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Worldwide Environmental Compliance Assessment and Management Program (ECAMP)

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13. ABSTRACT (Maximum 200 words)

Because of the growing number of environmental laws and regulations worldwide, the U.S. Air Force has adopted an environmental compliance program that includes a mechanism to identify compliance problems before they become notices of violation by the U.S. Environmental Protection Agency (USEPA).

In 1984, the U.S. Army Construction Engineering Research Laboratory, in cooperation with the Air Force Engineering and Services Center, began work on the Environmental Compliance Assessment and Management Program (ECAMP). The concept was to combine Federal, Department of Defense, and Air Force environmental regulations, along with good management practices and risk management issues, into a series of checklists showing not only the legal requirements, but also what specific items or operations to review. In addition, each question or protocol would list a point of contact to help assessors review the protocols as easily as possible.

This manual was developed using existing checklists from the USEPA and private industry. It was tested at 18 Air Force installations. The ECAMP manual has been updated annually to meet new environmental compliance laws and regulations.

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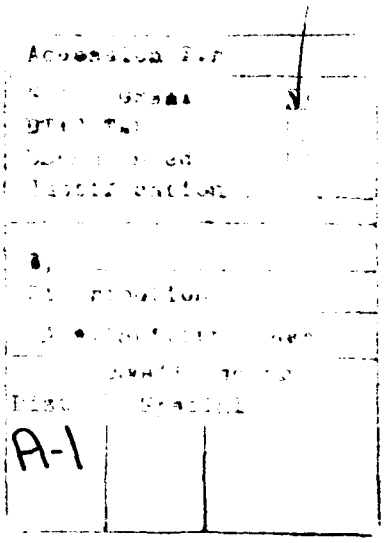
FORWORD

This work was performed for Headquarters United States Air Force, Director of Engineering and Services, Environmental Division, under reimbursable order number 89-01, "Research and Technology Transfer for Army and Air Force European Environmental Compliance Program", Task number 2, Work Unit 239. Captain John Ahern (HQ USAF/LEEVO) was the Technical Monitor.

The Work was performed by the Environmental Division (EN) of the U.S. Army Construction Engineering Research Laboratory (USACERL). Dr R. K. Jain is Chief of EN and Dr. D. K. Mann was the Principal Investigator.

Colonel Everett R. Thomas is Commander and Director of USACERL and Dr. L. R. Shaffer is Technical Director.



INTRODUCTION

PROGRAM BACKGROUND

The United States Air Force (USAF) initiated the Environmental Compliance Assessment and Management Program (ECAMP) as a comprehensive self-evaluation and program management system for achieving, maintaining, and monitoring environmental management with environmental evaluations and management action plans at Air Force installations. The objectives of the ECAMP are to:

1. Improve Air Force environmental management
2. Build supporting financial programs and budgets for environmental requirements
3. Assure Major Commands (MAJCOMS), installation commanders, environmental protection committees, environmental coordinators, and bioenvironmental engineers, that their environmental programs are effectively addressing environmental problems that could:

    a. impact mission effectiveness
    b. jeopardize the health or safety of Air Force personnel or the general public
    c. significantly degrade the environment
    d. erode public confidence in the Air Force and the United States

4. Anticipate future environmental problems.

The ECAMP regulation, Air Force Regulation (AFR) 19-16, requires periodic internal and external environmental compliance evaluations. The evaluations are designed to assess environmental compliance and to provide necessary feedback to commanders for organizing, directing, and controlling environmental protection activities.

GOVERNING POLICY

Policy concerning environmental compliance at overseas installations is contained in the following:

1. Executive Order (EO) 12088
2. Executive Order 12114
3. Department of Defense (DoD) Directive 5100.50
4. AFR 19-1
5. AFR 19-3
6. AFR 19-8.

ECAMP will assist the Air Force in implementing these policies. 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, it officers, or any person.

ECAMP does not commit the Air Force to comply with host country law beyond the current obligation under EO 12088 and the status of forces agreement (SOFA).

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

1. environmental impact statements
2. environmental studies related to the proposed action
3. environmental assessments, summary environmental analyses, or other appropriate documents.

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 SOFA, and conform to the extent practical to the following:

1. comply with the spirit, as well as the letter, of the National Environmental Policy Act and all other Federal environmental laws, executive orders, and regulations

2. demonstrate leadership in environmental pollution abatement and enhancement of the environment.

AFR 19-1, *Pollution Abatement and Environmental Quality*, sets up an environmental protection program. Air Force policy is to make sure facilities outside the United States territory are designed, constructed, and operated so as to comply with the substantive environmental pollution standards of general applicability in the host country.

AFR 19-3, *Environmental Impact Analysis Process (EIAP) Overseas*, establishes the policies, procedures, and responsibilities for considering the effects on the environment by major Air Force actions outside the United States. It describes how the overseas EIAP is used to identify environmental impact to host nation territory, global

commons, and/or protected global resources by major Air Force actions outside the United States, its territories or possessions.

AFR 19-8, *Environmental Protection Committees and Environmental Reporting*, establishes the Environmental Protection Committees (EPC) and assigns their responsibilities as a multidisciplinary approach to incorporate environmental concerns into the decision making process. It also details the environmental reporting procedures applicable worldwide which support the Air Force's pollution abatement program.

MANUAL OBJECTIVES

The ECAMP Compliance Assessment Manual for Installations Outside the United States is intended to serve as the primary tool for conducting environmental compliance evaluations at Air Force installations. The objectives of the manual are to:

1. compile applicable DoD and Air Force environmental regulations associated with Air Force operations and activities

2. synthesize good management practices and risk management issues into consistent and easy to use checklists

3. serve as an aid during the evaluation process.

A second, country-specific manual (if available), should be used in conjunction with the Worldwide manual. The country-specific manual contains the Air Force interpretation of the environmental pollution control standards of general applicability for that country.

ECAMP PROGRAM MANAGEMENT PROCESS

The ECAMP program management process begins with the environmental evaluation and written report that identifies compliance and management issues. The commander, through his Environmental Protection Committee (EPC), then assigns appropriate staff agencies to work each issue.

The path illustrated on the far left of Figure 1 represents the process the installation follows in resolving most issues. Immediate hazards should, of course, be addressed as quickly as possible. The procedural, easy-to-fix issues, are corrected during the process and documented in the report.

The path in the center, for the tough and expensive issues, includes preparation of a management action plan by the installation, describing how these problems will be addressed.

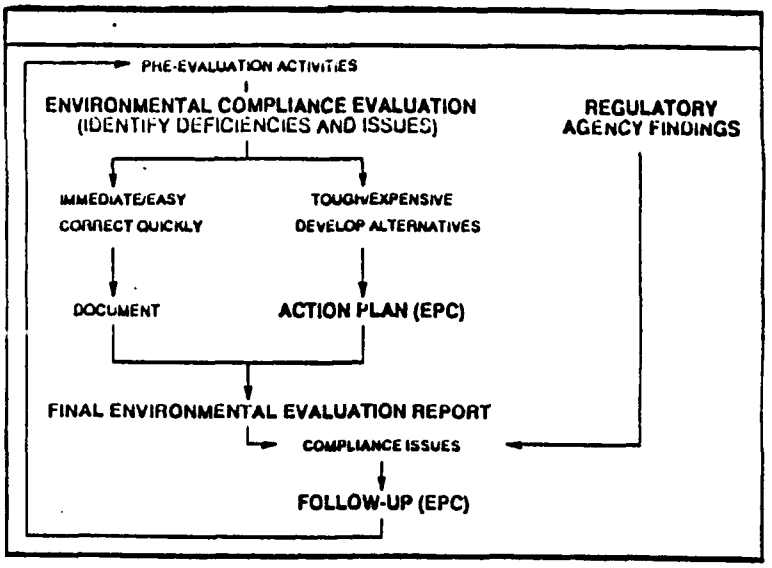


Figure 1. ECAMP Management Process

ENVIRONMENTAL EVALUATION PROCESS

The ECAMP 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 ECAMP Environmental Assessment Manual deals with the first two phases of the program management process. For detailed information on the post-evaluation phase of the process, the user is referred to the ECAMP policy. Brief descriptions of the pre-evaluation and site evaluation activities are presented below.

Pre-evaluation Activities - There are five key activities that should be completed before an evaluation team begins the evaluation activities:

1. Pre-Visit Questionnaire (external evaluations only). The purpose of the pre-visit questionnaire is to collect information which will familiarize the evaluation team with the installation and its operations so the evaluation team is able to review the applicable regulations and prepare a detailed evaluation schedule. A sample pre-visit questionnaire has been included as Attachment 1.

2. Define Evaluation Scope and Team Responsibilities. The installation or MAJCOMS 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 the evaluation can be properly planned. Additionally, the duration of the evaluation, appointment of team members by the EPC, and handling of

tenants and off-base 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 relevant host nation and local regulations affecting the installation. The applicable environmental regulations must be determined before the evaluation is begun. If not already available, checklist items for host nation and local requirements must be added to the checklists in the ECAMP Environmental Assessment Manual.

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, schedule, and be familiar with the evaluation checklists that will be used.

Site Evaluation Activities - On site, the evaluators will conduct record searches, interviews, and site surveys to determine the compliance status of the installation. Operations are compared with environmental standards, and any deficiencies are written up as findings. The data collected should be sufficient, reliable, and relevant to provide a sound basis for evaluation findings and recommendations. AF Form 1955, ECAMP Finding Summary, is available to assist evaluators in compiling needed information during an ECAMP evaluation. An AF Form 1955 should be completed for each finding during the evaluation. These forms comprise the basis for the ECAMP report. The format and content for ECAMP evaluation reports are covered in AFR 19-16.

All items of the ECAMP Finding Summary must be filled in up to "Sampling Results" for negative findings and up to "Criteria" for positive findings. The condition is a factual statement describing the status of the process, permit, or situation under investigation. A condition may be positive if the installation is going above and beyond the requirements. The criteria are the environmental standard (DoD, Air Force, Good Management Practice (GMP), Host Nation Standards) the installation is violating. The cause is the reason the condition exists. Causes can include staffing problems, incorrect or lack of training, procedures which are not followed, inadequate equipment or facilities. The effect can be actual or potential, and can include health and safety, environmental damage, cost, effectiveness of operation, legal consequences, and mission impact. Further instructions for completing AF Form 1955 are on the reverse side of the form.

For example, a team member assigned to evaluate the installation's hazardous waste management program visited the accumulation point at building 5000. The evaluator noticed some drums were damaged, and took a count of the total number of drums and the number of damaged drums to obtain an accurate description of the finding. Five of

the twenty-five drums were rusted and bulging. Item 3-16 states that containers should be tightly sealed and not be leaking, bulging, rusting, or badly dented. The damaged drums were behind the others, so the accumulation point manager may have overlooked them during his regular inspections. The accumulation point manager immediately put overpack drums on order. The evaluator is now ready to fill out an AF Form 1955 for this finding. A completed sample form for this finding is shown in Attachment 2.

MANUAL APPROACH

Air Force installations engage in many operations and activities, which 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 local, National, DoD, and USAF directives, as well as SOFA provisions and host nation standards of general applicability.

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

This manual is divided into ten major sections, which correspond to these major environmental categories:

Section	Environmental Category
I	Air Emissions Management
II	Hazardous Materials Management
III	Hazardous Waste Management
IV	Natural and Cultural Resources Management
V	Environmental Noise Management
VI	Pesticide Management
VII	POL Management
VIII	Solid Waste Management
IX	Special Programs Management
X	Water Quality Management

Each section is organized in the following format:

A. Applicability of this Protocol

- This part provides guidance on the major activities and operations included in the checklist and a brief description of the major application.

