* - a public water system that has at least 15 service connections used by year-round residents, or that regularly serves at least 25 of the same people for more than 6 mo/yr (USFK EGS, Chapter 3, Definitions).
- *Contaminant* - any physical, chemical, biological, or radiological substance in water.
- *Disinfectant* - any oxidant, including but not limited to, chlorine, chlorine dioxide, chloramines, and ozone, intended to kill or inactivate pathogenic microorganisms in water (USFK EGS, Chapter 3, Definitions).
- *Disinfection* - a process that inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.
- *Domestic or Other Nondistribution System Plumbing Problem* - a coliform contamination problem in a public water system with more than one service connection that is limited to the specific service connection from which the coliform-positive sample was taken.
- *Filtration* - a process for removing particulate matter from water by passage through porous media.
- *First Draw Sample* - a 1 L [0.26 gal] sample of tap water that has been standing in plumbing at least 6 h and is collected without flushing the tap (USFK EGS, Chapter 3, Definitions).
- *Follow-Up Lead Monitoring* - two consecutive 6-mo monitoring periods for water systems that do not comply with the lead/copper rule. Monitoring consists of lead/copper tap samples and water quality parameter (WQP) samples. This sampling cycle continues until the system demonstrates compliance with the lead/copper rule (USFK EGS, Chapter 3, Definitions).
- *Gross Alpha Particle Activity* - the total radioactivity due to alpha particle emissions, as inferred from measurements on a dry sample.
- *Groundwater Under the Direct Influence of Surface Water (GWUDISW)* - any water below the surface of the ground with (USFK EGS, Chapter 3, Definitions):
 1. significant occurrence of insects or other microorganisms, algae, or large-diameter pathogens such as *Giardia lamblia*
 2. significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH that closely correlate to climatological or surface water conditions.

(NOTE: Direct influence must be determined for individual sources.)

- *Halogen* - one of the chemical elements chlorine, bromine, or iodine.
- *Initial Lead Monitoring for Medium/Small Systems* - two consecutive 6-mo monitoring periods for first-draw samples for lead and copper (USFK EGS, Chapter 3, Definitions).
- *Large Water System* - in reference to lead and copper in systems, this refers to a water system that serves more than 50,000 people.
- *Lead-free* - a maximum lead content of 0.2 percent for solder and flux and 8.0 percent for pipes and fittings (USFK EGS, Chapter 3, Definitions).
- *Lead Service Line* - a service line made of lead that connects the water main to the building inlet and any lead pigtail, gooseneck, or other fitting that is connected to such a line (USFK EGS, Chapter 3, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Maximum Contaminant Level (MCL)* - the maximum permissible level of a contaminant in water that is delivered to the free-flowing outlet of the ultimate user of a public water system, except for turbidity, for which the maximum permissible level is measured after filtration (USFK EGS, Chapter 3, Definitions).
- *Maximum Contaminant Level Goal (MCLG)* - the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of people would occur and that allows an adequate margin of safety. Maximum contaminant level goals are nonenforceable health goals.
- *Maximum Total Trihalomethane Potential* - the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual, after 7 days at a temperature of 25 °C [77 °F] or above.
- *Medium Size Water System* - with reference to lead and copper in systems, a water system that serves more than 3300 and fewer than or equal to 50,000 people.
- *Near the First Service Connection* - located at one of the 20 percent of all service connections in the entire system that are nearest the water supply treatment facility, as measured by water transport time within the distribution system.
- *Nonpublic Water System (NPWS)* - a system that is not a public water system. For example, a well serving a building (USFK EGS, Chapter 3, Definitions).
- *Nontransient, Noncommunity (NTNC) Water System* - a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 mo/yr (USFK EGS, Chapter 3, Definitions).
- *PicoCurie (pCi)* - quantity of radioactive material producing 2.22 nuclear transformations/minute.
- *Point of Disinfectant Application* - the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.

- *Point-of-Entry (POE) Treatment Device* - a treatment device applied to the drinking water entering a structure to reduce contaminants in the drinking water throughout the structure (USFK EGS, Chapter 3, Definitions).
- *Point-of-Use (POU) Treatment Device* - a treatment device applied to a tap to reduce contaminants in drinking water at that tap (USFK EGS, Chapter 3, Definitions).
- *Potable Water* - water that has been examined and treated to meet the standards of USFK EGS, Chapter 3 (USFK EGS, Chapter 3, Definitions).
- *Public Water System (PWS)* - a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days per year. This term includes: (USFK EGS, Chapter 3, Definitions)
 1. any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system
 2. any collection or pretreatment storage facilities not under such control that are used primarily in connection with such system.

(NOTE: A public water system is either a "community water system" or a "noncommunity water system.")

- *Reduced Lead Monitoring* - the scale-back of both the number of samples and the frequency of monitoring for those water systems that have demonstrated consistent compliance with the lead/copper rule. An installation commander (IC) must obtain approval for reduced monitoring by submitting a request, in writing, to the USFK ACofS, Engineer. The USFK ACofS, Engineer is responsible for determining whether a water system qualifies for reduced monitoring. Reduced lead monitoring will consist of lead/copper tap samples and WQPs. This monitoring will be conducted annually for three consecutive years during the months of June, July, August, and September (USFK EGS, Chapter 3, Definitions).
- *Rem* - the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A millirem (mrem) is 1/1000 of a rem.
- *Sanitary Survey* - an onsite review of the water source, facilities, equipment, operation, and maintenance of a public water system to evaluate the adequacy of such elements for producing and distributing potable water (USFK EGS, Chapter 3, Definitions).
- *Standard Sample* - the aliquot of finished drinking water that is examined for the presence of coliform bacteria
- *Surface Water* - all water that is open to the atmosphere and subject to surface runoff.
- *System with a Single Service Connection* - a system that supplies drinking water to consumers via a single service line.
- *Total Trihalomethanes* - the sum of the concentration in mg/L of chloroform, bromoform, dibromochloromethane, and bromodichloromethane (USFK EGS, Chapter 3, Definitions).
- *Transient Noncommunity (TNC) Water System* - a public, non-community water system that does not regularly serve at least 25 of the same persons at least 6 mo/yr (USFK EGS, Chapter 3, Definitions).

- *Trihalomethane (THM)* - one of the family of organic compounds, named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.
- *Ultimate Reduced Lead Monitoring* - monitoring that consists of lead/copper tap samples and WQPs. Monitoring is conducted once every 3 yr during the months of June, July, August, and September (USFK EGS, Chapter 3, Definitions).
- *Underground Injection* - a subsurface emplacement through a bored, drilled, driven, or dug well, where the depth is greater than the largest surface dimension, whenever a principle function of the well is the emplacement of any fluid (USFK EGS, Chapter 3, Definitions).
- *Vulnerability Assessment* - an evaluation by U.S. Forces - Korea (USFK) that shows that contaminants of concern either have not been used in a watershed area or the source of water for the system is not susceptible to contamination (USFK EGS, Chapter 3, Definitions).

(NOTE: Susceptibility is based on prior occurrence, vulnerability assessment results, environmental persistence and transport of the contaminants, and any wellhead protection program.)

- *Water System* - refers to PWSs and NPWSs, and to purchasers who have a distribution system and water storage facilities (USFK EGS, Chapter 3, Definitions).

DRINKING WATER
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	3-1 through 3-4	(1)(2)(22)
Drinking Water		
General	3-5 through 3-17	(1)(2)(3)(9)(21)(22)
Water Quality Standards	3-18 through 3-28	(1)(2)(3)(9)
Disinfection and Filtration	3-29 through 3-33	(1)(2)(9)
Notification and Reporting Requirements	3-34 through 3-36	(1)(2)(3)(5)(9)
Corrosion and Corrosion Protection	3-37 through 3-39	(1)(2)(9)
Alternative Water Supplies	3-40	(3)(9)
Underground Injection Control	3-41	(3)(9)
Aquifers	3-42	(3)(9)
Swimming Pools	3-43 and 3-44	(1)(2)(3)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (9) Chief of Operations and Maintenance (O&M)
- (21) Public Affairs Office
- (22) Staff Judge Advocate

DRINKING WATER

Records to Review

- Permits
- Laboratory records, procedures, and results
- Special reports, certifications, etc., required by permit
- All notices of noncompliance
- All notices of violations
- Local service use permit
- Administrative orders

Physical Features to Inspect

- Water treatment plant
- Swimming pools

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer
- Chief of Operations and Maintenance (O&M)
- Public Affairs Office
- Staff Judge Advocate

**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>3-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on drinking water quality should be maintained at the installation (MP).</p> <p>3-2. OCONUS installations classified as suppliers of water must comply with the standards in the National Primary Drinking Water Regulation, the host country, or the SOFA, whichever are more stringent (AR 420-46, para 2-2a).</p> <p>3-3. Commanders of Army installations or activities have certain responsibilities with regard to host country regulatory agencies (AR 420-46, para 2-3c).</p>	<p>Verify that copies of the following are current and readily available: (1)(2)(22)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - DOD Instruction 4120.14, <i>Environmental Pollution Prevention, Control, and Abatement</i>, 30 August 1977 - AR 40-5, <i>Preventive Medicine</i>, 15 October 1990 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 420-46, <i>Water Supply and Wastewater</i>, 1 May 1992 - Technical Bulletin (TB) MED 575, <i>Occupational and Environmental Health: Swimming Pools and Bathing Facilities</i>, 2 July 1993 - TB MED 576, <i>Occupational and Environmental Health: Sanitary Control and Surveillance of Water Supplies at Fixed Installations</i>, March 1982 - Technical Manual (TM) 5-660, <i>Maintenance and Operation of Water Supply, Treatment, and Distributions Systems</i>. <p>Determine whether the installation is classified as a supplier of water. (1)(2)</p> <p>Verify that the installation complies with the standards in the National Primary Drinking Water Regulation, the host country, or the SOFA, whichever are more stringent. (1)(2)</p> <p>(NOTE: The practical effect of this requirement is to make a comparison with U.S. standards necessary. See U.S. TEAM Guide.)</p> <p>(NOTE: The theater surgeon may approve OCONUS requests for deviation from the Continental United States (CONUS) drinking water standards.)</p> <p>Determine whether the host nation has contacted the installation with regard to water supply issues. (1)(2)(22)</p> <p>Verify that the installation or activity commander cooperates with host country regulatory agencies. (1)(2)(22)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer (9) Chief of Operations and Maintenance (O&M) (21) Public Affairs Office (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-4. Installations must prepare a comprehensive water resource management plan (AR 420-46, para 2-5a through 2-5c).</p> <p>DRINKING WATER</p> <p>General</p> <p>3-5. Installation Commanders (ICs) must pursue access to municipal potable water supplies as needed to meet potable water source requirements (USFK EGS 3-3a(10)).</p> <p>3-6. Installations must develop an emergency contingency plan to ensure the provision of potable water despite interruptions from natural disasters and service interruptions (USFK EGS 3-3a(10)).</p>	<p>Verify that the installation has a water resource management plan that includes the following: (1)(2)</p> <ul style="list-style-type: none"> - a water supply contingency plan for national or local emergencies (enemy attack, mobilization, subnormal service, main breaks, fires, etc.) - an effective water conservation program - a section on water metering. <p>Verify that the plan is reviewed and updated annually. (1)(2)</p> <p>(NOTE: All USFK EGS requirements apply regardless of whether the installation produces or purchases water.)</p> <p>Verify that the IC pursues access to municipal potable water supplies as needed to meet potable water source requirements. (1)(2)</p> <p>(NOTE: Such access is pursued under the provisions of Article VI of the U.S.-ROK Status of Forces Agreement.)</p> <p>Verify that the installation has an emergency contingency plan that includes, at a minimum: (1)(2)(9)</p> <ul style="list-style-type: none"> - identification of key personnel - procedures to restore service - procedures to isolate damaged lines - identification of alternative water supplies - installation public notification procedures (see the next checklist item) - a vulnerability assessment. <p>Verify that the plan is updated as necessary. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-7. Installations must have a public notification plan and a standing operating procedure (SOP) for alerting personnel in emergencies or at times of actual or anticipated non-compliance (AR 420-46, para 2-6b through 2-6d).</p>	<p>Verify that the installation has both a public notification plan and an SOP for alerting personnel in emergencies at times of actual or anticipated noncompliance. (1)(2)(9)(21)</p> <p>Verify that the public notification plan and the SOP for alerting personnel are reviewed and updated annually. (1)(2)(9)</p> <p>Verify that DEH coordinates with the Public Affairs Office, the Installation Medical Authority, and the Staff Judge Advocate. (1)(3)(21)(22)</p>
<p>3-8. Installations must maintain a current map/drawing of the complete potable water system (USFK EGS 3-3a(1) and AR 420-46, para 2-7a).</p>	<p>Verify that the installation maintains a current map/drawing of the complete potable water system. (1)(9)</p> <p>Verify that the maps of the water supply distribution system are accurate and complete. (1)(9)</p> <p>Verify that these maps are prepared per TM 5-660. (1)(9)</p>
<p>3-9. Installations must have a Potable Water System Master Plan that is updated at least every 5 yr (USFK EGS 3-3a(2)).</p>	<p>Verify that the installation has a Potable Water System Master Plan. (1)(9)</p> <p>Verify that the plan is updated at least every 5 yr. (1)(9)</p>
<p>3-10. USFK water systems must meet specific operating requirements concerning positive pressure and maintenance practices (USFK EGS 3-3a(6) and 3a(7)).</p>	<p>Verify that a continuous positive pressure is maintained in the water distribution system. (9)</p> <p>Verify that the water distribution operation and maintenance practices include: (9)</p> <ul style="list-style-type: none"> - maintenance of a disinfectant residual throughout the water distribution system (except where an effective ultraviolet or ozone disinfectant process is used) - proper repair and replacement of mains procedures (including disinfection and bacteriological testing) - implementation of an effective annual water main flushing program - proper operation and maintenance of storage tanks and reservoirs - maintenance of distribution system components (including hydrants and valves).

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer (9) Chief of Operations and Maintenance (O&M) (21) Public Affairs Office (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-11. Installations must develop a cross-connection control and backflow prevention program (USFK EGS 3-3a(8) and AR 420-46, para 3-3).</p>	<p>Verify that the installation has an effective cross-connection control and backflow prevention program. (1)(2)</p> <p>Verify that program includes backflow prevention devices at facilities that have the potential to contaminate the water supply. (1)(2)</p> <p>(NOTE: Examples of such facilities include: - pest control shops - photographic laboratories - medical facilities.)</p> <p>Verify that a routine inspection and maintenance program has been established. (1)(2)</p>
<p>3-12. Installations must conduct sanitary surveys of the water system (USFK EGS 3-3a(4)).</p>	<p>Verify that surveys of the water system, including a review of required water quality analyses, are conducted at least annually and as warranted. (1)(9)</p> <p>Verify that off-installation surveys will be coordinated with the appropriate ROK authorities. (1)(9)</p>
<p>3-13. Installations must conduct vulnerability assessments (USFK EGS 3-3a(14)).</p>	<p>Verify that the installation has conducted a vulnerability assessment. (1)(9)</p>
<p>3-14. Installations must use only lead-free pipe, solder, flux, and fittings when installing or repairing water systems and plumbing systems for drinking water (USFK EGS 3-3a(11)).</p>	<p>Verify that only lead-free materials (see definition) are used. (1)(3)</p>
<p>3-15. The EC should review plans for water system modifications (MP).</p>	<p>Verify that the EC reviews plans for modifying the water system. (1)(9)</p>

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**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-16. Operators of water supply plants must meet the operator certification requirements of the host nation in which they are located (AR 420-46, para 10-1).</p>	<p>Verify that operators of water supply plants meet the operator certification requirements of the host nation in which they are located. (2)(3)</p>
<p>3-17. Personnel engaged or employed in the operation and maintenance of water treatment facilities must meet certification or training requirements as developed by the USFK Assistant Chief of Staff (ACofS), Engineer (USFK EGS 3-3d and AR 200-1, para 2-7a).</p>	<p>Verify that personnel engaged or employed in the operation and maintenance of water treatment facilities meet certification or training requirements as developed by the USFK ACofS, Engineer. (2)(3)</p>
<p>Water Quality Standards</p>	<p>(NOTE: Monitoring of secondary drinking water contaminants listed in Appendix 3-1 is not required, but the results of routine testing can be useful to plant operation.)</p> <p>(NOTE: Waivers for the monitoring requirements in this section may be granted only by the USFK Assistant Chief of Staff Engineer in coordination with the USFK Surgeon.)</p>
<p>3-18. Independent testing conducted in accordance with USEPA test methods and protocols must be used to demonstrate compliance with water quality standards (USFK EGS 3-3b and AR 200-1, para 2-7b).</p>	<p>Verify that the installation uses independent testing conducted in accordance with USEPA test methods and protocols to demonstrate compliance with water quality standards. (1)(2)(9)</p>
<p>3-19. USFK water systems must meet specific MCL and testing requirements for total coliform bacteria (USFK EGS 3-3b(1)).</p>	<p>Verify that the IC responsible for a PWS establishes a bacteriological monitoring program to ensure the safety of the water provided for human consumption and allow evaluation with the total coliform-related MCL. (1)(2)(9)</p> <p>(NOTE: The MCL is based only on the presence or absence of total coliforms.)</p>

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**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
3-19. (continued)	<p>Verify that each system has a written, site-specific monitoring plan and collects routine samples according to the schedule in Appendix 3-2. (3)(9)</p> <p>Verify that systems with initial samples testing positive for total coliforms collect repeat samples as soon as possible, preferably on the same day. (3)(9)</p> <p>Verify that repeat samples are taken at the same tap as the original sample and that an upstream and a downstream sample are both collected within five service connections of the original service connection. (3)(9)</p> <p>Verify that any additional required repeat sampling is performed according to local medical or Executive Agent guidance. (3)(9)</p> <p>Verify that monitoring continues until total coliforms are no longer detected. (3)(9)</p> <p>Verify that when routine or repeat samples are positive for total coliforms, they are tested for fecal coliforms or <i>Escherichia coli</i> (<i>E. coli</i>). (3)(9)</p> <p>Verify that, if more than one routine sample/mo is collected, no fewer than three repeat samples are collected for each total coliform-positive sample found.</p> <p>(NOTE: Any fecal coliform-positive repeat sample or <i>E. coli</i>-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or <i>E. coli</i>-positive routine sample constitutes a violation of the MCL for total coliforms.)</p> <p>Verify that, if the system has exceeded the MCL, installation personnel (U.S. and ROK) are notified no later than the end of the next business day that an acute risk to public health may exist. (1)(3)(9)</p> <p>Verify that PWSs have no more than 5 percent positive samples for the presence of total coliforms per month for a system examining 40 or more samples per month. (3)(9)</p> <p>Verify that PWSs have no more than one positive sample for the presence of total coliforms per month when a system analyzes fewer than 40 samples per month. (3)(9)</p> <p>Verify that, if the system is out of compliance, installation personnel (U.S. and ROK) are notified as soon as possible but no later than 14 days after the condition. (1)(9)</p> <p>Verify that special purpose samples are not used to determine compliance with the MCL for total coliforms.</p> <p>(NOTE: Samples such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, are examples of special purpose samples. Repeat samples are not considered special purpose samples.)</p>

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**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-20. USFK water systems must meet specific requirements with regard to inorganic chemical parameters and monitoring (USFK EGS 3-3b(2)).</p>	<p>Verify that the parameters in water distributed to end users do not exceed the limitations in Appendix 3-3. (1)(9)</p> <p>Verify that systems are monitored for inorganic chemicals at the frequency set in Appendix 3-4. (1)(9)</p> <p>Verify that, if the system is out of compliance, installation personnel (U.S. and ROK) are notified as soon as possible but no later than 14 days after the condition. (1)(9)</p> <p>(NOTE: If the installation is only monitoring annually on the basis of a waiver, it must immediately increase monitoring in accordance with Appendix 3-4 until authorities determine that the system is reliable and consistent and remedial actions are completed.)</p>
<p>3-21. Installations that fluoridate their water must meet specific requirements (USFK EGS 3-3b(3)).</p>	<p>Verify that the fluoride content of drinking water does not exceed the MCL of 2.0 mg/L given in Appendix 3-3. (1)(9)</p> <p>Verify that fluoride monitoring involves collecting one treated water sample at the entry point to the distribution system annually for surface water systems and once every 3 yr for groundwater systems. (1)(9)</p> <p>(NOTE: Daily monitoring is recommended for systems practicing fluoridation using the criteria in Appendix 3-5.)</p> <p>Verify that, if any sample exceeds the MCL, installation personnel (U.S. and ROK) are notified as soon as possible but no later than 14 days after the violation. (1)(9)</p>
<p>3-22. USFK water systems must meet specific standards for lead and copper action levels and reporting requirements when these levels are exceeded (USFK EGS 3-3b(4)).</p>	<p>Verify that the concentration of lead does not exceed 0.015 mg/L. (3)(9)</p> <p>Verify that the concentration of copper does not exceed 1.3 mg/L. (3)(9)</p> <p>(NOTE: Actions such as corrosion control treatment, public education, and removal of lead service lines are triggered if the above lead and/or copper action levels are exceeded in more than 10 percent of all sampled taps.)</p> <p>Verify that monitoring is carried out in accordance with Appendix 3-6. (3)(9)</p> <p>Verify that sampling sites selected are as outlined in Appendix 3-6. (3)(9)</p> <p>Verify that high risk sampling sites are targeted by conducting a materials evaluation of the distribution system. (3)(9)</p> <p>Verify that, if an action level is exceeded, additional water samples are collected as specified in Appendix 3-6. (3)(9)</p> <p>Verify that optimal corrosion control treatment is pursued. (3)(9)</p>

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**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-22. (continued)</p>	<p>Verify that, if action levels are exceeded after implementation of applicable corrosion control and source water substitution or treatment, lead service lines are replaced if it is lead service lines that are causing the excess. (3)(9)</p> <p>Verify that, when an action level is exceeded, installation personnel (U.S. and ROK) are notified as soon as possible but no later than 14 days after the violation. (3)(9)</p> <p>Verify that an education program for installation personnel is implemented within 60 days. (3)(9)</p>
<p>3-23. Installations must notify their users about lead in drinking water systems in certain circumstances (USFK EGS 3-3a(11)).</p>	<p>Determine whether consumers are exposed to water containing amounts of lead in excess of the action level or in excess of the levels in Appendix 3-6. (1)(2)</p> <p>Verify that, in such circumstances, the IC notifies the public concerning the following: (1)(2)</p> <ul style="list-style-type: none"> - the lead content of materials used in distribution or plumbing systems, or - the corrosivity of water that has caused leaching (if applicable), and - remedial actions that may be taken to reduce health risks.
<p>3-24. USFK water systems must meet specific requirements with regard to synthetic organics (USFK EGS 3-3b(5)).</p>	<p>Verify that synthetic organic chemicals in water distributed to people do not exceed the limitations in Appendix 3-7. (1)(9)</p> <p>Verify that systems are monitored for synthetic organics according to the schedule in Appendix 3-8. (1)(9)</p> <p>Verify that, if the system is out of compliance, installation personnel (U.S. and ROK) are notified as soon as possible, but no later than 14 days after the violation. (1)(9)</p> <p>(NOTE: When the MCLs for synthetic organic chemicals are exceeded, the installation must begin immediate quarterly monitoring and must increase quarterly monitoring if the level of any contaminant is at its detection limit but less than its MCL (see Appendix 3-8) and must continue until the system is reliable and consistent, and any necessary remedial measures are implemented.)</p>
<p>3-25. USFK water systems must meet specific requirements with regard to total trihalomethanes (USFK EGS 3-3b(6)).</p>	<p>Verify that PWS or NTNC systems that add a disinfectant (oxidant, such as chlorine, chlorine dioxide, or chloramines) to any part of the treatment process do not exceed an MCL of 0.10 mg/L for total trihalomethanes in drinking water. (3)(9)</p> <p>Verify that systems that add a disinfectant monitor for total trihalomethanes as outlined in Appendix 3-9. (3)(9)</p> <p>Verify that, if the system is out of compliance, installation personnel (U.S. and ROK) are notified as soon as possible, but no later than 14 days after the violation, and that remedial measures are undertaken. (3)(9)</p>

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**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-26. USFK water systems must meet specific requirements with regard to radionuclides (USFK EGS 3-3b(7)).</p>	<p>Verify that PWS and NTNC systems meet the MCLs for radionuclides and that monitoring is performed as outlined in Appendix 3-10. (3)(9)</p> <p>Verify that, if the average annual MCL for gross alpha activity, total radium, or gross beta is exceeded, the on-post community is notified as soon as possible, but no later than 30 days after receipt of the test results. (3)(9)</p> <p>(NOTE: After a violation of an MCL for radionuclides, monitoring will continue (monthly for gross beta, quarterly for gross alpha) until remedial actions are completed and the average annual concentration no longer exceeds the MCL.)</p> <p>Verify that, if any gross beta MCL is exceeded, the major radioactive components are identified. (3)(9)</p>
<p>3-27. Installations must test USFK PWS filtered waters daily for turbidity and must meet a specific MCL for turbidity (USFK EGS 3-3b(9)).</p>	<p>Verify that the installation tests PWS filtered water for turbidity daily. (3)(9)</p> <p>Verify that the monthly average of daily samples does not exceed 1 Nephelometric Turbidity Unit (NTU) in more than 5 percent of the samples. (3)(9)</p> <p>Verify that the average of 2 consecutive days does not exceed 5 NTU. (3)(9)</p> <p>Verify that, if the MCL for turbidity is exceeded, installation personnel (U.S. and ROK) are notified as soon as possible, but no later than 14 days after the violation. (3)(9)</p>
<p>3-28. Installations must periodically monitor USFK NPWSs for total coliforms and disinfectant residuals (USFK EGS 3-3b(11)).</p>	<p>Determine whether the installation operates an NPWS. (3)(9)</p> <p>Verify that the installation monitors (as a minimum) for total coliforms and disinfectant residuals at least quarterly. (3)(9)</p> <p>(NOTE: The USFK ACoFS, Engineer in coordination with the USFK Surgeon, will evaluate IC requests for waivers regarding the quarterly monitoring frequency at NPWS's.)</p>
<p>Disinfection and Filtration</p>	
<p>3-29. Water supply systems must undergo periodic inspections and preventive maintenance in order to ensure reliable, efficient, and safe operation (AR 420-46, para 2-7b).</p>	<p>Verify that the water supply system undergoes periodic inspection and preventive maintenance. (1)(2)(9)</p> <p>(NOTE: Assessors should review logs to establish compliance with this requirement.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer (9) Chief of Operations and Maintenance (O&M) (21) Public Affairs Office (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-30. DEH personnel must disinfect new and repaired water mains, storage tanks, wells, and equipment (AR 420-46, para. 3-1b).</p>	<p>Verify that DEH personnel (in conjunction with Installation Medical Authority (IMA)), disinfect new and repaired water mains, storage tanks, wells, and equipment according to the following American Waterworks Association (AWWA) standards: (1)(9)</p> <ul style="list-style-type: none"> - AWWA C651-86 - AWWA C652-86 - AWWA C653-87 - AWWA C654-87. <p>Verify that such disinfection occurs after construction, repairs, installation of taps, and contamination situations. (1)(9)</p>
<p>3-31. The DEH must develop a systematic flushing plan that provides adequate scouring velocities in water distribution lines (AR 420-46, para 3-1c).</p>	<p>Verify that the DEH has developed a systematic flushing plan that provides adequate scouring velocities in water distribution lines. (1)</p> <p>Verify that the water distribution system is flushed as necessary to remove accumulated debris. (1)(2)(9)</p>
<p>3-32. Installations that use surface water or GWUDISW to produce potable water must conform to certain treatment requirements (USFK EGS 3-3a(5) and 3-3b(8)).</p>	<p>Determine whether the installation employs surface water sources or GWUDISW. (1)(2)(9)</p> <p>Verify that the installation meets the surface water treatment requirements specified in Appendix 3-11. (1)(2)(9)</p>
<p>3-33. Installations that use a groundwater source as their supply of drinking water must disinfect the supplies (USFK EGS 3-3a(5)).</p>	<p>Determine whether the installation's water supply is groundwater. (1)(2)(9)</p> <p>Verify that, as a minimum, groundwater supplies are disinfected. (1)(2)(9)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer (9) Chief of Operations and Maintenance (O&M) (21) Public Affairs Office (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Notification and Reporting Requirements</p> <p>3-34. Specific records must be maintained for USFK water systems (USFK EGS 3-3a(12)).</p> <p>3-35. Installations must document actions taken to correct breaches of water quality criteria (USFK EGS 3-3a(13)).</p> <p>3-36. Required notifications must meet specific content standards (USFK EGS 3-3c).</p>	<p>Verify that records of chemical analyses are kept for 10 yr. (2)(3)</p> <p>Verify that records showing monthly operating reports are maintained for at least 3 yr. (2)(3)</p> <p>Verify that records of bacteriological results are maintained for at least 5 yr. (2)(3)</p> <p>Verify that the installation documents corrective actions taken to correct breaches of criteria. (2)(9)</p> <p>Verify that such documentation is maintained for at least 4 yr. (2)(9)</p> <p>Verify that all public notices are clear and understandable and address the following topics: (1)(2)(5)</p> <ul style="list-style-type: none"> - explanation of the violation - any potential adverse health effects - the population at risk - the steps that the system is taking to correct the violation - the necessity for seeking alternative water supply, if any - any preventive measures the consumer should take until the violation is corrected. <p>Verify that, in cases of continued noncompliance, the IC accomplishes public notification requirements at least every 3 mo. (1)(3)(9)</p>
<p>CORROSION AND CORROSION PROTECTION</p> <p>3-37. Installations must conduct scheduled water distribution system inspections to observe, evaluate, and record scale deposits and deterioration caused by corrosion (AR 420-46, para 6-1).</p>	<p>Verify that the installation conducts scheduled water distribution system inspections to observe, evaluate, and record scale deposits and deterioration caused by corrosion. (1)(2)(9)</p> <p>(NOTE: Assessors should review inspection records as a means of establishing compliance with this requirement.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer (9) Chief of Operations and Maintenance (O&M) (21) Public Affairs Office (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-38. External surfaces in contact with soil and all internal surfaces of steel water storage tanks must be protected from corrosion by a cathodic protection system (AR 420-46, para 6-2).</p> <p>3-39. Metallic water supply lines must be bonded and coated to protect against corrosion (AR 420-46, para 6-3 and para 6-4).</p> <p>ALTERNATIVE WATER SUPPLIES</p> <p>3-40. USFK installations must use only approved alternative water sources, if the use of alternative sources is necessary (USFK EGS 3-3b(12)).</p> <p>UNDERGROUND INJECTION CONTROL</p> <p>3-41. Underground injection must be carried out in such a way that underground water resources are protected (USFK EGS 3-3a(9)).</p>	<p>Verify that the external surface in contact with soil and all internal surfaces of steel water storage tanks are protected from corrosion by cathodic protection. (1)(2)(9)</p> <p>Verify that underground metallic lines are protected against corrosion in accordance with the standards outlined in Appendix 3-12. (1)(2)(9)</p> <p>Verify that cathodic protection is tested annually. (1)(2)(9)</p> <p>(NOTE: Alternative water sources includes POE and POU treatment devices, as well as bottled water supplies.)</p> <p>Determine whether the installation uses alternative water sources. (3)(9)</p> <p>Verify that the IC, in consultation with the installation medical authority, has approved alternative water sources. (3)(9)</p> <p>(NOTE: The use of appropriated funds to purchase bottled water is authorized only if it is a government necessity to maintain a supply of drinking water in the workplace or government-furnished living quarters, and no other potable water is reasonably available without charge at a lower cost.)</p> <p>Verify that the installation regulates underground injection so as to protect underground water sources. (3)(9)</p> <p>Verify that, at a minimum, the installation conducts monitoring to determine the effects of any underground injection wells on nearby groundwater supplies. (3)(9)</p>

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**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

AQUIFERS

3-42. Installations must protect water supply aquifers from contamination (USFK EGS 3-3a(3)).

Determine whether the installation is located by a water supply aquifer. (3)(9)

Verify that the aquifer is protected from contamination by suitable placement and construction of wells, siting and maintenance of septic systems and onsite treatment units, and appropriate land use management. (3)(9)

SWIMMING POOLS

3-43. Swimming pools must be operated, maintained, and repaired according to the standards outlined in TB MED 575 (AR 420-46, para 9-1).

Verify that the staff who maintain the pool comply with the following requirements: (1)(2)

- the pH of the pool does not drop below 7.2
- chlorine residuals and pH are determined at least four times daily when the pool is in use
- records for pH and chlorine are maintained for at least two swimming seasons
- when the membrane filter technique is used to determine the number of coliform colonies, the arithmetic mean for all samples analyzed for the past 30 days is less than or equal to 2.0 coliform organisms per 100 mL
- when the multiple tube fermentation technique is used, not more than 15 percent of the samples examined in the past 30 days shows positive results for coliform organisms in any of the 5 mL portions of this technique
- in terms of standard plate count, after incubation of the nutrient agar plates for 48 h at 35 +/- 0.5 °C [95 +/- 0.5 °F], the bacterial count is less than or equal to 200 bacteria per milliliter in greater than 85 percent of the samples examined in the last 30 days
- samples for bacteriologic examinations and concurrent pH and chlorine residual measurement are collected at least once a week.

(NOTE: TM 5-660 also contains guidance on the operation and management of swimming pools.)

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer (9) Chief of Operations and Maintenance (O&M) (21) Public Affairs Office (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
DRINKING WATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>3-44. Preventive Medicine (PVNTMED) personnel must carry out specific duties with regard to swimming pools and swimming areas (AR 40-5, para 12-6b).</p>	<p>Verify that PVNTMED personnel periodically inspect the swimming facilities and operational logs to ensure that the operations and monitoring required by TB MED 575 are being carried out. (3)</p> <p>Verify that PVNTMED personnel: (3)</p> <ul style="list-style-type: none"> - perform annual preseason and/or pre-opening inspections of swimming facilities - perform bacteriological sampling according to TB MED 575 - ensure that chlorine residual analyses are done by an approved method - maintain records of sanitary surveys, inspections, results of bacteriological analyses, and other pertinent information - conduct a yearly sanitary survey of all natural swimming areas under installation control.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer (9) Chief of Operations and Maintenance (O&M) (21) Public Affairs Office (22) Staff Judge Advocate

Appendix 3-1

Secondary MCLs (USFK EGS Table 3-12)

Contaminant	Secondary MCL
Aluminum	0.05 - 0.2 mg/L
Chloride	250 mg/L
Color	15 color units
Corrosivity	Noncorrosive
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5 to 8.5
Silver	0.1 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L



Appendix 3-2

Total Coliform Monitoring Requirements (USFK EGS Table 3-2)

Population Served per Month	Minimum Number of Samples per Month
25 to 1000 ¹	1
1001 to 2500	2
2501 to 3300	3
3301 to 4100	4
4101 to 4900	5
4901 to 5800	6
5801 to 6700	7
6701 to 7600	8
7601 to 8500	9
8501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30

¹ A noncommunity water system using groundwater and serving 1000 or fewer people may monitor once in each calendar quarter during which the system provides water, provided that a sanitary survey conducted within the last 5 yr shows the system is supplied solely by a protected groundwater source and free of sanitary defects.

Systems serving fewer than 4900 people which use groundwater and collect samples from different sites may collect all samples on a single day. All other systems must collect samples at regular intervals throughout the month.

Appendix 3-3

Inorganic Chemical MCLs (USFK EGS Table 3-3)

Contaminant	MCL (mg/L)
Arsenic ¹	0.05
Asbestos ¹	7 million fibers/L (longer than 10 µm)
Barium ¹	2.0
Cadmium ¹	0.005
Chromium ¹	0.1
Fluoride	2.0
Mercury ¹	0.002
Nitrate ²	10 (as N)
Nitrite ²	1 (as N)
Total Nitrite and Nitrate ²	10 (as N)
Selenium ¹	0.05
Sodium ³	
Antimony ¹	0.006
Beryllium ¹	0.004
Cyanide (as free Cyanide) ¹	0.2
Nickel ¹	0.1
Thallium ¹	0.002

¹ MCLs apply to CWS and NTNC systems.

² MCLs apply to CWS, NTNC, and TNC systems.

³ No MCL established. Monitoring is required so concentration levels can be made available on request.

(NOTE: See checklist item 3-22 for additional criteria concerning lead and copper.)



Appendix 3-4

Inorganics Monitoring Requirements

(USFK EGS Table 3-4)

Contaminant	Groundwater Baseline Requirement ¹	Surface Water Baseline Requirement	Trigger That Increases Monitoring ⁴	Waivers
Barium	1 sample/3 yr	Annual sample	> MCL	---
Cadmium	1 sample/3 yr	Annual sample	> MCL	---
Chromium	1 sample/3 yr	Annual sample	> MCL	---
Mercury	1 sample/3 yr	Annual sample	> MCL	---
Selenium	1 sample/3 yr	Annual sample	> MCL	---
Sodium	1 sample/3 yr	Annual sample	---	---
Asbestos	1 sample/9 yr	1 sample/9 yr	> MCL	Yes ²
Nitrate	Annual sample	Quarterly	> 50% MCL ⁵	Yes ³
Nitrite	Annual sample	Quarterly	> 50% MCL ⁵	Yes ³
Corrosivity ⁶	Once	Once	---	---
Arsenic	1 sample/3 yr	Annual sample	> MCL	---
Fluoride	1 sample/3 yr	Annual sample	> MCL	---
Antimony	1 sample/3 yr	Annual sample	> MCL	---
Beryllium	1 sample/3 yr	Annual sample	> MCL	---
Cyanide	1 sample/3 yr	Annual sample	> MCL	---
Nickel	1 sample/3 yr	Annual sample	> MCL	---
Thallium	1 sample/3 yr	Annual sample	> MCL	---

¹ Samples must be taken as follows: groundwater systems must take a minimum of one sample at every entry point to the distribution system that is representative of each well after treatment; surface water systems must take at least one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point that is representative of each source after the treatment.

² Necessity for analysis is predicated upon a vulnerability assessment conducted by the PWS.

³ The USFK ACofS, Engineer may reduce repeat sampling frequency. If, after 1 yr, all quarterly results are less than 50 percent of the MCL, surface water systems may reduce to an annual sample.

⁴ Increased monitoring requires a minimum of one sample per quarter.

⁵ Increased quarterly monitoring must be undertaken for nitrate and nitrite if a sample is greater than 50 percent of the MCL.

⁶ PWSs shall be analyzed within 1 yr of the effective date of country-specific environmental governing standards to determine the corrosivity entering the distribution system.

Appendix 3-5

Recommended Fluoride Concentration at Different Temperatures (USFK EGS Table 3-5)

Annual Average of Max. Daily Air Temperatures (°F)	Control Limits (mg/L)		
	Lower	Optimum	Upper
50.0 - 53.7	0.9	1.2	1.7
53.8 - 58.3	0.8	1.1	1.5
58.4 - 63.8	0.8	1.0	1.3
63.9 - 70.6	0.7	0.9	1.2
70.7 - 79.2	0.7	0.8	1.0
79.3 - 90.5	0.6	0.7	0.8

Appendix 3-6

Monitoring Requirements for Lead and Copper Water Quality Parameters

(USFK EGS Table 3-6)

System Size	Monitoring Type	Initial Monitoring ^{1,2}	Follow-up Monitoring ^{1,2}	Reduced Monitoring ³	Ultimate Reduced Monitoring
Population Served		2 consecutive 6-month sampling periods	2 consecutive 6-month sampling periods	annually for 3 years	every 3 years
10,000 to 50,000	Cold Water Tap (1st draw)	60	60	30	30
	POE ⁵	None	1	1	1
	WQPSs ⁴	None	10	7	7
3301 to 10,000	Cold Water Tap (1st draw)	40	40	20	20
	POE ⁵	None	1	1	1
	WQPSs ⁴	None	3	3	3
501 to 3300	Cold Water Tap (1st draw)	20	20	10	10
	POE ⁵	None	1	1	1
	WQPSs ⁴	None	3	3	3
101-500	Cold Water Tap (1st draw)	10	10	5	5
	POE ⁵	None	1	1	1
	WQPSs ⁴	None	1	1	1
less than 100	Cold Water Tap (1st draw)	5	5	5	5
	POE ⁵	None	1	1	1
	WQPSs ⁴	None	1	1	1

¹ Two consecutive 6-month monitoring periods.

² Sampling sites must be based on a hierarchal approach. For CWS, priority must be given to: single family residences that contain copper pipe with lead solder installed after 1982, contain lead pipes, or are served by lead service lines; then, structures, including multifamily residences, with the foregoing characteristics; and finally, residences and structures with copper pipe with lead solder installed before 1983. For NTNC systems, sampling sites must consist of structures that contain copper pipe with lead solder installed after 1982, contain lead pipes, and/or are served by lead service lines. First draw samples must be collected from a cold water kitchen or bathroom tap; nonresidential samples must be taken at an interior tap from which water is typically drawn for consumption.

(continued)

Appendix 3-6 (continued)

- ³ Monitor annually for lead and copper if action levels are met during each of two consecutive 6-month monitoring periods. Annual sampling must be conducted during the months of June, July, August, and September.
- ⁴ WQPSs must be representative of water quality throughout the distribution system and include a sample from the entry to the distribution system. Samples must be taken in duplicate for pH, alkalinity, calcium, conductivity or total dissolved solids, and water temperatures to allow a corrosivity determination (via a Langelier saturation index or other appropriate saturation index); additional parameters are orthophosphate when a phosphate inhibitor is used and silica when a silicate inhibitor is used.
- ⁵ POE: Point of entry into the water distribution system.

Appendix 3-7

Synthetic Organic Chemical MCLs (USFK EGS Table 3-7)

Synthetic Organic Chemical	MCL, mg/L	Detection Limit, mg/L
Pesticides, Polychlorinated Biphenyls (PCBs)		
Alachor	0.002	0.0002
Atrazine	0.003	0.0001
Carbofuran	0.04	0.0009
Chlordane	0.002	0.0002
2,4-D	0.07	0.0001
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00002
Endrin	0.002	0.00002
Ethylene dibromide (EDB)	0.00005	0.00001
Heptachlor	0.0004	0.00004
Heptachlorepoxyde	0.0002	0.00002
Lindane	0.0002	0.00002
Methoxychlor	0.04	0.0001
PCBs (as decachlorobiphenyls)	0.0005	0.0001
Pentachlorophenol	0.001	0.00004
Toxaphene	0.003	0.001
2,4,5-TP (Silvex)	0.05	0.0002
Benzo [a] pyrene	0.0002	0.00002
Dalapon	0.2	0.001
Di (2-ethylhexyl) adipate	0.4	0.0006
Di (2-ethylhexyl) phthalate	0.006	0.0006
Dinoseb	0.007	0.0002
Diquat	0.02	0.0004
Endothall	0.1	0.009
Glyphosate	0.7	0.006
Hexachlorobenzene	0.001	0.0001
Hexachlorocyclopentadiene	0.05	0.0001

(continued)

Appendix 3-7 (continued)

Synthetic Organic Chemical	MCL, mg/L	Detection Limit, mg/L
Oxamyl (Vydate)	0.2	0.002
Picloram	0.5	0.0001
Simazine	0.004	0.00007
2,3,7,8-TCDD (Dioxin)	3×10^{-8}	5×10^{-9}
Volatile Organic Compounds (VOCs)		
Benzene	0.005	0.0005
Carbon tetrachloride	0.002	0.0005
o-Dichlorobenzene	0.6	0.0005
cis-1,2-Dichloroethylene	0.07	0.0005
trans-1,2-Dichloroethylene	0.1	0.0005
1,1-Dichloroethylene	0.007	0.0005
1,1,1-Trichloroethane	0.20	0.0005
1,2-Dichloroethane	0.005	0.0005
1,2-Dichloropropane	0.005	0.0005
Ethylbenzene	0.7	0.0005
Monochlorobenzene	0.1	0.0005
para-Dichlorobenzene	0.075	0.0005
Styrene	0.1	0.0005
Tetrachloroethylene	0.005	0.0005
Trichloroethylene	0.005	0.0005
Toluene	1.0	0.0005
Vinyl chloride	0.002	0.0005
Xylene (total)	10	0.0005
Dichloromethane	0.005	0.0005
1,2,4-Trichlorobenzene	0.07	0.0005
1,1,2-Trichloroethane	0.005	0.0005

Use current USEPA test methods.

Appendix 3-8

Synthetic Organic Chemical Monitoring Requirements (USFK EGS Table 3-8)

Contaminant	Base Requirement ¹		Trigger for more monitoring ⁶	Waivers
	Groundwater	Surface water		
VOCs	Quarterly	Quarterly	> 0.0005 mg/L	Yes ^{2,3}
Pesticides/PCBs	4 quarterly samples/3 yr during most likely period for their presence		> Detection limit ⁵	Yes ^{3,4}

¹ Groundwater systems must take a minimum of one sample at every entry point that is representative of each well after treatment; surface water systems must take at least one sample at every entry point to the distribution system at a point that is representative of each source after treatment.

² Repeat sampling frequency may be reduced to annually after 1 yr of no detection and to every 3 yr after three rounds of no detection.

³ Monitoring frequency may be reduced, if warranted, based on a vulnerability assessment by the PWS.

⁴ Repeat sampling frequency may be reduced to the following, after one round of no detection:

- systems greater than 3300 may be reduced to two samples/yr every 3 yr
- systems less than 3300 may be reduced to one sample every 3 yr.

⁵ Detection limits noted in Appendix 3-7.

⁶ Increased monitoring requires a minimum of one sample per quarter.

⁷ Following SOC detection and increased monitoring, the installation may request that the USFK ACofS, Engineer approve reduced monitoring if the water system is reliably and consistently below the MCL. [NOTE: USFK EGS does not use the number 7 in Table 3-8.]

(NOTE: Compliance is based on an annual running average for each sample point for systems monitoring quarterly or more frequently. For systems monitoring annually or less frequently, compliance is based on a single sample, unless the DOD Executive Agent requests a confirmation sample. A system is out of compliance if any contaminant exceeds the MCL. If four consecutive quarters of sampling results are not available, and after receipt of written approval from the USFK ACofS, Engineer, the installation may substitute six quarters of sampling results collected during the past 2 yr to determine compliance.)

Appendix 3-9

Total Trihalomethane Monitoring Requirements (USFK EGS Table 3-9)

Population Served by System	Number of Samples per Distribution System	Frequency of Samples	Type of Sample
10,000 or more	4	Quarterly	Treated
Less than 10,000	1	Annually	Treated

(NOTES:

1. One of the samples must be taken at a location in the distribution system reflecting the maximum residence time of water in the system. The remaining samples must be taken at representative points in the distribution system. Systems using groundwater sources that add a disinfectant should have one sample analyzed for maximum total trihalomethane potential. Systems that employ surface water sources, in whole or in part, and that add a disinfectant should have one sample analyzed for total trihalomethanes.

2. Compliance is based upon a running yearly average of quarterly samples for systems serving more than 10,000 people. Noncompliance exists if the average exceeds the MCL. For systems serving less than 10,000 people and having a maximum total trihalomethane potential sample exceeding the MCL, a sample for total trihalomethanes must be analyzed. If the total trihalomethane sample exceeds the MCL, noncompliance results.

3. If four consecutive quarters of sampling results are not available, upon receipt of written approval from the USFK ACoS, Engineer, the installation may substitute six quarters of sampling results collected during the past two years to determine compliance.)



Appendix 3-10

Radionuclide MCLs and Monitoring Requirements

(USFK EGS Table 3-10)

MCL Contaminant	MCL, pCi/L
Gross Alpha ¹	15
Combined Radium-226 and -228	5
Gross Beta ²	50
Strontium-90	8
Tritium	20,000

Monitoring Requirements

For gross alpha activity and radium-226 and radium-228, systems must be tested once every 4 yr. Testing will be conducted using an annual composite of four consecutive quarterly samples or the average of four samples obtained at quarterly intervals at a representative point in the distribution system.

Gross alpha only may be analyzed if activity is less than or equal to 5 pCi/L. Where radium-228 may be present, radium-226 and/or radium-228 analyses should be performed when activity is greater than 2 pCi/L. If the average annual concentration is less than half the maximum contaminant level, analysis of a single sample may be substituted for the quarterly sampling procedure. A system with two or more sources having different concentrations of radioactivity must monitor source water in addition to water from a free-flowing tap. If the installation introduces a new water source, these contaminants must be monitored within the first year after introduction.

¹ Gross alpha activity includes radium-226, but excludes radon and uranium.

² Gross beta activity refers to the sum of beta particle and photon activity from manmade radionuclides. If gross beta exceed the MCL, i.e., equal a dose of 4 millirem/yr, the individual components must be determined.

Appendix 3-11

Surface Water Treatment Requirements

(USFK EGS Table 3-1)

1. Unfiltered Systems

- a. Systems that use unfiltered surface water or groundwater sources under the direct influence of surface water must analyze the raw water for total coliforms or fecal coliforms at least weekly and for turbidity at least daily for a minimum of 1 yr. If the total coliforms and/or fecal coliforms exceed 100/100 mL and 20/100 mL, respectively, appropriate filtration must be applied. Appropriate filtration must also be applied if turbidity exceeds 1 NTU.
- b. Disinfection must achieve at least 99.9 percent inactivation of *Giardia lamblia* cysts and 99.99 percent inactivation of viruses by meeting applicable Concentration/Time (CT) values.
- c. Disinfection systems must have redundant components to ensure uninterrupted disinfection during operational periods.
- d. Daily disinfectant residual monitoring immediately after disinfection is required. Disinfectant residual measurements in the distribution system must be made weekly.
- e. Water in a distribution system with a heterotrophic bacteria concentration less than or equal to 500 mL, measured as heterotrophic plate count, is considered to have a detectable disinfectant residual.
- f. If disinfectant residuals in the distribution system are undetected in more than 5 percent of monthly samples for two consecutive months, appropriate filtration must be implemented.

2. Filtered Systems

- a. The turbidity of filtered water must be monitored at least daily.
- b. The turbidity of filtered water must not exceed 1 NTU in 95 percent of the analyses in a month, with a maximum of 5 NTU.
- c. Disinfection requirements are identical to those for unfiltered systems.



Appendix 3-12

Corrosion Protection of Underground Metallic Surfaces (AR 420-46, Table 6-1)

Material	Soil-Reactivity (ohm-cm)	External Coating	Bonding	Cathodic Protection
Cast or Ductile Iron	<10,000	X	X	X
	10,000 to 30,000	N	X	N
	>30,000	N	N	N
Steel	<30,000	X	*	X
	>30,000	**	N	**

X = Required

N = Not required

* = Required only if mechanical joints are used

** = To be based on economic analysis

INSTALLATION:	COMPLIANCE CATEGORY: DRINKING WATER Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 4

WASTEWATER

Korea ECAS

SECTION 4

WASTEWATER

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol identifies regulations, responsibilities, and compliance requirements applicable to wastewater at military communities, including activities and procedures involved in its collection, treatment, and discharge.

The regulations, responsibilities, and compliance requirements associated with wastewater discharge at military communities include, but are not limited to, the following examples:

- sanitary or industrial wastewater discharged directly to a receiving stream or through an onsite treatment facility
- sanitary or industrial wastewater discharged to an offsite treatment works or to a treatment plant of another Department of Defense (DOD) activity
- stormwater runoff from industrialized areas of the military community to a receiving stream or water body.

Most military communities have wastewater discharges of one type or another; therefore, this protocol will be applicable to most military communities.

B. DOD Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 4 contains criteria to control and regulate discharges of wastewaters into surface waters, including domestic and industrial wastewater discharges and pollutants from indirect dischargers.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains requirements that address the certification and training of personnel.
- AR 420-46, *Water Supply and Wastewater*, 1 May 1992, establishes policies, criteria, responsibilities, and procedures for the operation, maintenance, repair, and construction of distribution, collection, treatment, and disposal facilities for water supply; it also includes policies, criteria, etc., for wastewater, stormwater, and industrial waste.

D. Responsibility for Compliance

- Directorate of Engineering and Housing (DEH) is responsible for monitoring wastewater discharge and streamwater quality at selected locations around the installation.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Average Monthly Discharge Limitations* - the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges (based upon 24-hr composite sample results) measured during a calendar month divided by the number of daily discharges measured during that month (USFK EGS, Chapter 4, Definitions).
- *Average Weekly Discharge Limitations* - the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges (based upon 24-hr composite sample results) measured during a calendar week divided by the number of daily discharges measured during that week (USFK EGS, Chapter 4, Definitions).
- *BOD₅* - the five-day measure of the pollutant parameter, biochemical oxygen demand (USFK EGS, Chapter 4, Definitions).
- *COD* - a measure of the oxygen consuming capacity of the organic matter present in wastewater, chemical oxygen demand (USFK EGS, Chapter 4, Definitions).
- *Contaminant* - any physical, chemical, biological, or radiological substance in water.
- *Continuous Discharge* - a discharge that occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.
- *Conventional Filtration Treatment* - a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.
- *Conventional Pollutants* - biochemical oxygen demand (BOD₅), total suspended solids (TSS), oil and grease, fecal coliforms, and pH (USFK EGS, Chapter 4, Definitions).
- *Daily Discharge* - the discharge of a pollutant measured during a calendar day or any 24-h period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration), daily discharge is calculated as the average measurement of the pollutant over the day (USFK EGS, Chapter 4, Definitions).
- *Diatomaceous Earth Filtration* - a process resulting in substantial particulate removal in which:
 1. a pre-coat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and
 2. additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake while the water is filtered by passing through the cake on the septum.
- *Direct Discharge* - any discharge of pollutants other than an indirect discharge (USFK EGS, Chapter 4, Definitions).

- *Direct Filtration* - a series of processes, including coagulation and filtration, but excluding sedimentation, that result in substantial particulate removal.
- *Discharge of a Pollutant* - any addition of any pollutant or combination of pollutants to waters of ROK from any point source (USFK EGS, Chapter 4, Definitions).
- *Domestic Wastewater* - used water and solids from residences (USFK EGS, Chapter 4, Definitions).
- *Domestic Wastewater Treatment Plant (DWWTP)* - any USFK or ROK facility designed to treat wastewater before its discharge to waters of ROK and in which the majority of such wastewater is made up of domestic sewage (USFK EGS, Chapter 4, Definitions).
- *Effluent* - wastewater or other liquid (whether raw or partially or completely treated) flowing from a facility, basin, treatment process, or treatment plant (USFK EGS, Chapter 4, Definitions).
- *Effluent Limitation* - any restriction imposed on quantities, discharge rates, and concentrations of pollutants that are ultimately discharged from point sources into waters of ROK (USFK EGS, Chapter 4, Definitions).
- *Existing Source* - a source that discharges pollutants to the waters of the ROK that was in operation or under construction prior to 1 October 1997 (USFK EGS, Chapter 4, Definitions).
- *Filtration* - a process for removing particulate matter from water by passage through porous media.
- *Flocculation* - a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.
- *Grab Sample* - a single sample taken from a specific point and time (USFK EGS, Chapter 4, Definitions).
- *Indirect Discharge* - the introduction of pollutants in process wastewater to a DWWTP (USFK EGS, Chapter 4, Definitions).
- *Industrial Wastewater* - wastewater discharged either directly or indirectly from factories, processing facilities or other facilities listed in Appendix 4-1 (USFK EGS, Chapter 4, Definitions).
- *Management Practice (MP)* - a practice that, although not mandated by law, is encouraged to promote safe operating procedures.
- *Maximum Daily Discharge Limitation* - the highest allowable daily discharge (USFK EGS, Chapter 4, Definitions).
- *New Source* - a source that discharges pollutants built or significantly modified on or after 1 October 1997 (USFK EGS, Chapter 4, Definitions).
- *pH* - an abbreviation of the French term *pouvoir hydrogene*, literally "hydrogen power." It is a measure of the acidity or alkalinity of a solution. Mathematically, it is the negative log to the base ten of the hydrogen ion concentration. In water the pH values range from 0 (very acidic) to 14 (very alkaline) (USFK EGS, Chapter 4, Definitions).

- *Point Source* - any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock, but not including vessels, aircraft, or any conveyance that merely collects natural surface flows of precipitation (USFK EGS, Chapter 4, Definitions).
- *Pollutant* - includes, but is not limited to, the following: dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water (USFK EGS, Chapter 4, Definitions).
- *Pretreatment* - the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a publicly owned treatment works (POTW).
- *Process Wastewater* - any water that during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product (USFK EGS, Chapter 4, Definitions).
- *Sedimentation* - a process for removing solids before filtration by gravity or separation.
- *Sewage* - wastewater (USFK EGS, Chapter 4, Definitions).
- *Sewer User Fee Areas* - the ROK government established sewer user fees for the cities of Seoul, Pusan, Taegu, and Chunchon, and requested USFK to pay sewer fees for the sewage that is discharged from various USFK installations located in the above cities. The US-ROK SOFA Joint Committee approved the sewer user fee rates on 3 March 1987 to be effective retroactively to 31 January 1986. These areas have been permitted to discharge their domestic sewage effluent into ROK municipal sewer collection systems without providing secondary treatment. A primary treatment requirement still exists - the sewers of many ROK municipalities cannot provide adequate scouring velocities to convey raw sewage (USFK EGS, Chapter 4, Definitions).
- *Slow Sand Filtration* - a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 m/h [\approx 16 in./h]) resulting in substantial particulate removal by physical and biological mechanisms.
- *Surface Water* - all water which is open to the atmosphere and which is subject to direct surface run-off (USFK EGS, Chapter 4, Definitions).
- *Total Suspended Solids (TSS)* - the pollutant parameter total filterable suspended solids (USFK EGS, Chapter 4, Definitions).
- *Total Toxic Organics (TTO)* - the sum of all quantifiable values greater than 0.01 mg/L for the toxic organics in Appendix 4-2 (USFK EGS, Chapter 4, Definitions).
- *Virus* - a microorganism of fecal origin infectious to humans by waterborne transmission.
- *Waters of the ROK* - surface waters including the territorial seas recognized under customary international law, including (USFK EGS, Chapter 4, Definitions):

1. all surface waters that are currently used, were used in the past, or may be susceptible to use in commerce
2. surface waters that are or could be used for recreation or other purposes
3. surface waters from which fish or shellfish are or could be taken and sold
4. surface waters that are used or could be used for industrial purposes by industries
5. surface waters including lakes, rivers, and streams (including intermittent streams), sloughs, prairie potholes, or natural ponds
6. tributaries of waters identified above.

(NOTE: Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of USFK EGS, Chapter 4, are not waters of ROK. This exclusion applies only to man-made bodies of water that neither were originally waters of ROK nor resulted from impoundment of waters of ROK.)



WASTEWATER
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	4-1 and 4-2	(1)(2)(22)
Wastewater Discharge		
General	4-3 through 4-8	(1)(2)(9)(14)(21)(22)
Point Source Discharges	4-9 through 4-11	(1)(2)(9)(14)
Discharges to DWWTPs		
General	4-12 through 4-16	(2)(9)(14)
Stormwater Discharge	4-17 and 4-18	(2)(9)(15)
Effluent Limitation	4-19 through 4-21	(2)(9)(14)
Training and Certification	4-22 through 4-24	(9)(14)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (6) Director of Logistics (DOL)
- (9) Chief of Operations and Maintenance (O&M)
- (14) Wastewater Treatment Plant Supervisor (O&M)
- (15) Land Management Officer (DEH)
- (21) Public Affairs Office (PAO)
- (22) Staff Judge Advocate (SJA)

WASTEWATER

Records to Review

- Permits
- Discharge monitoring reports for the past 2 yr
- Laboratory records, procedures, and results
- Monthly operating reports for wastewater treatment facilities
- Flow monitoring calibration certification and supporting records
- Ash pond volume certification and supporting records
- Red water inspection records
- Special reports, certifications, etc., required by permit
- Installation Spill Plan
- All records required by the spill plan
- All notices of noncompliance
- All notices of violations
- Sewage treatment plant operator certification
- Administrative orders
- Sewer and storm drain layout
- Local sewer ordinance
- Local service use permit
- Notification to local POTW
- Old Spill Reports
- Repair/Maintenance records for the wastewater treatment system
- Design plans for wastewater treatment plants
- Names and phone numbers of operators of sewage treatment plant
- Lab operators (wastewater analysis)
- Stormwater permits

Physical Features to Inspect

- Discharge to POTW
- Discharge outfall pipes
- Wastewater treatment facilities
- Industrial treatment facilities
- Streams, rivers, and open waterways
- Floor and sink drains (especially in industrial areas)
- Storm water collection points (especially in industrial areas)
- Oil storage tanks
- Oil/water separators
- Fire training pit
- Nonpoint source discharge areas
- Motor pools and vehicle maintenance stands
- Wash racks

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Director of Logistics (DOL)
- Chief of Operations and Maintenance (O&M)
- Wastewater Treatment Plant Supervisor (O&M)
- Land Management Officer (DEH)
- Public Affairs Office (PAO)
- Staff Judge Advocate (SJA)

**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>4-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on wastewater should be maintained at the installation (MP).</p> <p>4-2. Commanders of Army installations or activities have certain responsibilities with regard to host country regulatory agencies and substantive standards (AR 420-46, para 2-3c).</p> <p>WASTEWATER DISCHARGE</p> <p>General</p> <p>4-3. Each installation must have a system for investigating water pollution complaints from individuals and ROK water pollution control authorities (USFK EGS 4-3d).</p> <p>4-4. Installations must conduct periodic inspections of nondomestic wastewater sources to ensure that wastes are being handled properly (AR 420-46, para 4-5).</p>	<p>Verify the following are current and readily available: (1)(2)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Final Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 420-46, <i>Water Supply and Wastewater</i>, 1 May 1992 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - Technical Manual (TM) 5-660, <i>Maintenance and Operation of Water Supply, Treatment, and Distribution Systems</i>. <p>Determine whether the host nation has contacted the installation with regard to wastewater issues. (1)(2)(22)</p> <p>Verify that the installation or activity commander cooperates with host country regulatory agencies. (1)(2)(22)</p> <p>(NOTE: Either Korean or U.S. Environmental Protection Agency (USEPA) methods of analysis may be used to assess compliance with the wastewater effluent limitations of this section.)</p> <p>Verify that the installation implements a system for investigating water pollution complaints. (1)(2)(9)(21)(22)</p> <p>Verify that sources of nondomestic wastewater are inspected periodically to ensure that wastes are being handled properly. (1)(2)</p> <p>(NOTE: Such facilities as laboratories, boiler plants, cooling towers, photographic developing facilities, oil and/or water separators, other small treatment systems, and pesticide shops are examples of facilities that should be inspected.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (6) Director of Logistics (DOL) (9) Chief of Operations and Maintenance (O&M) (14) Wastewater Treatment Plant Supervisor (O&M) (15) Land Management Officer (DEH) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>4-5. Installations must develop a management plan to monitor and control nondomestic wastewater sources (AR 420-46, para 4-5).</p>	<p>Verify that the installation has a management plan that serves as a means of monitoring and controlling nondomestic wastewater sources. (1)(2)</p>
<p>4-6. Wastewater systems must undergo periodic inspections and preventative maintenance in order to ensure reliable, efficient, and safe operation (AR 420-46, para 2-7b).</p>	<p>Verify that the wastewater system is inspected periodically. (1)(2)(14)</p>
<p>4-7. Metallic wastewater collection lines must be bonded and coated to protect against corrosion (AR 420-46, para 6-3 and 6-4).</p>	<p>Verify that the corrosion protection of underground metallic lines meets the standards outlined in Appendix 4-3. (1)(2)(9)</p> <p>Verify that cathodic protection is inspected annually. (1)(2)(9)</p>
<p>4-8. Installations must prepare accurate and complete wastewater collection system maps and keep them current (AR 420-46, para 2-7a).</p>	<p>Verify that the installation has accurate and complete maps of the wastewater collection system. (1)(2)(14)</p> <p>(NOTE: Assessors should review the maps and spot check for the locations of drains and oil/water separators.)</p>
<p>Point Source Discharges</p>	
<p>4-9. Drains must in general not be used in close proximity to toxic or hazardous storage areas (AR 420-46, para 4-4).</p>	<p>Verify that drains are not used in close proximity to toxic or hazardous storage areas. (1)(2)(9)</p> <p>Verify that, if drains are present, they are designed to retain accidental spills or are connected to a wastewater treatment facility capable of safely disposing of spilled materials. (1)(2)(14)</p>

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**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>4-10. All new and existing point source dischargers of pollutants to waters of the ROK must meet specific domestic wastewater effluent limitations and monitoring requirements (USFK EGS 4-3a).</p> <p>4-11. Samples of wastewater discharges should be processed using proper collection, testing, and shipping procedures (MP).</p> <p>DISCHARGES TO DWWTPs</p> <p>General</p> <p>4-12. Installations must not discharge certain materials into a treatment works (USFK EGS 4-3b(1), 4-3b(5), and 4-3b(6)).</p>	<p>Verify that all new and existing sources of pollutants to waters of ROK comply with the effluent limitations in Appendix 4-4.</p> <p>Determine whether wastewater effluent noncompliance exists or is anticipated at an installation.</p> <p>Verify that commanders responsible for such installations coordinate with local municipal officials and concurrently request, through the USFK ACofS, Engineer (FKEN-ESD), access to municipal sewer services in accordance with the provisions of Article VI of the US-ROK SOFA.</p> <p>Verify that samples for monitoring are collected at the point of discharge prior to any mixing with the receiving water.</p> <p>Verify that all regulated parameters (BOD₅, TSS, pH) are sampled and monitored in accordance with the frequency listed in Appendix 4-5.</p> <p>Verify that, for wastewater sampling: (2)(9)(14)</p> <ul style="list-style-type: none"> - proper sample containers are used - samples are refrigerated during compositing - proper preservation techniques are used. <p>(NOTE: These and the following effluent limitations apply to all discharges of pollutants to DWWTPs and associated collection systems.)</p> <p>Verify that the installation does not discharge any of the following to a DWWTP: (9)(14)</p> <ul style="list-style-type: none"> - wastewater containing the following oils in a cumulative concentration exceeding 30 mg/L (in the normal hexane extract), which can pass through or cause interference to the DWWTP: <ul style="list-style-type: none"> - petroleum oil - nonbiodegradable cutting oil - products of mineral oil origin - any solid or viscous pollutants that may result in obstructions to plant flow - trucked or hauled waste. <p>(NOTE: DWWTPs may specify locations at which trucked and hauled waste may be discharged; the prohibition on discharge of such waste does not apply at such locations.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (6) Director of Logistics (DOL) (9) Chief of Operations and Maintenance (O&M) (14) Wastewater Treatment Plant Supervisor (O&M) (15) Land Management Officer (DEH) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>4-13. Installations must not introduce specific pollutants into a DWWTP (USFK EGS 4-3b(2) through 4-3b(4)).</p>	<p>Determine whether the installation has been granted any exemptions or variances concerning its discharges. (9)(14)</p> <p>Verify that no pollutants are discharged that create a fire or explosion hazard in the collection system or treatment facility, specifically: (9)(14)</p> <ul style="list-style-type: none"> - wastewater with a closed cup flashpoint of less than 60 °C (140 °F) - liquid waste solutions that contain more than 24 percent alcohol by volume with a flash point less than 60 °C (140 °F) - nonliquid wastes which, under standard temperature and pressure, can cause a fire through friction - ignitable compressed gases - oxidizers such as peroxide. <p>Verify that no pollutant that has the potential to be structurally corrosive is discharged to the DWWTP. (9)(14)</p> <p>Verify that no wastewater with a pH below 5.0 or with a pH above 9.0 is discharged to the DWWTP. (9)(14)</p> <p>(NOTE: The prohibitions on discharge of corrosives do not apply if the treatment facilities and collecting systems are specifically designed to handle such wastewater.)</p> <p>Verify that the following types of waste are not discharged: (9)(14)</p> <ul style="list-style-type: none"> - wastes that are normally unstable and readily undergo violent changes without detonating - wastes that react violently with water - wastes that form explosive mixtures with water or form toxic gases or fumes when mixed with water - cyanide or sulfide wastes that can generate potentially harmful toxic fumes, gases, or vapors - wastes capable of detonation or explosive decomposition or reaction at standard temperature and pressure - wastes that contain explosives regulated under USFK EGS, Chapter 5 - wastes that produce any toxic fumes, vapors, or gases with the potential to cause safety problems or harm to workers.
<p>4-14. Oil/water separators that are connected to the sanitary sewer should be operating correctly (MP).</p>	<p>Verify that oil/water separators connected to the sanitary sewer are operating correctly. (9)(14)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (6) Director of Logistics (DOL) (9) Chief of Operations and Maintenance (O&M) (14) Wastewater Treatment Plant Supervisor (O&M) (15) Land Management Officer (DEH) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>4-15. Sludges produced during the treatment of wastewater must be disposed of appropriately (USFK EGS 4-3g).</p> <p>4-16. Treatment plant supervisors must maintain certain operating logs and records (TM 5-660, para 18-20).</p>	<p>Verify that all sludges produced during the treatment of wastewater are disposed of in compliance with Section 6, <i>Hazardous Waste</i>, or Section 7, <i>Solid Waste</i>, as appropriate. (2)(14)</p> <p>Verify that the logs and records of the domestic wastewater plant supervisor are checked. (9)(14)</p> <p>Verify that forms are posted daily and are neat and legible. (9)(14)</p> <p>Verify that copies are distributed as follows: (9)(14)</p> <ul style="list-style-type: none"> - original retained by the DEH - duplicate to the MACOM.
<p>Stormwater Discharge</p> <p>4-17. Facilities for handling stormwater runoff from roads must meet specific criteria (AR 420-72, para 2-13h).</p>	<p>Verify that drainage channels, ditches, storm sewers, subsurface drains, and culverts are maintained so that they can function at full capacity. (2)(9)(15)</p> <p>Verify that catch basins, drop inlets, manholes, and similar structures are inspected and cleaned on a regular schedule based on the rate of silting or clogging with debris. (2)(9)(15)</p> <p>Verify that inspections take place no less than once a year. (2)(9)(15)</p> <p>Verify that ditches are kept clean and well graded or shaped. (2)(9)(15)</p>

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**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>4-18. Even where not covered by permit, stormwater discharge on the installation should be uncontaminated and periodically surveyed (MP).</p> <p>Effluent Limitations</p> <p>4-19. Installations must meet effluent limitations for direct and indirect discharges (USFK EGS 4-3c(1)).</p> <p>4-20. Industrial discharges must be monitored quarterly (USFK EGS 4-3c(2)).</p>	<p>Verify that stormwater discharge on the installation is uncontaminated. (2)(9)(15)</p> <p>(NOTE: Assessors should check the following:</p> <ul style="list-style-type: none"> - stormwater surveillance locations - analytical records - plan for storm sewer system and location of all outfalls and discharge points - areas of stormwater discharge physically for evidence of contamination (oil sheen, discoloration, etc.) - any oil/water separators connected to the storm sewer on the installation for proper operation and maintenance - major industrial shops or industrial areas, such as the following key areas: - battery shop - corrosion control - engine shop - motor pool - paint shop - plating shop - petroleum, oils, and lubricants (POL) area.) <p>Verify that the installation periodically surveys stormwater discharge for contamination. (2)(9)(15)</p> <p>Determine whether the facility is a point source of industrial wastewater effluent listed in Appendix 4-1. (2)(9)(14)</p> <p>Verify that the facility complies with the industrial wastewater effluent limitations listed in Appendix 4-6. (2)(9)(14)</p> <p>Verify that monitoring is carried out quarterly and that all the appropriate parameters are analyzed. (2)(9)(14)</p> <p>Verify that samples are collected at the point of discharge after treatment but prior to any mixing with any of the following: (2)(9)(14)</p> <ul style="list-style-type: none"> - any waters of the ROK - any raw or treated domestic wastewaters - any stormwaters. <p>(NOTE: Monitoring includes both sampling and analysis.)</p>

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**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>4-20. (continued)</p>	<p>(NOTE: Sampling for the toxic organics in Appendix 4-6 (e.g., polychlorinated biphenyl (PCB), trichloroethylene, tetrachloroethylene) and Appendix 4-2 can be avoided if the commanding officer determines that no discharge of concentrated toxic organics into the wastewaters has occurred and if the facility has implemented a TTO management plan.)</p> <p>(NOTE: The written TTO management plan must describe, at a minimum, both:</p> <ul style="list-style-type: none"> - sampling locations and frequencies - the actions planned to reduce TTO discharge in wastewater effluents and to prevent TTO discharges in excess of 0.01 mg/L.) <p>(NOTE: The TTO management approach may be a portion of the pollution prevention plan.)</p>
<p>4-21. Wash racks must be operated so as to prevent water pollution (AR 420-72, para 2-13k).</p>	<p>Verify that existing installed grease and sediment traps are kept in proper operating condition at all times. (9)</p> <p>Verify that drainage on existing wash racks is modified and that grease and sediment traps are installed where necessary. (9)</p> <p>Verify that new wash racks are provided with adequate grease and sediment traps or more extensive treatment facilities as needed. (9)</p>
TRAINING AND CERTIFICATION	
<p>4-22. Personnel engaged or employed in operation and maintenance of wastewater treatment facilities must meet USFK certification or training requirements (USFK EGS 4-3e and AR 200-1, para 2-7).</p>	<p>Verify that such personnel meet the certification and/or training requirements as developed by the USFK Assistant Chief of Staff Engineer. (9)(14)</p>
<p>4-23. Operators of wastewater treatment plants must meet the operator certification requirements of the host nation in which they are located (AR 420-46, para 10-1).</p>	<p>Verify that operators of wastewater treatment plants meet the operator certification requirements of the host nation in which they are located. (14)</p>

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**COMPLIANCE CATEGORY:
WASTEWATER
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

4-24. Supervisors at Army treatment plants must provide training in safety and occupational hazards to operating staff (TM 5-660, para 1-17).

Verify that safety and occupational hazards instructions are posted around plant or readily available to plant personnel. (9)(14)

Verify that continual training is conducted on proper safety practices at the plant. (9)(14)

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Appendix 4-1

Industrial Wastewater Discharge Facilities (USFK EGS Table 4-4)

<ul style="list-style-type: none">• Transportation / Vehicle Management facility<ul style="list-style-type: none">i. Washing facility: area of 20 m² [≈215 ft²] or larger or water usage of 2 m³/day [≈70 ft³/day] or more.ii. Repairing facility: area of 230 m² [≈2475 ft²] or larger.iii. Plating facility: 0.1 m³ [≈3 ft³] capacity or larger.iv. Oil/water separator facilities.
<ul style="list-style-type: none">• Laundry facility<ul style="list-style-type: none">Washing equipment: 2 m³ [≈70 ft³] capacity or larger or water usage with 1 m³/h [≈35 ft³/h] or more.
<ul style="list-style-type: none">• Printing facility<ul style="list-style-type: none">i. Washing equipment: 1 m³ [≈35 ft³] capacity or larger or water usage of 0.5 m³/h [≈18 ft³/h] or more.ii. Grinding equipment: 3 horse power or more.
<ul style="list-style-type: none">• Photography processing facility<ul style="list-style-type: none">i. Automatic developing equipment: one (1) or more.ii. Automatic printing equipment: one (1) or more.• Metal Coating Facility: Discharges of pollutants in process waters resulting from the chromating, phosphating or immersion plating on ferrous and nonferrous metals.• Chemical product manufacturing facility• Rubber/Plastic product manufacturing facility• Metal product/machine manufacturing facility• Petroleum refining facility• Leather product manufacturing facility• Food manufacturing facility• Marine product manufacturing facility• Fabric product manufacturing facility• Beverage manufacturing facility• Paper product manufacturing facility
<ul style="list-style-type: none">• Social service facility (educational, health, medical, research facilities, etc.)<ul style="list-style-type: none">i. Hospital facility: 80 beds or moreii. X-ray processing facility: two or more X-ray processing equipment.



Appendix 4-2

Components of Total Toxic Organics (USFK EGS Table 4-6)

Components of Total Toxic Organics
Volatile Organics
Acrolein (Propenyl)
Acrylonitrile
Methyl chloride (chloromethane)
Methyl bromide
Vinyl Chloride (chloroethylene)
Chloroethane
Methylene Chloride (9 dichloromethane)
1,1-Dichloroethene
1,1-Dichloroethane
1,2-Dichloroethane
1,2-trans-Dichloroethene
Chloroform (trichloromethane)
1,1,1-Trichloroethane
Carbon Tetrachloride (tetrachloromethane)
Bromodichloromethane
1,1,2,2-Tetrachloroethane
1,2-Dichloropropane
1,3-Dichloropropylene (1,3-Dichloropropene)
Trichloroethene
Dibromochloromethane
1,1,2 - Trichloroethane
Benzene
2 - Chloroethyl vinyl ether (mixed)
Bromoform (tribromomethane)
Tetrachloroethene
Toluene

(continued)

Appendix 4-2 (continued)

Components of Total Toxic Organics
Chlorobenzene
Ethylbenzene
Base/Neutral Extractable Organics
N-nitrosodimethylamine
bis (2-chloroethyl) ether
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
bis (2-chloroisopropyl)-ether
Hexachloroethane
N-nitrosodi-n-propylamine
Nitrobenzene
Isophorone
bis (2-chloroethoxy) methane
1,2,4-trichlorobenzene
Napthalene
Hexachlorobutadiene
Hexachlorocyclopentadiene
2-Chloronaphthalene
Acenaphthylene
Dimethyl Phthalate
2,6-Dinitrotoluene
Acenaphthene
2,4-Dinitrotoluene
Fluorene
4-Chlorophenyl phenyl ether
Diethyl phthalate
1,2-Diphenylhydrazine
N-nitrosodiphenylamine
4-Bromophenyl phenyl ether
Hexachlorobenzene

(continued)

Appendix 4-2 (continued)

Components of Total Toxic Organics
Phenathrene
Anthracene
Di-n-butyl phthalate
Fluoranthene
Pyrene
Benzidine
Butyl benzyl phthalate
1,2-benzoanthracene (benzo (a) anthracene)
Chrysene
3,3-Dichlorobenzidine
bis (2-ethylhexyl) phthalate
Di-n-octyl phthalate
3,4-Benzofluoranthene (benzo (b) fluoranthene)
11,12-Benzofluoranthene (benzo (k) fluoranthene)
Benzo (a) pyrene (3,4-benzopyrene)
Indeno (1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
1,2,5,6-Dibenzanthracene (dibenezo (a,h) anthracene)
1,12-Benzoperylene (benzo (g,h,i) perylene)
Acid Extractables Organics
2-Chlorophenol
Phenol
2-Nitrophenol
2,4-Dimethylphenol
2,4-Dichlorophenol
4,6-Dinitro-o-cresol
2,4,6-Trichlorophenol
2,4-Dinitrophenol
4-Nitrophenol
p-Chloro-m-cresol
Pentachlorophenol
Pesticides/PCBs

(continued)

Appendix 4-2 (continued)

Components of Total Toxic Organics
Alpha-Endosulfan
Beta-Endosulfan
Endosulfan sulfate
Alpha-BHC
Beta-BHC
Delta-BHC
Gamma-BHC
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Aldrin
Chlordane (technical mixture and metabolites)
Dieldrin
Endrin
Endrin aldehyde
Heptachlor
Heptachlor Epoxide (BHC-hexachlorocyclohexane)
Toxaphene
PCB-1242 (Arochlor 1242)
PCB-1254 (Arochlor 1254)
PCB-1221 (Arochlor 1221)
PCB-1232 (Arochlor 1232)
PCB-1248 (Arochlor 1248)
PCB-1260 (Arochlor 1260)
PCB-1016 (Arochlor 1016)
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Appendix 4-3

Corrosion Protection of Underground Metallic Surfaces (AR 420-46, Table 6-1)

Material	Soil-Reactivity (ohm-cm)	External Coating	Bonding	Cathodic Protection
Cast or Ductile Iron	<10,000	X	X	X
	10,000 to 30,000	N	X	N
	>30,000	N	N	N
Steel	<30,000	X	*	X
	>30,000	**	N	**

X = Required

N = Not required

* = Required only if mechanical joints are used

** = To be based on economic analysis



Appendix 4-4

Domestic Wastewater Effluent Limitation (USFK EGS Table 4-1)

	TIME PERIOD	BOD ₅	TSS	pH
Existing Sources	Average weekly limits	Class I and II: 30 mg/L	Class I and II: 30 mg/L	6.0 - 9.0
		Class III - V: 45 mg/L	Class III - V: 45 mg/L	
	Average monthly limits	Class I and II: 30 mg/L	Class I and II: 30 mg/L	6.0 - 9.0
		Class III - V: 60 mg/L	Class III - V: 60 mg/L	
New Sources	Average weekly limits	Class I and II: 30 mg/L	Class I and II: 30 mg/L	6.0 - 9.0
		Class III - V: 45 mg/L	Class III - V: 45 mg/L	
	Average monthly limits	30 mg/L	30 mg/L	6.0 - 9.0

NOTES:

1. All standards are based upon the use of 24-h composite sample results.
2. For information on the classifications of ROK receiving waters, see Appendix 4-7.
3. Minimum monitoring frequency requirements are contained in Appendix 4-5.

Appendix 4-5

Monitoring Requirements for Wastewater (USFK EGS Table 4-3)

Plant Capacity in million gallons per day (MGD)	Monitoring Frequency
0.0 - 0.099	Quarterly
0.1 - 0.99	Monthly
>1.0	Weekly

NOTE: Each analyzed sample will be a composite of grab samples of the effluent leaving a facility during a 24-h period.

Appendix 4-6

Industrial Wastewater Effluent (Maximum Daily Discharge) Limitations (USFK EGS Table 4-5)

Pollutant Category	Class I and II	Class III, IV, and V
pH	5.8 - 8.6	5.8 - 8.6
Normal hexane extracts: mineral oil (mg/L) animal/vegetable oil (mg/L)	5 or less 30 or less	5 or less 30 or less
Phenol (mg/L)	3 or less	3 or less
Cyanide (mg/L)	1 or less	1 or less
Chromium (mg/L)	2 or less	2 or less
Soluble iron (mg/L)	10 or less	10 or less
Zinc (mg/L)	5 or less	5 or less
Copper (mg/L)	3 or less	3 or less
Cadmium (mg/L)	0.1 or less	0.1 or less
Mercury (mg/L)	0.005 or less	0.005 or less
Organic phosphorus (mg/L)	1 or less	1 or less
Arsenic (mg/L)	0.5 or less	0.5 or less
Lead (mg/L)	1 or less	1 or less
Hexavalent chromium (mg/L)	0.5 or less	0.5 or less
Soluble manganese (mg/L)	10 or less	10 or less
Fluorine (mg/L)	15 or less	15 or less
PCB (mg/L)	0.003 or less	0.003 or less
Coliform bacteria (numbers/mL)	3000 or less	3000 or less
Temperature (°C)	40 or less	40 or less
Total nitrogen (mg/L)	60 or less	60 or less
Total phosphorus (mg/L)	8 or less	8 or less
Trichloroethylene (mg/L)	0.3 or less	0.3 or less
Tetrachloroethylene (mg/L)	0.1 or less	0.1 or less
Alkyl benzene sulfonate (ABS) (mg/L)	5 or less	5 or less
COD (mg/L)	100 or less	150 or less
TSS (mg/L)	100 or less	150 or less

(continued)

Appendix 4-6 (continued)

NOTES:

1. At locations where both animal/vegetable oil and mineral oil exist in the effluent, the total normal hexane extracts limitation is 30 mg/L.
2. Receiving water classifications are identified in Appendix 4-7.
3. Samples should be collected at the point of discharge prior to any mixing with the receiving water, raw or treated domestic sewage or stormwater.

Appendix 4-7

Existing Sources -- Domestic Wastewater BOD₅/TSS Limitations
 (average weekly discharge limitations)
 (USFK EGS Table 4-2)

USFK Installation	Stream/River	Class	BOD ₅ /TSS Limits (mg/L)
Camp Casey Camp Hovey Camp Nimble Camp Castle H-220 Heliport	Shinchon	IV	60
Camp Howze Camp Edwards	Kokrungchon	II	30
Camp Stanton Camp Pelham Camp Garry Owen Camp Giant	Munsanchon	V	60
Camp Greaves Camp Bonifas Camp Liberty Bell Warrior Base	Imchin River (downstream)	II	30
Camp Red Cloud Camp Essayons	Chungryangchon	III	60
Camp Falling Water Camp Kyle Camp Sears Camp Jackson Camp La Guardia	Uijongbu City Sewer	---	---
Camp Stanley	Chungryangchon (upstream)	II	30
Camp Page	Chunchon City Sewer*	---	---
Camp Long	Wonjuchon	IV	60
Camp Eagle	Seom River (upstream)	I	30
Camp Colbern	Han River (Paldang-Tanchon)	I	30
Camp Market	Kulpochon	V	60
K-16	Tanchon	V	60

(continued)

Appendix 4-7 (continued)

USFK Installation	Stream/River	Class	BOD₅/TSS Limits (mg/L)
Yongsan Garrison Nilbo Barracks FEDE Compound Camp Kim Camp Gray	Seoul City Sewer*	---	---
CP Tango	Sangjukchon	I	30
Sungnam Golf Course	Han River (Paldang-Tanchon)	I	30
Camp Humphreys	Anseongchon	II	30
Camp Carroll	Nakdong River (Kamchon Kumho R)	I	30
Camp Henry Camp Walker Camp George	Taegu City Sewer*	---	---
Camp Hialeah Pusan Storage Area Pier #8	Pusan City Sewer*	---	---
Osan Air Base	Chinwichon (downstream)	III	60
Kunsan Air Base	Kum River (downstream)	III	60
Taegu Air Base	Taegu City Sewer	---	---
Kwangju Air Base	Hwangryon River	II	30
Kimhae Air Base	Nakdong River	III	60
Suwon Air Base	Suwonchon	V	60
Chinhae Navy Base	Chinhae City Combined Sewer/ Chinhae Bay	---	60

NOTES:

1. Class I: Drinking Water Source (DWS) 1st degree -- usable after primary treatment such as filtration.
2. Class II: DWS 2nd degree/swimming -- usable after secondary treatment such as settling and filtration.
3. Class III: DWS 3rd degree -- usable after tertiary treatment, and Industrial 1st degree -- usable after common treatment and settling.
4. Class IV: Industrial 2nd degree/Agricultural -- usable after complete treatment and chemical treatment.
5. Class V: Industrial 3rd degree -- usable after chemical treatment.
6. Applicable average monthly discharge limitations are described in Appendix 4-4.
7. * Sewer User Fee Areas.
8. Remote sites and training fields are not included.

INSTALLATION:	COMPLIANCE CATEGORY: WASTEWATER Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 5

HAZARDOUS MATERIALS

Korea ECAS

SECTION 5

HAZARDOUS MATERIALS

Republic of Korea ECAS

A. Applicability of this Protocol

Most military communities handle many chemicals and substances that may be considered hazardous if not handled, stored, or used properly. A complete list of chemicals used at military communities would be too lengthy to include in this protocol, but many of the materials are hazardous, i.e., toxic chemicals, flammable substances, reactive substances, and corrosive materials.

This protocol primarily addresses the proper storage and handling of chemicals and the spill contingency and response requirements related to hazardous materials. Oil, pesticides, and asbestos are hazardous materials that require special management practices at military communities and are addressed in other protocols. Radioactive substances and the general category of hazardous wastes are also not included in this section of the manual. This protocol does not focus on individual hazardous chemicals or substances used at military communities. It deals with the generic requirements and management practices associated with minimizing impacts on the environment from spills or releases of hazardous materials as a result of improper storage and handling. As a general rule, most sections of this protocol will be applicable to most military communities.

All underground storage tank regulations that apply to hazardous materials have been consolidated into Section 19, *Underground Storage Tanks*. Regulations and procedures concerning Spill Prevention and Response Planning are addressed in Section 18.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 5 contains criteria for the storage, handling, transportation and disposition of hazardous materials used by U.S. Forces - Korea (USFK) installations.
- DOD 4145.19-R-1, *Storage and Materials Handling*, September 1979, Chapter 5, Section 4, *Hazardous Commodities*, provides overall guidance for storage and handling of various types of hazardous commodities at military communities.
- DOD Directive (DODD) 6050.8, *Storage and Disposal of Non-DOD Owned Hazardous or Toxic Materials in DOD Installations*, 27 February 1986, prohibits the storage of non-DOD-owned hazardous materials on DOD property.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no OCONUS-applicable requirements that address the management of hazardous materials directly.

D. Responsibility for Compliance

- The Director of Logistics (DOL) has the primary responsibility for receiving, storing, and issuing all hazardous commodities. The DOL reviews all items that have potential health hazards and determines if an issue exception code should be assigned to the item before being placed in storage. The receipt of hazardous materials with proper documentation and shipping papers is also the responsibility of the DOL. The DOL oversees the proper maintenance and operation of flammable/combustible materials storage facilities, acid storage facilities, and compressed gas storage facilities, and ensures that all hazardous materials are properly labeled.
- The Medical Department Activity (MEDDAC)/Medical Center (MEDCEN) is responsible for reviewing the issue exception codes for hazardous materials assigned by DOL and for approving or disapproving the recommendations.
- The Directorate of Engineering and Housing (DEH) is responsible for the storage and handling (in properly designed facilities) of all hazardous materials used by the DEH shops. The DEH is also responsible for reporting releases of hazardous materials to appropriate authorities.
- The Unit/Activity Commanders are responsible for the storage and handling of all hazardous materials used by their activity.
- The Installation Fire Department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department is responsible for making periodic fire safety inspections of flammable/combustible storage and handling areas on the military community.
- The Safety Officer is responsible for conducting evaluations of work place safety and inspections of the handling and storage of hazardous materials. The Safety Officer provides the appropriate manager with a report of findings and recommended corrective actions. The Safety Officer is also responsible for ensuring the prompt and accurate investigation of any hazardous material mishaps that result in injury or property damage.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. *Code of Federal Regulations* (CFR).

- *Basement* - a story of a building or structure having one-half or more of its height below ground level and to which access for fire fighting purposes is unduly restricted.
- *Boiling Point* - the temperature at which a liquid starts to boil when at atmospheric pressure (14.7 pounds per square inch absolute (psia), as determined by American Society for Testing and Materials (ASTM) Test D-86-72).
- *Closed Container* - a container sealed with a lid or other closing device such that liquid and/or vapor will not escape from at ordinary temperatures.
- *Combustible Liquid* - a liquid with a flashpoint at or above 100 °F (37.8 °C). Combustible liquids are categorized as Class II or Class III liquids and are further subdivided as follows:

1. Class II liquids are those with a flashpoint at or above 100 °F (37.8 °C), and below 140 °F (60 °C) except any mixture having components with a flashpoint of 200 °F (93.3 °C) or higher, the volume of which makes up 99 percent or more of the total volume of the mixture
 2. Class III A liquids are those with a flashpoint at or above 140 °F (60 °C), and below 200 °F (93.4 °C), except any mixture having components with flashpoint of 200 °F or higher, the total volume of which makes up 99 percent or more of the total volume of the mixture
 3. Class III B liquids are those having a flashpoint at or above 200 °F (93.4 °C).
- *Fire Area* - that portion of a building separated from the remainder by construction with a rated fire resistance of at least 1 h and with all communicating openings properly protected by an assembly with a fire resistance rating of at least 2 h.
 - *Flammable Aerosol* - an aerosol that must be labeled "Flammable" under the Federal *Hazardous Substance Labeling Act* (15 United States Code (USC) 1261). These aerosols are considered Class IA liquids.
 - *Flammable Liquid* - a liquid with a flashpoint below 100 °F (37.8 °C), except any mixture having components with flashpoints of 100 °F or higher, the total of which makes up 99 percent or more of the total volume of the mixture. Flammable liquids are categorized as Class 1 liquids and are further subdivided as follows:
 1. Class IA are those with a flashpoint below 73 °F (22.8 °C) and boiling point below 100 °F (37.8 °C)
 2. Class IB are those with a flashpoint below 73 °F (22.8 °C) and boiling points at or above 100 °F (37.8 °C)
 3. Class IC are those with a flashpoint at or above 73 °F (22.8 °C) and below 100 °F (37.8 °C).
 - *Flashpoint* - the minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. Flashpoints are established using several standard closed cup test methods.
 - *Hazardous Chemical Warning Label* - a label, tag, or marking on a container that is prepared in accordance with DOD Instruction (DODI) 6050.5-H, *DOD Hazardous Chemical Warning Labeling System*, and that provides the following information (USFK EGS, Chapter 5, Definitions):
 1. identification/name of hazardous chemicals
 2. appropriate hazard warnings
 3. the name and address of the manufacturer, importer, or other responsible party.
 - *Hazardous Material* - any material that is capable of posing an excessive risk to health, safety, or the environment if improperly handled, stored, issued, transported, labeled, or disposed of, or the material is listed in Appendix 6-1, Chart A.4 of Section 6, *Hazardous Waste*. Munitions are excluded (USFK EGS, Chapter 5, Definitions).
 - *Hazardous Material Information System (HMIS)* - the computer-based information system developed to accumulate, maintain, and disseminate important information on hazardous materials used by DOD (USFK EGS, Chapter 5, Definitions).
 - *Hazardous Material Shipment* - any movement of hazardous material in a USFK land vehicle or a vehicle used under USFK contract either from an installation to a final destination off the same installation, or from a point of origin off the installation to a final destination on the installation, in excess of any of the following quantities (USFK EGS, Chapter 5, Definitions):

1. for hazardous material identified as a result of inclusion in Appendix 6-1, Chart A.4, any quantity in excess of the RQ listed in Appendix 6-1, Chart A.4
 2. for other liquid or semi-liquid hazardous material, in excess of 410 L (110 gal)
 3. for other solid hazardous material, in excess of 225 kg (500 lb)
 4. for combinations of liquid, semi-liquid and solid hazardous materials, in excess of 340 kg (750 lb).
- *High Pressure Gas* - one of the following (USFK EGS, Chapter 5, Definitions):
 1. compressed gas with a pressure of 10 kg/m^2 (gauge) or greater at a temperature of $35 \text{ }^\circ\text{C}$

(NOTE: As an exception, acetylene gas is considered a high pressure gas if any gauge pressure (i.e., greater than 0 kg/cm^2 (gauge)) exists at a temperature of $35 \text{ }^\circ\text{C}$.)

 2. liquefied gas at a pressure of 2 kg/cm^2 (gauge) or greater at a temperature of $35 \text{ }^\circ\text{C}$.

(NOTE: As an exception, liquefied hydrogen cyanide, liquefied methane bromide, and liquefied ethylene oxide are considered high pressure gasses if any gauge pressure (i.e., greater than 0 kg/cm^2 (gauge)) exists at a temperature of $35 \text{ }^\circ\text{C}$.)
 - *Installation On-Scene Coordinator (IOSC)* - the official who coordinates and directs control and cleanup efforts at the scene of a POL or hazardous substance spill due to USFK activities on or near the installation. This official is designated by the Installation Commander (IC) (USFK EGS, Chapter 18, Definitions).
 - *Liquid* - any material with a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM Test D-5-73. When not otherwise identified, the term "liquid" will include both flammable and combustible liquid.
 - *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
 - *Material Safety Data Sheet (MSDS)* - a form used by manufacturers of chemical products to communicate to users the chemical, physical, and hazardous properties of their product (USFK EGS, Chapter 5, Definitions).
 - *Off-Installation Spill* - an uncontained release to land or water where USFK lacks jurisdiction (USFK EGS, Chapter 18, Definitions).
 - *On-Installation Spill* - an uncontained release to land or water under USFK control (USFK EGS, Chapter 18, Definitions).
 - *Petroleum, Oil, and Lubricant (POL)* - oil of any kind, including but not limited to, petroleum, oils, lubricants (including synthetic oils), fuel, oil sludges, oil refuse and oil mixed with other wastes. Refined petroleum, oils and lubricants include synthetic oils, oil sludges and oily wastes (refuse) (USFK EGS, Chapter 18, Definitions).
 - *Portable Tank* - a closed container having a liquid capacity over 60 gal and not intended for fixed installation.

- *Pressure Vessel* - a storage tank or container designed to operate at pressures above 15 pounds per square inch gauge (psig).
- *Reportable Quantity (RQ)* - a released quantity of 110 gal [\approx 416 L] or more of POL, or released quantity of a hazardous substance in excess of the substance-specific presented in Appendix 6-1, Chart A.4 (USFK EGS, Chapter 18, Definitions).
- *Safety Can* - an approved flammable liquid container with a spring closing lid, spout cover, and other features designed to relieve internal pressure safely and to provide safe storage for the liquid.
- *Significant Spill* - an uncontained release to the land or water in excess of any of the following quantities: (USFK EGS, Chapter 18, Definitions)
 1. for hazardous waste or hazardous substance identified as a result of inclusion in Appendix 6-1, Chart A.4, any quantity in excess of the RQ listed therein
 2. for POL or liquid or semi-liquid hazardous material, hazardous waste or hazardous substance, in excess of 415 L (110 gal)
 3. for other solid hazardous material, in excess of 225 kg (500 lb)
 4. for combinations of POL and liquid, semi-liquid and solid hazardous materials, hazardous waste or hazardous substance, in excess of 340 kg (750 lb).
- *Special High Pressure Gas* - hydrogen, oxygen, liquefied ammonia, acetylene, or liquefied chlorine (USFK EGS, Chapter 5, Definitions).
- *Special Toxic Substances* - toxic substances that are extremely harmful, listed in Appendix 5-1 (USFK EGS, Chapter 5, Definitions).
- *Toxic Substances* - specific chemical substances that are harmful to public health or the environment, listed in Appendix 5-2 (USFK EGS, Chapter 5, Definitions).



HAZARDOUS MATERIALS
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	5-1 through 5-6	(1)(2)(6)(7)(8)(9)
Hazardous Materials		
Storage and Handling	5-7 through 5-10	(1)(2)(6)
Storage/Dispensing Areas		
General	5-13 and 5-12	(1)(2)
Flammable/Combustible Liquids	5-13 through 5-22	(1)(6)(7)
Industrial Areas	5-23 through 5-25	(6)(7)
Bulk Storage		
Compressed Gases	5-26 through 5-28	(1)(3)(6)(7)
Acids	5-29 and 5-30	(1)(6)
Use of High Pressure Gas	5-31 and 5-32	(1)(6)
Transportation of Hazardous Materials	5-33 through 5-37	(6)(7)(9)
Releases	5-38 through 5-40	(1)(2)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (6) Director of Logistics (DOL)
- (7) Fuels Management Officer (DOL/DEH)
- (8) Transportation/Maintenance Officer (DOL)
- (9) Chief, Operations and Maintenance (O&M)



HAZARDOUS MATERIALS

Records to Review

- Installation Spill Plan
- Spill Reports
- Hazardous Material Inventory
- MSDS Inventory Records
- MSDS Training Records
- MSDS Shipping Documents
- MSDS Placarding of Materials

Physical Features to Inspect

- Hazardous Material Storage Areas (DOL - Supply, Shops)
- Shop Activities
- Flammable Storage Cabinets
- Shipping and Receiving Areas
- Supply and Storage Shops (DEH, DOL)
- Self Service Supply Center (DOL)
- Military Unit Supply/Storage Areas
- Print/Reproduction Shop

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer
- Director of Logistics (DOL)
- Fuels Management Officer (DOL/DEH)
- Transportation/Maintenance Officer (DOL)
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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>5-1. Copies of all relevant DOD directives/instruction, ARs, and guidance documents on hazardous materials should be maintained at the installation (MP).</p> <p>5-2. Installations must maintain a master listing of all storage facilities for hazardous materials and an inventory of all hazardous materials contained therein (USFK EGS 5-3e).</p>	<p>Verify that the following documents are maintained and kept current at the installation. (1)(6)(7)(8)(9)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - DOD 4145.19-R-1, Chapter 5, Section 4, <i>Storage and Materials Handling</i>, September 1979 - DODI 6050.5-H, <i>Hazardous Material Information System</i>, 25 January 1978 - DODD 6050.8, <i>Storage and Disposal of Non-DOD Owned Hazardous or Toxic Materials in DOD Installations</i>, 27 February 1986 - AR 40-5, <i>Preventive Medicine</i>, 15 October 1990 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 200-2, <i>Environmental Effects of Army Action</i>, 23 December 1988 - AR 385-10, <i>The Army Safety Program</i>, 23 May 1988 - AR 700-141, <i>Hazardous Materials Information System</i>, 20 January 1987 - AR 740-32, <i>Responsibilities for Technical Escort of Dangerous Materials</i>, 5 June 1975 - EO 12088, <i>Federal Compliance with Pollution Standards</i> - National Fire Protection Association (NFPA), <i>Fire Protection Guide of Hazardous Materials</i>. <p>Verify that the installation maintains a master listing of all storage facilities for hazardous materials and an inventory of all hazardous materials contained therein. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-3. Installations must have MSDSs for each chemical procured, stored, or used onsite (USFK EGS 5-3f and 5-3g).</p>	<p>Verify that an MSDS is on file for each chemical procured, stored, or used onsite. (1)(2)</p> <p>Verify that an MSDS is readily accessible for each hazardous chemical in the workplace during each work shift. (1)(2)</p> <p>Verify that the MSDS sheets are in English and contain at least the following information: (1)(2)</p> <ul style="list-style-type: none"> - the identity used on the label: <ul style="list-style-type: none"> - if the hazardous chemical is a single substance, the chemical and common name of the substance - if the hazardous chemical is a mixture that has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients that contribute to these known hazards and the common names(s) of the mixture itself - if the hazardous chemical is a mixture that has not been tested as a whole: <ul style="list-style-type: none"> - the chemical and common name(s) of all ingredients that have been determined to be health hazards and that comprise 1 percent or greater (0.1 percent or greater for carcinogens) of the composition - the chemical and common name(s) of all ingredients that have been determined to be health hazards and that comprise less than 1 percent (0.1 percent for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations that could present a health hazard to personnel - the chemical and common name(s) of all ingredients that have been determined to present a physical hazard when present in the mixture - physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point, etc.) - physical hazards of the chemical, including the potential for fire, explosion, and reactivity - health hazards of the chemical, including signs and symptoms of exposure and any medical conditions that are generally recognized as being aggravated by exposure to the chemical - primary route(s) of entry (e.g., inhalation, skin absorption, ingestion, etc.) - Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) and any other pertinent exposure limit - whether the chemical has been found to be a potential carcinogen - any generally applicable precautions, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for cleanup of spills and leaks - any generally applicable control measures, such as appropriate engineering controls, work practices, or personal protective equipment (PPE) - emergency and first aid procedures - date of preparation or last change

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-3. (continued)</p>	<p>- name, address, and telephone number of the chemical manufacturer, importer, employer, or other responsible party preparing or distributing the MSDS who can provide additional information on the chemical and appropriate emergency procedures.</p> <p>Verify that MSDSs are obtained or prepared for locally purchased items. (1)(2)</p>
<p>5-4. Personnel who use, handle, or store hazardous materials must be trained (USFK EGS 5-3k).</p>	<p>Verify that personnel who use, handle, or store hazardous materials are trained in spill response and related handling issues in accordance with DODD 6050.5, associated hazard communication program handbooks (e.g., 6050.5-H and 6050.5-W), and other component instructions. (1)(2)</p>
<p>5-5. USFK installations must reduce the use of hazardous materials where practical (USFK EGS 5-3i).</p>	<p>Verify that the installation reduces the use of hazardous materials where practical through: (1)(2)</p> <ul style="list-style-type: none"> - resource recovery - recycling - source reduction - acquisition, etc.
<p>5-6. The installation should coordinate with the fire department concerning the types of hazardous chemicals used at the installation, the areas where they are used, what they are used for, and the quantities used in a given operation (MP).</p>	<p>Verify that the fire department is aware of areas that are at high risk for chemical incidents. (7)</p> <p>(NOTE: Assessors should review coordination efforts with fire the department.)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>HAZARDOUS MATERIALS</p> <p>Storage and Handling</p> <p>5-7. Installations must not allow the storage of non-DOD-owned toxic or hazardous materials onsite (DODD 6050.8, para D).</p> <p>5-8. All hazardous materials on USFK installations must be labeled and have MSDS information either available or in HMIS (USFK EGS 5-3h).</p> <p>5-9. Lead-acid batteries that are to be recycled must be treated as hazardous material (USFK EGS 6-3i(4)).</p>	<p>Verify that the installation does not allow the storage of non-DOD-owned toxic or hazardous materials onsite. (1)(6)</p> <p>(NOTE: This does not apply to:</p> <ul style="list-style-type: none"> - agreements with General Services Administration (GSA) for the storage of strategic and critical materials in the National Stockpile Program - agreements between DOD Components and other Federal agencies for temporary storage or disposal of explosives - emergency lifesaving assistance to civil authorities involving the temporary storage or disposal of explosives - excess explosive generated under a DOD contract - arrangements with the Department of Energy for the temporary storage of nuclear materials or nonnuclear classified materials - military resources used during peacetime civil emergencies - assistance and refuge for commercial carriers carrying material of other Federal agencies during transportation emergencies.) <p>Verify that all hazardous materials are labeled with a Hazardous Chemical Warning Label. (1)(2)</p> <p>Verify that the MSDSs are either available or in HMIS. (1)(2)</p> <p>(NOTE: These requirements apply throughout the life-cycle of the material.)</p> <p>(NOTE: DODD 6050.5-H exempts some small "consumer" quantities of hazardous materials from some of the labeling requirements. Consult the unit safety manager or installation safety office for specific guidance on small and consumer quantity exemptions.)</p> <p>Verify that lead-acid batteries that are to be recycled are treated as hazardous material.</p>

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HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-10. Hazardous materials that cannot be reused (including less critical operations), recycled, or recovered on the USFK installation must be processed through the Defense Reutilization and Marketing Service (DRMS) (USFK EGS 5-3j).</p> <p>STORAGE/ DISPENSING AREAS</p> <p>General</p> <p>5-11. The installation must prevent the unauthorized entry of persons and livestock into the hazardous materials storage areas (USFK EGS 5-3L).</p> <p>5-12. Installations must maintain hazardous materials dispensing areas properly (USFK EGS 5-3b).</p>	<p>Verify that excess hazardous materials are processed through DRMS. (1)(2)</p> <p>Verify that the installation prevents unauthorized entry of persons and livestock into the hazardous materials storage areas. (1)(2)</p> <p>(NOTE: Assessors should examine the following types of hazardous materials storage areas:</p> <ul style="list-style-type: none"> - paint storage - pesticides storage - solvents storage.) <p>Verify that drums and containers in hazardous materials dispensing areas are not leaking. (1)(2)</p> <p>Verify that drip pans/absorbent materials are placed under containers as needed in order to collect drips or spills. (1)(2)</p> <p>Verify that container contents are clearly marked. (1)(2)</p> <p>(NOTE: Placards and labels available through supply channels are identified in Appendix 5-3.)</p> <p>Verify that dispensing areas are located away from catch basins and storm drains a sufficient distance to prevent any hazardous material from entering such basins and drains. (1)(2)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Flammable/ Combustible Liquids</p> <p>5-13. Flammable/combustible liquids should not be stored in ways that limit the use of exits, stairways, or areas normally used for the safe egress of people (MP).</p> <p>5-14. Specific MPs should be considered when storing and handling flammable/combustible materials (MP).</p> <p>5-15. Containers of flammable/combustible materials must be stored and handled according to specific practices (USFK EGS 5-3a and DOD 4145.19-R-1, para 5-404j).</p>	<p>Verify that exits and common traffic routes are not blocked. (6)(7)</p> <p>Verify that the following MPs are followed: (6)(7)</p> <ul style="list-style-type: none"> - no positive sources of ignition (open flames, welding, radial heat, mechanical sparks) are in the immediate area - no items are stored against pipes or coils producing heat - paint drums that are stored horizontally are rolled a half turn every 90 days - containers of paint are palletized prior to storage - aerosol containers are stored in well ventilated areas. <p>(NOTE: These MPs are suggested in DOD 4145.19-R-1.)</p> <p>Verify that containers are stored and handled such that: (6)(7)</p> <ul style="list-style-type: none"> - open flame devices are not in use in the storage area - combustible materials, other than wood pallets used in the storage of flammable/combustibles, are not stored in the storage facility - labels are not damaged - materials received without a date of manufacture label are marked with the shipping document date - leaking containers are removed from the storage area immediately - containers are stored so that they are issued or used in the order of dates of manufacture, with the oldest material used first - there are no open containers - containers are inspected periodically while in storage. <p>(NOTE: See Appendix 5-4 for guidelines for the maximum allowable capacity of containers and portable tanks based on specifications of the container and substance being stored.)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-16. Storage cabinets used for the storage of flammable/combustible liquids should meet specific requirements (MP).</p>	<p>Verify that no more than 228 L, or no more than 60 gal, of Class I or Class II liquids nor any more than 456 L (120 gal) of Class III liquids are stored in the cabinet. (1)(6)(7)</p> <p>Verify that the cabinets are fire resistant. (1)(6)(7)</p> <p>Verify that cabinets are constantly closed and are conspicuously labeled "FLAMMABLE--Keep Fire Away." (1)(6)(7)</p>
<p>5-17. Storage cabinets used for the storage of flammable/combustible liquids should be handled properly (MP).</p>	<p>Verify that materials within the cabinet are segregated. (1)(6)(7)</p> <p>Verify that there are no open containers within the cabinet. (1)(6)(7)</p> <p>Verify that all containers in the cabinet are labeled. (1)(6)(7)</p>
<p>5-18. Indoor flammable/combustible storage rooms must meet certain specifications (MP).</p>	<p>Verify that the installation's flammable/combustible storage rooms have the following: (1)(6)(7)</p> <ul style="list-style-type: none"> - walls that meet fire resistance test of NFPA 251-1969 - a 10 cm (4-in.) raised sill or ramp provided to adjacent rooms or buildings, or the floor of the storage area 10 cm (4-in.) lower than the surrounding floors - if sill or ramp is not present, an open grated trench that drains to a safe area - liquid tight wall/floor joints - self closing fire doors (NFPA 80) - electrical wiring and equipment that meet NFPA 70 requirements - either a gravity or a mechanical exhaust ventilation system - an exhaust system that provides for six changes of air in the room per hour - mechanical exhaust systems that are controlled by a switch outside the door and have exhaust outlets on exterior walls - a fresh air intake on exterior walls, if gravity ventilation is used - one clear aisle at least 91 cm, or 3-ft wide. <p>Verify that storage in the rooms meet the requirements in Appendix 5-5. (1)(6)(7)</p> <p>Verify that containers over 114 L, or over 30-gal, capacity are not stacked one upon the other. (1)(6)(7)</p> <p>Verify that dispensing is done by an approved pump or self closing faucet only. (1)(6)(7)</p>

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HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-19. The storage of flammable or combustible liquids in warehouses or storage buildings must meet specific requirements (USFK EGS 5-3a and DOD 4145.19-R-1, para 5-404d).</p>	<p>Verify that the following requirements are met: (6)(7)</p> <ul style="list-style-type: none"> - if the storage building is located 15 meters (m) (50 ft) or fewer from a building or line of adjoining property that may be built upon, the exposing wall is a blank wall having a fire-resistance rating of at least 2 h - any quantity of liquids may be stored as long as the storage arrangements outlined in Appendix 5-6 are met - containers in piles are separated by pallets or dunnage when necessary to provide stability and prevent excess stress on container walls - portable tanks stored over one tier high are designed to nest securely - no pile is closer than 91 cm (3 ft) to the nearest beam, chord, girder, or other obstruction - piles are 91 cm (3 ft) below sprinkler deflectors or discharge points of water spray, or other fire protection system - aisles are at least 91 cm (3 ft) wide when necessary for access to doors, windows, or standpipe connections.
<p>5-20. Installations must meet specific requirements with regard to flammable/combustible materials stored outside (USFK EGS 5-3a and DOD 4145.19-R-1, paras 5-404e and 5-404f).</p>	<p>Verify that the quantity and arrangement of materials is in accordance with Appendix 5-6. (1)(6)(7)</p> <p>Verify that the storage area is graded to divert spills or is surrounded by a curb at least 6 in. high. (1)(6)(7)</p> <p>Verify that drains terminate in a safe location. (1)(6)(7)</p>
<p>5-21. Installations should meet specific requirements for the storage and handling of materials outside (MP).</p>	<p>Verify that no more than 44180 L (1100 gal) of flammable/combustible liquids are stored adjacent to buildings. (1)(6)(7)</p> <p>Verify that the storage area is protected against tampering. (1)(6)(7)</p>
<p>5-22. Flammable/combustible storage areas meet certain fire protection standards (USFK EGS 5-3a and DOD 4145.19-R-1, para 5-404g).</p>	<p>Verify that at least one 12-B (or higher) rated portable fire extinguisher is located outside the door of any room used for storage and within 3 m (10 ft) of the door opening. (6)(7)</p> <p>Verify that at least one 12-B (or higher) rated portable fire extinguisher is located within 3 to 7 m (10 to 25 ft) of any Class I or Class II liquid storage area outside of a storage room, but inside a building. (6)(7)</p>

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Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Industrial Areas</p> <p>5-23. Areas where flammable/combustible materials are stored, dispensed, or used in industrial plants should meet specific guidelines (MP).</p> <p>5-24. Installations must meet specific requirements with regard to the incidental storage of flammable/combustible liquids in industrial areas (MP).</p>	<p>(NOTE: Checklist items 5-23 through 5-25 pertain to industrial areas where the use of flammable/combustible liquid is incidental to the principal business or where flammable or combustible liquids are handled or used only in unit physical operations which do not involve chemical reactions.)</p> <p>Verify that the following provisions are met: (6)(7)</p> <ul style="list-style-type: none"> - portable fire extinguishers and fire control equipment are in place in quantity and type as needed for the hazards of operation and storage at the site - adequate precautions are taken to prevent sources of ignition at the site - Class I liquids are not dispensed into containers unless nozzles and containers are electrically interconnected - operations such as welding and cutting for repairs to equipment are done under the supervision of an individual in charge - maintenance and operating practices control leakage and prevent the accidental escape of flammable or combustible liquids: <ul style="list-style-type: none"> - adequate aisles are maintained - combustible waste materials and residues are kept to a minimum, stored in covered metal containers, and disposed of daily - the grounds area around the buildings and unit operating areas are kept free of weeds, trash, or other unnecessary combustibles - tank vehicle and tank car loading or unloading facilities are separated from aboveground tanks, warehouses, and other plant buildings or nearest line of adjoining property by a distance of 7 m (25 ft) for Class I liquids and 4 m (15 ft) for Class II and III liquids. <p>Verify that flammable and combustible liquids are stored in closed containers. (6)(7)</p> <p>Verify that the storage areas meet the requirements outlined in checklist items 5-19 through 5-21 except that: (6)(7)</p> <ul style="list-style-type: none"> - the quantity of liquid that can be located outside of an inside storage room or storage cabinet in a building or in any one fire area of a building must not exceed: <ul style="list-style-type: none"> - 95 L (25 gal) of Class IA liquids in containers - 456 L (120 gal) of Class IB, IC, II, or III liquids in containers - 2508 L (660 gal) of Class IB, IC, II, or III liquids in a single portable tank. <p>(NOTE: Where large quantities of flammable or combustible liquids are needed, storage may be in tanks.)</p> <p>Verify that areas where flammable/combustible liquids are transferred from one container to another container are separated from other operations in the building by an adequate distance or by construction with fire resistance. (6)(7)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

5-24. (continued)

Verify that drainage or other means is provided to contain spills and that adequate natural or mechanical ventilation is present. (6)(7)

Verify that the following practices are followed at the point of final use: (6)(7)

- flammable liquids are kept in covered containers when not actually in use
- means are provided to dispose promptly and safely of spills and leaks where flammable/combustible liquids are used or handled
- Class I liquids are only used where there are no open flames or other sources of ignition
- flammable/combustible liquids are drawn from or transferred into vessels, containers, or portable tanks within a building only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self closing valve.

(NOTE: Transferring by means of air pressure on the container or portable tanks is prohibited.)

5-25. Areas where flammable/combustible liquids are used in unit operations such as mixing, drying, evaporating, filtering, or distilling should meet specific operating standards (MP).

Verify that the following parameters are met: (6)(7)

- areas are located so that each building or unit of equipment is accessible from at least one side for fire fighting
- areas where unstable liquids are handled or small scale unit chemical processes are carried on are separated from the remainder of the area by a fire wall of 2-h minimum fire resistance rating
- emergency drainage systems direct leakage and fire protection water to a safe location
- emergency drainage systems, if connected to public sewers or discharged into public waterways, are equipped with traps or a separator
- when Class I liquids are being used, ventilation is provided at a rate of not less than 1 cubic foot per minute per square foot (ft³/min/ft²) of solid floor area through either natural or mechanical means
- equipment is designed to limit flammable vapor-air mixtures.

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>BULK STORAGE</p> <p>Compressed Gases</p> <p>5-26. Bulk storage of compressed gases in roofed, open-sided sheds must meet certain criteria (USFK EGS 5-3a and DOD 4145. 19-R-1, para 5-405d(1)).</p> <p>5-27. Storage of compressed gases in enclosed storage facilities must meet certain criteria (USFK EGS 5-3a and DOD 4145.19-R-1, para 5-405d(2)).</p>	<p>Verify that compressed gas sheds meet the following requirements: (1)(6)(7)</p> <ul style="list-style-type: none"> - they are on concrete slab above grade - they are located in secured area - they are separated from other buildings by at least 15 m (50 ft) - if they have one or more sides, provisions are made to ensure complete change of air at least six times per hour - they are not heated. <p>Verify that, if necessary, stationary or rotating roof vents are used to lower temperature near ceiling to ambient conditions during warm weather. (1)(6)(7)</p> <p>Verify that flammable gases and gases that support combustion are stored in separate sheds with at least 15 m (50 ft) between sheds. (1)(6)(7)</p> <p>Verify that cylinders and portable tanks have pressure relief devices installed. (1)(6)(7)</p> <p>Verify that the compressed gas storage areas meet the following requirements: (1)(3)(6)</p> <ul style="list-style-type: none"> - buildings are one story in height, above grade, of noncombustible construction - separate storage compartments or rooms are available for flammable gases or gases that support combustion - at least one wall of each storage room or compartment for combustible gases is an exterior wall - every storage room or compartment is provided with either a gravity or a mechanical exhaust ventilation system designed to provide complete change of air at least six times per hour - buildings are not heated - cylinders and portable tanks have pressure relief devices installed.

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-28. Compressed gases must be handled in accordance with specific good practices (USFK EGS 5-3a and DOD 4145.19-R-1, para 5-405c(6) through 5-405c(9), para 5-405c(14), and para 5-405c(22)).</p> <p>Acids</p> <p>5-29. Installations must meet specific requirements with regard to the storage and handling of acids in bulk (USFK EGS 5-3a and DOD 4145.19-R-1, para 5-406).</p> <p>5-30. Workers in facilities where acids are stored in bulk should be provided with a copious, flowing supply of fresh, clean water for first aid (MP).</p>	<p>Verify that the following practices and procedures are observed in the handling of compressed gases: (1)(3)(6)</p> <ul style="list-style-type: none"> - oxygen cylinders are free from grease or oil - numbers or markings that are stamped on the cylinders are not altered or defaced - additional markings are not applied to cylinders without approval - empty cylinders are stored separately but in the same manner as full cylinders - valves on empty cylinders are closed - NO SMOKING signs are posted in and around compressed gas storage sheds. <p>Verify that bulk acid storage areas meet the following requirements: (1)(6)</p> <ul style="list-style-type: none"> - buildings are one story in height, of nonflammable or fire-resistant construction - permanent louvered openings at floor and ceiling levels or other gravity ventilation method are provided - safety equipment is available and operational (eye wash, deluge shower, self-contained breathing apparatus, protective clothing) - buildings are heated to prevent freezing, if applicable - different acids are stored separately in designated areas - NO SMOKING signs are posted - there are either floor drains or wall scuppers, if the building has automatic sprinkler protection. <p>(NOTE: Acid storage buildings should have automatic sprinkler protection.)</p> <p>(NOTE: In lieu of aisle space, noncombustible barriers that are at least 91 cm (3 ft) high and sealed at the floor level may be used to obtain maximum storage space.)</p> <p>Verify that workers in facilities where acids are stored in bulk are provided with a copious, flowing supply of fresh, clean water for first aid. (1)(6)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>USE OF HIGH PRESSURE GAS</p> <p>5-31. Users of high pressure gas are subject to certain requirements (USFK EGS 5-3m(1)).</p> <p>5-32. Users of special high pressure gas are subject to specific requirements (USFK EGS 5-3m(2)).</p>	<p>Verify that anyone who uses high pressure gas takes actions for the prevention of danger. (1)(6)</p> <p>(NOTE: This requirement applies if there is possibility of danger in using facilities, equipment, or containers.)</p> <p>Verify that anyone who intends to use special high pressure gas consults the installation safety manager prior to commencing their handling or use. (1)(6)</p> <p>(NOTE: The safety manager has oversight responsibility for preventing danger and ensuring the safety of facilities, equipment, and gas containers.)</p>
<p>TRANSPORTATION OF HAZARDOUS MATERIALS</p> <p>5-33. Hazardous materials shipments must meet specific standards (USFK EGS 5-3c).</p>	<p>Verify that shipping papers are kept within the driver's immediate reach for the duration of the shipment.</p> <p>Verify that the shipping papers clearly describe the quantity and identity of the material and include the relevant MSDS(s). (6)</p> <p>Verify that all drivers of hazardous materials shipments are briefed on the hazardous material in the shipment, including: (6)</p> <ul style="list-style-type: none"> - the health risks of exposure - the physical hazards of the material, including the potential for fire, explosion, and reactivity. <p>Verify that hazardous materials are identified as "Ignitable," "Corrosive," "Reactive," or "Toxic" in both the shipping papers and the briefing for the driver. (6)</p> <p>Verify that supervisory personnel do a walk-around inspection of the vehicles before and after the material is loaded. (6)</p> <p>Verify that two pair or more of protective gloves and boots and two or more protective coats and shovels are kept onboard the hazardous material transportation vehicle. (6)</p> <p>Verify that such protective items are appropriate to the hazardous material(s) being transported. (6)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

5-33. (continued)

Verify that signs in English and Korean languages are placed on the containers or covers of toxic substances listed in Appendices 5-1 and 5-2. (6)

Verify that such signs meet the following requirements: (6)

- for special toxic substances: the name of the special toxic substance is shown and "Special Toxic Substance" is written in white on a black background with a thick white border (See figure 5.1 in Appendix 5-7)
- for toxic substances: the name of the toxic substance is shown and "Toxic Substance" is written in red on a white background with a thick red border (See figure 5.2 in Appendix 5-7)
- size: the size of the skull and crossbones for toxic substances and for special toxic substances is greater than 1/10 of the width of the cover or container label and greater than 1.5 cm
- size: the size of the sign for toxic substances and for special toxic substances is greater than 1/10 of the width of the cover or container label and greater than 1.5 cm
- color: the color of the skull and crossbones symbol must be black.

Verify that, if more than 100g or 100 mL are being transported, the following descriptive information is provided:

- the name and address of the manufacturer or importer
- manufacturing registered number and manufacturing date
- volume (weight) or quantity
- constituents and contents
- uses and methods of use
- registration number/permission number and effective period
- name of antidotes or detoxifying methods for the toxic substances
- precautions in handling.

Verify that, if less than 100g or 100 mL are being transported, the name of a manufacturer is provided.

Verify that the transportation vehicle that carries toxic substances or special toxic substances has a Korean placard (see figure 5.3 in Appendix 5-7) and a placard cited in Appendix 5-3 affixed in the middle part of the rear side of the vehicle.

5-34. The installation should provide proper placarding on vehicles that transport hazardous materials off the installation (MP).

Verify that Army vehicles are used in transporting hazardous materials off the installation. (6)

Verify that proper placards are affixed to the vehicles. (6)

Verify that commercial vehicles used for transportation of hazardous materials have proper placards provided by the DOL. (6)

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-34. (continued)</p> <p>5-35. Installation transportation of hazardous materials between buildings should be accomplished with MPs to ensure against spills, releases, and accidents (MP).</p> <p>5-36. International air shipments of hazardous materials originating from USFK installations must meet specific standards (USFK EGS 5-3d(1)).</p> <p>5-37. International shipments of hazardous material on the open sea from USFK installations must meet specific standards (USFK EGS 5-3d(2)).</p> <p>RELEASES</p> <p>5-38. Specific actions must be taken in the event of any spill of POL or hazardous substance in excess of the relevant RQ (USFK EGS 18-3c(6) and 18-3e(2)).</p>	<p>(NOTE: Assessors identify proper procedures for placarding vehicles used to transport hazardous materials, if practical.)</p> <p>Verify that procedures exist to manage movement of hazardous materials throughout the installation. (6)(9)</p> <p>Verify that drivers are trained in spill control procedures. (9)</p> <p>Verify that provisions have been made for securing hazardous materials in vehicles during transport. (9)</p> <p>Determine whether the installation ships hazardous materials internationally by air. (6)(9)</p> <p>Verify that the following shipping standards are met: (6)(9)</p> <ul style="list-style-type: none"> - the International Air Transportation Association (IATA) Rules - appropriate USFK and component instructions. <p>Verify that the Installation Transportation Office is consulted for advice. (6)(9)</p> <p>Determine whether the installation ships hazardous materials internationally on the open sea. (6)(7)</p> <p>Verify that the following shipping standards are met:</p> <ul style="list-style-type: none"> - the International Maritime Organization (IMO) Rules - appropriate USFK and Component instructions. <p>Verify that the Installation Transportation Office is consulted for advice. (6)(9)</p> <p>Verify that spills of RQs of POL or hazardous substances are reported to the IOSC immediately. (1)(2)</p> <p>(NOTE: See Appendix 6-1 in the Section <i>Hazardous Waste</i> for RQs).</p> <p>Verify that immediate action is taken to eliminate the source and contain the spill. (1)(2)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-38. (continued)</p> <p>5-39. Additional actions must be taken in the event of spills of POL or hazardous substances that occur or migrate outside installation boundaries or threaten an ROK drinking water resource (USFK EGS 18-3e(5)).</p>	<p>Verify that local authorities are notified when the spill poses a hazard to human health or the environment outside the installation. (1)(2)</p> <p>Determine whether a POL or hazardous substance spill: (1)(2)</p> <ul style="list-style-type: none"> - has occurred off-post - has occurred inside the USFK installation and cannot be contained within the installation boundaries - threatens a ROK drinking water resource. <p>Verify that the unit that caused the release takes immediate action to contain the damage and cleanup the spill within the limits of their capabilities. (1)(2)</p> <p>Verify that the organization that causes the spill immediately notifies the area staff duty officer. (1)(2)</p> <p>Verify that the area staff duty officer in turn contacts the facility/base engineer and USFK Public Affairs Office (PAO) or Command Center (CC)--Seoul (after working hours). (1)(2)</p> <p>Verify that the facility/base engineering work force serves as the primary responder. (1)(2)</p> <p>(NOTE: It is the responsibility of the PAO and the Chief, Public Information, CC-Seoul to assist the local IC in informing local government officials of the incident.)</p> <p>Verify that the IC or his/her representative notifies ROK authorities immediately. (1)(2)</p> <p>Verify that USFK response to off-post spills/damages are limited to notification actions, spill control, collection of standing product, and fire prevention. (1)(2)</p> <p>(NOTE: Under the provisions of Article XXIII of the US-ROK Status of Forces Agreement (SOFA), claims by local national individuals or organizations for damages arising from off-installation spills will be handled through the established claims procedures.)</p> <p>(NOTE: The organization responsible for causing the spill will be responsible for reimbursement of costs associated with spill response and associated waste disposal.)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS MATERIALS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>5-40. The IOSC must make specific notifications and must submit a written follow-up report in certain cases (USFK EGS 18-3e(3) and 18-3e(4)).</p>	<p>Determine whether any of the following is the case: (1)(2)</p> <ul style="list-style-type: none"> - the spill occurs inside a USFK installation and cannot be contained within any required berm or secondary containment - the spill exceeds 415 L (110 gal) of POL - a water resource has been polluted - the IOSC has determined that the spill is significant. <p>Verify that the IOSC notifies the following immediately: (1)(2)</p> <ul style="list-style-type: none"> - the appropriate Military Department and/or Defense Agency - the USFK Assistant Chief of Staff, Engineer. <p>Verify that a follow-up written report is submitted that meets the requirements of USFK Regulation 703-1. (1)(2)</p>

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Appendix 5-1

Special Toxic Substances (USFK EGS Table 5-2)

Number*	Chemical Name	Percentage**
1.	(1,1'-Biphenyl)-4-amine: p-Biphenylamine, p-aminodiphenyl	
2.	(1R,4S,4aS,5S,8R,8aR)-1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexachloro-1,4,5,8-dimethanonaphthalene: HHDN, Aldrin, Octalene	
3.	(2,4-Dichlorophenoxy) acetic acid: 2,4-D, Hedonal Trionxol	
4.	(S)-a-Cyano-3-phenoxybenzyl(Z)-(1R-cis)-2, 2-dimethyl-3-[2-(2,2,2-trifluoro-1-trifluoromethyl-ethoxycarbonyl) vinyl] cyclopropanecarboxylate	
5.	[3-Chloro-N-(3-Chloro-5-trifluoromethyl-2-pyridyl)]-a,a,a-trifluoro-2, 6-dinitro-p-toluidine: Fluazinam	
6.	[5-(3-Carboxy-4-hydroxyphenyl) (3-carboxy-4-oxo-2, 5-cyclohexadien-1-ylidene)methyl]-2-hydroxybenzoic acid triammonium salt: Aluminon, Lysofon	
7.	1,1'-Oxybis[2-chloroethane]: sys-Dichloroethyl ether, DCEE, Chlorex	
8.	1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane: DDT	
9.	1,1-Dimethyl-4,4-dipyridinium: Paraquat, Gramoxone	
10.	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene: HEOD, Dieldrin, Octalox	
11.	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-exo-1,4-exo-5, 8-dimethanonaphthalene: Endrin, Nendrin	
12.	1,2,3,6-Tetrahydro-N-(trichloromethylthio)phthalimide: Captan, Captab, Orthocide	0.2
13.	1,2,4,5,6,7,8,8-Octachloro-1,2,3,3a,4,7,7a-hexahydro-4,7-methano-1H-indene: Chordan(e), Toxichlor, Niran	
14.	1,2-Dibromo-3-chloropropane: DBCP	
15.	1,2-Dibromorthane	
16.	1,3,4,5,6,7,8,8-Octachloro-1,3,3a,7,7a-hexahydro-4,7-methanoisobenzofuran: Isobenzen, Telorin, Omtan	
17.	1,3-Dichloropropene	
18.	1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene: Drinox, Heptachlor(e), Heptamul	5
19.	1-(2,2-Dimethyl-1-methylthiomethylpropylideneamino-oxy)-N-methylformamide: Thiofanox, Thiofanocarb, Dacamox	
20.	1-(4-Nitrophenyl)-3-(3-pyridylmethyl)urea: Priminl, Vacor	3
21.	1-Benzothiazol-2-yl-1, 3-dimethylurea: Methabenzthiazuron, Tribunil	

(continued)

Appendix 5-1 (continued)

Number*	Chemical Name	Percentage**
22.	1L-(1,3,4/2,6)-2, 3-Dihydroxymethyl-4-[(1S, 4R, 5S, 6S)-4,5,6-trihydroxy-3-hydroxymethylcyclohex-2-enylamino]cyclohexyl-B-D-glucopyranoside: Validamycin(A), Validacin, Valimon	
23.	2,2-Dimethyl-2,3-dihydro-7-benzofuranyl-N-methylcarbamate: Carbofuran, Furadan, Curaterr	5
24.	2,3-Dihydro-2, 2-dimethylbenzofuran-7-yl(dibutylaminothio)methylcarbamate: Carbosulfan, Marshal	
25.	2-Amino-3-chloro-1,4-naphthoquinone: ACN, Mogeton, ACNQ	
26.	2-Chloro-2-diethylcarbamoyl-1-methylvinyl dimethyl phosphate: Phosphamidon, Dimecron	
27.	2-Chloro-N-(2-chloroethyl)-N-methylethanamine: Mechlorthamine	
28.	2-Dimethyl-amino-5,6-dimethyl-4-pyrimidinyl dimethylcarbamate: Pirimor, Pirimicarb	
29.	2-Ethylthioethyl O,O-dimethyl phosphorothioate: Mathyl demeton, Metasystox	
30.	2-Chloro-4-methyl-6-dimethylaminopyrimidine	
31.	2-Methyl-2-(methylthio)propionaldehyde O-methylcarbamoyloxime: Aldicarb, Temik	
32.	2-tert-Butyl-5-(4-tert-butylbenzylthio)-4-chloropyridazin-3(2H)-one: Pyridaben	
33.	3,4-Dichlorobenzenediazothiourea: Chloropromurite, Muritan, Promurit	
34.	3-(3-Biphenyl-4-yl-1,2,3,4-tetrahydro-1-naphthyl)-4-hydroxycoumarin: Difenacoum, Ratak	
35.	3-[2-(3,5-Dimethyl-2-oxocyclohexyl)-2-hydroxyethyl] glutarimide: Cycloheximide, Actidione	
36.	3-[3-(4'-Bromobiphenyl-4-yl)-3-hydroxy-1-phenylpropyl]-4-hydroxycoumarin: Bromadiolone, Maki	
37.	3-[3-(4'-Bromol[1,1-biphenyl]-4-yl)1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-2H-1-benzopyran-2-one: Brodifacoum, Talon	
38.	4-Hydroxy-3[1,2,3,4-tetrahydro-3-[4-(4-trifluoromethylbenzyloxy)phenyl]-1-naphthyl]coumarin: Flocoumafen, Storm, Stratagen	
39.	5-(A-Hydroxy-A-2-pyridylbenzyl)-7-(A-2-pyridylbenzylidene)-5-norbomene-2,3-dicarboximido: Norbomido, Raticate, Shoxin	
40.	6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin 3-oxide: Endosulfan, Thiodan, Chlorthiepin	
41.	7-Chlorobicyclo[3.2.0]hepta-2,6-dien-6-yl dimethylphosphate: Heptenophos, Ragadan, Hostaquick	
42.	A,A,A-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine: Trifluralin, Treflan, Elancolan	

(continued)

Appendix 5-1 (continued)

Number*	Chemical Name	Percentage**
43.	A-Naphthyl thiourea: ANTU, Bantu, Dirax	
44.	Aluminum phosphide: Celphos, Phostoxin	
45.	Arsenic pentoxide: Arsonic acid anhydride	
46.	Arsenic trioxide: Arsenious acid, Arsenious oxide	
47.	Carbon tetrachloride	
48.	Chlorinated 2,2-dimethyl-3-methylenebicyclo[2.2.1]heptane: Camphechlor, Chlorinated camphene, Toxaphene	
49.	Diethyl 1,3-diethietan-2-ylidenephosphoramidate: Fosthietan, Acconem, Geofos	
50.	Diethyl 1,3-dithiolan-2-ylidenephosphoramidate: Phosfolan, Cyolane, Cylan	
51.	Diethyl(4-methyl-1,3-dithiolan-2-ylidene)phosphoramidate: Mephosfolan, Cytrolane	
52.	Diisopropyl fluorophosphate: Isofluorophate, DFP	
53.	Dimethyl-2,2-dichlorovinylphosphate: Dichlorvos, DDVP	
54.	Dithyl 5-methyl-3-pyrazolyl phosphate: Pyrazoxon	
55.	Fluoroacetic acid	
56.	Fluoroacetic acid amide: Fussol, Fluoroacetamide	
57.	Hexachlorocyclohexane: BCE, HCH	
58.	Lead arsenate	
59.	Methyl bromide	
60.	N'-(2-Methyl-4-chlorophenyl)-N,N-dimethylformamidine: Chlordimeform, Galecron, Fundal	
61.	N,N-Dimethyl-1-methyl carbamoyloxyimino-2-(methylthio)acetamide: Oxamyl, Vydate	
62.	N-Methyl-2,4-dinitro-N-(2,4,6-tribromophenyl)-6-(trifluoromethyl)benzenamine: Bromethalin(e)	
63.	O,O,O,O'-Tetraethyl dithiopyrophosphate: Sulfotep, Bladafum	
64.	O,O-Bis(4-Chlorophenyl)N-acetimidoylphosphoramidothioate: Phosacetim, Gophacide	
65.	O,O-Diethyl O-2[-(ethythio)ethyl]phosphorothioate mixture with O,O-Diethyl S-2[-(ethythio)ethyl]phosphorothioate: Demeton	
66.	O,O-Diethyl O-p-nitrophenyl thiophosphate: Parathion	
67.	O,O-Diethyl O-pyrazin-2-yl phosphorothioate: Thionazin, Nemafos, Cymnem	
68.	O,O-Diethyl O-quinoxalin-2-yl phosphorothioate: Quinalphos, Bayrusil, Ekalux	

(continued)

Appendix 5-1 (continued)

Number*	Chemical Name	Percentage**
69.	O,O-Diethyl S-2[-ethylthio)ethyl]phosphorodithioate: Disulfoton, Thiodemeton	
70.	O,O-Diethyl S-isopropylcarbamoylmethyl phosphorodithioate: Prothoate, Fac	
71.	O,O-Dimethyl O-4-(methylsulfinyl phenyl)thiophosphate: Fensulfotion, Terracur-P, Dasanit	
72.	O,O-Dimethyl O-p-nitrophenyl thiophosphate: Methyl parathion, Metaphos, Metacide	
73.	O,O-Dimethyl S-[(4-oxy-1,2,3-benzotriazol-3(4H)-yl)methyl] dithiophosphate: Azinphopsmethyl, Guthion	
74.	O,O-Dimethyl S-methyl carbamoylethyl dithiophosphate: Dimethoate, Cygon	
75.	O-2,5-Dichloro-4-(methylthio)phenyl O,O-diethyl phosphorothioate: Chlorthiophos, Celathion	
76.	O-Ethyl S,S-dioropyl phosphorodithioate: Ethoprophos, Mocap, Ekatina	
77.	O-Methyl O-(4-bromo-2,5-dichlorophenyl)phenyl thiophosphate: Phosvel, Abar, Leptophos	
78.	Octamethylphosphoramidate: Schradam, OMPA, System	
79.	Other extremely hazardous substances designated by the Minister of Environment	
80.	p-Chlorophenyldiazothiurea	
81.	Pentachlorophenol	
82.	Phenylmercuric triethanol ammonium borate: PTA-B	
83.	Phenylmercury acetate: PMA, PMAC	
84.	S-[[1,1-(Dimethylethyl)thio]methyl] O,O-dimethyl phosphorodithioate: Terbufos, Counter	
85.	S-[2-(Diethylamino)ethyl] O,O-diethyl phosphorothioate: Amiton, Tetram	
86.	S-2-Chloro-1-phthalimidoethyl O,O-diethyl dithiophosphate: Dialifos, Dialifor, Torak	
87.	S-Chloromethyl O,O-diethyl phosphorodithioate: Chlormephos, Dotan	
88.	S-Ethylthioethyl O,O-dimethyl phosphorodithioate: Thimeton, Ekatina	
89.	Strychnidin-10-one: Strychnine	
90.	tert-Butyl(E)-a-(1,3-dimethyl-5-phenoxy-pyrazol-4-yl)methyleneamino-oxy-p-toluate: Fenpyroximate	
91.	Tetraalkyllead	
92.	Tetraethyl pyrophosphate: TEPP, Tetron, Vapotone	
93.	Tetramethyl phosphorodiamidic fluoride: Dimefox	

(continued)

Appendix 5-1 (continued)

Number*	Chemical Name	Percentage**
94.	Thallium acetate	
95.	Thallium nitrate	
96.	Thallium sulfate	
97.	Thiosemicarbazide	
98.	Tributyl tin oxide	
99.	Trichloronitromethane: Chloropicrin	



Appendix 5-2

Toxic Substances (USFK EGS Table 5-1)

Number*	Chemical Name	Percentage**
1	(+)-a-[N-(3-Chlorophenyl)cyclopropanecarboxamido]-G-butyrolactone: Cyprofuram, vinicur	
2	(1,1-Biphenyl)-4-amine: p-Biphenylamine, p-aminodiphenyl	
3	(1R,4S,4aS,5S,8R,8aR)-1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene: HHDN, Aldrin, Octalene	
4	(2,4,5-Trichlorophenoxy)acetic acid: 2,4,5,-T, Weedone	
5	(2,4-Dichlorophenoxy)acetic acid: 2,4-D, Hedonal, Trinoxol	
6	(3B,5Z,7E,22E)-9,10-Secoergosta-5,7,10(19),22-tetraen-3-ol: Calciferol, Vitamin D2, Ergocalciferol	
7	(E)-O-2-Isopropoxycarbonyl-1-methylvinyl thylethylphosphoramidothioate: Propetamphos, Safrotin	
8	(R,S)-aCyano-4-fluoro-3-phenoxybenzyl-(1R,S)-cis,trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate: Baythroid, Cyfluthrin, Cyfoxylate	0.5
9	(RS)-a-Cyano-3-phenoxybenzyl N-2-(2-cloro-a,a,a-trifluoro-p-tolyl)-D-valinate: Fluvalinate, Mavrik	
10	(RS)-a-Cyano-3-phenoxybenzyl(s)-2-(4-difluoromethoxyphenyl)-3-methylbutyrate: Flucythrianate, Cybolt, Cytrin	
11	(S)-2,3,5,6-Tetrahydro-6-phenylimidazo[2,1-b]thiazole: Levamisole, Ketrax	3.4
12	(S)-3-(2-Piperidinyl)pyridine: Anabasin, Neomicotine	
13	(S)-a-Cyano-3-phenoxybenzil(1R)-cis-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylate: Deltamethrin, Decamethrin, Butox	
14	(S)-a-Cyano-3-phenoxybenzyl(Z)-(1R-cis)-2,2-dimethyl-3-[2-(2,2,2-trifluoro-1-trifluoromethylet-hoxycarbonyl)vinyl]cyclopropanecarboxylate: Acrinatrin	
15	(S)-a-Cyano-3-phenozybenzyl (1R,3S)-2,2-dimethyl-3-[(RS)-1,2,2,2-tetrabromoethyl]cyclopropanecarboxylate: Tralomethrin(e)	
16	[3-Chloro-N-(3-Chloro-5-trifluoromethyl-2-pyridyl)]-a,a,a-trifluoro-2,6-dinitro-p-toluidine: Fluazinam	
17	0,0-Bis(4-chlorophenyl)N-acetimidoylphosphoramithioate: Phosacetim, Gophacide	
18	0,0-Diethyl 0-(2,4-dichlorophenyl)thiophosphate: Dichlofenthion, Ecp, Nem-acide	
19	0,0-Diethyl 0-(3,5,6-trichloro-2-pyridl)thiophosphate: Chlorpyrifos, Dursban, Lorsban	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
20	0,0-Diethyl 0-(3-methyl-5-pyrazolyl)phosphate: Pyrazothion	
21	0,0-Diethyl 0-(3-oxo-2-phenyl-2H-pyridazin-6-yl)phosphorothioate: Pyridaphenthion	
22	0,0-Diethyl 0-[2-(ethylthio)ethyl]phosphorothioate mixture with 0,0-diethyl S-[2-(ethylthio)ethyl]phosphorothioate: Demeton, Systox, Mercaptophos	
23	0,0-Diethyl 0-1-phenyl-1,2,4-triazol-3-ylphosphorothioate: Triazophos, Hostathion	
24	0,0-Diethyl 0-p-nitrophenyl thiophosphate: Parathion	
25	0,0-Diethyl 0-pyrazin-2-yl phosphorothioate: Thiomazin, Nemaphos, Cynem	
26	0,0-Diethyl 0-quinoxalin-2-yl phosphorothioate: Quinalphos, Bayrusil, Ekalux	
27	0,0-Diethyl S-[2-(ethylthio)ethyl]phosphorothioate: Disulfoton, Thiodemeton	
28	0,0-Diethyl S-isopropylcarbamoylmethyl phosphorothioate: Prothoate, Fac	
29	0,0-Diisopropyl S-benzylthiophosphate: Kitazin, IBP	
30	0,0-Dimethyl 0-(3-methyl)-nitrophenyl)thiophosphate: Fenitrothion, Monocrotophos	
31	0,0-Dimethyl 0-4-(methylthio)phenyl phosphorothioate: Baytex, Fenthion, MPP	2
32	0,0-Dimethyl 0-p-nitrophenyl thiophosphate: Methyl parathion, Methaphos, Metacide	
33	0,0-Dimethyl S-(1,2-diethoxycarbonyl)ethyl)dithiophosphate: Malathion	
34	0,0-Dimethyl S-(5-methoxy-2-oxo-1,3,4-thiadiazol-2(3H)-ylmethyl)dithiophosphate: Methidathon, DMTP	
35	0,0-Dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(4H)-yl)methyl]dithiophosphate: Azinphos-methyl, Guthion	
36	0,0-Dimethyl S-methylcarbamoylmethyl dithiophosphate: Dimethoate, Cygon	
37	0,0-Dimethyl S-phthalimidomethyl phosphorodithioate: Phosmet, PMP, Imidan	
38	0,0-Dimethyl (S-2-(1-methylcarbamoyl)ethylthio)ethyl thiophosphate: Vamidotion	
39	0,0-Dimethyl-0,4-sulfamoylphenyl phosphorothioate: Cythioate, Cyflee	
40	0,0-Dimethyl-2-methylcarbamoylmethyl phosphorothioate: Omethoate, Folimat	
41	0,0-Dimethyldibromo-1,2-dichloroethyl phosphate: Naled, Dibrom, Bromchlorphos	
42	0,0-Dithyl[0-(methylsulfinyl)phenyl]thiophosphate: Fensulfothion, Terracur-P, Dasanit	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
43	0,4-Dimethylsulfamoylphenyl 0,0-dimethyl phosphorothioate: Famophos, Famphur	
44	0,4-Dimethylsulfamoylphenyl 0,0-dimethyl phosphorothioate: DSP, Kaya-ace	
45	0,S-Dimethyl phosphoramidothioate: Methamidophos, Monitoior, Tamaron	
46	0-(4-bromo-2,5-dichlorophenyl)0,0-diethyl phosphorothioate: Bromophos-ethyl, Nexagan	
47	0-[2-(Dimethylamino)-6-methyl-4-pyrimidinyl] 0,0-diethylphosphorothioate: Pyrimithate, Pyrimiate, Diothyl	
48	0-2,4-Dichlorophenyl 0-ethyl phenylphosphorothioate: EPBP, S-Seven	3
49	0-2,5-Dichloro-4-(methylthio)phenyl 0,0-diethyl phosphorothioate: Chlorthio-phos, Celathion	
50	0-2-Diethylamino-6-mathylpyrimin-4-yl 0,0-diethylphosphorothioate: Pirimi-phos-ethyl, Pirimicid	
51	0-4-Bromo-2-chlorophenyl 0-ethyl S-propyl phosphorothioate: Profenophos, Curacron, Selecron	
52	0-Methyl 0-(4-Bromo-2,5-dichlorophenyl)phenyl thiophosphate: Phosvel, Abar, Leptophos	
53	0-Methyl 0-cyclohexyl S-(p-chlorophenyl)thiophosphate: MHCP, Cerezin	
54	1,1',1''-Phosphinylidyne triaziridine: Triethylene phosphoramidate, Aphoxide, APO	
55	1,1',1''-Phosphinylidynetris (2-methylaziridine): Metepa, Methyl aphoxide, MAPO	
56	1,1'-Iminodi(octamethylene)diguandine: Guazatine, Panoctine	3.5
57	1,1'-Methylenedi(thiosemicarbazide): Bisthiosemi, Kayanex	2
58	1,1'-Oxybis[2-chloroethane]: sym-Dichloroethyl ether, DCEE, Chlorex	
59	1,1'-Thiobis(2-chloroethane): Mustard gas	
60	1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane: DDT	
61	1,1-Dichloro-1-nitroethane: Dichloronitroethene, Ethide	
62	1,1-Dimethyl-4,4-dipyridinium: Paraquat, Gramoxone	
63	1,1-Ethylene-2,2-dipyridylum dibromide: Diquat, dibromide, Reglox, Reglone	
64	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4a,5,6,7,8,8a-octahydro-exo-1,4-exo-5,8-dimethanonaphthalene: Endrin, Nendrin	
65	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4a,5,6,7,8,8a-octahydro-endo-exo-1,4,5,8-dimethanonaphthalene: HEOD, Dieldrin, Octalox	
66	1,2,3,6-Tetrahydro-N-(trichloromethylthio)phthalimide: Captan, Captap, Orthocide	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
67	1,2-Dibromo-3-chloropropane: DBCP	
68	1,2-Dibromoethane: EDB	50
69	1,2-Dihydro-3,6-pyridazinedione: Maleic hydrazide, MH	
70	1,2-O-(2,2,2-Trichloroethylidene)-q-D-glucofuranose: Chloralose, Glucochloralose, Glucochloral	
71	1,3,4,5,6,7,8,-Octachloro-1,3,3a,4,7,7a-hexahydricthanoisobenzofuran: Isobenzan, Telorin, Omtan	
72	1,3,4,5,6,7,8,-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7,1H-indene: Chlor-dan(e), Toxichlor, Niran	
73	1,3-Di(caramoylthio)-2-(N,N-dimethylamino)propane: Cartap, Padan, Cadan	2
74	1,3-Dichloropropene	
75	1,3-Dimethyl-1-(5-trifluoromethyl-1,3,4-thiadiazol-2-yl)urea: Thiazafuron, Erbotan	
76	1,4,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene: Drinox, Heptachlor(e), Heptamul	6
77	1,4-Dichlorobutane	
78	1-(2,2-Dimethyl-1-methylthiomethylpropylidenamino-oxy)-N-methylformamide: Thiofanox, Thiofanocarb, Dacamox	
79	1-(4-Amino-1,2-dihydro-2-oxopyrimidin-1-yl)-4[(S)-3-amino-5-(1-methylquanidino)valeramido]-1,2,3,4-tetraoxy-B-D-erythrohex-2-enopyranuronic acid: Blasticidin-S	
80	1-(4-Nitrophenyl)-3-(3-pyridylmethyl)urea: Priminil, Vacor	
81	1-[(Dimethylamino)carbonyl]-5-methyl-1H-pyrazol-3-yl dimethylcarbamate: Dimetilan, Snip	
82	1-allyl-1-(3,7-dimethyl-octyl)piperodinium: Piproctanyl, Alden, Stremtrol	
83	1-Benzothiazol-2-yl-1,3-dimethylurea: Methabenzthiazuron, Tribunil	
84	1-Chloro-1,2-dibromoethane: CDBE	
85	1-Chloro-2-nitropropane: Lanstan	
86	1-Hydro-2(1H)-pyridinethione: Omadine, Pyrithione, PTO	
87	1L-(1,3,4/2,6)-2,3-Dihydroxy-6-hydroxymethyl-4-[(1S,4R,5S,6S)-4,5,6-trihydroxy-3-hydroxy-methylcyclohex-2-enylamino]-cyclohexyl-B-D-glucoopyranoside: Validamycin(A), Validacin, Valimon	
88	2(4)-(1-Methylheptyl)-4,6(2,6)-dinitrophenyl crotonate: Dinocap, DPC, Miledex	
89	2,-(Dimethylacetyl)-1 H-indene-1,3(2H)-dione: Diphenadione, Diphacinone	
90	2,2,2-Trichloro-1,1-bis(4-chlorophenyl)ethanol: Dicofol, Kelthane	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
91	2,2,4,4,6,6-Hexakis(1-aziridinyl)-2,2,4,4,6,6-hexahydro-1,3,5,2,4,6-triazatriphosphorine: Apholate	
92	2,2-Dimethyl-1,3-benzodioxol-4-yl-methylcarbamate: Bendiocarb	
93	2,2-Dimethyl-2,3-dehydro-1-benzofuran-7-yl-N-(N-12-ethoxycarbonylisopropylsulfenamoyl)-N-methylcarbamate: Benfuracarb	
94	2,2-Dimethyl-2,3-dihydro-7-benzofuranyl-N-methylcarbamate: Carbofuran, Furan, Curaterr	
95	2,3-Dibromopropionitrile	
96	2,3-Dihydro-2,2-dimethylbenzofuran-7-yl(dibutylamin)methylcarbamate: Carbosulfan, Marshal	
97	2,4,6-Trinitrophenol: Picric acid (excluding explosives)	
98	2,4-Dichloro-6-nitrophenol	
99	2,4-Dinitro-6-methyl propylphenyldimethyl acrylate: Binapacryl, Morocide	
100	2,5-Cyclohexadiene-1,4-dione: Quinone, 1,4-Benzoquinone	
101	2,6-Dibromo-4-[(4-nitrophenyl)azo]phenol: BAB	3
102	2-(1,3-Dioxolan-2-yl)-phenyl methylcarbamate: Dixacarb, Elocron	
103	2-(1-Methylpropyl)phenyl methylcarbamate: Bassa, BPMC, Fenobucarb	2
104	2-(2,2-Dimethyl-1-oxopropyl)-1H-indene-1,3(2H)-dione: Pindone, Pival	
105	2-(2-Chloro-1-methoxyethoxy)phenyl methylcarbamate: Cloethocarb, Lance	
106	2-(methylthio)propionaldehyde O-methylcarbamoyloxime: Aldicarb, Temik	
107	2-(p-tert-Butylphenoxy)cyclohexyl 2-propynyl sulfate: Propargite, Omite	
108	2-[(4-Chlorophenyl)phenylacetyl]-1H-indene-1,3(2H)-dione: Chlorophacinone, Caid, Laphaidione	0.025
109	2-[5-Ethyletrahydro-5-[tetrahydro-3-methyl-5-[tetrahydro-6-hydroxy-6-(hydroxymethyl)-3,5-dimethyl-2H-pyran-2-yl]-2-furyl]-2-furyl]-9-hydroxy-B-methoxy-B-methoxy-a,G,2,8-tetramethyl-1,6-dioxaspiro[4,5]decane-7-butyric acid: Monensm	
110	2-Aminino-3-chloro-1,4-naphthoquinone: ACN, Motgeton, ACNQ	
111	2-Benzothiazol amine: 2-Aminobenzothiazol	
112	2-Bromo-2-nitropropane-1,3-diol: Bronopol	
113	2-Butanone: Methyl ethyl, ketone, MEK	
114	2-Butenal: Crotonaldehyde	
115	2-Chloro-1-(2,4-dichlorophenyl)vinyldimethyl phosphate: Dimethylvinphos	
116	2-Chloro-1-(2,4-dichlorophenyl)vinyldimethyl phosphate: Themivinphos	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
117	2-Chloro-2-diethylcarbamoyl-1-methylvinyl dimethyl phosphate: Phosphamidon, Dimecron	
118	2-Chloro-4,5-dimethylcarbamate: Carbanolate, Banol	
119	2-Chloro-4-methyl-6-dimethylaminopyrimidine	
120	2-Chloro-N-(2-chloroethyl)-N-methylethanamine: Mechloroethamine	
121	2-Chloroethyltrimethylammonium: Chlormequat, Cycocel	
122	2-Cyclohexyl-4,6-dinitrophenol: Dinex, DN	0.5
123	2-Dimethylamino-5,6-dimethyl-4-pyrimidinyl dimethylcarbamate: Pirimor, Pirimicarb	
124	2-Ethylthioethyl O,O-dimethyl phosphorthioate: Methyldemton, Metasystox	
125	2-Furancarboxaldehyde: Furfural	
126	2-Hydroxyethylhydrazine: Omaflora, Brombloom, 2-Hydrazinoethanol	
127	2-isopropyl-4-methylpyrimidinyl-6-diethyl thiophosphate: Diazion, Dimpylate	
128	2-Isopropoxybenzoic acid methylamide	1
129	2-Isopropoxyphenyl N-methylcarbamate: Baygon, Propuxur, Uden(e)	1
130	2-Isopropylphenyl methylcarbamate: Isprocarb, MICP, Etroforan	1.5
131	2-Isopropylphenyl O,O-dimethylphosphorodithioate: Isothioate, Hosdon	
132	2-Mesyl-2-Methylpropionaldehyde O-methylcarbonyloxime: Aldoxycarb, Standak	
133	2-Methoxy-4H-1,3,2-benzodioxaphosphorin 2-sulfate: Dixabenzofos, Salithion	
134	2-Propenal: Acrolein	
135	2-sec-Butyl-4,6-dinitrophenol: Dinoseb, DNBP	
136	2-sec-Butyl-4,6-dinitrophenyl acetate: Dinoseb acetate, DNBPA	
137	2-sec-Butyl-4,6-dinitrophenyl isopropyl carbonate: Dinobuton, Acrex, Sytasol	
138	2-tert-Butyl-4,6-dinitrophenol: Dinoterb	
139	2-tert-Butyl-5-(4-tert-butylbenzylthio)-4-chloropyridazin-3(2H)-one: Pyridaben	
140	3,5-Dimethyl-1,3,5-thiadiazinane-2-thione: Dazomet, Tiazon, Basamid	
141	3,5-Dimethyl-4-methyl thiophenyl methylcarbamate: Methiocarb, Mercaptodimethur	
142	3,5-Dimethylphenyl N-methylcarbamate: XMC, Macbal	3
143	3,7,9,13-Tetraazapentadeca-3,12-dien-6,10-dione: Thiocarb, Larvin, Semevin	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
144	3,7-Dichloro-8-quinoline carboxylic acid: Quinclorac	
145	3-(2-Chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylic acid cyano-(3-phenoxyphenyl)methyl ester: Cyhalothrin, Grenade	
146	3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea: Linuron, Methoxydiuron, Afalon	
147	3-(3-Biphenyl-4-yl-1,2,3,4-tetrahydro-1-naphthyl)-4-hydroxy-coumarin: Difenacoum, Ratak	
148	3-(a-Acetylbenzyl)-4-hydroxycoumarin: Warfarin, Rodex, Coumarins	
149	3-(Dimethoxyphosphinyloxy)-N-methylisocrotonamide: Azodrin, Monocrotophos, Apadrin	
150	3-(Methylthio)butanone O-methylcarbamate: Butocarboxim(e)	
151	3-[1-(2-Furanyl)-3-oxobutyl]-4-hydroxycoumarin: Coumafuryl, Fumarin	
152	3-[1-(4-Chlorophenyl)-3-oxobutyl]-4-hydroxy-2H-1-benzopyran-2-one: Coumachlor, Grenade	
153	3-[2-(3,5-Dimethyl-3-oxocyclohexyl)-2-hydroxyethyl]glutarimide: Cycloheximide, Actidione	0.2
154	3-[3-(4'-Bromo[1,1-biphenyl]-4-yl)-1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-2H-1-benzopyran-2-one: Brodifacoum, Talon	
155	3-[3-(4'-Bromobiphenyl-4-yl)-3-hydroxy-1-phenylpropyl]-4-hydroxycoumarin: Bromadiolone, Maki	
156	3-Buten-2-one: Methyl vinyl ketone	
157	3-Chloro-1,2-propanediol: Chlorohydrin	
158	3-Dimethylaminomethyleneaminophenyl methylcarbamate: Formethenate, Dicarzol	
159	3-Hydro-2-pentenedioic acid dimethyl ester dimethyl phosphate: Bomyl, Swat	
160	3-Methyl-1-(1-methylethyl)-1H-pyrazol-5-yl-dimethyl-carbamate: Isolan	
161	3-Methyl-5-isopropylphenyl-N-methylcarbamate: Promecarb(e), Carbamult	
162	4,6-Dinitro-0-cresol: DNOC, Antinonnin, Sinox	
163	4-(2-Chlorophenylhydrazone)-3-methyl-5-isoazolone: Drazoxolon, Ganocide	
164	4-(Dimethylamino)-3,5-dimethylphenyl methylcarbamate: Mexacarbate, Zectran	
165	4-Amino-6-tert-butyl-4,5-dihydro-3-methylthio-1,2,4-triazin-5-one: Metribuzin(e), Lexone, Sencor	
166	4-Diallylamino-3,5-dimethylphenyl N-methylcarbamate: APC, Hydrol, Allyxycarb	
167	4-Dimethylamino-m-tolymethyl carbamate: Acephate, Orthene	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
168	4-Ethylthiophenyl methylcarbamate: Toxamate, EMPC	
169	4-Hydroxy-3,5-di-iodobenzonitrile: Ioxynil, Actril	3
170	4-Hydroxy-3-(1,2,3,4-tetrahydro-1-naphthyl)coumarin: Coumatetral, Racumin	
171	4-Hydroxy-3-(1,2,3,4-tetrahydro-3[4-(4-trifluoromethylbenzyloxy)phenyl]-1-naphthyl)coumarin: Flocoumafen, Storm, Stratagem	
172	4-Indol-3-yl-butyric acid: IBA, Seradix, Rootone F	
173	5,10-Dihydro-5,10-dioxonaphto[2,3-b]-1,4-dithin-2,3-dicarbonitrile: Dithianone, Delan	
174	5,5-Dimethyl-3-oxocyclohex-1-enyl dimethylcarbamate: Dimetan	
175	5-(a-Hydroxy-a-2-Pyridybenzyl)-7-(a-2-pyridylbenzylidene)-5-norbornene-2,3-dicarboximide: Norbormide, Raticate, Shoxin	
176	5-[(3-Carboxy-4-hydroxyphenyl)(3-carboxy-4-oxo-2,5-cyclohexadion-1-ylidone)methyl]-2-hydroxybenzoic acid triammonium salt: Aluminon, Lysofon	
177	5-Amino-3-phenyl-1H-1,2,4-triazol-1-yl-N,N',N'-tetramethylphosphonic diamide: Triamiphos	
178	5-Benzyl-3-furylmethyl(IRS)-cis,trans-chrysabthemate: Resmethrin, Chryson, Benzyfuroline	
179	5-Methyl-1,2,4-triazolo[3,4-b]benzothiazole: Tricyclazole, Beam, Blaside	4
180	6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin 3-oxide: Endosulfan, Thioadan, Chlorthiepin	
181	6-Methyl-1,3-dithiolo-[4,5,b]-quinoxalin-2-one: Chinomethionate(e), Quiomethionate, Morestan	
182	6-tert-Butyl-2,4-dinitro-m-tolylacetate: Medinoterb acetate	
183	7-Bromo-6-chloro-3[3-(3-hydroxy-2-piperidyl)-2-oxypropyl]-4(3H)-quinazolinone: Halofuginone	
184	7-Chlorobicyclo[3.2.0]hepta-2,6-dien-6-yl dimethylphosphate: Heptenophos, Ragadan, Hostaquick	
185	7-Oxybicyclo[2.2.1]heptane-2,3-dicarboxylic acid: Endothal(1)	
186	9,10-Secocholesta-5,7,10(19)-trien-3-ol: Vitamin D3, Activated 7-dehydrocholesterol, Ebivit	
187	a-Naphthyl thiourea: ANTU, Bantu, Krysidi	
188	a,a,a-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine: Trifluralin, Treflan, Elancolan	
189	a-Amino-3-hydroxy-5-isoxazoleacetic acid: Ibotenic acid	
190	a-Cyano-m-phenoxybenzyl-a-isopropyl-p-chlorophenyl acetate: Fenvalerate	
191	A-Ethylthio-0-tolyl methylcarbamate: Ethiofencarb, Croneton	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
192	Acetylene dicarboxamide: Cellocidin, Lenamycin, 2-Butynediamide	
193	Acrylamide: Porpenamide	
194	Acrylonitrile: 2-Propenenitrile, Vinyl cyanide	
195	Alkanolammonium 2,4-dinitro-6-(1-methylpropyl) phenolate	
196	Aluminum phosphide: Celphos, Phostoxin (or any substance having aluminum phosphide solving accelerator)	
197	Ammonia	10
198	Ammonium hydrogen fluoride: Ammonium bifluoride	
199	Aniline	
200	Antimony compound	
201	Arsenic	
202	B-Naphthol	1
203	B-Fluoroethyl acetate	
204	Barium compound (excluding barium sulfate)	
205	Benzene	
206	Bichromate	
207	Bis[tris(2-methyl-2-phenylpropyl)tin] oxide: Fenbutatin oxide, Vendex, Osda-ran	
208	Bromine	
209	Bromo-2-propane: Bromoaceone	
210	Butyl-2,3-dimethylbenzofuran-7-yl N,N'-dimethyl-N,N'-thiodicarbamate: Furthiocarb, Deltanet	
211	Butyl-S-benzyl-S-ethyl dithiophosphate: Conen, BEBP	
212	Cadmium compound	
213	Calcium methanarsonic acid: MAC	
214	Carbon disulfide	
215	Carbon tetrachloride	
216	Chlorinated 2,2-dimethyl-3-methylenbicyclo[2.2.1]heptane: Campechlor, Chlorinated camphene, Texaphene	
217	Chloroacetic acid: MCA	
218	Chloroform	
219	Chloromethyloxirane: Epichlorohydrin	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
220	Chlorosulfonic acid	
221	Chromic acid	
222	Chromic anhydride	
223	Chromium acetate	
224	cis, trans-3-chloro-4-[4-methyl-2-(1H-1,2,4-triazol-1-ylmethyl)-1,3-dioxolan-2-yl]phenyl 4-chlorophenyl ether: Difenconazole	
225	Complex compound of calcium methyldichlorovinyl phosphate and dimethyldichlorovinyl phosphate: Carguophos	
226	Cresol: Methyl phenol, oxytoluene	
227	Curare: Urari	
228	Curarine	
229	Cyclotrimethylenetrinitramine: Cyclonite, RDX, Hexogen	
230	Di(2-chloroisopropyl) ether	
231	Diacetoxypropane: DAP	
232	Dichloroacetic acid	
233	Dichlorobenzenediazothiurea: Chlorothiophos, Muritan, Promurit	
234	Dichlorobenzoic acid	15
235	Dichloronitroethatn: GASPA, NET	
236	Diethyl (4-methyl-1,3-dithiolan-2-ylidene)phosphoramidate: Mephosfolan, Cytrolane	
237	Diethyl 1,3-dithiolan-2-ylidenephosphoramidate: Fosthiethan, Acconem, Geofos	
238	Diethyl 1,3-dithiolan-2-ylidenephosphoramidate: Phosfolan, Cyolane, Cylan	
239	Diethyl 5-methyl-3-pyrazolylphosphate: Pyrazoxoan	
240	Diethyl S-benzylthiophosphate: EBP, Kitzin	2.3
241	Diethyl(5-phenyl-3-isoxazolyl)thiophosphate: Isoxathion, Karpfos	
242	Diethyl-1-(2,4-dichlorophenyl)-2-chlorovinyl phosphate: Chorbenvinphos	
243	Diisopropyl fluorophosphate: Isofluorphate, DFP	
244	Diisopropyl S-(ethylsulfinylmethyl)dithiophosphate: Aphidan, IRSP	5
245	Dimethyl(E)-2-dimethylcarbamonyl-1-methylvinyl phosphate: Ektafos, Dicrotopos, Birdin, Carbicron	
246	Dimethyl 2,2,2-trichloro-1-hydroxyethylphosphonate: Dipterex, Trichlorfon, Chlophos	10

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
247	Dimethyl sulfate	
248	Dimethyl terephthalate	
249	Dimethyl(E)-1 methyl-2-(1-phenylethoxycarbonyl)vinyl phosphate: Crotoxyphos, Ciodrin	
250	Dimethyl(E)-1-methyl-2-(methylcarbamoyl)vinyl phosphate: Azodrin, Monocrotophos	
251	Dimethyl-2,2-dichlorovinylphosphate: Dichlorvos, DDVP	
252	Dimethyl-S-(p-chlorophenyl)thiophosphonate: DMCP, Fujithion	
253	Dimethylphenol: Xylenol	5
254	Dimethylsulfinylisopropyl thiophosphate	
255	Dipropyl-4-methylthiophenyl phosphate: Kayphos, Propaphos	
256	Dodecylguanidine acetate: Dodine, Carpene, Cyprex	
257	Ethyl 2-diethoxythiophosphoryloxy-5-methylpyrazolo[1,5a]pyrpyrimidine-6-carboxylate: Pyrazophos Afugan, Missile	
258	Ethyl 4-(methylthio)-m-tolyl isopropylphosphoranmidate: Fenamiphos, Nema-cur	
259	Ethyl acetate	
260	Ethyl bromide	
261	Ethyl chloride	
262	Ethyl O-benzoyl 3-chloro-2,6-dimethoxybenzohydroximate: Benzoximate, Citrazon, Aazomate	
263	Ethyl thiocynoacetate: REE, Sassen	1
264	Ethylene chlorohydrin: 2-chloroethanol	
265	Ferric methanardonic acid: MAF	
266	Fluroboacetic acid	
267	Fluroboacetic acid amide: Fussol, Fluoroacetamide	
268	Fluroboacto-p-bromoaniline: FABA	
269	Fluroboric acid	
270	Flurosilicic acid	
271	Formalin	1
272	Fuming sulfate acid: Oleum	
273	G-2,c-4,c-6,c-8-Tetraethyl-1,3,5,7-etraoxocane: Metaldehyde	
274	Hexachlorocyclohexane: BHC, HCH	1.5

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
275	Hexaethyl tetraphosphate	
276	Hydrazine hydrate	
277	Hydrochloric acid	10
278	Hydrogen bromide	
279	Hydrogen chlorate (excluding explosive)	
280	Hydrogen fluoride	
281	Hydrogen iodine	
282	Hydrogen peroxide	6
283	Hydrogen phosphide: Phosphine	
284	Hydroxylamine	
285	I-Naphthyl methylcarbamate: Carbaryl, Seven, Arylam	5
286	Inorganic copper (excluding fulminating copper and copper fulminate)	
287	Inorganic cyanide compound (excluding ferric ferricyanide, rhodan compound, and calcium cyanamide)	
288	Inorganic gold (excluding fulminating gold and gold fulminate)	
289	Inorganic silver (excluding silver chloride and silver fulminate)	
290	Inorganic tin	
291	Inorganic zinc (excluding zinc carbonate and zinc fulminate)	
292	Iodine	
293	L-2-Amino-4[(hydroxymethyl)phosphinoyl]-butyryl-L-ala-nyl-L-alanine: Phosphinothricylalanylalanine	19
294	Lasalocid	2
295	Lead compound (excluding lead tetroxide, lead sulfate, basic lead carbonate)	
296	m-(1-Methylbutyl)phenylmethyl carbamate mixture with m-(1-Ethylpropylphenyl carbamate (3:1): Bufencarb, Metalkamate	
297	m-Toly methylcarbamate: metolcarb, Tsumacide, MTMC	2
298	Magnoliaceae illicium religiosum siebet zucc	
299	Mercury	
300	Methyl alcohol: Methanol	
301	Methyl bromide	
302	Methyl chloride (NOTE: Pesticides in a container (300 mL or smaller) with 50% or less of methyl chloride are excluded.)	50

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
303	Methyl iodine	
304	Methyl isothiocyanate: Trapex, MITC	
305	Methyl N-(2,6-dimethylphenyl)-N-(2-methoxyacetyl)-DL-alaninate: Metalxyl, Ridomil, Apron	
306	Methylene bithiocyanate	
307	Methylhydrazine	
308	Methylsulfonal	
309	Molybdenum trioxide	
310	N'-(2-Methyl-4-chlorophenyl)-N,N-dimethylformamide: Chlorodimeform, Galecron, Fundal	3
311	N'N''-Diisopropyl-6-methylthio-1,3,5-triazine-2,4-diamine: Prometryn(e), Gesagard, Caparol	
312	N,N-Dimethyl-1,2,3-trithian-5-ylamine: Thiocyclam(e), Evisekt	3
313	N,N-Dimethyl-2,2-diphenyl acetamide: Diphenamide	
314	N,N-Dimethyl-2-methylcarbamoyloxyimino-2(methylthio) acetamide: Oxamyl, Vydate	
315	N-(1,1,2,2-Tetrachloroethylthio)cyclohex-4-ene-1,2-dicarboximid: Captafol, Difolatan	
316	N-(3-Chloro-4-Chlorodifluoromethylthiophenyl)-N,N-dimethyl-urea: Thiochloromethyl	12
317	N-(N-Trichloromethylthio)phthalimide: Folpet, Phaltan	
318	N-(p-Bromobenzyl) monofluoroacetamide	
319	N-[(Dichlorofluoromethyl)thio]-N',N'-dimethyl-N-phenyl sulphamide: Dichlofluanid, Elvaron, Euparen(e)	
320	N-Alkylaniline	
321	N-Alkyldimethylbenzyl ammonium chloride	
322	N-Alkyltoluidine	
323	N-Bromo-N'-chloro-5,5-dimethylhydantoin: Halogenated hydantoin	
324	N-Butylpyrolidine	
325	N-Methyl-2,4-dinitro-N-(2,4,6-tribromophenyl)-6-(trifluoromethyl) benzeneamine: Bromethaline(e)	
326	N-Methyl-N-(1-naphthyl) monofluoroacetoamide: MNFA, Nissol	
327	N-Methylcarbamyl-2-chlorophenol: Etrofol, CPMC, Hopcid	2.5

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
328	N-tert-Butyl-6-chloro-N'-ethyl-1,3,5-triazine-2,4-diamine: Gardoprim, Terbutylazine	
329	Nickel carbonyl	
330	Nicotene	
331	Nitric acid	
332	Nitrobenzene	
333	Nitrous acid	
334	O,O,O',O'-Tetraethyl dithiopyrophosphate: Sulfotep, Bladafum	
335	O,O,O',O'-Tetraethyl S,S'-methylene bis(phosphorodithioate): Ethion, Dithon	
336	O-(5-Chloro-1-isopropyl-1H-1,2,4-triazol-3-yl)O,O-dieyhyll phosphorothioate: Isazofos, Miral	
337	O-2-Chloro-4-methylthiophenyl O-methyl ethylphosphoramidothioate: Mitemate, Amidothioate	
338	O-Ethyl 4-(methylthio)phenyl s-propyl dithiophosphate: Sulprofos, Bolstar, Helothion	3
339	O-Ethyl O-2,4,5-trichlorophenyl ethylphosphonothioate: Trichloronate, Agrisil, Phytosol	
340	O-Ethyl O-2-isopropoxycarbonylphenyl isopropylphosphoramidothioate: Isofenphos, Oftanol, Amaze	
341	O-Ethyl O-4-nitrophenyl phenylphosphonothioate: EPN	
342	O-Ethyl S, S-diphenyl phosphorodithioate: EDDP, Edifenphos, Hinosan	2
343	O-Ethyl S, S-dipropyl phosphorodithioate: Ethoprofos, Mocap, Prophos	
344	O-Ethyl S-Phenyl-(R,S)-ethylphosphonodithioate: Fonofos, Dyfonate	
345	Octamethylpyrophosphoramidate: Schradan, OMPA, Sytam	
346	Other poisonous substances designated by the Minister of Environment	
347	Oxalic acid	
348	p-Chloropheyl diazothiurea	
349	p-Dimethylaminobenzenediazosulfonate	
350	Pentachlorophenol	1
351	Phenol	5
352	Phenylenediamine	
353	Phenylhydrazine: Hydrazinobenzene	
354	Phenyl N,N'-dimethylphosphorodiamidate: Diamidafos	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
355	Phosphorothioic acid O,O-dithyl O-(7,8,9,10-tetrahydro-6-oxo-6H-dibenzo[b,d]pyran-3-yl)ester: Coumithioate, Dithion, Dition	
356	Phosphorus sulfide	
357	Poly[oxyethylene(dimethylimino)ethylene(dimethylimino)ethylene dichloride]: WSCP	
358	Potassium	
359	Potassium hydroxide	5
360	Potassium, Sodium, Alloy of potassium and sodium	
361	Propylene oxide	
362	Rotenone	2
363	S,S'-(1,4-Dioxane-2,3-diyl)0,0,0',0'-tetraethyldi(phosphorodithioate): Dioxathion, Delnav, Deltic	
364	S,S'-Dimethyl 2-difluoromethyl-6-trifluoromethylpyridine-3,5-dicarbothioate: Dithiopyr	
365	S,S,S-Tributylphosphorotrithioate	
366	S-(2-Methyl-1-piperidyl carbonylmethyl)dipropyl dithiophosphate: Piperophos, Avirosan, Rilof	4.4
367	S-(4-Methylsulfonyloxyphenyl)-N-methylthiocarbamate	
368	S-(N-Ethoxycarbonyl-N-methylcarbamoylmethyl)0,0-diethylphosphorodithioate: Mercarbam, Affos, Murfotox	
369	S-(N-Formyl-N-methylcarbamoylmethyl)0,0-dimethyl phosphorodithioate: Formothion, Anthio, Aflix	
370	S-[[[(1,1-dimethylethyl)thio]methyl] 0,0-diethyl phosphorodithioate: Terbufos, Counter	
371	S-[2-(Diethylamino)ethyl] 0,0-diethylphosphorothioate: Amiton, Tetram	
372	S-2,5-Dichlorophenylthiomethyl 0,0-diethylphosphorodithioate: Phencapton	1.5
373	S-2-Benzenesulphonaminoethyl 0,0-diisopropylphosphorodithioate: Bensulide, Betasan, Prefar	
374	S-2-Chloro-1-phthalimidoethyl 0,0-dithyl dithiophosphate: Dialifos, Dialifor, Torak	
375	S-2-Ethylsulfinyl-1-methylethyl 0,0-dimethyl phosphorothioate: ESP, Estox, Oxydeprofos, Metasystox S	
376	S-2-Ethylsulfinyl-1-methylethyl 0,0-dimethyl phosphorothioate: Oxydemeton-methyl, Metasystox R	
377	S-2-Ethylsulfonylethyl 0,0-dimethyl phosphorothioate: Demeton-S-methyl sulfone, Metaisostoxsulfon	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
380	S-2-Ethylthioethyl 0,0-dimethyl phosphorodithioate: Thiometon, Ekatin	
381	S-4-Chlorophenylthiomethyl 0,0-methyl dithiophosphate: Carbophenothion, Trithion	
382	S-4-Chlorophenylthiomethyl 0,0-methyl phosphorodithioate: Methyltrithion, Tri-Me	
383	S-5-Methoxy-4-oxo-4H-pyran-3-ylmethyl 0,0-dimethyl phosphorothioate: Endothion, Endocide	
384	S-6-Chloro-2,3-dihydro-2-oxobenzoxazol-3-ylmethyl 0,0-diethyl phosphorodithioate: Phosalone, Zolone	2.2
385	S-a-(Ethoxycarbonyl)benzyl 0,0-dimethyl phosphorodithioate: PAP, Phenthoate, Cidial	3
386	S-Chloromethyl 0,0-diethyl phosphorodithioate: Chlormephos, Dotan	
387	S-Ethyl N,N-hexamethylenethiocarbamate: Molinate, Ordram	
388	S-Methyl N-[(methycarbamoyl)oxy]thioacetimidate: Methomyl, Lannate	
389	Salinomycin	1
390	Sea onion: Squill, Bulbusscillaë, Meerzwiebel	
391	Selenium	
392	Sodium	
393	Sodium aluminum fluoride: Cryolite, Kryolith	
394	Sodium cyanate	
395	Sodium Fluoride	
396	Sodium hydroxide	5
397	Sodium peroxide	5
398	Sodium-2-pyrimidinethiol 1-oxide	
399	Strychnidin-10-one: Strychnine	
400	Sulfonal	
401	Sulfur	
402	Sulfuric acid	10
403	Sulfuryl fluoride	
404	Tert-Butyl(e)-a-(1,3-dimethyl-5-phenoxy-pyrazol-4-ylmethyleneamino-oxy)-p-toluate: Fenpyroximate	
405	Tetraalkyl lead	
406	Tetrachloroisophthalonitrile: Chlorothalonil, TPN, Bravo	

(continued)

Appendix 5-2 (continued)

Number*	Chemical Name	Percentage**
407	Tetrachloronitriethane	
408	Tetraethyl pyrophosphate: TEPP, Tetron, Vpotone	
409	Tetramethyl phosphorodiamidic fluoride: Dimefox	
410	Tetramethylthiuram disulfide: Thiram(e), TMTD, Thiuram	
411	Thallium acetate	
412	Thallium nitrate	
413	Thallium sulfate	
414	Thiosemicarbazide	
415	Toluene	
416	Toluenediamine	
417	Toluidine	
418	Tri(cyclohexyl)-1H-1,2,4-triazol-1-yl tin: Azocyclotin, Peropal	
419	Triaryl tin hydroxide	2
420	Tributyl(2,4-dichlorobenzyl)phosphonium ion: Chlorphonium, Phosfon, Phos-fleur	
421	Trichloroacetic acid	
422	Trichloronitroethylene	
423	Trichloronitromethane: Chloropicrin	
424	Tricyclohexatin hydroxide: Cyhexatin, TCTH, Plictran	
425	Trifluoromethanesulfonic acid	10
426	Trilkyl tin hydroxide	2
427	Trithiocycloheptadiene-3,4,6,7-tetranitrile: TCH	15
428	Urea peroxide	17
429	Xylene: Dimethylbenzene, Xylol	
430	Yellow phosphorus: phosphorus	
431	Zinc dimethyldithiocarbamate: Zirem	
432	Zinc methyldithiocarbamate	
433	Zinc phosphide	

* Chemical concentrations are 1 percent if not listed.

**Chemical is not regarded as "hazardous" if its concentrations are less than the listed percentage (if given).

Appendix 5-3

Bilingual Labels and Placards Form Numbers (USFK EGS Table 5-3)

Form Name	Form Number	Remarks
Explosive	EA Label 124EK	DOT Label
Explosive 1.4	EA Label 118EK	DOT Label
Blasting Agent 1.5	EA Label 126EK	DOT Label
Explosive 1.6	EA Label 125EK	DOT Label
Flammable Gas	EA Label 91EK	DOT Label
Non-flammable Gas	EA Label 92EK	DOT Label
Poison Gas	EA Label 95EK	DOT Label
Flammable Liquid	EA Label 93EK	DOT Label
Flammable Solid	EA Label 94EK	DOT Label
Spontaneously Combustible	EA Label 85EK	DOT Label
Dangerous When Wet	EA Label 90EK	DOT Label
Oxidizer	EA Label 89EK	DOT Label
Organic Peroxide	EA Label 86EK	DOT Label
Poison	EA Label 96EK	DOT Label
Harmful (Stow Away From Foodstuffs)	EA Label 127EK	DOT Label
Infectious Substance	EA Label 133EK	DOT Label
Radioactive I	EA Label 130EK	DOT Label
Radioactive II	EA Label 131EK	DOT Label
Radioactive III	EA Label 132EK	DOT Label
Corrosive	EA Label 87EK	DOT Label
Class 9	EA Label 137	DOT Label
Empty	EA Label 128	DOT Label
Packaging Orientation	EA Label 129	DOT Label
Explosive	EA Label 98EK	DOT Placard
Explosive 1.4	EA Label 98-1EK	DOT Placard
Blasting Agent 1.5	EA Label 99EK	DOT Placard
Explosive 1.6	EA Label 98-2EK	DOT Placard
Flammable Gas	EA Label 101EK	DOT Placard

(continued)

Appendix 5-3 (continued)

Form Name	Form Number	Remarks
Non-flammable Gas	EA Label 100EK	DOT Placard
Poison Gas	EA Label 102EK	DOT Placard
Oxygen	EA Label 113EK	DOT Placard
Flammable	EA Label 103EK	DOT Placard
Combustible	EA Label 104EK	DOT Placard
Flammable Solid	EA Label 105EK	DOT Placard
Spontaneously Combustible	EA Label 112EK	DOT Placard
Dangerous When Wet	EA Label 114EK	DOT Placard
Oxidizer	EA Label 107EK	DOT Placard
Organic Peroxide	EA Label 135EK	DOT Placard
Poison	EA Label 108EK	DOT Placard
Harmful (Keep Away From Foodstuffs)	EA Label 136EK	DOT Placard
Radioactive	EA Label 109EK	DOT Placard
Corrosive	EA Label 110EK	DOT Placard
Class 9	EA Label 115EK	DOT Placard
Dangerous	EA Label 97EK	DOT Placard
Asbestos	EA Label 134EK	OSHA Label
PCBs (6" x 6")	DRMO Form 21	PCB Label

Appendix 5-4

Maximum Allowable Capacity of Containers and Portable Tanks for Hazardous Materials (AFOSH Standard 127-43, Table 1)

Container Type	Flammable Liquids			Combustible Liquids	
	<i>IA</i>	<i>IB</i>	<i>IC</i>	<i>II</i>	<i>II</i>
Glass or approved plastic ¹	1 pt ²	1 qt ²	1 ³	1	1
Metal (other than DOT drums)	1	5	5	5	5
Safety cans	2	5	5	5	5
Metal drums (DOT specifications)	60	60	60	60	60
Approved portable tanks	660	660	660	660	660

¹ Nearest metric size is also acceptable for the glass and plastic containers listed.

² 1 gal or nearest metric equivalent size may be used if metal containers must be avoided because of chemical reaction with their contents.

³ Quantities are in gallons for the rest of this table.

Appendix 5-5

Storage of Hazardous Materials in Inside Rooms

(AFOSH Standard 127-43, Table 2)

Fire Protection Provided ¹	Fire Resistance	Maximum Size	Total Allowable Quantities ² (gal/ft ² floor area)
Yes	2 h	500 ft ²	10
No	2 h	500 ft ²	4
Yes	1 h	150 ft ²	5
No	1 h	150 ft ²	2

¹ Fire protection system will be sprinkler, water spray, or other approved method.

² If metric containers are being stored, use the nearest metric equivalent.



Appendix 5-6

Indoor/Outdoor Storage for Flammable/Combustible Materials

(DOD 4145.19-R-1, Tables 5-1 through 5-4)

Indoor Container Storage			
<i>Class Liquid</i>	<i>Storage Level</i>	<i>*Protected Storage Maximum per Pile In Gallons</i>	<i>Unprotected Storage Maximum per Pile In Gallons</i>
IA	Ground and upper floors	2750 (50)	600 (12)
	Basement	Not permitted	Not permitted
IB	Ground and upper floors	5500 (100)	1375 (25)
	Basement	Not permitted	Not permitted
IC	Ground and upper floors	16,500 (300)	4125 (25)
	Basement	Not permitted	Not permitted
II	Ground and upper floors	16,500 (300)	4125 (75)
	Basement	5500 (100)	Not permitted
III	Ground and upper floors	55,000 (1000)	13,750 (250)
	Basement	8250 (450)	Not permitted

*A sprinkler or equivalent fire protection system installed in accordance with NFPA Standard 30.