B. DoD Regulations

- This part identifies any USEPA or DoD Regulations that address requirements associated with the specific environmental category.

C. U.S. Air Force Regulations

- This part identifies those USAF regulations that address requirements associated with the specific environmental category.

D. Responsibility for Compliance

- This part identifies and summarizes the individual organizations at an Air Force installation with responsibility for maintenance, operation, or environmental monitoring of activities associated with the environmental category.

E. Key Compliance Definitions

- This part presents definitions for those key terms associated with each environmental category.

ASSESSMENT CHECKLISTS

The final part of each section contains evaluation procedures (checklists) composed of statements of requirements or guidelines which 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, references, or activity that corresponds to the specific requirement or guideline.

INTRODUCTION TO MANUAL

The checklist portion of each section in the ECAMP manual is divided into 2 columns. The narrow columns contain statements of a requirement. These may be an Air Force or DoD requirement, or it may be a requirement considered to be a GMP not specifically mandated by regulation.

The wide 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 a facility. Contact/location information in parentheses is intended to give guidance on the department or location at the installation where action items are applicable. The contact/local code given is referenced to a legend at the bottom of the worksheet.

The worksheet provided at the end of each section is to be copied and used for detailed notations or comments. This worksheet is also divided into 2 columns. The first is for the status of the item: Not Applicable (N/A), Complies (C), Requires Management Action (RMA). The second is for reviewer comments such as location, statistics, or other observations. These notations will provide a record for use in preparing the final report. Notations should include both situations of substandard operation needing attention and those operations which exceed requirements or provide examples of good programs. For future reference and clarity, it is essential to record building number or other references be made of the location which is being reviewed.

The evaluation procedures are designed as an aid and should not be considered exhaustive. Use of the guide requires the evaluator's judgement to play a role in determining the focus and extent of further investigation. The MAJCOM is responsible for ensuring that host nation regulations are considered. The country-specific manual (if available) and local regulations should be reviewed so additional questions can be included which reflect the substantive requirements pertinent to individual installations.

CREATING SHOP-SPECIFIC SELF-INSPECTION CHECKLISTS

The ECAMP checklists are a useful tool for creating self-inspection checklists for individual shops. These shop specific checklists can be used by shop supervisors and workers to ensure correct practices and procedures are being followed on a routine basis. Thus, good self-inspection checklists are an excellent supplement to annual ECAMP evaluations.

A customized checklist can be created in five steps:

1. Review the shops' activities to determine which protocols apply
2. Select broad sections of the applicable protocols for closer review by using the checklist road maps found before the questions in each protocol
3. Review the individual questions selected for application to the shop in question
4. Edit the applicable questions to make them shop specific
5. Compile the questions on AF Form 1955.

For example, using these five steps, a customized checklist for a paint shop is derived as follows:

1. The paint shop has many environmental concerns:

-emissions from painting activities
-proper storage of flammable and combustible liquids
-hazardous waste accumulation point requirements
-management of the solid waste receptacles at the shop
-discharge of solvents, stripping compounds, and paint solids into the storm or sanitary systems.

Protocols that apply are:

-Air Emissions Management
-Hazardous Materials Management
-Hazardous Waste Management
-Solid Waste Management
-Water Quality Management.

2. Referring to the protocol "road maps" in this manual, the following items may apply to paint shop:

- in Air Emissions Management: spray painting or surface coating operations questions
- in Hazardous Materials Management: storage of flammable/combustible liquids questions
- in Hazardous Waste Management: small quantity and large quantity generator requirements questions
- in Solid Waste Management: management of the solid waste receptacles questions
- in Water Quality Management: unpermitted storm water discharge and discharge of waste water to an off-base Publicly Owned Treatment Works (POTW) or other treatment facility questions;

3. Most of these applicable checklist questions can be easily rewritten to specifically address paint shop concerns. Using Water Quality as an example, questions are edited to delete interviews and inspections in other shops:

Example Questions from the Checklist

10-27 Storm water discharge on the installation must be uncontaminated, and periodic surveillance of this discharge must be completed (AFR 19-7).

Interview with BEE. Examine supplement to AFR 19-7 for storm water surveillance locations. (2)

Examine analytical records and discuss any instances of elevated readings for any parameters. (2)

Obtain plan of storm sewer system and location of all outfalls and discharge points.

(1)(2)

Physically inspect areas of storm water discharge. Look for evidence of contamination (oil sheen, discoloration, etc.). (1)

Inspect any oil/water separators on the installation for proper operation and maintenance. Review recurring maintenance program for inspection and cleaning of oil/water separators. (1)

Physically inspect major industrial shops or industrial areas. Look for evidence of contaminated waste streams discharging to floor drains to storm system or catch basins. Key shops to be visited include:

- Engine Shop
- Motor Pool
- Paint Shop
- Plating Shop
- Corrosion Control
- POL Area.

10-29 The introduction of any pollutants which cause the following is prohibited (GMP):

a. fire or explosion hazards
b. corrosive problems (or as stated in 403.5(b)(2) - corrosive structural damage)
c. viscous obstructions
d. sludge discharges
e. excessive heat.

The evaluator should inspect selected industrial shops and areas on the base and look for evidence of prohibited discharge; examples are given below:

Inspect maintenance areas (engine shops, hangars, motor pool). Look for evidence of oils, greases, antifreeze, and fuels draining into sanitary lines.

Inspect corrosion control and cleaning shops. Look for evidence of oils, greases, and detergents draining into sanitary lines.

Inspect any areas on the installation which may contribute high temperature discharge (40^{o} C) to the POTW. Examples are:

- scrubber water
- boiler blow down
- laundries.

Inspect for discharges with a flow rate and/or pollutant concentration which will cause interference. Examples are:

- garbage shredded in cafeterias, dining halls
- pieces of metals, rubber, wood from shops
- grease traps in cooking facilities.

Inspect for any discharge with a pH lower than [illegible], unless the works are specifically designed to accommodate such discharge.

Example Rewrite Questions

10-27 Storm water discharge on the installation must be uncontaminated, and periodic surveillance of this discharge must be completed (AFR 19-7).

Physically inspect the paint shop for evidence of contaminated waste streams discharging to floor drains to storm system or catch basins.

10-29 The introduction of any pollutants which cause the following is prohibited (GMP):

a. fire or explosion hazards
b. corrosive problems (or as stated in 403.5(b)(2) - corrosive structural damage)
c. viscous obstructions
d. sludge discharges
e. excessive heat.

Inspect the paint shops. Look for solvents, stripping compounds, and paint solids discharging to sanitary lines.

4. Finally, all of the edited questions are compiled on AF Form 1955 for use in the shop. The example for the paint shop is shown in Attachment 3.

(NOTE: The same numbering convention is kept which allows ease of reference back to the original manual.)

OPERATIONS AND RELATED PROTOCOLS

Table 1 lists major operations and activities that affect the environment at typical Air Force installations, and the protocols within which they are addressed. As shown, many activities and operations cause environmental impacts in more than one area, and are, therefore, addressed in more than one protocol.

SUPPLEMENTAL INFORMATION

Any findings discovered through the use of this guidance manual by the internal assessment must be validated by the environmental coordinator and Judge Advocate. The findings and corrective actions must be recorded in the Environmental Protection Committee minutes.

Any change or suggestion for improving this guidance manual should be forwarded to: HQ USAF/LEEVO, Bolling AFB, Washington DC. 20332-5000.

Table 1
Major Activities / Operations at Air Force Installations and Related Protocols

	PROTOCOLS				
Major Activities/ Operations	I Air Emissions Management	II Hazardous Materials Management	III Hazardous Waste Management	IV Natural & Cultural Resources Management	V Environmental Noise Management
1. Incinerators	•		•		
2. Heat/Power Production	•		•		
3. AGE Operation	•		•		
4. Aircraft Operations	•				•
5. Aircraft Maintenance			•		
6. Fuel Storage	•	•			
7. Surface Casting Operations	•		•		
8. Sanitary Wastewater					
9. Storm Water Runoff		•			
10. Sludge Disposal	•				
11. POL Dispensing					
12. Wastewater Treatment					
13. Vehicle Maintenance	•	•	•		
14. Shop Activities	•		•		
15. Solid Waste Generation					
16. Water Supply					
17. Toxic/Hazardous Materials Use		•			
18. Firefighting Training	•				
19. PCB Electrical Equipment					
20. Pesticide/ Herbicide Use					
21. Environmental Noise					•
22. Emergency Planning		•			
23. Asbestos Removal					
24. Underground Storage Tanks		•			
25. Remodeling Activities				•	
26. Construction Activities				•	
27. Soil Removal				•	

Table 1 (Continued)
Major Activities / Operations at Air Force Installations and Related Protocols

Major Activities/ Operations	PROTOCOLS				
	VI Pesticides Management	VII POL Management	VIII Solid Waste Management	IX Special Programs Management	X Water Quality Management
1. Incinerators			•		
2. Heat/Power Production		•	•		•
3. AGE Operation		•			
4. Aircraft Operations		•			
5. Aircraft Maintenance		•			•
6. Fuel Storage		•			
7. Surface Casting Operations					•
8. Sanitary Wastewater					•
9. Storm Water Runoff	•	•			•
10. Sludge Disposal			•		•
11. POL Dispensing		•			
12. Wastewater Treatment			•		•
13. Vehicle Maintenance					
14. Shop Activities					•
15. Solid Waste Generation			•		
16. Water Supply					•
17. Toxic/Hazardous Materials Use					
18. Firefighting Training		•			•
19. PCB Electrical Equipment				•	
20. Pesticide/ Herbicide Use	•				
21. Environmental Noise					
22. Emergency Planning					
23. Asbestos Removal				•	
24. Underground Storage Tanks		•			
25. Remodeling Activities				•	
26. Construction Activities					
27. Soil Removal					

Attachment 1
Pre-Visit Environmental Management Questionnaire

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

Name of Installation:_____

	YES	NO	N/A
I. Air Emissions Management			
1. Does installation operate a fuel burner?	—	—	—
a. Central steam plant?	—	—	—
b. Hot water?	—	—	—
c. Approximate size of fuel burner _____			
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:

_____

	YES	NO	N/A
4. Does the installation operate any incinerators? (i.e. for classified documents, medical waste, solid waste, etc.)	—	—	—
a. How many? _____			
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?	—	—	—
8. Does the installation have a:			
a. Spray painting operation?	—	—	—
b. Surface coating operation?	—	—	—
(Attach list of locations if answered yes to either.)			
9. Have installation emissions resulted in complaints from the public due to:			
a. Odors?	—	—	—
b. Fugitive dusts?	—	—	—
c. Other? _____	—	—	—
10. Does the installation utilize air pollution control equipment?	—	—	—
If yes, please explain:			
_____			
_____			
11. Does installation operate a motor vehicle station?	—	—	—
12. Does the installation dispense fuel to motor vehicles?	—	—	—

13. Please list number of fuel storage areas and the fuel type.

Fuel type	Quantity	Fuel type	Quantity
_____	_____	_____	_____
_____	_____	_____	_____

	YES	NO	N/A
14. Does the installation have active aircraft operations?	—	—	—
15. Does the installation have active aircraft maintenance operations?	—	—	—
16. Does the installation have aerospace ground equipment (AGE) operations?	—	—	—

17. Please list any additional shop activities that generate any form of air pollution:

_____

_____

_____

II. Hazardous Materials Management

1. Does the installation store any flammable materials?	—	—	—
2. Does the installation transport any hazardous materials off-installation?	—	—	—
3. Does the installation have a procedure to ensure the proper labeling, packaging, and spill response for hazardous materials?	—	—	—
4. Does the installation store:			
a. Acids?	—	—	—
b. Caustics?	—	—	—
c. Flammables?	—	—	—
d. Combustibles?	—	—	—
e. Compressed gases?	—	—	—

	YES	NO	N/A
f. Oxidizers?	—	—	—

III. Hazardous Waste Management

1. Does the installation produce any wastes classified as:			
a. Ignitable?	—	—	—
b. Corrosive?	—	—	—
c. Reactive?	—	—	—
d. Toxic?	—	—	—
e. Other? (Please Explain)	—	—	—

_____

2. Does the installation treat, store or dispose of hazardous wastes on site?	—	—	—

If so, please specify waste type and treatment method:

_____

3. Does the installation accept wastes from other installations for treatment, storage or disposal?	—	—	—
4. Does the installation engage in the transportation of hazardous wastes:			
a. on base?	—	—	—
b. off base?	—	—	—
c. central transport (transportation squadron)?	—	—	—
d. individual unit transport?	—	—	—
5. Does the installation monitor:			
a. Groundwater?	—	—	—

	YES	NO	N/A
b. Leachate?	—	—	—
6. Does the installation have a hazardous waste management (contingency) plan?	—	—	—
7. Does the installation utilize other locations for the treatment, storage, or disposal of hazardous waste?	—	—	—

Please specify:

_____

_____

8. Does the installation use any nonhazardous solid waste (including used oil) as a supplemental fuel source?	—	—	—
9. Does the installation have a contractor dispose of its hazardous waste?	—	—	—

Which office monitors this contract?