NOTES:

1. When two or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile must be the smallest of the two or more separate maximum gallonages.
2. Aisles must be provided so that no container is more than 4 m (12 ft) from an aisle. Main aisles must be at least 2 m (8 ft) wide and side aisles at least 1 m (4 ft) wide. (Numbers in parentheses indicate the number of 55-gal drums.)
3. Each pile must be separated from each other by at least 1 m (4 ft).

(continued)

Appendix 5-6 (continued)

Outdoor Container Storage				
<i>Class Liquid</i>	<i>Maximum per pile¹ (gal)</i>	<i>Distance between piles² (ft)</i>	<i>Distance to property line that can be built upon^{1,3} (ft)</i>	<i>Distance to street, alley, public way⁴ (ft)</i>
IA	1100	5	20	10
IB	2200	5	20	10
IC	4400	5	20	10
II	8800	5	10	5
III	22,000	5	10	5

- ¹ When two or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile must be the smallest of the two or more separate maximum gallonages.
- ² Within 200 ft [60.96 m] of each container, there must be a 12-ft [3.66-m] wide accessway to permit access to fire control apparatus.
- ³ The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 must be doubled.
- ⁴ When total quantity stored does not exceed 50 percent of maximum per pile, the distance in columns 4 and 5 may be reduced 50 percent, but not to less than 3 ft [0.91 m].

(continued)

Appendix 5-6 (continued)

Indoor Portable Tank Storage			
<i>Class Liquid</i>	<i>Storage Level</i>	<i>*Protected Storage Maximum per Pile In Gallons</i>	<i>Unprotected Storage Maximum per Pile In Gallons</i>
IA	Ground and upper floors Basement	Not permitted Not permitted	Not permitted Not permitted
IB	Ground and upper floors Basement	20,000 Not permitted	2000 Not permitted
IC	Ground and upper floors Basement	40,000 Not permitted	5500 Not permitted
II	Ground and upper floors Basement	40,000 20,000	5500 Not permitted
III	Ground and upper floors Basement	60,000 20,000	22,000 Not permitted

*A sprinkler or equivalent fire protection system installed in accordance with NFPA Standard 30.

NOTES:

1. When two or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile must be the smallest of the two or more separate maximum gallonages.
2. Aisles must be provided so that no container is more than 4 m (12 ft) from an aisle. Main aisles must be at least 2 m (8 ft) wide and side aisles at least 1 m (4 ft) wide.
3. Each pile must be separated from each other by at least 1 m (4 ft).

(continued)

Appendix 5-6 (continued)

Outdoor Portable Tank Storage				
<i>Class Liquid</i>	<i>Maximum per pile¹ (gal)</i>	<i>Distance between piles² (ft)</i>	<i>Distance to property line that can be built upon^{1,3} (ft)</i>	<i>Distance to street, alley, public way⁴ (ft)</i>
IA	2200	5	20	10
IB	4400	5	20	10
IC	8800	5	20	10
II	17,600	5	10	5
III	44,000	5	10	5

¹ When two or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile must be the smallest of the two or more separate maximum gallonages.

² Within 200 ft of each container, there must be a 12-ft [4-m] wide accessway to permit access to fire control apparatus.

³ The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 must be doubled.

⁴ When total quantity stored does not exceed 50 percent of maximum per pile, the distance in columns 4 and 5 may be reduced 50 percent, but not to less than 3 ft [0.91 m].

Appendix 5-7

Specifications for Hazardous Material Signs
(USFK EGS, Chapter 5, Figures 5.1 through 5.3)

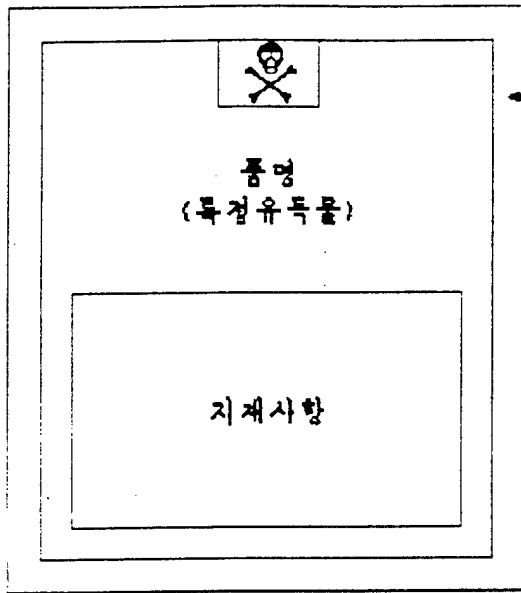


Figure 5.1.2

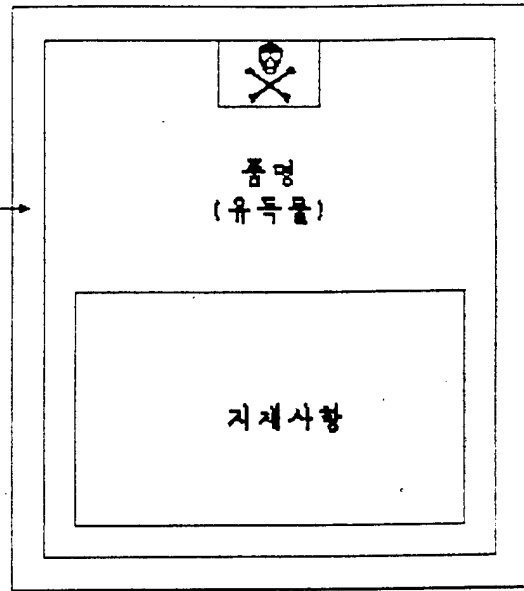


Figure 5.2.2

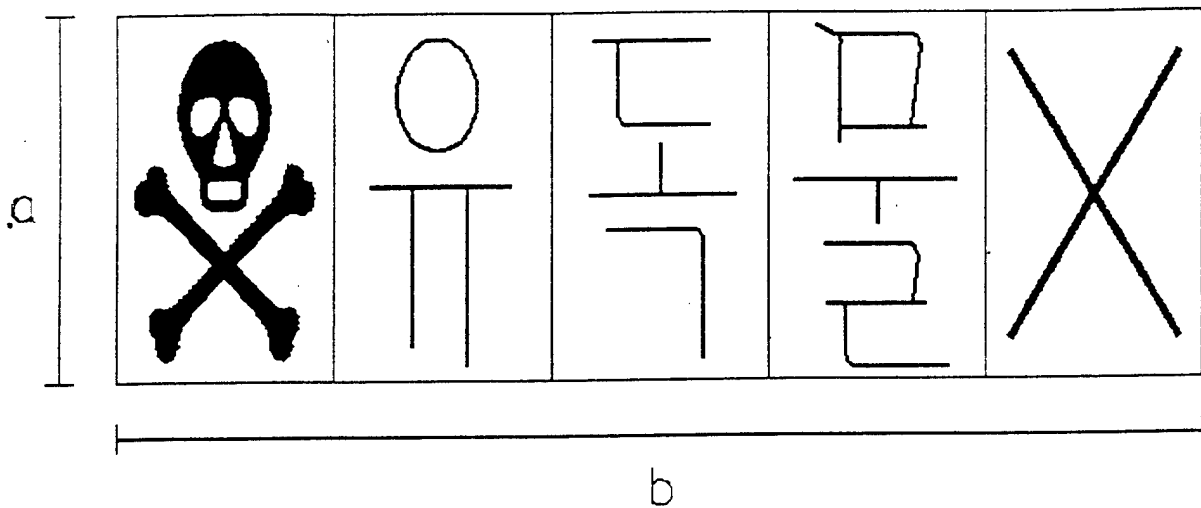


Figure 5.3

INSTALLATION:	COMPLIANCE CATEGORY: HAZARDOUS MATERIALS Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 6

HAZARDOUS WASTE

Korea ECAS

SECTION 6

HAZARDOUS WASTE

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to military communities that generate, store, treat, or dispose of any type of hazardous waste.

The Federal regulations that control the storage, handling, and treatment of hazardous waste have not been implemented on an Outside Continental United States (OCONUS)-wide basis. Individual Major Army Commands (MACOMs) have implemented portions of these regulations. This protocol summarizes many of the Federal hazardous waste regulations as good management practices (MPs). But, if a particular MACOM has implemented policy adopting specific U.S. hazardous waste regulations, the evaluator should consult the most recent *United States The Environmental Assessment Management (TEAM) Guide* for an accurate assessment of compliance.

This protocol and its associated evaluation worksheets are necessarily more complex than other protocols in this volume. Not all evaluation items will be applicable to all military communities. Guidance is provided to the assessor on the worksheets to direct him/her to the checklist items related to the type of hazardous waste activities/facilities on the military community.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 6 addresses the management of hazardous waste. It includes criteria for the identification, storage, transportation, treatment, and disposal of hazardous waste and Korean special waste.
- DOD 4160.21M gives guidance on waste turn-in for disposal at the Defense and Reutilization Marketing Office (DRMO).

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, requires installations to fund waste disposal, and it states that the Army will not dispose of hazardous waste in a foreign country unless the disposal meets or exceeds the criteria of the relevant final governing standards. Further, AR 200-1 requires that tenants and activities that generate hazardous waste be charged to recover the cost of disposing of their waste. Whereas the disposal of municipal solid waste is considered a routine cost of doing business and is not to be shown as an environmental project on the installation's Environmental Program Requirements Report, the costs for disposal of hazardous waste are to be identified as an environmental project on that report.

D. Responsibility for Compliance

- The Installation Commander (IC) is responsible for establishing and maintaining an active program of surveillance of: users, generators, transporters, and storers of hazardous wastes; the waste minimization program; and disposal activities. Operational responsibility for the hazardous waste program rests with the activities that generate, treat, store, transport, or dispose of the waste and the activities responsible for implementing health, safety, and environmental protection programs.
- The Directorate of Engineering and Housing (DEH) and Directorate of Safety and Health (DSH) will serve as the IC's expert representatives for the management of all wastes, unless otherwise directed by the IC.

In the area of compliance, the DEH/DSH will immediately: advise the IC on the receipt of enforcement notices, such as Notices of Violations (NOVs), consent orders, or compliance agreements; advise all waste generating activities on host nation and oversee Army requirements for managing hazardous waste, including requirements for permits, reporting, and recordkeeping; prepare all required reports on hazardous waste; monitor installation compliance with host nation hazardous waste requirements, including activities of tenants and subinstallations.

In the area of waste management (including disposal), the DEH/DSH will advise the IC, in coordination with generating activities, on the most cost-effective and efficient means of waste storage, treatment, and disposal; provide technical assistance and guidance to hazardous waste generating activities and tenants; provide for analysis of waste to determine whether it is hazardous under applicable laws; ensure hazardous wastes are properly identified, segregated, and weighed before treatment, storage, disposal, or transportation; certify that wastes are hazardous wastes and provide copies of waste analysis before arranging for off-post transportation; coordinate an annual installation-wide inventory of all hazardous waste and identify the waste generating activities; and establish, monitor, and execute programs in waste management, including waste minimization, resource recovery, and recycling.

- The Director of Logistics (DOL) will monitor installation-wide use of hazardous materials to ensure progress in meeting Army hazardous waste minimization goals and requirements, and provide quarterly progress reports to the DEH.

On a semi-annual basis, the DOL will recommend opportunities and provide a progress report to the IC in reducing the use and toxicity of hazardous materials, following the concurrence of the DEH.

Additionally, the DOL will arrange for and monitor all on-post and off-post shipments of hazardous waste, ensuring compliance with applicable laws and requirements; prepare and maintain records on transporting hazardous wastes, including manifests, and records maintained by the DRMO where co-located on an Army installation; sign the hazardous waste manifest as the IC's designee; coordinate with the DEH to obtain certification that wastes meet the definition of hazardous wastes before offering off-post transportation; advise waste generating activities on proper requirements for packaging, labelling, and shipping of solid waste and hazardous waste to enable the DOL to ensure that off-post transportation of these wastes conforms with Army, DOD, and host nation requirements; actively support the DEH in measuring progress to meet Federal and Army waste reduction goals and requirements; and communicate regularly with the Defense Logistics Agency (DLA) activity serving the installation to maintain current information on markets for hazardous wastes.

- Commanders of Medical Department Activities (MEDDACs) and U.S. Army Medical Centers (MED-CENs) will provide the IC or IC's designee with the hazardous waste management implications of new

and revised MEDDAC/MEDCEN practices for review and concurrence and prepare and maintain a management plan for the disposal of medical waste.

- Installation preventive medicine services (PVNTMED) personnel will support the hazardous waste management programs, provide technical assistance in identifying wastes and inventorying sources of hazardous wastes, and represent the MEDDAC/MEDCEN as an installation tenant and hazardous waste generator.
- Installation safety officers will oversee the storage, packaging, transportation, treatment, and disposal of waste, and monitor personnel training requirements to ensure compliance with Army safety standards.
- The Chief of the installation Public Affairs Office (PAO) will establish the necessary supporting public affairs program; coordinate and conduct public involvement to obtain a permit and permit modifications, including an Environmental Assessment (EA) or Environmental Impact Statement (EIS); and assist the commander in preparing for any public hearings or public meetings.
- Tenants (Federal and non-Federal), such as the DRMO, on Army properties or where the Army is a tenant on non-Army property will comply equally with all laws and requirements.
- Managers of government-owned contractor-operated (GOCO) facilities that produce hazardous waste on Army installations will apportion fees to support the treatment, storage, and disposal of hazardous wastes; establish administrative requirements to preclude the Federal Government from incurring liability associated with treatment, storage, or disposal of hazardous wastes; prohibit the use of DOD personnel in handling solid and hazardous wastes; comply with host nation laws and regulations and Army policies on reducing the volume, quantity, or toxicity of hazardous waste; prohibit the use of onsite hazardous waste treatment, storage, and disposal facilities for non-DOD owned hazardous wastes generated offsite; and pay fines assessed by host nation regulatory agencies for noncompliance (the Army cannot reimburse a GOCO for such fines).
- Hazardous waste generators will properly identify, label, package, treat, store, dispose of, measure, transport on-post, or offer for transport off-post, hazardous wastes per requirements of the MACOM, and USFK EGS requirements. Also, generators will ensure that all hazardous wastes generated during operations are certified by the DEH and tracked to minimize the potential for worker exposure, spills, or mixture with nonhazardous wastes; maintain accountability for and document the flow of hazardous materials from the point of receipt to point of turn-in for disposal; minimize waste generation wherever possible and feasible; and maintain an accurate inventory of hazardous waste that reflects changes in operation.
- Hazardous Waste Storage Area (HWSA) operators are responsible for ensuring compliance with hazardous waste regulations and permit standards applicable to the facility, including maintaining operational and training records.
- The Defense Reutilization and Marketing Service (DRMS) is an agency that may or may not be located on the installation. Regardless, it is the single agency designated by DOD to provide hazardous waste disposal service to the installation on a pay-for-services-rendered basis. The DRMS is responsible for compliance with all Army (including installation guidance) regulations at its storage/disposal facility.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Aboveground Tank* - a tank that is situated in such a way that the entire surface area of the tank is completely above the plane of the adjacent surrounding surface and the entire surface area of the tank (including the tank bottom) is able to be visually inspected.
- *Active Portion* - that portion of a facility where treatment, storage, or disposal operations are being or have been conducted and which is not a "closed portion."
- *Acute Hazardous Waste* - those wastes listed in Appendix 6-1 with a U.S. Environmental Protection Agency (USEPA) waste number with the designator "P" or those wastes with (H) following the waste number (USFK EGS, Chapter 6, Definitions).
- *Characteristics of Hazardous Waste* - the characteristics of ignitability, corrosivity, reactivity, and toxicity that identify hazardous waste.
- *Closed Portion* - the portion of a facility that has been closed in accordance with the approved closure plan and all applicable closure requirements.
- *Component* - either the tank or the ancillary equipment of the tank system.
- *Container* - any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.
- *Contingency Plan* - a document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or release of hazardous waste or hazardous waste constituents that could threaten human health or the environment.
- *Dike* - an embankment or ridge of either natural or man-made materials used to prevent the movement of liquids, sludges, solids, or other materials.
- *Discharge or Hazardous Waste Discharge* - the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on any land or water.
- *Disposal* - the utilization of those methods of treatment and/or containment technologies, as are approved in Paragraph 6-3k of USFK EGS, that effectively mitigate the hazards to human health or the environment of the discharge, deposit, injection, dumping, spilling, leaking, or placing of a hazardous waste into or on any land or water in a manner that, without application of such methods, such hazardous wastes or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater (USFK EGS, Chapter 6, Definitions).
- *Facility* - all contiguous land and structures, other appurtenances, and improvements on the land used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combination of them).

- *Free Liquids* - liquids that readily separate from the solid portion of a waste under ambient temperature and pressure.
- *Hazardous Constituent* - a chemical compound that is listed by name in Appendix 6-1 or possesses a characteristic described in Appendix 6-1 (USFK EGS, Chapter 6, Definitions).
- *Hazardous Material Fuel* - a material which exhibits characteristics identified in Appendix 6-1, Section A-1, or is listed in Appendix 6-1, Chart A.4 but which is burned for energy recovery rather than discarded (USFK EGS, Chapter 6, Definitions).
- *Hazardous Waste (HW)* - a discarded material that may be solid, semisolid, or liquid, or contained gas and either exhibits a characteristic of a hazardous waste in Appendix 6-1, Section A-1 or is listed as a hazardous waste in Appendix 6-1, Chart A.4 (USFK EGS, Chapter 6, Definitions).
- *Hazardous Waste Accumulation Point (HWAP)* - an area at or near the point of generation where hazardous wastes are temporarily stored, up to 206 L (55 gal) of hazardous waste or 1L (1 qt) of acute hazardous waste, from each waste stream, until removed to a Hazardous Waste Storage Area (HWSA) or shipped for treatment or disposal (USFK EGS, Chapter 6, Definitions).
- *Hazardous Waste Generation* - any act or process that produces hazardous waste as defined in USFK EGS (USFK EGS, Chapter 6, Definitions).
- *Hazardous Waste Profile Sheet (HWPS)* - a document that identifies and characterizes the waste by providing user's knowledge of the waste, and/or lab analysis and details the physical, chemical, and other descriptive properties or processes that created the hazardous waste (USFK EGS, Chapter 6, Definitions).
- *Hazardous Waste Storage Area (HWSA)* - a location on a USFK installation where more than 206 L (55 gal) of hazardous waste or 1 L (1 qt) of acute hazardous waste from any one waste stream is stored prior to shipment for treatment or disposal (USFK EGS, Chapter 6, Definitions).
- *Hazardous Waste Storage Area Manager* - a person or agency on the installation assigned the operational responsibility for receiving, storing, inspecting, and general management of the installation's HWSA or HWSA program (USFK EGS, Chapter 6, Definitions).
- *Incinerator* - an enclosed device using controlled flame combustion that neither meets the criteria for classification as a boiler nor is listed as an industrial furnace.
- *Incompatible Waste* - a hazardous waste that is unsuitable for (1) placement in a particular device or facility because it may cause corrosion or decay of containment materials (e.g., containers, liners, or tank walls) or (2) co-mingling with another waste or material under uncontrolled conditions because the co-mingling conditions produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, gases, or flammable fumes or gases.
- *Inner Liner* - a continuous layer of material placed inside a tank or container that protects the construction materials of the tank or container from the contained waste or reagents used to treat the waste.
- *Land Disposal* - placement in or on the land, including, but not limited to, land treatment, surface impoundments, underground injection wells, salt dome formations, salt bed formations, underground mines, or caves (USFK EGS, Chapter 6, Definitions).

- *Leachate* - any liquid, including any suspended components in the liquid, that has percolated through or drained from hazardous waste.
- *Leak Detection System* - a system capable of detecting the failure of either the primary or secondary containment structure or the presence of a release of hazardous waste or accumulated liquid in the secondary structure. Such a system must employ operational controls (e.g., daily visible containment for releases into the secondary containment system of aboveground tanks) or consist of an interstitial monitoring device designed to continuously and automatically detect the failure of the primary or secondary containment structure or the presence of hazardous waste released into the secondary containment structure.
- *Liner* - a continuous layer of natural or man-made materials, beneath or on the sides of a surface impoundment, landfill, or landfill cell, that restricts the downward or lateral escape of hazardous waste, hazardous waste constituents, or leachate.
- *Management Practice (MP)* - schedules of activities, prohibitions of practices, maintenance procedures, and other management procedures to prevent or reduce hazards to the environment.
- *On-Site* - the same, or geographically continuous property that may be divided by a public right-of-way, provided the entrance and exit between the properties is at a cross-roads intersection and access is by crossing as opposed to going along the right-of-way.
- *Representative Sample* - a sample of a universe or whole (e.g., waste pile, lagoon, groundwater) that can be expected to exhibit the average properties of the universe or whole.
- *Runoff* - any rainwater, leachate, or other liquid that drains over land from any part of a facility.
- *Run-on* - any rainwater, leachate, or other liquid that drains over land onto any part of a facility.
- *Sludge* - any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.
- *Special Waste* - specific types of waste as defined in Appendix 6-1, Section A-3. Special Waste may be, but is not necessarily, hazardous waste. (USFK EGS, Chapter 6, Definitions).
- *Special Waste Disposal Facility* - a facility where special waste is landfilled, incinerated, destroyed, neutralized, or cement solidified, or intermediately treated for such disposal. In particular, this refers to any one or a combination of the following intermediate and final disposal facilities (USFK EGS, Chapter 6, Definitions):
 1. Intermediate disposal facilities
 - a. an incineration facility
 - b. a high temperature destruction facility
 - c. a shredding/cutting facility
 - d. a melting facility
 - e. a graduation facility
 - f. a refining facility (a facility that disposes of waste by screening, extracting, filtering, or distilling techniques, etc.)
 - g. a reaction facility (a facility that disposes of waste by such chemical reactions as neutralization, oxidation, etc.)

- h. an oil/water separation facility
 - i. a coagulation/sedimentation facility
 - j. a dewatering facility
 - k. a drying facility
 - l. a solidification facility
 - m. a stabilization facility (including a composting facility)
2. Final disposal facilities
- a. an isolation type landfill
 - b. a management type landfill
 - c. a sedimentation type landfill
 - d. a stabilization type landfill.

- *Storage* - the holding of hazardous wastes for a temporary period, at the end of which the hazardous wastes are treated, disposed of, or stored elsewhere.
- *Sump* - any pit or reservoir that meets the definition of tank and those troughs/trenches connected to it that serve to collect hazardous waste for transport to hazardous waste storage, treatment, or disposal facilities. Except when used in rules for landfills, surface impoundments, and waste piles, "sump" means any lined pit or reservoir that serves to collect liquids drained from a leachate collection and removal system or leak detection system for subsequent removal from the system.
- *Surface Impoundment* - a facility or part of a facility that is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials designed to hold an accumulation of liquid wastes or wastes containing free liquids and that is not an injection well.
- *Tank* - a stationary device designed to contain an accumulation of hazardous waste that is constructed primarily of nonearthen materials (e.g., wood, concrete, steel, plastic) that provide structural support.
- *Tank System* - a hazardous waste storage or treatment tank and its associated ancillary equipment and containment system.
- *Treatment* - any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, recover energy or material resources from the waste, or render such waste: nonhazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume (USFK EGS, Chapter 6, Definitions).
- *Treatment, Storage, and Disposal Facility (TSDF)* - any facility not located on a USFK installation that is used for the collection, source separation, storage, transportation, transfer, processing, treatment, or disposal of hazardous waste (USFK EGS, Chapter 6, Definitions).
- *Treatment Zone* - a soil area of the unsaturated zone of a land treatment unit within which hazardous constituents are degraded, transformed, or immobilized.
- *Unfit-for-Use Tank System* - a tank system that has been determined, through an integrity assessment or other inspection, to be no longer capable of storing or treating hazardous waste without posing a threat of release of hazardous waste to the environment.

- *Unique Identification Number* - a number assigned to generators of hazardous waste to identify the generator and used to assist in tracking the waste from point of generation to ultimate disposal. In USFK, the DOD Activity Account Code (DODAAC) will be used (USFK EGS, Chapter 6, Definitions).
- *Unsaturated Zone or Zone of Aeration* - the zone between the land surface and the water table.
- *USFK Hazardous Waste Generator* - an installation or activity on an installation that produces a regulated hazardous waste (USFK EGS, Chapter 6, Definitions).
- *Zone of Engineering Control* - an area under the control of the owner/operator that, upon detection of a hazardous waste release, can be readily cleaned up before the release of hazardous waste or hazardous constituents to groundwater or surface water.

HAZARDOUS WASTE
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	6-1 through 6-4	(1)(2)(4)(6)
Training	6-5 and 6-6	(2)(6)(18)(19)(23)
Transportation of Hazardous Waste	6-7 through 6-10	(1)(6)(19)
Generators of Hazardous Waste	6-11 through 6-15	(1)(2)(19)
Hazardous Waste Accumulation Points	6-16 through 6-21	(1)(2)(19)
Hazardous Waste Storage Areas		
General	6-22 through 6-35	(2)(18)(23)
Containers	6-36 through 6-39	(2)(18)(19)(23)
Tank Systems	6-40 through 6-48	(1)(2)(6)(7)(18)(19)(23)
Documentation	6-49 through 6-52	(1)(2)(18)(23)
Hazardous or Special Waste Disposal		
General	6-53 through 6-59	(1)(2)(4)(5)(9)
Land Disposal	6-60 through 6-63	(1)(2)
Incinerators	6-64 through 6-68	(1)(2)(18)
Other (Contractor-Operated) Treatment Facilities	6-69 through 6-79	(1)(2)
Treatment Technologies	6-80 and 6-81	(1)(2)(4)
Specific Wastes	6-82 and 6-83	(1)(2)(4)(18)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (4) Safety and Health Officer
- (5) Fire Department
- (6) Director of Logistics (DOL)
- (7) Fuels Management Officer
- (18) TSDF Operators (DEH, DOL, DRMO)
- (19) Shop Activity Supervisor
- (23) Defense and Reutilization Marketing Office (DRMO)



HAZARDOUS WASTE

Records to Review

Generators:

- Hazardous waste manifests
- Manifest exception reports
- Delistings
- Speculative accumulation records
- Land disposal restriction certifications
- Employee training documentation
- Hazardous waste tank integrity assessments
- Installation Spill Plan
- Notifications of hazardous waste oil fuel marketing or blending activity
- Accumulation point inspection records
- Used Solvent Elimination Program Contract (DEH or DOL)

HWSAs:

- Location map of HWSAs
- Unmanifested waste reports
- Facility audit reports (inspection log)
- Waste analysis plan(s)
- Operating record
- Groundwater monitoring records and annual reports (where required)
- Facility biennial reports
- Closure/post closure notices (where applicable)
- Hazardous waste inventory

Physical Features to Inspect

- Disposal sites
- Accumulations points
- Incinerators
- Vehicles used for transport
- Storage facilities (including drums)
- Surface impoundments

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Safety and Health Officer
- Fire Department
- Director of Logistics (DOL)
- Fuels Management Officer

- HWSA Operators (DEH, DOL, DRMO)
- Shop Activity Supervisor
- Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>6-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on hazardous waste should be maintained at the installation (MP).</p> <p>6-2. Installations must recycle or reuse hazardous or special waste to the maximum extent practical (USFK EGS 6-3k(6)).</p> <p>6-3. Hazardous waste must not be used for dust suppression or road treatment (USFK EGS 6-3i(2)).</p> <p>6-4. Generators must identify and characterize the wastes generated at their sites (USFK EGS 6-3a(1) and 6-3a(2)).</p>	<p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)(2)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - National Fire Protection Association (NFPA), <i>Fire Protection Guide of Hazardous Materials</i> - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - Policy Letters. <p>Verify that installation environmental staff are familiar with and knowledgeable about regulatory requirements. (1)(2)(4)</p> <p>Verify that hazardous and nonhazardous materials are recycled or reused to the maximum extent practical. (1)(6)</p> <p>Verify that safe and environmentally acceptable methods are used to identify, store, prevent leakage of, and dispose of hazardous wastes in order to minimize risks to health and the environment. (1)(6)</p> <p>Verify that neither used oil, hazardous waste, nor used oil contaminated with any hazardous waste is used for dust suppression or road treatment. (1)</p> <p>Verify that the installation's generators identify and characterize their wastes. (1)</p> <p>(NOTE: See Appendix 6-1 for guidance.)</p> <p>(NOTE: Wastes may be identified and characterized on the basis of knowledge of the materials and processes that generated the wastes, or on the basis of laboratory analysis of the waste.)</p> <p>Verify that a HWPS is used to identify each hazardous waste stream. (1)</p> <p>Verify that wastes have been identified on the HWPS according to the inherent hazardous characteristics associated with the wastes in terms of: (1)(4)</p> <ul style="list-style-type: none"> - physical properties (solid, liquid, contained gases) - chemical properties (chemical constituents, technical or chemical name) - other descriptive properties (ignitable, corrosive, reactive, toxic).

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-5. (continued)</p>	<p>Verify that training for personnel whose duties include hazardous waste handling and management addresses the following in particular: (2)(6)(18)(19)</p> <ul style="list-style-type: none"> - emergency procedures (response to fire/explosion/spills; use of communications/alarm systems; body and equipment clean-up) - handling and storage of drums and containers - safe use of hazardous waste equipment - protection of personnel, including: <ul style="list-style-type: none"> - Personal Protective Equipment (PPE) - safety and health hazards - hazard communication - worker exposure - for generators and HWSA operators: <ul style="list-style-type: none"> - recordkeeping - security - inspections - contingency plans - storage requirements - transportation requirements. <p>Verify that training for new personnel assigned to duties involving actual or potential exposure to hazardous wastes is completed prior to their assuming those duties. (2)(6)(18)(19)</p> <p>Verify that personnel assigned to such duty after the effective date of USFK EGS work under direct supervision until training is completed. (2)(6)(18)(19)</p> <p>Verify that an annual review of initial training is provided. (2)(18)(19)</p> <p>(NOTE: Hazardous Waste Operations and Emergency Response (HAZWOPER) training will fulfill the requirements of this checklist item.)</p>
<p>6-6. Installations must document all hazardous waste training for each individual assigned duties involving actual or potential exposure to hazardous waste (USFK EGS 6-3j(5)).</p>	<p>Verify that all hazardous waste training is documented. (2)(18)(19)</p> <p>Verify that training records are up-to-date. (2)(18)(19)</p> <p>Verify that training records are retained for 3 yr after termination of duty of the personnel. (2)(18)(19)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>TRANSPORTATION OF HAZARDOUS OR SPECIAL WASTE</p> <p>6-7. Transportation of hazardous or special waste must meet specific requirements (USFK EGS 6-3a(4)(a)).</p> <p>6-8. All hazardous or special waste that leaves the installation must be accompanied by a manifest (USFK EGS 6-3a(4)(b)).</p> <p>6-9. The installation should ensure that transportation of hazardous wastes between buildings is accomplished so as to help prevent spills, releases, and accidents (MP).</p>	<p>Verify that offsite hazardous waste shipments are prepared in accordance with applicable requirements in Sections 5 and 6 of this manual. (1)(6)(19)</p> <p>(NOTE: This requirement applies when transporting hazardous waste, via military vehicle or commercial transportation, on ROK public roads and highways.)</p> <p>(NOTE: Standards may include requirements for placarding, marking, containerization, and labeling among others.)</p> <p>Verify that hazardous waste designated for international transport is prepared in accordance with applicable international regulations. (1)(6)(19)</p> <p>(NOTE: In the absence of applicable requirements in Sections 5 and 6 of this manual, international standards must be used.)</p> <p>Verify that all hazardous or special waste that leaves the installation is accompanied by a manifest. (1)(6)(19)</p> <p>Verify that DD Form 1348-1 (DOD Single Line Item Release/Receipt Document) is used.</p> <p>(NOTE: The manifest should include:</p> <ul style="list-style-type: none"> - generator's name, address, and telephone number - transporter's name, address, and telephone number - destination name, address, and telephone number - description of waste - total quantity of waste - date of shipment - date of receipt.) <p>Determine at the transportation branch whether procedures exist to manage movement of hazardous wastes throughout the installation. (1)</p> <p>Verify that drivers are trained in spill control procedures. (1)</p> <p>Verify that provisions are made to secure wastes in vehicles during transport. (1)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-10. Transporters should take immediate notification and cleanup action if discharge occurs during transport (MP).</p> <p>GENERATORS OF HAZARDOUS OR SPECIAL WASTE</p> <p>6-11. Each generators must use a DODAAC number for all record-keeping, reports, and manifests of hazardous or special wastes (USFK EGS 6-3a(3)).</p> <p>6-12. Generators must maintain an audit trail of hazardous waste from the point of generation to disposal (USFK EGS 6-3a(4)(c)).</p> <p>6-13. Generators must reduce the amount of special waste produced as much as possible (USFK EGS 6-3a(5)).</p> <p>6-14. Generators must meet specific collection and transportation standards for special wastes (USFK EGS 6-3a(6)).</p>	<p>Verify that transport operators have instructions to notify local authorities and take cleanup action. (1)(6)</p> <p>Verify that each generator uses a DODAAC number for all recordkeeping, reports, and manifests of hazardous or special wastes. (2)(19)</p> <p>Verify that generators using DRMS disposal services obtain a signed copy of the manifest from the initial DRMS recipient of the waste. (2)(19)</p> <p>Verify that, if a generator uses a hazardous or special waste management and/or disposal program of a USFK component with a different DODAAC number, it obtains a signed copy of the manifest from the receiving component. (2)(19)</p> <p>Verify that installations that dispose of their waste outside of the DRMS system have developed their own manifest tracking system. (2)(19)</p> <p>Verify that, if an ROK contractor is used, the contractor completes all ROK manifest forms and returns the completed documents to the government contracting officer's representative (COR) and the corresponding certificates of disposal to the generator.</p> <p>Verify that the generator reduces the amount of special waste produced as much as possible by means of technical improvement or recycling. (2)(19)</p> <p>Verify that collection and transportation equipment does not emit offensive odors or allow special wastes to be blown off or dropped. (1)(2)(19)</p> <p>Verify that particles of slag, waste asbestos, and waste agricultural chemicals are collected and transported in vinyl bags and are not blown off transportation equipment. (1)(2)(19)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-16. (continued)</p> <p>6-17. Containers at HWAPs must meet specific requirements (USFK EGS 6-3b(3) and 6-3d(1)(a) through 6-3d(1)(d)).</p> <p>6-18. HWAP container storage areas must have containment systems (USFK EGS 6-3b(3)).</p> <p>6-19. The HWAP must be inspected weekly for leaking containers and for deterioration of the containment system caused by corrosion and other factors (USFK EGS 6-3b(3) and 6-3d(1)(e)).</p> <p>6-20. HWAPs that have containers holding ignitable or reactive waste must be located at least 15 m (50 ft) inside the installation boundary (USFK EGS 6-3b(3) and 6-3d(3)).</p>	<p>Verify that each HWAP has warning signs appropriate to the waste being accumulated at the site. (1)(2)(19)</p> <p>Verify that containers are in good condition and free from severe rusting, bulging, or structural defects. (1)(2)(19)</p> <p>Verify that containers, including overpack containers, are compatible with the materials stored. (1)(2)(19)</p> <p>Verify that containers are kept closed, except when they need to be opened to add or remove waste. (1)(2)(19)</p> <p>Verify that containers are not opened, handled, or stored in a manner that could cause a rupture or a leak. (1)(2)(19)</p> <p>Verify that containers are marked with a hazardous waste marking and a label indicating the hazard class of the wastes (flammable, corrosive, etc.). (1)(2)(19)</p> <p>Verify that each container storage area has a containment system such as a drip pan, with sufficient capacity to contain 10 percent of the volume of the containers or the volume of the largest container, whichever is greater. (1)(2)(19)</p> <p>(NOTE: This applies only to containers that hold free liquids.)</p> <p>Verify that a weekly inspection is performed for leaking containers and for deterioration of containers and the containment system. (1)(2)(19)</p> <p>Verify that secondary containment systems are inspected for defects and emptied of accumulated releases. (1)(2)(19)</p> <p>Verify that containers which hold ignitable or reactive waste are at least 15 m (50 ft) inside the installation boundary. (2)(19)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-21. HWAPs must handle incompatible wastes according to specific requirements (USFK EGS 6-3b(3) and -3d(4)).</p> <p>HWSAs</p> <p>General</p> <p>6-22. New HWSAs must be located so as to minimize the risk of a release due to seismic activity, floods, or other natural events (USFK EGS 6-3c(1)).</p> <p>6-23. HWSAs must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste (USFK EGS 6-3c(2) and 6-3c(5)).</p> <p>6-24. HWSAs must be listed with on-installation emergency authorities and the USFK Environmental Programs Office (EPO) (USFK EGS 6-3c(1)).</p>	<p>Verify that incompatible wastes and materials are not placed in the same container. (2)(19)</p> <p>Verify that hazardous waste is not placed in an unwashed container that previously held an incompatible waste or material. (2)(19)</p> <p>Verify that storage containers holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments are separated from the other materials or protected from them by means of a dike, berm, wall, or other device. (2)(19)</p> <p>Verify that new HWSAs are (to the maximum extent possible) located so as to minimize the risk of a release due to seismic activity, floods, or other natural events. (18)</p> <p>Verify that, for facilities located where such risks may be encountered, the installation spill plan addresses the risk. (2)(18)(23)</p> <p>Verify that HWSAs are designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste. (2)(18)(23)</p> <p>Verify that sufficient aisle space is maintained to allow unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility operation. (18)(23)</p> <p>Verify that no containers obstruct exits. (18)(23)</p> <p>Verify that each installation gives a listing of HWSAs to on-installation emergency authorities (e.g., fire prevention department) and the USFK EPO. (2)</p> <p>Verify that the listing includes site maps and information on the types and quantities of HW generated and stored. (2)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-25. HWSAs must meet specific security requirements (USFK EGS 6-3c(4)).</p>	<p>Verify that the installation prevents the unknowing entry, and minimizes the possibility of unauthorized entry, of persons or livestock onto HWSA grounds.</p> <p>Verify that the HWSA security system consists of either: (18)(23)</p> <ul style="list-style-type: none"> - a 24-h surveillance system (e.g., television monitors, surveillance by guards) that continuously monitors and controls entry, or - an artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff) that completely surrounds the area, combined with a means to control entrance at all times (e.g., an attendant, television monitors, locked gate, or controlled roadway access). <p>Verify that a sign is posted with the words DANGER UNAUTHORIZED PERSONNEL KEEP OUT at each entrance and at other locations in sufficient numbers to be seen from any approach to the HWSA. (18)(23)</p> <p>Verify that the legend is written in English and Korean. (18)(23)</p> <p>Verify that signs are legible from 25 ft [7.5 m]. (18)(23)</p> <p>(NOTE: Existing signs with a legend other than the above may be used if the legend indicates that only authorized personnel are allowed to enter, and that entry can be dangerous.)</p>
<p>6-26. All HWSAs must be equipped in accordance with specific requirements (USFK EGS 6-3c(7)).</p>	<p>Verify that the following equipment is easily accessible to personnel in HWSAs and in working condition: (18)(23)</p> <ul style="list-style-type: none"> - internal communications or alarm system capable of providing immediate emergency instructions to facility personnel - telephone (immediately available at the scene of operations) or hand-held two-way radio - portable fire extinguishers and special extinguishing equipment (foam, inert gas, or dry chemicals) - spill control equipment - decontamination equipment (eyewash and shower) - water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems - PPE appropriate to the materials stored - eyewash and shower. <p>(NOTE: The requirement for adequate water volume and pressure does not apply at facilities where all wastes approved for storage therein are incompatible with water.)</p> <p>Verify that the equipment is tested and maintained as necessary to insure proper operation in an emergency. (18)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-27. Installations must meet specific requirements with regard to access to communications or alarm systems in HWSAs (USFK EGS 6-3c(6)).</p> <p>6-28. The storage of ignitable, reactive, or incompatible wastes at HWSAs must not threaten human health or the environment (USFK EGS 6-3c(10)).</p>	<p>Verify that, whenever hazardous waste is being poured, mixed, or otherwise handled, all personnel involved in the operation have immediate access to an internal alarm or emergency communications device, either directly or through visual or voice contact with another person. (18)(23)</p> <p>Verify that, if there is only one person on duty in the HWSA, said person has immediate access to a device, such as a telephone (immediately available at the scene of operation) or a hand-held two-way radio capable of summoning emergency assistance. (18)(23)</p> <p>Verify that the storage of ignitable, reactive, or incompatible wastes is accomplished so as to prevent threats to human health or the environment. (18)(23)</p> <p>Verify that the HWSA manager takes precautions to prevent accidental ignition or reaction of ignitable or reactive wastes. (18)(23)</p> <p>Verify that ignitable and reactive waste are separated and protected from sources of ignition or reaction. (18)(23)</p> <p>(NOTE: Sources of ignition or reaction include but are not limited to, open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat.)</p> <p>Verify that while ignitable or reactive waste is being handled, smoking and open flames are confined to specially designated areas. (18)(23)</p> <p>Verify that NO SMOKING signs are conspicuously placed wherever there is a hazard from ignitable or reactive waste. (18)(23)</p> <p>Verify that the NO SMOKING legend is written in English and Korean. (18)(23)</p> <p>Verify that water reactive waste is not stored in the same area as flammable and combustible liquids.</p>
<p>6-29. HWSAs must handle incompatible wastes in accordance with specific requirements (USFK EGS 6-3d(4)).</p>	<p>Verify that incompatible wastes and materials are not placed in the same container. (18)(23)</p> <p>Verify that hazardous waste is not placed in an unwashed container that previously held an incompatible waste or material. (18)(23)</p> <p>Verify that storage containers holding a hazardous waste that is incompatible with any waste or other materials stored nearby in containers, piles, open tanks, or surface impoundments are separated from the other materials or protected from them by means of a dike, berm, wall, or other device. (18)(23)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-30. Installations must develop a waste analysis plan (USFK EGS 6-3c(3)(a)).</p>	<p>Verify that the installation, in conjunction with the HWSA manager, has developed a plan to determine how and when wastes are to be analyzed. (2)(18)(23)</p> <p>Verify that the plan includes: (2)(18)(23)</p> <ul style="list-style-type: none"> - procedures for characterizing and verifying the testing of both onsite and offsite hazardous waste - testing parameters and the rationale for selecting them - frequency of analysis - testing and sampling methods.
<p>6-31. The installation must maintain an HWPS for each waste stream handled by each HWSA (USFK EGS 6-3c(3)(b)).</p>	<p>Verify that the installation maintains a file of HWPSs. (18)(23)</p> <p>Verify that no accumulated waste is accepted for storage unless the HWPS has been provided. (18)(23)</p> <p>Verify that the generator updates the HWPS as needed to reflect any new waste streams or process modifications that change the character of the hazardous waste being handled at the storage area. (18)(23)</p>
<p>6-32. HWSA managers must conduct periodic verification testing of the hazardous waste in storage (USFK EGS 6-3c(3)(b)).</p>	<p>Verify that periodic testing is carried out to ensure that the generator has accurately identified the stored hazardous wastes. (18)(23)</p>
<p>6-33. Prior to accepting waste from a generator, the HWSA manager must follow specific procedures (USFK EGS 6-3c(3)(c)).</p>	<p>Verify that prior to accepting waste from generators, the HWSA manager: (18)(23)</p> <ul style="list-style-type: none"> - inspects the waste to ensure that it matches the description provided - requests a new HWPS from the generator if there is reason to believe that the process generating the waste has changed - analyzes waste shipments to see if they match the waste description on the accompanying manifest and documents - rejects shipments that do not match the accompanying waste descriptions, unless the generator provides an accurate description.
<p>6-34. The installation must inspect HWSAs for malfunction, deterioration, operator errors, and discharges (USFK EGS 6-3c(8)).</p>	<p>Verify that inspections are conducted according to a written schedule that is kept at the HWSA and at a sufficient frequency to identify problems in time to correct them before they harm human health or the environment. (18)(23)</p> <p>Verify that the schedule identifies the type of problems to be looked for during the inspection. (18)(23)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-34. (continued)</p>	<p>Verify that the inspections cover all equipment and areas involved in the storage and handling of hazardous waste. (18)(23)</p> <p>Verify that areas subject to spills, such as loading and unloading areas, are inspected daily when in use. (18)(23)</p> <p>(NOTE: The EGS has established inspection frequency for the following equipment/facilities:</p> <ul style="list-style-type: none"> - containers at HWAPs and HWSAs - container storage areas - tank systems. <p>The frequency at which other equipment/facilities are inspected should be based on the rate of possible deterioration of the equipment and probability of an environmental or human health incident if the deterioration or malfunction or any operator error goes undetected between inspections.)</p> <p>Verify that the installation remedies any deterioration or malfunction of equipment or structures that the inspection reveals on a schedule that ensures that the problem does not lead to an environmental or human health hazard. (18)(23)</p> <p>Verify that, when an imminent hazard is identified or has already occurred, the installation takes action immediately. (18)(23)</p> <p>Verify that inspections are recorded in an inspection log or summary that is kept for at least 4 yr from the date of inspection and includes at least: (18)(23)</p> <ul style="list-style-type: none"> - date and time of inspection - name of the inspector - notation of the observations made - date and nature of any repairs or other remedial actions.
<p>6-35. At the closure of an HWSA, all hazardous waste and hazardous waste residues must be removed (USFK EGS 6-3g).</p>	<p>Verify that at the closure of an HWSA, all hazardous waste and hazardous waste residues are removed from the containment system, including remaining liners and bases. (18)(23)</p> <p>Verify that the closure is done in a manner which eliminates or minimizes the need for future maintenance or the potential for future releases of hazardous waste. (18)(23)</p> <p>Verify that the HWSA is closed in accordance with the closure plan. (18)(23)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Containers</p> <p>6-36. Containers at HWSAs must meet specific standards (USFK EGS 6-3d(1)(a) through 6-3d(1)(d)).</p> <p>6-37. HWSA container storage areas must have a containment system (USFK EGS 6-3d(2)).</p> <p>6-38. HWSAs must be inspected weekly for leaking containers and for deterioration of containers and the containment system caused by corrosion and other factors (USFK EGS 6-3d(1)(e)).</p>	<p>Verify that containers are in good condition and free from severe rusting, bulging or structural defects. (18)(23)</p> <p>Verify that containers, including overpack containers, are compatible with the materials stored. (18)(23)</p> <p>Verify that containers are kept closed except when they need to be opened to add or remove waste. (18)(23)</p> <p>Verify that containers are not opened, handled, or stored in a manner that could cause a rupture or a leak. (18)(23)</p> <p>Verify that containers are marked with a hazardous waste marking and a label indicating the hazard class of the wastes (flammable, corrosive, etc.). (18)(23)</p> <p>Verify that the container storage area has a containment system which is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed. (18)(23)</p> <p>(NOTE: Storage areas that store containers holding only wastes that do not contain free liquids need not have such an impervious containment system, provided that the storage area is sloped or otherwise designed and operated to drain and remove liquid from precipitation, or the containers are elevated or otherwise protected from contact with accumulated liquid.)</p> <p>Verify that the container storage area has a containment system that has sufficient capacity to contain 10 percent of the volume of the containers or the volume of the largest container, whichever is greater. (18)(23)</p> <p>Verify that a weekly inspection is performed. (18)(23)</p> <p>Verify that secondary containment systems are inspected for defects and emptied of accumulated releases. (18)(23)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-39. HWSAs that have containers holding ignitable or reactive waste must be located at least 15 m (50 ft) inside the installation's boundary (USFK EGS 6-3d(3)).</p> <p>Hazardous Waste Tank Systems</p> <p>6-40. Secondary containment must be in place tank systems used to store or treat hazardous waste (USFK EGS 6-3h(1) and 6-3h(4)).</p>	<p>Verify that containers which hold ignitable or reactive waste are at least 15 m (50 ft) from the installation boundary. (2)(19)</p> <p>(NOTE: These requirements apply to all storage tanks that contain hazardous waste. See Section 19 for underground storage tanks used to contain POL or hazardous substances.)</p> <p>(NOTE: This requirement applies to:</p> <ul style="list-style-type: none"> - all new tank systems or components, prior to their being put into service - existing tank systems when an annual leak test detects leakage - tanks systems that store or treat hazardous wastes by 1 January 1999.) <p>Verify that such tank systems have secondary containment that is: (6)(18)(19)(23)</p> <ul style="list-style-type: none"> - designed, installed, and operated to prevent the migration of liquid out of the system - capable of detecting and collecting releases and accumulated liquids until removal is possible - constructed to include one or more of the following: <ul style="list-style-type: none"> - a liner external to the tank - a vault - a double-walled tank. <p>(NOTE: The provisions of this checklist item do not apply to the following:</p> <ul style="list-style-type: none"> - tanks systems used to store or treat hazardous wastes that contain no free liquids and are situated inside a building with an impermeable floor - tank systems, including sumps, that serve as part of a secondary containment system to collect or contain releases of hazardous wastes.)

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-41. Tank ancillary equipment should also be provided with secondary containment (MP).</p>	<p>Verify that ancillary equipment has secondary containment. (6)(18)(19)(23)</p> <p>(NOTE: The following equipment is exempted from this MP: aboveground piping that is visually inspected for leaks on a daily basis</p> <ul style="list-style-type: none"> - welded flanges, welded joints, and welded connections that are visually inspected for leaks on a daily basis - sealless or magnetic coupling pumps and sealless valves that are visually inspected for leaks on a daily basis - pressurized aboveground piping systems with automatic shutoff valves that are visually inspected for leaks on a daily basis.)
<p>6-42. Existing tank systems without proper secondary containment must meet specific standards (USFK EGS 6-3h(2)).</p>	<p>Verify that, for tank systems without proper secondary containment, an annual determination is made as to whether the tank system is leaking or is fit for use. (6)(18)(19)(23)</p> <p>Verify that the installation obtains and keeps on file at the HWSA a written assessment of tank system integrity reviewed and certified by a competent authority. (2)</p>
<p>6-43. When new tank systems or components are installed, managers of HWSAs must obtain an assessment certifying that the tank system is acceptable (USFK EGS 6-3h(3))</p>	<p>Verify that the HWSA manager has received a written assessment that the tank system has sufficient structural integrity and is acceptable for the storage and treatment of hazardous waste. (2)(6)</p> <p>Verify that the assessment indicates: (2)(6)</p> <ul style="list-style-type: none"> - that the foundation, structural support, seams, connections, and pressure controls are adequately designed - that the tank system has sufficient structural strength, compatibility with the waste(s), and corrosion protection to ensure that it will not collapse, rupture, or fail. <p>Verify that the written assessment has been reviewed and certified by a competent authority. (2)(6)</p>
<p>6-44. Tanks used for hazardous waste treatment or storage must be operated in accordance with specific procedures (USFK EGS 6-3h(5)(a)).</p>	<p>Verify that hazardous wastes or treatment reagents are not placed in tanks if they could cause the tank system (including ancillary equipment or containment system) to fail. (18)(19)(23)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-45. Tank systems for ignitable, reactive, or incompatible wastes should meet specific requirements (MP).</p> <p>6-46. Installations must conduct inspections of tank systems and associated equipment (USFK EGS 6-3h(5)(b) and 6-3h(5)(c)).</p>	<p>Verify that ignitable or reactive wastes are not placed in a tank system unless one of the following conditions is met: (18)(19)(23)</p> <ul style="list-style-type: none"> - the waste is treated, rendered, or mixed before or immediately after placement in the tank system so that it is no longer reactive or ignitable, and the minimum requirements for reactive and ignitable wastes are met - the waste is treated or stored in such a way that it is protected from any material or conditions that may cause the waste to ignite or react - the tank system is used solely for emergencies. <p>Verify that the installation maintains the minimum protective distances between waste management areas and any public ways, streets, alleys, or an adjoining property line that can be built upon, as required in Tables 2-1 through 2-6 of the NFPA's <i>Flammable and Combustible Liquids Code</i> (NFPA 30). (1)(18)(19)(23)</p> <p>Verify that, unless minimum safety requirements are met, no incompatible wastes or incompatible wastes and materials are placed in the same tank system. (18)(19)(23)</p> <p>Verify that, unless minimum safety requirements are met, hazardous waste is not placed in a tank system that:</p> <ul style="list-style-type: none"> - previously held an incompatible waste or material and - has not been decontaminated. (18)(19)(23) <p>Verify that inspections of the following are conducted and logged at least once each operating day: (6)(18)(19)(23)</p> <ul style="list-style-type: none"> - aboveground portions of the tank to detect corrosion or releases - data gathered from monitoring and leak detection equipment (e.g., pressure and temperature gauges), to ensure that the tank system is being operated according to its design - the construction and the area surrounding tank, including the secondary containment system, for signs of leakage (wet spots, dead vegetation). <p>Verify that cathodic protection systems are inspected to ensure that they are functioning properly. (2)(6)(18)(19)(23)</p> <p>Verify that the proper operation of cathodic protection systems is confirmed within 6 mo after initial installation and annually thereafter. (2)(6)(18)(19)(23)</p> <p>Verify that all sources of impressed current are inspected and/or tested every other month. (2)(18)(19)(23)</p> <p>Verify that the installation manager documents all tank system inspections. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-47. Installations must meet specific requirements with regard to tank systems or secondary containment systems from which there has been a leak or spill, or that are unfit for use (USFK EGS 6-3h(6)).</p>	<p>Verify that such systems are immediately removed from service and repaired or closed. (2)(6)(18)(19)(23)</p> <p>Verify that the installation also takes the following steps: (2)(6)(18)(19)(23)</p> <ul style="list-style-type: none"> - stops the flow or addition of hazardous wastes to the tank - inspects systems to determine the cause of the release - contains the visible release and prevents further migration of the leak or spill to soils or surface water - removes and properly disposes of any contamination of the soil and surface water - completes required notifications and reports. <p>(NOTE: See Section 18, <i>Spill Prevention and Response Planning</i>.)</p>
<p>6-48. Installations must follow specific procedures when closing a tank system (USFK EGS 6-3h(7)).</p> <p>DOCUMENTATION</p> <p>6-49. HWSAs and HWAPs must maintain a hazardous waste log, inspection logs, manifests, and waste analysis/characterization records (USFK EGS 6-3e(1) through -3e(5)).</p>	<p>Determine whether the installation has closed any tank systems. (2)</p> <p>Verify that all waste residues and contaminated containment system components, soils, structures, and equipment have been removed or decontaminated to the greatest extent practicable. (2)(6)(18)(19)(23)</p> <p>Verify that the installation maintains a written hazardous waste log that includes the following: (1)(2)(18)(23)</p> <ul style="list-style-type: none"> - name and address of generator - description and hazard class of the waste - number and types of containers - quantity of hazardous waste - date stored - storage location - disposition data, including dates received, sealed, transported, and transporter used. <p>Verify that the hazardous waste log is available to emergency personnel in the event of a fire or a spill and is maintained until the closure of the installation. (1)(2)(18)(23)</p> <p>Verify that the installation maintains inspection logs for 4 yr. (1)(2)(18)(23)</p> <p>Verify that the installation retains manifests of incoming and outgoing hazardous wastes for 4 yr. (1)(2)(18)(23)</p> <p>Verify that the installation retains waste analysis/characterization records for a minimum period of 4 yr after closure. (1)(2)(18)(23)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-50. Installations must report an annual hazardous and special waste disposal quantity to USFK EPO each year by 30 June (USFK EGS 6-3e(7)).</p>	<p>Verify that the installation reports an annual (calendar year) hazardous and special waste disposal quantity to USFK EPO by 30 June each year. (2)</p>
<p>6-51. HWSAs must have a closure plan (USFK EGS 6-3e(6)).</p>	<p>Verify that the HWSA has a closure plan that includes: (1)(2)(18)(23)</p> <ul style="list-style-type: none"> - estimates of the storage capacity of hazardous waste - the steps to be taken to remove or decontaminate all waste residues - an estimate of the expected date of closure. <p>Verify that the installation develops a closure plan prior to opening a new HWSA. (1)(2)(18)(23)</p>
<p>6-52. Installations must have a contingency plan to manage spills and releases of hazardous waste (USFK EGS 6-3f, and 18-3d).</p>	<p>(NOTE: The control section of the installation spill plan may be considered a contingency plan.)</p> <p>Verify that the installation has a contingency plan to manage spills and releases of hazardous waste. (2)(18)(23)</p> <p>Verify that a copy of the contingency plan is maintained at the HWSA and each HWAP. (2)(18)(23)</p> <p>Verify that a copy of the plan has been submitted to all police departments, fire departments, hospitals, and emergency response teams upon which the plan relies to provide emergency services. (2)(18)(23)</p> <p>(NOTE: Assessors must consult Section 18, <i>Spill Prevention and Response Planning</i>, for additional requirements on the contents of the spill plan.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>HAZARDOUS OR SPECIAL WASTE DISPOSAL</p> <p>General</p> <p>6-53. The Executive Agent must determine whether USFK hazardous waste may be disposed of in ROK (USFK EGS 6-3k(2) and AR 200-1, para 14-3e).</p> <p>6-54. USFK hazardous or special waste must normally be disposed of through the DRMS (USFK EGS 6-3k(1)).</p> <p>6-55. USFK hazardous or special waste generators that use contractors for disposal must monitor their contractors for compliance with specific criteria (USFK EGS 6-3k(3)(c) and 6-3k(5)).</p>	<p>Verify that the installation has consulted with the USFK EPO and established which hazardous wastes may be disposed of in ROK. (1)(4)</p> <p>Verify that, if a hazardous waste cannot be disposed of according to USFK EGS, the HW is then either: (1)(4)</p> <ul style="list-style-type: none"> - retrograded to the United States - transshipped to another country for disposal, if permissible. <p>Verify that the installation normally disposes of its USFK hazardous or special waste through the DRMS. (1)(4)</p> <p>(NOTE: Installations use contractors to dispose of several types of special wastes such as asbestos and oil-contaminated waste. This requirement does not prohibit that practice. See checklist item 6-55.)</p> <p>(NOTE: A decision not to use the DRMS for hazardous waste disposal may be made for best accomplishment of the mission, but the decision should be concurred in by the component chain of command to ensure that installation contracts and disposal criteria are at least as protective as the criteria used by the DRMS.)</p> <p>Verify that hazardous or special waste is entrusted to special waste disposal contractors authorized by the Regional Administrator of the MOE or a public special waste disposal facility of the Environmental Management Corporation.</p> <p>Verify that the IC and contracting officers ensure that contractors:</p> <ul style="list-style-type: none"> - avoid the blowing or dropping of special waste and prevent offensive odors - use 150 kg/m³ [≈450 lb/ft³] or more of cement and less than 20 percent water content after solidification, when special waste is solidified with cement - achieve a reduction in volume of waste to less than 15 percent of the original volume, when special waste is disposed by incineration - achieve a reduction in volume of waste to less than 5 percent of the original volume, when special waste is disposed by high temperature destruction - meet air and water treatment standards for disposal of hazardous waste (See Section 2, <i>Air Quality</i> and Section 4, <i>Wastewater</i>) - have valid ROK permits.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-55. (continued)</p> <p>6-56. Installations that transship hazardous wastes to a country other than the United States must meet specific requirements (USFK EGS 6-3k(2)).</p> <p>6-57. Hazardous material that meets the definition of hazardous waste must be disposed of as a hazardous waste in certain circumstances (USFK EGS 6-3k(4)).</p>	<p>(NOTE: The MOE may additionally specify stricter air and water treatment standards considering the geographic situation and characteristics of the ecosystem.)</p> <p>Determine whether the installation transships hazardous wastes to a country other than the United States. (1)(4)</p> <p>Verify that the transshipment meets applicable international agreements. (1)(4)</p> <p>Verify that methods of disposal meet the requirements of either: (1)(4)</p> <ul style="list-style-type: none"> - the final governing standards for the nation in which the waste is disposed, if any such standards exist - the OEBGD. <p>Verify that, if final governing standards cannot be met, the waste is either retrograded to the US or transferred to another country where applicable final governing standards allow for disposal. (1)(4)</p> <p>Verify that the transshipment has been approved by the USFK ACofS, Engineer in conjunction with the Executive Agent of the receiving nation. (1)(4)</p> <p>(NOTE: The determination of whether particular USFK-generated hazardous waste may be disposed of in ROK is made by the USFK EPO, in coordination with the Director of DLA, or other relevant USFK components, and the Chief of the U.S. Diplomatic Mission.)</p> <p>Determine whether the installation has any hazardous materials that meet the definition of hazardous waste. (1)(2)(5)(9)</p> <p>Verify that the installation disposes of such materials as hazardous wastes whenever either:</p> <ul style="list-style-type: none"> - the installation is discarding the materials as being no longer useful - the materials have failed the DRMS reutilization, transfer, or sales cycles.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-58. Managers of contract-operated special waste disposal facilities must satisfy certain requirements (USFK EGS 6-3k(11)(a)).</p> <p>6-59. Technical evaluations of the acceptability of disposal operations must satisfy certain requirements (USFK EGS 6-3k(11)(b)).</p>	<p>Verify that contractor-operated special waste disposal facilities employ at least one engineer to oversee contractor operations. (2)</p> <p>(NOTE: This requirement applies to both on- and off-post facilities which include, but are not limited to: land farms, landfills, distillation and incineration facilities.)</p> <p>Verify that the engineer holds a Korean professional Grade I engineer license in one of the following areas:</p> <ul style="list-style-type: none"> - waste disposal - air quality - sanitary - civil - mechanical - chemical. <p>(NOTE: A Grade I engineer possesses knowledge, skills and abilities similar to an engineer with four years experience who holds pay grade 9 on the U.S. General Schedule.)</p> <p>Verify that the IC completes a technical evaluation on the acceptability of disposal operations at each facility at least once every 2 yr. (1)(2)</p> <p>Verify that documents of such inspections are retained with other disposal records. (2)</p> <p>(NOTE: Appendices 6-6 and 9-1, and portions of the EGS (primarily Chapters 5 through 7) contain technical management criteria which are to be used during these waste disposal facility inspections.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Land Disposal</p> <p>6-60. Land disposal facilities for hazardous waste must meet specific criteria (USFK EGS 6-3k(7)).</p> <p>6-61. Landfills used to dispose of special wastes must meet general design standards (USFK EGS 6-3k(8)(a)).</p>	<p>(NOTE: The requirements of this section apply to landfill contractors. It is the responsibility of the installation to ensure that the contractor's facilities satisfy these requirements.)</p> <p>Verify that there is a reasonable degree of certainty that hazardous constituents will not migrate from the disposal site for as long as the wastes remain hazardous. (1)(2)</p> <p>Verify that the land disposal system is off installation and has: (1)(2)</p> <ul style="list-style-type: none"> - a liner of natural or manmade materials that: <ul style="list-style-type: none"> - restricts the downward or lateral escape of hazardous wastes, hazardous constituents, or leachate - has a permeability no greater than 10^{-7} cm/s [3.94×10^{-8} in./s] - a leachate collection system - a groundwater monitoring program capable of determining the facility's impact on the quality of water in the aquifers underlying the facility. <p>Verify that the landfill: (1)(2)</p> <ul style="list-style-type: none"> - is cordoned with a 1.5 m [≈ 5 ft] or higher wire fence, unless the site is naturally isolated or in a secure area - has a retaining wall or banks constructed to withstand and retain safely the loading of special waste - has a weighing facility that can measure the weight of incoming special waste - has a foundation that is structured without settlement - uses equipment that prevents rain from flowing into the landfill area - uses equipment that separates and compacts waste - has a vehicle-wheel wash facility for transportation vehicles - has four or more groundwater monitoring wells constructed around the landfill area to assess the existence of groundwater contamination. <p>Verify that the landfill has a sign (larger than 100 cm x 50 cm [≈ 39 in. x ≈ 20 in.]) that reads "Special Waste Landfill Area" posted at the entrance to the landfill. (1)(2)</p> <p>Verify that each such sign includes the name, address, and telephone number of the landfill manager. (1)(2)</p>

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**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-62. Isolation type landfills must meet additional requirements (USFK EGS 6-3k(8)(b)).</p>	<p>Verify that the isolation type landfill has: (1)(2)</p> <ul style="list-style-type: none"> - a floor and outer walls that are: <ul style="list-style-type: none"> - waterproofed - constructed with a thickness of 15 cm [≈6 in.] or more of reinforced concrete with a compaction strength of 210 kg/m² [≈463 lb/ft²] or more as measured by the Korean Industrial Standard F-2405, or the structural equivalent - concrete partition walls provided at least every 50 m² [≈538 ft²] or 250 m³ [≈8830 ft³] of landfilling capacity - a concrete inner partition wall that is at least 10 cm [≈4 in.] thick and has 210 kg/cm² [≈463 lb/in.²] or more of strength - a cover that prevents rain water infiltration (i.e., run-on).
<p>6-63. Management type landfills must meet additional requirements (USFK EGS 6-3k(8)(b)).</p>	<p>Verify that the management type landfill has: (1)(2)</p> <ul style="list-style-type: none"> - sides and bottom that use a watertight material such as clay or high density polyethylene depending on the waste types and the depth of special waste disposed of within the landfill - a catch basin that collects leachate at the bottom of the landfill facility - equipment to transport collected leachate to treatment facilities - leachate storage and treatment tanks with at least seven times the capacity of the most frequent daily rainfall having 10 mm/day of rainfall during the last 10 yr - a facility that collects and disposes of gas emitted from the landfill for facilities that landfill organic special waste. <p>(NOTE: The requirement for the use of watertight material on the sides and bottom does not apply when the water permeability of natural soil is less than 10⁻⁷ cm/s [3.94 x 10⁻⁸ in./s].)</p> <p>Verify that, where high density polyethylene or equivalent synthetic resin materials are used for special waste disposal:</p> <ul style="list-style-type: none"> - at least two 1.5 cm thick, polyethylene layers are used - 60 cm of sand, clay or other water-tight material is installed on top of the polyethylene liner. <p>Verify that, where high density polyethylene or equivalent synthetic resin materials are used for general waste disposal:</p> <ul style="list-style-type: none"> - at least one 1.5 cm thick ply is used - 30 cm of sand, clay or other watertight material is installed on top of the polyethylene liner.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-63. (continued)</p> <p>Incinerators</p> <p>6-64. Incinerators used to dispose of hazardous or special waste incinerators must be licensed or permitted to accept the type of waste being burned (USFK EGS 6-3k(9)(a)).</p> <p>6-65. Incinerators for hazardous or special waste must meet specific standards as a prerequisite for ROK licensing/permitting or USFK EPO approval (USFK EGS 6-3k(9)(b)).</p> <p>6-66. Hazardous or special waste incinerators must meet specific operating standards (USFK EGS 6-3k(9)(b)).</p>	<p>Verify that, in all cases, the sand, clay or other water-tight material has a permeability coefficient of less than 10^{-7} cm/s [3.94×10^{-8} in./s].</p> <p>(NOTE: The requirements of this section apply to incinerators operated by contractors. It is the responsibility of the installation to ensure that the contractor's facilities satisfy these requirements.)</p> <p>(NOTE: The requirements of this section apply to incinerators that incinerate hazardous or special waste as well as to boilers and industrial furnaces that burn hazardous or special waste for any recycling purposes.)</p> <p>(NOTE: Specific requirements for incineration of Polychlorinated Biphenyls-(PCB)-containing wastes are set forth in Section 14, <i>Polychlorinated Biphenyls</i>.)</p> <p>Verify that off-installation incinerators used to dispose of hazardous or special waste are licensed or permitted by the ROK MOE or approved by the USFK EPO. (18)</p> <p>Verify that on-installation incineration has USFK EPO approval.</p> <p>(NOTE: On-installation incineration does not require a permit from ROK authorities.)</p> <p>Verify that incinerators are designed to include appropriate equipment to effectively destroy hazardous constituents and control harmful emissions. (18)</p> <p>Verify that incinerators are operated according to management practices (including proper combustion temperature, waste feed rate, combustion gas velocity, and other relevant criteria) so as to effectively destroy hazardous constituents and control harmful emissions. (18)</p> <p>Verify that incinerators achieve either of the following operating standards: (1)(2)</p> <ul style="list-style-type: none"> - the incinerator must: <ul style="list-style-type: none"> - achieve a destruction and removal efficiency of 99.99 percent for the organic hazardous constituents which represent the greatest degree of difficulty of incineration in each waste or mixture of waste - minimize carbon monoxide in stack exhaust gas - minimize emission or particulate matter - emit no more than 1.8 kg (4 lb) of hydrogen chloride per hour - the incinerator has demonstrated the ability to effectively destroy the organic hazardous constituents which represent the greatest degree of difficulty of incineration in each waste or mixture of waste to be burned.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-71. Graduation facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the graduation facility: (1)(2)</p> <ul style="list-style-type: none"> - has a disposal capacity of 125 kg/h [\approx276 lb/h] or more - is made of materials that are not eroded or damaged by special waste - has a device to control temperature and a thermometer, if the facility uses combustion gas - has an additional safety valve, if the facility uses vacuum evaporation - controls the volume of graduation - disposes of noxious gas generated by the graduation process - prevents inflow of outside air or gas leakage from the facility - controls the temperature and pressure appropriately for smooth graduation of special waste by types - regularly removes residues from the graduation process.
<p>6-72. Refining facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the refining facility: (1)(2)</p> <ul style="list-style-type: none"> - has an inside measurement of 0.1 m³ [\approx3.5 ft³] or more - disposes of toxic gas generated during the refining process - controls the volume of waste deposit - controls the amount of chemical deposit, temperature, pressure, agitation, etc. for proper refining or reaction - has the reaction chamber regularly cleaned to prevent erosion and to maintain normal function.
<p>6-73. Reaction facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the reaction facility: (1)(2)</p> <ul style="list-style-type: none"> - has an inside measurement of 0.1 m³ [\approx3.5 ft³] or more - has a reactor and equipment for waste supply control, agitation, and chemical deposit - uses a reactor made of materials that are not eroded or damaged by special waste - disposes of toxic gas generated during the reaction process.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-74. Oil and water separation facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the oil and water separation facility: (1)(2)</p> <ul style="list-style-type: none"> - has a separation capacity of 125 kg/h [\approx276 lb/h] or more - prevents the outflow of used oil and the counter-flowing of separated water - uses a storage tank for recovered oil with a capacity of 3 m³ [\approx106 ft³] or more that is made of materials that are not eroded or damaged and that prevents leaks of used oil - eliminates extraneous substances by means of a screen on inlets - controls the amount of used oil deposit - immediately conveys separated oil to an oil recollection storage tank - prevents the backflow of separated oil - uses a filter that is rinsed or replaced regularly - is inspected for performance every year by each area environment office.
<p>6-75. Coagulation/sedimentation facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the coagulation/sedimentation facility: (1)(2)</p> <ul style="list-style-type: none"> - has an inside measurement of 0.5 m³ [\approx18 ft³] or more - has a coagulation/sedimentation tank with a capacity to keep wastes for appropriate staying lengths - has a condensation/sedimentation tank and equipment for agitation and chemical deposit - uses an agitator with rotation speed control - has a device to discharge coagulated and sedimented sludge - has a cover to prevent the inflow of rain if the facility is constructed outdoors.
<p>6-76. Dewatering facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the dewatering facility: (1)(2)</p> <ul style="list-style-type: none"> - has an inside measurement of 0.2 m³ [\approx7 ft³] or more and a power of at least 0.1 HP - has the capacity to reduce water content to 80 percent or less - pumps wastewater generated from the dewatering process into the wastewater disposal facility - controls dewatering volume - prevents liquid waste or wastewater generated by the dewatering process from accidental discharge - uses a regularly cleaned filter or dewatering media that is replaced when necessary - removes foreign materials to prevent damages.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>6-77. Drying facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the drying facility: (1)(2)</p> <ul style="list-style-type: none"> - has an inside volume of 1 m³ [≈35 ft³] or more and uses more than 30 kg/h [≈65 lb/h] of fuel for converting waste to solid form - has equipment to control drying temperature for vacuum or dry heating systems - has a cover to prevent rain inflow for a natural drying system - disposes of toxic gas generated by the drying process - dries special wastes according to type and maintains proper drying temperature.
<p>6-78. Solidification facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the solidification facility: (1)(2)</p> <ul style="list-style-type: none"> - has a disposal capacity of 25 kg/h [≈55 lb/h] or more - has equipment to mix cement, water, and chemicals that reduce leaching evenly and to control the mixture ratio - uses equipment to cure the mixed substance - prevents rain runoff - is cleaned after each operation to remove residues in the mixer - provides for well cured cement.
<p>6-79. Stabilization facilities must meet specific operating standards (USFK EGS 6-3k(10)(f)).</p>	<p>Verify that the stabilization facility: (1)(2)</p> <ul style="list-style-type: none"> - has a disposal capacity of 25 kg/h [≈55 lb/h] or more, or an inside measurement of 2 m³ [≈70 ft³] or more - converts special waste to a chemically and biologically stable condition by using chemical substances or organisms - disposes of toxic gas generated by the stabilizing process.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Treatment Technologies</p> <p>6-80. Hazardous or special wastes that are disposed of as solid wastes must be treated prior to disposal so that they no longer exhibit hazardous characteristics (USFK EGS 6-3k(10)(a) through 6-3k(10)(d))</p> <p>6-81. Treatment residues of wastes categorized as hazardous or special must be managed as hazardous or special waste (USFK EGS 6-3k(10)(a) through 6-3k(10)(d)).</p>	<p>Determine whether wastes that are categorized as hazardous on the basis of Appendix 6-1, Section A-1 have been disposed of as solid wastes. (1)(2)(4)</p> <p>Verify that the following approved treatment technologies is used: (1)(2)(4)</p> <ul style="list-style-type: none"> - for organics: <ul style="list-style-type: none"> - incineration - fuel substitution where the units are operated so that destruction of hazardous constituents is at least as efficient, and hazardous emissions are no greater than those produced by incineration - biodegradation - recovery - chemical degradation - for heavy metals: <ul style="list-style-type: none"> - stabilization or fixation - recovery - for reactives: <ul style="list-style-type: none"> - treatments that change the chemical or physical composition of a material so that it no longer exhibits the characteristic of reactivity - for corrosives: <ul style="list-style-type: none"> - neutralization of corrosives to a pH value between 6.0 and 9.0 - recovery - incineration - chemical or electrolytic oxidation - chemical reduction - stabilization. <p>(NOTE: This requirement applies to the treatment residues of all wastes categorized as hazardous or special on the basis of Appendix 6-1, except for those wastes covered under Section A-1 of the appendix.)</p> <p>Verify that treatment residues which are categorized as hazardous or special are managed as hazardous or special wastes. (1)(2)(4)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)

**COMPLIANCE CATEGORY:
HAZARDOUS WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Specific Wastes</p> <p>6-82. Installations must manage lead-acid batteries that are not recycled as hazardous waste (USFK EGS 6-3i(4)).</p> <p>6-83. Mercury, nickel-cadmium, lithium, and lead-acid batteries must be treated prior to disposal (USFK EGS 6-3k(10)(e)).</p>	<p>Determine whether the installation has lead-acid batteries that have exhausted their life-cycle and are not recycled. (2)(4)</p> <p>Verify that the installation manages such batteries as hazardous waste. (2)(4)</p> <p>Verify that mercury, nickel-cadmium, lithium, and lead-acid batteries are being treated prior to disposal to stabilize, fix, or recover heavy metals and neutralize any corrosives. (2)(4)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (4) Safety and Health Officer (5) Fire Department (6) Director of Logistics (DOL) (7) Fuels Management Officer (18) HWSA Operators (DEH,DOL,DRMO) (19) Shop Activity Supervisor (23) Defense and Reutilization Marketing Office (DRMO)



Appendix 6-1

Characteristics of Hazardous Wastes and Lists of Hazardous Wastes and Hazardous Materials (USFK EGS Appendix A)

A-1 CHARACTERISTICS OF HAZARDOUS WASTE

A. General

1. A solid waste is a hazardous waste if it exhibits any of the characteristics identified in this section.
2. A hazardous waste that is identified by a characteristic in this section is assigned every USEPA Hazardous Waste Number that is applicable. This number must be used in complying with the notification, recordkeeping, and reporting requirements of these alternate standards.

B. Characteristic of Ignitability

1. A waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:
 - a. It is a liquid, other than an aqueous solution that contains less than 24 percent alcohol by volume and has a flash point less than 60 °C (140 °F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in American Society for Testing and Materials (ASTM) Standard D-93-80, or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D-3278-78, or as determined by an equivalent test method.
 - b. It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.
 - c. It is an ignitable, compressed gas as determined by appropriate test methods or the USEPA.
 - d. It is an oxidizer.
2. A waste that exhibits the characteristic of ignitability has the USEPA Hazardous Waste Number of D001.

C. Characteristic of Corrosivity

1. A waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:
 - a. It is aqueous and has a pH less than or equal to 2.0 or greater than or equal to 12.5, as determined by a pH meter.

(continued)

Appendix 6-1 (continued)

- b. It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm/yr or 0.250 in./yr at a test temperature of 55 °C (130 °F) as determined by the test method specified in National Association of Corrosion Engineers (NACE) Standard Technical Manual (TM)-01-69 as standardized in *Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods*.
2. A waste that exhibits the characteristic of corrosivity has the USEPA Hazardous Waste Number of D002.

D. Characteristic of Reactivity

1. A waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:
 - a. It is normally unstable and readily undergoes violent change without detonating.
 - b. It reacts violently with water.
 - c. It forms potentially explosive mixtures with water.
 - d. When mixed with water, it generates toxic gases, vapors, or fumes in a quantity sufficient to present danger to human health or the environment.
 - e. It is a cyanide or sulfide bearing waste that, when exposed to pH conditions between 2.0 and 12.5, can generate toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment.
 - f. It is capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement.
 - g. It is readily capable of detonation, explosive decomposition, or reaction at standard temperature and pressure.
 - h. It is a forbidden explosive.
2. A waste that exhibits the characteristic of reactivity has the USEPA Hazardous Waste Number of D003.

E. Characteristic of Toxicity

1. A waste exhibits the characteristic of toxicity if, the extract from a representative sample of the waste contains any of the contaminants listed in Charts A.1 or A.2 at the concentration equal to or greater than the respective value given in that Table. Where the waste contains less than 0.5 percent filterable solids, the waste itself is considered to be the extract for the purpose of this section.
2. A waste that exhibits the characteristic of toxicity has the USEPA Hazardous Waste Number specified in Charts A.1 or A.2 that corresponds to the toxic contaminant causing it to be hazardous.

(continued)

Appendix 6-1 (continued)

A-2 LISTS OF HAZARDOUS WASTES

A. General

1. A solid waste is a hazardous waste if it is listed in this section.
2. The basis for listing the classes or types of wastes listed employed one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
Toxicity Characteristic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)
3. Each hazardous waste listed in Section A-2 is assigned a USEPA Hazardous Waste Number that precedes the name of the waste. This number must be used in complying with the notification, recordkeeping and reporting requirements of these alternative standards.

B. Hazardous Wastes from Nonspecific Sources

The solid wastes in Chart A.3 are listed hazardous wastes from nonspecific sources.

C. Hazardous Wastes from Specific Sources

The solid wastes listed in Chart A.4, denoted "K" as the first character in the USEPA number are listed hazardous wastes from specific sources.

D. Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residue Thereof

The following materials or items are hazardous wastes if and when they are discarded or intended to be discarded: when they are mixed with waste oil or used oil, or other material and applied to the land for dust suppression or road treatment: when they are otherwise applied to the land in lieu of their original intended use; when they are contained in products that are applied to the land in lieu of their original intended use; or when, in lieu of their original intended use, they are produced for use as (or as a component of) a fuel, distributed for use as a fuel, or burned as a fuel.

1. Any commercial chemical product, or manufacturing chemical intermediate with the generic name listed in Chart A.4, annotated "P" or "U" as the first character in the USEPA waste number.
2. Any off-specification commercial chemical product or manufacturing chemical intermediate that, if it met specifications, would have the generic name listed in Chart A.4, annotated "P" or "U" as the first character in the USEPA waste number.
3. Any residue remaining in a container or in an inner liner removed from a container that has held any commercial chemical product or manufacturing chemical intermediate having the generic name listed in Chart A.4, annotated "P" or "U" as the first character in the USEPA waste number, unless the container is empty.

(continued)

Appendix 6-1 (continued)

(NOTE: Unless the residue is being beneficially used or reused, being legitimately recycled or reclaimed, or being accumulated, stored, transported, or treated prior to such use, reuse, recycling or reclamation, the residue should be discarded, and is thus, a hazardous waste. An example of a legitimate reuse of the residue would be where the residue remains in the container, and the container is used to hold the same commercial chemical product or manufacturing chemical intermediate it previously held. An example of the discard of the residue would be where the drum is sent to a drum reconditioner who reconditions the drum but discards the residue.)

4. Any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in Chart A.4, annotated "P" or "U" as the first character in the USEPA waste number, or any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any off-specification chemical product and manufacturing chemical intermediate that, if it met specifications, would have the generic name listed in Chart A.4, annotated "P" or "U" as the first character in the USEPA waste number of this section.

(NOTE: The phrase "commercial chemical product or manufacturing chemical intermediate having the generic name listed in..." refers to a chemical substance that is manufactured or formulated for commercial or manufacturing use that consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulation in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in Chart A.4, annotated "P" or "U" as the first character in the USEPA waste number. Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in Chart A.4, annotated "P" or "U" as the first character in the USEPA waste number, such waste will be listed in Chart A.3 or will be identified as a hazardous waste by the characteristics set forth in section A-1.)

5. The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products or manufacturing chemical intermediates referred to in Chart A.4, denoted "P" as the first character in the USEPA waste number, are hereby identified as acute hazardous wastes (H).

(NOTE: For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letters T (Toxicity) and R (Reactivity). Absence of a letter indicates that the compound only is listed for acute toxicity.)

These wastes and their corresponding USEPA Hazardous Waste Numbers are listed in Chart A.4, annotated "P" as the first character in the USEPA waste number.

6. The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products referred to in Chart A.4 are hereby identified as toxic wastes (T), unless otherwise designated.

(NOTE: For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letter T (Toxicity), R (Reactivity), I (Ignitability), and C (Corrosivity). Absence of a letter indicates that the compound is only listed for toxicity.)

(continued)

Appendix 6-1 (continued)

A-3 LISTS OF SPECIAL WASTES

- A. Waste acid (limited to waste acid with pH values of 2.0 or less)
- B. Waste alkali (limited to waste alkali with pH values of 12.5 or more)
- C. Waste oil (limited to waste oil with 5 percent or more of oil, and excluding waste containing PCB)
- D. Waste organic solvents:
 - 1. Halogen family (limited to substances specified below and generated from business activities using substances containing halogens):
 - a. Chlorobenzene
 - b. Dichlorobenzene
 - c. Dichlorodifluoromethane
 - d. Dichloroethane
 - e. Dichloromethane
 - f. Dichlorophenol
 - g. Monochlorophenol
 - h. Tetrachloroethylene
 - i. Tetrachloromethane
 - j. Trichloroethane
 - k. Trichloroethylene
 - l. Trichlorofluoromethane
 - m. Trichloromethane
 - n. Trichlorophenol
 - o. Trichlorotrifluoroethane
 - 2. Non-halogen family (limited to substances specified below and generated from business activities using substances containing non-halogens):
 - a. Acetone
 - b. Benzene
 - c. Butanol
 - d. Butylacetate
 - e. Cresol
 - f. Cyclohexane
 - g. Cyclohexanone
 - h. Decahydronaphthalene
 - i. Diacetin
 - j. Diethyleneether
 - k. Diethyleneglycol
 - l. Diethylsulfoxide
 - m. Dimethylformamide
 - n. Dimethylsulfide
 - o. Dioxan
 - p. Ethanol
 - q. Ethylacetate
 - r. Ethylbenzene

(continued)

Appendix 6-1 (continued)

- s. Ethyleneglycol
- t. Ethylether
- u. Ethylglycol
- v. Ethylphenol
- w. Formaldehyde
- x. Glyceroltriacetate
- y. Kerosene
- z. Methanol
- aa. Methylacetate
- ab. Methylethylketone
- ac. Methylisobuthylketone
- ad. Methylphenol
- ae. n-Butylalcohol
- af. n-Hexane
- ag. Nitrobenzene
- ah. Phenol
- ai. Propanol
- aj. Propyleneglycol
- ak. Pyridin
- al. Terpentin
- am. Tetrahydrofuran
- an. Tetrahydronaphthalene
- ao. Toulene
- ap. Triethyleneglycol
- aq. Xylene

E. Waste synthetic high polymers

1. Other waste synthetic polymers
2. Waste paint and waste lacquer
3. Waste synthetic fiber
4. Waste synthetic leather
5. Waste synthetic resins
6. Waste synthetic rubber

F. Waste asbestos (limited to the waste asbestos generated during producing/processing asbestos or removing buildings/structures)

G. Slag (limited to the slag containing substances specified in V. below)

H. Slag-dust slag (limited to the slag-dust containing substances specified in V. below)

I. Waste molding sand and waste sandblast (limited to the waste molding sand and waste sandblast that contain substances specified in V. below)

J. Waste fire resistant materials and pieces of pottery before secondary bake (limited to the waste fire resistant materials and pieces of pottery that contain substances specified in V. below)

K. Incineration residues (limited to the incineration ashes that contain substances specified in V. below)

(continued)

Appendix 6-1 (continued)

- L. Material disposed by solidification or stabilization (limited to material that contains substances specified in V. below)
- M. Waste catalyzers (limited to the waste catalyzers that contain substances specified in V. below)
- N. Waste adsorbents and waste absorbents (limited to the material that contains the substances specified in V. below)
- O. Waste agricultural chemicals (limited to agricultural chemicals generated during manufacturing and selling)
- P. Waste containing PCBs
1. Liquid waste (limited to PCB content of 50 mg/L or more)
 2. Non-liquid waste (limited to PCB content of 50 mg/L or more in the extraction liquid)
- Q. Sludge (limited to water content of less than 95 percent or solid content of 5 percent or more)
1. Sludge from wastewater treatment plants (limited to sludge discharged from the water pollution protection facility in a business that has obtained a construction permit for a facility discharging wastewater and discharged from the complex industrial wastewater final disposal facility, pursuant to Article 10.1 and 25 of the Water Environmental Preservation Law. However, sludge from filtration plants is excluded.)
 2. Manufacturing process sludge (limited to sludge discharged during an industrial manufacturing process)
 3. Designated sludge (limited to sludge containing substances specified in V. below and discharged from a business designated and notified by the Minister of Environment)
- R. Waste plaster
- S. Waste lime
- T. Animal carcasses
1. Processed leather residue (limited to leather or fur generated during manufacturing and processing)
 2. Processed meat residue (fur and contents in the internal organs generated during butchering livestock, and livestock's excrement is excluded)
 3. Processed marine residue (horny substances, such as shells, are excluded)
- U. Other materials designated/notified by the Minister of Environment as harmful to the environment or to public health.
- V. Hazardous substances contained in slag, waste molding sand, waste sand, waste fire resistant materials, pieces of pottery, incineration ashes, stabilizing or solidifying disposal materials, waste catalyzers, waste adsorbents, waste absorbents, and sludge
1. Lead or its compounds (lead contents of 3 mg/L or more in the extraction liquid as a result of extraction procedure test by the official test method for waste)
 2. Copper or its compounds (copper contents of 3 mg/L or more in the extraction liquid)

(continued)

Appendix 6-1 (continued)

3. Arsenic or its compounds (arsenic contents of 1.5 mg/L or more in the extraction liquid)
4. Mercury or its compounds (mercury contents with 0.005 mg/L or more in the extraction liquid)
5. Cadmium or its compounds (cadmium contents of 0.3 mg/L or more in the extraction liquid)
6. Hexavalent chromium or its compounds (hexavalent chromium contents of 1.5 mg/L or more in the extraction liquid)
7. Cyanide compounds (cyanide contents of 1 mg/L or more in the extraction liquid)
8. Organic phosphorus compounds (organic phosphorus contents of 1 mg/L or more in the extraction liquid)
9. Tetrachloroethylene (tetrachloroethylene contents of 0.1 mg/L or more in the extraction liquid)
10. Trichloroethylene (trichloroethylene contents of 0.3 mg/L or more in the extraction liquid).

(continued)

Appendix 6-1 (continued)

Chart A.1

Maximum Concentration of Contaminants for
the Toxicity Characteristics

USEPA HW No. ¹	Contaminant	CAS No. ²	Regulatory Level (mg/L)
D004	arsenic	7440-38-2	5.0
D005	barium	7440-39-3	100.0
D006	cadmium	7440-43-2	1.0
D007	chromium	7440-47-3	5.0
D016	2,4-D	94-75-7	10.0
D012	endrin	72-20-8	0.02
D008	lead	7439-92-1	5.0
D013	lindane	58-89-9	0.4
D009	mercury	7439-97-6	0.2
D014	methoxychlor	72-43-5	10.0
D010	selenium	7782-49-2	1.0
D011	silver	7440-22-4	5.0
D015	toxaphene	8001-35-2	0.5
D017	2,4,5-TP (Silvex)	93-72-1	1.0

¹ USEPA Hazardous Waste Number.

² Chemical Abstracts Service Number.

(continued)

Appendix 6-1 (continued)

Chart A.2

MAXIMUM CONCENTRATION OF CONTAMINANTS FOR
NONWASTEWATER

USEPA HW No. ¹	Contaminant	CAS No. ²	Regulatory Level mg/kg
D018	Benzene	71-43-2	36
D019	Carbon tetrachloride	56-23-5	5.6
D020	Chlordane	57-74-9	0.13
D021	Chlorobenze	108-90-7	5.7
D022	Chloroform	67-66-3	5.6
D023	o-Cresol	95-48-7	5.6
D024	m-Cresol	108-39-4	3.2
D025	P-Cresol	106-44-5	3.2
D026	Cresol		3.2
D027	1,4-Dichlorobenzene	106-46-7	6.2
D028	1,2-Dichloroethane	107-06-2	7.2
D029	1,1-Dichloroethylene	75-35-4	33
D030	2,4-Dinitrotoluene	121-14-2	140
D031	Heptachlor (and its epoxide)	76-44-8	0.066
D032	Hexachlorobenzene	118-74-1	37
D033	Hexachlorobutadiene	87-68-3	28
D034	Hexachloroethane	67-72-1	28
D035	Methyl Ethyl Ketone	78-93-3	36
D036	Nitrobenzene	98-95-3	14
D037	Pentachlorophenol	87-86-5	7.4
D038	Pyridine	110-86-1	16
D039	Tetrachloroethylene	127-18-4	5.6
D040	Trichloroethylene	79-01-6	5.6
D041	2,4,5-Trichlorophenol	95-95-4	37
D042	2,4,6-Trichlorophenol	88-06-2	37
D043	Vinyl Chloride	75-01-4	33

¹ USEPA Hazardous Waste Number.

² Chemical Abstracts Service Number.

(continued)

Appendix 6-1 (continued)

Chart A.3

LISTED HAZARDOUS WASTES FROM NONSPECIFIC SOURCES

USEPA Waste No. ¹	Hazardous Waste	Hazard Code
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, orthodichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F003	The following spent nonhalogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent nonhalogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above nonhalogenated solvents and a total of 10 percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)
F004	The following spent nonhalogenated solvents: cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above nonhalogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)

(continued)

Appendix 6-1 (continued)

USEPA Waste No. ¹	Hazardous Waste	Hazard Code
F005	The following spent nonhalogenated solvents: Toluene, methyl- ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above nonhalogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures	(I,T) ²
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	(T)
F007	Spent cyanide plating bath solutions from electroplating operations.	(R,T)
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	(R,T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	(R,T)
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	(R,T)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	(R,T)
F012	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.	(T)
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusion conversion coating process.	(T)

1. USEPA Hazardous Waste Number
2. (I,T) should be used to specify mixtures containing ignitable and toxic constituents.

(continued)

Appendix 6-1 (continued)

Chart A.4

LIST OF HAZARDOUS WASTE/SUBSTANCES/MATERIALS

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Acenaphthene	83329			100
Acenaphthylene	208968			5000
Acetaldehyde (i)	75070		U001	1000
Acetaldehyde, chloro-	107200		P023	1000
Acetaldehyde, trichloro-	75876		U034	5000
Acetamide, N-(aminothioxomethyl)-	591082		P002	1000
Acetamide, N-(4-ethoxyphenyl)-	62442		U187	100
Acetamide, 2-fluoro-	640197		P057	100
Acetamide, N-9H-fluoren-2-yl-	53963		U005	1
Acetic acid	64197			5000
Acetic acid (2,4-dichlorophenoxy)-	94757		U240	100
Acetic acid, lead(2+) salt	301042		U144	\$
Acetic acid, thallium(1+) salt	563688		U214	100
Acetic acid, ethyl ester (I)	141786		U112	5000
Acetic acid, fluoro-, sodium salt	62748		P058	10
Acetic anhydride	108247			5000
Acetone (I)	67641		U002	5000
Acetone cyanohydrin	75865	1000	P069	10
Acetone thiosemicarbazide	1752303	1000/10,000		1
Acetonitrile (I,T)	75058		U003	5000
Acetophenone	98862		U004	5000
2-Acetylaminofluorene	53963		U005	1
Acetyl bromide	506967			5000
Acetyl chloride (C,R,T)	75365		U006	5000
1-Acetyl-2-thiourea	591082		P002	1000
Acrolein	107028	500	P003	1
Acrylamide	79061	1000/10,000	U007	5000
Acrylic acid (I)	97107		U008	5000
Acrylonitrile	107131	10,000	U009	100
Acrylyl chloride	814686	100		1
Adipic acid	124049			5000
Adiponitrile	111693	1000		1
Aldicarb	116063	100/10,000	P070	1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Aldrin	309002	500/10,000	P004	1
Allyl alcohol	107186	1000	P005	100
Allylamine	107119	500		100
Ally chloride	107051			1000
Aluminum phosphide (R,T)	20859738	500	P005	100
Aluminum sulfate	10043013			5000
5-(Aminomethyl)-3-isoxazolol	2763964		P007	1000
Aminoptenn	54626	500/10,000		1
4-Aminopyndine	504245		P008	1000
Amiton	78535	500		1
Amiton oxalate	3734972	100/10,000		1
Amitrole	61825		U011	10
Ammonia	7664417	500		100
Ammonium acetate	631618			5000
Ammonium benzoate	1863634			5000
Ammonium bicarbonate	1066337			5000
Ammonium bichromate	7789095			10
Ammonium bifluonde	1341497			100
Ammonium bisulfite	10192300			5000
Ammonium carbamate	1111780			5000
Ammonium carbonate	506876			5000
Ammonium chloride	12125029			5000
Ammonium chromate	778989			10
Ammonium citrate, dibasic	3012655			5000
Ammonium fluoborate	13826830			5000
Ammonium fluoride	12125018			100
Ammonium hydroxide	1336216			1000
Ammonium oxalate	6009707 5972736 14258492			5000
Ammonium picrate (R)	131748		P009	10
Ammonium silicofluoride	16919190			1000
Ammonium sulfamate	7773060			5000
Ammonium sulfide	12135761			100
Ammonium tartrate	14307438 3164292			5000
Ammonium thiocyanate	1762954			5000
Ammonium vanadate	7803556		P119	1000
Amphetamine	300629	1000		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Amyl acetate	628637			5000
iso-Amyl acetate	123922			
Sec-Amyl acetate	626380			
tert-Amyl acetate	625161			
Aniline (I,T)	62533	1000	U012	5000
Aniline, 2,4,6- trimethyl	88051	500		1
Anthracene	120127			5000
Antimony ⁺⁺	7440360			5000
Antimony pentachloride	7647189			1000
Antimony pentafluoride	7783702	500		1
Antimony potassium tartrate	28300745			100
Antimony tribromide	7789619			1000
Antimony trichloride	10025919			1000
Antimony trifluoride	7783564			1000
Antimony trioxide	1309644			1000
Antimycine A	1397940	1000/10,000		1
ANTU	86884	500/10,000		100
Argentate(1-), bis(cyano-C)-, potassium	506616		P099	1
Aroclor 1016	12674112			1
Aroclor 1221	11104282			1
Aroclor 1232	11141165			1
Aroclor 1242	53469219			1
Aroclor 1248	12672296			1
Aroclor 1254	11097691			1
Aroclor 1260	11096825			1
Arsenic ⁺⁺	7440382			1
Arsenic acid H ₃ AsO ₄	1327522 7778394		P010	1
Arsenic disulfide	1303328			1
Arsenic oxide As ₂ O ₃	1327533		P012	1
Arsenic oxide As ₂ O ₅	1303282		P011	1
Arsenic pentoxide	1303282	100/10,000	P011	1
Arsenic trichloride	7784341			1
Arsenic trioxide	1327533		P012	1
Arsenic trisulfide	1303339			1
Arsenous trichloride	7784341	500		5000
Arsine	7784421	100		1
Arsine, diethyl-	692422		P038	1
Arsinic acid, dimethyl-	75605		U136	1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Arsorous dichloride, phenyl-	696286		P036	1
Asbestos+++	1332214			1
Auramine	492808		U014	100
Azasenne	115028		U015	1
Azindine	151564		P054	1
Azindine, 2-methyl-	75558		P067	1
Azinno[2',3',3,4]pyrrolo[1,2-a] indole-4, 7-dione,6-amino-8- [(aminocarbonylooxy) methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,[1aS-(1a-alpha,8-beta, 8a-alpha, 8b-alpha)]-	50077		U010	10
Aziphos-ethyl	2642719	100/10,000		1
Azinphos-methyl	86500	10/10,000		1
Banum cyanide	542621		P013	10
Benz[1]aceanthrylene, 1,2-dihydro-3-methyl-	56421		U157	10
Benz[c]acridine	225514		U016	100
Benzal chloride	98873	500	U017	5000
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	23950595		U192	5000
Benz[a]anthracene	56553		U018	10
1,2-Benzathracene	56553		U018	10
Benz[a]anthracene, 7,12-dimethyl-	57976		U094	1
Benzenamine (I,T)	62533		U012	5000
Benzenamine, 3-(Trifluoromethyl)	98168	500		1
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	492808		U014	100
Benzenamine, 4-chloro-	106478		P024	1000
Benzenamine 4-chloro-2-methyl-hydrochloride,	3165933		U049	100
Benzenamine, N,N-dimethyl-4-(phenylazo-)	60117		U093	10
Benzenamine, 2-methyl-	95534		U328	100
Benzenamine, 4-methyl-	106490		U353	100
Benzenamine, 4,4'-methylenebis(2-chloro-	101144		U158	10
Benzenamine, 2-methyl-, hydrochloride	636215		U222	100
Benzenamine, 2-methyl-5-nitro-	99558		U181	100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Benzenamine, 4-nitro-	100016		P077	5000
Benzene (I,T)	71432		U109	10
Benzene, 1-(Chloromethyl)-4-Nitro-	100141	500/10,000		1
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510156		U038	1
Benzene, 1-bromo-4-phenoxy-	101553		U030	100
Benzeneearsonic Acid	98055	10/10,000		1
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	305033		U035	10
Benzene, chloro-	108907		U037	100
Benzene, chloromethyl-	100447		P028	100
Benzenediamin, ar-methyl-	95807 496720 823405		U221	10
1,2-Benzenedicarboxylic acid, dioctyl ester	117840		U107	5000
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)]-ester	117817		U028	100
1,2-Benzenedicarboxylic acid, dibutyl ester	84742		U069	10
1,2-Benzenedicarboxylic acid, diethyl ester	84662		U088	1000
1,2-Benzenedicarboxylic acid, dimethyl ester	131113		U102	5000
Benzene, 1,2-dichloro-	95501		U070	100
Benzene, 1,3-dichloro-	541731		U071	100
Benzene, 1,4-dichloro-	106467		U072	100
Benzene, 1,1'-(2,2-dichloroethylidene) bis[4-chloro-	72548		U060	1
Benzene, dichloromethyl-	98873		U017	5000
Benzene, 1,3-diisocyanotomethyl-(R,T)	584849 91087 264716254		U223	100
Benzene, dimethyl (I,T) m-Benzene, dimethyl o-Benzene, dimethyl p-Benzene, dimethyl	1330207 108383 95476 106423		U239	1000
1,3-Benzenediol	108463		U201	5000
1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]- (R)	51434		P042	1000

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Benzeneethanamine, alpha, alpha-dimethyl-	122098		P046	5000
Benzene, hexachloro-	118741		U127	10
Benzene, hexahydro- (I)	110827		U056	1000
Benzene, hydroxy-	108952		U188	1000
Benzene, methyl-	108883		U220	1000
Benzene, 2-methyl-1,3-dinitro-	606202		U106	100
Benzene, 1-methyl-2,4-dinitro-	121142		U105	10
Benzene, 1-methylethyl- (I)	98828		U055	5000
Benzene, nitro-	98953		U169	1000
Benzene, pentachloro	608935		U183	10
Benzene, pentachloronitro-	82688		U185	100
Benzenesulfonic acid chloride (C,R)	98099		U020	100
Benzenesulfonyl chloride	98099		U020	100
Benzene, 1,2,4,5-tetrachloro-	95943		U207	5000
Benzenethiol	108985		P014	100
Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	50293		U061	1
Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-	72435		U247	1
Benzene,(trichloromethyl)-	98077		U023	10
Benzene, 1,3,5-trinitro-	99354		U234	10
Benzidine	92875		U021	1
Benzimidazole, 4,5-Dichloro-2-(Trifluormethyl)-	3615212	500/10,000		1
1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide	81072		U202	100
Benzo[a]anthracene	56553		U018	10
Benzo[b]fluoranthene	205992			1
Benzo[k]fluoranthene	207089			5000
Benzo[j,k]fluorene	206440		U120	100
1,3-Benzodioxole, 5-(1-propenyl)-	120581		U141	100
1,3-Benzodioxole, 5-(2-propenyl)-	94597		U203	100
1,3-Benzodioxole, 5-propyl	94586		U090	10
Benzoic acid	65850			5000
Benzonitrile	100470			5000
Benzo[rst]pentaphene	189559		U064	10
Benzo[ghi]perylene	191242			5000

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
2H-1-Benzophyran-2-one, 4-hydroxy-3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations greater than 0.3%	81812		P001	100
Benzo[a]pyrene	50328		U022	1
3,4-Benzopyrene	50328		U022	1
p-Benzoquinone	106514		U197	10
Benzotrichloride (C,R,T)	98077	100	U023	10
Benzoyl chloride	98884			1000
1,2-Benzphenanthrene	218019		U050	100
Benzyl chloride	100447	500	P028	100
Benzy cyanide	140294	500		1
Beryllium++	7440417		P015	10
Beryllium chloride	7787475			1
Beryllium fluoride	7787497			1
Beryllium nitrate	13597994 7787555			1
alpha-BHC	319846			10
beta-BHC	319857			1
delta-BHC	319868			1
gamma-BHC	58899		U129	1
Bicyclo [2,2,1]Heptane-2-carbonitrile, 5-chloro-6-(((Methylamino)Carbonyl)Oxylmino)-, (1s-(1-alpha, 2-beta, 4-alpha, 5-alpha, 6E))-	15271417	500/10,000		1
2,2'-Bioxirane	1464535		U085	10
(1,1'-Biphenyl)-4,4'diamine	92875		U021	1
(1,1'-Biphenyl)-4,4'diamine, 3,3'dichloro-	91941		U073	1
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethoxy-	119904		U091	100
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethyl-	119937		U095	10
Bis(chloromethyl) ketone	534076	10/10,000		1
Bis(2-chloroethyl)ether	111444		U025	10
Bis(2-chloroethoxy)methane	111911		U024	1000
Bis(2-ethylhexyl)phthalate	117817		U028	100
Bitoscanate	4044659	500/10,000		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Boron trichloride	10294345	500		1
Boron trifluoride	7637072	500		1
Boron trifluoride compound with methyl ether (1:1)	353424	1000		1
Bromoacetone	598312		P017	1000
Bromadiolone	28772567	100/10,000		1
Bromine	7726956	500		1
Bromoform	75252		U225	100
4-Bromophenyl phenyl ether	101553		U030	100
Brucine	357573		P018	100
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87683		U128	1
1-Butanamine, N-butyl-N-nitroso-	924163		U172	1
1-Butanol	71363		U031	5000
2-Butanone	78933		U159	5000
2-Butanone peroxide (R,T)	1338234		U160	10
2-Butanone, 3,3-dimethyl-1-(methylthio)-, O[(methylamino) carbonyl] oxime	3916184		P045	100
2-Butenal	123739 4170303		U053	100
2-Butene, 1,4-dichloro- (I,T)	764410		U074	1
2-Butenoic acid, 2-methyl-, 7[[2, 3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5, 7a-tetrahydro-1H-pyrrolizine-1-yl ester, [1S-[1- α (Z), 7(2S*,3R*), 7a- α]]-	303344		U143	10
Butyl acetate	123864			5000
iso-Butyl acetate	110190			
sec-Butyl acetate	105464			
tert-Butyl acetate	540885			
n-Butyl alcohol (I)	71363		U031	5000
Butylamine	109739			1000
iso-Butylamine	78819			
sec-Butylamine	513495			
tert-Butylamine	13952846 75649			
Butyl benzyl phthalate	85687			100
n-Butyl phthalate	84742		U069	10
Butyric acid	107926			5000
iso Butyric acid	79312			

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Cacodylic acid	75605		U136	1
Cadmium ⁺⁺²⁺	7440439			10
Cadmium acetate	543908			10
Cadmium bromide	7789426			10
Cadmium chloride	10108642			10
Cadmium oxide	1306190	100/10,000		1
Cadmium stearate	2223930	1000/10,000		1
Calcium arsenate	7778441	500/10,000		1
Calcium arsenite	52740166			1
Calcium carbide	75207			10
Calcium chromate	13765190		U032	10
Calcium cyanide Ca(CN) ₂	592018		P0221	10
Calcium dodecylbenzenesulfonate	26264062			1000
Calcium hypochlorite	7778543			10
Campechlor	8001352	500/10,000		1
Camphene, octachloro-	8001352		P123	1
Cantharidin	56257	100/10,000		1
Carbachol chloride	51832	500/10,000		1
Captan	133062			10
Carbamic acid, ethyl ester	51796		U238	100
Carbamic acid, methylnitroso-, ethyl ester	615532		U178	1
Carbamic acid, Methyl-, 0-(((2,4-Dimethyl-1, 3-Dithiolan-2-yl)Methyliene)Amino)-	26419738	100/10,000		1
Carbamic chloride, dimethyl-	79447		U097	1
Carbamodithioic acid, 1,2-ethaneiyylbis, salts & esters	111546		U114	5000
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	2303164		U062	100
Carbaryl	63252			100
Carbofuran	1563662	10/10,000		10
Carbon disulfide	75150	10,000	P022	100
Carbon oxyfluoride (R,T)	353504		U033	1000
Carbon tetrachloride	56235		U211	10
Carbonic acid, dithallium(1+)salt	6533739		U215	100
Carbonic dichloride	75445		P095	10
Carbonic difluoride	353504		U033	1000
Carbonochloridic acid, methyl ester	79221		U156	1000
Carbophenothion	786196	500		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Chloral	75876		U034	5000
Chlorambucil	305033		U035	10
Chlordane	57749	1000	U036	1
Chlordane, alpha & gamma isomers	57749		U036	1
Chlordane, technical	57749		U036	1
Chlorfenvinfos	470906	500		1
Chlorine	7782505	100		10
Chlormephos	24934916	500		1
Chlormequat chloride	999815	100/10,000		1
Chlornaphazine	494031		U026	100
Chloroacetaldehyde	107200		P023	1000
Chloroacetic acid	79118	100/10,000		1
p-Chloroaniline	106478		P024	1000
Chlorobenzene	108907		U037	100
Chlorobenzilate	510156		U038	10
p-Chloro-m-cresol	59507		U039	5000
Chlorodibromomethane	124481			100
Chloroethane	75003			100
Chloroethanol	107073	500		1
Chlorethyl chlorofomate	627112	1000		1
2-Chloroethyl vinyl ether	110758		U042	1000
Chloroform	67663	10,000	U044	10
Chloromethyl ether	542881	100		1
Chloromethyl methyl ether	107302	100	U046	10
beta-Chloronaphthalene	91587		U047	5000
2-Chloronaphthalene	91587		U047	5000
Chlorophacinone	3691358	100/10,000		1
o-Chlorophenol (2)	95578		U048	100
4-Chlorophenol phenyl ether	7005723			5000
1-(o-Chlorophenyl)thiourea	5344821		P026	100
3-Chloropropionitrile	542767		P027	1000
Chlorosulfonic acid	7790945			1000
4-Chloro-o-toluidine, hydrochloride	3165933		U049	100
Chlorpyrifos	2921882			1
Chloroxuron	1982474	500/10,000		1
Chlorthiophos	21923239	500		1
Chromic acetate	1066304			1000
Chromic acid	11115745 7738945			10
Chromic acid H ₂ CrO ₄ , calcium salt	13765190		U032	10

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Chromic chloride	10025737	1/10,000		1
Chromic sulfate	10101538			1000
Chromium++	7440473			5000
Chromous chloride	10049055			1000
Chrysene	218019		U050	100
Cobalt, ((2,2'-(1,2-ethanediylbis (Nitrilomethylidyne)) Bis(6-fluoro-phenolato))(2-)-N,N',O,O')-,	62207765	100/10,000		1
Cobaltous bromide	7789437			1000
Cobalt carabonyl	10210681	10/10,000		1
Cobaltous formate	544183			1000
Cobaltous sulfamate	14017415			1000
Coke Oven Emissions	NA			1
Colchicine	64868	10/10,000		1
Copper cyanide	544923		P029	10
Coumaphos	56724	100/10,000		10
Coumatetralyl	5836293	500/10,000		1
Creosote	8001589		U051	1
Cresol(s)	1319773		U052	1000
m-Cresol	108394			
o-Cresol	95487	1000/10,000		1000
p-Cresol	106445			
Cresylic acid	1319773		U052	1000
m-Cresol	108394			
o-Cresol	95487			
p-Cresol	106445			
Crimidine	535897	100/10,000		1
Crotonaldehyde	123739	1000	U053	100
	4170303	100		100
Cumene (I)	98828		U055	5000
Cupric acetate	142712			100
Cupric acetoarsenite	12002038			1
Cupric chloride	7447394			10
Cuprice nitrae	3251238			100
Cupric oxalate	5893663			100
Cupric sulfate	7758987			10
Cupric sultate, ammoniated	10380297			100
Cupric tartrate	815827			100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Cyanides (soluble salts and complexes) not otherwise specified	57125		P030	10
Cyanogen	460195		P031	100
Cyanogen bromide	506683	500/10,000	U246	1000
Cyanogen chloride	506774		P033	10
Cyanogen iodide	506785	1000/10,000		1
Cyanophos	2636262	1000		1
Cyanuric fluoride	675149	100		1
2,5-Cyclohexadiene-1,4-dione	106514		U197	10
Cyclohexane (I)	110827		U056	1000
Cyclohexane, 1,2,3,4,5,6-hexachloro, (1-alpha, 2-alpha, 3-beta, 4-alpha, 5-alpha, 6-beta)-	58899		U129	1
Cyclohexanone (I)	108941		Y057	5000
2Cyclohexanone	131895		P034	100
Cycloheximide	66819	100/10,000		1
Cyclohexylamine	108918	10,000		1
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77474		U130	10
Cyclophosphamide	50180		U058	10
2,4-D Acid	94757		U240	100
2,4-D Ester	94111 94791 94804 1320189 1928387 1928616 1929733 2971382 25168267 53467111			100
2,4-D, salts & esters	94757		U240	100
Daunomycin	20830813		U059	10
Decarborane(14)	17702419	500/10,000		1
Demeton	8065483	500		1
Demeton-S-Methyl	919868	500		1
DDD, 4,4'DDD	72548		U060	1
DDD, 4,4'DDE	72559			1
DDT, 4,4'DDT	50293		U061	1
Diallate	2303164		U062	100
Dialifor	10311849	100/10,000		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Diazinon	333415			1
Dibenz[a,h]anthracene	53703		U063	1
1,2:5,6-Dibenzanthracene	53703		U063	1
Dibenzo[a,h]anthracene	53703		U063	1
Dibenz[a,i]pyrene	189559		U064	10
1,2-Dibromo-3-chloropropane	96128		U066	1
Diborane	19287457	100		1
Dibutyl phthalate	84742		U069	10
Di-n-butyl phthalate	84742		U069	10
Dicamba	1918009			1000
Dichlobenil	119456			100
Dichlone	117806			1
Dichlorobenzene	25321226			100
m-Dichlorobenzene (1,3)	541731		U071	100
o-Dichlorobenzene (1,2)	95501		U070	100
p-Dichlorobenzene (1,4)	106467		U072	100
3,3'-Dichlorobenzidine	91941		U073	1
Dichlorobromomethane	75274			5000
1,4-Dichloro-2-butene (I,T)	764410		U074	1
Dichloroifluoromethane	75718		U075	5000
1,1-Dichloroethane	75343		U076	1000
1,2-Dichloroethane	107062		U077	100
1,1-Dichloroethylene	75354		U078	100
1,2-Dichloroethylene	156605		U079	1000
Dichloroethyl ether	11444	10,000	U025	10
Dichloroisopropyl ether	108601		U027	1000
Dichloromethoxy ethane	111911		U024	1000
Dichloromethyl ether	542881		P016	10
Dichloromethylphenylsilane	149746	1000		1
2,4-Dichlorophenol	120832		U081	100
2,6-Dichlorophenol	87650		U082	100
Dichlorophenylarsine	696286		P036	1
Dichloropropane	26638197			1000
1,1-Dichloropropane	78999			
1,3-Dichloropropane	142289			
1,2-Dichloropropane	78875		U083	1000
Dichloropropane-Dichloropropene (mixture)	8003198			100
Dichloropropene	26952238			100
2,3-Dichloropropene	78886			

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
1,3-Dichloropropene	542756		U084	100
2,2-Dichloropropionic acid	75990			5000
Dichlorvos	62737	1000		100
Dicofol	115322			10
Dicrotophos	141662	100		1
Dieldrin	60571		P037	1
1,2:3,4-Diepoxybutane (I,T)	1464535	500	U085	10
Diethyl chlorophosphate	814493	500		1
Diethylamine	109897			100
Diethylarsine	692422		P038	1
Diethylcarbamazine citrate	1642542	100/10,000		1
1,4-Diethylenedioxiide	123911		U108	100
Diethylhexyl phthalate	117817		U028	100
N,n'-Diethylhydrazine	1615801		U086	10
O,O-Diethyl S-methyl dithiophosphate	3288582		U087	5000
Diethyl-p-nitrophenyl phosphate	311455		P041	100
Diethyl phthalate	84662		P088	1000
O,O-Diethyl O-pyrazinyl phosphorothioate	297972		P040	100
Diethylstilbestrol	56531		U089	1
Digitoxin	71636	100/10,000		1
Diglycidyl Ether	2238075	1000		1
Digoxin	20830755	10/1000		1
Dihydrosafrole	94586		U090	10
Diisopropylfluorophosphate, 1,2,3,4, 10,10-10-hexa-chloro-1,4,4a,5,8, 8a-hexahydro-(1-alpha, 4-alpha, 4-beta, 5-alpha, 8-alpha, 8a-beta)1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5, 8,8a-hexahydro, (1-alpha, 4-alpha, 4a-beta, 5a-beta, 8-beta,	309002		U004	1
8a-beta)-2,7:3,6-Dimethanonaphth[2,3 b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1a-alpha, 2-beta, 2a-alpha, 3-beta, 6-beta	465736		P060	1
60571			P037	1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
6a-alpha, 7beta, 7aalpha)-2,7:3,6 Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a, 3,6,6a,7,7a-octa-hydro-, (1a-alpha, 2-beta, 2a-beta, 3-alpha, 6-alpha,	72206		P051	1
6a-beta, 7-beta, 7a-alpha)-Dimethoate	60515		P044	10
3,3'-Dimethoxybenzidine	119904		U091	100
Dimefox	115264	500		1
Dimethoate	60515	500/10,000		10
Dimethyl Phosphorochloridothioate	2524030	500		1
Dimethyl sulfate	77781	500		1
Dimethyl sulfide	75183	100		1
Dimethylamine (I)	124403		U092	1000
p-Dimethylaminoazobenzene	60117		U093	10
7,12-Dimethylbenz[a]anthracene	57976		U094	1
3,3'-Dimethylbenzidine	119937		U095	10
alpha, alpha-Dimethylbenzylhydroperoxide (R)	80159		U096	10
Dimethylcarbonyl chloride	79447		U097	1
Dimethyldichlorosilane	75785	500		1
1,1-Dimethylhydrazine	57147	1000	U098	1
1,2-Dimethylhydrazine	540738		U099	1
alpha, alpha-Dimethylphenethylamine	122098		P046	5000
Dimethyl-p-phenylenediamine	99989	10/10,000		1
2,4-Dimethylphenol	105679		U101	100
Dimethyl phthalate	131113		U102	5000
Dimethyl sulfate	77781		U103	100
Dimetilian	644644	500/10,000		1
Dinitrobenzene (mixed)	25154545			100
m-Dinitrobenzene	99650			
o-Dinitrobenzene	528290			
p-Dinitrobenzene	100254			
4,6-Dinitro-o-cresol and salts	534521	10/10,000	P047	10
Dinitrophenol	25550587			10
2,5-Dinitrophenol	329715			
2,6-Dinitrophenol	573568			
2,4-Dinitrophenol	51285		P048	10
Dinitrotoluene	25321146			10
3,4-Dinitrotoluene	610399			
2,4-Dinitrotoluene	121142		U105	10

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
2,6-Dinitrotoluene	606202		U106	100
Dinoseb	88857	100/10,000	P020	1000
Dinoterb	1420071	500/10,000		1
Di-n-octyl phthalate	117840		U107	5000
1,4-Dioxane	123911		U108	100
Dioxathion	78342	500		1
Diphacinone	82666	10/10,000		1
1,2-Diphenylhydrazine	122667		U109	10
Disphosphoramidate, octamethyl-	152169	100	P085	100
Diphosphoric acid, tetraethyl ester	107493		P111	10
Dipropylamine	142847		U110	5000
Di-n-propylnitrosamine	621647		U111	10
Diquat	85007 2764729			1000
Disulfoton	298044	500	P039	1
Dithiazanine iodine	514738	500/10,000		1
Dithiobiuret	541537	100/10,000	P049	100
Diuron	330541			100
Dodecylbenzenesulfonic acid	27176870			1000
Emetine, Dihydrochloride	316427	1/10,000		1
Endosulfan	115297	10/10,000	P050	1
alpha-Endosulfan	959988			1
beta-Endosulfan	33213659			1
Endosulfant sulfate	1031078			1
Endothall	145733		P088	1000
Endothion	2778043	500/10,000		1
Endrin	72208	500/1000	P051	1
Endrin aldehyde	742934			1
Endrin & metabolites	72208		P051	1
Epichlorohydrin	106898	1000	U041	1000
Epinephrine	51434		P042	1000
EPN	2104645	100/10,000		1
Ergocalciferol	50146	1000/10,000		1
Ergotamine tartrate	379793	500/10,000		1
Ethanal	75070		U001	1000
Ethanamine, N-ethyl-N-nitroso-	55185		U174	1
1,2-Ethanediamine, N,N-dimethyl-N'- 2-pyridinyl-N'-(2-thienylmethyl)-	91805		U155	5000
Ethane, 1,2-dibromo-	106934		U067	1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Ethane, 1,1-dichloro-	75343		U076	1000
Ethane, 1,2-dichloro-	107062		U077	100
Ethanedinitrile	460195		P031	100
Ethane, hexachloro-	67721		U131	100
Ethane, 1,1'-[methylenebis(oxy)] bis(2-chloro-	111911		U024	1000
Ethane, 1,1'-oxybis-	60297		U117	100
Ethane, 1,1'-oxybis(2-chloro-	111444		U025	10
Ethane, pentachloro-	76017		U184	10
Ethanesulfonyl chloride, 2-chloro	1622328	500		1
Ethane, 1,1,1,2-tetrachloro-	630206		U208	100
Ethane, 1,1,2,2-tetrachloro-	79345		U209	100
Ethanethioamide	62555		U218	10
Ethane, 1,1,1-trichloro-	71556		U226	1000
Ethane, 1,1,2-trichloro-	79005		U227	100
Ethanimidothioic acid, N-[[[(methylamino) carbonyl]oxy]-, methyl ester	16752775		P066	100
Ethanol, 1,2-Dichloro-, acetate	10140871	1000		1
Ethanol, 2-ethoxy-	110805		U359	1000
Ethanol, 2,2'-(nitrosoimino)bis-	1116547		U173	1
Ethanone, 1-phenyl-	98862		U004	5000
Ethene, chloro-	75014		U043	1
Ethene, 2-chloroethoxy-	110758		U042	1000
Ethene, 1,1-dichloro-	75354		U078	100
Ethene, 1,2-dichloro- (E)	156605		U079	1000
Ethene, tetrachloro-	127184		U210	100
Ethene, trichloro-	79016		U228	100
Ethion	563122	1000		10
Ethoprophos	13194484	1000		1
Ethyl acetate (I)	141786		U112	5000
Ethyl acrylate (I)	140885		U113	1000
Ethylbenzene	100414			1000
Ethylbis(2-Chloroethyl)amine	538078	500		1
Ethyl carbamate (urethane)	51796		U238	100
Ethyl cyanide	107120		P101	10
Ethylenebisdithiocarbamic acid, salts & esters	111546		U114	5000
Ethylenediamine	107153			5000

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Ethylenediamine-tetraacetic acid (EDTA)	60004			5000
Ethylene dibromide	106934		U067	1
Ethylene dichloride	107062		U077	100
Ethylene fluorohydrin	371620	10		1
Ethylene glycol monoethyl ether	110805		U359	1000
Ethylene oxide (I,T)	75218	1000	U115	10
Ethylenediamine	107153	10,000		5000
Ethylenethiourea	96457		U116	10
Ethylenimine	151564	500	P054	1
Ethyl ether (I)	60297		U117	100
Ethylthiocyanate	542905	10,000		1
Ethylidene dichloride	75343		U076	1000
Ethyl methacrylate	97632		U118	1000
Ethyl methanesulfonate	62500		U119	1
Famphur	52857		P097	1000
Fenamiphos	22224926	10/10,000		1
Fenitrothion	122145	500		1
Fensulfothion	115902	500		1
Ferric ammonium citrate	1185575			1000
Ferric ammonium oxalate	2944674 55488874			1000
Ferric chloride	7705080			100
Ferric fluoride	7783508			1000
Ferric nitrate	10421484			1000
Ferric sulfate	10028225			1000
Ferrous ammonium sulfate	10045893			1000
Ferrous chloride	7758943			100
Ferrous sulfate	7720787 7782630			1000
Fluential	4301502	100/10,000		1
Fluoranthene	206440		U120	100
Fluorene	86737			5000
Fluorine	7782414	500	P056	10
Fluoroacetamide	640197	100/10,000	P057	100
Fluoroacetic acid	144490	10/10,000		1
Fluoroacetic acid, sodium salt	62786		P058	10
Fluoroacetyl chloride	359068	10		1
Fluorouracil	51218	500/10,000		1
Fonofos	944229	500		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Formaldehyde	50000	500	U122	100
Formaldehyde cyanohydrin	107164	1000		1
Formetanate hydrochloride	23422539	500/10,000		1
Formothion	2540821	100		1
Formparanate	17702577	100/10,000		1
Formic acid (C,T)	64186		U123	5000
Fosthietan	21548323	500		1
Fuberidazole	3878191	100/10,000		1
Fulminic acid, mercury(2) salt (R,T)	628864		P065	10
Fumaric acid	110178			5000
Furan (I)	110009	500	U124	100, 100
Furan, tetrahydro- (I)	109999		U213	1000
2-Furancarboxaldehyde (I)	98011		U125	5000
2,5-Furandione	108316		U147	5000
Furfural (I)	98011		U125	5000
Furfuran (I)	110009		U124	100
Gallium trichloride	13450903	500/10,000		1
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	18883664		U206	1
D-Glucose, 2-deoxy-2-[[[(methylnitrosoamino)-carbonyl]amino]-	18883664		U206	1
Glycidylaldehyde	765344		U126	10
Guanidine, N-methyl-N'-nitro-N-nitroso-	70257		U163	10
Guthion	86500			1
Heptachlor	76448		P059	1
Heptachlor epoxide	1024573			1
Hexachlorobenzene	118741		U127	10
Hexachlorobutadiene	87683		U128	1
Hexachlorocyclohexane (gamma isomer)	58899		U129	1
Hexachlorocyclopentadiene	77474	100	U130	10
Hexachloroethane	67721		U131	100
Hexachlorophene	70304		U132	100
Hexachloropropene	1888717		U243	1000
Hexaethyl tetraphosphate	757584		P062	100
Hexamethylenediamine, N,N'-Dibutyl	4835114	500		1
Hydrazine (R,T)	302012	1000	U133	1
Hydrazine, 1,2-diethyl-	1615801		U086	10

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Hydrazine, 1,1-dimethyl-	57147		U098	10
Hydrazine, 1,2-dimethyl-	540738		U099	1
Hydrazine, 1,2-diphenyl-	122667		U109	10
Hydrazine, methyl-	60344		P068	10
Hydrazinecarbothioamide	79196		P116	100
Hydrochloric acid	7647010			5000
Hydrocyanic acid	74908	100	P063	10
Hydrofluoric acid	7664393		U134	100
Hydrogen chloride (gas only)	7647010	500		5000
Hydrogen cyanide	74908		P063	10
Hydrogen fluoride	7664393	100	U134	100
Hydrogen peroxide (Conc > 52%)	7722841	1000		1
Hydrogen selenide	7783075	10		1
Hydrogen sulfide	7783064	500	U135	100
Hydroperoxide, 1-methyl-1-phenylethyl-	80159		U096	10
Hydroquinone	123319	500/10,000		1
2-Imidazoliainethione	96457		U116	10
Indeno(1,2,3-cd)pyrene	193395		U137	100
Iron, Pentacarbonyl-	13463406	100		1
Isobenzan	297789	100/10,000		1
1,3-Isobenzofurandione	85449		U190	5000
Isobutyronitrile	78820	1000		1
Isobutyl alcohol (I,T)	78831		U140	5000
Isocyanic acid, 3,4-Dichlorophenyl ester	102363	500/10,000		1
Isodrin	465736	100/10,000	P060	1
Isofluorophate	55914	100		100
Isophorone	78591			5000
Isophorone Diisocyanbate	4098719	100		1
Isoprene	78795			100
Isopropanolamine dodecylbenzene sulfonate	42504461			1000
Isopropyl chloroformate	108236	1000		1
Isopropyl formate	625558	500		1
Isopropylmethylpyrazolyl dimethylcarbamate	119380	500		1
Isosafrole	120581		U141	100
3(2H)-Isoxazolone, 5-(aminomethyl)-	2763964		P007	1000
Kepone	143500		U142	1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Lactonitrile	78977	1000		1
Lasiocarpine	303344		U143	10
Lead acetate	301042		U144	#
Lead arsenate	7784409 7645252 10102484			1
Lead, bis(acetato-O)tetrahydroxytri	1335326		U146	100
Lead chloride	7758954			100
Lead fluoborate	13814965			100
Lead iodide	10101630			100
Lead nitrate	10099748			100
Lead phosphate	7446277		U145	#
Lead stearate	7428480 1072351 52652592 56189094			5000#
Lead subacetate	1335326		U146	100
Lead sulfate	15739807 7446142			100
Lead sulfide	1314870			5000#
Lead thiocyanate	592870			100
Leptophos	21609905	500/10,000		1
Lewisite	541253	10		1
Lindane	58899	1000/10,000	U129	1
Lithium chromate	14307358			10
Lithium hydride	7580678	100		1
Malathion	121755			100
Maleic acid	110167			5000
Maleic anhydride	108316		U147	5000
Maleic hydrazide	123331		U148	5000
Malononitrile	109773	500/10,000	U149	1000
Manganese, tricarbonyl methylcyclopentadienyl	12108133	100		1
Mechlorethamine	51752	10		1
Melphalan	148823		U150	1
Mephosfolan	950107	500		1
Mercaptodimethur	2032657			10
Mercuric acetate	1600277	500/10,000		1
Mercuric chloride	747947	500/10,000		1
Mercuric cyanide	592041			1
Mercuric nitrate	10045940			10

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Mercuric oxide	21908532	500/10,000		1
Mercuric sulfate	7783359			10
Mercuric thiocyanate	592858			10
Mercurous nitrate	10415755 7782867			10
Mercury	7439976		U151	1
Mercury (acetate-O)phenyl-	62384		P092	100
Mercury fulminate	628864		P065	10
Methacrolein diacetate	10476956	1000		1
Methacrylic anhydride	760930	500		1
Methacrylonitrile (I,T)	126987	500	U152	1000
Methacryloyl chloride	920467	100		1
Methacryloyloxyethyl isocyanate	30674807	100		1
Methamidophos	10265926	100/10,000		1
Methanamine, N-methyl-	124403		U092	1000
Methanamine, N-methyl-N-nitroso-	62759		P082	10
Methane, bromo-	74839		U029	1000
Methane, chloro- (I,T)	74873		U045	100
Methane, chloromethoxy-	107302		U046	10
Methane, dibromo-	74953		U068	1000
Methane, dichloro-	75092		U080	1000
Methane, dichlorodifluoro-	75718		U075	5000
Methane, iodo-	74884		U138	100
Methane, isocyanato-	624839		P064	##
Methane, oxybis(chloro-	542881		P016	10
Methanesulfonyl chloride, trichloro-	594423		P118	100
Methanesulfonyl fluoride	558258	1000		1
Methanesulfonic acid, ethyl ester	62500		U119	1
Methane, tetrachloro-	56235		U211	10
Methane, tetranitro- (R)	509148		P112	10
Methane, tribromo-	75252		U225	100
Methane, trichloro-	67663		U044	10
Methane, trichlorofluoro-	75694		U121	5000
Methanethiol (I,T)	74931		U153	100
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexa-chloro-1,5,5a, 6,9,9a-hexahydro-, 3-oxide	115297		P050	1
1,3,4-Metheno-2H-cyclobutal[cd] pentalen-2-one,1,1a,3,3a,4, 5,5a,5b,6-decachlorocatahydro-	143500		U142	1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
4,7-Methano-1H-indene, 1,4,5,6,7,8,8 heptachloro-3a, 4,7,7a-tetrahydro-	76448		P059	1
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8 octachloro-2,3, 3a,4,7,7a-hexahydro-	57749		U036	1
Methanol (I)	67561		U154	5000
Methapyrilene	91805		U155	5000
Methidathion	950378	500/10,000		1
Methiocarb	2032657	500/10,000		10
Methomyl	16752775	500/10,000	P066	100
Methoxychlor	72435		Y247	1
Methoxyethylmercuric acetate	151382	500/10,000		1
Methyl alcohol (I)	67561		U154	5000
Methyl bromide	74839	1000	U029	1000
1-Methylbutadiene (I)	504609		U186	100
Methyl chloride (I,T)	74873		U045	100
Methyl 2-chloroacrylate	80637	500		1
Methyl chlorocarbonate (I,T)	79221		U156	1000
Methyl chloroform	71556		U226	1000
Methyl chloroformate	79221	500	U156	1000
Methyl disulfide	624920	100		1
3-Methylcholanthrene	56495		U157	10
4,4'-Methylenebis(2-chloroaniline)	101144		U158	10
Methylene bromide	74953		U068	1000
Methylene chloride	75092		U080	1000
Methyl ethyl ketone (MEK) (I,T)	78933		U159	5000
Methyl ethyl ketone peroxide (R,T)	1338234		U160	10
Methyl hydrazine	60344	500	P068	10
Methyl iodide	74884		U138	100
Methyl isobutyl ketone	108101		U161	5000
Methyl isocyanate	624839	500	P064	##
Methyl isothiocyanate	556616	500		1
2-Methylacetonitrile	75865		P069	10
Methyl mercaptan	74931	500	U153	100
Methyl methacrylate (I,T)	80626		U162	1000
Methyl parathion	298000		P071	100
Methyl phenkapton	3735237	500		1
Methyl phosphoric dichloride	676971	100		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
4-Methyl-2-pentanone (I)	108101		U161	5000
Methyl thiocyanate	556649	10,000		1
Methylthiouracil	56042		U164	10
Methyl vinyl ketone	78944	10		1
Methylmercuric dicyanamide	502396	500/10,000		1
Methyltrichlorosilane	75796	500		1
Metolcarb	1129415	100/10,000		1
Mevinphos	7786347	500		10
Mexacarbate	315184	500/10,000		1000
Mitomycin C	50077	500/10,000	U010	10
MNNG	70257		U163	10
Monocrotophos	6923224	10/10,000		1
Monoethylamine	75047			100
Monomethylamine	73895			100
Muscimol	2763964	10,000	P007	1000
Mustard gas	505602	500		1
Naled	300765			10
5,12-Naphthaacenedione, 8-acetyl-10-[3 amino-2,3,6-tri-deoxy-alpha-L-lyxo-hexopyranosyl)-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	20830813		U059	10
1-Naphthalenamine	134327		U167	100
2-Naphthalenamine	91598		U169	10
Naphthalenamine, N,N'-bis(2-chloroethyl)-	494031		U026	100
Naphthalene, 2-chloro-	91587		U047	5000
1,4-Naphthalenedione	130154		U166	5000
2,7-Naphthalenedisulfonic acid, 3,3' [(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	72571		U236	10
Naphthenic acid	1338245			100
1,4-Naphthoquinone	130154		U166	5000
alpha-Naphthylamine	134327		U167	100
beta-Naphthylamine	91598		U168	10
alpha-Naphthylthiourea	86884		P072	100
Nickel++	7440020			100
Nickel ammonium sulfate	15699180			100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Nickel carbonyl	13463393	1	P073	10
Nickel carbonyl Ni(CO) ₄ , (T-4)-	13463393		P073	10
Nickel chloride	7718549 37211055			100
Nickel cyanide	557197		P074	10
Nickel hydroxide	12054487			10
Nickel nitrate	14216752			100
Nickel sulfate	7786814			100
Nicotine & salts	54115	100	P075	100
Nicotine sulfate	65305	100/10,000		1
Nitric acid	7697372	1000		1000
Nitric acid, thallium(1+) salt	10102451		U217	100
Nitric oxide	10102439	100	P076	10
p-Nitroaniline	100016		P077	5000
Nitrobenzene (I,T)	98953	10,000	U169	1000
Nitrocyclohexane	1122607	500		1
Nitrogen dioxide	10102440 10544726	100	P078	10
Nitrogen oxide	10102439		P076	10
Nitroglycenne	55630		P981	10
Nitrophenol (mixed)	25154556			100
m-Nitrophenol	554847			100
o-Nitrophenol (2)	88755			100
p-Nitrophenol (4)	100027		U170	100
2-Nitropropane (I,T)	96469		U171	10
N-Nitrosodi-n-butylamine	924163		U172	10
N-Nitrosodiethanolamine	1116547		U173	1
N-Nitrosodiethylamine	55185		U174	1
N-Nitrosodimethylamine	62759	1000	P082	10
N-Nitrosodiphenylamine	86306			100
N-Nitroso-N-ethylurea	759739		U176	1
N-Nitroso-N-methylurea	684935		U177	1
N-Nitroso-N-methylurethane	615532		U178	1
N-Nitrosomethylvinylamine	4549400		P084	10
N-Nitrosopipendine	199754		U179	10
N-Nitrosopyrrolidine	930552		U180	1
Nitrotoluene	1321126			1000
m-Nitrotoluene	99081			
o-Nitrotoluene	88722			
p-Nitrotoluene	99990			
5-Nitro-o-toluidine	99558		U181	100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Norbormide	991424	100/10,000		1
Octamethylpyrophosphoramidate	152169		P085	100
Organorhodium complex (PMN-82-147)	0	10/10,000		1
Osmium tetroxide	20816120		P087	1000
Ouabain	630604	100/10,000		1
7-Oxabicyclo[2,2,1]heptane-s,3-dicarboxylic acid	145733		P088	1000
Oxamyl	23135220	100/10,000		1
1,2-Oxathiolane, 2,2-dioxide	1120714		U193	10
2H-1,3,2-Oxazaphosphorin-2-amine, N,N bis(2-chloroethyl)tetrahydro-, 2-oxide	50180		U058	10
Oxetane, 3,3-bis(chloromethyl)-	78717	500		
Oxirane (I,T)	75218		U115	10
Oxiranecarboxyaldehyde	765344		U126	10
Oxirane, (chloromethyl)-	106898		U041	100
Oxydisulfoton	2497076	500		1
Ozone	10028156	100		1
Paraformaldehyde	30525894			1000
Paraldehyde	123637		U182	1000
Paraquat	1910425	10/10,000		1
Paraquat methosulfate	2074502	10/10,000		1
Parathion	56382	100	P089	10
Parathion-methyl	298000	100/10,000		100
Paris green	12002038	500/10,000		100
Pentaborane	19624227	500		1
Pentachlorobenzene	608935		U183	10
Pentachlorethane	76017		U184	10
Pentachlorophenol	87865		U242	10
Pentachloronitrobenzene (PCNB)	82688		U185	100
Pentadecylamine	2570265	100/10,000		1
Peracetic acid	79210	500		1
1,3-Pentadiene (I)	504609		U186	100
Perachloroethylene	127184		U210	100
Perchloromethylmercaptan	594423	500		100
Phenacetin	62442		U187	100
Phenanthrene	85018			5000
Phenol	108952	500/10,000	U188	1000
Phenol, 2-chloro-	95578		U048	100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Phenol, 4-chloro-3-methyl-	59507		U039	5000
Phenol, 2-cyclohexyl-4,6-dinitro-	131895		P034	100
Phenol, 2,4-dichloro	120832		U081	100
Phenol, 2,6-dichloro-	87650		U082	100
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	56531		U089	1
Phenol, 2,4-dimethyl-	105679		U101	100
Phenol, 2,4-dinitro-	51285		P048	10
Phenol, methyl- m-Cresol o-Cresol p-Cresol	1319773 108394 95487 106445		U052	1000
Phenol, 2-methyl-4,6-dinitro-	534521		P047	10
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	70304		U132	100
Phenol, 2,2'-thiobis(4,6-dichloro-	97187	100/10,000		1
Phenol, 2,2'-thiobis(4-chloro-6-methyl)-	4418660	10/10,000		1
Phenol, 2-(1-methylpropyl)-4,6-dinitro	88857		P020	1000
Phenol, 3-(1-methylethyl)-, methylcarbamate	64006	500/10,000		1
Phenol, 4-nitro-	100027		U170	100
Phenol, pentachloro-	87865		U242	10
Phenol, 2,3,4,6-tetrachloro-	58902		U212	10
Phenol, 2,4,5-trichloro-	95954		U230	10
Phenol, 2,4,6-trichloro-	88062		U231	10
Phenol, 2,4,6-trinitro-, ammonium salt	131748		P009	10
Phenoxarsine, 10,10'-oxydi-	58366	500/10,000		1
L-Phenylalanine, 4-[bis(2-chloroethyl) aminol]	148823		U150	1
Phenyl dichloroarsine	696286	500		1
1,10-(1,2-Phenylene)pyrene	193395		U137	100
Phenylhydrazine hydrochloride	59881	1000/10,000		1
Phenylmercury acetate	62384	500/10,000	P092	100
Phenylsilatrane	2097190	100/10,000		1
Phenylthiourea	103855	100/1000	P093	100
Phorate	298022	10	P094	1010
Phosacetim	4104147	100/10,000		1
Phosfolan	947024	100/10,000		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Phosgene	75445	10	P095	10
Phosmet	732116	10/10,000		1
Phosphamidon	13171216	100		1
Phosphine	7803512	500		100
Phosphonothioic acid, methyl-, o-ethyl o-(4-(methylthio)phenyl) ester	2703131	500		1
Phosphonothioic acid, methyl-, s-(2-(bis(1- methylethyl)amino) ethyl o-ethyl ester	50782699	100		1
Phosphonothioic acid, methyl-, O-(4-nitrophenyl) o-phenyl ester	2665307	500		1
Phosphoric acid	7664382			5000
Phosphoric acid, diethyl 4-nitrophenyl ester	311455		P041	100
Phosphoric acid, dimethyl 4-(methylthio) phenyl ester	3254635	500		1
Phosphoric acid, lead(2+) salt (2:3)	7446277	500	U145	#
Phosphorodithioic acid, O,O-diethyl S-[2(ethylthio)ethyl]ester	298044		P039	1
Phosphorodithioic acid, O,O-diethyl S(ethylthio), methyl ester	298022		P094	10
Phosphorodithioic acid, O,O-diethyl S-methyl ester	3288582		U087	5000
Phosphorodithioic acid, O,O-dimethyl S-[2(methyl-amino)-2-oxoethyl] ester	60515		P044	10
Phosphorofluondic acid, bis(1-methylethyl)ester	55914		P043	100
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	56382		P089	10
Phosphorothioic acid, O,[4[(dimethylamino)sulfonyl]phenyl]O,O-dimethyl ester	52857		P097	1000
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	298000		P071	100
Phosphorus	7723140	100		1
Phosphorus oxychloride	10025873	500		1000
Phosphorous pentachloride	10026138	500		1
Phosphorus pentasulfide (R)	1314803		U189	100
Phosphorus pentoxide	1314563	10		1
Phosphorus trichloride	7719122	1000		1000

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Phthalic anhydride	85449		U190	5000
Physostigmine	57476	100/10,000		1
Phosostigmine, salicylate (1:1)	57647	100/10,000		1
2-Picoline	109068		U191	5000
Picotoxin	124878	500/10,000		1
Piperidine	110894	1000		1
Piperidine, 1-nitroso-	100754		U179	10
Piprotal	5281130	100/10,000		1
Primifos-ethyl	23505411	1000		1
Plumbane, tetraethyl-	78002		P110	10
PCBs (See Aroclor)	1336363			1
Potassium arsenate	7784410			1
Potassium arsenite	10124502	500/10,000		1000
Potassium bichromate	7778509			10
Potassium chromate	7789006			10
Potassium cyanide	151508	100	P098	10
Potassium hydroxide	1310583			1000
Potassium permanganate	7722647			100
Potassium silver cyanide	506516	500	P099	1
Promecarb	2631370	500/10,000		1
Pronamide	23950585		U192	5000
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl] oxime	116063		P070	1
1-Propanamine (I,T)	107108		U194	5000
1-Propanamine, N-propyl-	142847		U110	5000
1-Propanamine, N-nitroso-N-propyl-	621647		U111	10
Propane, 1,2-dibromo-2-chloro	96128		U066	1
Propane, 2-intro- (I,T)	79469		U171	10
1,3-Propane sultone	1120714		U193	10
Propane 1,2-dichloro-	78875		U083	1000
Propanedinitrile	109773		U149	100
Propanenitrile	107120		P101	10
Propanenitrile, 2-chloro-	542767		P027	1000
Propanenitrile, 2-hydroxy-2-methyl-	75865		P069	10
Propane, 2,2'-oxybis[2-chloro-	108601		U027	1000
1,2,3-Propanetnol, trinitrate- (R)	55630		P081	10
1-Propanol, 2,3-dibromo-, phosphate (3:1)	126727		U235	10

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
1-Propanol, 2-methyl- (I,T)	78831		U140	5000
2-Propanone (I)	67641		U002	5000
2-Propanone, 1-bromo-	598312		P017	1000
Propargite	2312358			10
Propargyl alcohol	107197		P102	1000
Propargyl bromide	106967	10		1
2-Propenal	107028		P003	1
2-Propenamide	79061		U007	5000
1-Propene, 1,1,2,3,3,3-hexachloro-	1888717		U243	1000
1-Propene, 1,3-dichloro-	542756		U084	100
2-Propenenitrile	107131		U009	100
2-Propenenitrile, 2-methyl- (I,T)	126987		U152	1000
2-Propenoic acid (I)	79107		U008	5000
2-Prepenoic acid, ethyl ester (I)	140885		U113	1000
2-Prepenoic acid, 2-methyl-, ethyl ester	97632		U118	1000
2-Prepenoic acid, 2-methyl-, methyl ester (I,T)	80626		U162	1000
2-Propen-1-ol	107186		P005	100
Propiolactone, beta-	57578	500		1
Propionic acid	79094			5000
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	93721		U233	100
Propionic anhydride	123626			5000
Propiolactone, beta	57578	500		1
Propionitrile	107120	500		10
Propionitrile, 3-chloro-	542767	1000		1000
Propiophenone, 4-amino	70699	100/10,000		1
n-Propylamine	107108		U194	5000
Propyl chloroformate	109615	500		1
Propylene dichloride	78875		U083	1000
Propylene oxide	75569	10,000		100
1,2-Propylenimine	75558	10,000	P067	1
2-Propyn-1-ol	107197		P102	1000
Prothoate	2275185	100/10,000		1
Pyrene	129000	1000/10,000		5000
Pyrethrins	121299 121211 8003347			1
3,6-Pyridazinedione, 1,3-dihydro-	123331		U148	5000

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
4-Pyridinamine	504245		P008	1000
Pyridine	110861		U196	1000
Pyridine, 2-methyl-	109068		U191	5000
Pyridine, 2-methyl-5-vinyl-	140761	500		1
Pyridine, 4-amino-	504245	500/10,000		1000
Pyridine, 4-nitro-, 1-oxide	1124330	500/10,000		1
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)	54115		P075	100
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	66751		U237	10
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	56042		U164	10
Pyriminil	53558251	100/10,000		1
Pyrrolidine, 1-nitroso-	930552		U180	1
Quinoline 91225	91225			5000
Reserpine	50555		U200	5000
Resorcinol	106463		U201	5000
Sacchann and salts	81072		U202	100
Salcomine	14167181	500/10,000		1
Sarin	107448	10		1
Satrole	94597		U203	100
Selenious acid	7783008	1000/10,000	U204	10
Selenious acid, dithallium (1+) salt	12039520		P114	1000
Selenium ++	7782492			100
Selenium dioxide	7446084		U204	10
Selenium oxychloride	7791233	500		1
Selenium sulfide (R,T)	7488564		U205	10
Selenourea	630104		P103	1000
Semicarbazide hydrochloride	56417	1000/10,000		1
L-Senne, diazoacetate (ester)	115026		U015	1
Silane, (4-aminobutyl)diethoxymethyl-	3037727	1000		1
Silver++	7440224			1000
Silver cyanide	506649		P104	1
Silver nitrate	7761888			1
Silvex (2,4,5-TP)	93721		U233	100
Sodium	7440235			10
Sodium arsenate	7631892	1000/10,000		1
Sodium arsenite	7784465	500/10,000		1
Sodium azide	26628228	500	P105	1000

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
Sodium bichromate	10588019			10
Sodium bifluoride	1333831			100
Sodium bisulfite	7631905			5000
Sodium Cacodylate	124652	100/10,000		1
Sodium chromate	7775113			10
Sodium cyanide	143339		P106	10
Sodium dodecylbenzenesulfonate	25155300			1000
Sodium fluoride	7681494			1000
Sodium fluoroacetate	62748	10/10,000		10
Sodium hydrosulfide	16721805			5000
Sodium hydroxide	1310732			1000
Sodium hypochlorite	7681529 10022705			1000
Sodium methylate	124414			1000
Sodium nitrite	763200			100
Sodium pentachlorophenate	131522	100/10,000		1
Sodium phosphate, dibasic	7558794 10039324 10140655			5000
Sodium phosphate, tribasic	7601549 7758294 7785844 10101890 10124568 10361894			5000
Sodium selenate	13410010	100/10,000		1
Sodium selenite	10102188 7782823	100/1000		100
Sodium tellurite	10102202	500/10,000		1
Stannane, acetoxypentriphenyl	900958	500/10,000		1
Streptozotocin	18883664		U206	1
Strontium chromate	7789062			10
Strychnidin-1-one, 2,3-dimethoxy-	357573		P018	100
Strychnine, & salts	572494	100/10,000	P018	10
Strychnine, sulfate	60413	100/10,000		1
Styrene	100425			1000
Sulfotep	3689245	500		100
Sulfoxide, 3-chlorophpropyl octyl	3569571	500		1
Sulfur monochloride	12771083			1000
Sulfur dioxide	7446095	500		1
Sulfur phosphide (R)	1314803		U189	100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Sulfur tetrafluoride	7783600	100		1
Sulfur trioxide	7446119	100		1
Sulfuric acid	7664939 8014957	1000		1000
Sulfuric acid, dithallium (1 ⁺) salt	7446186 10031591		P115	100
Sulfuric acid, dimethyl ester	77781		U103	100
Tabun	77816	10		1
2,4,5-T acid	93765		U232	1000
2,4,5-T amines	2008460 1319728 3813147 6369966 6369977			5000
Tellurium	13494809	500/10,000		1
Tellurium hexafluoride	7783804	100		1
2,4,5-T esters	93798 1928478 25168154 61792072			1000
2,4,5-T salts	13560991			1000
2,4,5-T	93765		U232	1000
TDE	72548		U060	1
TEPP	10749	100		10
Terbufos	13071799	100		1
1,2,4,5-Tetrachlorobenzene	95943		U207	5000
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746016			1
1,1,1,2-Tetrachlorethane	630206		U208	100
1,1,2,2-Tetrachloroethane	79345		U209	100
Tetrachloroethene	127184		U210	100
Tetrachloroethylene	127184		U210	100
2,3,4,6-Tetrachlorophenol	58902		U212	10
Tetraethyl lead	78002	100	P110	10
Tetraethyl pyrophosphate	107493		P111	10
Tetraethyldithiopyrophosphate	3589245		P109	100
Tetraethyltin	597648	100		1
Tetramethyllead	75741	100		1
Tetrahydrofuran (I)	109999		U213	1000
Tetranitromethane (R)	509148	500	P112	10

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Tetraphosphoric acid, hexaethyl ester	757584		P062	100
Thallic oxide	1314325		P113	100
Thallium ++	7440280			1000
Thallium acetate	563688		U214	100
Thallium carbonate	6533739		U215	100
Thallium chloride	7791120		U216	100
Thallium nitrate	10102451		U217	100
Thallium oxide	1314325		P113	100
Thallium selenite	12039520		P114	1000
Thallium sulfate	7446186 10031591	100/10,000	P115	100
Thallos carbonate	6533739	100/10,000		100
Thallos chloride	7791120	100/10,000		100
Thallos malonate	2757188	100/10,000		1
Thallos sulfate	7446186	100/10,000		100
Thioacetamide	62555		U218	10
Thiocarbazide	2231574	1000/10,000		1
Thiodiphosphoric acid, tetraethyl ester	3689245		P109	100
Thiofanox	39196184	100/10,000	P045	100
Thioimidodicarbonic diamide [(H ₂ N)C(S)] 2NH	541537		P049	100
Thiomethanol (I,T)	74931		U153	100
Thionazin	297972	500		100
Thioperoxydicarbonic diamide [(H ₂ N)C(S)] 2S ₂ , tetra-methyl-	137268		U244	10
Thiophenol	108985	500	P104	100
Thiosemicarbazide	79196	100/10,000	P116	100
Thiourea	62566		U219	10
Thiourea, (2-chlorophenyl)-	5344821	100/10,000	P026	100
Thiourea, (2-methylphenyl)-	614788	500/10,000		1
Thiourea, 1-naphthalenyl-	86884		P072	100
Thiourea, phenyl-	103855		P093	100
Thiram	137268		U244	10
Titanium tetrachloride	7550450	100		1
Toluene	108883		U220	1000
Toluenediamine	95807 496720 823405 25376458		U221	10

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Toluene diisocyanate (R,T)	584849	500	U223	100
	91087	100		100
	26471625			
o-Toluidine	95534		U238	100
p-Toluidine	106490		U353	100
o-Toluidine hydrochloride	636215		U222	100
Toxaphene	8001352		P123	1
2,4,5-TP acid	93721		U233	100
2,4,5-TP esters	32534955			100
1H-1,2,4-Triazol-3-amine	61825		U011	10
Trans-1,4-dichlorobutene	110576	500		1
Triamiphos	1031476	500/10,000		1
Triazofos	24017478	500		1
Trichloroacety chloride	76028	500		1
Trichlorfon	52686			100
1,2,4-Trichlorobenzene	120821			100
1,1,1-Trichloroethane	71556		U226	1000
1,1,2-Trichloroethane	79005		U227	100
Trichloroethene	79016		U228	100
Trichloroethylene	79016		U228	100
Trichloroethylsilane	115219	500		1
Trichloronate	327980	500		1
Trichloromethanesulfenyl chloride	594423		P118	100
Trichloromonofluoromethane	75694		U121	5000
2,3,4-trichlorophenol	15950660			
2,3,5-Trichlorophenol	933788			
2,3,6-Trichlorophenol	933755			
2,4,5-Trichlorophenol	95954		U230	10
2,4,6-Trichlorophenol	88062		U231	10
3,4,5-Trichlorophenol	609198			
2,4,5-Trichlorophenol	95954		U230	10
2,4,6-Trichlorophenol	88062		I231	10
Trichlorophenylsilane	98135	500		1
Trichloro(chloromethyl)silane	1558254	100		1
Trichloro(dichlorophenyl)silane	27137855	500		1
Triethanolamine dodecylbenzene-sulfonate	27323417			1000
Triethoxysilane	998301	500		1
Triethylamine	121448			5000
Trimethylamine	75503			100
Trimethylchlorosilane	75774	1000		1

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Trimethylolpropane phosphite	824113	100/10,000		1
Trimethyltin chloride	1066451	500/10,000		1
1,3,5-Trinitrobenzene (R,T)	99354		U234	10
1,3,5-Trioxane, 2,4,6-trimethyl-	123637		U182	1000
Triphenyltin chloride	639587	500/10,000		1
Tris(2-chloroethyl)amine	555771	100		1
Tris(2,3-dibromopropyl) phosphate	126727		U235	10
Trypan blue	72571		U236	10
Unlisted Hazardous Wastes Characteristic of Corrosivity	NA		D002	100
Unlisted Hazardous Wastes Characteristic:	NA			
Arsenic (D004)	NA		D004	1
Barium (D005)	NA		D005	1000
Cadmium (D006)	NA		D006	10
Chromium (D007)	NA		D007	10
2,4-D (D016)	NA		D016	100
Endrin (D9012)	NA		D012	1
Lead (D008)	NA		D008	
Lindane (D013)	NA		D013	1
Mercury (D009)	NA		D009	1
Metoxychlor (D014)	NA		D014	1
Selenium (D010)	NA		D010	10
Silver (D011)	NA		D011	1
Toxaphene (D015)	NA		D015	1
2,4,5-TP (D017)	NA		D017	100
Vinyl chloride (D043)	NA		D043	1
Unlisted Hazardous Wastes Characteristic of Ignitability	NA		D001	00
Unlisted Hazardous Wastes Characteristic Reactivity	NA		D003	00
Uracil mustard	66751		U237	10
Uranyl acetate	541093			100
Uranyl nitrate	10102064 36478769			100
Urea, N-ethyl-N-nitroso	759739		U176	1
Urea, N-methyl-N-nitroso	684935		U177	1
Valinomycin	2001958	1000/10,000		1
Vanadic acid, ammonium salt	7803556		P119	1000
Vanadic oxide V ₂ O ₅	1314621		P120	1000
Vanadic pentoxide	1314621		P120	1000
Vanadium pentoxide	1314621	100/10,000		1000

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Vanadyl sulfate	27774136			1000
Vinyl chloride	75014		U043	1
Vinyl acetate	108054			5000
Vinyl acetate monomer	108054	1000		5000
Vinylamine, N-methyl-N-nitroso-	4549400		P084	10
Vinylidene chloride	75354		U078	100
Warfarin, & salts, when present at concentrations greater than 0.3%	81812	500/10,000	P001	100
Warfarin sodium	129066	100/10,000		1
Xylene (mixed)	1330207		U239	1000
m-Benzene, dimethyl	108383			
o-Benzene, dimethyl	95476			
p-Benzene, dimethyl	106423			
Xylenol	1300716			1000
Xylylene dichloride	28347139	100/10,000		1
Yohimban-16-carboxylic acid, 11,17 dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester (3-beta, 16-beta,17-alpha, 18-beta,20-alpha)-	50555		U200	5000
Zinc	7440666			1000
Zinc acetate	557346			1000
Zinc ammonium chloride	52628258 14639975 14639986			1000
Zinc borate	1332076			1000
Zinc bromide	7699458			1000
Zinc carbonate	3486359			1000
Zinc chloride	7646857			1000
Zinc cyanide	557211		P121	10
Zinc, dichloro(4,4-dimethyl-5((((methylamino)carbonyl)oxy)imino)pentaenitrile)-(t-4)-	58270089	100/1000		1
Zinc fluoride	7783495			1000
Zinc formate	557415			1000
Zinc hydrosulfite	7779864			1000
Zinc nitrate	7779886			1000
Zinc phenosulfonate	127822			5000
Zinc phosphide	1314847	500	P122	100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
Zinc phosphide Zn ₃ P ₂ ' when present at concentrations greater than 10%	1314847		P122	100
Zinc silicofluoride	16871719			5000
Zinc sulfate	7733020			1000
Zirconium nitrate	13746899			5000
Zirconium potassium fluoride	16923958			1000
Zirconium sulfate	14644612			5000
Zirconium tetrachloride	10026116			5000
F001			F001	10
The following spent halogenated solvents used in degreasing; all spent solvent mixtures/blends used in degreasing containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.				
a. Tetrachlorethylene	127184		U210	100
b. Trichloroethylene	79016		U228	100
c. Methylene chloride	75092		U080	1000
d. 1,1,1-Trichloroethane	71556		U226	1000
e. Carbon tetrachloride	56235		U211	10
f. Chlorinated fluorocarbons	NA			5000
F002			F002	10
The following spent halogenated solvents: all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.				
a. Tetrachloroethylene	127184		U210	100
b. Methylene chloride	75092		U080	1000
c. Trichloroethylene	79016		U228	100
d. 1,1,1-Trichloroethane	71556		U226	1000
e. Chlorobenzene	108907		U037	100
f. 1,1,2-Trichloro-1,2,2-trifluoroethane	76131			5000
g. o-Dischlorobenzene				
h. Trichlorofluoromethane	95501		U070	100
i. 1,1,2-Trichloroethane	75694		U121	5000
	79005		U227	100

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
F003			F003	100
The following spent nonhalogenated solvents and the still bottoms from the recovery of these solvents:				
a. Xylene	1330207	1000		
b. Acetone	67641	5000		
c. Ethyl acetate	141786	5000		
d. Ethylbenzene	100414	1000		
e. Ethyl ether	60297	100		
f. Methyl isobutyl ketone	108101	5000		
g. n-Butyl alcohol	71363	5000		
h. Cyclohexanone	108941	5000		
i. Methanol	67561	5000		
F004			F004	1000
The following spent nonhalogenated solvents and the still bottoms from the recovery of these solvents:				
a. Cresols/Cresylic acid	131773		U052	1000
b. Nitrobenzene	98953		U169	1000
F005			F005	100
The following spent nonhalogenated solvents and the still bottoms from the recovery of these solvents:				
a. Toluene	108883		U220	1000
b. Methyl ethyl ketone	78933		U159	5000
c. Carbon disulfide	75150		P022	100
d. Isobutanol	78831		U140	5000
e. Pyndine	110861		U196	1000
F006			F006	10
Wastewater treatment sludges from electroplating operations except from the following: (1) sulfuric acid anodizing aluminum, (2) tin plating on carbon steel, (3) zinc plating (segregated basis) on carbon steel, (4) aluminum or zinc-aluminum plating on carbon steel, (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel, and (6) chemical etching and milling of aluminum.				
F007			F007	10
Spent cyanide plating bath solutions from electroplating operations.				
F008			F008	10
Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.				
F009			F009	10
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.				
F010			F010	10
Quenching bath residues from oil baths from metal heat operations where cyanides are used in the process.				
F011			F011	10
Spent cyanide solution from salt bath pot cleaning from metal heat treating operations.				

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
F012			F012	10
Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.				
F019			F019	10
Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive coating process.				
F020			F020	1
Waste (except wastewater and spent carbon from hydrogen chloride purification) from the production of manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or-tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from highly purified 2,4,5-trichlorophenol.)				
F021			F021	1
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.				
F022			F022	1
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) or tetra-, penta-, or hexachlorobenzenes under alkaline conditions.				
F023			F023	1
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of hexa-chlorophene from highly purified, 2,4,5-tri-chlorophenol.)				
F024			F024	1
Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout wastes, from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. (This listing does not include light ends, spent filters and filter aids, spent desiccants, wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in Section 261.32.)				
F025			F025	1
Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.				
F026			F026	1
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetrapenta-, or hexachlorobenzene under alkaline conditions.				

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No. ¹	Threshold Planning ² Quantity (pounds)	USEPA Waste Number	RQ (pounds) ³
F027			F027	1
Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-tri-chlorophenol as the sole component.)				
F028			K028	1
Residues resulting from the incineration or thermal treatment of soil contaminated with USEPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027				
K001			K001	1
Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.				
K002			K002	#
Wastewater treatment sludge from the production of chrome yellow and orange pigments.				
K003			K003	#
Wastewater treatment sludge from the production of molybdate orange pigments.				
K004			K004	10
Wastewater treatment sludge from the production of zinc yellow pigments.				
K005			K005	#
Wastewater treatment sludge from the production of chrome green pigments.				
K006			K006	10
Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).				
K007			K007	10
Wastewater treatment sludge from the production of iron blue pigments.				
K008			K008	10
Oven residue from the production of chrome oxide green pigments.				
K009			K009	10
Distillation bottoms from the production of acetaldehyde from ethylene.				
K010			K010	10
Distillation side cuts from the production of acetaldehyde from ethylene.				
K011			K011	10
Bottom stream from the wastewater stripper in the production of acrylonitrile.				
K013			K013	10
Bottom stream from the acetonitrile column in the production of acrylonitrile.				
K014			K014	5000
Bottom from the acetonitrile purification column in the production of acrylonitrile.				
K015			K015	10
Still bottoms from the distillation of benzyl chloride.				
K016			K016	1
Heavy ends or distillation residues from the production of carbon tetrachloride.				

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
K017			K017	10
Heavy ends (still bottoms) from the purification column in the production of epi-chlorohydrin.				
K018			K018	1
Heavy ends from the fractionation column in ethyl chloride production.				
K019			K019	1
Heavy ends from the distillation of ethylene dichloride in ethylene chloride production.				
K020			K020	1
Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.				
K021			K021	10
Aqueous spent antimony catalyst waste from fluoromethanes production.				
K022			K022	1
Distillation bottom tars from the production of phenol/acetone from cumene.				
K023			K023	5000
Distillation light ends from the production of ophthalic anhydride from naphthalene.				
K024			K024	5000
Distillation bottoms from the production of phthalic anhydride from naphthalene.				
K025			K025	10
Distillation bottoms from the production of nitrobenzene by the nitration of benzene.				
K026			K026	1000
Stripping still tails from the production of methyl ethyl pyndines.				
K027			K027	10
Centrifuge and distillation residues from toluene diisocyanate production.				
K028			K028	1
Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.				
K029			K029	1
Waste from the product steam stripper in the production of 1,1,1-trichloroethane.				
K030			K030	1
Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.				
K031			K031	1
By-product salts generated in the production of MSMA and cacodylic acid.				
K032			K032	10
Wastewater treatment sludge from the production of chlordane.				
K033			K033	10
Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.				
K034			K034	10
Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.				
K035			K035	1
Wastewater treatment sludges generated in the production of creosote.				

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
K036			K036	1
Still bottoms from toluene reclamation distillation in the production of disulfoton.				
K037			K037	1
Wastewater treatment sludges from the production of disulfoton.				
K038			K038	10
Wastewater from the washing and stripping of phorate production.				
K039			K039	10
Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.				
K040			K040	10
Wastewater treatment sludge from the production of phorate.				
K041			K041	1
Wastewater treatment sludge from the production of toxaphene.				
K042			K042	10
Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.				
K043			K043	10
2,6-Dichlorophenol waste from the production 2,4-D.				
K044			K044	10
Wastewater treatment sludges from the manufacturing and processing of explosives.				
K045			K045	10
Spent carbon from the treatment of wastewater containing explosives.				
K046			K046	100
Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.				
K047			K047	10
Pink/red water from TNT operations.				
K048			K048	#
Dissolved air flotation (DAF) float from the petroleum refining industry.				
K049			K049	#
Slop oil emulsion solids from the petroleum refining industry.				
K050			K050	10
Heat exchanger bundle cleaning sludge from the petroleum refining industry.				
K051			K051	#
American Petroleum Institute (API) separator sludge from the petroleum refining industry.				
K052			K052	10
Tank bottoms (leaded) from the petroleum refining industry.				
K060			K060	1
Ammonia still lime sludge from coking operations.				
K061			K061	#
Emission control dust/sludge from the primary production of steel in electric furnaces.				

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
K062			K062	#
Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (Standard Industrial Classification Codes 331 and 332).				
K064			K064	##
Acid plant blowdown slurry/sludge resulting from thickening of blowdown slurry from primary copper production.				
K065			K065	##
Surface impoundment solids contained in and dredged from surface impoundments at primary lead smelting facilities.				
K066			K066	##
Sludge from treatment of process wastewater and/or acid plant blowdown from primary zinc production.				
K069			K069	#
Emission control dust/sludge from secondary lead smelting.				
K071			K071	1
Brine purification muds from the mercury cell process in chlorine production, where separately purified brine is not used.				
K073			K073	10
Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.				
K083			K083	100
Distillation bottoms from aniline extraction.				
K084			K084	1
Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K085			K085	10
Distillation or fractionation column bottoms from the production of chlorobenzenes.				
K086			K086	#
Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.				
K087			K087	100
Decanter tank tar sludge from coking operations.				
K088			K088	
Spent potliners from primary aluminum reduction.				
K090			K090	
Emission control dust or sludge from ferrochromiumsilicon production.				
K091			K091	
Emission control dust or sludge from ferrochromium production.				
K093			K093	5000
Distillation light ends from the production of phthalic anhydride from ortho-xylene.				

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
K094			K094	5000
Distillation bottoms from the production of phthalic anhydride from ortho-xylene.				
K095			K095	100
Distillation bottoms from the production of 1,1,1-trichloroethane.				
K096			K096	100
Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.				
K097			K097	1
Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.				
K098			K098	1
Untreated process wastewater from the production of toxaphene.				
K099			K099	10
Untreated wastewater from the production of 2,4-D.				
K100			K100	#
Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.				
K101			K101	1
Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K102			K102	1
Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K103			K103	100
Process residues from aniline extraction from the production of aniline.				
K104			K104	10
Combined wastewater streams generated from nitrobenzene/aniline production.				
K105			K105	10
Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.				
K106			K106	1
Wastewater treatment sludge from the mercury cell process in chlorine production.				
K107			K107	10
Column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazines.				
K108			K108	10
Condensed column overhead from product separation and condensed reactor vent gases from the production of 1,1-UDMH from carboxylic acid hydrazides.				
K109			K109	10
Spent filter cartridges from product purification from the production of 1,1-UDMH from carboxylic acid hydrazides.				
K110			K110	10
Condensed column overheads from intermediate separation from the production of 1,1-UDMH from carboxylic acid hydrazides.				

(continued)

Appendix 6-1 (continued)

Hazardous Waste/Substances	CAS No.¹	Threshold Planning² Quantity (pounds)	USEPA Waste Number	RQ (pounds)³
K111			K111	10
Product washwaters from the production of dinitrotoluene via nitration of toluene.				
K112			K112	10
Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K113			K113	10
Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K114			K114	10
Vicinalis from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K115			K115	10
Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K116			K116	10
Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.				
K117			K117	1
Wastewater from the reaction vent gas scrubber in the production of ethylene bromide via bromination of ethene.				
K118			K118	1
Spent absorbent solids from purification of ethylene dibromide in the production of ethylene dibromide.				
K123			K123	10
Process wastewater (including supermates, filtrates, and washwaters) from the production of ethylene-bisdithiocarbamic acid and its salts.				
K124			K124	10
Reactor vent scrubber water from the production of ethylene-bisdithiocarbamic acid and its salts.				
K125			K125	10
Filtration, evaporation, and centrifugation solids from the production of ethylene-bisdithiocarbamic acid and its salts.				
K126			K126	10
Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylene-bisdithiocarbamic acid and its salts.				
K131			K131	100
Wastewater from the reactor and spent sulfuric acid from the acid dryer in the production of methyl bromide.				
K132			K132	1000
Spent absorbent and wastewater solids from the production of methyl bromide.				
K136			K136	1
Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.				

(continued)

Appendix 6-1 (continued)

1. Chemical Abstract Service (CAS) Registry Number.
2. Quantity in storage above which the Executive Agent must be notified (see Section 5, *Hazardous Materials*).
3. Reportable Quantity (RQ) release that requires notification (see Section 9, *Petroleum, Oil, and Lubricant (POL)*).

++ No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 100 μm (0.004 in.).

+++ The RQ for asbestos is limited to friable forms only.

1* Indicates that the 1-lb [0.37 kg] RQ is a statutory RQ.

** Indicates that no RQ is being assigned to the generic or broad class.

Indicates that the RQ is subject to change when the assessment of potential carcinogenicity is completed.

The statutory RQ for this hazardous substance may be adjusted in a future rulemaking; until then, the statutory RQ applies.

Appendix 6-2

Commercial Chemical Products or Manufacturing Chemical Intermediates Identified as Toxic Wastes (40 CFR 261.33, 8 May 1990)

(NOTE: Primary hazardous properties of these materials are indicated by the letter (t) (toxicity), (r) (reactivity), (i) (ignitability), and (c) (corrosivity); absence of a letter indicates that the compound is listed only for acute toxicity.)

USEPA Hazardous Waste No.	Substance
U001	acetaldehyde (i)
U034	acetaldehyde, trichloro-
U187	acetamide, N-(4-ethoxyphenyl)-
U005	acetamide, N-9H-fluoren-2-yl-
U240	acetic acid, (2,4-dichlorophenoxy)-, salts and esters
U112	acetic acid, ethyl ester (i)
U144	acetic acid, lead(2+) salt
U214	acetic acid, thallium(1+) salt
see F027	acetic acid, (2,4,5-trichlorophenoxy)-
U002	acetone (i)
U003	acetonitrile (i,t)
U004	acetophenone
U005	2-acetylaminofluorene
U006	acetyl chloride (c, r, t)
U007	acrylamide
U008	acrylic acid (i)
U009	acrylonitrile
U011	amitrole
U012	aniline (i, t)
U136	arsenic acid, dimethyl-
U014	auramine
U015	azaserine

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U010	azirino(2,3,3,4(pyrrolo(1,2-a)indole -4,7-dione, 6-amino-8-(((aminocarbonyl)oxy)methyl)-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,
U157	benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	benza[c]ridine
U017	benzal chloride
U192	benzamide, 3,5-dichloro-n-(1,1-diethyl-2-propynyl-
U018	benz[a]anthracene
U094	1,2-benzanthracene, 7,12-dimethyl-
U012	benzenamine (i,t)
U014	benzenamine, 4,4-carbonimidoylbis(N,N-dimethyl-
U049	benzenamine, 4-chloro-2-methyl-, hydrochloride
U093	benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	benzenamine, 2-methyl-
U353	benzenamine, 4-methyl-
U158	benzenamine, 4,4-methylenebis(2-chloro-
U222	benzenamine, 2-methyl-, hydrochloride
U181	benzenamine, 2,-methyl-5-nitro
U019	benzene (i, t)
U038	benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester
U030	benzene, 1-bromo-4-phenoxy-
U035	benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U037	benzene, chloro-
U221	benzenediamine, ar-methyl-
U028	1,2-benzendicarboxylic acid, [bis(2-ethyl-hexyl)]ester

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U069	1,2-benzenedicarboxylic acid, dibutyl ester
U088	1,2-benzenedicarboxylic acid, diethyl ester
U102	1,2-benzendicarboxylic acid, dimethyl ester
U107	1,2-benzenedicarboxylic acid, dioctyl ester
U070	benzene, 1,2-dichloro-
U071	benzene, 1,3-dichloro-
U072	benzene, 1,4-dichloro-
U060	benzene, 1,1'-(2,2-dichloroethylidene) bis[4-chloro-
U017	benzene, (dichloromethyl)-
U223	benzene, 1,3-diisocyanatomethyl-(r,t)
U239	benzene, dimethyl-(i,t)
U201	1,3-benzenediol .
U127	benzene, hexachloro-
U056	benzene, hexahydro- (i)
U220	benzene, methyl-
U105	benzene, 1-methyl-2,4-dinitro-
U106	benzene, 2-methyl-1,3-dinitro-
U055	benzene, (1-methylethyl)-(i)
U169	benzene, nitro- (i,t)
U183	Benzene, pentachloro-
U185	benzene, pentachloronitro-
U020	benzenesulfonic acid chloride (c,r)
U020	benzenesulfonyl chloride (c,r)
U207	benzene, 1,2,4,5-tetrachloro-
U061	benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-chloro
U247	benzene, 1,1'-(2,2,2-trichloroethylidene)[4-methoxy-

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U023	benzene, (trichloromethyl)-
U234	benzene, 1,3,5-trinitro-
U021	benzidine
U202	1,2-benzisothiazolin-3-one, 1,1-dioxide and salts
U203	1,3-benzodioxole, 5-(2-propenyl)-
U141	1,3-benzodioxole, 5-(1-propenyl)-
U090	1,3-benzodioxole, 5-propyl-
U064	benzo[rs]t]pentaphene
U248	2-H-1-benzopyran-2-on2, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, and salts, when present at concentrations of 0.3% or less
U022	benzo[a]pyrene
U197	p-benzoquinone
U023	benzotrichloride (c,r,t)
U085	2,2-bioxirane (i,t)
U021	(1,1-biphenyl)-4,4-diamine
U073	(1,1-biphenyl)-4,4-diamine, 3,3-dichloro
U091	(1,1-biphenyl)-4,4-diamine, 3,3-dimethoxy-
U095	(1,1-biphenyl)4,4-diamine, 3,3-dimethyl-
U225	bromoform
U030	4-bromophenyl phenyl ether
U128	1,3-butadiene, 1,1,2,3,4,4-hexachloro
U172	1-butanamine, N-butyl-N-nitroso-
U031	1-butanol (i)
U159	2-butanone (i,t)
U160	2-butanone peroxide (r,t)
U053	2-butenal

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U074	2-butene, 1,4-dichloro- (i,t)
U143	2-butenic acid, 2-methyl-, 7- [(2,3-dihydroxy-2-(1-methoxyethyl)- -3-methyl-1-oxobutoxy)methyl] -2,3,5,7s-rytshyfto-1- pyrrolizin-1-yl ester, [1S-[alpha(Z),7(2S,3R), 7aalpha]]-
U031	n-Butyl alcohol (i)
U136	cacodylic acid
U032	calcium chromate
U238	carbamic acid, ethyl ester
U178	carbamic acid, methylnitroso- ethyl ester
U097	carbamic chloride, dimethyl-
U114	carbamodithioic acid, 1,2- ethanediylbis-, salts and esters
U062	carbamothioic acid, bis(1-methylethyl)-S- (2,3-dichloro-2-propenyl) ester
U215	carbonic acid, dithallium(1+)salt
U033	carbonic difluoride
U156	carbonochlorodic acid, methyl ester (i,t)
U033	carbon oxyfluoride (r,t)
U211	carbon tetrachloride
U034	chloral
U035	chlorambucil
U036	chlordan, alpha and gamma isomers
U026	chlomaphazine
U037	chlorobenzene
U039	p-chloro-m-cresol
U041	1-chloro-2,3-epoxypropane

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U042	2-chloroethyl vinyl ether
U044	chloroform
U046	chloromethyl methyl ether
U047	beta-chloronaphthalene
U048	o-chlorophenol
U049	4-chloro-o-toluidine, hydrochloride
U032	chromic acid H ₂ CrO ₄ , calcium salt
U050	chrysene
U051	creosote
U052	cresols (cresylic acid)
U053	crotonaldehyde
U055	cumene (i)
U246	cyanogen bromide
U197	2,5-cyclohexadiene-1, 4-dione
U056	cyclohexane (i)
U129	cyclohexane 1,2,3,4,5,6-hexachloro-, (1alpha, 2alpha, 3beta, 4alpha, 6beta)-
U057	cyclohexanone (i)
U130	1,3-cyclopentadiene, 1,2,3,4,5,5-hexachloro-
U058	cyclophosphamide
U240	2,4-d, salts and esters
U059	daunomycin
U060	ddd
U061	ddt
U062	diallate
U063	dibenz[a,h]anthracene
U064	dibenzo[a,i]pyrene
U066	1,2-dibromo-3-chloropropane
U069	dibutyl phthalate
U070	o-Dichlorobenzene
U071	m-Dichlorobenzene

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U072	p-Dichlorobenzene
U073	3,3'-dichlorobenzidine
U074	1,4-dichloro-2-butene (i,t)
U075	dichlorodifluoromethane
U078	1,1-dichloroethylene
U079	1,2-dichloroethylene
U025	dichloroethyl ether
U027	dichloroisopropyl ether
U024	dichloromethoxy ethane
U081	2,4-dichlorophenol
U082	2,6-dichlorophenol
U084	1,3-dichloropropene
U085	1,2:3,4-diepoxybutane (i, t)
U108	1,4-diethyleneoxide
U028	diethylhexyl phthalate
U086	N,N-diethylhydrazine
U087	O,O-diethyl-s-methyl dithiophosphate
U088	diethyl phthalate
U089	diethylstilbestrol
U090	dihydrosafrole
U091	3,3'-dimethoxybenzidine
U092	dimethylamine (i)
U093	dimethylaminoazobenzene
U094	7,12-dimethylbenz[a]anthracene
U095	3,3-dimethylbenzidine
U096	alpha,alpha-dimethylbenzylhydroperoxide (r)
U097	dimethylcarbamoyl chloride
U098	1,1-dimethylhydrazine
U099	1,2-dimethylhydrazine
U101	2,4-dimethylphenol
U102	dimethyl phthalate
U103	dimethyl sulfate

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U105	2,4-dinitrotoluene
U106	2,6-dinitrotoluene
U107	di-n-octyl phthalate
U108	1,4-dioxane
U109	1,2-diphenylhydrazine
U110	dipropylamine (i)
U111	di-n-propylnitrosamine
U041	epichlorhydrin
U001	ethanal (i)
U174	ethanamine, N-ethyl-N-nitroso-
U155	1,2-ethanediamine, n,n-dimethyl-n'-2-pyridinyl-n'-(2-thienylmethyl)-
U067	ethane, 1,2-dibromo-
U076	ethane, 1,1-dichloro-
U077	ethane, 1,2-dichloro-
U131	ethane, hexachloro-
U024	ethane, 1,1-[methylenebis(oxy)] bis[2-chloro-
U117	ethane, 1,1-oxybis- (i)
U025	ethane 1,1-oxybis[2-chloro-
U184	ethane, pentachloro-
U208	ethane, 1,1,1,2-tetrachloro-
U209	ethane, 1,1,2,2-tetrachloro-
U218	ethanethioamide
U359	ethane, 1,1,2-trichloro-
U173	ethanol 2,2'-(nitrosoimino)bis-2,2'-(nitrosoimino)bis-
U004	ethanone, 1-phenyl-
U043	ethene, chloro-
U042	ethene, (2-chloroethoxy-)
U078	ethene, 1,1-dichloro-
U079	ethene, 1,2-dichloro- (e)
U210	ethene, tetrachloro-

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U228	ethene, trichloro
U112	ethyl acetate (i)
U113	ethyl acrylate (i)
U238	ethyl carbamate (urethane)
U117	ethyl ether (i)
U114	ethylenebisdithiocarbamic acid, salts and esters
U067	ethylene dibromide
U077	ethylene dichloride
U359	ethylene glycol monoethyl ether
U115	ethylene oxide (i,t)
U116	ethylenethiourea
U076	ethylidene dichloride
U118	ethyl methacrylate
U119	ethyl methanesulfonate
U120	fluoranthene
U122	formaldehyde
U123	formic acid (c,t)
U124	furan (i)
U125	2-furancarboxaldehyde (i)
U147	2,5-furandione
U213	furan, tetrahydro- (i)
U125	furfural (i)
U124	furfuran (i)
U206	glucopyranose, 2-deoxy-2 (3-methyl-3-nitroso-ureido)-
U126	glycidylaldehyde
U163	guanidine, N-methyl-N'-nitro-N-nitroso-
U127	hexachlorobenzene
U128	hexachlorobutadiene
U130	hexachlorocyclopentadiene
U131	hexachloroethane

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U132	hexachlorophene
U243	hexachloropropene
U133	hydrazine (r,t)
U086	hydrazine, 1,2-diethyl-
U098	hydrazine, 1,1-dimethyl-
U099	hydrazine, 1,2-dimethyl-
U109	hydrazine, 1,2-diphenyl-
U134	hydrofluoric acid (c,t)
U134	hydrogen fluoride (c,t)
U135	hydrogen sulfide
U096	hydroperoxide, 1-methyl-1-phenylethyl-(r)
U116	2-imidazolidinethione
U137	indeno(1,2,3-cd)pyrene
U190	1,3-isobenzofurandione
U140	isobutyl alcohol (i,t)
U141	isosafrole
U142	kepone
U143	lasiocarpine
U144	lead acetate
U146	lead, bis(acetato-O) tetrahydroxytri-
U145	lead phosphate
U146	lead subacetate
U129	lindane
U163	mnng
U147	maleic anhydride
U148	maleic hydrazide
U149	malononitrile
U150	melphalan
U151	mercury
U152	methacrylonitrile (i,t)
U092	methanamine (N-methyl- (i)

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U029	methane, bromo-
U045	methane, chloro- (i,t)
U046	methane, chloromethoxy-
U068	methane, dibromo-
U080	methane, dichloro-
U075	methane, dichlorodifluoro-
U138	methane, iodo-
U119	methanesulfonic acid, ethyl ester
U211	methane, tetrachloro-
U153	methanethiol (i,t)
U225	methane, tribromo-
U044	methane, trichloro-
U121	methane, trichlorofluoro-
U154	methanol (i)
U155	methapyrilene
U142	1,3,4-metheno-2H-cyclobuta[cd]pentalen-2-one-1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
U247	methoxychlor
U154	methyl alcohol (i)
U029	methyl bromide
U186	1-methylbutadiene (i)
U045	methyl chloride (i,t)
U156	methyl chlorocarbonate (i,t)
U226	methyl chloroform
U157	3-methylcholanthrene
U158	4,4-methylenebis-(2-chloroaniline)
U068	methylene bromide
U080	methylene chloride
U159	methyl ethyl ketone (mek) (i,t)
U160	methyl ethyl ketone peroxide (r,t)
U138	methyl iodide
U161	methyl isobutyl ketone (i)

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U162	methyl methacrylate (i,t)
U161	4-methyl-2-pentanone (i)
U164	methylthiouracil
U010	mitomycin C
U059	5,12-Naphthacenedione, (Bs(cis)8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxyl]-7-8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-
U167	1-naphthalenamine
U168	2-naphthalenamine
U026	naphthalenamine, N,N'-bis (2-chloroethyl)-
U165	naphthalene
U047	naphthalene, 2-chloro-
U166	1,4-naphthalenedione
U236	2,7-naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-bis(azo)bis(5-amino-4-hydroxy)-, tetrasodium salt
U166	1,4-Naphthoquinone
U167	alpha-naphthylamine
U168	beta-naphthylamine
U217	nitric acid, thallium(1+) salt (2-chloromethyl)-
U169	nitrobenzene (i,t)
U170	p-nitrophenol
U171	2-nitropropane (i)
U172	n-nitrosodi-n-butylamine
U173	n-nitrosodiethanolamine
U174	n-nitrosodiethylamine
U176	n-nitroso-n-ethylurea
U177	n-nitroso-n-methylurea
U178	n-nitroso-n-methylurethane
U179	n-nitrosopiperidine

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U180	n-nitrosopyrrolidine
U181	5-nitro-o-toluidine
U193	1,2-oxathiolane, 2,2-dioxide
U058	2H-1,3,2-Oxazaphosphorine,2[bis(2-chloroethyl)amino]tetrahydro-, 2-oxide.
U115	oxirane (i,t)
U126	oxiranecarboxyaldehyde
U041	oxirane, 2-(chloromethyl)-
U182	paraldehyde
U183	pentachlorobenzene
U184	pentachloroethane
U185	pentachloronitrobenzene
see F027	pentachlorophenol
U161	pentanol, 4-methyl-
U186	1,3-pentadiene (i)
U187	phenacetin
U188	phenol
U048	phenol, 2-chloro-
U039	phenol, 4-chloro-3-methyl-
U081	phenol, 2,4-dichloro-
U082	phenol, 2,6-dichloro-
U089	phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (e)
U101	phenol, 2,4-dimethyl-
U052	phenol, methyl
U132	phenol, 2,2'-methylenebis [3,4,6-trichloro-
U170	phenol, 4-nitro-
see F027	phenol, pentachloro-
see F027	phenol, 2,3,4,6-tetrachloro-
see F027	phenol, 2,4,5-trichloro-
see F027	phenol, 2,4,6-trichloro-

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U150	l-phenylalanine, 4-[bis(2-chloroethyl)amino]-
U145	phosphoric acid, lead salt
U087	phosphorodithioic acid, 0,0-diethyl S-methyl ester
U189	phosphorus sulfide (r)
U190	phthalic anhydride
U191	2-picoline
U179	piperidine, 1-nitroso-
U192	pronamide
U194	1-propanamine (i,t)
U111	1-propanamine, n-nitroso-n-propyl-
U110	1-propanamine, n-propyl- (i)
U066	propane, 1,2-dibromo-3-chloro-
U083	propane, 1,2-dichloro-
U149	propanedinitrile
U171	propane, 2-nitro- (i,t)
U027	propane, 2,2-oxybis[2-chloro-
U193	1,3-propane sultone
see F027	propanoic acid, 2-(2,4,5-trichlorophenoxy)-
U235	1-propanol, 2,3-dibromo-, phosphate (3:1)
U140	1-propanol, 2-methyl- (i,t)
U002	2-propanone (i)
U007	2-propenamide
U084	1-propene, 1,3-dichloro-
U243	1-propene, 1,1,2,3,3,3-hexachloro-
U009	2-propenenitrile
U152	2-propanenitrile, 2-methyl- (i,t)
U008	2-propenoic acid (i)
U113	2-propenic acid, ethyl ester (i)
U118	2-propenoic acid, 2-methyl-, ethyl ester

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U162	2-propenoic acid, 2-methyl-, methyl ester (i,t)
U194	n-propylamine (i,t)
U083	propylene dichloride
U148	3,6-pyridazinedione, 1,2-dihydro-
U196	pyridine
U191	pyridine, 2-methyl-
U237	2,4(1H,3H)-pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U164	4(1H)-pyrimidinone, 2,3-dihydro-6-methyl 2-thioxo-
U180	pyrrolidine, 1-nitroso--
U200	reserpine
U201	resorcinol
U202	saccharin and salts
U203	safrole
U204	selenious acid
U204	selenium dioxide
U205	selenium sulfide
U205	selenium sulfide SeS2 (r,t)
U015	l-serine, diazoacetate (ester)
see F027	silvex (2,4,5-tp)
U206	streptozotocin
U103	sulfuric acid, dimethyl ester
U189	sulfur phosphide (r)
U232	2,4,5-T
U207	1,2,4,5-tetrachlorobenzene
U208	1,1,1,2-tetrachloroethane
U209	1,1,2,2-tetrachloroethane
U210	tetrachloroethylene
see F027	2,3,4,6-tetrachlorophenol
U213	tetrahydrofuran (i)

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U214	thallium (i) acetate
U215	thallium (i) carbonate
U216	thallium chloride
U216	thallium chloride TlCl
U217	thallium (i) nitrate
U218	thioacetamide
U153	thiomethanol (i,t)
U244	thioperoxydicarbonic diamide, tetramethyl-
U219	thiourea
U244	thiuram
U220	toluene
U221	toluenediamine
U223	toluene diisocyanate (r,t)
U328	o-toluidine
U353	p-toluidine
U222	o-toluidine hydrochloride
U011	1H-1,2,4-triazol-3-amine
U227	1,1,2-trichloroethane
U228	trichloroethylene
U121	trichloromonofluoromethane
U230	2,4,5-trichlorophenol
U231	2,4,6-trichlorophenol
U234	1,3,5-trinitrobenzene (r,t)
U182	1,3,5-trioxane, 2,4,6-trimethyl-
U235	tris(2,3-dibromopropyl)phosphate
U236	trypan blue
U237	uracil mustard
U176	urea, n-ethyl-n-nitroso-
U177	urea, n-methyl-n-nitroso-
U043	vinyl chloride
U248	Warfarin, when present at concentrations of .3% or less

(continued)

Appendix 6-2 (continued)

USEPA Hazardous Waste No.	Substance
U239	xylene (i)
U200	yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxy-benzoyl)oxy], methyl ester
U249	Zinc phosphide, when present at concentrations of 10% or less.