_____

IV. Natural and Cultural Resources Management

1. Does the installation have an area designated as a natural resource, including "highly protected" and "more generally protected"?	—	—	—
2. Does the installation have a plan for managing its natural resources?	—	—	—
3. Does the installation have an area designated as a:			
a. Cultural resource?	—	—	—
b. Archeological resource?	—	—	—
c. Historic structure?	—	—	—

	YES	NO	N/A
4. Are there any areas on the installation which have:			
a. Wetlands?	—	—	—
b. Flood Plains?	—	—	—
V. Environmental Noise Management			
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)?	—	—	—
VI. Pesticide Management			
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?

_____

_____

_____

VII. POL Management

Fuels and Lubricants

	YES	NO	N/A
1. Does the installation have a motor pool?	—	—	—
How many?_____			
2. Does the installation store oil in large volumes?	—	—	—
3. Does the installation have a spill prevention and response plan?	—	—	—
4. Does the installation's spill plan include provisions pertaining to hazardous substances or hazardous wastes?	—	—	—
5. Does the installation conduct spill response training?	—	—	—
6. Does the installation use "fuel bladders" during field exercises?	—	—	—
7. Does the installation have any oil/water separators?	—	—	—
a. How many? _____ (Please have a map available for the team showing locations.)			

UNDERGROUND STORAGE TANKS (USTs)

8. Does the installation have an aircraft fuel storage yard?	—	—	—
If yes, how many USTs are in the aircraft fuel storage yard and what size are they?			
_____			
_____			
9. Does the installation have a ground vehicle fuel storage yard?	—	—	—
If yes, how many USTs are in the ground vehicle fuel storage yard and what size are they?			
_____			

	YES	NO	N/A
10. Does the installation have an AAFES-run or other type of gas station located on the base?	—	—	—
If yes, how many USTs are located at the gas station and what size are they?			
_____			
_____			
11. Does the base have any other USTs used to store petroleum products?	—	—	—
If yes, where are they located, how many are there, and what size are they?			
_____			
_____			
12. Does the installation have any USTs used to store hazardous substances?	—	—	—
If yes, where are they located, how many are there, what size are they, and what hazardous product do they contain?			
_____			
_____			
13. Does the installation have any underground tanks out of service?	—	—	—

VIII. Solid Waste Management

1. Does the installation have a solid waste management facility on site?	—	—	—
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?	—	—	—

	YES	NO	N/A
e. Solid waste recycling program?	—	—	—
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 base?	—	—	—
b. off base?	—	—	—
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?	—	—	—
8. Does the installation generate pathological wastes?	—	—	—
9. Does the installation dispose of pathological waste by on-base incineration?	—	—	—

	YES	NO	N/A
IX. Special Programs			
PCBs			
1. Are PCB (polychlorinated biphenyl) 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?	—	—	—
Asbestos			
4. Does the installation have primary or secondary schools?	—	—	—
5. Has the installation conducted a complete base-wide asbestos facility survey?	—	—	—
6. Does the installation have a written asbestos management plan?	—	—	—
7. Does the installation have a written asbestos operating plan?	—	—	—
8. Has the installation undergone any asbestos removal projects in the past?	—	—	—

	YES	NO	N/A
9. Is there any asbestos on the installation that has been removed and is awaiting disposal at this time?	—	—	—
10. Will the installation have any demolition, remodeling or renovation projects underway at the time of the ECAMP assessment?	—	—	—

Please identify those projects and buildings:

_____

_____

_____

11. Does the installation maintain training records for asbestos workers?	—	—	—

Location of records

_____

Radon Gas

1. Is the installation located in a geographic area where radon gas is found?	—	—	—
2. Does the installation monitor for radon gas?	—	—	—

A-106

1. Does the installation include all environmental projects listed in the CECORs in the A-106 report also?	—	—	—

EIAP

1. Does the installation have any major actions programmed which will require an EIAP as described in AFR 19-3?	—	—	—

X. Water Quality

Drinking Water

1. Does installation operate a public water system?	—	—	—

	YES	NO	N/A
2. Does any portion of the installation's drinking water supply come from on-site wells or surface water sources?	—	—	—
3. Does the installation monitor on-site drinking water sources?	—	—	—
Wastewater Discharge			
4. 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?_____	—	—	—
5. 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?_____	—	—	—
6. Does the installation make use of an on-site waste water treatment system prior to effluent discharge?	—	—	—
7. Does the installation conduct any effluent monitoring?	—	—	—
8. Are monitoring samples analyzed by:			

	YES	NO	N/A
a. Installation personnel?	—	—	—
b. Off-site contractor?	—	—	—
9. Does the installation have a separate storm water runoff system	—	—	—
10. Does the installation have vehicle washracks (or other designated vehicle wash areas)?	—	—	—

XI. General Information

1. Does the installation contain water protection areas?	—	—	—
2. Is the installation suspected of contributing to a groundwater contamination problem?	—	—	—

Signature of individual completing this form:_____

Date completed:_____

ATTACHMENT 2

ENVIRONMENTAL COMPLIANCE ASSESSMENT AND MANAGEMENT PROGRAM (ECAMP) FINDING SUMMARY

PROTOCOL	ITEM NUMBER	TYPE (+ / -)	BLDG NO./LOCATION
Hazardous wastes	3-16	-	5xx

SECTION I - FINDING INFORMATION

1. CONDITION

Five of the twenty-five drums at the accumulation point at bldg xxx were rusted and bulging

2. CRITERIA

Containers must be tightly sealed and not leaking, bulging, rusting, or otherwise damaged (GMP)

3. FINDING IDENTIFICATION CODE	4. VIOLATION TYPE CODE	5. REPEAT FINDING			
3A	PS		YES	✓	NO
6. FINDING TYPE	**7. RATING**				
Management Practice	Management Practice				

8. SAMPLING RESULTS: ***(NOTE; Normally random sampling is used--if not, identify method used)***

a. UNIVERSE	b. SAMPLE SIZE	c. DISCREPANCIES	d. PERCENT
25	25	5	20%

SECTION II - COMMENTS

1. CAUSE(s)

Accumulation point managers are not adequately trained on container standards

2. EFFECT(s)

Drums may become damaged enough to leak.

3. SUGGESTED SOLUTION(s)

- Overpack the five damaged drums.
- Change hazardous waste training program to include container standards

4. COMMENTS

The accumulation point manager put the overpack drums on order.

PREPARED BY	REVIEWED BY	COMMITTEE REVIEW
Joe Holding	Sue Smith	✓

ATTACHMENT 2 (continued)

FINDING IDENTIFICATION CODES

AIR EMISSIONS
- 1A FUEL BURNERS
- 1B INCINERATORS
- 1C VOLATILE ORGANICS
- 1D OTHERS

HAZARDOUS MATERIALS MGT
- 2A STORAGE STRUCTURES
- 2B OPERATIONS/MANAGEMENT
- 2C OTHERS

HAZARDOUS WASTE MGT
- 3A ACCUMULATION POINTS
- 3B TSD FACILITIES
- 3C TRAINING
- 3D WASTE MINIMIZATION
- 3E OTHERS

NATURAL/CULTURAL RESOURCES
- 4A WILDLIFE/RECREATION FORESTRY
- 4B CULTURAL/HISTORIC
- 4C LAND/AGRICULTURE
- 4D WETLANDS/FLOODPLAINS
- 4E OTHERS

NOISE MGT (ENVIRONMENTAL)
- 5A AICUZ
- 5B PROCEDURES
- 5C OTHERS

PESTICIDE MANAGEMENT
- 6A FACILITIES/EQUIPMENT
- 6B OPERATIONS/MGT
- 6C OTHERS

POL MANAGEMENT
- 7A ABOVE GROUND TANKS
- 7B UNDERGROUND TANKS
- 7C OPERATIONS/MGT
- 7D OTHERS

SOLID WASTE MANAGEMENT
- 8A LANDFILLS
- 8B RECEPTACLES
- 8C RECYCLING
- 8D OTHERS

SPECIAL PROGRAMS
- 9A PC Bs
- 9B ASBESTOS
- 9C RADON MITIGATION
- 9D OTHERS

WATER QUALITY
- 10A SANITARY WASTEWATER
- 10B INDUSTRIAL WASTEWATER
- 10C STORMWATER RUNOFF
- 10D NON-POINT RUNOFF
- 10E OPERATIONS
- 10F OTHERS

VIOLATION TYPE CODES

ADMINISTRATIVE
- A1 RECORDS
- A2 LABELS
- A3 REPORTS
- A4 MANIFESTS
- A5 LACK OF A PERMIT
- A6 INADEQUATE/MISSING PLAN
- A7 PUBLIC NOTIFICATION
- A8 OPERATOR CERTIFICATION
- A9 FIRE STANDARD
- A10 PROGRAM PLANNING
- A11 SAMPLING
- A12 TRAINING
- A13 OTHER

POTENTIAL DISCHARGE
- P1 OPERATIONAL PRACTICES
- P2 INADEQUATE FACILITY
- P3 INADEQUATE EQUIPMENT/CONTAINERS
- P4 OTHER

DISCHARGE
- D1 EXCESS CHEMICAL PARAMETER
- D2 EXCESS PHYSICAL PARAMETER
- D3 GROUNDWATER CONTAMINATION
- D4 SPILLS/LEAKS
- D5 OTHER

VIOLATION TYPE CODES:

DISCHARGE--Spilling, leaking, pumping, pouring, emitting, emptying or dumping of a pollutant that is not covered by a permit or exceeds a permit limit

POTENTIAL DISCHARGE--Physical conditions and operating practices, if left uncorrected, could cause a discharge

ADMINISTATIVE--Program management and oversight issues such as plans, permits, training, records, reports, etc.

FINDING TYPE:

REGULATORY--Involves federal, state or local environmental requirements

PROCEDURAL--Involves DoD or USAF environmental requirements

HOST COUNTRY--Involves host country environmental requirements

MANAGEMENT PRACTICE--Environmental procedures/policies which are good practices but are not REGULATORY or PROCEDURAL

RATING:

SIGNIFICANT--Requires IMMEDIATE attention, poses a direct threat to human health/safety, can "shut you down".