Appendix 6-3

Toxicity Characteristics Constituents and Regulatory Levels

(40 CFR 261.24)

USEPA HW No.	Constituent	CAS No.	Chronic toxicity reference level	Regulatory Level(mg/L)
D004	Arsenic	7440-38-2	0.05	5.0
D005	Barium	7440-39-3	1.0	100.0
D018	Benzene	71-43-2	0.005	0.5
D006	Cadmium	7440-43-9	0.01	1.0
D019	Carbon tetrachloride	56-23-5	0.005	0.5
D020	Chlordane	57-74-9	0.0003	0.03
D021	Chlorobenzene	108-90-7	1	100.0
D022	Chloroform	67-66-3	0.06	6.0
D007	Chromium	7440-47-3	0.05	5.0
D023	o-Cresol	95-48-7	2	200.0 ¹
D024	m-Cresol	108-39-4	2	200.0 ¹
D025	p-Cresol	106-44-5	2	200.0 ¹
D026	Cresol		2	200.0 ¹
D016	2,4-D	94-75-7	0.1	10.0
D027	1,4-Dichlorobenzene	106-46-7	0.075	7.5
D028	1,2-Dichloroethane	107-06-2	0.005	0.5
D029	1,1-Dichloroethylene	75-35-4	0.007	0.7
D030	2,4-Dinitrotoluene	121-14-2	0.0005	0.13 ²
D012	Endrin	72-20-8	0.0002	0.02
D031	Heptachlor (and its hydroxide)	76-44-8	0.00008	0.008
D032	Hexachlorobenzene	118-74-1	0.0002	0.13 ²
D033	Hexachloro-1,3-butadiene	87-68	3	0.005
D034	Hexachloroethane	67-72-1	0.03	3.0
D008	Lead	7439-92-1	0.05	5.0
D013	Lindane	58-89-9	0.004	0.4
D009	Mercury	7439-97-6	0.002	0.2
D014	Methoxychlor	72-43-5	0.1	10.0
D035	Methyl ethyl ketone	78-93-3	2	200.0
D036	Nitrobenzene	98-95-3	0.02	2.0
D037	Pentachlorophenol	87-86-5	1	100.0
D038	Pyridine	110-86-1	0.04	5.0 ²

(continued)

Appendix 6-3 (continued)

USEPA HW No.	Constituent	CAS No.	Chronic toxicity reference level	Regulatory Level(mg/L)
D010	Selenium	7782-49-2	0.01	1.0
D011	Silver	7440-22-4	0.05	5.0
D039	Tetrachloroethylene	127-18-4	0.007	0.7
D015	Toxaphene	8001-35-2	0.005	0.5
D040	Trichloroethylene	79-01-6	0.005	0.5
D041	2,4,5-Trichlorophenol	95-95-4	4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	0.02	2.0
D017	2,4,5-TP (Silvex)	93-72-1	0.01	1.0
D043	Vinyl chloride	75-01-4	0.002	0.2

¹ If o-, m-, and p-cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used.

² Quantitation limit is greater than the calculated regulatory level. Therefore, the quantitation limit becomes the regulatory level. (Source: Federal Register 55:61, page 11804.)

Appendix 6-4

**Vehicle Identification of Special Waste
(Temporary) Collection and Transportation**
(USFK EGS, Chapter 6, Figure 6.1)

This appendix contains the "vehicle identification of special waste (temporary) collection and transportation" issued by the Regional Administrators of Environmental Administration. It must be attached to the vehicles used for special waste collection and transportation.

The figure shows two circular diagrams representing the layout of a Special Waste (Temporary) Collection/Transportation Certificate. Each circle is divided into three horizontal sections by two lines.

Left Circle (English Text):

- Top section: Collection / Transportation Certificate No. :
Vehicle No. :
Types of Waste Transported
Effective Period
- Middle section: **SPECIAL WASTE (TEMPORARY)
COLLECTION/TRANSPORTATION CERTIFICATE**
- Bottom section: date
Regional Administrator of the Environmental Administration
(signature)

Right Circle (Korean Text):

- Top section: 수질·운반차량증 번호
지방번호:
운반폐기물어 종류
유효기간: 년 월 일 ~ 년 월 일
- Middle section: 특정폐기물(임시)수질 운반차량증
- Bottom section: 년 월 일
지방환경청장 인

- Diameter : 10 cm
- Ground Color : yellow (white for "temporary vehicles")

Figure 6.1



Table 6-5

Hazardous Materials/Hazardous Waste Storage Incompatibility Chart

Substances in bold have detailed example lists on the next page.

If the material contains:	It may not be stored with any of the following:
Acid (pH below 2.0)	Caustics (pH above 12.5) Reactive Metals Alcohol Water Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents Spent Cyanide and Sulfide Solutions Oxidizers
Caustic (pH above 12.5)	Acid (pH below 2.0) Reactive Metals Alcohol Water Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents
Reactive Metals	Caustics Acids Alcohol Aldehydes Halogenated, Nitrated, or Unsaturated Hydrocarbons Reactive Organic Compounds and Solvents Oxidizers
Reactive Organic Compounds and Solvents	Caustics Acids Reactive Metals
Spent Cyanide and Sulfide Solutions	Acids
Oxidizers	Acetic or Other Organic Acids Concentrated Mineral Acids Reactive Metals Reactive Organic Compounds and Solvents Ignitable [Flammable/Combustible] Wastes*

* "Ignitable" in this context refers to substances with a flashpoint below 140 °F, and includes:

Combustible substances, with a flashpoint below 140 °F

Flammable substances, with a flashpoint below 100 °F.

Some Deadly Combinations

Acids + Oil or Grease = Fire

Acids + Caustics = Heat/Spattering

Caustics + Epoxies = Extreme Heat

Chlorine Gas + Acetylene = Explosion

Flammable Liquids + Hydrogen Peroxide = Fire/Explosion

Aluminum Powder + Ammonium Nitrate = Explosion

Sodium Cyanide + Sulfuric Acid = Lethal Hydrogen Cyanide

Ammonia + Bleach = Noxious Fumes

(continued)

Appendix 6-5 (continued)

In general: **Reactives** must be segregated from **Ignitables**
Acids must be segregated from **Caustics**
Corrosives should be segregated from **Flammables**
Oxidizers should be segregated from **EVERYTHING**
Many **Corrosives** are "Water Reactive"
Most **Organic Reactives** must be segregated from **Inorganic Reactives** (metals)

Ignitables (Flammables/Combustibles)	Corrosives	
	Acids	Caustics
Carburetor Cleaners Engine Cleaners Epoxy, Resins, Adhesives, and Rubber Cements Finishes Fuels Lacquers Paints Paint Thinners Paint Wastes Pesticides that contain Solvents (such as Methyl Alcohol, Ethyl Alcohol, Isopropyl Alcohol, Toluene, Xylene). Petroleum Solvents (Drycleaning Fluid) Solvents: Acetone Benzene Carbon Tetrachloride (Carbon Tet) Ethanol (Ethyl Alcohol) Ethyl Benzene Isopropanol (Isopropyl Alcohol) Kerosene (Fuel Oil #1) Methanol (Wood Alcohol) Methyl Ethyl Ketone (MEK) Petroleum Distillates Tetrahydrofuran (THF) Toluene (Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A) White Spirits (White Spirits, Mineral Spirits, Naptha) Xylene (Xylol) Stains Stripping Agents Varsol Waste Fuels Waste Ink Wax Removers Wood Cleaners	Battery Acids Degreasers and Engine Cleaners Etching Fluids Hydrobromic Acid Hydrochloric Acid (Muriatic Acid) Nitric Acid (<40%) (Aquafortis) Phosphoric Acid Rust Removers Sulfuric Acid (Oil of Vitriol)	Acetylene Sludge Alkaline Battery Acids Alkaline Cleaners Alkaline Degreasers Alkaline Etching Fluids Lime and Water Lime Wastewater Potassium Hydroxide (Caustic Potash) Rust Removers Sodium Hydroxide (Caustic Soda, Soda Lye)
	Reactive Metals	Reactive Organic Compounds and Solutions
	Oxidizers	Alcohols Aldehydes Chromic Acids (from chrome plating, copper stripping and aluminum anodizing) Cyanides (from electroplating operations) Hypochlorides (from water treatment plants, swimming pools, sanitizing operations) Organic Peroxides (including Hydrogen Peroxide) Perchlorates Permanganates Sulfides
	Chlorine Gas Nitric Acid (>40%), aka Red Fuming Nitric Nitrates (Sodium Nitrate, Ammonium Nitrate) Perchlorates Perchloric Acid Peroxides Calcium Hypochlorite (>60%)	

Appendix 6-6

Technical Management Checklist for Waste Disposal Facility Contracts (USFK EGS, Table 6-2)

Facility	Checking Items
1. Intermediate Disposal Facility	
a. General	<ul style="list-style-type: none"> • Appropriateness of type and quantity of waste incinerated • Physical conditions for the floor of storage or main disposal facility • Arrangement of temperature recorder and appropriateness of its operation • Appropriate action plan in case of accidents • Drainage of water in pipes of facility or equipment that are likely to freeze • Appropriate operation of facility and equipment in accordance with operation guide • Availability of fire extinguishers
b. Incineration Facility and High Temperature Destruction Facility	<ul style="list-style-type: none"> • Conditions of fireproof material • Normal operation of combustion burner and extra burner • Normal operation of safety facilities • Normal operation of preventive facilities • Pollutant concentrations in off-gas • Condition of cleanliness in the combustion chamber, etc. • Normal operation of cooling pumps • Air density and fuel ratio • Execution of periodical inspection • Startup temperature and closeout during accidents • Appropriateness of temperature and pressure
c. Shredding/Cutting Facility	<ul style="list-style-type: none"> • Conditions of shredding and cutting equipment • Method to contain particulate
d. Melting Facility	<ul style="list-style-type: none"> • Normal operation of temperature control equipment • Normal operation of disposal facility for toxic gas
e. Graduation, Refining, and Reaction Facility	<ul style="list-style-type: none"> • Erosion or damage of evaporation and graduation tank • Normal operation of temperature control equipment • Normal operation of disposal facility for toxic gas • Execution of periodical cleaning
f. Oil and Water Separation Facility	<ul style="list-style-type: none"> • Damage of water collection and transportation facility • Erosion or damage of separated oil storage tank • Cleanliness of screen from foreign substances • Normal operation of equipment controlling amount of waste oil • Periodical replacement or washing of filter cloth

(continued)

Appendix 6-6 (continued)

Facility	Checking Items
g. Coagulation/Sedimentation Facility	<ul style="list-style-type: none"> • Normal operation of agitation equipment • Appropriate removal of sludge
h. Dewatering Facility	<ul style="list-style-type: none"> • Normal operation of dewatering equipment • Wastewater discharging from dewatering process • Periodical replacement or washing of filter cloth • Appropriate removal of foreign substances
i. Drying Facility	<ul style="list-style-type: none"> • Normal operation of drying temperature control equipment • Availability of a cover to prevent inflow of rain • Normal operation of disposal facility for toxic gas
j. Solidification Facility	<ul style="list-style-type: none"> • Normal operation of mixing equipment • Mixture ratio (cement, water, and stabilizer) • Loss of mixed substances out of the curing facility • Cleaning of mixers
k. Stabilization Facility	<ul style="list-style-type: none"> • Normal operation of disposal facility for toxic gas
2. Final Disposal Facility	
a. General	<ul style="list-style-type: none"> • Damage to security fence • Availability of landfill area signs and recording its content • Normal operation of weighing equipment • Subsidence of the ground of landfill areas • Inspection of underground water wells
b. Isolation Type Landfill	<ul style="list-style-type: none"> • Damage to floor, outside walls, and partitions • Cover shall prevent inflow of rain
c. Management and Sedimentation Type Landfill	<ul style="list-style-type: none"> • Damage to watertight materials • Damage to leachate collection wells and transportation equipment • Periodical cleaning of leachate collection wells and transportation equipment • Damage to water controlling tank • Normal operation of leachate disposal facility • Quality of discharging water • Normal operation of discharging gas disposal facility

Appendix 6-6

Technical Management Checklist for Waste Disposal Facility Contracts (USFK EGS, Table 6-2)

Facility	Checking Items
1. Intermediate Disposal Facility	
a. General	<ul style="list-style-type: none"> • Appropriateness of type and quantity of waste incinerated • Physical conditions for the floor of storage or main disposal facility • Arrangement of temperature recorder and appropriateness of its operation • Appropriate action plan in case of accidents • Drainage of water in pipes of facility or equipment that are likely to freeze • Appropriate operation of facility and equipment in accordance with operation guide • Availability of fire extinguishers
b. Incineration Facility and High Temperature Destruction Facility	<ul style="list-style-type: none"> • Conditions of fireproof material • Normal operation of combustion burner and extra burner • Normal operation of safety facilities • Normal operation of preventive facilities • Pollutant concentrations in off-gas • Condition of cleanliness in the combustion chamber, etc. • Normal operation of cooling pumps • Air density and fuel ratio • Execution of periodical inspection • Startup temperature and closeout during accidents • Appropriateness of temperature and pressure
c. Shredding/Cutting Facility	<ul style="list-style-type: none"> • Conditions of shredding and cutting equipment • Method to contain particulate
d. Melting Facility	<ul style="list-style-type: none"> • Normal operation of temperature control equipment • Normal operation of disposal facility for toxic gas
e. Graduation, Refining, and Reaction Facility	<ul style="list-style-type: none"> • Erosion or damage of evaporation and graduation tank • Normal operation of temperature control equipment • Normal operation of disposal facility for toxic gas • Execution of periodical cleaning
f. Oil and Water Separation Facility	<ul style="list-style-type: none"> • Damage of water collection and transportation facility • Erosion or damage of separated oil storage tank • Cleanliness of screen from foreign substances • Normal operation of equipment controlling amount of waste oil • Periodical replacement or washing of filter cloth

(continued)

Appendix 6-6 (continued)

Facility	Checking Items
g. Coagulation/Sedimentation Facility	<ul style="list-style-type: none"> • Normal operation of agitation equipment • Appropriate removal of sludge
h. Dewatering Facility	<ul style="list-style-type: none"> • Normal operation of dewatering equipment • Wastewater discharging from dewatering process • Periodical replacement or washing of filter cloth • Appropriate removal of foreign substances
i. Drying Facility	<ul style="list-style-type: none"> • Normal operation of drying temperature control equipment • Availability of a cover to prevent inflow of rain • Normal operation of disposal facility for toxic gas
j. Solidification Facility	<ul style="list-style-type: none"> • Normal operation of mixing equipment • Mixture ratio (cement, water, and stabilizer) • Loss of mixed substances out of the curing facility • Cleaning of mixers
k. Stabilization Facility	<ul style="list-style-type: none"> • Normal operation of disposal facility for toxic gas
2. Final Disposal Facility	
a. General	<ul style="list-style-type: none"> • Damage to security fence • Availability of landfill area signs and recording its content • Normal operation of weighing equipment • Subsidence of the ground of landfill areas • Inspection of underground water wells
b. Isolation Type Landfill	<ul style="list-style-type: none"> • Damage to floor, outside walls, and partitions • Cover shall prevent inflow of rain
c. Management and Sedimentation Type Landfill	<ul style="list-style-type: none"> • Damage to watertight materials • Damage to leachate collection wells and transportation equipment • Periodical cleaning of leachate collection wells and transportation equipment • Damage to water controlling tank • Normal operation of leachate disposal facility • Quality of discharging water • Normal operation of discharging gas disposal facility

INSTALLATION:	COMPLIANCE CATEGORY: HAZARDOUS WASTE Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 7

SOLID WASTE

Korea ECAS

SECTION 7

SOLID WASTE

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol addresses the collection, storage, and disposal of solid waste at installations.

Solid waste is considered to be nonhazardous trash, rubbish, garbage, bulky wastes, liquids, or sludges generated by any installation operations and activities.

This protocol also includes recycling and resource recovery activities since this form of solid waste management is required by Department of Defense (DOD) and Headquarters, Department of the Army (HQDA) directives. Installations are encouraged to develop pollution prevention programs.

B. DOD Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 7, includes criteria for a comprehensive management program to ensure that solid waste is identified, collected, stored, transported, treated, and disposed in an environmentally safe manner in order to protect human health and the environment. These criteria apply to residential and commercial solid waste generated at the installation level. The management of solid waste is generally in accordance with the Korean Waste Management Law and corresponding local government programs.
- DOD Directive 4165.60, *Solid Waste Management*, 4 October 1976, provides guidance and direction to all DOD military communities on the topics of solid waste collection, disposal, material recovery, and recycling in agreement with the *Solid Waste Disposal Act (SWDA)*. It specifically makes mandatory, at all DOD components, compliance with the standards found in 40 Code of Federal Regulations (CFR) 240, 241, 243, and 245 (see para V(A)).

C. Army Regulations (AR)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no requirements that apply to solid waste management OCONUS. It does, however, state that the disposal of municipal solid waste is considered a routine cost of doing business and is therefore not to be shown as an environmental project on the installation's Environmental Program Requirements Report.
- AR 420-47, *Solid and Hazardous Waste Management*, 1 January 1985, details the operations and procedures to be followed in the storage and collection of solid waste.

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH) is responsible for the location, construction, and operation of onsite landfills and for the storage and transportation of solid wastes to either onsite or off-site disposal facilities.

E. Key Compliance Definitions

These definitions were obtained from directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. CFR.

- *Bottom Ash* - the solid material that remains on a hearth or falls off the grate after thermal processing is complete (DOD Directive 4165.60, para V(A)).
- *Bulk Waste* - large items of solid waste such as household appliances, furniture, large auto parts, trees, branches, stumps, and other oversized wastes whose large size precludes or complicates their handling by normal solid waste collection, processing, or treatment methods (USFK EGS, Chapter 7, Definitions).
- *Carry-out Collection* - collection of solid waste from a storage area proximate to the dwelling unit(s) or establishment where generated (USFK EGS, Chapter 7, Definitions).
- *Cell* - compacted solid wastes that are enclosed by natural soil or cover material in a land disposal site (USFK EGS, Chapter 7, Definitions).
- *Class A Compost* - compost that contains average contaminant levels no greater than the following levels (USFK EGS 7-3p(1)):

Contaminant	Allowable Average Concentration, mg/kg
Polychlorinated biphenyls (PCBs)	1
Cadmium	10
Chromium	1000
Copper	500
Lead	500
Mercury	5
Nickel	100
Zinc	1000

- *Class B Compost* - compost that fails to meet the standards for Class A Compost (USFK EGS 7-3p(2)).
- *Closed Landfill* - a sanitary landfill where all cells have been completely utilized and the disposal of solid waste has ended, and which the owner or operator has closed in accordance with the approved facility closure plan and all applicable closure requirements (USFK EGS, Chapter 7, Definitions).
- *Collection* - the act of consolidating solid wastes (or materials that have been separated for the purpose of recycling) from various locations (USFK EGS, Chapter 7, Definitions).
- *Collection Frequency* - the number of times collection is provided in a given period of time (USFK EGS, Chapter 7, Definitions).

- *Commercial Solid Waste* - all types of solid wastes generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes (USFK EGS, Chapter 7, Definitions).
- *Compactor Collection Vehicle* - a vehicle with an enclosed body, containing mechanical devices, that conveys solid waste into the main compartment of the body and compresses it into a smaller volume of greater density (USFK EGS, Chapter 7, Definitions).
- *Composting* - the controlled biological decomposition of organic solid waste under aerobic conditions (USFK EGS, Chapter 7, Definitions).
- *Construction and Demolition Waste* - the waste building materials, packaging, and rubble resulting from construction, alteration, remodeling, repair, and demolition operations on pavements, houses, buildings, and other structures (USFK EGS, Chapter 7, Definitions).
- *Cover Material* - material that is used to cover compacted solid wastes in a land disposal site (USFK EGS, Chapter 7, Definitions).
- *Curb Collection* - collection of solid waste placed adjacent to a street (USFK EGS, Chapter 7, Definitions).
- *Daily Cover* - cover material that is spread and compacted on the top and side slopes of compacted solid wastes at least at the end of each operating day in order to control vectors, fire, moisture, and erosion and to assure an aesthetic appearance (40 CFR 241.101 as adopted by DOD Directive 4165.60, para V(A)).

(NOTE: In addition to the above definition, soil that is spread and compacted or synthetic material that is placed on the top and side slopes of compacted solid waste at least at the end of each operating day in order to control vectors, fire, moisture, and erosion and to assure an aesthetic appearance (USFK EGS, Chapter 7, Definitions).)

- *Disposal* - the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater (USFK EGS, Chapter 7, Definitions).
- *Existing Landfill* - a sanitary landfill that is in existence, operation, or both. An existing landfill may be divided into cells for operation, planning, and management purposes (USFK EGS, Chapter 7, Definitions).
- *Failed or Failing Landfill* - a sanitary landfill from which the ground- or surface water is being polluted and consequently causing non-compliance with pollution control standards or regulations, or both (USFK EGS, Chapter 7, Definitions).
- *Final Cover* - cover material that serves the same function as daily cover but, in addition, may be permanently exposed on the surface (USFK EGS, Chapter 7, Definitions).
- *Fly Ash* - suspended particles, charred paper, dust, soot, and other partially oxidized matter carried in the products of combustion (40 CFR 240.101 as adopted by DOD Directive 4165.60, para V(A)).

- *Food Waste* - the organic residues generated by the handling, storage, sale, preparation, cooking, and serving of foods, commonly called garbage (USFK EGS, Chapter 7, Definitions).
- *Generation* - the act or process of producing solid waste (USFK EGS, Chapter 7, Definitions).
- *Government Furnished Materials* - materials furnished to government contractors pursuant to the execution of government contracts as defined in the Federal Acquisition Regulation 17.345(b) (USFK EGS, Chapter 7, Definitions).
- *Groundwater* - water present in the unsaturated zone of an aquifer (40 CFR 241.101 as adopted by DOD Directive 4165.60, para V(A)).
- *High-grade Paper* - letterhead, dry copy paper, miscellaneous business forms, stationery, typing paper, tablet sheets, and computer printout paper and cards commonly sold as white ledger, computer printout, and tab card grade by the wastepaper industry. High-grade paper is included in the commercial solid waste category (USFK EGS, Chapter 7, Definitions).
- *Industrial Solid Waste* - solid waste generated by industrial processes and manufacturing (USFK EGS, Chapter 7, Definitions).
- *Integrated Solid Waste Management (ISWM)* - Army solid waste policy is based on the concept of integrated solid waste management. ISWM is designed to minimize the initial input to the waste stream through source reduction, reduce the volume of the waste stream requiring treatment or disposal through re-use and recycling, and finally disposal or treatment of solid waste through the effective combination of incineration, composting, and landfill disposal (USFK EGS, Chapter 7, Definitions).
- *Intermediate Cover* - cover material that serves the same function as daily cover but must resist erosion for a longer period of time because it is applied in areas where additional cells are not to be constructed for extended periods of time (40 CFR 241.101 as adopted by DOD Directive 4165.60, para V(A)).
- *Land Application Unit* - an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment or disposal (USFK EGS, Chapter 7, Definitions).
- *Land Disposal* - placement in or on the land, including, but not limited to, land treatment, facilities, surface impoundments, underground injection wells, salt dome formations, salt bed formations, underground mines or caves (USFK EGS, Chapter 6, Definitions).
- *Large Volume Waste Generator* - any USFK installation which produces more than 300 kg/day [\approx 661 lb/day] of MSW (USFK EGS, Chapter 7, Definitions).
- *Leachate* - liquid that has percolated through solid waste and has extracted dissolved or suspended materials from it (USFK EGS, Chapter 7, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Municipal Solid Waste (MSW)* - normally, residential and commercial solid waste generated within a community, not including yard waste (USFK EGS, Chapter 7, Definitions).

- *Municipal Solid Waste Management Facility (MSWMF)* - any of the following facilities are considered municipal solid waste management facilities (USFK EGS, Chapter 7, Definitions):
 1. a landfill: a discrete area of land or an excavation, on or off the installation, that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile. A landfill unit also may receive other types of wastes, such as commercial solid waste and industrial waste
 2. an incineration facility
 3. a compaction facility, a shredding facility, or transfer facility of MSW in order to facilitate transportation
 4. a facility of which the main function is to recycle MSW by classifying or treating the waste so that it may be used as compost, animal feed, fuel, etc.

- *New Landfill* - a sanitary landfill that is not designed as a part of the initial plan of an existing landfill or is newly created without an existing landfill contiguous to it. Any natural or manmade boundaries (e.g., surface waters, roads, railroads, adjoining the existing landfill) will not preclude the status of contiguity (USFK EGS, Chapter 7, Definitions).

- *Office Waste* - solid waste generated in buildings or rooms in which the affairs of business, professional persons, or branches of government, are carried on. Excluded is waste generated in cafeterias, snack bars, or other food preparation and sales areas, and medical waste (USFK EGS, Chapter 7, Definitions).

- *Open Burning* - burning of solid wastes in the open, such as in an open dump (USFK EGS, Chapter 7, Definitions).

- *Open Dump* - a land disposal site at which solid wastes are disposed of in a manner that does not protect the environment, is susceptible to open burning, and is exposed to the elements, vectors, and scavengers (USFK EGS, Chapter 7, Definitions).

- *Open Waste Dumping* - the deposition of solid waste in a manner that does not protect the environment, is suspect to open burning, and is exposed to the elements, vectors, and scavengers (USFK EGS, Chapter 7, Definitions).

- *Qualifying Recycling Programs (QRP)* - organized operations that require concerted efforts to divert or recover scrap or waste from waste streams; or identify, segregate, and maintain the integrity of the recyclable materials to maintain or enhance the marketability of the materials (USFK EGS, Chapter 7, Definitions).

- *Recoverable Resources* - materials that have useful physical or chemical properties after serving their original purposes. Recoverable resources can be reused or recycled for the same or for other purposes (USFK EGS, Chapter 7, Definitions).

- *Recyclable Materials* - includes materials diverted from the solid waste stream and the beneficial use of such materials. Recycling is further defined as the result of a series of activities by which materials that would become or otherwise remain waste are diverted from the solid waste stream by collection, separation, and processing and are used as raw materials in the manufacture of goods sold or distributed in commerce or the reuse of such materials as substitutes for goods made of virgin materials. Examples of recyclable materials include (but are not limited to): paper, food waste, plastic, glass, all cardboard and other packaging materials, newspapers, and empty food and beverage containers. Recyclable materials also include scrap (including ferrous and nonferrous scrap) and firing range expended brass and mixed metals gleaned from firing range cleanup that do not require demilitarization. Items requiring demilita-

rization or mutilation prior to sale are not recyclable materials. For the purposes of USFK EGS, the following materials are not recyclable materials and will not be sold through a QRP: precious metals; government furnished materials; hazardous waste; machine parts; electrical components; unopened containers of unused oil, solvents, or paints; and repairable items that have not progressed through the disposal cycle (USFK EGS, Chapter 7, Definitions).

- *Recycling* - the series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of new products other than fuel for producing heat or power by combustion (USFK EGS, Chapter 7, Definitions).
- *Residential Solid Waste* - the wastes generated by the normal activities of households, including, but not limited to, food wastes, rubbish, ashes, and bulky wastes (USFK EGS, Chapter 7, Definitions).
- *Resource Recovery* - the process of obtaining materials or energy from solid waste or used petroleum, oil, and lubricant (POL) product (USFK EGS, Chapter 7, Definitions).
- *Resource Recovery Facility* - any physical plant that processes residential, commercial or institutional solid waste, biologically, chemically, or physically, and recovers useful products, such as shredded fuel, combustible oil or gas, steam, metal, glass, etc., for resale or reuse (DOD Directive 4165.60, Encl 2, J and USFK EGS, Chapter 7, Definitions).
- *Reuse* - the use of a product more than once in its same form for the same purpose; e.g., a soft-drink bottle is reused when it is returned to the bottling company for refilling (USFK EGS, Chapter 7, Definitions).
- *Rubbish* - a general term for solid waste, excluding food wastes and ashes, taken from residences, commercial establishments, and institutions (USFK EGS, Chapter 7, Definitions).
- *Sanitary Landfill* - a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading the solid wastes in thin layers, compacting the solid wastes to the smallest practical volume, and applying and compacting cover material at the end of each operating day (USFK EGS, Chapter 7, Definitions).
- *Satellite Vehicle* - a small collection vehicle that transfers its load into a larger vehicle operating in conjunction with it (USFK EGS, Chapter 7, Definitions).
- *Scavenging* - the uncontrolled and unauthorized removal of materials at any point in the solid waste management system (USFK EGS, Chapter 7, Definitions).
- *Service Solid Waste Management Manual* - for the Army, Army Technical Manual (TM) 5-634 (USFK EGS, Chapter 7, Definitions).
- *Site Footprints* - original dimensions of the sanitary landfill (existing or closed) (USFK EGS, Chapter 7, Definitions).

- *Sludge* - the accumulated semiliquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluent, dissolved materials in irrigation return flows, or other common water pollutants (USFK EGS, Chapter 7, Definitions).
- *Solid Waste* - garbage, refuse, sludge, and other discarded materials, including solid, semisolid, liquid, and contained gaseous materials resulting from institutional, industrial, commercial, mining, agricultural, or community operations and activities. Solid wastes are either discarded or accumulated, stored, or treated prior to being discarded. Infectious wastes are not included in this category for purposes related to recycling. A material is discarded if it is abandoned (and not used, reused, reclaimed, or recycled) by being disposed of, burned, or not treated. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluent, dissolved materials in irrigation return flows or other common water pollutants (USFK EGS, Chapter 7, Definitions).
- *Solid Waste Storage Container* - a receptacle used for the temporary storage of solid waste while awaiting collection (USFK EGS, Chapter 7, Definitions).
- *Source Reduction* - source reduction programs can reduce the volume of the solid waste stream. Reducing the amount of material that reaches the installation and will require disposal is an effective and efficient means to reduce solid waste volume. Consideration should be given to how items are packaged when choosing products. The minimum packaging that will ensure safe arrival and meet installation storage and handling needs should be selected (USFK EGS, Chapter 7, Definitions).
- *Source Separation* - the separation of materials at their point of generation by the waste generator (USFK EGS, Chapter 7, Definitions).
- *Stationary Compactor* - a powered machine that is designed to compact solid waste or recyclable materials, and which remains stationary when in operation (USFK EGS, Chapter 7, Definitions).
- *Storage* - the interim containment of solid waste after generation and prior to collection for ultimate disposal, and the interim containment of recyclable materials prior to collection for recovery (USFK EGS, Chapter 7, Definitions).
- *Street Wastes* - material picked up by manual or mechanical sweepings of alleys, streets, and sidewalks, wastes from public waste receptacles, and material removed from catch basins (USFK EGS, Chapter 7, Definitions).
- *Thermal Processing* - processing of waste material by means of heat (40 CFR 240.101 as adopted by DOD Directive 4165.60, para V(A)).
- *Transfer Station* - a site at which solid wastes are concentrated for transport to a processing facility or land disposal site. A transfer station may be fixed or mobile (USFK EGS, Chapter 7, Definitions).
- *Treatment* - any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any solid waste (USFK EGS, Chapters 6 and 7, Definitions).

- *Vector* - a carrier, usually an arthropod, that is capable of transmitting a pathogen from one organism to another (USFK EGS, Chapter 7, Definitions).
- *Working Face* - that portion of the land disposal site where solid wastes are discharged and are spread and compacted prior to the placement of cover material (40 CFR 241.101 as adopted by DOD Directive 4165.60, para V(A)).
- *Yard Waste* - grass and shrubbery clippings, tree limbs, leaves, and similar organic materials commonly generated in residential yard maintenance (also known as green waste) (USFK EGS, Chapter 7, Definitions).

SOLID WASTE
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	7-1 through 7-4	(1)(2)
Recycling	7-5 through 7-10	(1)(2)(9)
Solid Waste Storage and Collection	7-11 through 7-24	(1)(2)(9)(21)
Onsite Land Disposal		
Specific Wastes	7-25 through 7-29	(1)(2)(9)
Operations	7-30 through 7-43	(1)(2)(9)
Closure and Postclosure	7-44 through 7-46	(1)(2)(9)
New Landfills	7-47 through 7-49	(1)(2)(9)
Thermal Processing Facilities	7-50 through 7-63	(1)(2)(9)
Resource Recovery Facilities	7-64 and 7-65	(1)(2)(9)
Composting Facilities	7-66 and 7-67	(1)(2)(9)
Open Dumping	7-68	(1)(2)(9)
Large Volume Waste Generators	7-69 and 7-70	(1)(2)(9)(20)

(a) CONTACT CODE:

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SOLID WASTE

Records to Review

- Record of current nonhazardous solid waste management practices
- Documentation of locations (map) and descriptions of all nonhazardous waste treatment, storage, and disposal facilities (TSDFs)
- Records of operational history of all active and inactive TSDFs
- Environmental monitoring procedures or plans and analytical results
- Records of resource recovery practices, including the sale of materials for the purpose of recycling
- Solid waste removal contracts and inspection records
- Regional solid waste management plan
- Unique local rules for handling solid waste
- Installation solid waste management plans, Standing Operating Procedures (SOPs)
- Any regulatory agreement, waivers, exemptions, inspection reports, compliance orders, and notices relating to solid waste program
- Groundwater well monitoring data

Physical Features to Inspect

- Resource recovery facilities
- Incineration and land disposal facilities (active and inactive)
- Areas where nonhazardous waste is disposed of
- Construction debris areas
- Waste receptacles
- Solid waste vehicle storage and washing areas
- Groundwater monitoring wells
- Methane gas vents at landfills

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Chief of Operations and Maintenance (O&M)
- Director of Contracting (DOC)
- Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>7-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on solid waste should be maintained at the installation (MP).</p> <p>7-2. Installations must develop and implement a solid waste management strategy (USFK EGS 7-3c).</p> <p>7-3. Buildings and all other facilities that are constructed, modified, or leased after the effective date of the USFK EGS must provide for storage areas that can be easily cleaned and maintained and that allow for safe and efficient collection of solid waste (USFK EGS 7-3f).</p> <p>7-4. Installations must not use open burning as a regular method of solid waste disposal (USFK EGS 7-3n).</p>	<p>(NOTE: Installations have the right to cooperate with ROK officials, consistent with Article VI of the US-ROK Status of Forces Agreement (SOFA), in the use of trash and garbage removal services that are owned, controlled, or regulated by the government of the ROK or local administrative subdivisions thereof.)</p> <p>Verify that copies of the following documents are current and available at the installation: (1)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - <i>DOD Directive 4165.60, Solid Waste Collection, Disposal, Material Recovery, and Recycling</i>, 4 October 1976 - <i>AR 200-1, Environmental Protection and Enhancement</i>, 21 February 1997 - <i>AR 420-47, Solid and Hazardous Waste Management</i>, 1 January 1985. <p>Verify that the installation has developed and implemented a strategy for reducing solid waste disposal. (1)(2)</p> <p>(NOTE: This strategy could include recycling, composting, and waste minimization efforts.)</p> <p>Verify that buildings and facilities in the design phase will have appropriate solid waste storage areas that will accommodate the anticipated volume of waste. (1)(2)</p> <p>Verify that open burning is not the installation's regular method of solid waste disposal. (1)(2)</p> <p>Verify that, if burning is the disposal method of choice, the installation uses incinerators that meet applicable air quality standards. (1)(2)</p> <p>(NOTE: For air quality standards, see Section 2, <i>Air Emissions</i>.)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
RECYCLING	
<p>7-5. Army installations must institute recycling programs, where cost effective, and must reduce the volume of solid waste materials at the source (USFK EGS 7-3i; DOD 4165.60, para V(a), V(c), and V(d)).</p>	<p>Verify that a solid waste reduction/resource recovery program exists. (1)(9)</p> <p>Verify that efforts are made to reduce the volume of solid waste materials at the source. (1)(2)(9)</p>
<p>7-6. Reusable and marketable materials should be collected at regular intervals (MP).</p>	<p>Verify that reusable or marketable materials are collected at regular intervals. (1)(2)(9)</p>
<p>7-7. Installations with office facilities of over 100 office workers must recover high-grade paper (DOD Directive 4165.60, para V(L)).</p>	<p>Determine whether the installation has over 100 office workers. (2)</p> <p>Verify that high-grade paper is separated at the source of generation. (2)</p> <p>Verify that high-grade paper is separately collected. (2)</p> <p>Verify that high-grade paper is sold for recycling. (2)</p>
<p>7-8. Installations where more than 500 families reside must recycle newspapers (40 CFR 246.201-1 and DOD Directive 4165.60, para V(J)).</p>	<p>Determine whether the installation has more than 500 families residing on it. (2)</p> <p>Verify that used newspapers are separated at the source of generation. (2)</p> <p>Verify that used newspapers are separately collected. (2)</p> <p>Verify that used newspapers are sold for recycling. (2)</p>
<p>7-9. Any installation that generates 10 tons (10,160 kg) or more of waste corrugated containers per month must sell this material for recycling (DOD Directive 4165.60, para V(K)).</p>	<p>Determine whether the installation generates 10 tons (10,160 kg) or more of waste corrugated containers per month. (2)</p> <p>Verify that waste corrugated containers are collected separately. (2)</p> <p>Verify that waste corrugated containers are sold for recycling. (2)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-10. Installations that recycle lead acid batteries must manage them as hazardous materials (USFK EGS 6-3i(4)).</p> <p>SOLID WASTE STORAGE AND COLLECTION</p> <p>7-11. Solid waste that is disposed of offsite must be disposed of at licensed or permitted facilities only (DOD Directive 4165.60, para V).</p> <p>7-12. Installations must treat, store, and dispose of USFK solid wastes in facilities that meet specific criteria (USFK EGS 7-3a).</p> <p>7-13. Installations must use solid waste storage containers that meet specific design standards (USFK EGS 7-3g).</p> <p>7-14. Installations must store containers in accordance with specific requirements (USFK EGS 7-3h).</p>	<p>Verify that lead acid batteries that are awaiting recycling are managed as hazardous materials. (2)</p> <p>Verify that offsite landfills that receive installation wastes are licensed or permitted. (1)(2)</p> <p>(NOTE: Assessors conduct interviews and carry out record searches as part of the verification process.)</p> <p>Verify that the installation treats, stores, and disposes of USFK solid wastes in facilities that meet the criteria of USFK EGS, Chapter 7, to the maximum extent practical. (1)(2)</p> <p>Verify that storage containers are leakproof, waterproof, and vermin-proof, including sides, seams, and bottoms. (1)(9)</p> <p>Verify that storage containers are durable enough to withstand anticipated usage without rusting, cracking, or deforming in a manner that would impair serviceability. (1)(9)</p> <p>Verify that storage containers have functional lids. (1)(9)</p> <p>Verify that containers are stored on a firm, level, well-drained surface that is large enough to accommodate all of the containers. (1)(9)</p> <p>Verify that the storage area is clean and free of spills. (1)(9)</p>

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SOLID WASTE
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REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-15. Installations must store all solid wastes and materials separated for recycling according to specific guidelines (USFK EGS 7-3d and AR 420-47, para 3-4a).</p>	<p>Verify that all solid wastes are stored so as not to cause a fire, health or safety hazard, or provide food or harborage for vectors. (1)(2)</p> <p>Verify that such materials are contained or bundled to prevent spillage. (1)(2)</p> <p>Verify that solid waste containers are of an adequate size and number to contain all waste generated between collections. (1)(2)</p> <p>Verify that reusable containers are capable of being serviced without the collector coming into contact with the waste. (1)(2)</p>
<p>7-16. Installations must meet specific requirements with regard to the storage of food wastes (AR 420-47, para 3-4b).</p>	<p>Verify that food wastes are stored securely in covered or closed containers that are nonabsorbent, leakproof, durable, easily cleanable (if reusable), and designed for safe handling. (1)(2)</p> <p>Verify that containers for food waste are: (1)(2)</p> <ul style="list-style-type: none"> - large enough and numerous enough to hold all food wastes, rubbish, and ashes from residences or establishments for the period of time between collections - kept clean so that they are not a nuisance and do not harbor, feed, or breed vectors - emptied completely of all solid wastes when serviced - sturdy enough to be leak-proof and not easily damaged - marked UNAUTHORIZED PERSONNEL ARE NOT TO ENTER DUMPSTER FOR ANY REASON.
<p>7-17. Installation personnel should be periodically informed about materials that are prohibited from disposal in solid waste receptacles (MP).</p>	<p>Verify that a program exists at the installation to keep personnel informed about proper waste disposal practices. (1)(21)</p>
<p>7-18. Installations must operate their collection systems in a manner that protects the health and safety of personnel associated with the operation (AR 420-47, para 3-5 and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that the collection system is operated safely. (1)(2)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-19. Installations must maintain collection equipment according to certain standards if such equipment is considered to be operating in interstate or foreign commerce (AR 420-47, para 3-6a and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that all vehicles used for the collection and transportation of solid waste meet all applicable standards established by the Federal Government, including: (1)(2)</p> <ul style="list-style-type: none"> - Motor Carrier Safety Standards (49 CFR Parts 390 through 396) - Noise Emission Standards for Motor Carriers Engaged in Interstate Commerce (40 CFR Part 202) - Federal Motor Vehicle Safety Standards (49 CFR Parts 500 through 580) (for Federally owned collection equipment only).
<p>7-20. All collection equipment must meet specific criteria (AR 420-47, para 3-6b through para 3-6d and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that all vehicles used for collection and transportation of solid wastes or materials separated for recycling are enclosed and have suitable covers to prevent spillage. (2)</p> <p>Verify that equipment used in the compaction, collection, and transportation of solid waste or materials separated for recycling is constructed, operated, and maintained adequately. (2)</p> <p>Verify that the following types of equipment meet the standards established by the American National Standards Institute: (2)</p> <ul style="list-style-type: none"> - rear-loading compaction equipment - side-loading compaction equipment - front-loading compaction equipment - tilt-frame equipment - hoist-type equipment - satellite vehicles - special collection compaction equipment - stationary compaction equipment.
<p>7-21. All installations must collect solid wastes or materials separated for recycling according to a certain schedule (DOD Directive 4165.60, para V(A) and AR 420-47, para 3-7).</p>	<p>Verify that solid wastes that contain food wastes are collected at a minimum of once a week. (1)(2)</p> <p>(NOTE: The written approval of the Installation Commander must be obtained if waste from dining facilities and similar activities is to be collected more than once a day.)</p> <p>Verify that bulky wastes are collected at a minimum of once every 3 mo. (1)(2)</p> <p>Verify that all wastes are collected with sufficient frequency to inhibit the propagation or attraction of vectors and the creation of nuisances. (1)(2)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-22. Installations must collect solid waste in a safe and efficient manner (DOD Directive 4165.60, para V(A) and AR 420-47, para 3-8).</p> <p>7-23. Installation industrial shop waste receptacles should be inspected quarterly to verify that hazardous wastes are not being deposited (MP).</p> <p>7-24. Installations must meet specific requirements with regard to the management of bulky wastes (USFK EGS 7-3e and AR 420-47, para 3-4d).</p>	<p>Verify that solid wastes or materials separated for recycling are collected in a safe, efficient manner. (1)(2)</p> <p>Verify that the collection vehicle operator immediately cleans up any spillage caused by his or her operations. (1)(2)</p> <p>Verify that records and interviews confirm that receptacles were inspected. (1)</p> <p>Verify that corrective actions were taken where necessary. (1)(2)</p> <p>Inspect a sample of solid waste receptacles at shops for presence of hazardous waste. (1)(2)</p> <p>Verify that bulky wastes are stored so as not to create a nuisance and to avoid the accumulation of solid waste and water in and around the bulky items by removing all doors from large household appliances and covering the items. (1)(2)</p> <p>Verify that bulky wastes are screened for the presence of hazardous constituents and ozone depleting substances. (1)(2)</p> <p>Verify that detachable or removable hazardous waste is segregated and disposed of properly. (1)(2)</p> <p>(NOTE: See Section 6, <i>Hazardous Waste</i>, Section 14, <i>Polychlorinated Biphenyls</i> and Section 15, <i>Asbestos</i>.)</p>
<p>ONSITE LAND DISPOSAL</p> <p>Specific Wastes</p> <p>7-25. Bulky wastes must be disposed of in a specific fashion (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that automobile bodies, furniture, and appliances are either salvaged or crushed and pushed onto the working face near the bottom of the cell. (1)(2)(9)</p> <p>Verify that demolition and construction debris, tree stumps, and large timbers are pushed onto the working face near the bottom of the cell. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-26. Water treatment plant sludges must be covered with soil or MSW (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that water treatment plant sludges are covered with soil or MSW. (1)(2)(9)</p>
<p>7-27. Incinerator and air pollution control residues must be disposed of in a specific fashion (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that incinerator and air pollution control residues are incorporated into the face and covered as necessary to prevent them from becoming airborne. (1)(2)(9)</p>
<p>7-28. Installations must develop procedures for dealing with yard waste and construction debris (USFK EGS 7-3L(6)).</p>	<p>Verify that the installation has developed procedures for dealing with yard waste and construction debris that keep it out of MSWMF units to the maximum extent possible (e.g., composting, recycling). (1)(2)(9)</p>
<p>7-29. Installations must investigate options for composting MSW (USFK EGS 7-3L(4)).</p>	<p>Verify that the installation has investigated options for composting MSW as an alternative to landfilling or treatment prior to landfilling. (1)(2)(9)</p>
<p>Operations</p>	
<p>7-30. Installations must implement programs to detect and prevent the disposal of certain wastes in their MSWMFs (USFK EGS 7-3L(3) and 7-3L(13)).</p>	<p>Verify that the installation has a program that effectively prevents the disposal in the MSWMF of hazardous waste, infectious waste, PCB waste, and other waste determined to be unsuitable for the specific landfill. (1)(2)(9)</p> <p>Verify that the installation prohibits the disposal of bulk or non-containerized liquids in the MSWMF, if possible. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-31. Installations that operate land disposal sites must provide a list of excluded materials to regular users and develop criteria for unacceptable materials (USFK EGS 7-3L(2) and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that a list of excluded materials is displayed prominently at the site entrance. (1)(2)(9)</p> <p>Verify that a list of excluded materials is given to all regular users of the site. (1)(2)(9)</p> <p>Verify that the installation has established criteria for unacceptable wastes based on site-specific factors. (1)(2)(9)</p> <p>(NOTE: Examples of site-specific factors are:</p> <ul style="list-style-type: none"> - hydrology - chemical and biological characteristics of the waste - available alternative disposal methods - environmental and health effects - safety of personnel.)
<p>7-32. Installations must use certain standard sanitary landfill techniques as part of their operations (USFK EGS 7-3L(1) and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that standard techniques of spreading and compacting solid wastes are used. (1)(2)(9)</p> <p>Verify that, on any operating day, MSW handling equipment is capable of: (1)(2)(9)</p> <ul style="list-style-type: none"> - spreading solid waste in layers no more than 0.6 m (2 ft) thick while confining it to the smallest practicable area - compacting the spread solid wastes to the smallest practicable volume. <p>Verify that daily cover is placed over disposed solid waste at the end of each operating day, regardless of weather. (1)(2)(9)</p>
<p>7-33. Specific requirements as to cover material must be met at land disposal sites (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that cover material is applied as necessary to: (1)(2)(9)</p> <ul style="list-style-type: none"> - minimize fire hazards - minimize infiltration of precipitation - minimize odors - minimize blowing litter - control gas venting - control vectors - discourage scavenging - provide a pleasing appearance. <p>Verify that intermediate cover is applied on areas where additional cells are not to be constructed for extended periods of time. (1)(2)(9)</p> <p>Verify that final cover is applied on each area as it is completed or if the area is to remain idle for over 1 yr. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-34. Land disposal sites that accept special wastes must have approval of the responsible agency (DOD Directive 4165.60, para V(A)).</p> <p>7-35. Installations must operate land disposal sites in such a way as to protect water quality (USFK EGS 7-3L(11), and DOD Directive 4165.60, para V(A)).</p> <p>7-36. Installations must operate land disposal sites in such a way as to protect air quality (USFK EGS 7-3L(5) and DOD Directive 4165.60, para V(A)).</p> <p>7-37. Installations must control decomposition gases at land disposal sites (USFK EGS 7-3L(9) and DOD Directive 4165.60, para V(A)).</p>	<p>Determine whether the land disposal site accepts special wastes. (1)(2)(9)</p> <p>Verify that the land disposal site has agency approval to accept special wastes. (1)(2)(9)</p> <p>Verify that surface watercourses and runoff are diverted from the land disposal site. (1)(2)(9)</p> <p>Verify that the land disposal site is constructed and graded to promote rapid surface water runoff without excessive erosion. (1)(2)(9)</p> <p>Verify that the site is regraded as necessary to avoid ponding of precipitation and to maintain the integrity of cover material. (1)(2)(9)</p> <p>Verify that siltation or retention basins or other approved methods of retarding runoff are used where necessary to avoid stream siltation or flooding problems. (1)(2)(9)</p> <p>Verify that leachate collection and treatment systems are used where necessary to protect groundwater and surface water resources. (1)(2)(9)</p> <p>Verify that MSW and leachate are not in contact with groundwater or surface water. (1)(2)(9)</p> <p>Verify that aquifers will not be contaminated. (1)(2)(9)</p> <p>Verify that there is no open burning of MSW. (1)(2)(9)</p> <p>(NOTE: Infrequent burning of agricultural wastes, silvicultural wastes, land-clearing debris, diseased trees, or debris from emergency clean-up operations is allowed.)</p> <p>Verify that dust control measures are initiated as necessary. (1)(2)(9)</p> <p>Verify that decomposition gases are not allowed to migrate laterally from the land disposal site. (1)(2)(9)</p> <p>Verify that decomposition gases do not pose an explosion or toxicity hazard. (1)(2)(9)</p> <p>Verify that methane gas generated by the MSWMF does not exceed 25 percent of the lower explosive limit for methane in facility structures. (1)(2)(9)</p> <p>(NOTE: The lower explosive limit for methane is 5.0 percent by volume.)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-38. Installations must control vectors at land disposal sites (USFK EGS 7-3L(8) and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that conditions at the land disposal site are unfavorable for the harboring, feeding, and breeding of disease vectors. (1)(2)(9)</p> <p>Verify that vector control contingency programs are implemented when necessary to prevent or rectify vector problems. (1)(2)(9)</p>
<p>7-39. Land disposal sites must be designed and operated in an aesthetically acceptable manner (USFK EGS 7-3L(10) and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that blowing litter is controlled through portable litter fences or other devices. (1)(2)(9)</p> <p>Verify that wastes that are easily moved by wind are covered as necessary to prevent their becoming airborne. (1)(2)(9)</p> <p>Verify that onsite vegetation is cleared only as necessary. (1)(2)(9)</p> <p>Verify that natural windbreaks are maintained. (1)(2)(9)</p> <p>Verify that buffer strips and/or berms are used to screen the site from nearby residences and major roadways. (1)(2)(9)</p> <p>Verify that salvage material is removed from the site frequently. (1)(2)(9)</p>
<p>7-40. Installations must control public access to landfill facilities (USFK EGS 7-3L(12)).</p>	<p>Verify that public access to landfill facilities is controlled. (1)(2)(9)</p>
<p>7-41. Land disposal sites must be designed, constructed, and operated in such a way as to protect the health and safety of personnel (USFK EGS 7-3L(7) and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that a safety manual is available to employees. (1)(2)(9)</p> <p>Verify that personal safety devices are provided to facility employees. (1)(2)(9)</p> <p>Verify that equipment is provided with safety devices. (1)(2)(9)</p> <p>Verify that there are provisions to extinguish fires. (1)(2)(9)</p> <p>Verify that communications equipment is available on site. (1)(2)(9)</p> <p>Verify that scavenging is prohibited. (1)(2)(9)</p> <p>Verify that traffic signs or markers are provided to promote an orderly traffic pattern to and from the discharge area. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-42. Operators of land disposal sites must maintain records of their operations (USFK EGS 7-3L(14)).</p> <p>7-43. The records kept by operators of land disposal sites must contain certain information (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that records on the operations of the landfill are maintained. (1)(2)(9)</p> <p>Verify that the records kept by the operators of the land disposal sites contain at least the following information: (1)(2)(9)</p> <ul style="list-style-type: none"> - major operational problems, complaints, or difficulties - results of leachate sampling and analyses - results of gas sampling and analyses - results of groundwater and surface water quality sampling and analyses upstream and downstream from the site - vector control efforts - dust and litter control efforts - quantitative measurements of the solid wastes handled - description of solid waste materials received.
<p>Closure and Postclosure</p> <p>7-44. Installations must take specific actions in the course of closure and postclosure operations (USFK EGS 7-3m(1) through 7-3m(3)).</p> <p>7-45. Installations must prepare a written closure plan that meets specific requirements (USFK EGS 7-3m(4)).</p>	<p>Verify that a final cover is installed that is designed to minimize infiltration and erosion. (1)(2)(9)</p> <p>Verify that the infiltration layer is made up of a minimum of 46 cm (18 in.) of earthen material, geotextiles, or combination thereof, that have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 0.00005 cm/s, whichever is less. (1)(2)(9)</p> <p>Verify that the erosion layer is a minimum of 21 cm (8 in.) of earth material that can sustain native plant growth. (1)(2)(9)</p> <p>Verify that the installation has a written closure plan. (1)(2)(9)</p> <p>Verify that the closure plan includes the following, at a minimum: (1)(2)(9)</p> <ul style="list-style-type: none"> - a description of the monitoring and maintenance activities required to ensure the integrity of the final cover - a survey plot showing the exact site location - a description of planned uses during the postclosure period. <p>Verify that the closure plan is kept as part of the installation's permanent records. (1)(2)(9)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-46. Installations should, upon closure of a site, record a detailed description with the area's land recording authority (MP).</p>	<p>Verify that upon closure of a site, a detailed description is recorded with the area's land recording authority. (1)(2)(9)</p>
<p>NEW LANDFILLS</p>	
<p>7-47. Installations must not initiate new or expand existing waste landfill units (USFK EGS 7-3j).</p>	<p>Verify that the installation does not initiate a new or expanded waste landfill unit beyond existing site footprints. (1)(2)(9)</p>
<p>7-48. The design and operation of new MSWFM units must incorporate certain broad factors (USFK EGS 7-3k and DOD Directive 4165.60, para V(A)).</p>	<p>Verify that the following broad factors are taken into account in the design and operation of the new MSWFM: (1)(2)(9)</p> <ul style="list-style-type: none"> - location restrictions in regard to airport safety (i.e., bird hazards), floodplains, wetlands, aquifers, seismic zones, and unstable areas - procedures for excluding hazardous waste - cover material criteria (e.g., daily cover) - disease vector control - explosive gas control - air quality criteria (e.g., no open burning) - access requirements - liquids restrictions - recordkeeping requirements - inspection program. <p>Verify that the following have been evaluated: (1)(2)(9)</p> <ul style="list-style-type: none"> - the onsite soil characteristics - climatic conditions - socioeconomic factors.
<p>7-49. Plans for the design, construction, and operation of new sites or modifications to existing sites must be prepared or approved by a professional engineer (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that a professional engineer has prepared or approved plans. (1)(2)(9)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

**THERMAL
PROCESSING
FACILITIES**

7-50. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must provide special areas for certain wastes while they await processing (DOD Directive 4165.60, para V(A)).

Verify that storage areas for bulky wastes, digested and dewatered sludges from wastewater treatment facilities, raw sewage sludges, and septic tank pumpings are clearly marked. (1)(2)(9)

(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

7-51. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must train personnel in any unusual handling requirements for accepting certain wastes (DOD Directive 4165.60, para V(A)).

Verify that personnel are thoroughly trained to handle bulky wastes, digested and dewatered sludges from wastewater treatment facilities, raw sewage sludges, and septic tank pumpings. (1)(2)(9)

(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

7-52. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must inform regular users about materials that are excluded (DOD Directive 4165.60, para V(A)).

Verify that regular users are given a list of excluded materials. (1)(2)(9)

Verify that a list of excluded materials is posted prominently at the facility. (1)(2)(9)

(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-53. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must have certain procedures and precautions to deal with unacceptable wastes that are delivered to or left at the facility (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that there is an operating plan that specifies procedures and precautions to be taken if unacceptable wastes are delivered to or left at the facility. (1)(2)(9)</p> <p>Verify that operating personnel are thoroughly trained in such procedures. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>7-54. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must meet certain site selection criteria (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that the facility is located in an area zoned for industrial use and has adequate utilities to serve it. (1)(2)(9)</p> <p>Verify that the site is accessible by permanent roads leading from the public road system. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>7-55. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must have plans for the design of new facilities or modifications of existing facilities prepared or approved by a professional engineer (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that a professional engineer prepares or approves plans for the design of new facilities or modification of existing facilities. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-56. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must operate in a manner that protects water quality (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that all waters discharged from the facility are treated to meet the most stringent of applicable water quality standards. (1)(2)(9)</p> <p>Verify that, when monitoring equipment indicates excessive discharge contamination, appropriate adjustments are made to lower the concentrations to acceptable levels. (1)(2)(9)</p> <p>Verify that, in the event of an accidental spill, the local regulatory agency is notified immediately. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>7-57. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must operate in a manner that protects air quality (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that emissions do not exceed applicable, existing emission standards. (1)(2)(9)</p> <p>Verify that all emissions, including dust from vents, are controlled. (1)(2)(9)</p> <p>Verify that, when monitoring equipment indicates excessive emissions, appropriate adjustments are made to lower the emissions to acceptable levels. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>7-58. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must control vectors (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that a housekeeping schedule is established and maintained. (1)(2)(9)</p> <p>Verify that solid waste and residue do not accumulate at the facility for more than 1 week. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>7-59. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must operate in an aesthetically acceptable manner (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that a routine housekeeping and litter removal schedule is established and implemented. (1)(2)(9)</p> <p>Verify that solid wastes that cannot be processed by the facility are removed on a weekly basis. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-60. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must dispose of residue and other solid waste products resulting from the thermal process in an environmentally acceptable manner (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that the furnace operator records, in a log, the estimated percentage of unburned combustibles. (1)(2)(9)</p> <p>Verify that, if residue or fly ash is collected in a wet condition, it is drained of free moisture. (1)(2)(9)</p> <p>Verify that residue and fly ash are transported by means that prevent the loads from shifting, falling, or blowing from the container. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>7-61. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must be designed, operated, and maintained in a manner to protect the health and safety of personnel (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that procedures are developed for operation in emergency situations. (1)(2)(9)</p> <p>Verify that approved respirators or self-contained breathing apparatus are available at convenient locations. (1)(2)(9)</p> <p>Verify that training in first aid practices and emergency procedures is given to all personnel. (1)(2)(9)</p> <p>Verify that personal safety devices are provided to all personnel. (1)(2)(9)</p> <p>Verify that any regular user or individual that poses a safety hazard is barred from the facility and reported to the responsible agency. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>7-62. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must follow certain general operating criteria (DOD Directive 4165.60, para V(A)).</p>	<p>Verify that the facility supervisor is experienced in the operation of the type of facility designed. (1)(2)(9)</p> <p>Verify that alternate and standby disposal and operating procedures are established for implementation during emergencies, air pollution episodes, and shutdown periods. (1)(2)(9)</p> <p>Verify that a routine maintenance schedule is established. (1)(2)(9)</p> <p>Verify that engineering drawings are updated as the facility is modified. (1)(2)(9)</p> <p>Verify that key operational procedures are prominently posted. (1)(2)(9)</p> <p>Verify that equipment manuals, catalogs, spare parts lists, and spare parts are readily available at the facility. (1)(2)(9)</p> <p>Verify that training opportunities are available for personnel. (1)(2)(9)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

7-62. (continued)

7-63. Installations with thermal processing facilities designed to process or that are processing 50,800 kg/day (50 tons/day) or more of MSW must provide records and monitoring data (DOD Directive 4165.60, para V(A)).

(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)

Verify that extensive monitoring and recordkeeping are practiced during: (1)(2)(9)

- the first 12 to 18 mo of operation of a new or renovated facility
- periods of high air pollution
- periods of upset conditions at the facility.

Verify that operating records are kept in a daily log and include as a minimum: (1)(2)(9)

- the total weight and volume of solid waste received during each shift, including the number of loads received, the ownership or specific identity of delivery vehicles, and the source and nature of the solid wastes accepted
- furnace and combustion chamber temperatures recorded at least every 60 min and as changes are made, including explanations for abnormally high and low temperatures
- rate of operation, such as grate speed
- overfire and underfire air volumes and pressure and distribution recorded at least every 60 min and as changes are made
- weights of bottom ash, grate siftings, and fly ash, individually or combined, recorded at intervals appropriate to normal facility operation
- estimated percentages of unburned material in the bottom ash
- water used on each shift for bottom ash quenching and scrubber operation
- power produced and utilized during each shift
- quality, production totals, and consumption rates if steam is produced
- auxiliary fuel used for each shift
- gross calorific value of daily representative samples of bottom ash, grate siftings, and fly ash
- required emission measurements and laboratory analyses
- complete records of monitoring instruments
- problems encountered and methods of solution.

(NOTE: Representative samples of process waters should be collected and analyzed as recommended by the responsible agency.)

(NOTE: Sampling time should be varied so that all shifts are monitored on a weekly basis.)

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-63. (continued)</p>	<p>Verify that an annual report is prepared and that it includes the following information: (1)(2)(9)</p> <ul style="list-style-type: none"> - minimum, average, and maximum daily volume and weight of waste received and processed, summarized on a monthly basis - summary of the laboratory analyses, including at least monthly averages - number and qualifications of personnel in each job category - total workhours per week - number of state certified or licensed personnel - staffing deficiencies - serious injuries, their cause, and preventive measures instituted - identification and brief discussion of major operational problems and solutions - adequacy of operation and performance with regard to environmental requirements, general level of housekeeping and maintenance, testing and reporting proficiency, and recommendations for corrective actions - copy of all significant correspondence, reports, inspection reports, and any other communications from enforcement agencies. <p>Verify that a methodology for evaluating the facility's performance has been developed. (1)(2)(9)</p> <p>(NOTE: This does not apply to hazardous, agricultural, or mining wastes.)</p>
<p>RESOURCE RECOVERY FACILITIES</p> <p>7-64. Certain installations must establish and/or use resource recovery facilities to separate and recover materials, energy, or both, from solid waste (DOD Directive 4165.60 (V)(F) and 4165.60(V)(H)).</p> <p>7-65. Installations that establish or utilize a resource recovery facility must design such facilities to process a standard amount of solid waste (DOD Directive 4165.60, para V(A)).</p>	<p>Determine whether the installation generates 101,600/day (100 tons/day) or more of residential, commercial, and institutional solid waste after complying with waste reduction and source separation policies. (1)</p> <p>Verify that the installation establishes and/or uses resource recovery facilities. (1)(2)</p> <p>Verify that joint or regional civilian community resource recovery facilities are utilized whenever possible. (1)</p> <p>Verify that the facility is designed to process at least 65 percent (by wet weight) of the input solid waste into recycled material, fuel, or energy. (1)(2)(9)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>COMPOSTING FACILITIES</p> <p>7-66. Composting facilities that process 5000 tons [≈4540 metric tons] of sludge from a domestic wastewater treatment plant annually must meet specific standards (USFK EGS 7-3o).</p>	<p>Verify that a record is maintained for the characteristics of the waste, sewage sludge, and other materials, including the source and volume or weight of the material. (1)(2)(9)</p> <p>Verify that access to the facility is controlled. (1)(2)(9)</p> <p>Verify that all access points are secured when the facility is not in operation. (1)(2)(9)</p> <p>Verify that by-products (including residual materials that can be recycled) are stored to prevent vector intrusion and aesthetic degradation. (1)(2)(9)</p> <p>Verify that materials that are not composted are removed periodically. (1)(2)(9)</p> <p>Verify that runoff water that has been in contact with composted waste, materials stored for composting, or residual waste is diverted to a leachate collection system. (1)(2)(9)</p> <p>Verify that the temperature and retention time for material being composted is monitored and recorded. (1)(2)(9)</p> <p>Verify that the compost is analyzed periodically for the following: (1)(2)(9)</p> <ul style="list-style-type: none"> - percentage of total solids - volatile solids as a percentage of total solids - pH - ammonia - nitrate nitrogen - total phosphorus - cadmium - chromium - copper - lead - nickel - zinc - mercury - PCBs. <p>Verify that compost is produced by a process that further reduces pathogens. (1)(2)(9)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>7-66. (continued)</p>	<p>(NOTE: Two acceptable methods of production are windrowing and the enclosed vessel method:</p> <ul style="list-style-type: none"> - windrowing consists of an unconfined composting process involving periodic aeration and mixing such that aerobic conditions are maintained during the composting process - enclosed vessel method involves mechanically mixing compost under controlled environmental conditions: <ul style="list-style-type: none"> - the retention time in the vessel must be at least 72 h with the temperature maintained at 55 °C [131 °F] - a stabilization period of at least 7 days must follow the decomposition period.)
<p>7-67. Compost produced at a facility that processes 5000 tons [≈4540 metric tons] of sludge from a domestic wastewater treatment plant annually must be distributed in accordance with the classification of the compost (USFK EGS 7-3p).</p> <p>OPEN DUMPING</p> <p>7-68. Open dumping is prohibited in certain areas (USFK EGS 7-3q).</p>	<p>Verify that compost distributed or marketed as commercial fertilizer, speciality fertilizer, soil amendment, or plant amendment is registered with the Executive Agent. (1)(2)(9)</p> <p>Verify that Class A compost is: (1)(2)(9)</p> <ul style="list-style-type: none"> - stabilized - stored until it has matured (a 60 percent decomposition). <p>Verify that Class B compost is distributed on a restricted basis only. (1)(2)(9)</p> <p>(NOTE: Class A compost may be distributed for unrestricted use, including agricultural applications.)</p> <p>(NOTE: The Executive Agent determines appropriate distribution for Class B compost.)</p> <p>Verify that no one dumps any waste in cultural properties areas, parks, squares, camping areas, public beaches, roads, harbors, fishery ports, sewer systems, rivers, lakes, forests, and other areas or facilities without justifiable reasons. (1)(2)(9)</p> <p>(NOTE: Other areas where dumping is not permitted are:</p> <ul style="list-style-type: none"> - coastal areas - areas so designated and declared to produce or preserve marine products - areas, such as roadsides, railroad track beds, or resort areas - areas so designated and declared to preserve the quality of agricultural water - areas within 15,000 m [≈49,213 ft] from service water reservoirs or protection areas for service water (30,000 m [≈98,425 ft] in case of a service water reservoir for a very wide area).)

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
SOLID WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>LARGE VOLUME WASTE GENERATORS</p> <p>7-69. Installations that are large volume waste generators of MSW must use appropriate disposal methods (USFK EGS 7-3r).</p> <p>7-70. Large volume MSW generators that manage the disposal of their waste must meet collection and transportation standards (USFK EGS 7-3r(1)).</p>	<p>Verify that ICs, which generate more than 300 kg/d of combined MSW and recyclable materials, recycle and dispose of these materials by using either: (1)(2)(9)(20)</p> <ul style="list-style-type: none"> - trained USFK employees - local governments (under the provisions of Article VI of the U.S.-ROK SOFA) - local government-approved contractors. <p>Verify that all recycling activities on USFK installations complies with DOD policies. (1)(2)(9)</p> <p>Verify that off-post MSW and recyclable material handling activities, regardless of the laborers used, respect local ordinances. (1)(2)(9)</p> <p>Verify that the DRMO and ICs obtain off-post recycling services only from those businesses which have approval from the ROK MOE or the local government authorities. (1)(2)(9)(20)</p> <p>Verify that different types of recyclable and disposable wastes are not mixed during collection and transportation. (1)(2)(9)</p> <p>Verify that wastes are transported in equipment such that the containers prevent the excessive generation of offensive odors, refuse blowing off, or leachate release. (1)(2)(9)</p> <p>Verify that once a waste or recyclable material hauling vehicle has been unloaded, the vehicle is cleaned in a manner that prevents trash from blowing away. (1)(2)(9)</p> <p>Verify that recyclable, combustible, and noncombustible MSW are separately collected and transported. (1)(2)(9)</p> <p>(NOTE: Separation/classification schemes may differ depending on the collection plan of each city/county/ward or local conditions.)</p> <p>Verify that transportation equipment is cleaned so as not to blow dust and trash after unloading MSW at landfills. (1)(2)(9)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (9) Chief of Operations and Maintenance (O&M) (20) Director of Contracting (DOC) (21) Public Affairs Office (PAO)

INSTALLATION:	COMPLIANCE CATEGORY: SOLID WASTE Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 8

MEDICAL WASTE MANAGEMENT

Korea ECAS

SECTION 8

MEDICAL WASTE MANAGEMENT

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol addresses the collection, storage, and disposal of medical waste at Army installations.

Medical waste includes any medical wastes generated by the military community hospital (some countries classify medical/pathological wastes as hazardous waste; consult local requirements).

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 8 addresses the management of regulated medical waste (RMW) at U.S. Forces - Korea (USFK) medical/dental/veterinary treatment facilities and water/wastewater laboratories at the installation level. The requirements it contains do not apply to household waste.

C. Army Regulations (AR)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no provisions directly relevant to the management of medical waste overseas.
- AR 40-5, *Preventive Medicine*, 15 October 1990, details the procedures for handling infectious and pathological waste.

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH) is responsible for the treatment, storage, disposal, and/or transportation of medical waste to onsite or offsite disposal facilities.
- Commanders of medical department activities (MEDDACs) and U.S. Army Medical Centers (MEDCENs) prepare and maintain a management plan for the disposal of medical waste.
- Installation preventive medicine services (PVNTMED) personnel support the medical waste management programs, provide technical assistance in identifying wastes and inventorying sources of medical waste, and represent the MEDDAC/MEDCEN as an installation tenant and medical waste generator.
- Installation safety officers oversee the storage, packaging, transportation, treatment, and disposal of medical waste, and monitor personnel training requirements to ensure compliance with Army safety standards.

E. Key Compliance Definitions

These definitions were obtained from directives/instructions and ARs listed at the end of each definition.

- *Animal Waste* - contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including that produced in veterinary facilities), production of biologicals, or testing of pharmaceuticals. Carcasses of road kills, euthanized animals, animals dying of natural causes, and waste produced by general veterinary practices are not considered animal waste (USFK EGS, Chapter 8, Definitions).
- *Blood and Blood Products* - any of the following (USFK EGS, Chapter 8, Definitions):
 1. free flowing liquid or semi-liquid human blood, plasma, serum, and other blood derivatives that are waste
 2. items such as gauze or bandages that are saturated or dripping with human blood, including those items produced in dental procedures such as saliva soaked gauze or cotton rolls
 3. items caked with dried blood and capable of releasing the blood during normal handling procedures.
- *Cultures, Stocks and Vaccines* - cultures and stocks of infectious agents and associated biologicals, including: cultures from medical/pathological and water/wastewater laboratories, discarded live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate, and mix cultures (USFK EGS, Chapter 8, Definitions).
- *Infectious Waste* - any waste with pathogens of sufficient virulence and quality capable of causing an infectious disease in an exposed, susceptible host (AR 40-5, Glossary, Section II).
- *Isolation Centers for Disease Control (CDC) Risk Group IV Waste* - biological waste and discarded materials contaminated with blood, excretion exudates, or secretions from humans who are isolated to protect others from highly communicable diseases, or isolated animals known to be infected with highly communicable diseases caused by agents designated in Appendix 8-1. This category includes pox viruses and arboviruses (USFK EGS, Chapter 8, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Medical Waste Generator* - any water/wastewater laboratory, medical, dental, or veterinary activity that generates RMW (USFK EGS, Chapter 8, Definitions).
- *Medical Waste Treatment* - any method, technique, or process designed to render RMW noninfectious (USFK EGS, Chapter 8, Definitions).
- *Nonregulated Medical Waste* - solid material intended for disposal that is produced as the direct result of patient diagnosis, treatment, or therapy. Typically such waste is generated in patient sleeping rooms, treatment or therapy rooms, isolation rooms (except where the patient is isolated for a CDC Risk Group IV Waste), rooms used for diagnostic procedures, doctors' offices, and nursing units. Examples of items included in this category are soiled dressings, bandages, disposable catheters, swabs, used disposable drapes, gowns, masks and gloves, empty used specimen containers and blood tinged gauze, sponges, or chux. This waste requires no further treatment (USFK EGS, Chapter 8, Definitions).

- *Pathological Waste* - human pathological wastes, including tissues, organs, body parts, extracted human teeth not returned to patients, and body fluids that are removed during surgery, autopsy, or other medical procedures, and specimens of body fluids (USFK EGS, Chapter 8, Definitions).
- *Pathological Waste* - any wastes that include anatomical parts of humans and animals, excluding human corpses and animal carcasses (AR 40-5, Glossary, Section II).
- *Regulated Medical Waste (RMW)* - waste that is potentially capable of causing disease in humans and may pose a risk to both individuals and community health if not handled or treated properly. Consists of the following classes of waste: cultures, stocks and vaccines; pathological waste; blood and blood products; all used and unused sharps; animal waste; and Isolation CDC Risk Group IV waste. Liquid human blood, plasma and other derivatives whether dried, dripping, or free flowing are considered in this category (USFK EGS, Chapter 8, Definitions).
- *Used and Unused Sharps* - sharps that have been used in animal or human patient care or treatment in medical, research, or support laboratories, including hypodermic needles, syringes (with or without the attached needle), pasteur pipettes, scalpel blades, blood collection tubes and vials, test tubes, needles attached to tubing, and culture dishes (regardless of the presence of infectious agents). Other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides and cover slips, are also included in this category (USFK EGS, Chapter 8, Definitions).



MEDICAL WASTE MANAGEMENT
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	8-1	(1)(2)
Medical Waste		
General	8-2	(1)(3)
Generation	8-3 through 8-7	(1)(3)
Storage and Transport	8-8 through 8-11	(1)(3)
Treatment/Disposal	8-12 through 8-20	(1)(3)(23)
Spills	8-21 and 8-22	(1)(3)
Training	8-23 and 8-24	(1)(3)

(a) CONTACT CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (23) Defense and Reutilization Marketing Office (DRMO)

MEDICAL WASTE MANAGEMENT

Records to Review

- Record of current medical waste management practices
- Environmental monitoring procedures or plans and analytical results
- Medical waste removal contracts and inspection records
- Regional solid waste management plan
- Unique local rules for handling medical waste
- Installation medical waste management plans, Standing Operating Procedures (SOPs)
- Any regulatory agreement, waivers, exemptions, inspection reports, compliance orders, and notices relating to medical waste program

Physical Features to Inspect

- Waste receptacles

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer
- Defense and Reutilization Office (DRMO)



**COMPLIANCE CATEGORY:
MEDICAL WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>8-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on medical waste should be maintained at the installation (MP).</p> <p>MEDICAL WASTE</p> <p>General</p> <p>8-2. Radioactive medical waste must be managed in accordance with service directives (USFK EGS 8-3a(5)).</p> <p>Generation</p> <p>8-3. All personnel who handle RMW must wear protective equipment (USFK EGS 8-3a(8)).</p> <p>8-4. Mixtures of RMW and other types of waste must be handled in accordance with specific criteria (USFK EGS 8-3a(1) and 8-3a(3)).</p> <p>8-5. RMW must be handled in accordance with specific requirements (USFK EGS 8-3a(2) and 8-3a(6)).</p>	<p>(NOTE: The requirements of this protocol do not apply to what would otherwise be household waste.)</p> <p>Verify that copies of the following are current and available at the installation: (1)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - <i>AR 40-5, Preventive Medicine</i>, 15 October 1990 - <i>AR 200-1, Environmental Protection and Enhancement</i>, 21 February 1997. <p>Determine whether the installation disposes of radioactive medical waste. (1)(3)</p> <p>Verify that radioactive medical waste is disposed of in accordance with Army guidance. (1)(3)</p> <p>Verify that all personnel handling RMW wear appropriate personal protective equipment (PPE) such as gloves, coveralls, masks, and goggles sufficient to prevent risk of exposure to infectious agents or pathogens. (1)(3)</p> <p>Verify that mixtures of RMW and hazardous wastes are handled as infectious hazardous waste. (1)(3)</p> <p>(NOTE: Priority is given to the hazard that presents the greatest risk.)</p> <p>(NOTE: Mixtures of RMWs and hazardous wastes are the responsibility of the generating USFK component.)</p> <p>Verify that mixtures of solid waste and RMW are handled as RMW. (1)(3)</p> <p>Verify that RMW is segregated from nonregulated medical waste at its point of origin and securely bagged to provide a barrier between waste and worker. (1)(3)</p> <p>Verify that RMW is placed in leakproof, puncture resistant, plastic bag lined receptacles. (1)(3)</p>

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**COMPLIANCE CATEGORY:
MEDICAL WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>Storage and Transport</p> <p>8-8. RMW must be handled in accordance with specific requirements (USFK EGS 8-3b).</p> <p>8-9. RMW storage containers must meet specific requirements (USFK EGS 8-3c(1)).</p> <p>8-10. RMW must be stored in a designated RMW storage area (USFK EGS 8-3c(2)).</p>	<p>Verify that RMW is transported and stored in such a way as to minimize human exposure to the extent possible. (1)(3)</p> <p>Verify that carts of storage containers used to transport RMW are constructed of readily cleanable material (plastic or stainless steel) and are closed whenever possible. (1)(3)</p> <p>Verify that all carts or storage containers used for RMW transport and storage are marked with a bilingual universal biohazard symbol. (1)(3)</p> <p>Verify that a spill containment and cleanup kit is maintained in each vehicle transporting RMW. (1)(3)</p> <p>(NOTE: See checklist item 8-21 for suggestions on the contents of the RMW spill kit.)</p> <p>Verify that the RMW storage container is a leakproof rigid container constructed of heavy plastic or metal that can be easily cleaned. (1)(3)</p> <p>Verify that the RMW storage container is marked with the bilingual universal biohazard symbol. (1)(3)</p> <p>Verify that the RMW storage container has: (1)(3)</p> <ul style="list-style-type: none"> - a capacity no greater than 55 gal [≈208 L] - a lid - a red plastic bag (3 mil) used as a liner. <p>(NOTE: The RMW container may also serve as a transport container.)</p> <p>Verify that RMW is stored in a designated RMW storage area that is: (1)(3)</p> <ul style="list-style-type: none"> - secured - properly identified with a bilingual universal biohazard symbol - kept clean and free from pests. <p>(NOTE: Storage time should be kept as short as possible.)</p> <p>(NOTE: Pathological waste is exempt from the requirements of this checklist item.)</p>

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**COMPLIANCE CATEGORY:
MEDICAL WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>8-11. Installations must meet specific standards with regard to the management of anatomical pathology waste (USFK EGS 8-3c(3)).</p> <p>Treatment/Disposal</p> <p>8-12. RMW must be treated in accordance with certain requirements (USFK EGS 8-3d(1) and AR 40-5, para 11-7c(6)(b)).</p> <p>8-13. Sterilizers must meet specific operating requirements (USFK EGS 8-3d(2)).</p>	<p>Verify that all anatomical pathology waste is placed in containers lined with plastic bags that comply with the requirements of checklist item 8-9 above. (1)(3)</p> <p>Verify that treated pathological waste (the product of incineration or cremation) is disposed of only by burial, cremation, or solid waste landfill. (1)(3)</p> <p>Verify that pathological waste is kept refrigerated in the morgue freezer prior to pickup for disposal. (1)(3)</p> <p>Verify that the maximum time for freezer storage of any RMW does not exceed 30 days. (1)(3)</p> <p>Verify that RMW is treated and disposed of in accordance with the requirements of Appendix 8-2. (1)(3)</p> <p>Verify that, in addition to the requirements of Appendix 8-2: (1)(3)</p> <ul style="list-style-type: none"> - liquid microbiological waste is rendered noninfectious by steam sterilization or incineration, prior to disposal in a sanitary sewer system - solid microbiological waste is steam sterilized prior to disposal with general waste or is incinerated - CDC Risk Group IV waste is decontaminated by steam sterilization, incineration, or other approved technologies prior to disposal - suction canister waste from operating rooms is either decanted into a clinical sink or sealed into leak-proof containers and incinerated. <p>(NOTE: Vaccine waste requires no treatment prior to steam sterilization or incineration.)</p> <p>(NOTE: Sharps containers require no treatment prior to incineration or other approved disposal technologies.)</p> <p>(NOTE: Blood and blood products require no treatment prior to disposal in the sanitary sewer system or prior to steam sterilization or incineration. Established blood bank procedures for bulk blood take precedence.)</p> <p>Verify that, if sterilization is required, sterilizers are maintained at a temperature of 121 °C (250 °F) for at least 90 min. (1)(3)</p> <p>Verify that, if sterilization is required, the effectiveness of sterilizers is checked at least weekly using <i>Bacillus stearo thermophilus</i> spore strips or an equivalent biological performance test. (1)(3)</p>

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**COMPLIANCE CATEGORY:
MEDICAL WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>8-14. Incinerators used to treat medical waste must meet specific design and operating standards (USFK EGS 8-3d(3)).</p>	<p>Verify that the incinerator maintains: (1)(3)</p> <ul style="list-style-type: none"> - a minimum primary chamber temperature between 1440-1600 °F [≈760-870 °C] - a secondary chamber temperature between 1800-2000 °F [≈980-1200 °C] - a minimum residence time in the secondary chamber of 2 s sufficient to destroy all infectious agents and pathogens. <p>Verify that the incinerator meets all applicable requirements listed in Section 2, <i>Air Emissions</i>. (1)(3)</p>
<p>8-15. Ash or residue from the incineration of RMW must be assessed for hazardous characteristics (USFK EGS 8-3d(4)).</p>	<p>Verify that ash or residue from the incineration of RMW is assessed for hazardous characteristics. (1)(3)</p> <p>Verify that ash that is determined to be hazardous waste is managed as hazardous waste. (1)(3)</p> <p>(NOTE: See Section 6, <i>Hazardous Waste</i>.)</p> <p>Verify that all other residue that is not determined to be hazardous is disposed of in accordance with the requirements of Chapter 7 of the USFK EGS. (1)(3)</p> <p>(NOTE: See Section 7, <i>Solid Waste</i>.)</p>
<p>8-16. Installations must keep records concerning infectious medical waste (AR 40-5, para 11-7c(6)(b) and 11-7c(6)(c)).</p>	<p>Verify that, for infectious medical waste transported to a contract or other offpost incinerator or treatment site, the waste is handled by a manifest procedure whereby a given identifiable quantity of waste is receipt-accepted at the disposal site. (1)(3)</p> <p>Verify that such receipts are returned and made part of the generator's record of waste production and disposal. (1)(3)</p>
<p>8-17. Installations must meet specific requirements with regard to RMW disposal logs (USFK EGS 8-3d(5)).</p>	<p>Verify that RMW disposal logs are maintained for all RMW waste accepted for disposal and retained for 4 yr after the date of disposal. (1)(3)</p> <p>Verify that RMW disposal logs contain, at a minimum: (1)(3)</p> <ul style="list-style-type: none"> - date generated - type of waste - weight of waste - method of disposal.

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**COMPLIANCE CATEGORY:
MEDICAL WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>8-18. RMW disposal contracts must meet certain requirements (USFK EGS 8-3d(6)).</p>	<p>Determine whether the installation uses a contractor to dispose of its RMW. (1)(3)</p> <p>Verify that the RMW disposal contract requires that the disposal contractor certifies with a receipt that RMW is properly disposed in agreement with ROK requirements and in a manner that minimizes occupational exposure and protects both the environment and the public. (1)(3)</p>
<p>8-19. Installations must develop contingency plans for the treatment or disposal of RMW in case the primary means becomes inoperable (USFK EGS 8-3d(7)).</p>	<p>Verify that the installation has a written, detailed contingency plan. (1)(3)</p>
<p>8-20. Chemical disinfection must be conducted using approved procedures and compounds (USFK EGS 8-3d(8)).</p>	<p>Verify that, if chemical disinfection is required, such disinfection is conducted using procedures and compounds approved by USFK medical personnel for use on any pathogen or infectious agent suspected to be present in the waste. (1)(3)</p>
<p>Spills</p>	
<p>8-21. Spill containment and cleanup kits must be maintained in the vicinity of RMW generation, at the disposal site, and within each RMW transportation vehicle (USFK EGS 8-3e(1)).</p>	<p>Verify that a spill containment and cleanup kit is maintained at a designated location in the vicinity of RMW generation, at the disposal site, and within each vehicle used to transport RMW. (1)(3)</p> <p>(NOTE: Suggested minimum items for the kit are:</p> <ul style="list-style-type: none"> - absorbent material capable of absorbing 5 gal [≈19 L] of liquid - hospital grade disinfectant effective against mycobacteria - sufficient red plastic bags with sealing or closure devices to double enclose 150 percent of the maximum load accumulated or transported - sufficient quantity of impermeable overalls, gloves, boots, caps, and surgical masks to accommodate cleanup personnel.)
<p>8-22. Spills of RMW must be cleaned up in accordance with specific requirements (USFK EGS 8-3e(2)).</p>	<p>Verify that spills of RMW are cleaned up as soon as possible. (1)(3)</p> <p>Verify that response personnel wear appropriate PPE based on the level of protection desired. (1)(3)</p> <p>Verify that spills of blood or body fluids are removed with absorbent material. (1)(3)</p> <p>Verify that such absorbent material is then managed as RMW. (1)(3)</p>

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**COMPLIANCE CATEGORY:
MEDICAL WASTE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>8-22. (continued)</p> <p>Training</p> <p>8-23. All employees and new employees of RMW generators who have direct contact with patients or who handle RMW must receive proper training (USFK EGS 8-3f(1) and -3f(2); AR 40-5, para 11-7c(1)(c)).</p> <p>8-24. Written documentation of all training must be maintained (USFK EGS 8-3f(3)).</p>	<p>Verify that surfaces contacted by RMW are washed with soap and water and chemically decontaminated. (1)(3)</p> <p>Verify that all employees of RMW generators who have direct contact with patients, or who segregate, package, store, transport, treat, or dispose of RMW are provided annual training in RMW that is pertinent to the primary job of the employee being trained. (1)(3)</p> <p>Verify that annual formal training in RMW includes reiteration of worksite policies and procedures. (1)(3)</p> <p>Verify that all new employees having contact with RMW as explained above receive initial training that includes an orientation to local RMW worksite policies and procedures before the employee begins work. (1)(3)</p> <p>Verify that written documentation of all training is maintained by the RMW generator supervisor for 4 yr or the duration of the employee's tour, whichever is shorter. (1)(3)</p>

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Appendix 8-1

CDC Classification of Etiologic Agents on the Basis of Hazard Class IV* (USFK EGS Table 8-1 [corrected])

Anthrax
Congo-Crimean Hemorrhagic Fever
Creutzfeldt-Jakob Disease
Ebola
Hypr
Junin
Kyasanur Forest Disease
Lassa Fever
Machupo
Marburg Virus Disease
Omsk Hemorrhagic Fever
Plague
Russian Spring/Summer Encephalitis
Smallpox

* listing not all inclusive

Source: Biosafety in Microbiologic and Biomedical Laboratories CDC 84-8395, Center for Disease Control, Atlanta, Georgia.

Appendix 8-2

Treatment and Disposal Methods for Infectious Medical Waste (USFK EGS Table 8-2)

Type of Medical Waste	Method of Treatment	Method of Disposal
Microbiological	Steam sterilization Chemical disinfection Incineration	Municipal Solid Waste Management Facility (MSWMF) ¹
Pathological	Incineration ² Cremation	MSWMF Burial Cremation
Bulk blood	³	Domestic wastewater treatment plant
Suction canister waste	NONE	Domestic wastewater treatment plant Incineration
Sharps in sharps containers	Steam sterilization Incineration	MSWMF

¹ Consult the relevant requirements of Section 7, *Solid Waste Management*, for standards for solid waste landfills.

² Placentas may also be ground and discharged to a domestic wastewater treatment plant that complies with the standards of Section 4, *Wastewater Management*.

³ Bulk blood known to be infectious must be treated by incineration or steam sterilization before disposal.

INSTALLATION:	COMPLIANCE CATEGORY: MEDICAL WASTE MANAGEMENT Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 9

PETROLEUM, OIL, AND LUBRICANTS (POL)

Korea ECAS

SECTION 9

PETROLEUM, OIL, AND LUBRICANTS (POL)

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to military communities that store, transport, dispose of, or utilize petroleum, oil, and lubricants (POL). The protocol presents review action items that respond to regulations, procedures, and organizational mechanisms designed to prevent or limit the accidental release of POL materials to surface water, groundwater, or soils. Procedures designed to review the control of volatile organic compounds (VOCs) from POL sources are addressed in Section 2, *Air Emissions*.

This protocol covers management of storage tanks, pipeline delivery systems, truck fill stands, immediate operating storage areas, and fueling/defueling flightline operations. POL materials addressed include jet fuel (JP-4, JP-7, JP-8), aviation gasoline (AVGAS), motor gasoline (MOGAS), diesel fuel, and lubricating oils. Waste petroleum-based solvents (including PD-680) are addressed in Section 6, *Hazardous Waste*.

Some local requirements for POL may vary in important ways, and the evaluator should obtain copies of the spill plans, where appropriate, and review them for differences before conducting the evaluations. In particular, the evaluator should check for differences in the definitions of reportable quantities and the specific procedures for reporting spills that may exist in local regulations.

Regulations and procedures concerning Spill Prevention and Response Planning are addressed in Section 18. Requirements concerning the storage of POL in Underground Storage Tanks (USTs) are addressed in Section 19.

U.S. Forces - Korea (USFK) Regulation 703-1, *Bulk Petroleum Management*, 16 September 1993, establishes petroleum policy, assigns responsibilities, and prescribes procedures for the management of bulk petroleum. USFK activities must comply with that regulation as a minimum.

B. DOD Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 9 outlines the criteria for the control and abatement of pollution from the storage, transfer, and distribution of petroleum products.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no requirements directly related to the management of POL.

D. Responsibility for Compliance

- The Installation Commander (IC) is responsible for reviewing and implementing the plan for recoverable and waste petroleum.
- The Fire Department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department will be responsible for making periodic fire safety inspections of flammable/combustible storage and handling areas, hazardous waste storage areas, and accumulation points on the installation.
- The Safety Officer is responsible for conducting evaluations of work place safety and inspections of the handling and storage of hazardous materials and waste. The Safety Officer provides the appropriate manager with a report of the findings and recommended corrective actions. The Safety Officer is also responsible for ensuring the prompt and accurate investigation of any hazardous material mishaps that result in injury or property damage.
- The Fuels Management Officer of the Directorate of Engineering and Housing (DEH) is responsible for the safe and efficient receipt, storage, handling, issuing, and accounting of all petroleum products to include all general operations and inspections.
- The DEH is responsible for the maintenance of all installed petroleum storage and dispensing systems. This responsibility often is discharged by the Liquid Fuels Maintenance (LFM) shop. The DEH also is responsible for the calibration of permanently installed meters.
- The Environmental Coordinator (EC) monitors all POL activities that may affect the environment and usually is responsible for coordinating the review and updating of the installation spill plan. The EC also often coordinates the reportable spills notification of appropriate agencies on behalf of the Installation On-Scene Coordinator (IOSC).

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Associated Piping* - a length or system of piping connected to a UST and used to transport petroleum products or hazardous substances to or from the UST.
- *Bulk Storage Tanks* - field-erected tanks, usually having a capacity greater than 190,000 L (50,000 gal) and constructed above- or belowground (USFK EGS Chapter 9, Definitions).
- *Cathodic Protection* - a technique to prevent corrosion of a metal surface by making the surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or impressed current.
- *Competent Agency, Authority, Individual, Official, Person, etc* - an agency, authority, individual, official, person, etc., who/which is either: (USFK EGS Chapter 9, Definitions)
 1. specially designated as competent by the USFK EGS
 2. specifically designated as competent by the authority of the U.S. or ROK government

3. specifically designated as competent or meets the qualifications of competency of a recognized U.S. or ROK trade organization or association
 4. based on experience, training and/or authority granted per DOD component policy or regulations is judged by the responsible commander to be a capable and appropriate organization/individual to accomplish the task in question.
- *Connected Piping* - all underground piping, including valves, elbows, joints, flanges, and flexible connectors, attached to a tank system through which regulated substances flow. For the purpose of determining how much piping is connected to any individual UST system, the piping that joins two UST systems should be allocated equally between them.
 - *Discharge* - any release into the environment, included but not limited to any spilling, leaking, pumping, pouring, emitting, emptying, or dumping (USFK EGS, Chapter 9, Definitions).
 - *Field Constructed Tank* - any tank assemble piece by piece in the field, such as a welded steel or concrete tank (USFK EGS, Chapter 9, Definitions).
 - *Flow-through Process Tank* - a tank that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of materials during the operation of the process. Flow-through process tanks do not include tanks used to store material before introduction into the production process or to store finished products or by-products from the production.
 - *Hazardous Substance* - any substance having the potential to do serious harm to human health or the environment if spilled or released in reportable quantity (RQ). A listing of these substances and corresponding RQ is contained in Appendix 6-1. The term does not include (USFK EGS, Chapter 18, Definitions):
 1. petroleum, including crude POL or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance above
 2. natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).
 - *Heating Oil* - petroleum that is No. 1, No. 2, No. 4 light, No. 4 heavy, No. 5 heavy, and No. 6 technical grades of fuel oil, other residual fuel oils (including Navy Special Fuel Oil and Bunker C), and other fuels when used as substitutes for one of these fuel oils.
 - *Installation On-Scene Coordinator (IOSC)* - the official who coordinates and directs control and cleanup efforts at the scene of a POL or hazardous substance spill due to USFK activities on or near the installation. This official is designated by the IC (USFK EGS, Chapter 18, Definitions).
 - *Liquid Trap* - sumps, well cellars, and other traps used in association with oil and gas production, gathering, and extracting operations (including gas production plants) for the purpose of collecting oil, water, and other liquids. These liquid traps may temporarily collect liquids for subsequent disposition or reinjection into a production or pipeline stream, or may collect and separate liquids from a gas stream.
 - *Maintenance* - normal operational upkeep to prevent a UST system from releasing a product.
 - *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Motor Fuel* - petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any grade of gasohol, and is typically used in the operation of motor engines.
- *Noncommercial Purposes* - with respect to motor fuel, fuel that is not for resale.
- *Off-Installation Spill* - an uncontained release to the land or water where USFK lacks jurisdiction (USFK EGS, Chapter 18, Definitions).
- *Oil* - POL of any kind or in any form, including, but not limited to, petroleum, fuel POL, sludge, POL refuse, and POL mixed with wastes other than dredged spoil (USFK EGS, Chapter 18, Definitions).
- *On-Installation Spill* - an uncontained release to land or water under USFK control (USFK EGS, Chapter 18, Definitions).
- *Overflow Release* - a release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the regulated substance to the environment.
- *Pipe or Piping* - a hollow cylinder or tubular conduit that is constructed of nonearthen materials.
- *Pipeline Facility* - includes new and existing pipes, pipeline rights of way, auxiliary equipment (e.g., valves, manifolds, etc.), and buildings or other facilities used in the transportation of POL (USFK EGS, Chapter 9, Definitions).
- *POL* - oil of any kind, including but not limited to, POL (including synthetic oils), fuel, oil sludges, oil refuse, and oil mixed with other wastes. Refined POL to include synthetic oils, oil sludges, and oily wastes (refuse) (USFK EGS, Chapter 9, Definitions).
- *POL Facility* - an installation with any individual aboveground tank of 2500 L (660 gal) or greater, aggregate aboveground storage of 5000 L (1320 gal) or greater, UST storage of greater than 15,900 L (4200 gal), or a pipeline facility (USFK EGS, Chapter 9, Definitions).
- *Regulated Substance* - 1) any substance defined in section 101(14) of the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* (but not including any substance regulated as a hazardous waste under subtitle C), and 2) petroleum, including crude oil or any fraction thereof, that is liquid at standard conditions of temperature and pressure (60 °F [15 °C] and 14.7 pounds per square inch absolute (psia)).

The term "regulated substance" includes, but is not limited to, petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil through processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

- *Reportable Quantity* - for POL, a released quantity of 110 gal [≈416 L] or more of POL, or released quantity of hazardous substance in excess of the substance-specific RQ presented in Appendix 6-1, Chart A.4. (USFK EGS, Chapter 18, Definitions).
- *Residential Tank* - a tank located on property used primarily for dwelling purposes.

- *Septic Tank* - a watertight covered receptacle designed to receive or process, through liquid separation or biological digestion, the sewage discharged from a building sewer. The effluent from such receptacle is distributed through the soil and settled solids and scum from the tank are pumped out periodically and sent to a treatment facility.
- *Stormwater or Wastewater Collection System* - piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water runoff resulting from precipitation or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of stormwater and wastewater does not include treatment except when needed in order to transport.
- *Storage Tank* - a fixed container designed to store POL (USFK EGS, Chapter 9, Definitions).
- *Surface Impoundment* - a natural topographic depression, manmade excavation, or diked area formed primarily of earthen materials (although may be lined with manmade materials) that is not an injection well.
- *Tank* - a stationary device designed to contain an accumulation of regulated substances and constructed of nonearthen materials (e.g., concrete, steel, plastic) that provide structural support.
- *Underground Area* - an underground room such as a basement, cellar, shaft, or vault, providing enough space for physical inspection of the exterior of the tank situated on or above the surface of the floor.
- *Underground Storage Tank (UST)* - any tank, including underground piping connected thereto, larger than 420 L (110 gal) that is used to contain POL products or hazardous substances and the volume of which, including the volume of connected pipes, is 10 percent or more beneath the surface of the ground, but does not include: (USFK EGS, Chapter 9, Definitions)
 1. tanks containing heating oil used for consumptive use on the premises where it is stored
 2. septic tanks
 3. stormwater or wastewater collection systems
 4. flow through process tanks
 5. surface impoundments, pits, ponds, or lagoons
 6. field constructed tanks
 7. hydrant fueling systems.
- *Used Oil* - any oil or other waste POL product that has been refined from crude oil, or is a synthetic oil, has been used, and as a result of such use, is contaminated by physical or chemical impurities. Used oil exhibiting the characteristics of reactivity, ignitability, and corrosivity is still considered used oil, unless it has been mixed with other hazardous waste. However, used oil that exhibits the characteristic of toxicity is a hazardous waste and will be managed as such (USFK EGS, Chapter 6, Definitions).
- *Used Oil Burned for Energy Recovery* - used oil that is burned for energy recovery is termed used oil fuel. It includes any fuel processed from used oil by processing, blending, or other treatment (USFK EGS, Chapter 6, Definitions).
- *U.S. Industry Standards* - those standards adopted by independent professional organizations, including, but not limited to: (USFK EGS, Chapter 9, Definitions)
 1. American Society for Testing and Materials (ASTM)
 2. American National Standards Institute (ANSI)
 3. American Petroleum Institute (API)

4. National Association of Corrosion Engineers (NACE)
 5. National Fire Protection Association (NFPA)
 6. Underwriters Laboratories (UL).
- *Waste Petroleum Product* - a product that is no longer suitable for any use because of excessive degradation or contamination by hazardous or toxic wastes.
 - *Wastewater Treatment Tank* - a tank designed to receive and treat influent wastewater through physical, chemical, or biological methods.

PETROLEUM, OIL, AND LUBRICANTS (POL)

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	9-1	(1)(2)(3)(22)
POL	9-2 through 9-16	(1)(2)(4)(5)(6)(9)(13)
Pipelines	9-17 through 9-19	(1)(2)(6)
Discharges/Spills	9-20 through 9-22	(1)(2)
Used Oil	9-23 through 9-26	(1)(2)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (4) Safety and Health Officer
- (5) Fire Department
- (6) Director of Logistics
- (9) Chief of Operations and Maintenance (O&M)
- (13) Engineering, Plans, & Services (EP&S)
- (22) Staff Judge Advocate (SJA)



PETROLEUM, OIL, AND LUBRICANT (POL)

Records to Review

- Registration records for all in-service, temporarily out-of-service, and permanently closed tanks
- Groundwater well monitoring data
- Installation Spill Plan

Physical Features to Inspect

- Airfield refueling operations
- Refueling facilities, including:
 - Aboveground storage tanks and dikes
 - Venting
 - Fill pipes
 - Gauges
 - Stations
- Washrack areas
- Vehicle maintenance areas
- Oil separators
- Oil and hazardous substance site
- Rapid refueling points
- Fuel bladders

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer
- Safety and Health Officer
- Fire Department
- Director of Logistics (DOL)
- Chief of Operations and Maintenance (O&M)
- Engineering, Plans, & Services (EP&S)
- Staff Judge Advocate



**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>9-1. Copies of all relevant DOD directive/instructions, ARs, and guidance documents on POL management should be maintained at the installation (MP).</p> <p>POL</p> <p>9-2. Each installation must have a contingency plan to manage spills and releases at all POL facilities (USFK EGS 9-3a).</p> <p>9-3. Installations should have a plan for the management of reclaimed, recoverable, and waste liquid petroleum products (MP).</p> <p>9-4. Drainage of stormwaters from diked areas around bulk POL above-ground storage tanks (ASTs) must be controlled by a valve (USFK EGS 9-3b(3)).</p> <p>9-5. Certain good management practices should be followed when tending diked areas around bulk ASTs (MP).</p>	<p>Verify that current copies of the following are maintained at the installation: (1)(2)(3)(22)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - USFK Regulation 703-1, <i>Bulk Petroleum Management</i>, 16 September 1993. <p>Verify that the installation has such a contingency plan. (2)(6)</p> <p>(NOTE: See Section 18, <i>Spill Prevention and Response Planning</i>, for regulations and procedures concerning spill plans.)</p> <p>Verify that the installation has prepared and adopted a plan for the management of recoverable and waste liquid petroleum products. (2)(6)</p> <p>Verify that drainage of stormwaters from diked areas around bulk POL ASTs is controlled by a valve. (1)(2)</p> <p>Verify that such valves are closed and locked when not in active use. (1)(2)</p> <p>Verify that drainage valves are attended when open. (1)(2)</p> <p>Verify that any drainage water is tested to determine whether it represents a harmful discharge. (1)(2)</p> <p>Verify that water drained from diked areas does not cause a harmful discharge. (1)(2)</p> <p>Verify that personnel draining the diked area know how to identify a discharge. (1)(2)</p>

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**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>9-6. Drainage water from diked areas around bulk POL ASTs that is determined to contain petroleum products in harmful quantities must be treated before discharge (USFK EGS 9-3b(4)).</p>	<p>Verify that, prior to draining stormwater from diked areas, the water is inspected for petroleum sheen. (9)(13)</p> <p>Verify that any sheen is collected with adsorbent material prior to drainage, or treated using an oil-water separator. (9)(13)</p> <p>Verify that the adsorbent material is disposed of according to any hazardous characteristics it exhibits. (9)(13)</p>
<p>9-7. All bulk POL ASTs must be either double-walled with interstitial monitoring or provided with a secondary means of containment for the entire contents plus sufficient free board to allow for precipitation and expansion of product (USFK EGS 9-3b(1)).</p>	<p>Verify that all bulk POL ASTs are either double-walled with interstitial monitoring or provided with a secondary means of containment. (1)(2)</p> <p>Verify that the secondary means of containment has sufficient capacity for the entire contents plus sufficient free board to allow for precipitation and expansion of product. (1)(2)</p>
<p>9-8. The maximum permeability for diked areas around bulk POL ASTs must be 10^{-7} cm/s (USFK EGS 9-3b(2)).</p>	<p>Verify that the permeability of diked areas does not exceed 10^{-7} cm/s. (9)(13)</p>
<p>9-9. A product recovery system should be installed at the tank water drain-off valve for tanks storing aviation fuels (MP).</p>	<p>Verify that product recovery systems are in place and operating correctly at aviation fuel tanks. (9)(13)</p>
<p>9-10. The DEH Utilities Maintenance and Operations and Director of Logistics (DOL) Fuel Maintenance should have a memorandum of agreement pertaining to draining of floating roof tanks and interior dike basins (MP).</p>	<p>Verify that a memorandum of agreement has been prepared and signed or coordinated through the DEH Director and the EC. (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>9-11. Washwater and fuel sludge resulting from periodic tank cleaning must be tested for hazardous characteristics (USFK EGS 9-3c).</p>	<p>Verify that tank cleaning wastes are tested for hazardous characteristics as defined in Appendix 6-1, Section A-1. (1)(2)(9)(13)</p> <p>(NOTE: This requirement does not apply if the installation can demonstrate and document sufficient knowledge of the hazardous waste by other means.)</p> <p>Verify that tank bottom waters that are periodically drained from bulk storage tanks are collected and tested for hazardous characteristics. (1)(2)(9)(13)</p> <p>Verify that wastes that test positive for hazardous characteristics are handled as hazardous waste. (1)(2)(9)(13)</p> <p>(NOTE: Wastes containing 5 percent or more of oil that does not exhibit hazardous characteristics are classified as special waste and managed in accordance with Section 6, <i>Hazardous Waste</i>.)</p> <p>(NOTE: Washwater containing less than 5 percent of oil and not classified as a special waste is handled in accordance with Section 4, <i>Wastewater</i> (see especially Appendix 4-6).)</p>
<p>9-12. Installation Fuels Management should have a quality control and inspection program (MP).</p>	<p>Verify that internal quality inspections are carried out as follows: (9)(13)</p> <ul style="list-style-type: none"> - at least five spot check inspections are being conducted per week - unsatisfactory areas are reinspected after 30 days, but before 45 days, unless otherwise directed. <p>Verify that quality control and inspection personnel are conducting external inspections annually. (9)</p>
<p>9-13. ASTs should undergo periodic integrity testing (MP).</p>	<p>Verify that periodic leak tests have been conducted. (1)(2)(9)</p> <p>(NOTE: A decrease in converted fuel volume equal to or greater than 0.25 in. [0.635 cm] constitutes a suspected leak).</p> <p>(NOTE: Such techniques as the following may be employed to test tank integrity:</p> <ul style="list-style-type: none"> - hydrostatic testing - visual inspection - a system of nondestructive shell thickness testing.) <p>Verify that the DEH Director, EC, and Safety and Health Officer have been notified of all confirmed leaks. (1)(2)(4)</p> <p>Verify that leaking tanks have been repaired or replaced. (1)(2)</p>

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**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>9-14. All fuel tanks that activities use for operations purposes should be inspected annually (MP).</p> <p>9-15. Installations should inspect MOGAS, diesel, kerosene, and aviation fuel test cell storage tanks periodically (MP).</p> <p>9-16. Buried fuel piping should have a protective wrapping and coating and should be cathodically protected if soil conditions warrant (MP).</p>	<p>Verify that organizational fuel tanks are inspected annually. (1)(4)(6)(9)</p> <p>Verify the following through a review of inspection forms: (1)(4)(6)(9)</p> <ul style="list-style-type: none"> - certified tank calibration charts to measure fuel volumes are present on all tanks of 2512 L, or 661 gal and over - condition of tanks, piping, and dikes is noted. <p>Verify that any confirmed leaking tanks were repaired or replaced. (1)(4)(6)(9)</p> <p>Verify that inspections have been conducted as required. (2)</p> <p>Verify that leaking or deteriorated tanks have been repaired or replaced. (1)(2)</p> <p>Verify that leaks were reported to the DEH Director, EC, and Safety and Health Officer. (1)(2)(4)</p> <p>Verify that buried fuel piping is properly protected from corrosion. (2)(5)(6)(9)</p> <p>Verify that the voltage is greater than -0.85 volts (v), but not more than -3.0 v (monthly), for impressed current systems. (2)(6)(9)</p> <p>Verify that the voltage is greater than -0.85 v, but not more than -3.0 v (biannually), for sacrificial anode systems. (2)(6)</p> <p>Verify that leak detection and failure are reported. (2)(6)</p>
<p>PIPELINES</p> <p>9-17. All new tank and pipeline facilities with a construction start date after 1 October 1994 must be designed and constructed to meet recognized U.S. industry standards (USFK EGS 9-3e).</p>	<p>Verify that all new tank and pipeline facilities with a construction start date after 1 October 1994 are designed and constructed to meet recognized U.S. industry standards. (1)(2)</p>

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**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>9-18. All pipeline facilities carrying POL must be tested and maintained in accordance with recognized U.S. industry standards (USFK EGS 9-3d).</p> <p>9-19. Army operated off-installation pipelines should be inspected regularly (MP).</p>	<p>Verify that all pipeline facilities carrying POL are tested and maintained in accordance with recognized U.S. industry standards. (2)</p> <p>Verify that commanders of activities responsible for operation of pipeline facilities handling POL prepare and follow a procedural manual for operations, maintenance, and emergencies. (2)</p> <p>Verify that each new pipeline system and each system in which pipe has been replaced or relocated is hydrostatically tested, in accordance with recognized U.S. industry standards, and is without leakage. (6)</p> <p>Verify that off-installation pipelines are inspected regularly. (1)(2)</p> <p>Verify that the installation maintains records of these inspections. (1)(2)</p> <p>Verify that detected leaks and failures have been reported and that leaking pipes have been repaired or replaced. (6)</p>
<p>DISCHARGES/SPILLS</p> <p>9-20. Specific actions must be taken in the event of any spill of POL or hazardous substance in excess of the relevant RQ (USFK EGS 9-3f, 18-3c(6), and 18-3e(2)).</p>	<p>Verify that spills of RQs of POL or hazardous substances are reported to the IOSC immediately. (1)(2)</p> <p>(NOTE: See Appendix 6-1 in the Section <i>Hazardous Waste</i> for RQs).</p> <p>Verify that local authorities are notified when the spill poses a hazard to human health or the environment outside the installation. (1)(2)</p> <p>Verify that, when there is a POL spill, the immediate response involves: (1)(2)</p> <ul style="list-style-type: none"> - eliminating any sources of ignition - stopping the leak at the source - controlling the migration of the spill - calling for help - preventing personal injury. <p>Verify that followup steps include: (1)(2)</p> <ul style="list-style-type: none"> - preventing the migration of released POL into soils and nearby surface waters - continuing the monitoring and mitigation of any fire and safety hazards posed by vapors or free product - determining soil and water cleanup action - beginning free product removal as soon as possible.

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**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>9-21. Additional actions must be taken in the event of spills of POL or hazardous substances that occur or migrate outside installation boundaries or threaten an ROK drinking water resource (USFK EGS 18-3e(5)).</p>	<p>Determine whether a POL or hazardous substance spill: (1)(2)</p> <ul style="list-style-type: none"> - has occurred off-post - has occurred inside the USFK installation and cannot be contained within the installation boundaries - threatens a ROK drinking water resource. <p>Verify that the unit that caused the release takes immediate action to contain the damage and cleanup the spill within the limits of their capabilities. (1)(2)</p> <p>Verify that the organization that causes the spill immediately notifies the area staff duty officer. (1)(2)</p> <p>Verify that the area staff duty officer in turn contacts the facility/base engineer and USFK Public Affairs Office (PAO) or Command Center (CC)--Seoul (after working hours). (1)(2)</p> <p>Verify that the facility/base engineering work force serves as the primary responder. (1)(2)</p> <p>(NOTE: It is the responsibility of the PAO and the Chief, Public Information, CC-Seoul to assist the local IC in informing local government officials of the incident.)</p> <p>Verify that the IC or his/her representative notifies ROK authorities immediately. (1)(2)</p> <p>Verify that USFK response to off-post spills/damages, are limited to notification actions, spill control, collection of standing product, and fire prevention. (1)(2)</p> <p>(NOTE: Under the provisions of Article XXIII of the US-ROK Status of Forces Agreement (SOFA), claims by local national individuals or organizations for damages arising from off-installation spills will be handled through the established claims procedures.)</p> <p>(NOTE: The organization responsible for causing the spill will be responsible for reimbursement of costs associated with spill response and associated waste disposal.)</p>

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**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>9-22. The IOSC must make specific notifications and must submit a written follow-up report in certain cases (USFK EGS 18-3e(3) and 18-3e(4)).</p>	<p>Determine whether any of the following is the case: (1)(2)</p> <ul style="list-style-type: none"> - the spill occurs inside a USFK installation and cannot be contained within any required berm or secondary containment - the spill exceeds 415 L (110 gal) of POL - a water resource has been polluted - the IOSC has determined that the spill is significant. <p>Verify that the IOSC notifies the following immediately: (1)(2)</p> <ul style="list-style-type: none"> - the appropriate Military Department and/or Defense Agency - the USFK Assistant Chief of Staff, Engineer. <p>Verify that a follow-up written report is submitted that meets the requirements of USFK Regulation 703-1. (1)(2)</p>
<p>USED OIL</p> <p>9-23. Installations that burn used oil may do so in specific devices only (USFK EGS 6-3i(1)).</p>	<p>Verify that used oil fuel is burned in the following devices only: (1)(2)</p> <ul style="list-style-type: none"> - industrial furnaces - industrial boilers located on the site of a facility engaged in a manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes - utility boilers used to produce electric power, steam, heated, or cooled air, or other gases or fluids - used oil-fired space heaters if: <ul style="list-style-type: none"> - the heater burns only used oil that the USFK installation generates - the heater is designed to have a maximum capacity of not more than 0.5 MBtu/h [0.147 MW], and - the combustion gases from the heater are properly vented to the ambient air.
<p>9-24. Neither used oil nor used oil contaminated with any hazardous waste may be used for dust suppression or road treatment (USFK EGS 6-3i(2)).</p>	<p>Verify that the installation does not use used oil for dust suppression or road treatment. (1)(2)</p>

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**COMPLIANCE CATEGORY:
PETROLEUM, OIL, AND LUBRICANTS (POL)
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>9-25. Installations that use lubricant as recycled fuel must meet specific requirements (USFK EGS 6-3i(3)).</p> <p>9-26. Installations that generate used oil and market it directly to a burner should meet specific standards (MP).</p>	<p>Determine whether the installation uses lubricant as recycled fuel. (1)(2)</p> <p>Verify that the installation meets the requirements for refining waste oil facilities, equipment, and technical ability listed in Appendix 9-1. (1)(2)</p> <p>Verify that the installation prepares and sends the receiving facility an invoice detailing the following for off-specification used oil: (1)(2)</p> <ul style="list-style-type: none"> - an invoice number - the names and addresses of the shipping and receiving facilities - the quantity of off-specification oil to be delivered - the dates of shipment or delivery. <p>Verify that copies of the invoices are kept for 3 yr. (1)(2)</p> <p>Verify that for used oil that is not off-specification, copies of the waste analyses are kept for 3 yr. (1)(2)</p> <p>Verify that the installation has a signed notice from the burner that the oil will only be burned in approved Furnaces and/or boilers. (1)(2)</p>

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Appendix 9-1

Requirements for Refining Waste Oil Facilities, Equipment, and Technical Ability (USFK EGS Table 6-1))

Refining Facility Equipment	Technical Ability
a. Refining facility that disposes of 20 kg/day [\approx 44 lb/day] or more waste oil, appropriate to the following criteria:	1 or more waste disposal, air environmental, water environmental, or chemical engineers (Grade I)
1. Remaining carbon: 8% or less by the weight ratio	
2. Water and Sediment: 1% or less by the volume ratio	
3. Ash content: 1.5% or less by the weight ratio	
4. Sulfur content: 1% or less by the weight ratio	
5. Cadmium and its compounds: 2 ppm or less by the weight ratio	
6. Lead and its compounds: 100 ppm or less by the weight ratio	
7. Chromium and its compounds: 10 ppm or less by the weight ratio	
8. Arsenic and its compounds: 5 ppm or less by the weight ratio	
b. Storage facility whose size can store waste oil and refined oil for 30 days or more.	



INSTALLATION:	COMPLIANCE CATEGORY: PETROLEUM, OIL, AND LUBRICANTS (POL) Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 10

NOISE

Korea ECAS

SECTION 10

NOISE

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to all military communities that have aircraft operations, including airfields, weapons ranges, military training routes (MTRs), small arms training, or other noise generating activities that could impact the environment. This protocol presents review action items that respond to mechanisms for planning operations with consideration for noise.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 10 contains criteria to control environmental noise within installations. It is limited to measures allowing reasonable internal U.S Forces - Korea (USFK) planning efforts and does not address procedures for operating aircraft or ships.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no provisions on environmental noise management that apply to overseas installations.

D. Responsibility for Compliance

- The Installation Compatible Use Zone (ICUZ) Committee, membership of which should include, as a minimum, representatives from the installation commander, environmental management, master planning, Public Affairs Office (PAO), Staff Judge Advocate (SJA), and plans, operations, and training (range control and airfield operations), is responsible for: reviewing complaints; investigating and recommending mitigative actions; coordinating with the public as necessary; assessing installation activities for potential noise impacts; monitoring land development plans, programs, and projects in areas adjacent to the installation; and reviewing development of on-post activities.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *A-Weighted Sound Level* - calculation of noise exposure that emphasizes sound in the frequency range where most speech information occurs, and thus closely resembles the frequency response of the human ear. Sound measures that are measured on the A-scale are abbreviated dB(A) (USFK EGS, Chapter 10, Definitions).

- *Day-Night Average Sound Level* (L_{dn}) - a measure of installation noise exposure expressed in a single number ("xx L_{dn} " as in 55 L_{dn}) that is obtained by adding a 10 dB penalty to nighttime sound levels (2200-0700) to account for increased annoyance caused by noise during these hours (USFK EGS, Chapter 10, Definitions).
- *Decibel* (dB) - the unit of sound pressure is the decibel and is symbolically represented as dB. Sound pressure is the amplitude or measure of the difference between atmospheric pressure (with no sound present) and total pressure (with sound present). The decibel scale is a logarithmic scale. The standard reference pressure for 0 dB is 0.00002 Pascals (USFK EGS, Chapter 10, Definitions).
- *Equivalent Level* (L_{eq}) - the equivalent steady-state sound that, in a stated period of time, would contain the same acoustic energy as the time-varying sound during the same period (USFK EGS, Chapter 10, Definitions).
- *Facilities Controlling Noise/Vibration* - those facilities defined in Appendix 10-1 that remove or reduce noise and/or vibration from facilities generating noise/vibration (USFK EGS, Chapter 10, Definitions).
- *Facilities Generating Noise/Vibration* - those machines, instruments, facilities, and other sources defined in Appendix 10-2 that generate noise and vibration (USFK EGS, Chapter 10, Definitions).
- *Improvement Order* - an order that may be issued by the Minister of Environment when noise and/or vibration limits of facilities generating noise and/or vibration violate the permissible noise/vibration standards prescribed in the Korean Noise/Vibration Control Law. This order may direct the respective businessman to establish, improve, replace or take any other necessary measures on the generation facilities or the prevention facilities within a period prescribed by the Prime Minister Order (USFK EGS, Chapter 10, Definitions).
- *Management Practices* (MPs) - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Noise* - unwanted or annoying sound caused by the use of machines, instruments, facilities, and other sources (USFK EGS, Chapter 10, Definitions).
- *Noise/Vibration Control Zone* - an area designated by the Mayor/Governor in which it is deemed necessary to prevent noise and/or vibration from special construction works in order to preserve the living environment of the residents of that area (USFK EGS, Chapter 10, Definitions).
- *Significant Noise Source* - noise from any source such as mobile and stationary equipment, machines, boiler houses, and ranges which cause an identifiable and disturbing noise emission. This definition does not apply to noise generated by U.S. naval vessels or U.S. military aircraft.
- *Sound Exposure Level* (SEL) - a measure of single noise events, such as ground runup or blast noise. It is the level, in decibels, of the time integral of squared A-weighted sound pressure over a given time period or event, with reference to the square of the standard reference sound pressure of 20 micropascals (μPa) and a reference duration of 1 s (USFK EGS, Chapter 10, Definitions).
- *Transportation* - trains, automobiles, streetcars, roadways, and railroads. Airplanes and ships are excluded from this definition (USFK EGS, Chapter 10, Definitions).

NOISE MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	10-1 through 10-11	(1)(10)(11)(21)
Facilities Generating Noise/Vibration	10-12 through 10-14	(1)
Motor Vehicles	10-15	(1)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (10) Range Control (DPTMSEC)
- (11) Aviation Commander (DPTMSEC)
- (21) Public Affairs Office (PAO)

NOISE

Records to Review

- Facility Master Plan Document
- Complaint log from local community and followup documentation
- Contour maps (if applicable)

Physical Features to Inspect

- Power generating equipment
- Emergency generators
- Test tracks
- Industrial facilities
- Ranges
- Airfields/heliports/helipads
- Areas of noise/land use conflict
- Vehicle motor parks
- Rock quarry operations

People to Interview

- Directorate of Engineering and Housing (DEH)
- Range Control (DPTMSEC)
- Aviation Commander (DPTMSEC)
- Public Affairs Office (PAO)



**COMPLIANCE CATEGORY:
NOISE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>10-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on noise management should be maintained at the installation (MP).</p> <p>10-2. Installations with significant noise sources must develop and maintain a noise contour map (USFK EGS 10-3a through 10-3c).</p> <p>10-3. The siting and conduct of aircraft ground run-up must be evaluated for low frequency vibration as well as general audible noise (USFK EGS 10-3f).</p>	<p>Verify that copies of following documents are maintained and kept current at the installation: (1)(11)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 95-1, <i>Army Aviation: Flight Regulations</i> - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 200-2, <i>Environmental Effects of Army Actions</i>, 23 December 1988 - AR 210-70, <i>Intergovernmental Coordination of DOD Federal Development Program and Activities</i>, 31 December 1984 - Department of the Army (DA) memorandum from Director of Army Staff, <i>Installation Compatible Use Noise Zone Program Implementation</i>, 20 January, 1983 - DA memorandum from Director of Army Staff, <i>Installation Compatible Use Noise Zone Program Implementation</i>, 14 July, 1987 - Technical Manual (TM) 5-803-2, <i>Planning in the Noise Environment</i>. <p>Verify that, if the installation has significant noise sources, it has developed and maintains a noise contour map limited to the installation. (1)(10)(11)</p> <p>(NOTE: Installations may use a computerized program for developing noise contours from operational data using the Day-Night Average Sound Level (L_{dn}) noise descriptor system.)</p> <p>Verify that noise analysis for airfields is developed using the A-weighted L_{dn}. (1)(10)(11)</p> <p>(NOTE: The noise simulation program used to assess heavy weapons noise is MicroBNOISE. This software was developed and is maintained by the U.S. Army Construction Engineering Research Laboratories.)</p> <p>(NOTE: Noise level contours are generated using the NOISEMAP 6.1 computer program. This program is maintained by the U.S. Air Force (USAF) Armstrong Aerospace Medical Research Laboratory.)</p> <p>Verify that the conduct of ground run-up is evaluated for both low frequency vibration and general audible noise. (1)(10)(11)</p>

(1) Directorate of Engineering and Housing (DEH) (10) Range Control (DPTMSEC) (11) Aviation Commander (DPTMSEC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
NOISE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>10-4. Installations must attempt to minimize environmental noise impacts (USFK EGS 10-3g).</p>	<p>Verify that the installation identifies noise sources that create noise impacts. (1)(10)(11)</p> <p>Verify that the installation investigates possible mitigation measures. (1)(10)(11)</p> <p>Verify that, if practical, the installation programs resources to reduce noise impacts. (1)(10)(11)</p>
<p>10-5. Installations must maintain records of incompatible buildings and land uses (USFK EGS 10-3d).</p>	<p>Verify that the installation maintains records of incompatible buildings and land uses on the installation. (1)(10)(11)</p> <p>(NOTE: Appendix 10-3 establishes compatible uses and the noise level reduction (NLR) to achieve acceptable indoor noise levels for facilities.)</p>
<p>10-6. Installations must review installation master plans to ensure that existing and future facility siting is consistent with an acceptable noise environment (USFK EGS 10-3e).</p>	<p>Verify that the installation master plan is reviewed to ensure that existing and future facility siting is consistent with an acceptable noise environment. (1)(10)(11)</p>
<p>10-7. Installations must maintain operational data on noise producing activities (USFK EGS 10-3h).</p>	<p>Verify that the installation maintains operational data to facilitate development of noise level contour installation compatible use zone studies. (1)(10)(11)</p>
<p>10-8. Installations must have procedures to register and resolve noise complaints (USFK EGS 10-3i).</p>	<p>Verify that the installation has procedures to register and resolve noise complaints. (1)(10)(11)(21)</p>
<p>10-9. Noise complaints from ROK authorities and other ROK entities must be handled in accordance with specific criteria (USFK EGS 1-13).</p>	<p>Verify that, within 14 calendar days following receipt of a ROK environmental inquiry or complaint, the activity/installation commander responds to the complaint originator using the standard format in Appendix 10-4. (1)(10)(11)(21)</p> <p>Verify that the commander responding to the inquiry/complaint provides the USFK ACofS, Engineer (through the chain of command) with a copy of the response. (11)</p>

(1) Directorate of Engineering and Housing (DEH) (10) Range Control (DPTMSEC) (11) Aviation Commander (DPTMSEC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
NOISE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>10-9. (continued)</p> <p>10-10. Installations must limit noise and vibration levels (USFK EGS 10-3j).</p> <p>10-11. Installations that emit noise in noise restriction areas must comply with the standards for living noise (USFK EGS 10-3k).</p> <p>FACILITIES GENERATING NOISE/VIBRATION</p> <p>10-12. When a facility generating noise/vibration is being built or modified, a facility controlling noise/vibration must also be built (USFK EGS 10-3L(1)).</p>	<p>Verify that, if the inquiry/complaint suggests or alleges noncompliance with EGS, the commander also provides the USFK ACofS, Engineer with a written draft corrective action plan. (11)</p> <p>Verify that the draft corrective action plan describes resource impacts and includes a time frame for resolving the perceived and actual environmental situations. (11)</p> <p>Verify that the installation complies with the prescribed noise and vibration levels listed in Appendix 10-5. (1)(10)(11)</p> <p>Verify that, if noise and/or vibration levels are exceeded, the installation establishes self-monitoring.</p> <p>Determine whether the installation is located in a noise restriction area. (1)(10)(11)</p> <p>Verify that the installation complies with the standards for living noise listed in Appendix 10-6.</p> <p>(NOTE: The requirements of this section do not apply to facilities generating noise/vibration whose borders are at least 200 m [656 ft] from residential buildings, shopping malls, schools, hospitals, religious buildings, factories, and tourism sites.)</p> <p>(NOTE: The correction factors for permissible noise standards in Appendix 10-7 may be applied to the measured noise level before comparing with noise standards, provided that the total correction factors applied do not exceed 50 dB(A).)</p> <p>(NOTE: The correction factors for permissible vibration standards in Appendix 10-8 may be applied to the measured noise level before comparing with noise standards, provided that the total correction factors applied do not exceed 60 dB(A).)</p> <p>Verify that, when a facility generating noise/vibration is being built or modified, a facility controlling noise/vibration is built in conjunction with it. (1)</p> <p>(NOTE: This requirement does not apply to facilities that generate noise/vibration at levels below the permissible standards listed in Appendix 10-5.)</p> <p>Verify that the facility controlling noise/vibration is designed and executed by a registered individual or company. (1)</p>

(1) Directorate of Engineering and Housing (DEH) (10) Range Control (DPTMSEC) (11) Aviation Commander (DPTMSEC) (21) Public Affairs Office (PAO)

**COMPLIANCE CATEGORY:
NOISE
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>10-13. Factories generating noise/vibration must meet applicable noise/vibration standards (USFK EGS 10-3L(2)).</p>	<p>Verify that the factory generating noise/vibration complies with the general noise standards listed in Appendix 10-5 and applicable correction factors listed in Appendices 10-6 and 10-7. (1)</p> <p>(NOTE: The installation of facilities controlling noise/vibration is recommended where any facility generating noise/vibration is installed.)</p>
<p>10-14. Installations operating facilities generating noise/vibration must measure and record the noise and/or vibration (USFK EGS 10-3n).</p>	<p>Determine whether the installation operates any facilities generating noise/vibration listed in Appendix 10-2. (1)</p> <p>Verify that the installation measures the noise and/or vibration annually. (1)</p> <p>Verify that the installation maintains records of annual noise/vibration measurements for 4 yr. (1)</p> <p>(NOTE: Facilities that have a facility controlling noise/vibration are exempt from the self-monitoring process.)</p>
MOTOR VEHICLES	
<p>10-15. USFK-owned, non-tactical vehicles and privately owned vehicles must meet applicable noise standards for running automobiles (USFK EGS 10-3m).</p>	<p>Verify that such vehicles comply with the noise standards for running automobiles listed in Appendix 10-9. (1)</p>

(1) Directorate of Engineering and Housing (DEH) (10) Range Control (DPTMSEC) (11) Aviation Commander (DPTMSEC) (21) Public Affairs Office (PAO)

Appendix 10-1

Noise and Vibration Control Barriers and Equipment (USFK EGS Table 10-8)

1. Noise Reduction Control

- a. Soundproofing Silencers
- b. Soundproofing Covers and Roofs
- c. Engineered Windows and Walls
- d. Soundproofing Tunnels
- e. Trees, Forests, and Hills
- f. Noise Absorbing Equipment and Facilities
- g. Other noise controls equivalent to or better than those listed above

2. Vibration Proofing Barriers

- a. Elastic Supports and Vibration Suppressors
- b. Vibration Prevention Furrows
- c. Vibration Control Piping
- d. Other vibration controls which are equivalent to or better than those above

Appendix 10-2

Facilities Generating Noise/Vibration (USFK EGS Table 10-7)

1. Facilities Generating Noise

a. Structure, machine, and equipment using motive power (by horse power [hp]):

- compressor with 10 hp or more
- ventilator with 10 hp or more
- cutter with 10 hp or more
- presser with 10 hp or more
- crusher with 10 hp or more
- transmitter with 30 hp or more
- lathe with 20 hp or more
- flour maker with 20 hp or more
- saw (at lumber mill) with 20 hp or more
- wood processing facility with 20 hp or more
- printing facility with 20 hp or more
- roller with 30 hp or more
- any facility that has a structure, machine, or equipment listed above will be considered a discharge facility if the total horse power in the same category exceeds 50 hp, even if individual horse power does not reach the criteria listed above
- any facility that has a structure, machine, or equipment listed above will be considered a discharge facility if the total horse power in the same category exceeds the criteria listed above

b. Structures, machines, and equipment using motive power (by number):

- 100 or more industrial sewing machines
- cement brick or cement block manufacturing facility with 4 pressers or vibrators

2. Facilities Generating Vibration

- press with 20 hp or more (oil-pressure driven is excluded)
- crusher with 30 hp or more
- wood processing facility with 30 hp or more
- casting instrument with 50 hp or more
- cement brick or cement block manufacturing facility with 4 pressers or vibrators

NOTES:

1. A discharge facility is a facility that emits or generates noise.
2. To convert from kW to hp, multiply by 1.34.



Appendix 10-3

Minimum Building Sound Level Requirements and Acceptable Land Uses

(USFK EGS Table 10-1)

Facility	Outdoor Noise Environment (L_{dn}/L_{eq} in dB(A))				
	85-89	80-84	75-79	70-74	65-69
Family housing	No	No	No	NLR30 ⁽⁴⁾	NLR25 ⁽⁴⁾
Bachelor housing	No	No	NLR35 ⁽⁴⁾	NLR30 ⁽⁴⁾	NLR25 ⁽⁴⁾
Transient Lodging - Hotel, Motel, etc.	No	No	NLR35 ⁽⁴⁾	NLR30 ⁽⁴⁾	NLR25 ⁽⁴⁾
*Classrooms, Libraries, Churches	No	No	No	NLR30	NLR25
*Offices and Administration Buildings - Military	NLR40	NLR35	NLR30	NLR25	Yes
*Offices - Business and Professional	No	No	NLR30	NLR25	Yes
Hospitals, Medical Facilities, Nursing Homes (24-h occupancy)	No	No	No	NLR30	NLR25
*Dental Clinic, Medical Dispensaries	No	No	NLR30	NLR25	Yes
*Outdoor Music Shells	No	No	No	No	No
*Commercial and Retail Stores, Exchanges, Movie Theaters, Restaurants and Cafeterias, Banks, Credit Unions, Enlisted Member (EM)/ Officer Clubs	No	No	NLR30	NLR25	Yes
*Flight Line Operations, Maintenance and Training	NLR35 ⁽⁵⁾	NLR30 ⁽⁵⁾	Yes	Yes	Yes
*Industrial, Manufacturing and Laboratories	No	NLR35 ⁽⁵⁾	NLR30 ⁽⁵⁾	NLR25 ⁽⁵⁾	Yes
*Outdoor Sports Arenas, Outdoor Spectator Sports	No	No	No	Yes ⁽¹⁾	Yes ⁽¹⁾
*Playgrounds, Active Sport Recreational Areas	No	No	No	Yes	Yes
*Neighborhood Parks	No	No	No	Yes	Yes
*Gymnasiums, Indoor Pools	No	NLR30	NLR25	Yes	Yes
*Outdoor - Frequent Speech Communication	No ^(2,3)	No ^(2,3)	No ⁽²⁾	No ⁽²⁾	No ⁽²⁾
*Outdoor - Infrequent Speech Communication	No ^(2,3)	No ^(2,3)	Yes	Yes	Yes
Livestock Farming, Animal Breeding	No	No	No	Yes	Yes
*Agricultural (except livestock)	Yes ⁽³⁾	Yes ⁽³⁾	Yes	Yes	Yes

*For detailed design, the L_{eq} for the appropriate period of usage is the preferred measure of the noise environment.

Yes: Land use compatible with noise environment. No special noise control restriction. Normal construction appropriate.

(continued)

Appendix 10-3 (continued)

NLR: Appropriate noise level reduction where indoor activities predominate.

No: Land use not compatible with noise environment, even if special building noise insulation provided.

KEY:

- (1) Land use is acceptable, provided special sound reinforcement systems are installed.
- (2) Land use may be acceptable, provided special speech communication systems are used.
- (3) Land use may be acceptable provided hearing protection devices are worn by personnel. Check applicable hearing damage regulations.
- (4) Although it is recognized that local conditions may require residential uses in these areas, this use is strongly discouraged in L_{dn} 70-74 and L_{dn} 75-79 and discouraged in L_{dn} 65-69. The absence of viable development options should be determined. NLR criteria will not eliminate outdoor environment noise problems, and, as a result, site planning and design should include measures to minimize this impact, particularly where the noise is from ground level sources.
- (5) The NLR must only be incorporated into the design and construction of portions of these buildings where the public is received, where office areas and noise sensitive work areas exist, or where the normal noise level is low.

Appendix 10-4

USFK Standard Letter of Response to Environmental Complaints / Inquiries (USFK EGS Figure 1-1)

ORGANIZATION:

ADDRESSEE:

Dear (_____),

This letter is in response to your letter, dated (_____), regarding (_____), at (_____). Issues such as your request for information on (_____) are best handled in accordance with the US-ROK Joint Committee procedures [through the US-ROK Status of forces Agreement (SOFA) process]. I suggest that you send your request to the ROK SOFA Joint Committee Secretariat, ATTN: Director, North American Division II, American Affairs Bureau, Republic of Korea Ministry of Foreign Affairs. Additionally, you might consider sending your request to the ROK component of the Environmental Subcommittee. The Director of Policy Coordination at the ROK Ministry of Environment (TEL: 02-500-4240) [sic].

I have forwarded your letter to the US SOFA Secretariat for information. Should this issue be tabled by the US-ROK SOFA Joint Committee, I am confident that the panel of environmental experts from both the US and the ROK components of the Environmental Subcommittee will work to resolve this issue to mutual satisfaction. The Chief, Environmental Programs Office, USFK is available at phone 02-7913-5049 if you have any further questions.

Again, thank you for your concern,

Appendix 10-5

General Noise Standards (USFK EGS Table 10-2)

General Areas		Standards (L_{eq} dB(a))	
		Daytime (0600 - 2200)	Night (2200 - 0600)
Area	I	50	40
	II	55	45
	III	65	55
	IV	70	65
Road Side	I, II	65	55
	III	70	60
	IV	75	70

* Not applicable to noise from trains and construction activities

NOTES:

Category I includes:

1. Natural Environmental Preservation Areas, tour/recreation areas, and settlement areas prescribed in the Land Use and Management Law
2. Green Belt prescribed in the Presidential Decree for the Urban Planning Law
3. Exclusive residential areas prescribed in the Presidential Decree for the Urban Planning Law
4. Areas within 50 m [\approx 175 ft] from the boundary of a hospital prescribed in the Medical Law
5. Areas within 50 m [\approx 175 ft] from the boundary of schools.

Category II includes:

1. All settlement areas other than residential sectors prescribed in the Land Use and Management Law
2. General and semi-residential areas prescribed in the Presidential Decree for the Urban Planning Law.

Category III includes:

1. Commercial areas prescribed in the Urban Planning Law
2. Semi-industrial areas prescribed in the Presidential Decree for the Urban Planning Law.

Category IV includes:

1. General and exclusive industrial areas prescribed in the Presidential Decree for the Urban Planning Law
2. Industrial areas prescribed in the Land Use and Management Law.

Appendix 10-6

Standards for Noise Near Living Areas

(USFK EGS Table 10-3)

Area	Type of Noise		Morning (0500 - 0800) Evening (1800 - 2200)	Daytime (0800 - 1800)	Night Time (2200 - 0500)
residential, green-belt, resort, natural environmental preservation area, area inside 50 m [≈175 ft] radius from the boundary of a school or hospital	noise from a megaphone or loudspeaker	outdoor provision	70 dB(A) or less	80 dB(A) or less	60 dB(A) or less
		indoor provision	50 dB(A) or less	55 dB(A) or less	45 dB(A) or less
	factory and business		50 dB(A) or less	55 dB(A) or less	45 dB(A) or less
	noise from construction site		65 dB(A) or less	70 dB(A) or less	55 dB(A) or less
commercial, industrial, areas other than residential in colony	noise from a megaphone or loudspeaker	outdoor provision	70 dB(A) or less	80 dB(A) or less	60 dB(A) or less
		indoor provision	60 dB(A) or less	65 dB(A) or less	55 dB(A) or less
	noise from construction site		70 dB(A) or less	75 dB(A) or less	55 dB(A) or less

NOTE:

1. Area is classification is based on the Land Use and Management Law; Urban areas classifications are based upon the Urban Planning Law.
2. If noise from construction sites is generated less than 2 h/day during the daytime, the restriction noise standard permits an additional 10 dB; if between 2 h/day and 4 h/day, an extra 5 dB is permitted.
3. Civil Defense Drill alarms (over outdoor loudspeakers) must sound for no more than 2 minutes each month.



Appendix 10-7

Correction Factors for Permissible Noise Standards for Facilities Generating Noise

(USFK EGS Table 10-4)

Category	Description	Correction Factor
Blast	Sudden outburst of sound	+5
Percentage of noise duration to the period concerned ¹	50% or more	0
	25% or more, but less than 50%	-5
	12.5% or more, but less than 25%	-10
	Less than 12.5%	-15
By hour	Daytime: 0600 - 1800	0
	Evening: 1800 - 2400	+5
	Night time: 2400 - 0600	+10
By area ²	Urban area - exclusive residential area, green area - general residential area, semi-residential area - commercial area, semi-industrial area - general industrial area, exclusive industrial area	0 -5 -15 -20
	Forest preservation area, natural environment preservation area, tour/recreation area, residential sector in the village area	+20
	Whole sector in the village area except residential sector, aquatic resources preservation area, cultivation area, development promotion area, reserved area, unspecified area	+20
	Industrial area	-20
	Area within 50 m [\approx 175 ft] from the border of general hospitals defined by the Medical Law and schools defined by the Education Law	0

¹ Period: 8 hours during daytime; 4 hours in the evening; 2 hours night.

² Area classification is based on the Land Use and Management Law; Urban area classifications are based upon the Urban Planning Law.



Appendix 10-8

Correction Factors for Permissible Vibration Standards for Facilities Generating Vibration (USFK EGS Table 10-5)

Category	Description	Correction Factor
Percentage of vibration duration to the period concerned ¹	50% or more	0
	25% or more, but less than 50%	-5
	Less than 25%	-10
By hour	Daytime: 0600 - 1800	0
	Evening: 1800 - 2400	+5
	Night time: 2400 - 0600	+5
By area ²	Urban area - exclusive residential area, green area - general residential area, semi-residential area - commercial area, semi-industrial area - general industrial area, exclusive industrial area	0 -5 -10 -15
	Forest preservation area, natural environment preservation area, tour/recreation area, residential sector in the village area	0
	Whole sector in the village area except residential sector, aquatic resources preservation area, cultivation area, development promotion area, reserved area, unspecified area	-5
	Industrial area	-15
	Area within 50 m [=175 ft] from the border of general hospitals defined by the Medical Law and schools defined by the Education Law	0

¹ Period: 8 hours in daytime; 4 hr in the evening; 2 hr at night.

² Area classification is based on the Land Use and Management Law; Urban classifications are based upon the Urban Planning Law.

Appendix 10-9

Noise Standards for Operating Vehicles (USFK EGS Table 10-6)

Type of Vehicle	Muffler Noise (dB(A))		Horn Noise (dB(C))
	2 February 1991 - 31 December 1995	after 1 January 1999	after 2 February 1991
Light Duty Automobile	103 or less	100 or less	115 or less
Passenger Automobile	103 or less	100 or less	
Small Freight Vehicles	103 or less	100 or less	
Heavy Duty Vehicles	107 or less	105 or less	
Two-Wheel Vehicles	110 or less	105 or less	

Types of Automobiles

1. Light Duty Automobiles:
 - automobiles for a very small number of passengers or small amount of freight
 - engine size (emission): less than 800 cc.
2. Passenger Automobiles:
 - ordinary passenger vehicles, including wagons
 - engine size (emission): 800 cc or larger
 - weight: less than 3 tons [≈ 2.72 metric tons].
3. Small Freight Vehicles:
 - ordinary freight vehicles, including jeeps, coaches, and vans
 - engine size (emission): 800 cc or larger
 - weight: less than 3 tons [≈ 2.72 metric tons].
4. Heavy Duty Vehicles:
 - vehicles for a very large number of passengers or large amount of freight
 - weight: 3 tons [≈ 2.72 metric tons] or larger.
5. Two Wheel Vehicles:
 - vehicles, including motorcycles and passenger side cars, for one or two passengers
 - engine size (emission): 50 cc or larger
 - weight: less than 0.5 ton [≈ 0.45 metric ton].



INSTALLATION:	COMPLIANCE CATEGORY: NOISE Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 11

PESTICIDES

Korea ECAS

SECTION 11

PESTICIDES

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to any Army facility that uses, stores, or handles pesticides. It integrates the requirements of Department of Defense (DOD) regulations and Army regulations (ARs) into a single document that normally will apply to any facility that handles pesticides.

Much of the guidance for pest management involves Operation and Maintenance (O&M) procedures. This protocol combines O&M guidance and compliance matters. It is used to determine the compliance status of operations, facilities, and equipment used to store and apply pest control chemicals. The protocol addresses the adequacy of facilities, operating procedures, personnel qualifications, and reporting of pesticide use.

B. DOD Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 11, contains criteria regulating the use, storage, and handling of fungicides, insecticides, herbicides, rodenticides, and other chemicals used to reduce pest populations at USFK installations. It does not address the use of these items by individuals acting in an unofficial capacity in a residence or garden. The disposal of pesticides is covered in Section 6, *Hazardous Waste*, and Section 7, *Solid Waste*.
- DODI 4150.7, *Department of Defense Pest Management Program*, 22 April 1996, sets forth the policy, responsibilities, and procedures for pest management programs. This instruction establishes the DOD policy of maintaining safe, efficient, and environmentally sound integrated pest management programs to prevent or control pests that may adversely affect health, readiness, or military operations, or damage structures, materiel, or property. The *DOD Plan for the Certification of Pesticide Applicators of Restricted-Use Pesticides* establishes the requirement that USAF military and civilian pest managers be certified. DODI 4150.7 requires that a component pest management consultant do an onsite consultant review of each installation's pest management program at least every 36 months. An Environmental Compliance Assessment System (ECAS) assessment does not preclude such a visit. DODI 4150.7 applies outside the continental United States consistent with applicable international agreements, Status of Forces Agreements, and the FGS issued for the host nation.
- DODD 4150.7 is supplemented by Technical Information Memoranda (TIM) that provide specific criteria and procedures for the operation of a pest management program. The TIM contain guidance only and are nonregulatory. The following TIM are appropriate to have on hand:
 - TIM 13 - *Ultra Low Volume Dispersal of Insecticides by Ground Equipment* (March 1985)
 - TIM 14 - *Personal Protective Equipment for Pest Management Personnel* (March 1992)
 - TIM 15 - *Pesticide Spill Prevention and Management* (June 1992)
 - TIM 16 - *Pesticide Fires: Prevention, Control, and Cleanup* (June 1981)
 - TIM 18 - *Installation Pest Management Program Guide* (February 1987)
 - TIM 20 - *Pest management Operations in Medical Treatment Facilities* (October 1989)
 - TIM 21 - *Pesticide Disposal Guide for Pest Control Shops* (October 1986)

TIM 24 - *Contingency Pest Management Pocket Guide* (September 1991)
TIM 25 - *Devices for Electrocution of Flying Insects* (August 1988)
TIM 26 - *Lyme Disease - Vector Surveillance and Control* (March 1990)
TIM 27 - *Stored Products Pest Monitoring Techniques* (June 1992)
TIM 29 - *Integrated Pest Management In and Around Buildings* (July 1994).

- Military Handbook 1028-8A, *Design of Pest Management Facilities*, 1 November 1991, includes basic criteria for planning and designing military pest control facilities.
- DOD Regulation 4145.19-R-1, *Storage and Materials Handling*, September 1979. Chapter 5, Section 4 of this regulation provides overall guidance for storage and handling of various hazardous commodities at Army installations.

C. Army Regulations

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, requires OCONUS installations to use host-nation-registered pesticides.
- AR 420-76, *Pest Management*, 3 June 1986, contains policies, standards, and procedures for pest control activities at Army controlled facilities. It sets minimum levels of pest management operations in real property maintenance activities (RPMAs).

D. Responsibility For Compliance

- The Directorate of Engineering and Housing (DEH) will prepare a pest management plan, supervise and direct pest management operations, conduct preventive maintenance and surveillance inspections, ensure that operating personnel are adequately trained, maintain supplies of pesticides and related equipment, and assure that all pest management operations are carried out safely. In addition, the Facilities Engineer will decide which activities should be contracted out, perform all recordkeeping and reporting requirements of AR 420-76, notify heads of nonappropriated funds activities that restricted and controlled pesticides must be applied under supervision of certified personnel, and cooperate with medical authorities.
- Preventive Medicine (PVNTMED) will conduct the installation pesticide monitoring program, obtain information in a timely fashion on the identification of pests and their susceptibility to pesticides as necessary and report to the facilities engineer, establish health and personnel safety criteria for pesticide operation, provide certification training, and assist the MACOM pest management personnel in conducting an onsite installation pest management program review.
- The Installation Pest Management Coordinator will be a pest management supervisor or member of the professional pest management personnel, will develop and monitor the installation pest management annual work plan, and will coordinate with activities conducting pest surveillance or applying pesticides to ensure that all applicable information is reported per AR 420-76.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFRs).

- *Acute Lethal Dosage (LD₅₀)* - a statistically derived estimate of the concentration of a substance that would cause 50 percent mortality to the test population under specified conditions.
- *Caution* - the human hazard signal word required on the front panel of a pesticide container determined by the toxicity category of the pesticide. All pesticide products meeting the criteria of Toxicity Category III or IV must bear on the front panel the signal word CAUTION; see *Toxicity Category*.
- *Certified Pesticide Applicators* - personnel who apply restricted-use pesticides or supervise the use of restricted-use pesticides and who have been authorized to do so by successfully completing a training program required by the DOD Pest Management Board, followed by formal certification (USFK EGS, Chapter 11, Definitions).
- *Danger* - the human hazard signal word required on the front panel of a pesticide container determined by the toxicity category of the pesticide. All pesticide products meeting the criteria of Toxicity Category I must bear on the front panel the signal word DANGER; see *Toxicity Category*.
- *Direct Supervision* - supervision that includes being at the specific location where pest management work is conducted; providing instruction and control; and maintaining a line-of-sight view of the work performed. Certain circumstances may temporarily remove the line-of-sight view of the application of pesticide from the supervisor such as topographic constraints, vegetation constraints, or building structural constraints. Under these temporary circumstances, the supervisor shall be responsible for the actions of the pesticide applicators (DODI 4150.7, Enclosure 2).
- *Direct Supervision* - supervision by a certified pesticide applicator at the specific location where the work is conducted and maintaining a line-of-sight view of the work performed (AR 420-76, Glossary, Section II).
- *Disease Vector* - any animal capable of transmitting the causative agent of a human disease; serving as an intermediate or reservoir host of a pathogenic organism; or producing human discomfort or injury, including (but not limited to) mosquitoes, flies, other insects, ticks, mites, snails, and rodents. It is recognized that certain disease vectors are predominately economic pests that as conditions change may require management or control as a disease vector (DODI 4150.7, Enclosure 2).
- *DOD-Certified Pesticide Applicator* - DOD military or civilian personnel certified in accordance with the *DOD Plan for the Certification of Pesticide Applicators of Restricted-Use Pesticides* (DODI 4150.7, Enclosure 2).
- *Hazardous Waste Profile Sheet* - a document that identifies and characterizes the waste by providing user's knowledge of the waste, and/or lab analysis, and details the physical, chemical, and other descriptive properties or processes that created the hazardous waste (USFK EGS, Chapter 6, Definitions).
- *Installation Pesticide Applicator* - DOD employees or contract personnel whose job responsibilities involve the application of pesticides on DOD installations and property (DODI 4150.7, Enclosure 2).

- *Integrated Pest Management* - the use of all available pest management practices to prevent and suppress pest infestation/population in an environmentally sound manner (USFK EGS, Chapter 11, Definitions).
- *Integrated Pest Management* - under the terms of AR 420-76, a comprehensive approach to pest control or prevention that considers various chemical, physical, and biological suppression techniques; the habitat of the pest; and the interrelationship between pest populations and the ecosystem (AR 420-76, Glossary, Section II).
- *Integrated Pest Management* - for the purposes of DODI 4150.7, a planned program, incorporating continuous monitoring, education, record-keeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, materiel, or the environment. IPM uses targeted, sustainable (effective, economical, environmentally sound methods, including education, habitat modification, biological control, genetic control, cultural control, mechanical control, physical control, regulatory control, and where necessary, the judicious use of least-hazardous pesticides (DODI 4150.7, Enclosure 2).
- *Management Practices (MPs)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *On-Site Supervision* - supervision that includes being physically located on the installation, but not necessarily at the specific work site during the work performance and being able to be contacted and at the work site within 30 minutes (AR 420-76, Glossary, Section II).
- *On-Site Supervision* - supervision that includes being physically located on the installation, but not necessarily at the specific worksite, during the work performance and being able to be contacted and at the worksite within 30 min (DODI 4150.7, Enclosure 2).
- *Personal Relief* - pest management control efforts made by DOD personnel or their family members at their own expense for control of pests consistent with DOD and component pest management policy (DODI 4150.7, Enclosure 2).
- *Pest* - arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds, undesirable vegetation, and other organisms (except for microorganisms that cause human or animal disease) that adversely affect the well being of humans or animals, attack real property, supplies, equipment or vegetation, or are otherwise undesirable (USFK EGS, Chapter 11, Definitions and AR 420-76, Glossary, Section II).
- *Pest* - for DODI 4150.7, the prevention and control of disease vectors and pests that may adversely affect the DOD mission or military operations; the health and well-being of people; or structures, materiel, or property (DODI 4150.7, Enclosure 2).
- *Pest Management Consultant* - professional DOD pest management personnel located at component Headquarters, field operating agencies, major commands, facilities engineering field divisions or activities, or area support activities who provide technical and management guidance for the conduct of installation pest management operations. Some pest management consultants may be designated by their component as certifying officials (DODI 4150.7, Enclosure 2).

- *Pest Management Coordinator* - the individual officially designated by the Installation Commander (IC) to coordinate and oversee the installation pest management program and installation pest management plan. Pest management coordinators shall be certified as pesticide applicators if their job responsibilities require them to apply or supervise the use of pesticides (DODI 4150.7, Enclosure 2).
- *Pest Management Personnel* - personnel involved with professional activities who monitor or mitigate pest problems, including personnel that carry out a pest management program, carry out pest control work (which includes selecting, mixing or applying pesticides), monitor pest populations, coordinate various activities that prevent or mitigate pest problems. This includes active duty, civilian (United States and local nationals) and contract workers directly involved with the program; it does not include persons whose contact with pesticides is limited to transporting, loading, and unloading closed containers (USFK EGS, Chapter 11, Definitions).
- *Pest Management Plan* - a long-range, comprehensive installation planning and operational document that establishes the strategy and methods for conducting a safe, effective and environmentally sound IPM program. Written pest management plans are required as a means of establishing and implementing an installation pest management program (DODI 4150.7, Enclosure 2).
- *Pesticide* - any registered substance or mixture of substances used to destroy pests, control their activity, or prevent them from causing damage (USFK EGS, Chapter 11, Definitions).
- *Pesticide* - in AR 420-76, any substance or mixture of substances, including biological control agents, that may prevent destroy, repel, or mitigate pests; also, any substance or mixture of substances used as a plant regulator, defoliant, or desiccant (AR 420-76, Glossary, Section II).
- *Pesticide Applicator* - any individual who applies pesticides or supervises the use of pesticides by others (DODI 4150.7, Enclosure 2). See also *Certified Pesticide Applicator*, *DOD-Certified Pesticide Applicator*, *Installation Pesticide Applicator*, and *Uncertified Installation Pesticide Applicator*.
- *Pesticide Applicator* - any individual who applies pesticides or supervises the use of any pesticide by others, including: (AR 420-76, Glossary, Section II)
 1. DOD certified pesticide applicators, i.e. military or civilian personnel certified in accordance with the DOD Plan for the Training and Certification of Pesticide Applicators
 2. Uncertified pesticide applicators, i.e. DOD or contract employees who work under the supervision of a certified pesticide applicator, or who apply only pesticides authorized for use by uncertified personnel.
- *Pesticide Handling* - operations involving contact or potential contact with pesticides, including loading, unloading, transferring, storing, mixing and applying pesticides, filling or cleaning pest management equipment, preparing pesticide waste for disposal, and pesticide spill response (USFK EGS, Chapter 11, Definitions).
- *Pesticide Product* - a pesticide in the particular form (including composition, packaging, and labeling) in which the pesticide is, or is intended to be, distributed or sold. This includes any physical apparatus used to deliver or apply the pesticide if distributed or sold with the pesticide.
- *Pesticide Waste* - materials that are subject to disposal in accordance with pesticide disposal restrictions: (USFK EGS, Chapter 11, Definitions)

1. any pesticide that has been suspended, that does not meet specifications, or that is contaminated, improperly mixed, or otherwise unusable, whether concentrated or diluted
 2. spilled pesticides and contaminated spill cleanup material
 3. any containers, equipment, or material that are contaminated with pesticides; empty pesticide containers that have been triple rinsed, punched, and crushed are not considered hazardous waste but are normal solid waste.
- *Professional Pest Management Personnel* - DOD military officers commissioned in the Medical Service or Biomedical Sciences Corps or DOD civilian personnel with college degrees in biological or agricultural sciences who are in a current assignment that includes pest management responsibilities exercised regularly. DOD civilian employees also shall meet Office of Personnel Management qualification standards. Based on assignment, some professional pest management personnel are pest management consultants (DODI 4150.7, Enclosure 2).
 - *Professional Pest Management Personnel (PPMP)* - personnel with college degrees in biological or agricultural sciences who are in a current assignment that includes pest management responsibilities exercised regularly (AR 420-76, Glossary, Section II).
 - *Restricted-Use Pesticide* - (also *Restricted Pesticide*) a pesticide that the U.S. Environmental Protection Agency (USEPA) or ROK regulatory agency has determined to have potential for causing unreasonable adverse effects on health and the environment when applied by uncertified pest management personnel (USFK EGS, Chapter 11, Definitions).
 - *Standard Pesticides and Pest Control Equipment* - pesticides and pest control equipment, standardized, purchased, and stocked as items proven best for use at USFK military installations (USFK EGS, Chapter 11, Definitions).
 - *Toxicity Category* - required warnings and precautionary statements are based on the toxicity category of the pesticide. The category is assigned on the basis of the highest hazard shown in the table listed in 40 CFR 156.10.
 - *Uncertified Pesticide Applicator* - DOD employees who are not certified under the DOD plan during an apprenticeship period not exceeding two years and who must apply pesticides under the supervision of a DOD-certified applicator (DODI 4150.7, Enclosure 2).
 - *Warning* - the human hazard signal word required on the front panel of a pesticide container determined by the toxicity category of the pesticide. All pesticide products meeting the criteria of Toxicity Category II shall bear on the front panel the signal word WARNING.

PESTICIDES

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	11-1 through 11-15	(1)(2)(4)(17)(33)
Pesticide Application	11-16 through 11-29	(2)(3)(4)(15)(16)(17)(33)
Documentation and Notification	11-30 through 11-35	(2)(4)(17)(33)
Pest Control Shop Facilities	11-36 through 11-52	(2)(17)(33)
Storage, Mixing, and Preparation of Pesticides	11-53 through 11-67	(2)(4)(17)(33)
Highly and Moderately Toxic Pesticides	11-68 through 11-75	(4)(17)(33)
Pesticide Waste Disposal	11-76 through 11-82	(2)(4)(17)(33)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Health Physician/Preventive Medicine Officer
- (4) Safety and Health Officer
- (5) Golf Course Maintenance
- (15) Land Management Officer (DEH)
- (16) Building and Grounds Division (DEH)
- (17) Entomology Shop (DEH)
- (22) Staff Judge Advocate (SJA)
- (33) Golf Course Pesticide Shop

PESTICIDES

Records to Review

- Records of pesticides purchased by the facility (purchase orders, inventory)
- Pesticide application records
- Description of the facility's pest control program
- Installation pest management plan
- Certification status of pesticide applicators
- Pesticide disposal manifests
- Contracts for pest management
- Recent ventilation rating for pesticide fume hood and pesticide mixing/storage rooms
- Staffing requirements for pest management program

Physical Features to Inspect

- Personnel protection equipment
- Pesticide application equipment
- Pesticide storage areas, including storage containers
- Military unit storage/supply areas
- DEH/Director of Logistics (DOL) supply and storage areas
- Field sanitation training sites

People to Interview

- Directorate of Engineering and Housing (DEH)
- Health Physician/Preventive Medicine Officer
- Golf Course Maintenance
- Land Management Officer (DEH)
- Safety and Health Officer
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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>11-1. Copies of all relevant DOD directives/instructions, Department of the Army (DA) directives, and guidance documents should be maintained at the installation (MP).</p> <p>11-2. The installation must have a Pest Management Coordinator (AR 420-76, para 2-4e and para 2-8).</p>	<p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - DODD 4150.7, <i>DOD Pest Management Program</i>, 22 April 1996 - DOD 4145.19-R-1, <i>Storage and Materials Handling</i>, September 1979 - DOD 4160.21-M, <i>Hazardous Property Management</i>, 28 January 1985 - AR 11-34, <i>The Army Respiratory Protection Program</i>, 15 February 1990 - AR 40-5, <i>Preventive Medicine</i>, 15 October 1990 - AR 40-574, <i>Aerial Dispersal of Pesticides</i>, 26 April 1976 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 385-10, <i>The Army Safety Program</i>, 23 May 1988 - AR 385-32, <i>Protective Clothing and Equipment</i>, 31 October 1985 - AR 420-76, <i>Pest Management</i>, 3 June 1986 - TIM 13 - <i>Ultra Low Volume Dispersal of Insecticides by Ground Equipment</i> (March 1985) - TIM 14 - <i>Personal Protective Equipment for Pest Management Personnel</i> (March 1992) - TIM 15 - <i>Pesticide Spill Prevention and Management</i> (June 1992) - TIM 16 - <i>Pesticide Fires: Prevention, Control, and Cleanup</i> (June 1981) - TIM 18 - <i>Installation Pest Management Program Guide</i> (February 1987) - TIM 20 - <i>Pest management Operations in Medical Treatment Facilities</i> (October 1989) - TIM 21 - <i>Pesticide Disposal Guide for Pest Control Shops</i> (October 1986) - TIM 24 - <i>Contingency Pest Management Pocket Guide</i> (September 1991) - TIM 25 - <i>Devices for Electrocutation of Flying Insects</i> (August 1988) - TIM 26 - <i>Lyme Disease - Vector Surveillance and Control</i> (March 1990) - TIM 27 - <i>Stored Products Pest Monitoring Techniques</i> (June 1992) - TIM 29 - <i>Integrated Pest Management In and Around Buildings</i> (July 1994) - Military Handbook 1028-8A, <i>Design of Pest Management Facilities</i> (1 November 1991). <p>Verify that a pest management supervisor or PPMP has been designated to coordinate all installation pest management activities. (2)(4)</p> <p>Verify that the Pest Management Coordinator develops and monitors the pest management annual work plan and collects the information necessary to prepare DD Form 1532. (2)(4)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-3. Each installation must have a comprehensive pest management plan (USFK EGS 11-3a, DODI 4150.7, E.3.v(1), and AR 420-76, para 2-5a and 3-2a).</p>	<p>Verify that the installation implements and maintains a written Installation Pest Management Plan (IPMP). (2)(4)(17)</p>
<p>11-4. Installation pest management plans must meet specific content requirements (USFK EGS 11-3a, AR 420-76, para 3-2b, Appendix C, and DODI 4150.7, Encl. 4, para 4b).</p>	<p>Verify that the plan is a comprehensive, long-range, narrative document that: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - describes all installation and satellite installation pest management requirements and programs, including those for contracts, natural resources, golf courses, and out leases, and identifies minimum pest management staffing requirements - describes all IPM procedures required to monitor and control pests on the installation - describes all IPM procedures for surveillance and control of disease vectors - identifies all resources, such as work years, facilities, and equipment, required to support the installation pest management program - identifies all pesticides (including USEPA registration numbers) approved by the component pest management consultant for use in the installation pest management program - describes all health and safety measures that will be taken to protect both pest management personnel and the general public from pesticide exposure and risk - describes pest management functions that can be done more economically through commercial contracts and provides, or references, cost comparison analysis - describes any pest management operation with special environmental considerations such as those that: <ul style="list-style-type: none"> - use a restricted-use pesticide - use any pesticide application that may contaminate surface or ground water - include 259 or more contiguous hectares (640 acres) in one pesticide operation - may adversely affect endangered or other protected species and their habitat - involve aerial application of pesticides - involve permits for the use of experimental-use pesticides - identifies animal control efforts for feral cats, feral dogs, or wildlife - identifies active or potential vector-borne diseases and describe medical department collaboration with host nation agencies for vector surveillance and control matters - identifies golf course pest management operations - addresses pest management training/certification requirements

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-4. (continued)</p> <p>11-5. Installations must meet additional requirements with regard to pest management plans (DODI 4150.7, Encl. 4, paras 2, 8d, and 8h).</p> <p>11-6. The installation's pest management coordinator must meet specific requirements (DODI 4150.7, Encl. 4, paras 5a and 2a(3)).</p> <p>11-7. Installations must meet specified measures of merit in the pest management program (DODI 4150.7, Encl. 3).</p>	<ul style="list-style-type: none"> - addresses recordkeeping and reporting on pest surveillance and pesticide usage - addresses the maintenance of a reference library. <p>Verify that the plan lists all program objectives, arranged in order of priority, according to potential or actual impact on health, morale, structures, materiel, or property. (2)(4)(17)(33)</p> <p>Verify that the plan clearly delineates the responsibilities for surveillance and control of medically important insects and other arthropods.</p> <p>Verify that the plan specifically addresses the surveillance and control of insects and other arthropods in child care and food service facilities.</p> <p>(NOTE: A suggested format for the plan appears in Enclosure 8 of DODI 4150.7.)</p> <p>Verify that the installation's pest management coordinator has an appropriate position and educational background and has the management skills necessary to implement the installation's pest management plan. (2)(4)(17)(33)</p> <p>Verify that the pest management coordinator is DOD-certified.</p> <p>Verify that the installation meets the following measures of merit: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - Measure of Merit 1: by the end of FY97 the installation has a pest management plan that is prepared, reviewed, and updated annually by pest management professionals - Measure of Merit 2: by the end of FY 2000, the amount of pesticides applied annually on DOD installations is reduced by 50% from the FY 93 baseline in pounds of active ingredients (NOTE: The goal for this measure of merit must not be obtained by substituting more toxic pesticides that have lower application rates than the pesticide in use.) - Measure of Merit 3: by the end of FY 98, 100 percent of installation pesticide applicators are properly certified. (NOTE: Direct hire employees have a maximum of 2 yr to become certified after initial employment, contract employees need appropriate certification when the contract is let.)

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PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-8. Installations must not construct buildings that have heating, ventilation, or air-conditioning (HVAC) ducts located below the floor (DODI 4150.7, Encl. 4, para 4c(2)).</p>	<p>Verify that buildings are not constructed with HVAC ducts located in and below the floor. (1)(2)</p> <p>(NOTE: This prohibition is intended to prevent accidental contamination of the ducts with termiticides.)</p> <p>(NOTE: Postconstruction treatment of structures with HVAC ducts is prohibited without a waiver from the component pest management consultant.)</p>
<p>11-9. A self-help pest control program must be available for use by the occupants of military housing to control minor infestations of household pests (AR 420-76, paras 2-3m, 3-13 and Appendix G).</p>	<p>Verify that a self-help pest control program has been established. (2)(4)(17)</p> <p>Verify that housing occupants must make a concerted self-help pest control effort before services from the installation pest control services are scheduled. (2)(4)(17)</p> <p>Verify that the pesticides being distributed by self-help have been approved by the MACOM Pest Management Consultant (PMC). (2)(4)(17)</p> <p>Verify that records are being maintained of pest control supplies issued. (2)(4)(17)</p> <p>Verify that such records are provided to the pest management coordinator once a month to be included on the DD Form 1532-1. (2)(4)(17)</p>
<p>11-10. Self-help programs must be managed in accordance with specific standards (DODI 4150.7, para. E.3.v.(3) and Encl. 4, para 8i(3)).</p>	<p>Verify that self-help programs are established for military housing when cost effective and when IPM monitoring indicates the need for a self-help program. (2)(4)(17)</p> <p>Verify that liquid pesticides are not issued.</p> <p>(NOTE: Self-help pest management materials issued may include cockroach and ant baits and/or traps, mouse traps, glue boards, and general use pesticide aerosols with crack and crevice devices as recommended by the component pest management consultant.)</p> <p>Verify that self-help personnel provide written instructions and appropriate precautions beyond those on pesticide labels to military quarters' and housing occupants.</p> <p>Verify that, if a pesticide is issued to an occupant, records are maintained.</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-11. Pest management and disease vector control during military contingency operations, readiness training exercises, and deployments must meet specific standards (DODI 4150.7, Encl. 4, para 9).</p> <p>11-12. Pest management consultants must provide the guidance needed to protect all closing or closed facilities from pests from the beginning of deactivation until property disposal (DODI 4150.7, Encl. 4, para 8j).</p> <p>11-13. Contracts for installation pest control services must be reviewed and approved prior to advertisement for bid (AR 420-76, para 3-12c and d, 4-3a and c, 3-4k).</p> <p>11-14. Labels on pesticides must bear the appropriate instructions and warnings concerning the pesticide (USFK EGS 11-3h).</p>	<p>Verify that pesticides are applied consistent with the policies and procedures described in DODI 4150.7 during military contingency operations, readiness training exercises, and deployments. (2)(4)(17)(33)</p> <p>Verify that individuals who apply pesticides in these situations are certified in accordance with the <i>DOD Plan for the Certification of Pesticide Applicators of Restricted-Use Pesticides</i> or are under the direct or on-site supervision of a certified individual.</p> <p>(NOTE: Shipboard independent duty technicians and other military personnel who have received special training for limited site application of preselected pesticides during military operations or deployments are exempt from the certification requirement, but they must be fully trained.)</p> <p>Verify that pest management consultants provide the guidance needed to protect all closing or closed facilities from pests from the beginning of deactivation until property disposal. (2)(4)(17)(33)</p> <p>Verify that contracts for pest control services have been approved (preferably in writing) by the MACOM PMC. (2)(17)</p> <p>Verify that contract pest control services are monitored by a DOD trained and certified Quality Assurance Evaluator (QAE). (2)(17)</p> <p>Verify that contractor employees are certified to apply pesticides. (2)(17)</p> <p>Verify that the pesticides are properly labeled in both English and Korean. (17)(33)</p> <p>Verify that labels bear: (17)(33)</p> <ul style="list-style-type: none"> - the appropriate use instructions - a precautionary message based on the toxicity category of the pesticide - environmental hazards - storage and disposal requirements. <p>(NOTE: Examples of precautionary messages include "danger," "warning," or "caution.")</p>

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PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-15. Pesticides for sale in post exchanges and commissaries must meet specific restrictions (AR 40-5, para 10-4h).</p>	<p>Verify that pesticides for sale in post exchanges and commissaries are registered as "General Use" pesticides. (2)(4)</p> <p>Verify that no "Restricted Use" pesticides or pesticides with labels indicating that only professional pest management personnel may use the product are sold in the post exchange or commissary (see Appendix 11-1). (2)(4)</p> <p>Verify that the pesticides are arranged separately on sales display shelves and in storage according to type. (2)(4)</p> <p>Verify that pesticides are segregated from all food products in storage, during transportation, and while on display. (2)(4)</p> <p>(NOTE: Segregation means that there will be sufficient space between pesticides and food items so that spillage or leakage will not contaminate food.)</p>
<p>PESTICIDE APPLICATION</p> <p>11-16. Installations must use standard pesticides and pest control equipment only (USFK EGS 11-3d, DODI 4150.7, para E.3.v(6) and Encl. 4, para 6a(2), and AR 200-1, para 4-3h).</p>	<p>Verify that installations use only standard pesticides and pest control equipment that are one of the following: (2)(17)(33)</p> <ul style="list-style-type: none"> - approved for stocking by the Armed Forces Pest Management Board (AFPMB) - approved in writing by the cognizant USFK pest management authority. <p>Verify that host-nation-registered pesticides are used.</p>
<p>11-17. Paint containing insecticides is prohibited from use on DOD property (DODI 4150.7, Encl. 4, para 6f).</p>	<p>Verify that neither interior nor exterior paint that contains pesticides is used on the installation. (2)(4)(17)(33)</p> <p>(NOTE: This prohibition also applies to insecticides formulated and labelled for use as paint additives.)</p> <p>(NOTE: Paints containing fungicides as mildew inhibitors may be used when the application directions specify no special restrictions due to the fungicide. Approved marine anti-fouling compounds or coatings may be applied to protect the surfaces of watercraft.)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-18. The use of regularly scheduled, periodic pesticide applications and of preventative pesticide treatments is prohibited (DODI 4150.7, Encl. 4, para 6g).</p> <p>11-19. Installations must have an appropriate number of certified pesticide applicators (AR 420-76, para 3-1a).</p> <p>11-20. Certain pesticide applicators must meet certification, training, and/or supervision requirements (USFK EGS 11-3b and 11-3k; DODI 4150.7, para E.3.v(4) and Encl. 4, para 5b; and AR 420-76, para 3-1).</p>	<p>Verify that the installation does not perform regularly scheduled, periodic pesticide applications. (2)(4)(17)(33)</p> <p>(NOTE: This prohibition does not apply in situations where the installation pest management plan clearly documents that no other technology or approach is available to protect personnel or property of high value.)</p> <p>Verify that preventative pesticide treatments are not used unless the component pest management consultant has given approval based on current surveillance information or records documenting past disease vectors or pest problems that require this approach.</p> <p>Verify that the installation has the appropriate number of certified pesticide applicators (in-house or contract) required to perform pest management operations at the installation (see Appendix 11-2). (2)(17)(33)</p> <p>Verify that applicators are trained and/or certified if they: (2)(3)(4)(16)(17)(33)</p> <ul style="list-style-type: none"> - are full time employees who perform pest management activities at least 25 percent of their on-duty time - apply restricted use or controlled pesticides. <p>Verify that pesticide applicators are certified in accordance with DODI 4150.7, <i>DOD Pest Management Program</i> and the <i>DOD Plan for the Certification of Pesticide Applicators of Restricted-Use Pesticides</i>. (2)(3)(4)(16)(17)(33)</p> <p>Verify that restricted-use pesticides are applied by or under the direct supervision of certified pesticide applicators. (2)(3)(4)(16)(17)(33)</p> <p>Verify that personnel who are undergoing apprenticeship training, but are not yet certified, apply pesticides only under the direct supervision of a certified pesticide applicator.</p> <p>Verify that part-time pesticide applicators (less than 25 percent on-duty time) who do not use restricted-use or controlled pesticides are trained in: (2)(3)(4)(16)(17)(33)</p> <ul style="list-style-type: none"> - the safe, efficient, and environmentally sound use of pesticides - other integrated pest management techniques. <p>(NOTE: See Appendix 11-1 for a list of restricted-use pesticides.)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-21. DOD-certified pesticide applicators must be recertified every 3 yr (DODI 4150.7, Encl. 4, para 5b(3)).</p>	<p>Verify that DOD-certified pesticide applicators are recertified every 3 yr. (2)(3)(4)(16)(17)(33)</p>
<p>11-22. All pesticide applicators must participate in a medical surveillance program (USFK EGS 11-3c; AR 40-5, para 10-15).</p>	<p>Verify that all pesticide applicators are included in a medical surveillance program. (3)(4)</p> <p>Verify that the program for pesticide applicators includes: (3)(4)</p> <ul style="list-style-type: none"> - baseline physical examination with a cholinesterase test - annual physical - a physical and cholinesterase test at least every six months for pest management personnel who work with organophosphates or carbamate pesticides.
<p>11-23. All pest management personnel must be provided with personal protective equipment (PPE) (USFK EGS 11-3g; AR 11-34, para 3-5b(2), AR 385-32, para 4a, AR 420-76, para 4-1c; DOD Directive 4165.19-R-1, para 3-415a).</p>	<p>Verify that all pest management personnel are provided with PPE that is appropriate for the work they perform and the types of pesticides to which they may be exposed. (2)(3)(4)(17)</p> <p>Verify that protective devices such as the following are provided for all persons engaged in pest control operations: (2)(3)(4)(17)</p> <ul style="list-style-type: none"> - respirators - masks - gloves - safety shoes - goggles - protective clothing. <p>Verify that approved masks, respirators, rubber gloves, rubber boots, and protective clothing are provided at government expense and used, as required, during the mixing and application of pesticides. (2)(3)(4)(17)</p> <p>Verify that pesticide-contaminated protective clothing is not home laundered but is laundered at government expense. (2)(3)(4)(17)</p> <p>Verify that severely contaminated clothing is not laundered but is treated as a pesticide-related waste and disposed of as such. (2)(3)(4)(17)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-24. Individuals who handle pesticides must wear an approved respiratory device (DOD Directive 4145.19-R-1, para 3-415a(6) and para 3-415a(7)).</p>	<p>Verify that all personnel who handle pesticides wear an approved respiratory device that is appropriate for protection against the pesticides they use. (4)(17)(33)</p> <p>Verify that all respirators, gas masks, cartridges, and canisters are Occupational Safety and Health Administration/Mine Safety and Health Administration (OSHA/MSHA) approved for the specific pesticide being handled. (4)(17)(33)</p> <p>(NOTE: Paint respirators do not provide protection from pesticide vapors.)</p>
<p>11-25. Specific operational practices should be observed in dealing with pesticides (MP).</p>	<p>Verify that health and safety procedures emphasizing good work habits, reduction or elimination of hazards, and use of personal protective equipment are followed. (4)(17)(33)</p> <p>Verify that protective clothing and equipment are stored away from chemical areas. (4)(17)(33)</p> <p>Verify that respirator cartridges/canisters are changed at appropriate intervals. (4)(17)(33)</p> <p>Verify that periodic fit testing of respirators is conducted. (4)(17)(33)</p>
<p>11-26. Vehicles used for pesticide applications must be dedicated to pest control operations and meet specific design requirements (AR 420-76, para 4-1d and 4-1e(1)).</p>	<p>Verify that vehicles used during pest control operations are single purpose. (4)(17)(33)</p> <p>Verify that pest control vehicles have separate cab and cargo compartments. (4)(17)(33)</p> <p>Verify that lockable storage is provided on the vehicles. (4)(17)(33)</p> <p>Verify that spill cleanup kits are placed on vehicles. (4)(17)(33)</p>
<p>11-27. Dispersal equipment used for pesticide applications should be dedicated to the pest management operation (MP).</p>	<p>Verify that dispersal equipment is used solely in support of pest management activities. (4)(17)(33)</p>
<p>11-28. Installations must ensure the prevention of damage to wildlife from pesticide applications (DOD 4145.19-R-1, para 3-417).</p>	<p>Verify that basic precautions are observed that prevent drift of pesticides to the following: (2)(15)(17)(33)</p> <ul style="list-style-type: none"> - wooded areas occupied by wildlife - land area not intended for treatment - fish-bearing waters.