MAJOR--Requires less than immediate attention, could affect human health/safety, would probably result in an NOV.

MINOR--Procedural, temporary, or occasional deficiencies of no immediate consequence.

MANAGEMENT PRACTICE--Used for positive findings and when the finding is of the management practice type.

ENVIRONMENTAL COMPLIANCE REQUIREMENTS

ENVIRONMENTAL COMPLIANCE ASSESSMENT AND MANAGEMENT PROGRAM (ECAMP)

COMPLIANCE CATEGORY: Water Quality

REGULATOR REQUIREMENTS AND INSTRUCTIONS TO EVALUATOR

IC-27 Storm water discharges on the installation must be characterized, and periodic surveillance of this discharge must be completed (AFR 19-1).

- Physically inspect the paint shop for evidence of contaminated waste streams discharging to floor drains, to storm system catch basins.

IC-24 The introduction of any pollutants which cause the following is prohibited:

a) fire or explosion hazards;

b) corrosive problems (or as stated in 403.5(b)(2) - corrosive structural damage;

c) viscous obstructions;

d) sludge discharges;

e) excessive heat.

(GMP)

- Inspect the paint shops. Look for solvents, stripping compounds, and paint solids discharging to sanitary lines

CONTACT/LOCATION CODES

CE Paint Shops, MWR paint shops, MA paint shops

[redacted]

ENVIRONMENTAL COMPLIANCE REQUIREMENTS

ENVIRONMENTAL COMPLIANCE ASSESSMENT AND MANAGEMENT PROGRAM (ECAMP)

COMPLIANCE CATEGORY:

REGULATOR REQUIREMENTS AND INSTRUCTIONS TO EVALUATOR

CONTACT/LOCATION CODES

Section I

Air Emissions Management

SECTION I

AIR EMISSIONS MANAGEMENT

A. Applicability of this Protocol

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

- particulates, sulfur dioxide (SO_2), and nitrogen oxide (NO_x) from fuel burning at steam and hot water generation plants and boilers
- particulate emissions from the operation of classified material and pathological incinerators
- the emission of volatile organic compound (VOC) vapors from the storage and transfer of certain petroleum fuels and chemicals (solvents), and the operation of degreasers and other processes (paint stripping and metal finishing) which use solvents
- the emission of NO_x and hydrocarbons from aerospace ground equipment (AGE) and vehicles operated on the base.

Most Air Force installations have air emissions sources in each of these four categories. Therefore this protocol is applicable to some extent at all Air Force installations.

The regulatory requirements in this protocol are based on Department of Defense (DoD) and Air Force regulations that apply at overseas installations. Good Management Practices (GMPs) are derived U.S. from Environmental Protection Agency (EPA) regulations, and typical state or local regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force employees and protect the environment. Any procedural EPA requirements, such as permits and notifications, are not applicable overseas, and, therefore, are not in the worldwide manual. GMPs in the air emissions protocol are derived from the following EPA regulations: 40 Code of Federal Regulations (CFR) 51, 40 CFR 60, and 40 CFR 80.

B. DoD Regulations

- DoD Instruction 4120.14 (NOTAL) implements within DoD policies provided by Executive Order (EO) 12088 and Office of Management and budget (OMB)

Circular A-106 and establishes policies for developing and submitting plans for installing improvements needed to abate air emissions from DoD facilities.

- DoD Directive 6050.9, *Chlorofluorocarbons (CFCs) and Halons*, establishes policy and assigns responsibilities for the management of CFCs and halons and the long-term process of decreasing DoD dependence on CFCs and halons.

C. U. S. Air Force Regulations

- Air Force Regulation (AFR) 19-6, *Air Pollution Control Systems for Boilers and Incinerators*, provides guidance on how to select, design, operate, and maintain emission control devices on boilers and incinerators.

- Air Force Technical Manual TO 00-20B-5, *USAF Motor Vehicle and Vehicular Equipment Inspection*, establishes procedures for inspection and reporting on vehicle emissions.

D. Responsibility for Compliance

- The Combat Support Group Commander is usually the person responsible for compliance.

- The Base Civil Engineering (BCE) 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 and boiler plants are responsible for the operation of fuel burners and are part of the Operations Branch of Civil Engineering.

- The Environmental Coordinator in Base Civil Engineering (BCE) is responsible for the preparation of all air pollution emission source permit applications.

- The regional hospital or base clinic is responsible for the operation of any pathological incinerators located in their facility.

- The Fuels Management Branch of Base Supply is responsible for the operation of all fuel handling, transportation (tanks and/or pipelines), and storage facilities on base. They are also responsible for insuring that all fuels satisfy specifications. The Fuels Management Branch is also responsible for the operations of the Military Service Station, which dispenses leaded or unleaded fuel.

- The Automotive Maintenance Branch of Base Transportation is responsible for the emission testing and vehicle maintenance required by Host Nation and Air Force regulations.

- The various maintenance squadrons at the base are responsible for the operation of degreasers and other industrial processes that are regulated or may require operating permits.

- The Base Exchange operates a service station that dispenses leaded and unleaded fuels and is subject to the Host Nation requirements. The service station is normally operated by a contractor, but the labeling and nozzle size regulations still apply. The Government is responsible for compliance, but the contractor may also be responsible depending on the contract wording.

- The Bioenvironmental Engineer (BEE) is responsible for monitoring of ambient air quality and preparation of the installation air emission inventory.

E. Key Compliance Definitions

These definitions were obtained from the various Air Force regulations listed previously.

- *Coal Refuse* - any waste products of coal mining, cleaning, and coal preparation operations (e.g., culm, gob, etc.) containing coal, matrix material, clay, and other organic and inorganic material.

- *Distillate Oils* - those liquid fractions of petroleum normally derived by vaporization and condensation of petroleum remaining after gasoline and fractions more volatile than gasoline have been removed.

- *Export* - the transport of controlled substances manufactured from raw materials or feedstock chemicals from within the United States or its territories to persons or countries outside the United States or its territories, excluding United States military bases and ships for on-board use.

- *Federally Enforceable* - all limitations and conditions which are enforceable by the Federal Environmental protection Agency (EPA) administrator, including those requirements developed pursuant to 40 CFR Parts 60 and 61, requirements within any applicable host country implementation plan, any permit requirements established pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR 51, Subpart I, including operating permits issued under an EPA-approved program that is incorporated into the host country implementation plan and expressly requires adherence to any permit issued under such program.

- *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 heat.

- *Fossil-Fuel Fired Steam Generating Unit* - a furnace or boiler used in the process of burning fossil fuel for the purpose of producing steam by heat transfer.

- *Fossil Fuel and Wood Residue Steam Generating Unit* - a furnace or boiler used in the process of burning fossil fuel and wood residue for the purpose of producing steam by heat transfer.

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

- *Gasoline Carrier* - any distributor who transports, stores, or causes the transportation or storage of gasoline without taking title to it or otherwise having any ownership of the gasoline, and without altering either the quality or quantity of the gasoline.

- *Gasoline Distributor* - any person who transports, stores, or causes the transportation or storage of gasoline at any point between any gasoline refinery or importer's facility, and any retail outlet or wholesale purchaser consumer facility.

- *Good Management Practice (GMP)* - a practice that, although not mandated by law, is encouraged to promote safe and environmentally sound operating procedures.

- *Import* - is the transport of virgin, used, and recycled controlled substances from outside the United States and its territories to persons within the United States or its territories.

- *Major Stationary Source* - any stationary source of air pollution that emits or has the potential to emit 100 tons per year of any regulated pollutant.

- *Maximum Heat Input Capacity (of a steam generating unit)* - determined by operating the facility at maximum capacity for 24 hours and using the heat loss method described in Sections 5 and 7.3 of the American Society of Mechanical engineers (ASTM) *Power Test Codes* 4.1 (Incorporation by Reference see 40 CFR 60.17 (IBR)) 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.

- *Nitrogen Content* - determined using American Society of Testing and Materials (ASTM) Method D3431-80, *Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons* (IBR - see 40 CFR 60.17) or fuel suppliers. If residual oil blends are used, fuel nitrogen specifications may be prorated based on the ratio of residual oils of different nitrogen content in the fuel blend.

- *Opacity* - that property of a substance tending to obscure vision; is measured in terms of percent opacity.

- *Particulate Matter* - any material (except uncombined water) that exists in a finely divided form as a liquid or solid at standard conditions.

- *Pathological Waste* - waste consisting of animal or human tissue (a portion of which is considered infectious).

- *Reasonably Available Control Technology (RACT)* - devices, systems, process modifications, or other technologies that will permit a reduction in air pollution emissions.

- *Reid Vapor Pressure (RVP)* - the absolute vapor pressure of volatile crude oil and volatile nonviscous petroleum liquids (except liquefied petroleum gases) as determined by American Society for Testing and Materials, Part 17, 1973, D-323-72 (reapproved 1977). RVP is currently being tested and regulated in order to reduce VOC emissions from evaporating gasoline, which is a significant contributor to ozone layer deterioration

- *Residual Oils* - liquid or semiliquid fractions of petroleum remaining after distillate oils and fractions more volatile than distillate oils have been removed.

- *Smoke Density Measuring Device* - Ringelmann Chart, published by the U.S. Bureau of Mines and described in information Circular 8333, and on which are illustrated graduated shades of gray to black for use in estimating the light- obscuring capacity of smoke.

- *Sulfur Oxides* - sulfur dioxide, sulfur trioxide, their acids, and the salts of their acids.

- *Suspended Particulate* - any material (except water in uncombined form) that is, or has been, airborne.

- *Solvent* - organic materials that are liquid at standard conditions and which are used as dissolvers, viscosity reducers, or cleaning agents.

- *True Vapor Pressure* - the equilibrium partial pressure exerted by a petroleum liquid as determined in accordance with methods described in American Petroleum Institute (API) Bulletin 2517, *Evaporation Loss from Floating Roof Tanks*, 1962.

- *Very Low Sulfur Oil* - means an oil that contains no more than 0.5 weight percent sulfur or that, when combusted without sulfur dioxide emission control, has a sulfur dioxide emission rate equal to or less than 0.5 lb/MBtu heat input.

- *Volatile Organic Compound (VOC)* - any compound of carbon that has a vapor pressure of 0.75 psi absolute (77.6 mm Hg) or greater according to the New Source Performance Standards (NSPS) under actual storage conditions, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, or carbonates, and ammonium carbonate.

  (Note: Within Prevention of Significant Deterioration (PSD) and nonattainment regulations, VOCs also exclude: methane, ethane, methylene chloride, 1,1,1-trichloroethane, trichlorotrifluoroethane (CFC-113), trichlorotrifluoromethane (CFC-11), dichlorodifluoromethane (CFC-12), chlorodifluoromethane (CFC-22), trifluoromethane (FC-23), dichlorotetrafluoroethane (CFC-114), chloropentafluoroethane (CFC-115), dichlorotrifluoroethane (HCFC-123), tetrafluoroethane (HFC-134a), dichlorofluoroethane (HCFC-141b), chlorodifluoroethane (HCFC-142b).)

AIR EMISSIONS MANAGEMENT PROTOCOL

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS: *
All installations	1-1 through 1-3	(1)(2)
If the installation is subject to a Host Nation inspection, permitting or certification program	1-4	
If the installation operates a fuel burner (central steam plant, or hot water, or hot water steam boilers)	1-5 through 1-14	(1)(2)(3)(4)
If the installation operates an incinerator	1-15 and 1-17	(1)(3)
If the installation engages in any open burning or firefighter training	1-18	(3)
If the installation operates a motor vehicle inspection station	1-19 and 1-20	(5)

***CONTACT/LOCATION CODE:**

(1) BCE [Base Civil Engineering/Environmental Planning]
(2) BEE [Bioenvironmental Engineering]
(3) Air Pollution Source Operator
(4) Fuels - Management Branch
(5) Transportation - Maintenance Branch
(6) LGS [Base Supply]
(7) MWR [Morale, Welfare, and Recreation] Auto Hobby Shop
(8) Refrigeration Shops [BCE]
(9) Equipment Maintenance Squadron
(10) AAFES [Army Air Force Exchange Service] Gas Station

AIR EMISSIONS MANAGEMENT PROTOCOL

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS: *
If the installation receives, stores, handles, or distributes gasoline, JP-4, Motor Gasoline (MOGAS) or other VOCs	1-21 and 1-25	(4)(5)(9)(10)
If the installation uses chloroflurocarbons (CFCs) and halons	1-26	(1)(6)
If the installation operates a paint booth or solvent cleaning operation	1-27	(2)(5)(7)(9)

***CONTACT/LOCATION CODE:**

(1) BCE (Base Civil Engineering/Environmental Planning)
(2) BEE [Bioenvironmental Engineering]
(3) Air Pollution Source Operator
(4) Fuels - Management Branch
(5) Transportation - Maintenance Branch
(6) LGS [Base Supply]
(7) MWR [Morale, Welfare, and Recreation] Auto Hobby Shop
(8) Refrigeration Shops [BCE]
(9) Equipment Maintenance Squadron
(10) AAFES [Army Air Force Exchange Service] Gas Station

AIR EMISSIONS MANAGEMENT

Records to Review:

- Host Country air pollution control regulations
- 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
- Air Emergency Episode Plan
- Host Country regulatory inspection reports
- Documentation of preventative measures or actions
- Results of air sampling at the conclusion of response action.

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

Sources to Interview:

- BCE [Base Civil Engineering/Environmental Planning]
- BEE [Bioenvironmental Engineering]
- Air pollution source operators
- Fuels - Management Branch
- Transportation - Maintenance Branch

COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
1-1. Determine actions or changes since previous review of air emissions.	• Obtain a copy of previous review report and determine if non-compliance issues have been resolved. (1)(2)
...	...
1-2. Copies of all relevant Host Nation and local regulations, DoD, and USAF directives and guidance documents on air emissions should be maintained at the installation (AFR 19-1, Section C).	• Determine if copies of the following regulations are maintained and kept current at the base: (1) - AFR 19-6, *Air Pollution Control Systems for Boilers and Incinerators.* • Determine if copies of Host Nation and local air emission regulations are maintained at the installation. • Examine regulations with base environmental staff. Determine if staff is familiar and knowledgeable of air emissions requirements. (1)
...	...
1-3. Each Air Force facility is required to conduct an emissions inventory which at a minimum lists all sources of air pollution to include building location, source and pollutants emitted (i.e. SO_x, NO_x, HC, and/or particulates). Estimates of the total emissions of each pollutant will be quantified "only if required" by the MAJCOM or Host Nation (AFR 19-7).	• Verify if an emission inventory has recently been completed or updated. (1)(2) • Examine the emission and permit inventories for completeness. Compare the inventory to any permits issued to ensure that all recent changes and modifications have been included. (1)(2) • Determine if updates of air emissions inventory are conducted when processes or materials used are changed. (2) (NOTE: The reviewer should keep a copy of the inventory during the review as it will be used in later stages of the review when facilities are inspected.)
...	...

(1) BCE [Base Civil Engineering/Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Air Pollution Source Operator (4) Fuels - Management Branch (5) Transportation - Maintenance Branch (6) LGS [Base Supply] (7) MWR [Morale, Welfare, and Recreation] Auto Hobby Shop (8) BCE [Refrigeration Shops] (9) Equipment Maintenance Squadron (10) AAFES [Army Air Force Exchange Service] Gas Station

COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
1-4. Host Nations may have a permitting and/or inspection program similar to the permit programs contained in State Implementation Plans (SIPs).	• Check whether Host Nation authorities conduct periodic inspections/certification/permitting of air emission sources. (1)(3) - Check to ensure plant operators are familiar with Host Nation standards they are measured against. - Check plants which fall under Host Nation inspection criteria to see if inspections are being accomplished. - Review Host Nation certification against host standards to ensure that our plants meet standards. - If plants do not meet standards, review actions taken/planned to come into compliance with host standards. - Check that installation performs adequate Host Nation emissions testing. Methods include: (3) - -commonly accepted Host Nation practices - -those listed in 40 CFR 51, Appendix A - -those listed in 40 CRF 51, Appendix M.
...	...
1-5. Fuel burners should meet visible emission standards (GMP).	• Inspect the facility and observe normal opacity level. Determine if opacity is greater than 20%. (3) • Reviewer should attempt to observe the facility during startup or soot blowing to verify opacity level of 40% for less than 5 minutes/hr is complied with. (3)
...	...
1-6. Regulations typically control existing fuel burning sources to specified opacity levels (GMP: Ref.: Subpart Q, AFR 19-7, and Applicable Host Nation and local regulations).	• Determine Host Nation and local requirements on opacity levels. Conduct review steps noted above. (3)
...	...
1-7. Regulations typically control existing fuel burning sources for particulates (0.05 - 0.06 lb/MBtu is typical) (NSPS regulation).	• Determine Host Nation requirements for particulates. (1) • Review available monitoring data for particulate emissions to verify compliance with emission limitations. (1)(2)(3) • Discuss with facility operator any operating procedures used to stay in compliance with particulate limitations. (3)
...	...

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
1-8. Particulate (dust) emission control devices may be required. These devices must be properly maintained and operated (AFR 19-6).	• Inspect emission control devices for proper operation. (3) • Determine if gauges on control panel are reading within limits specified in permit. (3) • Determine schedule for maintenance and type of maintenance conducted on the emission control devices. (3) • Determine if proper authorities are informed during periods when emission control equipment is shut down. (1)(3)
...	...
1-9. Fuel burning sources are typically limited to sulfur dioxide (SO_2) emissions of 0.8 lb/ MBtu heat input. The sulfur content of fuel used may also be limited (GMP: Ref.: NSPS regulation). (NOTE: Host nation regulations need to be reviewed for specific contaminants content limitations.)	• Examine available sulfur content analysis records for fuel used in boilers. (4) • Determine if sulfur content is within limits (Typically sulfur content limitations range from 0.2% - 0.3% [Ref.: Host Nation standards]). • Examine any available SO_2 monitoring data to verify emissions are within limitations. (2) (3)
...	...
1-10. Fuel burning sources greater than 100 MBtu/hr shall not exceed set sulfur dioxide emissions standards.	• Check that sulfur emissions don't exceed: - 1.2 lb/MBtu if the facility combusts coal - 0.5 lb/MBtu if the facility combusts oil other than very low sulfur oil (NOTE: Facilities may be exempt from sulfur emissions performance testing requirements if they combust only very low sulfur oil.)
...	...

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
1-11. Owners or operators of those installations that are NOT subject to sulphur dioxide emissions limits must comply with certain recordkeeping requirements.	• Check that the following information is maintained for each steam generating unit operating day: - calendar date - the number of hours of operation - a record of the hourly steam load. • Check that the following is submitted to the Administrator each quarter: - the annual capacity factor over the previous 12 months - the average fuel nitrogen content during the quarter, if residual fuel was fired; and - if the facility meets the criteria described in 40 CFR 60.22b(j), the results of any nitrogen oxides emission tests required during the quarter, the hours of operation during the quarter, and the hours of operation since the last nitrogen emission test.
...	...
1-12. Fuel burners over 250 MBtu/hr should have combustion efficiency (CO_2) and emission monitoring (opacity) equipment installed on the boiler. SO_2 and NO_x detectors may be required (GMP).	• Inspect applicable sources for the proper operation of the following monitoring equipment: (3) - CO_2 or O_2 monitor - opacity monitor - NO_x detector - SO_2 detector - gaseous fuel burners do not require SO_2 or opacity monitor - SO_2 detector is not required if monitored by fuel sampling. • Determine schedule for calibration of instruments. Inspect schedule to determine if it is maintained. • Check to see if recording charts are within normal operational variances.
...	...
1-13. Fuel burners typically should have fuel consumption and electrical/steam output instruments installed (GMP).	• Interview facility operator to verify if instruments are installed and operating properly. (3) • Determine if instruments are calibrated regularly. (3) • Determine if monitoring records are maintained for 2 years. (3)
...	...
1-14. Records of fuel analyses and fuel burner operations should be maintained (GMP).	• Review fuel analysis records to determine if they contain: (3) - sulfur content - ash content - heating value.

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
1-15. Incinerators that handle medical/ pathological wastes must maintain a temperature of 1500° F for a minimum of 0.3 seconds retention time (GMP).	• Check controls of pathological incinerator to see if temperature is monitored. If it is, check to see if "1500° F for a minimum of 0.3 seconds" criterion or appropriate other limitations is achieved. (2)(3)
...	...
1-16. Both pathological and classified material incinerators should be secured to prevent unauthorized use (GMP).	• Check the incinerators for fenced-in areas or locks on doors and control cabinets. (3)
...	...
1-17. Incinerators at Air Force installations should be a multiple chamber type with burners fired by supplemental fuel in each chamber. Burners should be fired until all combustible material is burned (GMP).	• Inspect incinerators on the installation. (1)(3) • Verify that there are two supplemental fuel burners on the incinerator and that they fire into two distinct chambers. (The secondary chamber can be the base of the stack.) (3) • Check the timing/control mechanism for the supplemental fuel feed. Insure that both burners are fired for an adequately long period of time to insure complete combustion before being shut off. (3)
...	...
1-18. Air Force installations should have a policy to control the release of air contaminants from open burning.	• Check base policy on open burning and verify that the base policy is being followed. (3)
...	...

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
1-19. All Air Force vehicles are required to be annually tuned up and tested for exhaust emissions. (Air Force Technical Order (AFTO) 00-20B-5 attached, Section 2-6).	• Interview the transportation maintenance chief and insure that the required testing is performed annually in conjunction with the annual safety inspection, or more often if required by local laws. (5) • Verify that engine diagnostic tests are being performed using available test equipment, and that faulty parts/assemblies are repaired or replaced as necessary. (5) • Determine whether exhaust emission system is serviced and maintained as follows: - Vehicle performance is compared against manufacturer's specifications, e.g., cylinder balance, CO_2 and hydrocarbons. - Choke is inspected to ensure it is operating properly. - Emission control devices, hoses, and PCV valves are inspected, cleaned, or replaced as appropriate. - Verify that all mechanics know how to operate both the dynamometer and infrared exhaust analyzer and/or opacity meter. (5) • Verify if the testing is performed by a mechanic thoroughly trained in the operation of the specific dynamometer and engine analyzing equipment. (5)
...	...
1-20. Specific vehicle exhaust emission limits are typically established by ordinance. Air Force vehicles failing to achieve these standards should be returned or repaired so emission standards are achieved (applicable Host Nation regulations).	• Determine if country has a vehicle inspection and maintenance program. • Determine if transportation maintenance branch is aware of Host Nation emission standards. • Interview maintenance chief to determine if vehicles that fail testing are returned/repaired before they are returned to service. (5)
...	...
1-21. Leaded gasoline shall not be introduced into any motor vehicle labeled "unleaded gasoline only," equipped with a gasoline tank filler inlet designed for introduction of unleaded gasoline (GMP).	• Interview the Fuels Management Officer to determine what grades of gasoline are used, where they are dispensed and what controls are in place to insure proper fueling of vehicles. (4)(10)
...	...