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-28. (continued)</p> <p>11-29. Public safety should be ensured when applying or using pesticides (MP).</p> <p>DOCUMENTATION AND NOTIFICATION</p> <p>11-30. Installations must notify component pest management consultants whenever host nation regulators ask to inspect pest management operations (DODI 4150.7, Encl. 4, para 4c(2)).</p> <p>11-31. Copies of material safety data sheets (MSDSs) for all pesticides must be available at storage and holding facilities and on vehicles (USFK EGS 11-3o).</p> <p>11-32. Daily pesticide application and surveillance records are required (AR 420-76, para 4-4b and DODI 4150.7, para E.3.h).</p>	<p>Verify that the installation guards against runoff or washoff by rain from treated areas to fish-bearing waters. (2)(15)(17)(33)</p> <p>Verify that hazardous exposure to the general public has been eliminated by: (4)(17)(33)</p> <ul style="list-style-type: none"> - posting appropriate signs for treatment area - scheduling low use periods or restricted usage for a number of days - following water use restrictions and reentry times according to the pesticide labels. <p>Verify that the installation notifies the component pest management consultant whenever host nation regulators ask to inspect pest management operations. (2)(4)(17)(33)</p> <p>Verify that MSDSs are available at: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - each pesticide storage and holding facility - each vehicle used to transfer pesticides. <p>(NOTE: Approved Korean pesticide labels are equivalent to MSDSs.)</p> <p>Verify that DD Form 1532-1 is used to account for daily applications of pesticides. (4)(17)(33)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Health Physician/Preventive Medicine Officer (4) Safety and Health Officer (5) Golf Course Maintenance (15) Land Management Officer (DEH) (16) Building and Grounds Division (DEH) (17) Entomology Shop (DEH) (22) Staff Judge Advocate (33) Golf Course Pesticide Shop

**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-33. DD Form 1532, Pest Management Report, must be submitted monthly or according to MACOM requirements (AR 420-76, para 4-4c(1), 4-4c(3) through 4-4c(5)).</p> <p>11-34. Installations must meet additional record keeping requirements (DODI 4150.7, para E.3.v(7) and Encl. 4, para 10).</p>	<p>Verify that DD Form 1532, which reports pest control operations and pesticide use, is prepared monthly. (2)(4)(17)</p> <p>Verify that the DD Form 1532 includes all installation pest control operations. (2)(4)(17)</p> <p>Verify that the DD Form 1532 records surveillance by (facilities engineer pest management personnel, the installation veterinarian, and PVNTMED officer). (2)(4)(17)</p> <p>Verify that a copy of DD Form 1532 is sent to: (2)(4)(17)</p> <ul style="list-style-type: none"> - MACOM PMC - Installation medical authority - U.S. Army Environmental Hygiene Agency (USAEHA). <p>Verify that records of all pest management operations performed on the installation are properly maintained and reported to the component pest management consultant. (4)(17)(33)</p> <p>Verify that the records:</p> <ul style="list-style-type: none"> - account for all shop operations and provide a historical record of pest management operations and pesticide applications for each building, structures, or outdoor site - include information on kinds, amounts, uses, dates, places of application, and applicators' names and certification numbers - include all pesticide application performed on the installation, including work done on golf courses by nonappropriated fund activities, by contract services, and as a part of leases and land management and forestry programs as well as the work performed by the installation pest management shop. <p>Verify that applications performed during military operations, excluding arthropod skin and clothing repellent, are recorded.</p> <p>Verify that DD Form 1532, Pest Management Report, or an equivalent computer product, is produced monthly using the DD Form 1532-1 information.</p> <p>Verify that these records are archived after 2 yr for permanent retention.</p> <p>(NOTE: Pesticides applied by installation personnel for their own relief are excluded from the recordkeeping requirements.)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-35. An Environmental Assessment (EA) must be prepared prior to the aerial application of a pesticide (AR 420-76, paras 3-10 and 4-4d).</p>	<p>Verify that an EA is prepared prior to the aerial application of a pesticide. (2)</p> <p>Verify that, if the EA shows it to be necessary, an Environmental Impact Statement is prepared prior to the aerial application of a pesticide. (2)</p> <p>Verify that the proposed aerial application of a pesticide is reported to HQDA(DAEN-ZCF-B) by 1 December preceding the period of planned application.</p>
<p>PEST CONTROL SHOP FACILITIES</p>	
<p>11-36. Pest control shop facilities and service vehicles must be provided with spill kits (MIL-HDBK 1028-8A, para 3.5.2.2, implementing USFK EGS 11-3f and 3i).</p>	<p>Verify that pest control shop facilities and service vehicles are provided with spill kits. (2)(17)(33)</p>
<p>11-37. Installations must include certain features in pest control shop facilities (MIL-HDBK 1028-8A, paras 3.1.3, 3.1.4.3, and 3.4.8, implementing USFK EGS 11-3f).</p>	<p>Verify that pest control shop facilities include at least the following: (2)(17)(33)</p> <ul style="list-style-type: none"> - clean areas (office, vestibule and airlock (where appropriate, given weather conditions), and mechanical and electrical spaces) - pesticide handling areas (storage and mixing rooms) - transitional areas (dressing area, shower and locker rooms, toilet, laundry and cleaning gear room) - an outdoor hardstand and parking apron for vehicles and equipment.
<p>11-38. Pest control shop facilities must have security fencing and gates (MIL-HDBK 1028-8A, para 3.4.6, implementing USFK EGS 11-3f).</p>	<p>Verify that a climb-resistant chain link fence prevents unauthorized entry. (2)(17)(33)</p> <p>(NOTE: The fence may be omitted if other security measures, such as bars or heavy-gauge wire mesh over the windows, are taken.)</p> <p>Verify that the fence is at least 7 ft (2.13 m) high, without top rail. (2)(17)(33)</p> <p>Verify that the fence fabric is twisted and barbed at the top and bottom. (2)(17)(33)</p> <p>Verify that security gates to the fence are kept locked. (2)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-39. Holding tanks are prohibited in new construction (MIL-HDBK 1028-8A, para 3.5.2.3, implementing USFK EGS 11-3f).</p> <p>11-40. Pest control shop facilities must be located in accordance with specific criteria (MIL-HDBK 1028-8A, para 3.4.1 and 3.4.2, implementing USFK EGS 11-3f).</p> <p>11-41. Pest control shop facilities must meet specific standards with regard to accessibility, grading, and parking (MIL-HDBK 1028-8A, para 3.4.3 through 3.4.5, implementing USFK EGS 11-3f).</p>	<p>Verify that the facility has no drainage to holding tanks. (2)(17)(33)</p> <p>Verify that pest control shop facilities are located away from congested areas. (2)(17)(33)</p> <p>Verify that new construction results in isolated, single-purpose structures. (2)(17)(33)</p> <p>Verify that pest control shop facilities are located a minimum of 200 ft (61 m) from surface water, existing wells and cisterns, and 100-yr flood plains. (2)(17)(33)</p> <p>Verify that the facility is located downhill from the above sensitive areas. (2)(17)(33)</p> <p>(NOTE: Diking must be provided if space is limited.)</p> <p>Verify that the facility is not located uphill from potable water sources or continuously occupied structures. (2)(17)(33)</p> <p>(NOTE: Facilities should not be located over aquifers (subsurface potable water supplies), unless the aquifer is adequately protected through containment measures.)</p> <p>Verify that the facility is located at least 100 ft (30.4 m) from other structures.</p> <p>Verify that vehicles carrying supplies or pulling trailer-mounted dispersal equipment have access to the facility. (2)(17)(33)</p> <p>Verify that the facility is accessible to vehicles and pedestrians on at least two sides. (2)(17)(33)</p> <p>Verify that runoff from fire-fighting is prevented from reaching ponds, lakes, streams, or rivers. (2)(17)(33)</p> <p>(NOTE: Diking, if provided, is recommended for large pest control shop facilities only.)</p> <p>Verify that there is adequate space to park all pesticide dispersal equipment inside the pest management area, under cover. (2)(17)(33)</p> <p>Verify that the part of the compound used for travel and vehicle parking is covered with gravel or paved. (2)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-41. (continued)</p>	<p>Verify that employee parking, if provided, is located outside the security fence or perimeter. (2)(17)(33)</p>
<p>11-42. The arrangement of spaces in pest control shop facilities must meet specific requirements (MIL-HDBK 1028-8A, para 3.1.3 and 3.1.4.3, implementing USFK EGS 11-3f).</p>	<p>Verify that arrangement of spaces allows workers to arrive in a clean area, dress for hazardous exposure in the change area, leave through a pesticide area doorway, and retrace that path at the end of the workday. (2)(17)(33)</p> <p>Verify that there is no direct access between the office and the pesticide storage and mixing areas. (2)(17)(33)</p> <p>Verify that doorways are arranged so that no pesticide need be carried through clean areas. (2)(17)(33)</p> <p>Verify that the mixing room is located adjacent to the storage area and the equipment storage area (if indoors). (2)(17)(33)</p> <p>Verify that the mixing room is accessible through the corridor to the shower and locker rooms and the exterior. (2)(17)(33)</p>
<p>11-43. Installations must meet specific requirements with regard to the foundations, floor slabs, and floor finishes in pest control shop facilities (MIL-HDBK 1028-8A, para 3.1.5.1, implementing USFK EGS 11-3f).</p>	<p>Verify that there are no floor drains in the interior pesticide areas. (2)(17)(33)</p> <p>Verify that, in areas where pesticides are handled or stored, floors slope (3/100) from sills to the center. (2)(17)(33)</p> <p>Verify that, if the floor does not slope, a 4 in. (102 mm) concrete curb is provided in the pesticide areas. (2)(17)(33)</p> <p>Verify that exterior slabs slope to a sump with a closeable drain located not more than 6 ft (1.829 m) from the outer margin of the washstand. (2)(17)(33)</p> <p>Verify that exterior ramps slope downward from exterior flat (flushed) door sills. (2)(17)(33)</p> <p>(NOTE: The intent of these provisions is to provide containment for at least 110 percent of the capacity of the largest bulk liquid pesticide container anticipated for the facility.)</p> <p>Verify that no utility, heating, or ventilation ducting is located in or below slabs. (2)(17)(33)</p> <p>Verify that pesticide concentrates and finished (formulated) materials are prevented from entering the sanitary or storm sewer systems. (2)(17)(33)</p> <p>Verify that concrete floors are finished with a nonabsorbent nonskid finish. (2)(17)(33)</p> <p>(NOTE: Change rooms and office floors may be tiled.)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-43. (continued)</p> <p>11-44. Installations must meet specific requirements with regard to the exterior walls of pest control shop facilities (MIL-HDBK 1028-8A, para 3.1.5.2, implementing USFK EGS 11-3f).</p> <p>11-45. Installations must meet specific requirements with regard to the doors and windows in pest control shop facilities (MIL-HDBK 1028-A, para 3.1.5.3, implementing USFK EGS 11-3f).</p>	<p>Verify that the floors in both the storage and mixing areas are covered with nonskid epoxy sealant or are otherwise made impermeable. (2)(17)(33)</p> <p>Verify that exterior walls are constructed of metal, concrete, or masonry. (2)(17)(33)</p> <p>Verify that the interior surfaces of exterior walls are constructed of metal, coated concrete, or masonry. (2)(17)(33)</p> <p>Verify that no porous surface finishes are used. (2)(17)(33)</p> <p>Verify that exterior doors are self-locking and self-closing with weather stripping. (2)(17)(33)</p> <p>Verify that doors have locks that prevent unauthorized entry. (2)(17)(33)</p> <p>Verify that flat (flush) sills are provided for all doors between the mixing and storage areas. (2)(17)(33)</p> <p>Verify that the facility has a 9 x 9 ft (2.74 x 2.74 m) overhead garage door with weather stripping. (2)(17)(33)</p> <p>(NOTE: Higher doors may be necessary to accommodate high-mast equipment.)</p> <p>Verify that, if the garage is separate from the pesticide mixing and storage areas, a flat (flush) sill is provided for the garage doorway. (2)(17)(33)</p> <p>Verify that, if the garage is not separate from the pesticide mixing and storage areas, a ramp to a 4 in. (104 mm) high sill is provided. (2)(17)(33)</p> <p>Verify that there is a slope away from the exterior of the door to prevent rain water from entering the facility. (2)(17)(33)</p> <p>Verify that the pest control shop facility has nonporous framed windows that are double glazed, where appropriate, with a thermal barrier feature. (2)(17)(33)</p> <p>Verify that, if the facility is not surrounded by a climb-resistant chain link fence and security gates, it has interior security mess windows. (2)(17)(33)</p> <p>(NOTE: It is permissible to have no windows as an alternative.)</p> <p>Verify that drop ceilings are not used in pesticide areas. (2)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-46. A fire extinguisher must be provided by the door between the storage and mixing areas (MIL-HDBK 1028-8A, para 3.7.1, implementing USFK EGS 11-3f).</p>	<p>Verify that a fire extinguisher is located by the door between the storage and mixing areas. (2)(17)(33)</p>
<p>11-47. Drains from pesticide mixing areas must not be connected to septic systems, sanitary sewer, or stormwater system (MIL-HDBK 1028-8A, para 3.5.2.5, implementing USFK EGS 11-3f).</p>	<p>Verify that no pesticide mixing area is connected to septic systems, sanitary sewer, or stormwater system. (2)(17)(33)</p>
<p>11-48. Pest control shop areas must have backflow prevention devices (MIL-HDBK 1028-8A, para 3.5.2.10 and 3.5.2.11, implementing USFK EGS 11-3f).</p>	<p>Verify that reduced pressure backflow prevention devices are installed on plumbing that provides a source of water for filling pesticide dispersal equipment tanks. (2)(17)(33)</p> <p>Verify that permanent hose bibs (overhead filling pipes) have a discharge hose and an approved backflow prevention device. (2)(17)(33)</p> <p>(NOTE: The requirement as to hose bibs applies to outdoor washdown areas of medium and large facilities.)</p>
<p>11-49. Mixing and storage areas must have a ventilation system separate from that in the rest of the facility (MIL-HDBK 1028-8A, para 3.5.4.2, implementing USFK EGS 11-3f).</p>	<p>Verify that mixing and storage areas have a ventilation system separate from that in the rest of the facility. (2)(17)(33)</p> <p>Verify that the system is provided with a roof-mounted, centrifugal fan system selected for a minimum of six air changes per hour. (2)(17)(33)</p> <p>Verify that fans discharge vertically. (2)(17)(33)</p> <p>Verify that replacement air is heated to 55 °F (13 °C). (2)(17)(33)</p> <p>Verify that the ventilation system has a control switch with a light to indicate ON at the entrance to the pesticide handling areas. (2)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-56. Herbicides and insecticides must be stored separately in order to avoid cross contamination or adverse reactions (USFK EGS 11-3j).</p> <p>11-57. Installations must meet specific requirements with regard to pesticide storage (AR 420-76, para 4-1b(2)).</p> <p>11-58. Indoor storage areas for pesticides must meet specific requirements (MIL-HDBK 1028-8A, para 3.1.4.1.2, implementing USFK EGS 11-3i).</p>	<p>Verify that herbicides and insecticides are stored separately in order to maintain sufficiently safe segregation. (2)(4)(17)(33)</p> <p>Verify that the storage facility uses 4 ft [≈122 cm] aisles to separate herbicides and insecticides. (2)(4)(17)(33)</p> <p>Verify that pesticide containers are stored in well-ventilated, dry storage areas. (2)(4)(17)(33)</p> <p>Verify that pesticide containers are protected from freezing temperatures and direct sunlight. (2)(4)(17)(33)</p> <p>Verify that rigid containers are stored in an upright position. (2)(4)(17)(33)</p> <p>Verify that all containers are stored off the ground with labels plainly visible to permit ready access and inspection. (2)(4)(17)(33)</p> <p>Verify that herbicides and insecticides are stored separately, with the use of 4 ft [≈122 cm] aisles, in order to avoid cross-contamination or adverse reactions. (2)(4)(17)(33)</p> <p>Verify that pesticides are stored in an area sealed or separated from clean areas, with direct access to the exterior. (2)(4)(17)(33)</p> <p>Verify that pesticides are stored in such a way that: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - they are off the floor, with all labels visible - they are stored no more than 8 ft (2.44 m) high. <p>Verify that lanes are present to provide effective access and inspection. (2)(4)(17)(33)</p> <p>Verify that pesticides are stored in a dry building in which a temperature is maintained that is above 50 °F (12 °C) and below 100° F (38° C). (2)(4)(17)(33)</p> <p>Verify that pesticides are stored separated from the following areas: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - mixing areas - shower and locker room - offices - any area where personnel work for prolonged periods. <p>Verify that no pesticide concentrates are stored in a room containing a floor drain of any type. (2)(4)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-58. (continued)</p> <p>11-59. Certain chemicals must be stored outside of occupied buildings (MIL-HDBK 1028-8A, para 3.1.4.1.4, implementing USFK EGS 11-3i).</p> <p>11-60. Outdoor storage areas for pesticides must meet specific requirements (MIL-HDBK 1028-8A, para 3.1.4.1.4, implementing USFK EGS 11-3f and 11-3i).</p> <p>11-61. Motor vehicles may not be stored in the same areas as pesticides (MIL-HDBK 1028-8A, para 3.1.4.1.3, implementing USFK EGS 11-3i).</p> <p>11-62. Mixing rooms must meet specific requirements (MIL-HDBK 1028-8A, para 3.1.4.2, implementing USFK EGS 11-3f).</p>	<p>Verify that storage and mixing areas have containment provided either by curbing or sloped floors. (2)(4)(17)(33)</p> <p>Verify that all liquid fumigants are stored outside of occupied buildings in hazardous chemical lockers. (2)(4)(17)(33)</p> <p>Verify that toxic or flammable pesticides are stored on the ground floor of unoccupied buildings. (2)(4)(17)(33)</p> <p>Verify that outdoor storage areas for pesticides are: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - secured and under cover - protected from radiant heating, freezing temperatures, and moisture. <p>Verify that no motor vehicles are stored in the same area as pesticides. (2)(4)(17)(33)</p> <p>(NOTE: Wherever possible, vehicles are to be located outside or in a separate building from the pesticide storage or handling area.)</p> <p>Verify that, where motor vehicles are located under the same roof as the pesticide area, they are separated from the pesticide area by a minimum of 2-h fire rated construction. (2)(4)(17)(33)</p> <p>Verify that mixing rooms have electricity and hot and cold water. (2)(4)(17)(33)</p> <p>Verify that mixing rooms have metal or plastic shelves to hold pesticides off the floor. (2)(4)(17)(33)</p> <p>(NOTE: Plastic is preferred for the pallets, and steel stands are recommended for keeping drums off the floor.)</p> <p>Verify that no wooden pallets are in use. (2)(4)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-62. (continued)</p>	<p>Verify that the work area contains a pesticide-resistant sink equipped with the following: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - a closeable drain - a contiguous self-draining drip-proof counter top at least 5 ft (1.524 m) long - sideboards - splash panel on back - an adjacent shelf for holding measuring devices and concentrates.
<p>11-63. Leaking pesticide containers must be handled in accordance with specific requirements (AR 420-76, para 4-1b(2) and 4-2(c)).</p>	<p>Verify that pesticides in deteriorated or leaking containers are recontainerized or overpacked in approved containers. (4)(17)(33)</p> <p>Verify that pesticides that are recontainerized or overpacked for turn-in to Defense Reutilization and Marketing Office (DRMO) are in containers that meet Department of Transportation (DOT) specifications. (4)(17)(33)</p> <p>Verify that new containers or overpacks of repackaged pesticide turned in to DRMO are labeled with the following information: (4)(17)(33)</p> <ul style="list-style-type: none"> - NSN--REPACKAGED, if applicable - nomenclature and percent active ingredient - type and quantity of rinse solution or contamination, if applicable - total quantity in gallons (liquids) or pounds (solids) - date repackaged (month/year) - the phrase FOR DISPOSAL ONLY.
<p>11-64. A pesticide spill cleanup kit must be strategically located where pesticides are stored and mixed (AR 420-76, para 4-1e(1)).</p>	<p>Verify, that a pesticide spill cleanup kit is available to cleanup and detoxify spills in the pesticide storage facility. (4)(17)(33)</p>
<p>11-65. Suitable facilities for emergency decontamination should be available for immediate emergency use within the pesticide storage/mixing facility (MP).</p>	<p>Verify that an emergency shower and eye wash are present in the pesticide storage facility. (4)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-66. A changing room should be provided for pest control personnel to change into protective clothing (MP).</p> <p>11-67. Empty pesticide containers must be handled in accordance with specific requirements (AR 420-76, para 4-2d and AR 40-5, para 10-5c).</p>	<p>Verify that the pest control facility has a changing room. (4)(17)(33)</p> <p>Verify that adequate personnel locker space is provided (one to contain clean protective clothing and personnel clothing and another for contaminated clothing). (4)(17)(33)</p> <p>Verify that a hot water shower is available for personnel to use at the end of the duty day. (4)(17)(33)</p> <p>Verify that toilet facilities are available. (4)(17)(33)</p> <p>Verify that empty containers containing small amounts (1 in. [2.54 cm] or less) of liquid pesticide are drained for 1 minute into the spray tank. (4)(17)(33)</p> <p>Verify that drained containers are triple rinsed, each time using a volume of appropriate diluent equal to approximately 10 percent of the container capacity. (4)(17)(33)</p> <p>Verify that the rinse liquid is either used as a diluent for future pesticide use or disposed of as a pesticide-related waste. (4)(17)(33)</p> <p>Verify that empty and rinsed pesticide containers are not reused for any purpose. (4)(17)(33)</p> <p>Verify that empty and rinsed pesticide containers are: (4)(17)(33)</p> <ul style="list-style-type: none"> - recycled through a registered drum reconditioner - returned through DRMO to the pesticide manufacturer or formulator for refilling with the same class of pesticide - recycled as scrap metal through a metal reclaiming company, or - crushed or otherwise rendered unusable and buried in a sanitary landfill in accordance with relevant requirements.
<p>HIGHLY AND MODERATELY TOXIC PESTICIDES</p>	
<p>11-68. Installations should consider installing an environmental monitoring system in the vicinity of pesticide storage facilities under certain conditions (AR 420-76, para 4-1b(1)).</p>	<p>Verify that the installation has considered providing monitoring systems when appropriate. (4)(17)(33)</p> <p>(NOTE: Monitoring systems are particularly appropriate when there is no spill management system and when the facility handles large quantities of pesticides and is located near a sensitive area.)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-69. Storage facilities for pesticides and excess pesticides that are classed as highly toxic or moderately toxic and that must be labeled DANGER, POISON, WARNING, or with the skull and crossbones must meet specific requirements (AR 420-76, para 4-1b(1)).</p>	<p>Verify that the site location, where possible, is in an area where flooding is unlikely and where hydrogeological conditions prevent contamination of any water system by runoff or percolation. (4)(17)(33)</p> <p>(NOTE: The following may be considered:</p> <ul style="list-style-type: none"> - proximity to surface water and to sanitary wastewater or stormwater systems - location relative to floodplains, depth of groundwater, and general soil types and typical permeabilities.) <p>Verify that storage is in a dry, separate room, building, or covered area where fire protection is provided. (4)(17)(33)</p> <p>Verify that: (4)(17)(33)</p> <ul style="list-style-type: none"> - all containers are in good condition - the lids and bungs on metal or rigid plastic containers are tight - the pesticides are segregated, and if practicable, stored under a sign containing the name of the formulation. <p>Verify that containers are regularly inspected for corrosion and leaks and that absorbent material is available for spill cleanup. (4)(17)(33)</p> <p>Verify that excess pesticides and containers are segregated. (4)(17)(33)</p>
<p>11-70. Personnel in storage/usage facilities for pesticides classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol, should follow specific practices and procedures to ensure safety (AR 420-76, para 4-1b(1)).</p>	<p>Verify that no food consumption, drinking, smoking, or tobacco use is undertaken in any area where pesticides are present. (4)(17)(33)</p> <p>Verify that the following practices are part of pest management operations: (4)(17)(33)</p> <ul style="list-style-type: none"> - people handling pesticides keep hands away from mouths and eyes and wear rubber gloves during all pesticide handling - people handling pesticides wash hands immediately upon completion of working with pesticides and always prior to eating, smoking, or using toilet facilities - inspections are made once a month to determine if any pesticide containers are leaking - pesticide containers are inspected for leakage prior to handling.

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-71. Decontamination facilities are required for personnel and equipment at installations using pesticides classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol (AR 420-76, para 4-1b(1)).</p> <p>11-72. Installations must post signs and safety procedures in pesticide storage facilities and equipment that contain or use pesticides classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol (AR 420-76, para 4-1b(1) and 4-1b(3)).</p> <p>11-73. Installations must notify the local fire department, hospitals, public health officials, and police department in writing that pesticides are being stored (AR 420-76, para 4-1b(1)).</p>	<p>Verify that facilities are available for personnel decontamination. (4)(17)(33)</p> <p>Verify that facilities are available for the decontamination of equipment, including vehicles that have been used for pesticide applications. (4)(17)(33)</p> <p>Verify that berms, curbing, impervious surfaces, and catchment drains that are used to impound washwater resulting from decontamination do not allow leakage. (4)(17)(33)</p> <p>Verify that drains that impound wash water do not connect to sanitary sewer or stormwater systems. (4)(17)(33)</p> <p>Verify that the procedure for disposal of washwater resulting from decontamination activities is the same as for excess pesticides. (4)(17)(33)</p> <p>Verify that signs reading DANGER, POISON, and PESTICIDE STORAGE are posted on or near entries to storage facilities. (4)(17)(33)</p> <p>Verify that safety precautions and accident prevention measures are posted. (4)(17)(33)</p> <p>Verify that an inventory of pesticides is displayed outside of the storage facility, identifying all chemicals in storage. (4)(17)(33)</p> <p>Verify that all items of moveable equipment used for handling pesticides is labeled: (4)(17)(33)</p> <p align="center">CONTAMINATED WITH PESTICIDES.</p> <p>Verify that notification has been submitted and includes a statement of the hazards that pesticides may present during a fire. (4)(17)</p> <p>Verify that a floor plan of the storage facility, indicating the location of the different pesticide classifications, has been submitted to the fire department. (4)(17)</p> <p>Verify that the fire chief has the home telephone numbers of the person(s) responsible for the pesticide storage facility. (4)(17)</p> <p>(NOTE: These requirements apply where large quantities of pesticides classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol are being stored, or where other conditions warrant.)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-74. Pre-fire plans for pesticide storage areas must be updated annually (AR 420-76, para 4-1f).</p> <p>11-75. Certain precautions should be taken in the event of a fire at a pesticide storage area where pesticides are classed as highly toxic or moderately toxic and labeled DANGER, POISON, WARNING, or with the skull and crossbones symbol (MP).</p> <p>PESTICIDE WASTE DISPOSAL</p> <p>11-76. Installations must dispose of any pesticides, pesticide containers, or pesticide container residues in accordance with specific restrictions (AR 420-76, para 4-2a(2)).</p> <p>11-77. Disposal must be initiated for all excess pesticides (USFK EGS 11-3L through 3n; DOD 4160.21M, para VI(B)(77); and AR 420-76, para 4-2b(1)).</p>	<p>Verify that the pesticide management coordinator has a pre-fire plan and that it is updated annually. (4)(17)</p> <p>Verify, by interviewing the fire chief, that the following precautions are taken: (4)(17)</p> <ul style="list-style-type: none"> - fire fighting personnel wear supplied air suits and rubberized clothing - personnel avoid breathing or otherwise contacting toxic smoke and fumes - personnel wash completely as soon as possible after encountering smoke and fumes - water used in fire fighting is contained within the storage site drainage system - individuals who might be threatened by the fumes/smoke are evacuated - firemen take cholinesterase tests after fighting fires involving organophosphate or N-alkyl carbamate pesticides. <p>Verify that no pesticides, pesticide containers, or pesticide container residues are disposed of in a manner inconsistent with their labels. (2)(4)(17)(33)</p> <p>Verify that no pesticides, pesticide containers, and pesticide container residues are disposed of in such a way as to cause: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - open dumping - open burning - water dumping or ocean dumping - direct exposure that may result in contamination of food or feed supplies - violation of any applicable pollution control standard. <p>Verify that the installation does not store or turn in any pesticide or pesticide-related waste generated by the civilian community. (2)(4)(17)(33)</p> <p>Verify that, unless otherwise restricted or cancelled, all properly identified excess serviceable pesticides are redistributed within the supply system. (2)(4)(17)(33)</p> <p>(NOTE: The best method for disposal of excess pesticides, if not restricted by a suspension or cancellation notice, is to use them in accordance with label directions.)</p> <p>Verify that unserviceable excess pesticides are turned in to the local DRMO for disposal. (2)(4)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-77. (continued)</p>	<p>Verify that pesticide wastes generated from pesticide spills or improper mixes are considered for hazardous characteristics. (2)(4)(17)(33)</p> <p>Verify that such wastes or mixtures which exhibit hazardous characteristics are disposed of in accordance with the provisions of Section 6, <i>Hazardous Waste</i>. (2)(4)(17)(33)</p> <p>Verify that, if the pesticide waste is not a hazardous waste, it is disposed of in accordance with the label instructions and other provisions of Section 7, <i>Solid Waste</i>. (2)(4)(17)(33)</p>
<p>11-78. Installations must meet certain requirements before excess pesticides that cannot be used locally may be turned in to DRMO (AR 420-76, para 4-2b(5)).</p>	<p>Verify that excess pesticides that cannot be used locally are turned in to DRMO only if both of the following conditions are met: (2)(4)(17)(33)</p> <ul style="list-style-type: none"> - the container has a complete original USEPA-approved label on the container, and - the product has not deteriorated or been adulterated.
<p>11-79. Installations must meet certain requirements with regard to pesticides for turn-in that lack proper labels or whose composition has altered (AR 420-76, para 4-2b(5)).</p>	<p>Verify that pesticides for turn-in that lack proper labels or whose composition has altered are labeled FOR DISPOSAL ONLY. (2)(4)(17)(33)</p> <p>(NOTE: The generating activity is not authorized to modify existing pesticide labels of pesticides for turn-in or to affix any new, revised, or re-used labels to the container without the written permission of the pesticide manufacturer.)</p>
<p>11-80. Generating activities must notify DRMO in writing to arrange for a pre-inspection to ensure that the DRMO has proper storage facilities and adequate space (AR 420-76, para 4-2b(2) and 4-2b(4)).</p>	<p>Verify that the installation notifies DRMO in writing to arrange for a pre-inspection to ensure that the DRMO has proper storage facilities and adequate space. (2)(4)(17)(33)</p> <p>Verify that, if the receiving DRMO has a suitable storage facility for pesticides and space is available, the DRMO physically stores the property. (2)(4)(17)(33)</p> <p>Verify that, if the DRMO does not have suitable storage, the generating activity stores the property until disposition instructions are received from DRMO. (2)(4)(17)(33)</p> <p>Verify that, if neither the installation nor DRMO have conforming storage facilities, the activity with the most conforming storage stores the property. (2)(4)(17)(33)</p>

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**COMPLIANCE CATEGORY:
PESTICIDES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>11-81. Pesticides for turn-in must be in properly labeled containers that are not leaking and are able to withstand normal handling (AR 420-76, para 4-2b(3)).</p>	<p>Verify that pesticides for turn-in are in properly labeled containers that are not leaking and are able to withstand normal handling. (2)(4)(17)(33)</p>
<p>11-82. No concentrated pesticides may be discarded to the sanitary sewer or storm drain (MIL-HDBK 1028-8A, para 3.5.2.1, implementing USFK EGS 11-3f and 11-3i).</p>	<p>Verify that no concentrated pesticides are discarded to the sanitary sewer or storm drain. (2)(4)(17)(33)</p>

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Appendix 11-1

Restricted Use Pesticides

(40 CFR 152.175)

The following uses of pesticide products containing the active ingredients specified below have been classified for restricted use and are limited to use by or under the direct supervision of a certified applicator.

Active Ingredient	Formulation	Use Pattern	Classification ¹	Criteria Influencing Restriction
Acrolein	As sole active ingredient. No mixtures registered.	All uses	Restricted	Inhalation hazard to humans. Residue effects on avian species and aquatic organisms.
Aldicarb	As sole active ingredient.	Ornamental uses (indoor and outdoor)	do	Other hazards-accident history.
	No mixtures registered.	Agricultural crop uses	Under further evaluation	
Aluminum phosphide	As sole active ingredient. No mixtures registered.	do	do	Inhalation hazard to humans.
Azinphosmethyl	All liquids with a concentration greater than 13.5 percent.	do	do	do
	All other formulations.	do	Under further evaluation	
Carbofuran	All concrete suspensions and wettable powders 40 percent and greater.	do	do	Acute inhalation toxicity.
	All granular formulations.	Rice	Under evaluation	
	All granular and fertilizer formulations.	All uses except rice	do	
Chloropicrin	All formulations greater than 2 percent.	All uses	Restricted	Acute inhalation toxicity. Hazard to non-target organisms.
	All formulations.	Rodent control	Restricted	
	All formulations 2 percent and less.	Outdoor uses (other than rodent control)	Unclassified	

*do means same as above (previous row).

(continued)

Appendix 11-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification ¹	Criteria Influencing Restriction
Clonitralid	All wettable powders 70 percent and greater.	All uses	do	Acute inhalation toxicity.
	All granulars and wettable powders.	Molluscide uses	do	Effects on aquatic organisms.
	Pressurized sprays 0.55 percent and less.	Hospital antiseptics	Unclassified	
Dicrotophos	All liquid formulations 8 percent and greater.	All uses	Restricted	Acute dermal toxicity; residue effects on avian species (except for tree injections).
Disulfoton	All emulsifiable concentrates 65 percent and greater, all emulsifiable concentrates and concentrate solutions 21 percent and greater with fensulfothion 43 percent and greater, all emulsifiable concentrates 32 percent and greater in combination with 32 percent fensulfothion and greater.	do	Restricted	do Acute inhalation toxicity.
	Non-aqueous solution 95 percent and greater.	Commercial seed treatment	Restricted	Acute dermal toxicity.
	Granular formulations 10 percent and greater.	Indoor uses (greenhouse)	do	Acute inhalation toxicity.
Ethoprop	Emulsifiable concentrates 40 percent and greater.	do	do	Acute dermal toxicity.
	All granular and fertilizer formulations.	do	Under evaluation	

*do means same as above (previous row).

(continued)

Appendix 11-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification ¹	Criteria Influencing Restriction
Ethyl parathion	All granular and dust formulations greater than 2 percent fertilizer formulations, wettable powders, emulsifiable concentrates, concentrated suspensions, concentrated solutions.	do	Restricted	Inhalation hazard to humans. Acute dermal toxicity. Residue effects on mammalian, aquatic, avian species.
	Smoke fumigants.	do	do	Inhalation hazard to humans.
	Dust and granular formulations 2 percent and below.	do	do	Other hazards-accident history.
Fenamiphos	Emulsifiable concentrates 35 percent and greater.	do	do	Acute dermal toxicity.
Fonofos	Emulsifiable concentrates 44 percent and greater.	All uses	do	Acute dermal toxicity.
	Emulsifiable concentrates 12.6 percent and less with pebulate 50.3 percent and less.	Tobacco	Unclassified	
Methamidophos	Liquid formulations 40 percent and greater.	All uses	Restricted	Acute dermal toxicity; residue effects on avian species.
	Dust formulations 2.5 percent and greater.	All uses	Restricted	Residual effects on avian species.
Methidathion	All formulations.	All uses except stock safflower and sunflower	Restricted	Residue effects on avian species.
	All formulations.	Nursery stock, safflower, and sunflower	Unclassified	Residue effects on avian species.

*do means same as above (previous row).

(continued)

Appendix 11-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification ¹	Criteria Influencing Restriction
Methomyl	As sole active ingredient in 1 percent to 2.5 baits (except 1 percent fly bait).	Nondomestic outdoor agricultural crops, ornamental and turf. All other registered uses.	Restricted	Residue effects on mammalian species.
	All concentrated solution formulations.	do	do	Other hazards accident history.
	90 percent wettable powder formulations (not in water soluble bags).	do	do	do
	90 percent wettable powder formulation in water soluble bags.	do	Unclassified	
	All granular formulations.	do	do	
	25 percent wettable powder formulations.	do	do	
	In 1.24 percent to 2.5 percent dusts as sole active ingredient and in mixtures with fungicides and chlorinated hydrocarbon, inorganic phosphate and biological insecticides.	do	do	
Methylbromide	All formulations in containers greater than 1.5 lb.	All uses	Restricted	Other hazards accident history.
	Containers with not more than 1.5 lb of methyl bromide with 0.25 percent to chloropicrin as an indicator.	Single applications (nondomestic use) for soil treatment in closed systems	Unclassified	
	Containers with not more than 1.5 lb having no indicator.	All uses	Restricted	do

*do means same as above (previous row).

(continued)

Appendix 11-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification ¹	Criteria Influencing Restriction
Methyl parathion	All dust and granular formulations less than 5 percent.	do	do	Other hazards-accident history. All foliar applications restricted based on residue effects on mammalian and avian species.
	Microencapsulated. All dust and granular formulations 5 percent and greater and all wettable powders and liquids.	do	do	Residue effects on avian species. Hazard to bees. Acute dermal toxicity. Residue effects on mammalian and avian species.
Nicotine (alkaloid)	Liquid and dry formulations 14 percent and above.	Indoor (greenhouse)	Restricted	Acute inhalation toxicity.
	All formulations.	Applications to cranberries	Restricted	Effects on aquatic organisms.
	Liquid and dry formulations 1.5 percent and less.	All uses (domestic and nondomestic)	Unclassified	
Paraquat (dichloride) and paraquat bis(methylsulfate)	All formulations and concentrations except those listed below.	All uses	Restricted	Other hazards. Use and accident history, human toxicological data.
	Pressurized spray formulations containing 0.44 percent Paraquat bis(methylsulfate) and 15 percent petroleum distillates as active ingredients.	Spot weed and grass control	do	
	Liquid fertilizers containing concentrations of 0.025 percent paraquat dichloride and 0.03 percent atrazine; 0.03 percent paraquat dichloride and 0.37 percent atrazine, 0.04 percent paraquat dichloride and 0.49 percent atrazine.	All uses	Unclassified	

*do means same as above (previous row).

(continued)

Appendix 11-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification ¹	Criteria Influencing Restriction
Phorate	Liquid formulations 65 percent and greater.	do	Restricted	Acute dermal toxicity. Residue effects on avian species (applies to foliar applications only). Residue effects on mammalian species (applies to foliar application only).
	All granular formulations.	Rice	Restricted	Effects on aquatic organisms.
Phosphamidon	Liquid formulations 75 percent and greater.	do	do	Acute dermal toxicity. Residue effects on mammalian species. Residue effects on avian species.
	Dust formulations 1.5 percent and greater.	do	do	Residue effects on mammalian species.
Picloram	All formulations and concentrations except tordon 101R.	do	do	Hazard to nontarget organisms (specifically nontarget plants both crop and non-crop).
	Tordon 101 R forestry herbicide containing 5.4 percent picloram and 20.9 percent 2, 4-D.	Control of unwanted trees by cut surface treatment	Unclassified	
Sodium cyanide ³	All capsules and ball formulations.	All uses	Restricted	Inhalation hazard to humans.
Sodium fluoroacetate	All solutions and dry baits.	do	do	Acute oral toxicity. Hazard to nontarget organisms. Use and accident history.

*do means same as above (previous row).

(continued)

Appendix 11-1 (continued)

Active Ingredient	Formulation	Use Pattern	Classification ¹	Criteria Influencing Restriction
Strychnine	All dry baits pellets and powder formulations greater than 0.5 percent.	do	do	Acute oral toxicity. Hazard to nontarget avian species. Use and accident history.
	All dry baits pellets and powder formulations.	All uses calling for burrow builders	do	Hazard to nontarget organisms.
	All dry baits, and pellets, and powder formulations 0.5 percent and below.	All uses except subsoil	do	do
	do	All subsoil uses	Unclassified	do
Sulfotepp	Sprays and smoke generators.	All uses	Restricted	Inhalation hazard to humans.
Zinc Phosphide	All formulations 2 percent and less.	All domestic uses and nondomestic uses in and around buildings	Unclassified	Acute inhalation toxicity. Hazard to nontarget organisms. Acute oral toxicity.
	All dry formulations 60 percent and greater.	All uses	Restricted	
	All bait formulations.	Nondomestic outdoor uses (other than around buildings)	Restricted	
	All dry formulations 10 percent and greater.	Domestic uses.	Restricted	

*do means same as above (previous row).

NOTES:

- ¹ "Under evaluation" means no classification decision has been made and the use/formulation in question is still under active review within the USEPA.
- ² Percentages given are the total of dioxathion plus related compounds.
- ³ M-44 sodium cyanide capsules may only be used by certified applicators who have also taken the required additional training.

The provisions are effective as of 8 August 1995.

Appendix 11-2

Requirements for Installation Pest Management Program

(AR 420-76, Table 3-1)

Pest Control Recognized Requirements man-years*	Minimum No. of Certified Full-time Pesticide Applicators Required	Installation Pest Management Plan	Onsite Program Review
Less than 0.25	None unless restricted use pesticides are used or unusually sensitive environmental conditions exist including endangered species	Individual plan not required; included in supporting installation plan	Requirements established by MACOM PMC
0.25 to 0.49	One	Same as above	Same as above
0.50 to 1.49	One	Individual pest management plans required	Annual or biennial
1.50 to 3.99	Two	Same as above	Same as above
4.00 or More	50 percent of the pest management workforce	Same as above	Same as above

* Multiply the total productive man-years required for the pest management program by a factor of 1.19 to determine the recognized requirement. This factor includes essential time allowance for annual and sick leave, on-the-job training, formal training, mandatory attendance at lectures on safety, security, and fire prevention, and required medical examination.

INSTALLATION:	COMPLIANCE CATEGORY: PESTICIDES Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 12

HISTORIC AND CULTURAL RESOURCES

Korea ECAS

SECTION 12

HISTORIC AND CULTURAL RESOURCES

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to any military community with cultural resources, which includes historic and pre-historic properties. Plans and programs for the protection and management of cultural resources are also included.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 12 contains criteria for required plans and programs needed for the protection and management of cultural resources (including historic and prehistoric properties) located within the U.S. Forces Korea (USFK) territories and listed on the Korea or World Heritage List. The purpose is to preserve and protect buildings, structures, sites, and objects of historical, architectural, archaeological, or cultural value on USFK-controlled property and in maneuver rights areas. Specifically, this section advises on the issues of orders for restriction or prohibition of certain actions, for the establishment of specified cultural properties, for excavation of buried cultural properties, etc.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, states the Army policy to conserve, protect, restore, and enhance cultural resources outside the continental United States.
- AR 420-40, *Historic Preservation*, 15 May 1984, provides policy and regulatory guidance on historic preservation. It states that outside of the United States, "Department of the Army activities will comply with:
 1. historic preservation requirements of the host nation
 2. international and Status of Forces Agreements
 - 3 requirements for *National Historic Preservation Act (NHPA)* protection of properties on the World Heritage List."

Therefore, while the standards outlined in AR 420-40 are treated as good Management Practices (MPs) for Outside Continental United States (OCONUS) installations, the compliance procedures are not applicable OCONUS.

- *The National Historic Preservation Act of 1966*, (16 U.S. Code 470a-2) requires Installation Commanders to inform the Secretary of the Army of property listed on the host nation's equivalent of the U.S. National Register prior to approval of any Federal undertaking that may directly and adversely affect such property.

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH) is responsible for supervising, controlling, and managing installation historic preservation programs.
- The Installation Historic Preservation Officer is responsible for implementing the historic preservation program, training installation personnel, and locating, inventorying, and evaluating installation cultural resources.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Action* - all activities or programs of any kind authorized, funded, or carried out, in whole or in part, on USFK-controlled installations (USFK EGS, Chapter 12, Definitions).
- *Adverse Effect* - changes that diminish the quality or significant value of archeological resources, or cultural resources or properties (USFK EGS, Chapters 12, Definitions).
- *Archaeological Resource* - any material remains of prehistoric or historic human life or activities. Such resources include, but are not limited to: pottery, basketry, bottles, weapons, weapon projectiles, tools, structures or portions of structures, pit houses, rock paintings, rock carvings, intaglios, graves, human skeletal materials, or any portion of any of the forgoing items (USFK EGS, Chapter 12, Definitions).
- *Building* - a structure created to shelter any form of human activity, such as a house, barn, church, hotel, or similar structure. Building may refer to a historically related complex, such as a courthouse and jail or a house and barn.
- *Buried Cultural Property* - a cultural property that was buried or discovered under the land, on the sea bottom, or at a construction site (USFK EGS, Chapter 12, Definitions).
- *Cultural Mitigation* - specific steps designed to lessen the adverse effects of a USFK action on a cultural or archeological resource, including (USFK EGS, Chapter 12, Definitions):
 1. limiting the magnitude of the action
 2. relocating the action in whole or in part
 3. repairing, rehabilitating, or restoring the affected property
 4. recovering and recording data from cultural properties that may be destroyed or substantially altered.
- *Cultural Properties* - any of the following (USFK EGS, Chapter 12, Definitions):
 1. Tangible cultural properties: buildings, classical books, calligraphic ancient documents, painting, sculptures, industrial art objects, etc. and other tangible cultural products that possess high historical or artistic value and other archaeological specimens which belong to the categories above
 2. Monuments: shell-mound, ancient tombs, castle sites, palace sites, pottery remains, layers containing remains, etc. and other sites of historical remains that possess high historical or scientific value, scenic beauties that possess high artistic or ornamental values and animals (including

places of habitat, breeding, and migration), plants (including habitat), minerals and caves that have high scientific value.

- *Cultural Resources Program* - identification, evaluation, documentation, curation, acquisition, protection, rehabilitation, restoration, management, stabilization, maintenance, recording, and reconstruction of cultural resources and any combination of the foregoing (USFK EGS, Chapter 12, Definitions).
- *Designated Cultural Properties* - any of the following (USFK EGS, Chapter 12, Definitions):
 1. National designated cultural properties: cultural properties that are designated by the Minister of Culture; and
 2. City/Province designated cultural properties: cultural properties that are not national designated cultural properties but are deemed worthy of preservation and that are designated by the various mayors and governors within their respective property jurisdictions.
- *Historic Preservation* - identification, evaluation, documentation, curation, acquisition, protection, rehabilitation, restoration, management, stabilization, maintenance, recording, and reconstruction of cultural resources, and any combination of the foregoing.
- *Inventory* - to determine the location of cultural resources that may have world, national, or local significance (USFK EGS, Chapter 12, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Material Remains* - physical evidence of human habitation, occupation, use, or activity, including the site, loci, or context in which such evidence is situated, including:
 1. surface or subsurface structures
 2. surface or subsurface artifact concentrations or scatters
 3. whole or fragmentary tools, implements, containers, weapons, clothing, and ornaments
 4. by-products, waste products, or debris resulting from manufacture or use
 5. organic waste
 6. human remains
 7. rock carvings, rock paintings, and intaglios
 8. rock shelters and caves
 9. all portions of shipwrecks
 10. any portion or pieces of any of the foregoing.
- *National Treasure* - tangible cultural properties chosen from among the "Treasures" by the Minister of Culture after consultation with the Cultural Properties Committee. National treasures are rare and of great human cultural value (USFK EGS, Chapter 12, Definitions).
- *Preservation* - the act or process of applying measures to sustain the existing form, integrity, and material of a building or structure and the existing form and vegetative cover of a site. It may include initial stabilization work where necessary, as well as ongoing maintenance of the historic building materials (USFK EGS, Chapter 12, Definitions).
- *Property* - a site, building, object, structure, or collection of such items (USFK EGS, Chapter 12, Definitions).

- *Protection* - the act or process of applying measures designed to affect the physical condition of a property by safeguarding it from deterioration, loss, attack, or alteration, or to cover or shield the property from danger or injury. In the case of buildings and structures, such treatment is generally temporary and anticipates future historic preservation treatment; in the case of archaeological sites, the protective measure may be temporary or permanent (USFK EGS, Chapter 12, Definitions).
- *Restoration* - the act or process of accurately recovering the form and details of property and its setting, as it appeared at a particular period of time, by means of the removal of later work or by the replacement of missing earlier work.
- *Treasure* - an especially important tangible cultural property as designated by the Minister of Culture after consultation by the Cultural Properties Committee (USFK EGS, Chapter 12, Definitions).
- *Undertaking* - any project, activity, or program that can result in changes in the character or use of cultural resources if any such resources are located in the area of potential effects.

HISTORIC AND CULTURAL RESOURCES

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	12-1	(1)(2)(21)
Historic and Cultural Properties	12-24 through 12-9	(1)(2)(12)
Curation Activities	12-10 and 12-11	(1)(2)(12)

(a) CONTACT/LOCATION CODE:

- (1) Directorate Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (12) Director of Plans, Training, Mobilization, and Security (DPTMSEC)
- (21) Public Affairs Office (PAO)
- (22) Staff Judge Advocate (SJA)



HISTORIC AND CULTURAL RESOURCES

Records to Review

- For construction (including maintenance, demolition, rehabilitation, etc.) activities, documentation of finding of no adverse effect, finding of adverse effect, or Memoranda of Agreement with appropriate host nation authorities.
- Installation Master Plan
- Historic Preservation Plan
- Standing Operating Procedures for ensuring compliance
- Curation inventories and bailment agreements
- Archaeological site forms and maps
- Cultural resources reports, contracts, and scopes of work

Physical Features to Inspect

- Sites of historic or archaeological interest (designation, protection, and interpretation)
- Repositories of archaeological records and collections
- Buildings and structures of potential historical significance

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Director of Plans, Training, Mobilization, and Security (DPTMSEC)
- Public Affairs Office (PAO)
- Staff Judge Advocate (SJA)



**COMPLIANCE CATEGORY:
HISTORIC AND CULTURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>12-1. Copies of all relevant DOD directive/instruction, ARs, and guidance documents on historic and cultural resources should be maintained at the installation (MP).</p> <p>HISTORIC AND CULTURAL PROPERTIES</p> <p>12-2. Installations must inventory cultural property and resources in areas under USFK control, if financially and otherwise practical (USFK EGS 12-3b and 12-3f, and AR 200-1, para 14-7a.).</p> <p>12-3. Installations must ensure that planning for major actions includes consideration of possible effects on cultural or archaeological property or resources (USFK EGS 12-3i and AR 200-1, para 14-7b).</p>	<p>Verify that the following documents are maintained and kept current at the installation: (1)(2)(21)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 420-40, <i>Historic Preservation</i>, 15 May 1984 - AR 870-20, <i>Museums and Historical Artifacts</i>, 9 February 1987. <p>Verify that, if financially and otherwise practical, the installation inventories cultural property and resources in areas under USFK control. (1)(2)</p> <p>(NOTE: The cultural inventory can be developed from a records search and visual survey.)</p> <p>Verify that, if financially and otherwise practical, the installation inventories archaeological resources in areas under USFK control. (1)(2)</p> <p>(NOTE: The requirement in AR 200-1 to identify cultural resources which require special protection efforts is not accompanied by any qualification with regard to practicality. Thus, if the installation can demonstrate that funds have been requested via the Environmental Program Requirements report and subsequently denied and provide in addition a documented command decision regarding the impracticality of an inventory, then there is no Class I finding; however, a Class III finding does exist.)</p> <p>Verify that the installation's planning for major actions includes consideration of possible effects on cultural or archaeological property or resources. (1)(2)</p>

(1) Directorate Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (12) Director of Plans, Training, Mobilization, and Security (DPTMSEC) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
HISTORIC AND CULTURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>12-4. Installation Commanders have specific responsibilities with regard to properties on the host nation's equivalent of the United States' National Register (16 U.S. Code (USC) 470a-2, Section 402).</p>	<p>Determine whether any Federal undertaking may directly and adversely affect a property that is on the host nation's equivalent of the United States' National Register.</p> <p>Verify that the Installation Commander informs the Secretary of the Army of such property.</p> <p>(NOTE: This notification is to be made so that the Secretary of the Army may take into account the effect of the undertaking on such property for purposes of avoiding or mitigating any adverse effects.)</p> <p>Verify that the Installation Commander takes the above action prior to the approval of the undertaking.</p>
<p>12-5. Installations must notify the USFK ACofS, Engineer of the discovery of any potential cultural property or resources or archaeological resources not previously inventoried that are discovered in the course of a USFK action (USFK EGS 12-3k).</p>	<p>Verify that ICs report the discovery of the following to the USFK ACofS, Engineer: (1)(2)(12)</p> <ul style="list-style-type: none"> - any potential cultural property or resources - archeological resources not previously inventoried that are discovered in the course of a USFK action. <p>(NOTE: In turn, the USFK ACofS, Engineer will notify ROK officials through proper channels.)</p>
<p>12-6. Installations must preserve and protect certain newly discovered items pending a decision on final disposition by the IC (USFK EGS 12-3j).</p>	<p>Verify that the installation preserves and protects potential cultural property or resources or archaeological resources discovered in the course of a USFK action that have not previously been inventoried. (1)(2)(12)</p>
<p>12-7. Installations must develop a plan for the protection and preservation of cultural resources (USFK EGS 12-3c).</p>	<p>Verify that installations with cultural resources identified on the installation inventory have a plan for the protection and preservation of cultural resources and mitigation of any adverse effects. (1)(2)</p>

(1) Directorate Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (12) Director of Plans, Training, Mobilization, and Security (DPTMSEC) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
HISTORIC AND CULTURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>12-8. Personnel who perform cultural or archaeological resource functions must have the required expertise in world, national and local history and culture (USFK EGS 12-3a and AR 200-1, para 14-7a).</p> <p>12-9. Installations must establish measures sufficient to protect known cultural property or archaeological resources until appropriate mitigation or preservation can be completed (USFK EGS 12-3d, 12-3e, 12-3g, and 12-3h; and AR 200-1, para 14-7a).</p>	<p>Verify that personnel who perform cultural or archaeological resource functions have the requisite expertise in world, national, and local history and culture. (1)</p> <p>Verify that cultural and archaeological resources are protected at the installation. (1)(2)(12)</p> <p>Verify that the installation has established measures sufficient to: (1)(2)</p> <ul style="list-style-type: none"> - prevent excavation or disturbance of cultural properties, including areas known to contain buried or submerged historic properties - prevent USFK personnel from disturbing or removing archaeological resources without the permission of ROK. <p>Verify that the installation prevents cultural property, such as a national treasure, treasure, or important folk-lore property, from being exported or carried out of Korea. (1)(2)</p> <p>(NOTE: This requirement does not apply to persons with written permission of the ROK government. Specifically, anyone who has an advanced permit from the Minister of Culture for the purpose of international cultural exchange may be exempted from this non-exportation requirement.)</p>
<p>CURATION ACTIVITIES</p> <p>12-10. OCONUS installations with historically significant Army artifacts must inform the Chief of Military History (CMH) through Army Central Activity of the U.S. Army Material Command of those artifacts being held overseas for return to the continental United States (AR 870-20, para 1-4c).</p>	<p>Determine whether the installation has any historically significant Army artifacts being held for return to the United States. (1)(2)(12)</p> <p>Verify that the CMH has been notified. (1)(2)(12)</p>

(1) Directorate Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (12) Director of Plans, Training, Mobilization, and Security (DPTMSEC) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate

**COMPLIANCE CATEGORY:
HISTORIC AND CULTURAL RESOURCES
Republic of Korea ECAS**

**REGULATORY
REQUIREMENTS:**

**REVIEWER CHECKS:
June 1997**

12-11. Directors of museums containing Army artifacts must manage collections according to specific standards (AR 870-20, para 1-4h).

Verify that the director has addressed the following issues in the care of the collection: (1)(2)(12)

- identification
- designation
- collection
- preservation/conservation
- classification
- accessioning/cataloging
- loans
- transfers
- disposition
- performance of historical research.

(1) Directorate Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (12) Director of Plans, Training, Mobilization, and Security (DPTMSEC) (21) Public Affairs Office (PAO) (22) Staff Judge Advocate

INSTALLATION:	COMPLIANCE CATEGORY: HISTORIC AND CULTURAL RESOURCES Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 13

ENDANGERED SPECIES AND NATURAL RESOURCES

Korea ECAS

SECTION 13

ENDANGERED SPECIES AND NATURAL RESOURCES

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to any military community with improved, semi-improved, and unimproved grounds. Plans and programs for protection and management of natural resources such as soil, water, plants, and wildlife are also included.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 13 addresses required plans and programs for the protection, enhancement, and management of natural resources and endangered or threatened species. These plans and programs are needed to ensure that military actions are not likely to jeopardize the continued existence of natural resources and any biological species declared endangered or threatened by the Korean government. The Korean government designates protection areas where the preservation of natural ecosystems is specially needed and imposes strict restrictions on collecting, importing, or exporting endangered animals or plants or those wild species that have been specified by the government.
- DOD Directive 4700.4, *Natural Resources Management Program*, 24 January 1989, prescribes policies and procedures for an integrated program for multiple-use management of natural resources on property under DOD control. Although it does not directly regulate overseas military communities, it is considered to contain good management practices (MPs).

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, states the Army policy to conserve, protect, restore, and enhance natural resources outside the continental United States.
- AR 200-3, *Natural Resources--Land, Forest, and Wildlife Management*, 28 February 1995, prescribes current Army policies, procedures and standards for the conservation, management, and restoration of land and the renewable resources thereon, consistent with and in support of the military mission and in consonance with national policies. OCONUS installations comply with the regulation as applicable and as outlined in accordance with the relevant final governing standards. The February 1995 version is undergoing revision in 1996. The assessor is responsible for referring to the revised AR as soon as it is available.

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH) is responsible for funding, supervising, controlling, and managing installation natural resources, including plant and animal species.

- The Natural Resources Manager is responsible for preparing management plans and cooperative agreements, budgets, and the annual natural resources report. The Natural Resources Manager also implements and controls all activities in furtherance of natural resources management. On installations without a full-time Natural Resources Manager, these duties would normally be assigned to the environmental coordinator or community planner.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. *Code of Federal Regulations* (CFR).

- *Action* - all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by DOD installations (USFK EGS, Chapter 13, Definitions).
- *Adverse Effect* - changes that diminish the quality or significant value of natural resources. For biological resources, adverse effects include overall population fitness (USFK EGS, Chapter 13, Definitions).
- *Conservation* - wise management and use of natural resources to provide the best public benefits for present and future generations (USFK EGS, Chapter 13, Definitions).
- *Conservation* - the wise and scientific management of natural resources according to principles that provide optimum public benefit, continued productivity for present and future generations, and support of the military mission (AR 200-3, Glossary, Section II).
- *Endangered Species* - any species of flora or fauna designated and declared by the Minister of Environment and World Agreement for Endangered Species, whose continued existence is, or is likely to be, threatened and is therefore subject to special protection from destruction or adverse modification of associated habitat and to restrictions on foreign trade according to the Foreign Trade Agreement for Endangered Species (see Appendix 13-1) (USFK EGS, Chapter 13, Definitions).
- *Grounds* - all land and water acreage for which an installation commander (IC) has responsibility (including satellite areas). Grounds are grouped into the following three categories: improved grounds, semi-improved grounds, and unimproved grounds (AR 200-3, Glossary, Section II).
- *Improved Grounds* - includes acreage on which intensive maintenance activities must be planned and performed annually as fixed requirements. Activities include mowing, irrigation, fertilization, cultivation, aeration, seeding, sodding, spraying, pruning, trimming; weed, dust, and erosion control; drainage, planting for landscape effect, wind and sound abatement, and other intensive practices (AR 200-3, Glossary, Section II).
- *Land Management* - the planning and execution of programs to improve, utilize, and maintain all land and water areas for the greatest net public benefit while supporting the military mission. Included are subordinate land uses that are mutually compatible and consistent with maintaining environmental qualities (AR 200-3, Glossary, Section II).
- *Management Plan* - a document describing natural resources and their quantity, condition, and actions to ensure conservation and good stewardship (USFK EGS, Chapter 13, Definitions).

- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Natural Ecosystem Preservation Area* - areas listed in Appendix 13-2 which fall under one of the following areas designated and declared by the Minister of Environment (USFK EGS, Chapter 13, Definitions):
 1. an area that is worthy of scientific research since it preserves the originality of natural ecosystems or has abundant natural resources
 2. an area that requires preservation for scientific research or natural scenery since its topographic or geological features are unique
 3. an area that is worthy of preservation, where endangered species or Korean native species grow
 4. an area that represents diverse ecosystems or samples of ecosystems
 5. an area that requires special protection of other natural ecosystems.
- *Natural Resource* - all living and inanimate materials supplied by nature that are of aesthetic, ecological, educational, historical, recreational, scientific, or other value (USFK EGS, Chapter 13, Definitions).
- *Natural Resources* - the viable and/or renewable products of nature and their environments of soil, air, and water. Included are plants and animals occurring on grasslands, rangelands, and croplands, and in forests, lakes, and streams (AR 200-3, Glossary, Section II).
- *Natural Resources Management* - action taken to protect, manipulate, alter, or manage environmental, human, and biological resources in harmony with each other to meet present and future human needs (USFK EGS, Chapter 13, Definitions).
- *Semi-improved Grounds* - includes areas on which periodic recurring maintenance is performed but to a lesser degree than on improved grounds. Practices normally include such cyclic variables as soil sterilization, weed and brush control, drainage maintenance, and mowing for fire protection and major land repair/restoration/rehabilitation as may result from mission activities. Semi-improved grounds acreage may be combined with improved grounds acreage for reporting purposes when only two categories of grounds (improved and other than improved) are used (AR 200-3, Glossary, Section II).
- *Specified Wild Species* - any species of flora or fauna, listed in Appendix 13-3 or designated and declared by the Minister of Environment, whose continued existence is, or is likely to be, threatened or whose species is worthy of protection for scientific research, and is therefore subject to special protection from destruction or unbalance in a natural ecosystem (USFK EGS, Chapter 13, Definitions).
- *Unimproved Grounds* - all acreage not classified as improved or semi-improved (AR 200-3, Glossary, Section II).

ENDANGERED SPECIES AND NATURAL RESOURCES

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	13-1 through 13-2	(1)(2)(15)(21)(22)(31)
Training	13-3 through 13-6	(1)(2)(9)(12)
Natural Resources Management	13-7 through 13-17	(1)(2)(9)(12)(15)
Endangered Species and Specified Wild Species	13-18 through 13-21	(1)(2)(9)(12)(15)
Outdoor Recreation	13-22 through 13-24	(1)(2)(9)(15)(31)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (9) Chief of Operations and Maintenance (O&M)
- (12) Director of Plans, Training, Mobilization, and Security (DPTMSEC)
- (15) Land Management Officer (DEH)
- (21) Public Affairs Office (PAO)
- (22) Staff Judge Advocate (SJA)
- (31) Directorate of Personnel and Community Activities (DPCA)

ENDANGERED SPECIES AND NATURAL RESOURCES

Records to Review

- Installation Master Plan
- Standing Operating Procedures (SOPs) for ensuring compliance

Physical Features to Inspect

- Sites of interest in natural and wildlife resources

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Chief of Operations and Maintenance (O&M)
- Director of Plans, Training, Mobilization, and Security (DPTMSEC)
- Land Management Officer (DEH)
- Public Affairs Office (PAO)
- Staff Judge Advocate (SJA)
- Directorate of Personnel and Community Activities (DPCA)

**COMPLIANCE CATEGORY:
ENDANGERED SPECIES AND NATURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>13-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on endangered species and natural resources should be maintained at the installation (MP).</p> <p>13-2. The natural resources management professional must be an active participant in all planning and decision making activities regarding uses of the land (AR 200-3, para 3-2b).</p> <p>TRAINING</p> <p>13-3. Personnel who manage natural resources must be properly trained (USFK EGS 13-3g and AR 200-1, para 14-7a).</p> <p>13-4. Certain installations must establish a mandatory, ongoing awareness program for all personnel who may have contact with endangered species or specified wild species or their habitat (AR 200-3, para 2-6b).</p>	<p>Verify that copies of the following documents are maintained and kept current at the installation: (1)(2)(21)(22)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - DOD Directive 4700.4, <i>Natural Resources Management Program</i>, 24 January 1989 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 200-3, <i>Natural Resources -- Land, Forest, and Wildlife Management</i>, 28 February 1995 - AR 405-90, <i>Disposal of Real Estate</i>, 10 May 1985 - Technical Manual (TM) 5-630, <i>Ground Maintenance and Land Management</i>. <p>Verify that the natural resources management professional is an active participant in all planning and decision making activities regarding uses of the land. (2)(12)(15)(31)</p> <p>Verify that personnel who manage natural resources are properly trained. (1)(2)(12)</p> <p>Determine whether the installation has endangered species, specified wild species, or environmentally sensitive areas. (1)</p> <p>Verify that such installations have established a mandatory, ongoing awareness program for all personnel (military and civilian) who may have contact with endangered species, or specified wild species, or their habitat, or other environmentally sensitive areas. (2)</p>

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**COMPLIANCE CATEGORY:
ENDANGERED SPECIES AND NATURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>13-5. Periodic and comprehensive technical instruction and training must be provided for natural resources management personnel who are responsible for the control of insects and plants (AR 200-3, para 2-6b).</p>	<p>Verify that periodic and comprehensive technical instruction and training is provided for natural resources management personnel who are responsible for the control of insects and plants. (2)(9)</p>
<p>13-6. Persons involved in natural resource law enforcement must have special training to meet legal requirements and liability protection (AR 200-3, para 2-6f).</p>	<p>Verify that persons involved in natural resource law enforcement have special training to meet legal requirements and liability protection. (2)</p>
<p>NATURAL RESOURCES MANAGEMENT</p>	
<p>13-7. Certain installations must develop programs for conserving, managing, and protecting natural resources (USFK EGS 13-3a).</p>	<p>Determine whether the installation has land and water areas. (1)(2)(15)</p> <p>Verify that the installation has a program for conserving, managing, and protecting natural resources. (1)(2)(15)</p> <p>Verify that the installation considers ROK conservation practices in developing that program. (1)(2)(15)</p>
<p>13-8. Installations must have management plans for certain resources where these resources exist (USFK EGS 13-3b).</p>	<p>Determine whether the installation has any of the following resources: (1)(2)(15)</p> <ul style="list-style-type: none"> - land (soil and water) - forest - fish and wildlife - outdoor recreation. <p>Verify that the installation has management plans for such resources. (1)(2)(15)</p>

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**COMPLIANCE CATEGORY:
ENDANGERED SPECIES AND NATURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>13-9. The land management program at the installation should address specific issues (MP).</p>	<p>Verify that the land management program address the following issues: (1)(2)(15)</p> <ul style="list-style-type: none"> - land use limitations - mission requirements - fire protection - coastal zone management (where appropriate) - beach properties (where appropriate) - wetlands - prescribed burning - floodplains management - Integrated Training Area Management, as appropriate.
<p>13-10. Land management operations must be consistent with modern conservation and land use principles (USFK EGS 13-3i and AR 200-3, para 3-1).</p>	<p>Verify that land management at the installation is consistent with modern conservation and land use principles. (1)(2)(15)</p>
<p>13-11. Installations must meet specific standards with regard to grounds maintenance (USFK EGS 13-3f and AR 200-3, para 4-1).</p>	<p>Verify that installation grounds are maintained in ways that meet designated mission use and assure harmony with the natural landscape. (1)(9)</p> <p>Verify that turf areas are maintained with a permanent vegetative cover of desirable plants. (1)(9)</p> <p>Verify that landscape planting, pruning, cultivation, and other maintenance is done according to TM 5-630. (1)(9)</p>
<p>13-12. A protective vegetative cover must be used to control dust and/or stabilize sites (USFK EGS 13-3j and AR 200-3, para 2-15).</p>	<p>Verify that the installation uses a protective vegetative cover to control dust and/or stabilize sites. (1)(2)</p> <p>Verify that installation sources of dust, runoff, silt, and erosion debris are controlled to prevent damage to land, water resources, equipment, and facilities (including adjacent properties). (1)(2)(12)(15)</p> <p>Verify that an erosion and sediment control plan has been implement where appropriate. (1)(2)</p> <p>Verify that remedial actions have been initiated. (1)(2)</p>

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**COMPLIANCE CATEGORY:
ENDANGERED SPECIES AND NATURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>13-13. ICs must emphasize the maintenance and protection of habitat favorable to the local fish and wildlife (USFK EGS 13-3h).</p>	<p>Verify that habitats that are favorable to the reproduction and survival of indigenous fish and wildlife are maintained and protected. (1)(2)</p>
<p>13-14. Exporting/importing of species without specific approval is prohibited (USFK EGS 13-3L).</p>	<p>Verify that no species is exported, imported, or carried without approval from the Minister of Environment. (1)(2)</p> <p>(NOTE: Dogs and cats do not require such approval.)</p>
<p>13-15. The installation's fish and wildlife management program must be in accordance with specific requirements (AR 200-3, paras 6-1b and 6-2b).</p>	<p>Verify that lands and waters suitable for conservation of fish and wildlife are managed so as to conserve wildlife resources. (1)(2)</p> <p>Verify that nongame as well as game species are considered when planning activities.</p> <p>Verify that all hunting, fishing, and trapping on the installation is in accordance with applicable host nation laws and regulations.</p>
<p>13-16. The installation should have a mitigation and monitoring plan (MP).</p>	<p>Verify that the installation has a mitigation and monitoring plan for environmental compliance. (1)(2)(9)(12)</p> <p>Verify that the installation has developed plans to preserve, protect, and acquire the water supplies necessary to support all natural resources projects and programs. (1)(2)(22)</p>
<p>13-17. Installations on which irrigation is practiced must meet specific requirements (AR 200-3, paras 4-6a, 4-6b, and 4-6d).</p>	<p>Determine whether irrigation is practiced on the installation. (1)(2)(9)</p> <p>Verify that the installation has developed a water conservation plan as part of its natural resources management plan. (1)(2)(9)</p> <p>Verify that irrigation is limited to areas where it is essential to establish and maintain required vegetation or when agricultural outlease contracts require it. (1)(2)(9)</p> <p>Verify that, if the installation is in an arid area, it does not use irrigation to create environments to grow non-arid plants. (1)(2)(9)</p> <p>Verify that installations in arid and semi-arid areas make maximum use of desert landscape materials and/or others that require low moisture. (1)(2)(9)</p> <p>Verify that irrigation in arid areas is limited to selected high-visibility areas or where required to maintain vegetative cover to meet the designated use (such as golf course greens). (1)(2)(9)</p>

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**COMPLIANCE CATEGORY:
ENDANGERED SPECIES AND NATURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ENDANGERED SPECIES AND SPECIFIED WILD SPECIES</p> <p>13-18. Installations must manage endangered species (USFK EGS 13-3c and AR 200-1, para 14-7c).</p> <p>13-19. If financially and otherwise practical, ICs must initiate surveys for endangered species and specified wild species determined by the MOE (USFK EGS 13-3e and AR 200-1, para 14-7a).</p> <p>13-20. ICs must report the discovery of any endangered species to the USFK ACofS, Engineer (USFK EGS 13-3d).</p> <p>13-21. Installations must protect specified wild species (USFK EGS 13-3k).</p>	<p>Verify that the IC maintains a current list of endangered species and specified wild species determined by the Korean Ministry of Environment. (1)(2)</p> <p>(NOTE: Appendices 13-1 and 13-3 together constitute such a list.)</p> <p>Verify that the IC takes into account the effect of any undertaking that might affect any of the following:</p> <ul style="list-style-type: none"> - internationally protected animal and plant species and their habitat - plant and animal species on the host nation's equivalent of the U.S. Endangered Species Act. <p>Verify that every effort is made to avoid or minimize adverse effects on such resources prior to the undertaking.</p> <p>Verify that, if financially and otherwise practical, the installation initiates surveys for endangered species and specified wild species determined by the MOE. (1)(2)(15)</p> <p>Verify that, if it is financially and otherwise practical, the installation supports ROK-initiated surveys. (1)(2)</p> <p>(NOTE: The requirement in AR 200-1 to identify natural resources which require special protection efforts is not accompanied by any qualification with regard to practicality. Thus, if the installation can demonstrate that funds have been requested via the Environmental Program Requirements report and subsequently denied and provide in addition a documented command decision regarding the impracticality of an inventory, then there is no Class I finding; however, a Class III finding does exist.)</p> <p>Verify that the IC reports the discovery of any endangered species to the USFK ACofS, Engineer. (1)(2)(15)</p> <p>(NOTE: In turn, the USFK ACofS, Engineer will notify ROK officials through the SOFA Environmental Subcommittee.)</p> <p>Verify that no specified wild species is captured, collected, transplanted, exported, processed, distributed, or stored. (1)(2)</p> <p>(NOTE: The requirements of this checklist item may be waived in specifically permitted cases.)</p>

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**COMPLIANCE CATEGORY:
ENDANGERED SPECIES AND NATURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>OUTDOOR RECREATION</p> <p>13-22. The conservation of outdoor recreation resources must be considered in all plans, programs, site feasibility studies, and project planning and design (AR 200-3, para 7-1b).</p> <p>13-23. ICs must provide for controlled recreational access at Department of Army installations and facilities with land and water areas suitable for the recreational use and enjoyment by the public (AR 200-3, para 2-10a(1)).</p> <p>13-24. Installations must control the use of off-road vehicles (ORVs) (AR 200-3, para 8-1, 8-2b, 8-4a(2), and 8-4d(1)(d))</p>	<p>Verify that the conservation of outdoor recreation resources is considered in all plans, programs, site feasibility studies, and project planning and design. (1)(2)(31)</p> <p>Determine whether the installation has any land and water areas suitable for recreational use and enjoyment by the public. (1)(2)(9)</p> <p>Verify that controlled recreational access is provided. (1)(2)(9)</p> <p>(NOTE: Such access is provided:</p> <ul style="list-style-type: none"> - within manageable quotas - subject to safety, military security, and threatened and endangered species restrictions - consistent with the capability of the resource to support the use - at such times as it can be granted without bona fide impairment of the military mission, as determined by the IC.) <p>Determine whether ORVs are authorized on the installation. (1)(2)(15)(31)</p> <p>Verify that all lands and water areas are closed to off-road recreational use by motorized ORVs except those areas and trails which are specifically designated suitable and specifically designated for such use. (1)(2)(15)(31)</p> <p>Verify that, prior to designating trails for ORV use, the environmental consequences were assessed and environmental statements processed indicating the impact of the use. (1)(2)(15)(31)</p> <p>Verify that lands where ORV use will be permitted are designated in the INRMP and, where appropriate, included as a part of the master plan. (1)(2)(15)(31)</p> <p>Verify that ORVs are not operated in a manner likely to cause excessive damage or disturbance of the land, wildlife, or vegetative resources. (1)(2)(15)(31)</p>

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**COMPLIANCE CATEGORY:
ENDANGERED SPECIES AND NATURAL RESOURCES
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
13-24. (continued)	<p>(NOTE: The following lands may not be designated for one or more types of ORV use areas:</p> <ul style="list-style-type: none"> - areas restricted for security or safety purposes, such as explosive ordnance impact areas - areas containing geological and soil conditions, flora or fauna, or other natural characteristics of fragile or unique nature which would be subject to excessive or irreversible damage by use of ORVs - areas where the use by a type or types of ORV would cause unequivocal and irreversible damage or destruction as a result of such use, provided, however, that types of ORVs not causing damage or destruction may be permitted to use such areas - areas which are key fish and wildlife habitats, as identified under environmental consideration - areas which contain archeological sites, historical sites, pictographs, or areas set aside for their scenic value, and area in which noise would adversely affect other uses or wildlife resources - areas in or adjacent to outdoor recreation areas where noise or vehicle emissions would be an irritant to the users of the outdoor recreation area - noise sensitive areas such as housing, schools, churches, or areas where noise or vehicular emissions would be an irritant to inhabitants - areas or trails set aside for horses and their recreational use - areas where ORVs use would disturb nesting or breeding of wildlife.)

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Appendix 13-1

Endangered/Threatened Species

(USFK EGS Table 13-1)

COMMON NAME	SCIENTIFIC NAME	HISTORIC RANGE
Crane, Japanese	<i>Grus japonensis</i>	China, Japan, Korea, Russia
Dhole (Asiatic wild dog)	<i>Cuon alpinus</i>	Korea, China, India, Southeast Asia
Egret, Chinese	<i>Egretta eulophotes</i>	China, Korea
Ibis, Japanese crested	<i>Nipponia nippon</i>	Japan, Korea
Stork, oriental white	<i>Ciconia ciconia boyciana</i>	Japan, Korea
Woodpecker, Tristram's	<i>Dryocopus javensis richardsi</i>	Korea

Appendix 13-2

Natural Ecosystem Preservation Areas

(USFK EGS Table 13-3)

<p>1. The Mouth of the Nakdong River Natural Ecosystem Preservation Area</p> <p>a. Location: Pusan City SahaGu, the sea extending over the whole of Shinpyung, Janglim, and Dadaedong</p> <p>b. Size: 34.208 km² [≈21 mi²]</p> <p>c. Ministry of Environment Notification No. 89-4 (10 March 1989)</p>
<p>2. Jiri Mountain Natural Ecosystem Preservation Area</p> <p>a. Location: JunNam Guryegun, areas over Simwon valley at Sandongmyon and Pia valley at Tojeemyon</p> <p>b. Size: 20.2 km² [≈13 mi²]</p> <p>c. Ministry of Environment Notification No. 89-19 (29 December 1989)</p>
<p>3. Daeam Mountain Natural Ecosystem Preservation Area</p> <p>a. Location: Kangwondo Injegun Seohwamyon, Daeam mountain areas</p> <p>b. Size: 1.06 km² [≈0.66 mi²]</p> <p>c. Ministry of Environment Notification No. 89-20 (29 December 1989)</p>
<p>4. Baekun Mountain natural Ecosystem Preservation Area</p> <p>a. Location: JunNam Kangyanggun, Baekun mountain areas over Okryongmyon, Jinsangmyon, and Daapmyon</p> <p>b. Size: 9.74 km² [≈6 mi²]</p> <p>c. Ministry of Environment Notification No. 93-34 (26 April 1993)</p>
<p>5. Daeduk Mountain/Kumdaebong Natural Ecosystem Preservation Area</p> <p>a. Location: Kangwondo Taebak city, Daeduk mountain/Kumdaebong areas</p> <p>b. Size: 4.20 km² [≈2.61 mi²]</p> <p>c. Ministry of Environment Notification No. 93-63 (26 April 1993)</p>



Appendix 13-3

Specified Wild Species* (USFK EGS Table 13-2)

Classification		Scientific Name	Common Name
Amphibia	-6	<i>Bufo bufo gargarizans</i> Cantor	Duggeobi
	-7	<i>Bufo stejnegeri</i> Schmidt	Mul-duggeobi
	-9	<i>Hyla suweonensis</i> Kuramoto	Suwon-chong-gaiguri
	-2	<i>Hynobius leechi</i> (Boulenger)	Doryongnyong
	-8	<i>Kaloula borealis</i> (Barbour)	Maenggonggi
	-1	<i>Onychodactylus fischeri</i> (Boulenger)	Ggori-chirei-doryongnyong
	-4	<i>Rana amurensis coreana</i> Okada	Amursan-gaiguri
	-3	<i>Rana plancyi chosonica</i> Okada	Gum-gaiguri
	-5	<i>Rana temporaria dybowski</i> Gunther	Bukbangsan-gaiguri
	Reptilia	-10	<i>Agkistrodon blomhoffii brevicaudus</i> Stejneger
-9		<i>Agkistrodon saxatilis</i> Emilianov	Ggachi-salmosa
-6		<i>Dinodon rufozonatum rufozonatum</i> (Cantor)	Neung-gureongi
-8		<i>Elaphe rufodorsata</i> Cantor	Muzachi
-5		<i>Elaphe schrenckii</i> Strauch	Gureongi
-11		<i>Eremias argus</i> Peters	Pyobeom-jangjibaim
-1		<i>Geoclemys reevesii</i> Gray	Namsaengi
-2		<i>Leiopisma laterale</i> (Say)	Domabaem
-3		<i>Natrix vibakari ruthveni</i> Van Denburgh	Dairyuk-yuhyolmoki
-7		<i>Sibynophis collaris</i> Gray	Bibaribaim
-12		<i>Takydromus wolteri</i> Fischer	Jul-jangjibaim
-13		<i>Trionyx maackii</i> Brant	Jara
-4		<i>Zamenis spinalis</i> (Peters)	Silbaim
Insecta	-20	<i>Acalolepta fraudatorix</i> Bates	Udan-hanulso
	-17	<i>Anoplodera variicornis</i> Dalman	Alraksuyeomsanggot-hanulso
	-4	<i>Aporia crataegi</i> Linne	Sangje-nabi
	-26	<i>Chalcophora japonica</i> Gory	Sonamu-bidan-beolrai
	-18	<i>Chlorophorus diadema</i> Motschulsky	Beom-hanulso

(continued)

Appendix 13-3 (continued)

Classification	Scientific Name	Common Name
Insecta (cont)	-25 <i>Chrysochroa fulgidissima</i> Schonerr	Bidan-beolrai
	-30 <i>Cicindela hybrida nitida</i> Lichtenstein	Chuhong-gil-yapjabi
	-23 <i>Dicranocephalus adamsi</i> Pascoe	Sasum-pungdaingi
	-9 <i>Dilipa fenestra</i> Leech	Yurichang-nabi
	-14 <i>Eumenis autonoe</i> Esper	San-guldduk-nabi
	-11 <i>Fabriciana nerippe</i> C. & R. Felder	Wang-enjeom-pyobeom-nabi
	-3 <i>Grapium sarpedon</i> Linne	Chong-ddy-jebi-nabi
	-28 <i>Gymnopleurus mopsus</i> Pallas	So-ddongguri
	-6 <i>Lampides boeticus</i> Linne	Mulgyol-bugeon-nabi
	-21 <i>Melolontha frater</i> Arrow	Kun-pungdaingi
	-24 <i>Metopodentus inclinatus</i> Motschulsky	Top-sasum-beolrai
	-12 <i>Neptis raddei</i> Bremer	Eri-sejul-nabi
	-13 <i>Nymphalis antiopa</i> Linne	Sinbu-nabi
	-19 <i>Palimna liturata</i> Bates	Alraksuyeom-hanulso
	-15 <i>Parantica sits</i> (Kollar)	Wang-nabi
	-2 <i>Parnassius bremeri</i> Bremer	Bulgun-geom-mosi-nabi
	-29 <i>Polyphylla laticollis</i> Lewis	Suyeom-pungdaingi
	-8 <i>Protantigius superans</i> Oberthur	Gipunsan-bugeon-nabi
	-16 <i>Psephactus remiger</i> Harold	Ban-nalgai-hanulso
	-10 <i>Sasakia charonda</i> Hewitson	Wang-osaek-nabi
	-1 <i>Satarupa nymphalis</i> Speyer	Daewang-palrang-nabi
	-27 <i>Scarabaeus typhon</i> (Fincher-Waldheim)	Wang-so-ddongguri
	-31 <i>Scarites sulcatus</i> Oliver	Kun-chorongbak-meonji-beolrai
	-5 <i>Shijimiaeoides divina</i> Fixsen	Kun-hong-ddy-geombaki-purun-geom-bugeon-nabi
	-7 <i>Spindasis takanonis</i> Matsumura	Ssang-ggori-bugeon-nabi
	-22 <i>Xylotrupes dichotomus</i> Linne	Jangsu-pungdaingi
Flora	-59 <i>Aconitum chiisanense</i> Nakai	Ji-i-ba-ggot
	-60 <i>Aconitum koreanum</i> R. Raymond	Norang-dol-jjogi
	-64 <i>Aconitum trilobum</i> I. Yang	Sei-bbul-tugu-ggot
	-120 <i>Adenophora grandiflora</i> Nakai	Doraji-mosi-dai

(continued)

Appendix 13-3 (continued)

Classification	Scientific Name	Common Name
Flora (cont) -108	<i>Ajuga spectabilis</i> nakai	Ja-nancho
-79	<i>Albizia coreana</i> Nakai	Wang-jagui-namu
-16	<i>Aletris fauriei</i> Lev.	Yeou-ggori-pul
-106	<i>Anagallidium dichotomum</i> (L.) Griseb.	Daesung-ssun-pul
-101	<i>Androsace cortusaefolia</i> Nakai	Kungang-bom-maji
-95	<i>Arctous ruber</i> (Rehder et Wilson) Nakai	Hong-wol-gyul
-98	<i>Ardisia crenata</i> Sims	Baik-ryang-gum
-7	<i>Arisaema negishii</i> Makino	Seom-cheon-namseong
-8	<i>Arisaema takesimense</i> Nakai	Seom-namseong
-53	<i>Asarum maculatum</i> Nakai	Gai-jokdori
-15	<i>Aspidistra elatior</i> Bl.	Yop-ran
-85	<i>Berchemia racemosa</i> var. <i>magna</i> Makino	Meok-neon-chul
-56	<i>Brasenia schreberi</i> J.F. Gmel.	Sun-chai
-31	<i>Bulbophyllum inconspicuum</i> Max.	Huk-nancho
-91	<i>Bupleurum euphorbioides</i> Nakai	Dungdai-siho
-92	<i>Bupleurum latissimum</i> Nakai	Seom-siho
-124	<i>Cacalia pseudo-taimingasa</i> Nakai	Eori-byongpung
-46	<i>Calanthe coreana</i> Nakai	Seom-saiu-nan
-37	<i>Calanthe discolor</i> Lindley	Saiu-nancho
-45	<i>Calanthe discolor</i> Linl. var. <i>bicolor</i> (Lindl.) Makino	Kun-saiu-nan
-36	<i>Calanthe reflexa</i> Max.	Yeorum-saiu-nan
-38	<i>Calanthe striata</i> R. Brown	Kum-saiu-nan
-73	<i>Cardamine koreana</i> Nakai	Cham-gocho-naingi
-6	<i>Carex chordorhiza</i> Ehrh.	Daian-sacho
-51	<i>Celtis edulis</i> Nakai	Noran-paeng-namu
-69	<i>Corydalis grandicalyx</i> B. Oh et Y. Kim	Galqui-hyon-hosaek
-70	<i>Corydalis humilis</i> B. Oh et Y. Kim	Nanjangi-hyon-hosaek
-71	<i>Corydalis maculata</i> B. Oh et Y. Kim	Geom-hyon-hosaek
-39	<i>Cremastra appendiculata</i> Makino	Yak-nancho
-3	<i>Crypsinus hastatus</i> (Thunb.) Copel.	Ko-rancho

(continued)

Appendix 13-3 (continued)

Classification	Scientific Name	Common Name
Flora (cont) -48	<i>Cymbidium goeringii</i> Reichb. fil	Bochun-wha
-49	<i>Cymbidium nipponicum</i> Makino	Daehung-nan
-40	<i>Crpripedium japonicum</i> Thunberg	Kwangnung-yogang-ggot
-89	<i>Daphne kiusiana</i> Miq.	Baik-seohyang
-47	<i>Dendrobium moniliforme</i> (L.) Sw.	Seokgok
-61	<i>Desmodium caudatum</i> Dc.	Doanjang-pul
-93	<i>Diapensia obovata</i> (Fr. Schm.) Nakai	Ammai
-9	<i>Disporum ovale</i> Ohwi	Kumgang-aegi-nari
-74	<i>Drosera peltata</i> var. <i>nipponica</i> (Masam) Ohwi	Ggun-ggun-i-gui-i-gai
-75	<i>Drosera rotundifolia</i> Linne	Ggun-ggun-i-jugeok
-2	<i>Dryopteris crassirhizoma</i> Nakai	Kwangjung
-90	<i>Echinopanax horridum</i> (Non Decne) Kom.	Ddat-durup-namu
-80	<i>Echinosophora koreensis</i> Nakai	Gai-neu-sam
-84	<i>Empetrum nigrum</i> var. <i>japonicum</i> K. Koch	Siromi
-66	<i>Epimedium koreanum</i> Nakai	Samji-guyeop-cho
-83	<i>Euphorbia fauriei</i> Lev. et Vnt.	Dumei-dae-guk
-57	<i>Euryale ferox</i> Salisb.	Gasi-yeon-ggot
-102	<i>Forsythia ovata</i> Nakai	Manri-wha
-103	<i>Forsythia saxatilis</i> Nakai	San-gainari
-43	<i>Galeola septentrionalis</i> Reichb. fil	Eurum-nancho
-30	<i>Gastrodia elata</i> Blume	Chonma
-105	<i>Gentiana jamesii</i> Hemsl.	Biro-yongdam
-104	<i>Gentiana pseudo-aquatica</i> Kusenezoff	Whin-gunul-yongdam
-35	<i>Goodyera schlechtendaliana</i> Reichb. fil	Sachol-nan
-41	<i>Habenaria radiata</i> Spreng.	Haeorabi-nancho
-119	<i>Hanabusaya asiatica</i> Nakai	Kumgang-chorong-ggot
-14	<i>Hemerocallis micrantha</i> Nakai	Hamyang-wonchuri
-86	<i>Hibiscus hamabo</i> Sieb. et Zucc.	Whangkun
-5	<i>Hydrocharis dubia</i> (Bl.) Backer	Jara-pul
-26	<i>Iris dichotoma</i> Pallas	Daechong-buchai
-29	<i>Iris odaesanensis</i> Y. Lee	Norang-munui-but-ggot

(continued)

Appendix 13-3 (continued)

Classification	Scientific Name	Common Name
Flora (cont) -25	<i>Iris rossii</i> var. <i>album</i> Y. Lee	Whin-gaski-but-ggot
-27	<i>Iris setosa</i> Pallas	Buchai-but-ggot
-28	<i>Iris uniflora</i> var. <i>carinata</i>	Naniang-i-but-ggot
-61	<i>Isopyrum mandshurica</i> Komarov	Manju-baram-ggot
-67	<i>Jeffersonia dubia</i> Benth.	Ggaing-ggaing-i-pul
-78	<i>Kirengeshoma koreana</i> Nakai	Nado-sung-ma
-113	<i>Lathraea japonica</i> Miq.	Gai-chong-yong
-44	<i>Lecanorchis japonica</i> Bl.	Muyop-ran
-65	<i>Leontice microrhyncha</i> S. Moore	Han-gre-ryong-pul
-121	<i>Leontopodium coreanum</i> Nakai	Somdari
-122	<i>Ligularia taquetii</i> Nakai	Getchui
-18	<i>Lilium callosum</i> S. et Z.	Ddang-nari
-11	<i>Lilium cernuum</i> Komarov	Sol-nari
-12	<i>Lilium hansonii</i> Leichtl.	Seom-mal-nari
-17	<i>Lilium tenuifolium</i> Fisch.	Kun-sol-nari
-118	<i>Lonicera okamotoana</i> Ohwi	Whin-dung-goi-bul
-22	<i>Lycoris aurea</i> Herbert	Gaisang-sa-wha
-23	<i>Lycoris koreana</i> Nakai	Baikyang-ggot
-62	<i>Megaleranthis saniculifolia</i> Ohwi	Modemi-pul
-107	<i>Menyanthes trifoliata</i> L.	Jorum-na-mul
-94	<i>Monotropa hypopithys</i> L.	Gusang-nan-pul
-32	<i>Neofinetia falcata</i> (Thunb.) Hu	Pung-nan
-42	<i>Orchis cyclochila</i> Max.	Nado-jebi-nan
-114	<i>Orobanche coerulescens</i> Steph.	Cho-jong-yong
-112	<i>Pedicularis manshurica</i> Max.	Manju-song-i-pul
-110	<i>Pedicularis verticillata</i> Linne	Gurum-song-i-pul
-54	<i>Phytolacca insularis</i> Nakai	Seom-jari-gong
-52	<i>Pilea taquetii</i> Nakai	Cheju-kun-multong-i
-19	<i>Polygonatum robustum</i> Nakai	Wang-dul-gul-rai
-21	<i>Polygonatum stenophyllum</i> Max.	Chung-chung-dung-gul-rai
-100	<i>Primula modesta</i> var. <i>fauriae</i> Takeda	Seol-aeng-cho

(continued)

Appendix 13-3 (continued)

Classification	Scientific Name	Common Name
Flora (cont) -1	<i>Psilotum nudum</i> (L.) Griseb	Sol-ip-nan
-58	<i>Ranunculus kazusensis</i> Makino	Maiwha-marum
-96	<i>Rhododendron brachycarpum</i> var. <i>roseum</i> Koidz	Hong-manbyong-cho
-97	<i>Rhododendron mucronulatum</i> for. <i>albiflorum</i> T. Lee	Whin-jindalrai
-76	<i>Rodgersia podophylla</i> A. Gray	Do-ggai-bi-buchai
-50	<i>Saururus chinensis</i> Baill	Sam-baik-cho
-126	<i>Saussurea polylepis</i> Nakai	Hongdo-seo-deol-chi
-125	<i>Saussurea seoulensis</i> Nakai	Bun-chui
-68	<i>Schizandra nigra</i> Max.	Huk-o-mija
-109	<i>Scopolia japonica</i> Max.	Michi-kwang-i-pul
-111	<i>Scrophularia takesimensis</i> Nakai	Seom-hyon-sam
-123	<i>Senecio koreanus</i> Kom.	Kukwha-bang-mang-i
-55	<i>Silene fasciculata</i> Nakai	Hanla-jang-gu-chai
-24	<i>Sisyrinchium angustifolium</i>	Whin-dungsim-but-ggot
-20	<i>Smilacina bicolor</i> Nakai	Jaju-som-dai
-4	<i>Taxus caespitosa</i> Nakai	Seol-ak-nun-ju-mok
-63	<i>Thalictrum coreanum</i> Lev.	Yeon-ip-gguing-ui-dari
-77	<i>Tiarella polyphylla</i> D. Don	Heol-dduk-i-pul
-13	<i>Tofieldia fauriei</i> Lev. et Vnt.	Hanla-dol-changpo
-99	<i>Trientalis europaea</i> L. var. <i>artica</i> (Fischer) Ladeb.	Gisaing-ggot
-10	<i>Trillium tschonskii</i> Max.	Kun-yeon-yong-cho
-116	<i>Utricularia bifida</i> L.	Ddang-gui-gai
-117	<i>Utricularia japonica</i> Makino	Tongbal
-115	<i>Utricularia racemosa</i> Wall.	Isak-gui-gai
-34	<i>Vexillarium yakusimense</i> (Yamamoto)	Paik-un-nan
-88	<i>Viola diamantica</i> Nakai	Kumang-jebi-ggot
-87	<i>Viola websteri</i> Hemsl.	Wang-jebi-ggot
-72	<i>Wasabia koreana</i> Nakai	Gochu-naing-i

* Ministry of Environment Notification No. 93-3 (18 January 1993)

(continued)

Appendix 13-3 (continued)

Specified Wild Species (Specified Fish)**

Classification	Scientific Name	Common Name
Fish -2	<i>Acipenser debryans</i> Dumeril	Kal-sang-eo ¹
-1	<i>Acipenser sinesis</i> Gray	Cholgap-sang-eo ²
-4	<i>Acheilognathus signifer</i> Berg	Muknap-jaru
-5	<i>Acheilognathus sonjinesis</i> Kim et Kim	Imsil-nap-jaru
-3	<i>Anguilla marmorata</i> Quoy et Gaimarde	Mutae-jang-eo
-22	<i>Brachymystax lenok</i> (Pallas)	Yeol-mok-eo
-18	<i>Cobitis choii</i> Kim et Son	Miho-jong-gae
-17	<i>Cobitis koreensis pumilus</i> Kim et Lee	Buan-jong-gae
-16	<i>Cobitis rotundicudata</i> Wakiya et Mori	Saiko-migguraji ³
-24	<i>Coreoperca kawamebari</i> (Temminck et Schlegel)	Ggeok-geogi ⁴
-10	<i>Geobiobotia brevibarva</i> Mori	Dol-sang-eo
-9	<i>Geobiobotia marocephalus</i> Mori	Ggu-guri
-11	<i>Gabiobotia nakongensis</i> Mori	Whin-su-maja
-6	<i>Hamibarbus mylodon</i> (Breg)	Eoreum-chi
-21	<i>Liobagrus obesus</i> Son, Kim et Choo	Tung-sari
-12	<i>Moroco semotilus</i> (Jordan et Starks)	Beodul-gaji
-13	<i>Moroco sp.</i> Uchida	Keungang-mochi ⁵
-19	<i>Niwaella brevifasciata</i> Kim Lee	Jomsu-suchi
-14	<i>Phoximus phoximus</i> (Linnaeus)	Yeonjun-mochi
-20	<i>Pseudobagrus brevicorpus</i> (Mori)	Ggochi-dongjagae
-7	<i>Pseudopungtungia nigra</i> Mori	Gapdol-gogi
-23	<i>Pungitius sinesis</i> (Guichenot)	Gasi-gogi
-8	<i>Saurogobio dabryi</i> Bleeker	Duwoojaeng-i
-15	<i>Squaliobarbus curriculus</i> (Richardson)	Nunbul-gae

** Ministry of Environment Notification No. 93-3 (18 January 1993); Addendum (1 April 1996)

¹ and ² Excludes species which live in the sea.

³ Includes only the species whose habitat is the Nakdong River.

⁴ Includes only those species whose habitats are Sanyang stream (Geoje-Do), and Samsan and Kusan streams (Haenam-Gun).

⁵ Includes only those species whose habitat is the Kum River.

INSTALLATION:	COMPLIANCE CATEGORY: ENDANGERED SPECIES AND NATURAL RESOURCES Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 14

POLYCHLORINATED BIPHENYLS (PCBs)

Korea ECAS

SECTION 14

POLYCHLORINATED BIPHENYLS (PCBs)

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to all military communities. It contains protocols for polychlorinated biphenyls (PCBs) and is written in response to regulations that are applicable to the conduct of activities that involve these pollutants. This section is used to determine the compliance status of the management activities associated with PCBs and in-service and out-of-service PCB items.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 14 discusses the actions and controls needed to abate threats to human health and the environment from the handling, use, storage, and disposal of PCBs.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no OCONUS-applicable requirements directly related to PCBs.

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH), through the Exterior Electrical Shop or the Environmental Coordinator (EC) is responsible for identifying, inspecting, marking (labeling), and properly servicing PCB electrical equipment (transformers and capacitors).
- The EC is responsible for ensuring that out-of-service items are located in a technically adequate PCB storage facility. Normally, such facilities are located at the Defense Reutilization and Marketing Office (DRMO) which is responsible for storage, transportation, and contracting for disposal.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Capacitor* - a device for accumulating and holding a charge of electricity that consists of conducting surfaces separated by a dielectric (USFK EGS, Chapter 14, Definitions).
- *Disposal* - to intentionally or accidentally discard, throw away, or otherwise complete or terminate the useful life of PCBs and PCB items.

- *In or Near Commercial Buildings* - within the interior of, on the roof of, attached to the exterior wall of, in the parking area serving, or within 30 m [≈98 ft] of a nonindustrial, nonsubstation building. Commercial buildings are typically accessible to both members of the general public and employees, and include: (USFK EGS, Chapter 14, Definitions)
 1. public assembly properties
 2. educational properties
 3. institutional properties
 4. residential properties
 5. stores
 6. office buildings
 7. transportation centers (e.g., airport terminal buildings, subway stations, bus stations, or train stations).

- *Incinerator* - an engineered device using controlled flame combustion to thermally degrade PCBs and PCB items. Examples include rotary kilns, liquid injection incinerators, cement kilns, and high temperature boilers (USFK EGS, Chapter 14, Definitions).

- *Large Capacitors* - a capacitor with greater than 1 L fluid capacity (USFK EGS, Chapter 14, Definitions).

- *Leak or Leaking* - any instance in which a PCB article, a PCB container, or PCB equipment has any PCBs on any portion of its external surface (USFK EGS, Chapter 14, Definitions).