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
1-22. A sign stating that only unleaded gas should be introduced into labeled vehicles should be displayed at each pump stand (GMP- if only unleaded gasoline is dispensed, this sign may be omitted).	• Inspect the base gas stations to insure that: (5) - signs are posted - nozzles are properly sized.
...	...
1-23. Each gas pump must be labeled indicating the type of fuel, i.e., "unleaded gasoline" or "contains lead anti-knock compounds" (GMP).	• Inspect the base gas stations to insure that gas pumps are labeled properly. (4)(9)(10)
...	...
1-24. All above-ground storage tanks for MOGAS and JP-4 greater than 40,000 gallon capacity should have internal or external floating roofs that meet certain criteria (GMP).	• Identify and inspect all above ground JP-4 and MOGAS storage tanks over 40,000 gallon capacity with Fuels Management Officer (FMO). (4) • Inspect floating roof to verify: - Closure seal has no visible holes, tears, or other openings. - Ladder and gauging holes have seals. (4) • Determine that closure seals are inspected at least yearly (GMP), and that records of inspection are maintained. (4)
...	...
1-25. All above-and below-ground VOC storage tanks over 250 gallons should have submerged fill pipes (GMP).	• Obtain list of all VOC storage tanks over 250 gallons on the installation. (4) • Determine from FMO or Base Fuels (LGSF) if tanks have submerged fill pipes. (4) • Visually check a sample of tanks for presence of a submerged fill pipe using a flashlight. • Determine that fill pipe extends to within 6 inches of the bottom of the tank by using a gauging stick with a nonsparking (bronze or wooden) shoe. • If available, use the stick to determine the depth of the tank and the depth to the end of the fill tube. Determine that there is 6 inches or less of space between the two. (4)
...	...

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COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
1-26. Installations that utilize CFCs and halons must comply with requirements identified in DoD Directive 6050.9.	• Determine if the CFCs and Halon Annual Report (DD Form 2530) has been completed. (1) (NOTE: Reviewer should keep a form of the report, as it will be used in later stages of the review when facilities are inspected.) (1) • Inspect areas where CFCs and halons are used for the following requirements: (1)(6)(5)(8) - Dependence on CFCs and halons is reduced. - Emissions are being minimized. - Conservation practices have been implemented.
...	...
1-27. Painting and use of solvents should be done in areas that provide adequate ventilation in accordance with guidelines. Ventilation exhaust should be filtered to prevent release of VOC contaminants to the environment Air Force Office of Safety and Health (AFOSH 161-2).	• Determine if painting and solvent use are accomplished in areas with adequate ventilation. (2)(5)(7)(9) • Determine if exhaust from ventilation is properly filtered to prevent excessive release of VOCs to the environment. (2)(5)(7)(9)

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Appendix I-1

Standards of Performance, 40 CFR Part 60

Source Category	Affected Facility	Pollutant	Emission Level	Monitoring Requirement
		Subpart D		
Steam generators (> 250 MBtu/hr)	Coal Fired Boilers	Particulate	0.05 lb/106 Btu	None.
		Opacity	20%	Continuous
		SO_2	1.2 lb/106 Btu	Continuous
		NO_x (except ignite and coal refuse)	0.70 lb/106 Btu	Continuous
	Oil Fired Boilers	Particulate	0.05 lb/106 Btu	None.
		Opacity	20%; 40% 2 min/hr	Continuous
		SO_2	0.80 lb/106 Btu	Continuous
		NO_x	0.30 lb/106 Btu	Continuous
	Gas Fired Boilers	Particulate	0.05 lb/106 Btu	None.
		Opacity	20%	None.
		NO_x	0.20 lb/106 Btu	Continuous
		Subpart E		
Incinerators (> 50 tons/day)	Inciner-ators	Particulate	0.08 gr/dscf	None.
		CO_2	corrected to 12%	
		Subpart K *		
Storage Vessels for Petroleum Liquids	Storage Tanks > 40,000	Hydrocarbons	For vapor pressure 78-570 mm gal. capacity	None.
				Hg. equip with floating roof, vapor recovery system, or equivalent; for vapor pressure > 570 mmHg, equip with vapor recovery system or equivalent.

* Emission level units, mmHg, are different from those in the regulation (kPa & PSIA). The regulation also contains requirements for 20,000 gallon tanks.

INSTALLATION:	COMPLIANCE CATEGORY: AIR EMISSIONS MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

(1) BCE [Base Civil Engineering/Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Air Pollution Source Operator (4) Fuels - Management Branch (5) Transportation - Maintenance Branch (6) LGS [Base Supply] (7) MWR [Morale, Welfare, and Recreation] Auto Hobby Shop (8) BCE [Refrigeration Shops] (9) Equipment Maintenance Squadron (10) AAFES [Army Air Force Exchange Service] Gas Station

Section II

Hazardous Materials Management

SECTION II

HAZARDOUS MATERIALS MANAGEMENT

A. Applicability of this Protocol

Most Air Force installations handle many chemicals and substances which may be considered hazardous if not handled, stored, or used properly. A complete list of chemicals used at Air Force installations is too lengthy to include in this protocol, but consists of many that have hazardous properties, 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 Air Force installations, and are addressed in separate protocols. Radioactive substances and the general category of hazardous wastes are also not included in this protocol. This protocol does not focus on individual hazardous chemicals or substances used at Air Force installations. It deals with the generic requirements and good management practices (GMPs) associated with minimizing impacts on the environment due to spills or releases of hazardous materials due to improper storage and handling. As a general rule, most sections of this protocol will be applicable to most Air Force installations.

The regulatory requirements in this protocol are based on Department of Defense (DoD) regulations, U.S. Air Force Occupational Safety and Health (USAFOSH) standards, and Air Force regulations that apply at overseas installations. GMPs are derived from U.S. Environmental Protection Agency (EPA) regulations and National Fire Protection Association (NFPA) publications that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force employees and protect the environment. Any procedural EPA requirements, such as permits and notifications, are not applicable overseas, and, therefore, are not in the worldwide manual. GMPs in the Hazardous Materials protocol are derived from 40 Code of Federal Regulations (CFR) 280, 49 CFR 172, and NFPA publications.

B. DoD Regulations

- DoD Directive 4145.19-R-1, Chapter 5, Section 4, *Hazardous Commodities*, provides overall guidance for storage and handling of various types of hazardous commodities at Air Force installations.

C. U.S. Air Force Regulations

- AFR 19-1, *Pollution Abatement and Environmental Quality*, provides guidance for writing oil and hazardous substance contingency plans.

- USAFOSH 127-43, applies to the storage, use and handling of flammable and combustible liquids in containers or tanks of 60 gallons or less and in portable tanks up to 660 gallons capacity. The Standard implements those portions of Occupational Safety and Health Administration (OSHA) Standard 1910.106 applicable to Air Force operations, and, in addition, covers several items not addressed in the OSHA standard.

- Headquarters United States Air Force/Director of Logistics (HQ USAF/LE) policy letter, *Title III of Sara* dated (9 November 1987 and 27 September 1988), states "we must actively participate in local emergency planning committees and provide our technical expertise in community emergency response plan development." Though Federal facilities are not subject to Emergency Planning and Community Right-to-Know Act (EPCRA), the Air Force has developed policy guidelines for installations. These requirements are stated in policy letters dated 9 November 1987 and 27 September 1988 and are included in this protocol.

D. Responsibility for Compliance

- Base Supply (LGS) has primary responsibility to receive, store, and issue all hazardous commodities. Base Supply reviews all items that have a potential health hazard and determines if an issue exception code should be assigned to the item before being placed in storage. The receipt of hazardous materials with the proper documentation and shipping papers is also the responsibility of Base Supply. The proper maintenance and operation of flammable/combustible materials storage facilities, acid storage facilities, and compressed gas storage facilities is also the responsibility of Base Supply.

- Director of Base Medical Services, through the Bioenvironmental Engineering Section (BEE), is responsible for reviewing the issue exception codes for hazardous materials assigned by base supply, and to approve or disapprove the recommendations.

- Base Civil Engineer (BCE) is responsible for the storage and handling of all hazardous materials used by the civil engineering shops.

- Base 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 installation.

- Base Safety Manager is responsible for conducting workplace safety evaluations and inspections of the handling and storage of hazardous materials. The Safety Manager provides the appropriate manager with a report of findings and recommended corrective actions. They are 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 Federal, DoD, and Air Force regulations.

- *Basement* - any portion of a building below ground level.

- *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 to prevent liquid and/or vapor from escaping at atmospheric temperatures and pressures.

- *Combustible Liquid* - a liquid having a flashpoint at or above 100^{O} F (37.8^{O} C). Combustible liquids are categorized as Class II or Class III liquids, and are further subdivided as shown:

  1. Class II liquids are those having a flashpoint at or above 100^{O} F (37.8^{O} C), and below 140^{O} F (60^{O} C).

  2. Class IIIA liquids are those having flashpoints at or above 140^{O} F (60^{O}C), and below 200^{O} F (93.4^{O}C).

  3. Class IIIB liquids are those having flashpoints at or above 200^{O} F (93.4^{O} C).

- *Fire Area* - that portion of a building separated from the remainder by walled construction having a rated fire resistance of at least 1 hour. All openings must be protected by an approved assembly having a fire resistance rating of at least 1 hour.

- *Flammable Aerosol* - an aerosol that is required to be labeled "Flammable" under the Federal Hazardous Substance Labeling Act (15 USC 1261). These aerosols are considered Class IA liquids.

- *Flammable Liquid* - a liquid with a flashpoint below 100° F (37.8° C) with a vapor pressure not exceeding 40 psia at 100°F (37.8° C). Flammable liquids are categorized at Class 1 liquids, and are further subdivided as follows:

  1. Class 1A are those that have a flashpoint below 73° F (22.8° C) and boiling point below 100° F (37.8° C).
  2. Class 1B are those that have flashpoints below 73° F (22.8°C) and boiling points at or above 100° F (37.8° C).
  3. Class 1C are those that have flashpoints 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.

- *Good Management Practice (GMP)* - practices that, although not mandated by law, are encouraged to promote safe operating procedures. Compliance with Host Country standards is normally considered a GMP.

- *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.

- *Portable Tank* - a closed container having a liquid capacity over 60 gallons and not intended for permanent installation.

- *Pressure Vessel* - a storage tank or container designed to operate at pressures above 15 PSIG (pounds per square inch gauge).

- *Safety Can* - an approved flammable liquid container having a spring-closing lid, spout cover, and other features designed to safely relieve internal pressure and to provide safe storage for the liquid.

- *Storage Refrigerator for Flammables* - a unit designed or modified so the storage compartment, to include the door, and door frame, meets the requirements for Class 1, Division 1 locations as described in National Fire Protection Agency (NFPA) 70.

- *Unstable Reactive Liquid* - a liquid which will vigorously polymerize, decompose, condense, or become self-reactive under conditions of shock, pressure, temperature, or combinations thereof.

HAZARDOUS MATERIALS MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS	CONTACT THESE PERSONS OR GROUPS:(*)
All installations	2-1 through 2-4	(1)(2)(3)(4)
If the installation stores flammable/ combustible liquids	2-5 through 2-11	(1)(2)(3)
If the installation maintains bulk storage of compressed gases or acids	2-12 through 2-14	(1)(2)
If the installation stores, disposes, or dispenses hazardous materials	2-15 through 2-20	(1)(2)(3)(4)(5)
If the installation transports hazardous materials	2-21 through 2-25	(1)(4)

(*)CONTACT/LOCATION CODE:

(1) LGS [Base Supply]
(2) BCE [Base Civil Engineering]
(3) Fire Department
(4) Safety Officer
(5) BEE [Bioenvironmental Engineering]
(6) Disaster Preparedness Office
(7) LGT [Transportation Officer]
(8) LFM [Liquid Fuels Maintenance Shop]

HAZARDOUS MATERIALS MANAGEMENT

Records to Review:

- Spill Control and Contingency Plan
- Emergency Plan documents
- Material Safety Data Sheets
- Inventory records
- Training records
- Inspection records
- Shipping papers
- Placarding of hazardous materials

Physical Features to Inspect:

- Hazardous material storage areas
- Shop activities
- Shipping and receiving area

Sources to Interview:

- BCE [Base Civil Engineering]
- LGS [Base Supply]
- Base Fire Department
- BEE [Bioenvironmental Engineering]
- Base Safety Manager
- LGT [Transportation Officer]

COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS:**	**REVIEWER CHECKS:**
2-1. Determine actions or changes since previous review of hazardous materials.	• Obtain copies of previous review report and determine if non-compliance issues have been resolved. (2)
...	...
2-2. A master listing of all hazardous materials storage facilities should be maintained at the installation (GMP).	• Determine from interviews, locations of all hazardous materials storage areas on the base. (1) (2)(3)(4)
...	...
2-3. All relevant regulations, directives, and guidance documents on hazardous materials management should be maintained at the installation (GMP).	• Determine from interviews if the following documents are maintained and kept current at the base: (1)(2)(3)(4) - AFR 19-8, *Environmental Protection Committees and Environmental Reporting* - AFR 67-1, *Hazardous Materials Management and Reporting* (LGS) - DoD 4145.19-R-1, Chapter 5, Section 4, *Hazardous Commodities* - DoD 6050.5-L, *Hazardous Materials (microfiche)* - USAFOSH Standard 127-43 - USAFOSH Standard 127-68 - USAFOSH Standard 161-21 - NFPA, *Fire Protection Guide of Hazardous Materials.* • Examine regulations with base environmental staff. Determine if staff is familiar and knowledgeable of requirements.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS**	**REVIEWER CHECKS:**
2-4. Any pollution incident caused by an Air Force activity or occurring on an Air Force installation must be reported (AFR 19-8, Section B).	• Verify that installation to submits an Report Control Symbol (RCS): HAF-LEE 7139, *Pollution Incident Report*, for any pollution incident caused by an Air Force activity or occurring on an Air Force installation which: - threaten public health and welfare - could result in substantial harm to plants and animals - contaminates, or threatens to contaminate, surface or ground waters - results in release of any hazardous substance listed in 40 CFR 302, *EPA Designation, Reportable Quantities, and Notification Requirements for Hazardous Substances under CERCLA*, in reportable quantities - violates applicable water quality standards - causes a film or sheen on/or discoloration of, the surface of the water or adjoining shorelines or causes a sludge or emulsion to be deposited beneath the water surface or an adjoining shorelines (for oil discharge) - could cause unfavorable publicity for DOD or it's agencies. • Review past copies of Pollution Incident Reports. (2) • Review established procedures for reporting pollution incidents. Determine of they are following guidelines in AFR 19-8. (2) • Talk to Public Affairs Office and determine if any past incidents have resulted in unfavorable publicity for the U.S. Government, DoD, or the Air Force. (9)
...	...
2-5. Indoor flammable/combustible storage facilities must meet certain construction specifications (AFOSH STD 127-43,4c). If local standards apply use local standards instead of AFOSH STD.	• Inspect the installation's flammable/combustible storage facility. • Observe that the following criteria are met: (1) (2) - Walls meet fire resistant test NFPA 251-1969. - A 4-inch raised sill or ramp is provided to adjacent rooms or buildings, or the floor of the storage area is 4 inches lower than the surrounding floors. - If sill or ramp is not present, an open-grated trench that drains to a safe area is in the building. - Liquid tight wall/floor joints exist. - Self-closing fire doors exist (NFPA 80). - Electrical wiring and equipment meet NFPA 70 requirements. - Continuous mechanical exhaust ventilation exists. - Make-up and exhaust air openings are within 12 inches of the floor and air movement across all portions of the floor occurs. - Exhaust air goes directly to the exterior of the building. - If storage facility is within 50 feet from another building, the wall facing the building must be blank with a 2-hour fire resistance rating. - Building is 1 story devoted principally to storing of flammable materials with a 2-hour fire rated exterior wall having no opening within 10 feet of any storage (See Appendix II-1).

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
...	...
2-6. Installations should consider local regulations and sensitivities regarding the transport of hazardous materials similar to SARA Title III and Emergency Planning and Community right-to-Know Act (EPCRA) (see chemical list at Appendix II-2)(GMP).	• Interview the transportation officer and Public Affairs to determine what notification procedures the host country requires/desires prior to the transportation of hazardous materials. (7) • Verify that the installation is following any required procedures.
...	...
2-7. Flammable/ combustible materials stored inside buildings must meet certain storage and handling criteria (DoD 4145.19-R-1, Chapter 5, 5-404d,i, and AFOSH STD 127-43, 5d).	• Inspect the flammable/combustible storage facility. Observe that the following operational procedures are followed: (1) (2) - Exterior markings are on the building. - Stacked containers of flammable liquids are separated by pallets or dunnage. - Stacks are no closer than 3 feet to nearest beam, girder, and 3 feet below sprinklers. - Aisles are at least 3 feet wide. - All containers bear contents, labels, and hazard markings. - Total quantity and arrangement of liquids within a building complies with the requirements (see Appendix II-3).
...	...
2-8. Flammable/ combustible storage facilities must meet certain fire protection standards (DoD 4145.19-R-1, Chapter 5, 5-404g,h, and AFOSH STD 127-43, 4f). Use local standard where applicable.	• Inspect the flammable/combustible storage facility. Observe the following: (1) - At least one 10-BC-rated fire extinguisher is located outside and and within 10 feet of the door opening. - At least one 20-BC-rated fire extinguisher is located between 10-25 feet of any Class I or Class II liquid storage area outside of a storage room, but inside a building. - Fire extinguishing sprinklers or system are installed and operating. - No smoking permitted within 50 feet and signs posted. - Positive sources of ignition (open flames, cutting, welding, radiant heat, mechanical sparks) are prevented. - No water-reactive materials stored in the same room with flammable/combustible liquids.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
2-9. Flammable/ combustible materials stored in outdoor areas must meet certain criteria (AFOSH STD 127-43, 4e and DoD 4145.19-R-1).	• Inspect outdoor flammable/combustible storage areas. Observe the following: (1) - Storage area is graded to divert spills away from other building or is surrounded by a curb at least 6 inches high. - Drains from storage area terminate in a safe location. - The quantity and arrangement of materials comply with AFOSH requirements (see Appendix II-3). - No leaking or severely corroded drums are present. - Drums stored in outdoor storage areas are placed horizontally (on sides) in double rows, butt-to-butt with closures (bungs and vents) facing outward. - The end drum of the bottom tier is braced to prevent rolling.
...	...
2-10. Incidental storage of flammable liquids in industrial areas must conform to certain requirements (AFOSH STD 127-43, 4h). Use local standard where applicable.	• Inspect industrial areas at the installation. Look for incidental storage of flammable materials. Observe that the following criteria are complied with: (2) (3) - Storage must be in metal cabinets stenciled "Flammable - Keep Fire Away." - Storage limited to 1 gallon of Class I liquid or 10 gallons of Class II and Class III liquids, not to exceed 10 gallons per cabinet. - Storage will be limited to a 5-day supply. - Each work center is limited to one cabinet. - Fire department has been informed of all incidental storage areas in industrial shops.
...	...
2-11. Hazardous materials dispensing areas around the installation should be properly maintained (AFOSH STD 127-43, AFR 19-7).	• Inspect shops where hazardous materials (solvents, chemicals) are maintained or dispensed for shop use. Observe the following for GMPs: (2) - drums/containers not leaking and tightly sealed - drip pans/absorbent materials placed under containers - containers clearly marked with contents - dispensing areas located away from catch basins or storm drains - flammable safety cans or containers painted red with yellow band or the name of the contents stenciled in yellow - flammable paints, oils, or varnishes in 1- or 5-gallon containers used for building maintenance purposes may be stored outside approved cabinets or rooms for less than 10 calendar days - containers and portable tanks of Class I liquids electrically bonded and grounded during transfer of liquid - approved safety cans used for transporting and dispensing flammable liquids in quantities of 5 gallons or less - periodic inspections of chemical dispensing areas are conducted.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
2-12. Bulk storage of compressed gases in roofed, open-sided sheds must meet certain criteria (DoD 4145.19-R-1). Use local standard where applicable.	• Inspect areas of installation where compressed gases are stored. Observe that the following criteria are met: (1) (2) - Shed is on concrete slab above grade. - Shed is located in secured area. - Shed is separated from other buildings by at least 50 feet. - Flammable gases and gases which support combustion are stored in separate sheds with at least 50 feet between sheds. - If shed has one or more sides, provisions are made to insure complete change of air at least six times per hour. - Shed is not heated. - If necessary, stationary or rotating roof vents are used to lower temperature near ceiling to ambient conditions during warm weather.
...	...
2-13. Bulk storage of compressed gases in enclosed storage facilities must meet certain criteria (DoD 4145.19-R-1, AFR 69-8). Use local standard where applicable.	• Inspect areas of installation where compressed gases are stored. Observe that the following criteria are followed: (1)(2) - Building is one story in height, preferably 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 an exterior wall. - Every storage room or compartment is provided with either a gravity or mechanical exhaust ventilation system designed to provide complete change of air at least six times per hour. - Building is not heated.
...	...
2-14. Bulk storage of acids must meet certain storage and handling criteria (DoD 4145. 19-R-1).	• Inspect areas of the installation where bulk acids are stored. Observe that the following criteria are followed: (1) (2) - Building is one story in height, preferably of noncombustible construction. - Building is permanent louvered openings at floor and ceiling levels or other gravity ventilation method. - Safety equipment is available and operating (eyewash, deluge shower, self-contained breathing apparatus, protective clothing). - Building is heated (if applicable). - Different acids stored in separate spaces or noncombustible, sealed barriers at least 3 feet high between acids. - "NO SMOKING" signs are posted. - Automatic sprinkler protection provided (see Appendix II-4).
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS:**	**REVIEWER CHECKS:**
2-15. Hazardous materials dispensing areas around the installation should be properly maintained (AFOSH STD 127-43, AFOSH STD 161-21, and AFR 19-7).	• Inspect shops where hazardous materials (solvents, chemicals) are maintained or dispensed for shop use. Observe the following GMPs: (2) - Drums/containers are not leaking and are tightly sealed. - Drip pans/absorbent material are placed under containers. - Containers are clearly marked with contents. - Dispensing areas are located away from catch basins or storm drains. - Flammable safety cans or containers are painted red with yellow band or the name of the contents stenciled in yellow. - Flammable paints, oils, or varnishes in 1- or 5-gallon containers used for building maintenance purposes are stored outside approved cabinets or rooms for less than 10 calendar days. - Containers and portable tanks of Class I liquids are electrically bonded and grounded during transfer of liquid. - Approved safety cans are used for transporting and dispensing flammable liquids in quantities of 5 gallons or less. - Periodic inspections of chemical dispensing areas are conducted.
...	...
2-16. Hazardous materials storage areas shall be inspected by Fire Department (Tech Services) (AFR 127-12, AFR 127-2).	• Determine command inspection requirement, forms, and reporting. (4) • Obtain list of buildings, shops, and materials inspected by Safety Office. (4) • Review safety records for inspections of hazardous materials storage areas. Note any deficiencies and verify that corrective actions have been made. (4)
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
2-17. Installations must have a written Oil and Hazardous Substance Contingency Plan for spill events (AFR 19-1). (NOTE: This same plan may be necessary for evaluating oil related operations in Review Protocol VII, POL Management.)	• Examine the Oil and Hazardous Substance Contingency Plan. Review it for the following items while interviewing personnel from Base Supply, Fire Department, Safety Department, Civil Engineering, and Bioenvironmental Engineering: (1)(2)(3)(4)(5) - All areas where hazardous substances are stored should be included in the plan. - One individual or department is designated to initiate the spill response. - The plan is written, reviewed, and made available to other departments on the base. - The plan should be rehearsed through periodic drills and demonstrations. - Materials and equipment needed to manage a spill are specified in the plan and are readily available. Items should include: - -respiratory protection - -absorbents - -ear/eye protection - -spill kits - -protective clothing - -neutralizers. - Response materials and protective clothing are readily available. - Emergency medical procedures and first aid materials are specified in the plan. - Hazard control materials are listed in the plan, including items such as: - -hazard signs and labels - -rope, wire, tape - -monitors, survey meters. - The plan should specify phone numbers of Host Nation agencies that must be notified when a spill occurs. - The plan should include contacts for agencies that provide emergency advice and assistance. - The plan specifies personnel decontamination procedures that must be followed after the spill has been cleaned up.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS:**	**REVIEWER CHECKS:**
2-18. Hazardous substance USTs must also have a secondary containment system (GMP). (NOTE: Refer to Section VII, POL protocol, for Petroleum UST standards.)	• Existing hazardous substance USTs must meet petroleum UST standards. (1)(6) • Existing USTs must meet requirements for new hazardous substance USTs by 22 December 1998 as stated below: (1) - Secondary containment is designed and constructed to: - -contain regulated substances released until they are detected and removed - -prevent release of regulated substance to the environment at any time during the operational life of the UST - -be checked for evidence of release at least every 3 days. - Double-walled tanks must be designed, constructed, and installed to: - -contain releases from any portion of the inner tank within the innerwall - -detect failure of the innerwall. - *External liners, including vaults, must be designed, constructed,* and installed in a manner that: - -contains 100% of the capacity of the largest tank within its boundary - -prevents the interference of precipitation of groundwater intrusion with the ability to contain or detect release of regulated substances - -surrounds the tank completely. • Underground piping must be equipped with secondary containment that satisfies the above requirements. • Piping that delivers regulated substances under pressure must be equipped with an automatic line leak detector. • Other release-detection methods may be used if they are approved by the implementing agency.
...	...
2-19. General-purpose warehouse *or storage* facilities may be used for storage of hazardous materials provided certain storage and handling criteria are observed (DoD 4145.19-R-1).	• Inspect any general-purpose storage facilities on the installation. (1) (2) • Use Appendix III-3 and III-4 as a guide to verify if hazardous materials identified in the facility are permitted to be there, and that storage and separation criteria are met.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
2-20. The installation must maintain a master listing Material Safety Data Sheet (MSDS).	• Discuss with Bioenvironmental Engineering (BEE) the program for accumulating MSDS for materials used on the base. (5) • Ensure that local purchase items are contracted for using clause 52.223-2, "Hazardous Material Identification and Material Safety Data," of Federal Acquisition Regulation (FAR) 23.303. (1)(5)
...	...
2-21. Transportation personnel are responsible for ensuring that all Air Force shipments of hazardous materials/hazardous waste conform with applicable international, Federal, and military regulations (AFR 75-1 [c1]).	• Review transportation procedures with personnel. • Determine if they are properly trained with record maintained.
...	...
2-22. Packages or freight containers containing a hazardous material offered for transportation by the installation must meet specific labeling requirements (DoD 4160.21-M, Chapter 21, Bld; AFR 75-1[c1]).	• Inspect a sample of containers of hazardous materials awaiting shipment. (7) • Verify label on container is compatible with classification on shipping papers. (7) • Verify label is correct for the particular country. (7) • Ensure that labeling required to identify contents and special handling is printed in English and the Host Nation's language prior to shipment on public roads (GMP).
...	...
2-23. Each package, container, or transport vehicle must be marked in accordance with specific marking requirements (DoD 4160-21-M, Chapter 21, Bld; AFR 75-1[c1]).	• Check for commodity description (proper shipping name) on container. (1) • Check for name and address of consignee (or consignor) on the container. (1) • Check to ensure markings are in the native language of any personnel likely to handle the material, as well as in English (GMP).
...	...