- *Management Practices (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Mark* - the descriptive name, instructions, cautions, or other information applied to PCBs, PCB items, or other objects subject to USFK EGS (USFK EGS, Chapter 14, Definition).

- *Marking* - the marking of PCB items and PCB storage areas and transport vehicles by means of applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets the criteria of USFK EGS (USFK EGS, Chapter 14, Definitions).

- *Non-PCB Transformers* - any transformer that contains less than 50 ppm PCB (USFK EGS, Chapter 14, Definition).

- *PCB or PCBs* - any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such a substance.

- *PCB Article* - any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) has been in direct contact with PCB. This includes capacitors, transformers, electric motors, pumps, and pipes (USFK EGS, Chapter 14, Definition).

- *PCB Article Container* - any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment, and whose surface(s) has not been in direct contact with PCBs (USFK EGS, Chapter 14, Definition).

- *PCB Container* - any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles and whose surface(s) has been in direct contact with PCBs (USFK EGS, Chapter 14, Defi-

nitition).

- *PCB-contaminated Electrical Equipment* - any electrical equipment including, but not limited to, transformers, capacitors, circuit breakers, reclosers, voltage regulators, switches, electromagnets, and cable that contain 50 ppm or greater PCB, but less than 500 ppm PCB (USFK EGS, Chapter 14, Definitions).
- *PCB Equipment* - any manufactured item, other than a PCB container or a PCB article container, that contains a PCB article or other PCB equipment and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures (USFK EGS, Chapter 14, Definitions).
- *PCB Item* - any PCB article, PCB article container, PCB container, or PCB equipment, that deliberately or unintentionally contains, or has as a part of it, any PCB or PCBs at a concentration of 50 ppm or greater (USFK EGS, Chapter 14, Definitions).
- *PCB Transformer* - any transformer that contains 500 ppm PCB or greater (USFK EGS, Chapter 14, Definitions).
- *Posing an Exposure Risk to Food or Feed* - being in any location where human food or animal feed products could be exposed to PCBs released from a PCB item.
- *Restricted Access Area* - areas where access by unauthorized personnel is controlled by fences, other man-made structures, or naturally occurring barriers such as mountains, cliffs, or rough terrain (USFK EGS, Chapter 14, Definitions).
- *Substantial Contact Area* - an area that is subject to public access on a routine basis or that could result in substantial dermal contact by employees (USFK EGS, Chapter 14, Definitions).



POLYCHLORINATED BIPHENYLS (PCBs)

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	14-1	(1)(2)
General	14-2 through 14-6	(1)(2)
PCB Records	14-7 through 14-9	(1)(2)
PCB Transformers	14-10 through 14-18	(1)(2)
Other PCB Items	14-19 through 14-22	(1)(2)
PCB Spills	14-23 through 14-25	(1)(2)
PCB Storage	14-26 through 14-28	(1)(2)
PCB Disposal	14-29 through 14-33	(1)(2)(3)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer

POLYCHLORINATED BIPHENYLS (PCBs)

Records to Review

- Inspection, storage, maintenance, and disposal records for PCBs/PCB items
- PCB Equipment inventory and sampling results
- Correspondence with regulatory agencies concerning PCB noncompliance situations
- Annual reports

Physical Features to Inspect

- PCB storage areas
- Equipment, fluids, and other items, used or stored at the facility, that contain PCBs

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer

**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>14-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents should be maintained at the installation (MP).</p> <p>GENERAL</p> <p>14-2. PCB items (see definition) and rooms, vaults, or storage rooms that contain them must be marked in English and the Korean language (USFK EGS 14-3a(3)).</p> <p>14-3. Installations must repair or replace leaking PCB transformers within 48 h or as soon as possible (USFK EGS 14-3a(6) and 3b(8)).</p> <p>14-4. All transformers and electrical equipment procured locally after 1 October 1994, must contain less than 10 ppm PCB (USFK EGS 14-3a(7)).</p>	<p>Verify that copies of the following regulations are maintained and kept current at the installation: (1)(2)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997. <p>Verify that PCB items and rooms, vaults, or storage rooms that contain them are prominently marked in English and the Korean language. (1)(2)</p> <p>Verify that the items or areas are identified as containing PCBs. (1)(2)</p> <p>Verify that there is a warning against improper handling and disposal. (1)(2)</p> <p>Verify that a phone number is provided for use in the event of spills or questions about disposal. (1)(2)</p> <p>(NOTE: Fluorescent light ballasts are excluded from this marking requirement.)</p> <p>Verify that the installation repairs or replaces leaking PCB transformers within 48 h. (1)(2)</p> <p>Verify that leaking PCB fluids are containerized. (1)(2)</p> <p>Determine whether the installation has any transformers or electrical equipment procured locally after 1 October 1994, regardless of source. (1)(2)</p> <p>Verify that such transformers and electrical equipment are certified to contain less than 50 ppm PCB. (1)(2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>14-5. Transformers containing greater than 50 ppm PCB must be phased out and replaced (USFK EGS 14-3a(8)).</p> <p>14-6. Transformer fluids containing greater than 50 ppm PCB must not be used (USFK EGS 14-3a(9)).</p> <p>PCB RECORDS</p> <p>14-7. Installations with PCB items must maintain a written inventory of those PCB items (USFK EGS 14-3a(4)).</p> <p>14-8. All required periodic inspections must be documented at the installation (USFK EGS 14-3a(5)).</p> <p>14-9. Installations must retain records of inspections and maintenance histories for 4 yr after disposal of a transformer (USFK EGS 14-3a(5)).</p>	<p>Determine whether the installation has any transformers containing greater than 50 ppm PCB. (1)(2)</p> <p>Verify that such transformers are phased out and replaced with new non-PCB transformers by 1 January 2005. (1)(2)</p> <p>Verify that the installation does not use transformer fluids containing greater than 50 ppm PCB in any application. (1)(2)</p> <p>Verify that the installation maintains a written inventory of PCB items. (1)(2)</p> <p>Verify that the inventory contains a current list, by type, of all PCB items in use, placed into storage for disposal, or disposed of for that year. (1)(2)</p> <p>Verify that, for PCB items that are in use, the inventory includes laboratory test results.</p> <p>Verify that a copy of the inventory is provided to the U.S. Forces - Korea (USFK) Environmental Programs Office (EPO). (1)(2)</p> <p>Verify that all required periodic inspections are documented at the installation. (1)(2)</p> <p>Determine whether the installation has disposed of any transformers. (1)(2)</p> <p>Verify that records of inspections and maintenance histories are retained for at least 4 yr after the disposal of a transformer. (1)(2)</p>

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**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>PCB TRANSFORMERS</p> <p>14-10. PCB transformers may not be used in any application that poses a risk of contamination to food or feed (USFK EGS 14-3b(1)).</p> <p>14-11. Certain PCB transformers must be equipped with electrical protection (USFK EGS 14-3b(3)).</p> <p>14-12. PCB transformers must be registered with the fire department (USFK EGS 14-3b(2)).</p> <p>14-13. Combustible materials should not be stored near PCB transformers (MP).</p> <p>14-14. PCB transformers must be serviced properly (USFK EGS 14-3b(5)).</p>	<p>Verify that no PCB transformer is used in any application that poses a risk of contamination to food or feed. (1)(2)</p> <p>Verify that PCB transformers that are used in or near commercial buildings or are located in sidewalk vaults have electrical protection to minimize transformer failure that would result in the release of PCBs. (1)(2)</p> <p>Verify that all PCB transformers, including those in storage for reuse, are registered with the fire department. (1)(2)</p> <p>(NOTE: It would be useful to provide the following information: - physical location of PCB transformer(s) - principle constituent of dielectric fluid (i.e., PCBs, mineral oil, silicone oil, etc.) - name and telephone number of contact person knowledgeable of PCB transformer(s).)</p> <p>Verify that all combustible materials have been removed from areas within PCB transformer enclosures (i.e., vaults or partitioned areas) and from areas within 5 m (16 ft) of a PCB transformers or their enclosures. (1)(2)</p> <p>(NOTE: Combustible materials include, but are not limited to, paints, solvents, plastics, paper, and scrap wood.)</p> <p>Verify that servicing activities are properly conducted as follows: (1)(2)</p> <ul style="list-style-type: none"> - transformers classified as PCB-contaminated electrical equipment are serviced only with dielectric fluid that contains less than 500 ppm PCB - the transformer coil is not removed during servicing - PCBs removed during servicing are captured and disposed of properly - dielectric fluids containing less than 500 ppm that are mixed with fluids containing 500 ppm or greater are not used as dielectric fluid in any electrical equipment - dielectric fluids containing 500 ppm or greater are not used as dielectric fluid in any transformers classified as PCB-contaminated electrical equipment.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>14-15. Installations must inspect certain PCB transformers (USFK EGS 14-3a(6), 3b(6) and 3b(8)).</p>	<p>Verify that leaking PCB transformers that have not been repaired or replaced are inspected daily. (1)(2)</p> <p>Verify that in-service PCB transformers are inspected at least once every 3 mo. (1)(2)</p> <p>Verify that the following are inspected at least every 12 mo: (1)(2)</p> <ul style="list-style-type: none"> - PCB transformers with impervious, undrained secondary containment capacities of 100 percent of dielectric fluid - PCB transformers that have been tested and found to contain less than 60,000 ppm PCBs. <p>(NOTE: It would be useful to record the following information as part of each PCB transformer inspection:</p> <ul style="list-style-type: none"> - location of transformer - dates of each visual inspection - date when any leak was discovered - name of person conducting inspection - location and estimate of the dielectric fluid quantity of any leaks - data and description of any cleanup, containment, or repair performed - results of any daily inspections of transformers with uncorrected active leaks.)
<p>14-16. Personnel who discover leaking PCB transformers should follow proper reporting procedures (MP).</p>	<p>Verify that personnel who discover leaking PCB transformers follow proper reporting procedures. (1)(2)</p> <p>(NOTE: See Section 18, <i>Spill Prevention and Response Planning</i>.)</p>
<p>14-17. PCB transformers that have been removed and stored for reuse must be returned to their original application and location only (USFK EGS 14-3b(4)).</p>	<p>Verify that such PCB transformers are returned to their original application and location and not used at another location. (2)</p> <p>(NOTE: This restriction does not apply if there is no practical alternative to use at another location.)</p> <p>Verify that such alternative used does not exceed 1 yr. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>14-18. Installations must take specific actions if a PCB transformer is involved in a fire (USFK EGS 14-3b(7)).</p> <p>OTHER PCB ITEMS</p> <p>14-19. Installations must service electromagnets, switches, and voltage regulators that may contain PCBs at any concentration in accordance with specific standards (USFK EGS 14-3c(1)).</p> <p>14-20. Installations must meet specific requirements with regard to the use and storage of PCB large capacitors (USFK EGS 14-3c(2)).</p>	<p>Verify that, if a PCB transformer is involved in a fire and subjected to sufficient heat and/or pressure that might result in violent or nonviolent rupture, measures are taken to control water runoff. (2)</p> <p>(NOTE: Blocking floor drains is one way to control water runoff.)</p> <p>Verify that runoff water is: (2)</p> <ul style="list-style-type: none"> - tested for PCB, dioxin, and furan compounds - treated if required. <p>Verify that PCB-contaminated electrical equipment is serviced only with dielectric fluid that contains less than 500 ppm PCB. (2)</p> <p>Verify that the installation does not service any electromagnets, switches, or voltage regulators that contain PCB concentrations of 500 ppm or greater. (2)</p> <p>(NOTE: This restriction applies only if it is necessary to remove and rework any internal components as part of service.)</p> <p>Verify that PCBs removed during servicing are captured and either reused as dielectric fluid (if less than 50 ppm) or disposed of properly.</p> <p>Verify that PCBs from electromagnets, switches, and voltage regulators with a PCB concentration of at least 500 ppm are not mixed with or added to dielectric fluid from PCB-contaminated electrical equipment. (2)</p> <p>Verify that dielectric fluids that contain 500 ppm or greater are not used as dielectric fluid in any electromagnets, switches, and voltage regulators classified as PCB-contaminated electrical equipment. (2)</p> <p>Verify that the installation does not use PCB large capacitors (whether of high or low voltage) that pose an exposure risk to food or feed. (1)(2)</p> <p>Verify that the installation does not store such capacitors for use. (1)(2)</p> <p>Verify that the installation uses PCB large capacitors (whether of high or low voltage) only in restricted-access electrical substations or in contained and restricted-access indoor areas. (1)(2)</p> <p>Verify that there is no public access to such capacitors that have been installed indoors. (1)(2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>14-20. (continued)</p> <p>14-21. When PCB items are removed from service, they must be marked with the removal date (USFK EGS 14-3c(4)).</p> <p>14-22. When fluorescent light ballasts are replaced, they must be properly classified (USFK EGS 14-3c(3)).</p> <p>PCB SPILLS</p> <p>14-23. The installation must address PCBs in its spill plan (USFK EGS 14-3a(1) and 3d(1)(e)).</p> <p>14-24. Spills of PCB liquids at concentrations of 50 ppm or greater must be responded to immediately and cleaned up according to specific standards (USFK EGS 14-3a(2)).</p>	<p>Verify that such capacitors have been installed indoors only where the roof, walls, and floor are adequate to contain any release of PCBs. (1)(2)</p> <p>Determine whether the installation is storing any PCB items that have been removed from service. (1)(2)</p> <p>Verify that all PCB items removed from service are marked with the date on which they were removed from service. (1)(2)</p> <p>Verify that installation personnel look for the "No PCB" label when replacing fluorescent light ballasts. (1)(2)</p> <p>Verify that unmarked ballasts are classified as either PCB ballasts or are determined to be PCB free. (1)(2)</p> <p>Determine whether the installation has any PCB items. (1)(2)</p> <p>Verify that PCB items are addressed in the installation spill plan. (1)(2)</p> <p>(NOTE: This requirement also applies to PCB items in temporary storage.)</p> <p>Determine whether PCB storage facilities are located where they are at risk from seismic activity, floods, or other natural events. (1)(2)</p> <p>Verify that the installation's spill plan addresses such storage facilities directly. (1)(2)</p> <p>(NOTE: See Section 18, <i>Spill Prevention and Response Planning</i>, for further details on the contents of the spill plan).</p> <p>Verify that the installation responds immediately to spills of PCB liquids at concentrations of 50 ppm or greater. (1)(2)</p> <p>Verify that surfaces located in substantial contact areas are cleaned to 10 µg per 100 cm² [15.5 in.²]. (1)(2)</p> <p>Verify that surfaces in all other contact areas are cleaned to 100 µg per 100 cm² [15.5 in.²]. (1)(2)</p> <p>Verify that contaminated soil located in restricted access areas is removed until the soil tests no higher than 25 ppm PCB. (1)(2)</p> <p>Verify that the area is then backfilled with clean soil containing less than 1 ppm PCB. (1)(2)</p>

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**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
14-25. (continued)	<p>Verify that, if the spill occurs in a restricted access area other than an outdoor substation: (1)(2)</p> <ul style="list-style-type: none"> - high-contact solid surfaces are cleaned to 10 µg per 100 cm² [15.5 in.²] (as measured by standard wipe tests) - low-contact, indoor, impervious solid surfaces are decontaminated to 10 µg per 100 cm² [15.5 in.²] - low-contact, indoor, nonimpervious surfaces are cleaned to either 10 or 100 µg per 100 cm² [15.5 in.²] and encapsulated at the option of the installation - low-contact, outdoor surfaces (both impervious and nonimpervious) are cleaned to 100 µg per 100 cm² [15.5 in.²] - soil contaminated by the spill is cleaned to 25 ppm PCB by weight - postcleanup samples are taken. <p>Verify that spills in nonrestricted access locations are decontaminated as follows: (1)(2)</p> <ul style="list-style-type: none"> - furnishings, toys, and other easily replaceable household items are disposed of and replaced - indoor solid surfaces and high-contact, outdoor solid surfaces are cleaned to 10 µg per 100 cm² [15.50 in.²] (as measured by standard wipe tests) - indoor vault areas and low-contact, outdoor, impervious solid surfaces are decontaminated to 10 µg per 100 cm² [15.5 in.²] - at the option of the installation, low-contact, outdoor, nonimpervious solid surfaces are cleaned to either 10 or 100 µg per 100 cm² [15.5 in.²] and encapsulated - soil is decontaminated to 10 ppm PCB by weight provided that the soil is excavated to a minimum depth of 25 cm or 10 in. and replaced with clean soil - postcleanup samples are taken. <p>Verify that records documenting all cleanup and decontamination are maintained for 5 yr. (1)(2)</p> <p>(NOTE: Neither the occurrence/discovery of the spill on the weekend nor overtime costs are considered acceptable reasons for delaying response.)</p> <p>(NOTE: The final numerical cleanup standards do not apply to spills directly into surface waters, drinking water, sewers, grazing lands, and vegetable gardens.)</p>

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**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>14-28. PCB storage must be in United Nations (UN) packaging Group II containers (USFK EGS 14-3d(5)).</p> <p>PCB DISPOSAL</p> <p>14-29. Installations must return DOD-generated PCBs manufactured in the United States to the Continental United States (CONUS) for delivery to a permitted disposal facility under certain conditions (USFK EGS 14-3e(5)).</p> <p>14-30. Installations that generate PCB waste of 50 ppm or greater PCB must maintain an audit trail for the waste (USFK EGS 14-3e(1)).</p> <p>14-31. Installations must dispose of PCB items through the DRMO only (USFK EGS 14-3e(2)).</p> <p>14-32. Installations must dispose of PCB-contaminated liquids in accordance with specific requirements (USFK EGS 14-3e(3)).</p>	<p>Verify that containers used for the storage of PCBs are UN Packaging Group II containers. (2)</p> <p>(NOTE: These UN Packaging Group II containers meet specifications described in 49 CFR 172.101.)</p> <p>Determine whether ROK or third-country disposal of DOD-generated PCBs manufactured in the United States is not possible, is prohibited, or will not be managed in an environmentally sound manner. (1)(2)</p> <p>Verify that the installation returns DOD-generated PCBs manufactured in the United States to CONUS for delivery to a permitted disposal facility in the above circumstances. (1)(2)</p> <p>Verify that the installation maintains an audit trail at least as stringent as the audit trail required for hazardous waste. (2)</p> <p>Verify that all PCB items are disposed of through the DRMO. (2)</p> <p>Verify that PCB-contaminated dielectric fluids with concentrations of greater than 500 ppm are disposed of in an incinerator with 99.9 percent combustion efficiency. (2)</p>

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**COMPLIANCE CATEGORY:
POLYCHLORINATED BIPHENYLS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>14-33. PCB or PCB-contaminated transformers, PCB articles, PCB containers, rags, soils, and other debris contaminated with PCBs at concentrations greater than 50 ppm must be incinerated (USFK EGS 14-3e(4)).</p>	<p>Verify that items with PCBs at concentrations greater than 50 ppm are disposed of in a high-temperature incinerator with at least a 99.9 percent combustion efficiency. (2)(3)</p> <p>(NOTE: U.S. Environmental Protection Agency (USEPA)-600/4-87-045, <i>The Determination of Polychlorinated Biphenyls in Transformer Fluid and Waste Oils</i>, is used to establish PCB concentrations.)</p>

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INSTALLATION:	COMPLIANCE CATEGORY: POLYCHLORINATED BIPHENYLS (PCBs) Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 15

ASBESTOS

Korea ECAS

SECTION 15

ASBESTOS

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to all military communities. This section contains the protocol for asbestos and is used to determine the compliance status of the management activities associated with the identification, management, removal, and disposal of asbestos.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 15 addresses the actions and controls needed to abate threats to human health and the environment from the handling, use, storage, and disposal of asbestos.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no provisions directly relevant to asbestos management at installations outside the continental United States.

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH) establishes an installation asbestos management team and appoints an asbestos management control officer or team leader. The DEH maintains records of asbestos survey results, and plans and updates the records as changes occur.
- The Asbestos Management Team prepares the Asbestos Management Plan, which contains documentation of all asbestos management efforts and mechanisms for oversight of the program. The team consists at least of representatives from the DEH, the Environmental Office, Preventive Medicine, the Safety Office, the Civilian Personnel Office (CPO), the Staff Judge Advocate (SJA), and the Public Affairs Office (PAO).

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Active Waste Disposal Site* - any disposal site other than an inactive site.
- *Adequately Wetted* - sufficiently mixed or penetrated with liquid to prevent the release of particulates.

- *Asbestos* - a generic term used to describe six distinctive varieties of fibrous mineral silicates, including chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any other of these materials that have been chemically treated and/or altered (USFK EGS, Chapter 15, Definitions).
- *Asbestos-containing Material (ACM)* - any material containing more than 1 percent asbestos by weight (USFK EGS, Chapter 15, Definitions).
- *Asbestos-containing Waste Materials (ACWM)* - this includes filters from control devices, friable asbestos waste material, and bags or other similar packaging contaminated with commercial asbestos. As applied to demolition and renovation operations, this term also includes regulated asbestos-containing material waste and materials contaminated with asbestos, including disposable equipment and clothing.
- *Category I Nonfriable ACM* - asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos.
- *Category II Nonfriable ACM* - any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos.
- *Demolition* - the wrecking or taking out of any load-supporting structural member of a facility, together with any related handling operations, or the intentional burning of any facility.
- *Friable Asbestos* - any material containing more than 1 percent asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure (USFK EGS, Chapter 15, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Permissible Exposure Limit (PEL)* - an airborne concentration of 0.1 of an asbestos fiber per cubic centimeter (f/cc) as an 8-h time-weighted average (USFK EGS, Chapter 15, Definitions).
- *Regulated Asbestos-containing Material (RACM)* - includes: friable asbestos material; Category I Nonfriable ACM that has become friable; Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; and Category II nonfriable ACM that has a high probability of becoming crumbled, crushed, or pulverized.
- *Renovation* - altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting structural members are wrecked or taken out are demolition.
- *Strip* - to take off RACM from any part of a facility.
- *Structural Member* - any load-supporting member of a facility, such as beams and load-supporting walls, or any non-load-supporting member, such as ceilings and non-load-supporting walls.
- *Visible Emissions* - any emissions that are visually detectable without the aid of instruments that come from RACM or asbestos-containing waste materials or from any asbestos milling, manufacturing, or fabricating operations. This does not include condensed water vapor.

ASBESTOS

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PER- SONS OR GROUPS: (a)
All Installations	15-1	(1)(2)
Asbestos Management		
General	15-2 through 15-4	(1)(2)(3)
Personal Safety	15-5 and 15-6	(2)(3)
Renovation and Demolition	15-7 through 15-12	(1)(2)(3)
Asbestos Disposal	15-13 through 15-15	(1)(2)(3)
Asbestos in Schools	15-16 and 15-17	(1)(2)(3)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer



ASBESTOS

Records to Review

- Installation asbestos management plan and operating plan
- Notifications to regulators concerning asbestos disposal
- Records of onsite disposal and transportation, and offsite disposal of asbestos
- Regulatory inspection reports
- Documentation of asbestos sampling and analytical results
- Documentation of preventive measures or actions
- Results of air sampling at the conclusion of response action
- Records of asbestos training program
- List of buildings insulated with asbestos or housing ACM
- Record of demolition or renovation projects completed in the past 5 yr that involve friable asbestos
- Decision documents/records of decision
- Administrative records

Physical Features to Inspect

- Pipe, spray-on, duct, and troweled cementitious insulation and boiler lagging
- Ceiling and floor tiles
- Asbestos insulation in equipment (exhaust systems, generators, vehicles, aircraft, etc.)
- Maintenance shops (brake shoes, clutch plates)

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer



**COMPLIANCE CATEGORY:
ASBESTOS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>15-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on asbestos management should be maintained at the installation (MP).</p> <p>ASBESTOS MANAGEMENT</p> <p>General</p> <p>15-2. Installations must appoint an asbestos program manager (USFK EGS 15-3a).</p> <p>15-3. Installations must prepare and implement a written asbestos management plan that meets specific minimum requirements (USFK EGS 15-3b).</p>	<p>Verify that copies of the following are maintained on the installation: (1)(2)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 200-2, <i>Environmental Effects of Army Actions</i>, 23 December 1988 - AR 385-10, <i>The Army Safety Program</i>, 23 May 1988 - AR 405-90, <i>Disposal of Real Estate</i>, 10 May 1985 - Technical Bulletin (TB) MED 502, <i>Occupational and Environmental Health: Respiratory Protection Program</i> - TB MED 513, <i>Occupational and Environmental Health Guidelines for the Evaluation and Control of Asbestos Exposure.</i> <p>Verify that the installation has an asbestos program manager who serves as the single point of contact for all asbestos-related activities. (1)(2)</p> <p>Verify that the asbestos program manager maintains USEPA accreditation as an Asbestos Building Inspector and an Asbestos Management Planner. (1)(2)</p> <p>Verify that an Installation Asbestos Management Plan has been prepared. (1)(2)</p> <p>Verify that the plan addresses the following topics: (1)(2)</p> <ul style="list-style-type: none"> - a notification and education program to tell workers, tenants, and building occupants where potentially friable ACM is located and how and why to avoid disturbing it - regular ACM surveillance to note, assess, and document any changes in the ACM's condition - work control/permit systems to control activities which might disturb ACM - operations and maintenance (O&M) work practices to avoid or minimize fiber release during activities affecting ACM - record keeping to document O&M activities related to asbestos identification, management, and abatement - medical and respiratory protection programs, as applicable - training for the asbestos program manager and custodial and maintenance staff - procedures to assess and prioritize identified hazards for abatement.

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**COMPLIANCE CATEGORY:
ASBESTOS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>15-3. (continued)</p> <p>15-4. Friable materials that may be contaminated with asbestos should be tested (MP).</p> <p>Personal Safety</p> <p>15-5. The installation must not expose employees, visitors, or contractors to airborne asbestos above the PEL without appropriate personal protective equipment (PPE) (USFK EGS 15-3c).</p> <p>15-6. Personnel working with asbestos must have physical examinations (TB MED 513).</p> <p>RENOVATION AND DEMOLITION</p> <p>15-7. Prior to renovation or demolition, the installation must determine whether ACM will be removed or disturbed and record the determination in the project authorization document (USFK EGS 15-3d).</p>	<p>Verify that the accredited asbestos management planner addresses the frequency of ACM surveillance in the asbestos management plan. (1)(2)</p> <p>Verify that friable materials that are suspected of being contaminated are tested when located in areas where workers might be exposed. (1)(2)</p> <p>Verify that individuals are not exposed to airborne asbestos concentrations above the PEL without appropriate PPE. (2)(3)</p> <p>Verify that all personnel working with asbestos are given physical examinations as required by TB MED 513: (2)(3)</p> <ul style="list-style-type: none"> - before beginning work with asbestos - annually while employed - at termination of employment. <p>Verify that, prior to renovation or demolition, the installation determines whether ACM will be removed or disturbed and records the determination in the project authorization document (e.g., work order). (1)</p>

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**COMPLIANCE CATEGORY:
ASBESTOS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>15-8. An asbestos survey report must be prepared and furnished to the Installation Commander (IC) prior to certain actions (USFK EGS 15-3e).</p>	<p>Verify that an asbestos survey report is produced prior to the demolition or renovation of a facility that involves removing or disturbing friable ACM. (1)</p> <p>Verify that the survey report is furnished to the IC. (1)</p> <p>Verify that a copy of the asbestos survey report is kept on file permanently. (1)</p>
<p>15-9. Installations must remove ACM when it poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated (USFK EGS 15-3f).</p>	<p>Verify that the installation removes ACM when it poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated. (1)(2)(3)</p> <p>(NOTE: Asbestos should not be removed for the sole purpose of eliminating asbestos.)</p>
<p>15-10. Installations must remove certain types of ACM prior to any renovation or demolition (USFK EGS 15-3g).</p>	<p>Verify that, before renovating or demolishing any facility or any part of a facility in which ACM is found, the installation removes: (1)(3)</p> <ul style="list-style-type: none"> - all friable ACM - nonfriable ACM with a high degree of probability of becoming friable once disturbed.
<p>15-11. When a facility is to be demolished by intentional burning, all RACM should be removed (MP).</p>	<p>Verify that RACM is removed before a facility is demolished by intentional burning. (1)(3)</p>
<p>15-12. Installations must meet specific criteria before and during the removal of asbestos (USFK EGS 15-3h).</p>	<p>Verify that the installation uses contracting for asbestos abatement, unless in-house performance is adequately justified and funded and personnel are adequately trained and certified. (1)(3)</p> <p>Determine whether the installation carries out in-house abatement of asbestos. (1)(3)</p> <p>Verify that all workers are trained prior to the removal. (1)(3)</p> <p>Verify that monitoring programs are in place during asbestos removal to document exposure levels. (1)(3)</p> <p>Verify that all workers involved in the removal use properly fitted respiratory protection and PPE. (1)(3)</p>

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**COMPLIANCE CATEGORY:
ASBESTOS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>15-12. (continued)</p> <p>ASBESTOS DISPOSAL</p> <p>15-13. Installations must dispose of asbestos-containing waste materials in accordance with specific standards (USFK EGS 15-3i).</p> <p>15-14. Active waste disposal sites where ACM is being disposed of should meet specific standards (MP).</p>	<p>Verify that appropriate engineering controls and work practices are used to contain and control asbestos fiber releases for all asbestos removal that has the potential to release airborne asbestos fibers in concentrations greater than the PEL. (1)(3)</p> <p>Verify that all ACM waste is adequately wetted, sealed in a leak-proof container, and properly disposed of in a stabilization landfill as defined in Section 7, <i>Solid Waste</i>. (1)(3)</p> <p>Verify that containers are labeled in English and the Korean language: (1)(3)</p> <p style="text-align: center;">DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD</p> <p>Verify that permanent records are maintained that document the disposal action and site. (1)(3)</p> <p>Determine whether the installation is operating a landfill where asbestos is being disposed of. (1)</p> <p>Verify that there are no visible emissions from active asbestos-containing waste disposal sites, or that: (1)(2)(3)</p> <ul style="list-style-type: none"> - at the end of each operating day, or once in a 24-h period, the waste material is covered with either at least 15 cm (6 in.) of compacted non-ACM, or - a resinous or petroleum-based dust suppression agent is applied (waste crank case oil is not suitable for this purpose), or - an approved alternative method of control is used. <p>Verify that the waste is either properly covered daily by non-ACM or that proper warning signs and fences are installed and maintained as follows: (1)(2)(3)</p> <ul style="list-style-type: none"> - warning signs are displayed at all entrances at intervals of 100 m (330 ft) or less along the property line of the site or the perimeter of the section of the site where ACMs are disposed of and the signs state that the site contains asbestos and warn against creating dust - the area is adequately fenced. <p>(NOTE: This requirement does not apply if a natural barrier exists that deters access by the general public.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

**COMPLIANCE CATEGORY:
ASBESTOS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>15-14. (continued)</p> <p>15-15. Inactive waste disposal sites should meet specific standards (MP).</p>	<p>Verify that a record is kept of the location, depth, and area of asbestos-containing waste on a map or diagram of the disposal area. (1)(3)</p> <p>Verify that inactive waste disposal sites meet one of the following criteria: (1)(3)</p> <ul style="list-style-type: none"> - no visible emissions are discharged - ACWM is covered with at least 15 cm (6 in.) of compacted non-ACM, and a vegetation cover is grown and maintained - the ACWM is covered with at least 60 cm (2 ft) of non-ACM, and the cover is maintained to prevent exposure. <p>(NOTE: In desert areas where vegetation is difficult to maintain, at least 8 cm (3 in.) of additional well-graded, non-asbestos-containing, crushed rock may be used instead.)</p> <p>Verify that warning signs and a fence are installed to deter public access. (1)(3)</p> <p>(NOTE: This requirement does not apply if a natural barrier to public access exists.)</p> <p>Verify that easily legible warning signs are displayed at all entrances and at intervals of 100 m (330 ft) or less that indicate that the area is an asbestos waste disposal site. (1)(3)</p> <p>Verify that a procedure is in place to notify the administrator in writing at least 45 days prior to excavating or disturbing any ACWM at an inactive waste disposal site. (1)(2)</p>
<p>ASBESTOS IN SCHOOLS</p> <p>15-16. Department of Defense Dependents Schools (DODDS) must meet specific requirements with regard to ACM (USFK EGS 15-3j).</p>	<p>Verify that both friable and nonfriable ACM have been identified in elementary and secondary schools. (1)(2)(3)</p> <p>Verify that all suspect materials that are not confirmed to be ACM have been sampled. (1)(2)(3)</p> <p>Verify that samples are analyzed using appropriate techniques. (1)(2)(3)</p> <p>Verify that a certified inspector has provided a written analysis of all friable, known, or assumed ACM in school buildings. (1)(2)(3)</p> <p>Verify that appropriate response actions are selected and implemented in a timely manner to protect human health and the environment. (1)(2)(3)</p> <p>Verify that all maintenance and custodial persons who may work in buildings that contain ACM receive awareness training regarding asbestos, its uses and forms, location in school buildings, and recognition of ACM. (1)(2)(3)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

**COMPLIANCE CATEGORY:
ASBESTOS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>15-16. (continued)</p>	<p>Verify that each school has an asbestos management plan that includes all leased or owned facilities. (1)(2)(3)</p> <p>(NOTE: The DODDS asbestos management plan could be part of the installation asbestos management plan.)</p>
<p>15-17. Organized parent groups and parents of children in DODDS and child development centers should be informed of the location of friable ACM (MP).</p>	<p>Verify that organized parent groups, and parents of children in DODDS and child development centers have been informed of the location of friable ACM. (1)(2)(3)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

INSTALLATION:	COMPLIANCE CATEGORY: ASBESTOS Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 16

RADON

Korea ECAS

SECTION 16

RADON

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to all military communities. It is used to determine the compliance status of the activities associated with radon management.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 16, outlines the criteria for assessing and mitigating radon. The objective of the criteria is to control radon exposures and prevent possible adverse health effects in persons living and working on DOD installations.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no provisions that are directly relevant to the management of radon overseas.

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH) is responsible for reviewing radon assessments and for planning, programming, and institutionalizing radon mitigation features for existing and future military community projects.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Detailed Radon Testing* - a comprehensive testing program for radon (USFK EGS, Chapter 16, Definitions).
- *Initial Radon Screening* - short-term radon testing in a statistically representative sample of selected high priority facilities (family housing, child development centers, schools, dormitories, etc.). The purpose of initial screening is to identify installations having high radon levels (USFK EGS, Chapter 16, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Mitigation* - actions taken to reduce radon levels in facilities having radon levels higher than 4 picoCuries per liter (pCi/L), as identified during detailed radon testing (USFK EGS, Chapter 16, Definitions).
- *Post-Mitigation Monitoring* - follow-up radon testing in facilities where mitigation has been completed. The purpose of post-mitigation monitoring is to ensure that mitigation actions were effective in reducing radon levels below 4 pCi/L (USFK EGS, Chapter 16, Definitions).
- *Radon* - a naturally occurring, odorless, colorless, inert radioactive gas that is formed from the radioactive decay of uranium. Radon gas becomes a health hazard when it accumulates in an enclosed area or poorly ventilated spaces, and occupants breathe the high levels of radon over a prolonged period of time. The gas can move through small spaces in the soil and rock on which the structure is built. It can seep into a structure through dirt floors, cracks in concrete floors and walls, floor drains, sumps, joints, and tiny cracks or pores in hollow-block walls (USFK EGS, Chapter 16, Definitions).

RADON

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	16-1	(1)(2)
Radon Management	16-2 through 16-9	(1)(2)(3)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer



RADON

Records to Review

- Annual reports
- Inventory sheets for detector placement

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer



**COMPLIANCE CATEGORY:
RADON
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>16-1. Copies of all relevant DOD directive/instruction, ARs, and guidance documents on radon management should be maintained at the installation (MP).</p> <p>RADON MANAGEMENT</p> <p>16-2. Installations must properly prioritize their facilities for radon assessment and mitigation (USFK EGS 16-3a).</p> <p>16-3. Initial screening samples must be collected from facilities in accordance with a specific schedule (USFK EGS 16-3b).</p> <p>16-4. Installations that have only Priority 2 and 3 facilities must conduct radon screening to obtain a statistically representative sample by 1 January 1996 (USFK EGS 16-3d).</p>	<p>Verify that up-to-date copies of the following are maintained on the installation: (1)(2)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997. <p>Verify that the installation has prioritized its facilities in accordance with the following list: (1)(2)</p> <ul style="list-style-type: none"> - Priority 1: military family housing, day care centers, hospitals, schools, unaccompanied officers/enlisted quarters, confinement facilities, visiting officer/enlisted quarters, and dormitories/ barracks - Priority 2: administrative areas having 24-h operations - Priority 3: all other structures routinely occupied over 4 h per day. <p>Verify that the installation has collected initial screening samples from selected Priority 1 facilities before 1 October 1995. (1)(2)</p> <p>(NOTE: Priority 2 and 3 facilities are not involved in the initial screening program.)</p> <p>Verify that the samples are collected according to a protocol that yields a statistically representative sample. (1)(2)</p> <p>Determine whether the installation has only Priority 2 and 3 buildings. (1)(2)(3)</p> <p>Verify that radon screening has been carried out so that a sample was ready by 1 January 1996. (1)(2)(3)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

**COMPLIANCE CATEGORY:
RADON
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>16-5. Detailed testing is required if any initial screening sample results are above 4 pCi/L (USFK EGS 16-3c).</p>	<p>Verify that, if any initial screening sample results are above 4 pCi/L, 12-mo or representative radon samples are collected from all Priority 1, 2, and 3 facilities. (1)(2)(3)</p>
<p>16-6. Installations must have a Quality Assurance/Quality Control (QA/QC) program to ensure the validity of test results (USFK EGS 16-3f).</p>	<p>Verify that the installation has a QA/QC program to ensure the validity of radon test results. (1)(2)</p>
<p>16-7. Installations must mitigate certain structures according to a specific schedule (USFK EGS 16-3e).</p>	<p>Verify that the installation mitigates facilities that have radon levels above 4 pCi/L in accordance with Appendix 16-1. (1)(2)(3)</p>
<p>16-8. Installations must develop and implement post-mitigation monitoring programs (USFK EGS 16-3h).</p>	<p>Verify that the installation has developed and implemented a post-mitigation monitoring program to confirm and document the effectiveness of mitigation actions. (1)(2)(3)</p>
<p>16-9. Installations must develop an information package on the potential health effects of radon and provide the information along with radon test results to facility occupants (USFK EGS 16-3g).</p>	<p>Verify that the installation has developed an information packet on radon. (1)(2)(3)</p> <p>Verify that the packet and the radon monitoring results are given to facility occupants upon assignment. (1)(2)(3)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (3) Preventive Medicine Officer

Appendix 16-1

Radon Mitigation Schedule
(USFK EGS Table 16-1)

Radon Level (pCi/L)	Mitigation Within:
Greater than 200	1 mo of sample results or move occupants
200 or less, but greater than 20	6 mo of sample results
20 or less, but greater than 8	4 yr
8 or less, but greater than 4	5 yr
4 or less	No action required

INSTALLATION:	COMPLIANCE CATEGORY: RADON Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 17

ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS

Korea ECAS

SECTION 17

ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to all Army facilities. Because the requirements addressed in this protocol are procedural in nature, no host nation regulations are included here.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 17 establishes procedures that have been developed for informing decision-makers of environmental considerations when authorizing or approving major DOD actions undertaken at installations outside the United States.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, requires Army agencies that control actions outside the United States to consider the environmental effects of their actions and to prepare environmental documents as specified in Executive Order (EO) 12114. Since the requirements of that EO are explicitly incorporated into USFK EGS, compliance with USFK EGS will assure compliance with the EO. AR 200-1 requires that the results of any predecisional environmental impact reviews be documented.
- AR 200-2, *Environmental Effects of Army Actions*, addresses Outside Continental United States (OCONUS) issues in para 1-5c, stating that "[The] Worldwide and long-range character of environmental problems will be recognized, and where consistent with national security requirements and U.S. foreign policy, appropriate support will be given to initiatives, resolutions, and programs designed to maximize international cooperation in protecting the quality of the world human environment."

D. Responsibility for Compliance

- The Directorate of Engineering and Housing (DEH) prepares and provides input into the Annual Work Plan (AWP), Command Operating Budget (COB), and other budgetary documents.
- The Civilian Personnel Office (CPO) provides personnel active support regarding classification, recruitment, and placement.
- The Director of Resource Management (DRM) provides support and guidance to manpower survey/Schedule X activity in establishing and maintaining required staffing.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. *Code of Federal Regulations* (CFR).

- *Affecting* - will or may have an effect.
- *Categorical Exclusions (CXs)* - a category of actions that do not require an Environmental Assessment (EA) or Environmental Impact Statement (EIS) because the Department of the Army (DA) has determined that the actions do not have an individual or cumulative effect on the environment (AR 200-2, Glossary).
- *Categorical Exclusion* - in addition to the above definition: a class of actions, defined and approved in accordance with EO 12114, DOD Directive 6050.7, and service regulations, that normally do not, individually or cumulatively, significantly harm the environment and that require no further environmental review beyond appropriate documentation of the decision to apply the exclusion (USFK EGS, Chapter 17, Definitions).
- *Effects* - effects are either direct or indirect. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are altered in time or farther removed in distance, but are still reasonably foreseeable.
- *Environment* - the natural and physical environment, excluding social, economic, and other environments (USFK EGS, Chapter 17, Definitions).
- *Environmental Assessment (EA)* - a concise analysis to assist DOD components in determining whether there is potential for significant environmental impacts associated with the proposed action and whether an environmental impact statement is required (USFK EGS, Chapter 17, Definitions).
- *Environmental Impact Statement (EIS)* - an analysis of the likely environmental consequences of a proposal for a major Federal action that is to be considered by DOD components in deciding whether to approve the proposal. It includes a review of the affected environment, a description of any adverse environmental effects that cannot be avoided if the proposal is adopted, alternatives to the proposed action (including a no-action alternative), actions taken to avoid environmental harm or otherwise to better the environment, and environmental considerations and actions by the other participating nations, bodies, or organizations (USFK EGS, Chapter 17, Definitions).
- *Environmental Review* - an analysis of the likely environmental consequences of the action that is to be considered by DOD components in the decision making process. It includes a review of the affected environment, actions taken to avoid environmental harm or otherwise to better the environment, and environmental considerations and actions by the other participating nations, bodies, or organizations. Environmental reviews will be prepared either unilaterally by the DOD or in conjunction with another U.S. agency, but do not include foreign government participation (USFK EGS, Chapter 17, Definitions).
- *Environmental Reviews* - concise reviews of the environmental issues involved that are prepared unilaterally by the U.S. (AR 200-2, Appendix H, para C(1)(a)(2)).

- *Environmental Studies* - bilateral or multilateral environmental studies, relevant or related to the proposed action, conducted by the U.S. and one or more foreign nations or by an international body or organization in which the U.S. is a member or participant (AR 200-2, Appendix H, para C(1)(a)(1)).
- *Environmental Study* - an analysis of the likely environmental consequences of the action that is to be considered by DOD components in the decision making process. It includes a review of the affected environment, actions taken to avoid environmental harm or otherwise better the environment, and environmental considerations and actions by the other participating nations, bodies, or organizations. Environmental studies are prepared by the U.S. in conjunction with one or more foreign nations, or by an international body or organization in which the U.S. is a member or participant (USFK EGS, Chapter 17, Definitions).
- *Federal Action* - an action that is implemented or funded directly by the U.S. Government. It does not include actions in which the U.S. participates in an advisory, information gathering, representational, or diplomatic capacity, nor does it include actions taken by a foreign government in a foreign country in which the U.S. is a beneficiary of the action or actions in which foreign governments use funds derived indirectly from the U.S. (USFK EGS, Chapter 17, Definitions).
- *Finding of No Significant Impact (FONSI)* - a decision document that briefly states why an action will not significantly affect the environment, and that an EIS will not be prepared. The FONSI includes a summary of the EA and notes any related environmental documents. If the EA is attached, the FONSI need not repeat any of the EA discussion, but may incorporate it by reference (USFK EGS, Chapter 17, Definitions).
- *Foreign Nation* - any geographic area (land, water, or airspace) that is under the jurisdiction of one or more foreign governments; any area under military occupation by the U.S. alone or jointly with any other foreign government; and any area that is the responsibility of an international organization of governments. Foreign nation includes contiguous zones and exclusive economic zones established consistent with customary international law (USFK EGS, Chapter 17, Definitions).
- *Global Commons* - geographical areas outside the jurisdiction of any nation. They include the oceans outside territorial limits and Antarctica. They do not include contiguous zones and fisheries zones of foreign nations (AR 200-2, Glossary, Section II).
- *Major Action* - an action, involving substantial expenditures of time, money, or resources, that affects the environment on a large geographic scale or has substantial environmental effects on a more limited geographic area. A major action is substantially different or a significant departure from other actions previously analyzed with respect to environmental considerations and approved with which the action under consideration may be associated. A deployment of units, ships, aircraft, or mobile military equipment that does not involve significant changes to the physical environment and that does not require additional support facilities that would significantly change the physical environment is not a major action for purposes of USFK EGS (USFK EGS, Chapter 17, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Negative Decision* - a record of decision not to prepare environmental analyses (USFK EGS, Chapter 17, Definitions).

- *Proponent* - in general, the lowest level decision maker who has the responsibility to evaluate the proposal and its environmental impacts and determine what environmental documents are required. The proponent has the responsibility to recommend and implement, where there are practicable alternatives and/or mitigation methods that will reduce or eliminate those impacts, because the knowledge of all aspects of the action and the ability to modify the planned action to minimize impact exist at this level. Proponents for different projects may exist at all levels of a service components structure (USFK EGS, Chapter 17, Definitions).
- *Record of Consideration (REC)* - a document that concisely describes the proposed action, identifies the proponent, and explains why further environmental analysis and documentation is not required. A REC documents that *National Environmental Policy Act (NEPA)* and/or other environmental analysis and documentation requirements have been fulfilled or have been adequately assessed in existing pertinent documents. A REC also documents the use of CXs that require such records (USFK EGS, Chapter 17, Definitions).

ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	17-1	(1)(2)(22)
Managing Environmental Effects	17-2 through 17-4	(1)(2)
Environmental Analyses		
General	17-5 and 17-6	(2)
Environmental Impact Statements	17-7 through 17-13	(2)
Environmental Studies and Environmental Reviews	17-14 through 17-20	(2)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (13) Engineering, Plans, and Services (EP&S)
- (22) Staff Judge Advocate (SJA)
- (26) Master Planner (DEH)

ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS

Records to Review

- AWP (Environmental Impact)
- Unfinanced Requirements Report (UFR)
- Categorical exclusions, if any
- EISs, EAs, and/or statements that such are not required, if any
- Plans for military exercises, if any

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Staff Judge Advocate (SJA)
- Master Planner (DEH)



**COMPLIANCE CATEGORY:
ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>17-1. Copies of all relevant DOD directives/instructions, ARs, and guidance documents on environmental effects should be maintained at the installation (MP).</p> <p>MANAGING ENVIRONMENTAL EFFECTS</p> <p>17-2. The installation must carry out certain responsibilities in the management of environmental effects (AR 200-2 para 1-4k).</p> <p>17-3. Army units must integrate environmental reviews concurrently with other planning and decision-making actions (AR 200-2, para 2-6a).</p> <p>17-4. The EC should have access to installation and tenant planning processes (MP).</p>	<p>Verify that copies of the following regulations are maintained on the installation: (1)(2)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - AR 200-2, <i>Environmental Effects of Army Actions</i>, 23 January 1989 - AR 415-15, <i>Military Construction, Army (MCA) Program Development</i>. <p>Verify that the installation: (1)(2)</p> <ul style="list-style-type: none"> - monitors proposed actions and programs within its command - assures that appropriate environmental documentation is prepared and forwarded to the appropriate proponent - initiates the preparation of necessary environmental documentation and assesses the environmental consequences of proposed programs and projects - coordinates appropriate environmental documents and public affairs initiatives with MACOM, Headquarters, Department of the Army (HQDA) agencies, and the Army Environmental Office - assists in the review of environmental documents prepared by the DOD and other Army agencies, as requested. <p>Verify that installation organizations have developed some method to ensure that they consult with the EC to determine environmental review and documentation requirements for actions they plan or perform. (2)</p> <p>Verify that action proponents have documented compliance with environmental review requirements for actions they plan or perform. (2)</p> <p>Verify that the EC has access to installation and tenant planning processes. (2)</p> <p>(NOTE: Such access may be gained by attendance at Master Planning Board meetings or other means appropriate to the particular installation and its mission.)</p> <p>Verify that the EC has access to Range Control schedules. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (26) Master Planner (DEH)

**COMPLIANCE CATEGORY:
ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ENVIRONMENTAL ANALYSES (EA)</p> <p>General</p> <p>17-5. Proponents that are responsible for proposals must complete the appropriate EAs (USFK EGS 17-3a).</p> <p>17-6. If it is determined that no EA is required, the installation must document that decision (USFK EGS 17-3c).</p> <p>Environmental Impact Statements</p> <p>17-7. Installations must use an EA to determine whether an EIS is required (USFK EGS 17-3c).</p>	<p>(NOTE: The term 'environmental analysis' is understood to include environmental impact statements (EIS), environmental reviews (ERs), and environmental studies (ESs).)</p> <p>Determine whether the installation has sponsored proposals that require EAs. (2)</p> <p>Verify that the proponent has completed the EA appropriate to each such proposal. (2)</p> <p>(NOTE: This requirement does not apply if a CX approved pursuant to DOD Directive 6050.7 is applicable and invoked or if the action is otherwise exempt. See checklist item 17-16.)</p> <p>(NOTE: See Appendix 17-1 for a summary of which types of actions require which kinds of analysis.)</p> <p>Verify that, if it is determined that no environmental analysis is required, a negative decision is completed. (2)</p> <p>(NOTE: EISs are required for the following types of actions <i>only</i>:</p> <ul style="list-style-type: none"> - major DOD actions that do significant harm to the environment of the global commons - major DOD actions that significantly affect natural or ecological resources of global importance designated for protection by the President or in the case of such a resource protected by an international agreement that is binding on the United States.) <p>Verify that the installation uses an EA to determine whether or not preparation of an EIS is required. (2)]</p> <p>(NOTE: The EA is prepared under DODD 6050.7, and is an internal DOD document that does not require public participation or other attributes under domestic law.)</p> <p>Verify that the decision not to prepare an EIS is documented and forwarded to USFK EPO. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (26) Master Planner (DEH)

**COMPLIANCE CATEGORY:
ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>17-8. Installations in the process of completing an EIS must meet certain requirements while engaged in that process (AR 200-2, Appendix G, para C(2) through C(6)).</p>	<p>Verify that no action is taken that does significant harm or limits the choice of a reasonable alternative until the completion of the documentation process. (2)</p> <p>(NOTE: In the case of an emergency where the actions are taken that do significant harm to the environment, the DOD component concerned must consult with the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics.)</p> <p>(NOTE: Environmental documents may be combined with other documents to reduce duplication. Both the use of collective statements and tiering is acceptable.)</p> <p>(NOTE: If a current and acceptable environmental document already exists for a particular action, regardless of which federal agency prepared it, AR 200-2 does not require the preparation of a new document.)</p>
<p>17-9. EISs must be prepared in two stages (AR 200-2, Appendix G, para D(2)).</p>	<p>Verify that the installation prepares both a draft and a final version of its EISs. (2)</p>
<p>17-10. Draft EISs must be sufficiently complete to permit meaningful analysis and comment (AR 200-2, Appendix G, para D(2)).</p>	<p>Verify that the installation's draft EISs are sufficiently complete to permit meaningful analysis and comment. (2)</p> <p>Verify that the draft statement is made available to the U.S. public for comment. (2)</p> <p>Verify that the Department of State, the Council on Environmental Quality, and other interested Federal agencies are informed of the availability of the draft statement and are afforded an opportunity for comment. (2)</p> <p>(NOTE: Communications with foreign governments concerning environmental agreements and other formal arrangements with foreign governments concerning environmental matters will be coordinated with the Department of State, and due regard must be given to whether the EIS contains classified information. Informal, working-level communications and arrangements are not included in this coordination requirement.)</p>
<p>17-11. Installations must take into account substantive comments received on draft EISs (AR 200-2, Appendix G, para D(3)).</p>	<p>Verify that final EISs consider, either individually or collectively, substantive comments received on draft EISs. (2)</p> <p>Verify that the final statement is made available to the public in the United States. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (26) Master Planner (DEH)

**COMPLIANCE CATEGORY:
ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>17-12. Installations must use supplements to draft or final EISs under certain circumstances (AR 200-2, Appendix G, para D(4)).</p>	<p>Verify that supplements to draft or final EISs are prepared when: (2)</p> <ul style="list-style-type: none"> - substantial changes to the proposed action are made relative to the environment of the global commons, or - significant new information or circumstances (relevant to environmental concerns) bears on the proposed action or its environmental effects on the global commons.
<p>17-13. Draft and final EISs must include certain information (AR 200-2, Appendix G, para D(5) through D(7)).</p>	<p>Verify that EISs contain the following: (2)</p> <ul style="list-style-type: none"> - a section on consideration of the purpose and need for the proposed action - a section on the environmental effects of the proposed action and reasonable alternatives - a section that provides a succinct description of the environment of the global commons affected by the proposed action and reasonable alternatives - a section that analyzes, in comparative form, the environmental effects on the global commons of the proposed action and reasonable alternatives. <p>Verify that the EIS contains clear statements as to why relevant information is missing, whether that information is unavailable or scientifically uncertain. (2)</p> <p>(NOTE: Public hearings are not required.)</p>
<p>ESs and ERs</p>	
<p>17-14. Specific analyses and documentation procedures must be carried out when an installation performs certain types of major DOD actions that do significant harm to the environment of a foreign nation or to a protected global resource (USFK EGS 17-3a and 17-3b, and AR 200-2, Appendix H, para B(1) and C(3)(a)).</p>	<p>Verify that the installation performs appropriate analyses and creates documentation for the following types of major Federal actions: (2)</p> <ul style="list-style-type: none"> - those that significantly affect the environment of a foreign nation that is not involved in the action - those that are determined to cause significant harm to the environment because they provide to that nation: <ul style="list-style-type: none"> - a product or involve a physical project that produces a principal product, emission, or effluent that is prohibited or strictly regulated by Federal law in the United States because its toxic effects on the environment create a serious public health risk - a physical project that is prohibited or strictly regulated in the United States by Federal law to protect the environment against radioactive substances - those that significantly harm natural or ecological resources of global importance designated for protection by the President or, in case of such a resource protected by international agreement binding on the United States, designated for protection by the Secretary of State.

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (26) Master Planner (DEH)

**COMPLIANCE CATEGORY:
ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>17-14. (continued)</p>	<p>(NOTE: Included in the category of "prohibited or strictly regulated" are the following: asbestos, vinyl chloride, acrylonitrile, isocyanates, polychlorinated biphenyls, mercury, beryllium, arsenic, cadmium, and benzene.)</p> <p>Verify that either an environmental study or an environmental review was prepared, as appropriate. (2)</p> <p>(NOTE: The following are exempt from these requirements:</p> <ul style="list-style-type: none"> - actions that are determined by a DOD component not to do significant harm to the environment outside the U.S. or to a designated resource of global importance - actions taken by the President - actions taken by or pursuant to the direction of the President or a cabinet officer in the course of armed conflict - actions taken by or pursuant to the direction of the President or a cabinet officer when the national security or national interest is involved - intelligence activities and arms transfers - votes and other actions in international conferences and organizations - actions involving export licenses, export permits, or export approvals, other than those relating to nuclear activities - actions relating to nuclear activities and nuclear material, except actions providing a nuclear production or utilization facility as defined in the <i>Atomic Energy Act of 1954</i>, as amended, or a nuclear waste management facility to a foreign nation - disaster and emergency relief action.) <p>(NOTE: Additional exemptions may be granted on a case-by-case basis.)</p> <p>(NOTE: If a current and acceptable environmental document already exists for a particular action, regardless of which federal agency prepared it, AR 200-2 does not require the preparation of a new document.)</p>
<p>17-15. Certain information must be recorded in the event that a decision is made not to prepare an ES (AR 200-2, Appendix H, para D(3)).</p>	<p>Verify that, if a negative decision is made, the file is documented with a record of that decision and the names of the decision makers who participated. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (26) Master Planner (DEH)

**COMPLIANCE CATEGORY:
ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>17-16. Installations in the process of completing an ES must meet certain requirements while engaged in that process (AR 200-2, Appendix H, para D(3)).</p>	<p>Verify that no action concerning the proposal is taken that would do significant harm to the environment until the study has been completed and the results considered. (2)</p>
<p>17-17. The content of an ES is subject to certain requirements (AR 200-2, Appendix H, para D(4) and D(5)).</p>	<p>Verify that the environmental study includes the following: (2)</p> <ul style="list-style-type: none"> - a general review of the affected environment - the predicted effects of the action on the environment - significant know actions taken by governmental entities with respect to the proposed action to protect or improve the environment - if no actions are being taken to protect or enhance the environment, a statement as to whether the decision not to do so was made by the affected foreign government or international organization. <p>Verify that the ES is made available to the Department of State, the Council on Environmental Quality, and other interested Federal agencies. (2)</p> <p>Verify that the ES is made available to public in the U.S. upon request. (2)</p> <p>(NOTE: The requirements with respect to the preparation, content, and distribution of ESs in the international context are considered to be flexible, and due regard must be given to whether the document contains classified information.)</p>
<p>17-18. Certain information must be recorded in the event that a decision is made not to prepare an ER (AR 200-2, Appendix H, para E(3)).</p>	<p>Verify that, if a decision is made not to prepare an ER, a record is made of that decision and its basis. (2)</p>
<p>17-19. Installations in the process of completing an ER must meet certain requirements while engaged in that process (AR 200-2, Appendix H, para E(3)).</p>	<p>Verify that no action concerning the proposal is taken that would do significant environmental harm until the review has been completed. (2)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (26) Master Planner (DEH)

**COMPLIANCE CATEGORY:
ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>17-20. The content of an ER is subject to certain requirements (AR 200-2, Appendix H, para E(4) and E(5)).</p>	<p>Verify that the environmental review includes the following, to the extent reasonably practical: (2)</p> <ul style="list-style-type: none"> - a statement of the proposed action including its timetable, physical features, general operating plan, and other similar broad-gauge descriptive factors - identification of the important issues involved - the aspects of the actions taken or to be taken by the Army that ameliorate or minimize the impact on the environment - the actions known to have been taken or to be planned by the government of any participating and affected foreign nations that will affect environmental considerations. <p>Verify that the ER is made available to the Department of State, the Council on Environmental Quality, and other interested Federal agencies. (2)</p> <p>Verify that the ER is made available to the public in the U.S. upon request. (2)</p> <p>(NOTE: The requirements with respect to the preparation, content, and distribution of ERs in the international context are considered to be flexible, and due regard must be given to whether the document contains classified information. The provision for distribution is not a requirement that distribution be made prior to taking the action that is the subject of the review.)</p>

(1) Directorate of Engineering and Housing (DEH) (2) Environmental Coordinator (EC) (13) Engineering, Plans, and Services (EP&S) (21) Public Affairs Office (PAO) (26) Master Planner (DEH)



Appendix 17-1

Environmental Effects Abroad

(USFK EGS Table 17-1)

Analyses Of Overseas Actions	
Action	Analyses Required
a. Major DOD actions significantly affecting the environment of the geographic areas outside the jurisdiction of any nation (i.e., outside any economic zone, fishery zone, territorial sea, or other claim established consistent with customary international law). Antarctica is considered outside the jurisdiction of any nation.	Environmental Impact Statement
b. Major DOD actions significantly affecting the environment of a foreign nation that is not participating with the United States and not otherwise involved in the action.	Environmental Review or Environmental Study
c. Major DOD actions significantly affecting the environment of a foreign nation in which the actions provide, to that nation, a product or physical project producing a principal product or an emission or effluent that is prohibited or strictly regulated by Federal law in the United States because its toxic effects on the environment create a serious public health risk.	Environmental Review or Environmental Study
d. Major DOD actions significantly affecting the environment of a foreign nation in which the actions provide, to that nation, a physical project that is prohibited or strictly regulated by Federal law in the United States to protect against radioactive substances.	Environmental Review or Environmental Study
e. Major DOD actions that significantly affect natural or ecological resources of global importance designated for protection by the President or, in the case of such a resource protected by international agreement binding on the United States, by the Secretary of State. Recommendations to the President in such cases will be accompanied by the views of the Council on Environmental Quality and the Secretary of State.	Environmental Impact Statement, Environmental Review, or Environmental Study
f. Major DOD actions affecting only the environment of a participating or otherwise involved foreign nation and that do not involve emissions, effluents that are prohibited or strictly regulated by Federal law in the United States, or resources of global importance that have been designated for protection.	No formal document required.

INSTALLATION:	COMPLIANCE CATEGORY: ENVIRONMENTAL EFFECTS ABROAD OF MAJOR FEDERAL ACTIONS Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 18

SPILL PREVENTION AND RESPONSE PLANNING

Korea ECAS

SECTION 18

SPILL PREVENTION AND RESPONSE PLANNING

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol contains the criteria to prevent, control, and report spills of Petroleum, Oil and Lubricant (POL) and hazardous substances. It is U.S. Forces - Korea (USFK) policy to prevent spills of these substances due to USFK activities and to provide prompt, coordinated response to contain and clean up spills that might occur.

Some local requirements for POL may vary in important ways, and the assessor should obtain copies of the spill plans, where appropriate, and review them for those differences before conducting the evaluations. In particular, the evaluator should check for differences in the definitions of reportable quantities (RQs) and the specific procedures for reporting spills that may exist in local regulations.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 18 contains criteria for an installation spill plan. It also addresses requirements for reporting spills of POL and hazardous substances, but checklist items derived from those requirements are to be found in Section 6, *Hazardous Materials*, and Section 9, *Petroleum, Oils, and Lubricants*.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no OCONUS-applicable requirements related to spill prevention and response.

D. Responsibility for Compliance

- The Installation Commander (IC) is responsible for assigning the duty of drafting and reviewing the installation spill plan prior to its promulgation, and for conducting the review and update of it. Often, the IC delegates the specific preparation of the plan to the Directorate of Engineering and Housing (DEH) for implementation by the Environmental Coordinator (EC).
- The Installation Response Team (IRT) responds to spills when requested by an Installation On-Scene Coordinator (IOSC) and to perform spill containment, recovery, cleanup, disposal, and restoration activities as directed by the IOSC. The IRT is a multidisciplinary team that includes the following people: Facilities Engineer, EC, Director of Safety and Health, Fire Chief, Military Police, Public Affairs Officer, Safety Officer, and Staff Judge Advocate.

- The Fire Department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department will be responsible for making periodic fire safety inspections of flammable/combustible storage and handling areas and of hazardous waste accumulation points (HWAPs) and storage areas (HWSAs) on the installation.
- The Fuels Management Officer of the DEH is responsible for the safe and efficient receipt, storage, handling, issuing, and accounting of all petroleum products, to include all general operations and inspections.
- The DEH is responsible for the maintenance of all installed petroleum storage and dispensing systems. This responsibility often is discharged by the Liquid Fuels Maintenance (LFM) shop. The DEH also is responsible for the calibration of permanently installed meters.
- The EC monitors all POL activities that may affect the environment and usually is responsible for coordinating the review and updating of the ISCP. The EC also often coordinates the reportable spills notification of appropriate agencies on behalf of the IOSC.

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Installation On-Scene Coordinator (IOSC)* - the official who coordinates and directs control and cleanup efforts at the scene of a POL or hazardous substance spill due to USFK activities on or near the installation. This official is designated by the IC (USFK EGS, Chapter 18, Definitions).
- *Installation Response Team (IRT)* - a team performing emergency functions as defined and directed by the IOSC (USFK EGS, Chapter 18, Definitions).
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.
- *Off-Installation Spill* - an uncontained release to land or water where USFK lacks jurisdiction (USFK EGS, Chapter 18, Definitions).
- *Oil* - POL of any kind or in any form, including, but not limited to, petroleum, fuel POL, sludge, POL refuse, and POL mixed with wastes other than dredged spoil (USFK EGS, Chapter 18, Definitions).
- *On-Installation Spill* - an uncontained release to land or water under USFK control (USFK EGS, Chapter 18, Definitions).
- *Petroleum, Oil, and Lubricant (POL)* - oil of any kind, including but not limited to, petroleum, oils, lubricants (including synthetic oils), fuel, oil sludges, oil refuse and oil mixed with other wastes. Refined petroleum, oils and lubricants include synthetic oils, oil sludges, and oily wastes (refuse) (USFK EGS, Chapter 18, Definitions).

- *Reportable Quantity (RQ)* - a released quantity of 110 gal [415 L] or more of POL, or released quantity of a hazardous substance in excess of the substance-specific RQ presented in Appendix 6-1, Chart A.4 (USFK EGS, Chapter 18, Definitions).
- *Significant Spill* - an uncontained release to the land or water in excess of any of the following quantities: (USFK EGS, Chapter 18, Definitions)
 1. for hazardous waste or hazardous substance identified as a result of inclusion in Appendix 6-1, Chart A.4, any quantity in excess of the RQ listed therein
 2. for POL or liquid or semi-liquid hazardous material, hazardous waste or hazardous substance, in excess of 415 L (110 gal)
 3. for other solid hazardous material, in excess of 225 kg (500 lb)
 4. for combinations of POL and liquid, semi-liquid and solid hazardous materials, hazardous waste or hazardous substance, in excess of 340 kg (750 lb).
- *Tank* - a stationary device designed to contain an accumulation of regulated substances and constructed of nonearthen materials (e.g., concrete, steel, plastic) that provide structural support.

SPILL PREVENTION AND RESPONSE PLANNING

GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	18-1	(1)(2)(3)(22)
Installation Spill Plan	18-2 through 18-5	(1)(2)(6)(7)(8)(9)
Miscellaneous	18-6 through 18-9	(1)(2)(5)(6)(9)(13)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (5) Fire Department
- (6) Director of Logistics
- (7) Fuels Management Officer (Director of Logistics (DOL)/DEH)
- (8) Transportation/Maintenance (DOL)
- (9) Chief of Operations and Maintenance (O&M)
- (13) Engineering, Plans, & Services (EP&S)
- (22) Staff Judge Advocate (SJA)

SPILL PREVENTION AND RESPONSE PLANNING

Records to Review

- Registration records for all in-service, temporarily out-of-service, and permanently closed tanks
- Groundwater well monitoring data
- Installation Spill Plan

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer
- Fire Department
- Director of Logistics (DOL)
- Chief of Operations and Maintenance (O&M)
- Engineering, Plans, & Services (EP&S)
- Staff Judge Advocate (SJA)

**COMPLIANCE CATEGORY:
SPILL PREVENTION AND RESPONSE PLANNING
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>18-1. Copies of all relevant DOD directive/instructions, ARs, and guidance documents on Spill Prevention and Response Planning should be maintained at the installation (MP).</p> <p>INSTALLATION SPILL PLAN</p> <p>18-2. All USFK installations must prepare, implement, and maintain plans that provide for the prevention, control, and reporting of all spills of POL and hazardous substances (USFK EGS 9-3a and Chapter 18).</p>	<p>Verify current copies of the following are maintained at the installation: (1)(2)(3)(22)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997 - USFK Regulation 703-1, <i>Bulk Petroleum Management</i>, 16 September 1993. <p>Verify that the installation has prepared and implemented a spill plan. (2)(6)</p> <p>Verify that prevention section of the spill plan includes: (2)</p> <ul style="list-style-type: none"> - name, title, responsibilities, duties, and telephone number of the designated person responsible for coordinating the response to POL and hazardous substances - general information on the installation, including: <ul style="list-style-type: none"> - name - type or function - location and address - charts of drainage patterns - drains - catch basins - oil water separators - wash racks - sewer lines - designated water protection areas - maps showing locations of facilities - critical water resources - land uses - possible migration pathways - inventory list of all storage, handling, and transfer facilities that could possibly produce a significant spill of POL or hazardous substances; for each listing include: <ul style="list-style-type: none"> - prediction of direction and rate of flow - total quantity of POL or hazardous substances that might be spilled as a result of major failure - inventory of all POL and hazardous substances at storage, handling, and transfer facilities

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**COMPLIANCE CATEGORY:
SPILL PREVENTION AND RESPONSE PLANNING
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
18-2. (continued)	<ul style="list-style-type: none"> - description of general safety and fire prevention precautions for spill cleanup actions - detailed description of countermeasures, including structures and equipment for diversion and containment of spills for each facility listed in the inventory - description of deficiencies in spill prevention and control measures at each facility listed in the inventory, including corrective measures required, procedures to be followed to correct listed deficiencies, and any interim control measures in place - written procedures for: <ul style="list-style-type: none"> - operations to preclude spills of POL or hazardous substances - inspections - recordkeeping requirements. <p>Verify that the control section of the plan (which may be considered a contingency plan) contains: (2)</p> <ul style="list-style-type: none"> - specification of the responsibilities, duties, procedures, and resources to be used to contain and clean up spills - description of immediate response actions, posted at all storage, handling, and disposal facilities - responsibilities, composition, and training requirements of the IRT - procedures for IRT alert and response to include: <ul style="list-style-type: none"> - access to a reliable communications system for timely notification of a POL or hazardous substance spill - public affairs involvement - current roster of persons and alternates who must be notified of a spill, including: <ul style="list-style-type: none"> - name - organization mailing address - work and home telephone number - without compromising security, provisions for the notification of the emergency coordinator after normal working hours - procedure for notifying the IC - procedure for notifying appropriate local authorities in the event of hazard to human health and the environment outside the installation - assignment of responsibilities for making notifications to emergency services providers - surveillance procedures for early detection of POL and hazardous substance spills - prioritized list of critical water resources to be protected, including on-installation wells - other resources available through prearranged agreements, including mutual aid agreements with ROK fire departments to clean up or reclaim a large spill - cleanup methods, including procedures and techniques used to identify, contain, disperse, reclaim, and remove POL and hazardous substances - disposal procedures for contaminated POL, absorbent, or product

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**COMPLIANCE CATEGORY:
SPILL PREVENTION AND RESPONSE PLANNING
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
18-2. (continued)	<ul style="list-style-type: none"> - procedures to be accomplished prior to resumption of operations - public affairs section - an annual exercise of installation spill response actions - provisions for necessary training to ensure the effectiveness of personnel and equipment. <p>Verify that, if the installation stores hazardous wastes in addition to POL, the contingency plan contains the following: (2)</p> <ul style="list-style-type: none"> - names and office telephone numbers of all individuals qualified to act as an emergency coordinator - arrangements with local hospitals, police and fire departments, contractors and emergency response teams - means to contact emergency services (i.e, phone numbers) on a 24 h basis - list of all emergency equipment at the facility and list and location of decontamination equipment, including the location and a physical description of each item on the list and a brief outline of its capabilities - an evacuation plan for facility personnel (where there is a possibility evacuation would be needed) that includes: <ul style="list-style-type: none"> - a description of the signal(s) used to begin evacuation - evacuation routes - alternate evacuation routes (where the primary route could be blocked by releases of hazardous waste or fires) - a designated meeting place. <p>Verify that the reporting section of the plan addresses the following: (2)</p> <ul style="list-style-type: none"> - recordkeeping when emergency procedures are implemented - notification from the IOSC to the appropriate Military Department and/or Defense Agency and the USFK ACofS, Engineer in the following circumstances: <ul style="list-style-type: none"> - when the spill occurs inside a USFK installation and cannot be contained within any required berm or secondary containment - when the spill exceeds 415 L (110 gal) of POL - when a water resource has been polluted - when the IOSC has determined that the spill is significant - a follow-up written report. <p>Verify that the contingency plan addresses each POL storage and distribution facility specifically. (2)</p> <p>Verify that the plan is certified by a competent authority. (2)</p>

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**COMPLIANCE CATEGORY:
SPILL PREVENTION AND RESPONSE PLANNING
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>18-3. The installation spill plan should be available in both English and Korean (MP).</p>	<p>Verify that the installation spill plan is available in both English and Korean. (2)</p> <p>(NOTE: This MP is suggested by USFK EGS 6-3f(2)(b).)</p>
<p>18-4. Copies of the spill plan should be available at every potential spill site (MP).</p>	<p>Verify that copies of the spill plan are available at every potential spill site. (2)</p>
<p>18-5. The spill plan must be reviewed and updated periodically (USFK EGS 9-3a, 18-3a, and 18-3d).</p>	<p>Verify that, if the installation stores hazardous materials and hazardous waste in addition to POL, the spill plan is updated every year. (2)(6)</p> <p>Verify that, in other circumstances, the spill plan is updated at least once every 5 yr or following any change that affects the potential for a significant spill to occur. (2)(6)</p>
<p>MISCELLANEOUS</p>	
<p>18-6. Installations that store hazardous materials and hazardous wastes must designate one or more emergency coordinators for spill response (USFK EGS 18-3d(1)).</p>	<p>Verify that one or more emergency coordinators for spill response have been designated. (1)(2)</p> <p>Verify that, if more than one emergency coordinator has been designated, one is named as primary coordinator. (1)(2)</p> <p>Verify that the primary coordinator and the others are listed in the spill plan in the order in which they will assume responsibility. (1)(2)</p> <p>Verify that designated emergency coordinators are thoroughly familiar with the following: (1)(2)</p> <ul style="list-style-type: none"> - all aspects of the spill plan - all operations and activities involving hazardous waste - the location and characteristics of waste handled - the location of records - storage locations. <p>Verify that emergency coordinators have the authority to commit the resources needed to carry out the provisions of the spill plan. (1)(2)</p>

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**COMPLIANCE CATEGORY:
SPILL PREVENTION AND RESPONSE PLANNING
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>18-7. Installations must provide necessary training to ensure the effectiveness of personnel and equipment (USFK EGS 18-3c(16)).</p>	<p>Verify that the installation provides necessary training to ensure the effectiveness of personnel and equipment. (1)(2)(6)(9)</p>
<p>18-8. The installation must provide for an annual exercise of installation spill response actions (USFK EGS 18-3c(15)).</p>	<p>Verify that the installation provides for an annual exercise of installation spill response actions. (1)(2)(6)(9)</p> <p>Verify that the exercise is conducted at one of the following sites: (1)(2)(6)(9)</p> <ul style="list-style-type: none"> - fuel dispensing station - POL storage area - heating oil transfer site - aboveground tank without secondary containment.
<p>18-9. Installations must post descriptions of immediate response actions at all storage, handling, and disposal facilities (USFK EGS 18-3c(2)).</p>	<p>Verify that the installation has posted descriptions of immediate response actions at all storage, handling, and disposal facilities. (1)(2)</p> <p>Verify that the description is in a one-page, bilingual format, that states: (1)(2)</p> <ul style="list-style-type: none"> - Immediately take action: <ul style="list-style-type: none"> - Evaluate health/safety risk - Extinguish flames - Attempt to stop the spill - Immediately call help: <ul style="list-style-type: none"> - Call the Fire Department - Provide your name, telephone number, location, the incident, risk, and actions - Continue spill response: <ul style="list-style-type: none"> - Secure site - Apply absorbents and/or containment - Remove spill material and/or waste.

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INSTALLATION:	COMPLIANCE CATEGORY: SPILL PREVENTION AND RESPONSE PLANNING Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

SECTION 19

UNDERGROUND STORAGE TANKS (USTs)

Korea ECAS

SECTION 19

UNDERGROUND STORAGE TANKS (USTs)

Republic of Korea ECAS

A. Applicability of this Protocol

This protocol applies to military communities that have USTs. It addresses the management of storage tanks, pipeline delivery systems, immediate operating storage areas, and fueling/defueling flightline operations. Regulations and procedures concerning Spill Prevention and Response Planning are addressed in Section 18. General criteria for the control and abatement of pollution from the storage, transfer, and distribution of petroleum products are contained in Section 9, *Petroleum, Oils, and Lubricants*. Standards for USTs that contain hazardous waste are found in Section 6, *Hazardous Waste*.

B. Department of Defense (DOD) Regulations

- *United States Forces, Korea Environmental Governing Standards (USFK EGS)*, 7 October 1996, Chapter 19 details requirements for Petroleum, Oil, and Lubricant (POL) and hazardous substance USTs.

C. Army Regulations (ARs)

- AR 200-1, *Environmental Protection and Enhancement*, 21 February 1997, contains no requirements that apply to POL or hazardous substance USTs located outside the continental United States.

D. Responsibility for Compliance

- The Fire Department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department will be responsible for making periodic fire safety inspections of flammable/combustible storage and handling areas, hazardous waste storage areas, and accumulation points on the installation.
- The Safety Officer is responsible for conducting evaluations of work place safety and inspections of the handling and storage of hazardous materials and waste. The Safety Officer provides the appropriate manager with a report of the findings and recommended corrective actions. The Safety Officer is also responsible for ensuring the prompt and accurate investigation of any hazardous material mishaps that result in injury or property damage.
- The Fuels Management Officer of the Directorate of Engineering and Housing (DEH) is responsible for the safe and efficient receipt, storage, handling, issuing, and accounting of all petroleum products to include all general operations and inspections.
- The DEH is responsible for the maintenance of all installed petroleum storage and dispensing systems. This responsibility often is discharged by the Liquid Fuels Maintenance (LFM) shop. The DEH also is responsible for the calibration of permanently installed meters.

- The Environmental Coordinator (EC) monitors all POL activities that may affect the environment and usually is responsible for coordinating the review and updating of the installation spill plan. The EC also often coordinates the reportable spills notification of appropriate agencies on behalf of the Installation On-Scene Coordinator (IOSC).

E. Key Compliance Definitions

These definitions were obtained from the directives/instructions and ARs listed at the end of each definition. If there is no citation listed for the definition, it has been drawn from the U.S. Code of Federal Regulations (CFR).

- *Cathodic Protection* - a technique to prevent corrosion of a metal surface by making the surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or impressed current.
- *Connected Piping* - all underground piping, including valves, elbows, joints, flanges, and flexible connectors, attached to a tank system through which regulated substances flow. For the purpose of determining how much piping is connected to any individual UST system, the piping that joins two UST systems should be allocated equally between them.
- *Flow-through Process Tank* - a tank that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of materials during the operation of the process. Flow-through process tanks do not include tanks used to store material before introduction into the production process or to store finished products or by-products from the production.
- *Free-product* - a regulated substance that is present as a nonaqueous phase liquid (e.g., liquid not dissolved in water).
- *Hazardous Substance* - see Appendix 6-1, Chart A.4 (USFK EGS, Chapter 19, Definitions)
- *Hazardous Substance UST* - a UST that contains a hazardous substance (but not including hazardous waste as defined in Section 6, *Hazardous Waste*) or any mixture of such hazardous substances, and petroleum, and which is not a petroleum UST (USFK EGS, Chapter 19, Definitions).
- *Heating Oil* - petroleum that is No. 1, No. 2, No. 4 light, No. 4 heavy, No. 5 heavy, and No. 6 technical grades of fuel oil, other residual fuel oils (including Navy Special Fuel Oil and Bunker C), and other fuels when used as substitutes for one of these fuel oils.
- *Installation On-Scene Coordinator (IOSC)* - the official who directs control and cleanup efforts at the scene of a POL or hazardous substance spill due to U.S. Forces - Korea (USFK) activities on or near the installation. This official is designated by the Installation Commander (IC) (USFK EGS, Chapter 18, Definitions).
- *Maintenance* - the normal operational upkeep to prevent a UST system from releasing a product.
- *Management Practice (MP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures.

- *Motor Fuel* - petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any grade of gasohol, and is typically used in the operation of motor engines.
- *New Underground Storage Tank* - any UST installed on or after 1 October 1994 (USFK EGS, Chapter 19, Definitions).
- *Oil* - in addition to the above definition, POL of any kind or in any form, including, but not limited to, petroleum, fuel POL, sludge, POL refuse, and POL mixed with wastes other than dredged spoil (USFK EGS, Chapter 18, Definitions).
- *On the Premises Where Stored (Heating Oil)* - UST systems located on the same property where the stored heating oil is used.
- *Pipe or Piping* - a hollow cylinder or tubular conduit that is constructed of nonearthen materials.
- *Pipeline Facilities* - includes new and existing pipes, pipeline rights of way, auxiliary equipment (e.g., valves, manifolds, etc.), and buildings or other facilities used in the transportation of POL (USFK EGS, Chapter 9, Definitions).
- *POL* - includes, but is not limited to, petroleum and petroleum-based substances comprised of complex blends of hydrocarbons derived from crude oil through processes of separation, conversion, upgrading, and finishing, such as motor fuels, residual fuel oils, lubricants, petroleum solvents, and used oils (USFK EGS, Chapter 19, Definitions).
- *POL Facility* - an installation with any individual above ground tank of 2500 L (660 gal) or greater, aggregate aboveground storage of 5000 L (1320 gal) or greater, UST storage of greater than 15,900 L (4200 gal), or a pipeline facility (USFK EGS, Chapter 9, Definitions).
- *Regulated Substance* -
 1. any substance defined in section 101(14) of the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* (but not including any substance regulated as a hazardous waste under subtitle C), and
 2. petroleum, including crude oil or any fraction thereof, that is liquid at standard conditions of temperature and pressure (60 °F [\approx 15 °C] and 14.7 pounds per square inch absolute (psia)).

The term "regulated substance" includes, but is not limited to, petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil through processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

- *Release Detection* - determining if a release of a regulated substance has occurred from the UST system into the environment or into the interstitial space between the UST system and its secondary barrier or the secondary containment around it.
- *Repair* - to restore a tank or UST system component that has caused a release of product from the UST system.

- *Reportable Quantity (RQ)* - a released quantity of 110 gal [\approx 416 L] or more of POL, or released quantity of a hazardous substance in excess of the substance-specific reportable quantity (RQ) presented in Appendix 6-1 Chart A.4 (USFK EGS, Chapter 18, Definitions).
- *Septic Tank* - a watertight covered receptacle designed to receive or process, through liquid separation or biological digestion, the sewage discharged from a building sewer. The effluent from such a receptacle is distributed through the soil, and settled solids and scum from the tank are pumped out periodically and sent to a treatment facility.
- *Stormwater or Wastewater Collection System* - piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water runoff resulting from precipitation or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of stormwater and wastewater does not include treatment except when needed in order to transport.
- *Surface Impoundment* - a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is not an injection well.
- *Tank* - a stationary device designed to contain an accumulation of regulated substances and constructed of nonearthen materials (e.g., concrete, steel, plastic) that provide structural support.
- *Underground Storage Tank (UST)* - under the USFK EGS, this is any tank, including underground piping connected thereto, larger than 415 L (110 gal) that is used to contain POL products or hazardous substances and the volume of which, including the volume of connected pipes, is 10 percent or more beneath the surface of the ground, but does not include: (USFK EGS, Chapter 19, Definitions)
 1. tanks containing heating oil used for consumptive use on the premises where it is stored
 2. septic tanks
 3. stormwater or wastewater collection systems
 4. flow through process tanks
 5. surface impoundments, pits, ponds, or lagoons
 6. field constructed tanks
 7. hydrant fueling systems
 8. vaulted tanks.
- *Upgrade* - the addition or retrofit of some systems, such as cathodic protection, lining, or spill and over-fill controls, to improve the ability of a UST system to prevent the release of product.

UNDERGROUND STORAGE TANKS
GUIDANCE FOR CHECKLIST USERS

	REFER TO CHECKLIST ITEMS:	CONTACT THESE PERSONS OR GROUPS: (a)
All Installations	19-1 through 19-4	(1)(2)(3)(6)(9)(22)
New USTs	19-5 through 19-7	(1)(2)(4)(6)(9)
Existing USTs	19-8 and 19-9	(1)(3)(4)(6)(8)(9)
Leaking USTs	19-10	(1)(2)(6)(9)
Additional Requirements for Hazardous Substance USTs	19-10 through 19-14	(1)(2)(4)(6)(9)

(a) CONTACT/LOCATION CODE:

- (1) Directorate of Engineering and Housing (DEH)
- (2) Environmental Coordinator (EC)
- (3) Preventive Medicine Officer
- (4) Safety and Health Officer
- (5) Fire Department
- (6) Director of Logistics (DOL)
- (9) Chief of Operations and Maintenance (O&M)
- (22) Staff Judge Advocate (SJA)

UNDERGROUND STORAGE TANKS

Records to Review

- Results of all UST testing, sampling, monitoring, inspection, maintenance, and repair work (for 1 yr)
- Registration records for all in-service, temporarily out-of-service, and permanently closed tanks
- Records for UST disposal, closure, and removal from activity and results of excavation area assessment (for 3 yr)
- UST inventory - map
- UST replacement program
- Groundwater well monitoring data

Physical Features to Inspect

- UST sites
- Airfield refueling operations
- Refueling facilities, including:
 - Belowground storage tanks and dikes
 - Venting
 - Fill pipes
 - Gauges
 - Rapid refueling points

People to Interview

- Directorate of Engineering and Housing (DEH)
- Environmental Coordinator (EC)
- Preventive Medicine Officer
- Safety and Health Officer
- Fire Department
- Director of Logistics (DOL)
- Chief of Operations and Maintenance (O&M)
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**COMPLIANCE CATEGORY:
UNDERGROUND STORAGE TANKS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>ALL INSTALLATIONS</p> <p>19-1. Copies of all relevant DOD directive/instructions, ARs, and guidance documents on UST management should be maintained at the installation (MP).</p> <p>19-2. Whenever feasible, POL USTs must be replaced with above-ground tanks (USFK EGS 19-3b(4)).</p> <p>19-3. All installations must maintain a UST inventory (USFK EGS 19-3a).</p> <p>19-4. Underground metallic storage tanks should be protected from corrosion by coatings, cathodic protection, or other effective methods (MP).</p> <p>NEW USTs</p> <p>19-5. New tanks and piping must have corrosion protection (USFK EGS 19-3b(1)).</p>	<p>Verify current copies of the following are maintained at the installation: (1)(2)(3)(22)</p> <ul style="list-style-type: none"> - <i>United States Forces, Korea Environmental Governing Standards (USFK EGS)</i>, 7 October 1996 - AR 200-1, <i>Environmental Protection and Enhancement</i>, 21 February 1997. <p>Verify that, whenever feasible, the installation replaces POL USTs with aboveground tanks. (1)(2)(6)(9)</p> <p>Verify that the installation has an inventory of USTs, including hazardous substance USTs. (1)(2)(6)(9)</p> <p>Verify that new USTs are appropriately protected from corrosion. (1)(2)</p> <p>Verify that the voltage is greater than -0.85V, but not more than -3.0V (monthly), for impressed current systems. (1)(2)(4)</p> <p>Verify that the voltage is greater than -0.85V, but not more than -3.0V (biannually), for sacrificial anode systems. (1)(2)(4)</p> <p>Verify that leak detection and leak detection failure is reported. (1)(2)</p> <p>(NOTE: The requirements of this section apply both to POL USTs and to hazardous substance USTs.)</p> <p>Verify that new tanks and piping have corrosion protection. (1)(2)(4)(9)</p> <p>(NOTE: This requirement does not apply to tanks and piping that are constructed of fiberglass or other noncorrodible materials.)</p> <p>Verify that the corrosion protection system is certified by a competent authority. (1)(2)(4)(9)</p>

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**COMPLIANCE CATEGORY:
UNDERGROUND STORAGE TANKS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>19-6. New USTs must be fitted with spill and overfill prevention equipment (USFK EGS 19-3b(2)).</p>	<p>Verify that new USTs have spill and overfill prevention equipment. (1)(2)(6)(9)</p> <p>(NOTE: This equipment is not required if the UST system is filled by transfers of no more than 95 L (25 gal) at one time.)</p> <p>Verify that, where spill and overfill protection are required, a spill catchment basin is installed around the fill pipe. (1)(2)(6)(9)</p> <p>Verify that overfill prevention equipment does one of the following: (1)(2)(6)</p> <ul style="list-style-type: none"> - automatically shuts off flow into the tank when the tank is no more than 95 percent full - sounds a high level alarm (set at 90 percent of the tank's capacity).
<p>19-7. Leak detection systems on new USTs must meet specific operating requirements (USFK EGS 19-3b(3)).</p>	<p>Verify that leak detection systems are capable of detecting a 0.4 L/h (0.1 gal/h) leak rate or a release of 570 L (150 gal) (or 1 percent tank volume, whichever is greater) within 30 days with a probability of detection of 0.95 and a probability of false alarm of not more than 0.05. (1)(6)(9)</p> <p>Verify that one of the following leak detection methods is used: (1)(6)(9)</p> <ul style="list-style-type: none"> - automatic tank gauging - vapor monitoring - groundwater monitoring - interstitial monitoring. <p>Verify that new pressurized UST piping is equipped with automatic line leak detectors and uses either an annual tightness test or monthly monitoring. (1)(6)(9)</p> <p>Verify that suction piping has either a line tightness test conducted every 3 yr or uses monthly monitoring. (1)(6)(9)</p>
<p>EXISTING USTs</p> <p>19-8. Existing USTs and piping must be properly closed if not needed or be upgraded to meet new UST system standards by 1 October 2004 (USFK EGS 19-3c(1) and 19-3c(2)).</p>	<p>Verify that existing USTs and piping without leak detection, corrosion protection, and spill/overflow protection are tightness tested annually according to recognized U.S. standards and inventoried monthly to verify system tightness. (1)(3)(4)(8)</p> <p>Verify that existing tanks with corrosion protection and spill/overflow protection are tightness tested every 5 yr or inventoried monthly. (1)(3)(4)</p> <p>Verify that a replacement and upgrading program is in place. (1)(6)</p>

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**COMPLIANCE CATEGORY:
UNDERGROUND STORAGE TANKS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>19-9. If an existing UST has not been used for 1 yr, all of the product and sludges must be removed (USFK EGS 19-3c(4)).</p>	<p>Determine whether there are USTs at the installation that have not been used for 1 yr or more. (1)(6)(9)</p> <p>Verify that all of the product and sludges have been removed. (1)(6)(9)</p> <p>(NOTE: Non-leaking tanks and abandoned tanks need not be removed from the ground, provided that they are cleaned and filled with an inert substance such as sand.)</p>
<p>LEAKING USTs</p> <p>19-10. Leaking USTs must be emptied and removed from service immediately (USFK EGS 19-3c(3)).</p>	<p>Verify that leaking USTs are emptied and removed from service immediately. (1)(2)(6)(9)</p> <p>Verify that contaminated groundwater and/or soil are remediated when there is imminent or substantial danger. (1)(2)(6)(9)</p> <p>(NOTE: Imminent and substantial danger refers to acute injury or death, rather than illness or injury typically caused by long term, chronic exposure. A determination of whether an imminent and substantial danger exists shall be made by the IC after consultation with the USFK Surgeon and the USFK ACofS, Engineer.)</p> <p>Verify that all free-standing POL is removed to the extent possible. (1)(2)(6)(9)</p> <p>Verify that, if the USTs are no longer needed, they are removed from the ground. (1)(2)(6)(9)</p> <p>Verify that, if the USTs are still needed, they are repaired or replaced. (1)(2)(6)(9)</p>
<p>ADDITIONAL REQUIREMENTS FOR HAZARDOUS SUBSTANCE USTs</p> <p>19-11. Existing hazardous substance USTs must meet specific standards (USFK EGS 19-3e).</p>	<p>Verify that existing hazardous substance tanks and piping are either upgraded or replaced to meet the requirements for new hazardous substance tanks and piping by 1 January 1999. (1)(2)(4)</p> <p>Verify that existing tanks and piping that do not incorporate leak detection are tightness tested annually and inventoried monthly. (1)(2)(4)</p>

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**COMPLIANCE CATEGORY:
UNDERGROUND STORAGE TANKS
Republic of Korea ECAS**

REGULATORY REQUIREMENTS:	REVIEWER CHECKS: June 1997
<p>19-12. New hazardous substance USTs and piping must have secondary containment (USFK EGS 19-3b and 3d(1)).</p> <p>19-13. New hazardous substance USTs must monitor the interstitial space for tanks and piping monthly (USFK EGS 19-3d(2)).</p> <p>19-14. Leak detection systems on hazardous substance USTs must meet specific operating requirements (USFK EGS 19-3d(1) and 3b(3)).</p>	<p>Determine whether the installation has installed any new USTs. (1)(2)(4)(9)</p> <p>Verify that hazardous substance USTs have secondary containment for both the tanks and the piping. (1)(2)(4)(9)</p> <p>(NOTE: Installations can meet the secondary containment requirement by using double-walled tanks and piping, or by using liners or vaults.)</p> <p>Verify that the interstitial space (space between the primary and secondary containment) is monitored monthly for liquids or vapors. (1)(2)(4)(9)</p> <p>Verify that leak detection systems are capable of detecting a 0.4 L/h (0.1 gal/h) leak rate or a release of 570 L (150 gal) (or 1 percent tank volume, whichever is greater) within 30 days with a probability of detection of 0.95 and a probability of false alarm of not more than 0.05. (1)(6)(9)</p> <p>Verify that new pressurized piping is equipped with automatic line leak detectors and uses either an annual tightness test or monthly monitoring. (1)(6)(9)</p> <p>Verify that suction piping has either a line tightness test conducted every 3 yr or uses monthly monitoring. (1)(6)(9)</p>

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INSTALLATION:	COMPLIANCE CATEGORY: UNDERGROUND STORAGE TANKS (USTs) Korea ECAS	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		