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COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
2-24. The installation may be responsible to offer proper placarding to vehicles transporting hazardous materials off the installation (AFR 75-1[c1]).	• Determine from base transportation branch if Air Force vehicles are used to transport hazardous materials off the installation. (7) • If Air Force vehicles are used, determine if proper placards are affixed to vehicles (see Appendix II-5). (7) • If Air Force vehicles are not used for transportation of hazardous materials, determine if base supply has proper placards available for use by commercial vehicles (unless contractor is required to supply them). (7) • If practical, evaluator should observe the placarding of vehicles used to transport hazardous materials. (7)
...	...
2-25. The installation should ensure that transportation of hazardous materials between buildings is accomplished in accordance with good management practices to help ensure against spills, releases, and accidents (AFR 75-1[c1]).	• Determine if procedures exist to manage movement of hazardous materials throughout the base. (1) (4) • Determine if drivers are trained in spill-control procedures. (4) • Determine if provisions have been made for securing hazardous materials in vehicles when transporting. (4)
...	...

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Appendix II-1

Flammable/Combustible Materials
Indoor Container Storage

Class Liquid	Storage Level	*Protected Storage Maximum per Pile Gallons	Height	Unprotected Storage Minimum per Pile Gallons	Height
IA	Ground and upper floors	2,750 (50)	3 ft. (1)	600 (12)	3 ft. (1)
	Basement	Not permitted		Not permitted	
IB	Ground and upper floors	5,500 (100)	6 ft. (2)	1,375 (25)	3 ft. (1)
	Basement	Not permitted		Not permitted	
IC	Ground and upper floors	16,500 (300)	6 ft. (2)	4,125 (25)	3 ft (1)
	Basement	Not permitted		Not permitted	
II	Ground and upper floors	16,500 (300)	9 ft. (3)	4,125 (75)	9 ft. (3)
	Basement	5,500 (100)	9 ft. (3)	Not permitted	
III	Ground and upper floors	55,000 (1,000)	15 ft. (5)	13,750 (250)	12 ft. (4)
	Basement	8,250 (450)	9 ft. (3)	Not permitted	

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

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

NOTE 2: Aisles will be provided so no container is more than 12 feet from an aisle. Main aisles will be at least 8 feet wide and side aisles at least 4 feet wide. (Numbers in parentheses indicate corresponding number of 55-gallon drums.)

NOTE 3: Each pile shall be separated from each other by at least 4 feet.

Appendix II-1
(Continued)

Flammable/Combustible Materials
Outdoor Container Storage

Class	Maximum per pile (See NOTE 1)	Distance between piles (See NOTE 2)	Distance to property line that can be built upon (see NOTES 3 and 1)	Distance to street, alley public way (See NOTE 4)
	(Gal)	(Ft)	(Ft)	(Ft)
IA	1,100	5	20	10
IB	2,200	5	20	10
IC	4,400	5	20	10
II	8,800	5	10	5
III	22,000	5	10	5

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

NOTE 2: Within 200 feet of each container, there will be a 12-foot wide access way to permit approach of fire control apparatus.

NOTE 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 will be doubled.

NOTE 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 less than 3 feet.

Appendix II - 2

Consolidated List of Chemicals Covered in Title III of Superfund Amendments and Reauthorization Act (SARA)

This consolidated chemical list includes chemicals subject to reporting requirements under Title III of SARA of 1986. This consolidated chemical list does not contain all chemicals, however, that are subject to reporting requirements in Section 311 and 312 of SARA Title III. These hazardous chemicals, for which material safety data sheets (MSDS) must be developed under Occupational Safety and Health Act Hazard Communication Standards, are identified by broad criteria, rather than enumeration. There are over 50,000 such substances that meet the criteria. The consolidated list has been prepared to help determine whether there is a need to submit reports under Section 304 or 313 of Title III and, for a specific chemical, what reports need to be submitted.

The list includes chemicals referenced under the four following Federal statutory provisions:

1. SARA, Section 302, Extremely Hazardous Substances - The presence of which, in sufficient quantities, requires certain emergency planning activities to be conducted. Releases of these substances are also subject to reporting under Section 304 of Title III. The final rule listing the extremely hazardous substances and their threshold planning quantities (TPQ), was published 22 Apr 87 (52 CFR 13370).

2. CERCLA, Hazardous Substances, Reportable Quantities (RQ), Chemicals - Releases are subject to reporting under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund" of 1980. Such releases are also subject to reporting under Section 304 of Title III. CERCLA hazardous substances, and their RQs, are listed in 40 CFR Part 302, Table 302.4.

3. SARA, Section 313, Toxic Chemicals - Emissions or releases of which must be reported annually as part of SARA Title III's community right-to-know provisions. The Section 313 rule containing these chemicals was published on 4 Jun 87 (52 CFR 21152).

4. RCRA, Hazardous Wastes - from the "P" and "U" lists (40 CFR 261.33) of specific chemicals. RCRA hazardous wastes from the "F" and "K" lists are not included here; such waste streams are also CERCLA hazardous substances. This listing is provided as an indicator that you may already have data on a specific chemical that can be used for Title III reporting purposes.

There are four columns in the consolidated list corresponding to these four statutory provisions. If a chemical is listed as an extremely hazardous substance under Section 302, its TPQ is given in the Section 302 column. Similarly, the CERCLA RQ is given for those chemicals that are CERCLA hazardous substances. A key to the symbols used in the Section 302 and CERCLA columns precedes the list. An "X" in the column for Section 313 indicates that the chemical is subject to reporting under Section 313.

The letter-and-digit code in the RCRA column is the chemical's RCRA hazardous waste code. A blank in any of these columns indicates that the chemical is not subject to the corresponding statutory authorities. A fifth column, headed "State," is left entirely blank, to be checked if State reporting requirements apply to a chemical. The heading "Section 304" over the Section 302 and CERCLA lists indicates that the reporting requirements in Section 304 of SARA Title III apply to Section 302 extremely hazardous substances and CERCLA hazardous substances. As indicated, most chemicals on the consolidated list are subject to reporting requirements under more than one statutory provision.

The Chemical Abstract Service (CAS) registry number is provided for each chemical on the list.

For additional copies of this list, address requests to:

Title III Hotline
U.S. Environmental Protection Agency
WH-562A
401 M Street, SW
Washington, DC 20640
Phone: (800) 535-0262

Key to Symbols in the Consolidated Chemical List

\# - Indicates that the CERCLA RQ is subject to change when an assessment of potential carcinogenicity and/or chronic toxicity is completed; until then, the statutory RQ applies. See 50 CFR 13456 (4 Apr 85) and 51 CFR 34541 (29 Sep 86).

\## - Indicates that an adjusted RQ has been proposed, but a final judgment has not been made. See 50 CFR 13456 (4 Apr 85).

\### - EPA may adjust the RQ for methyl isocyanate in a future rulemaking; until then, the statutory 1 lb applies. See 52 CFR 8140 (4 Apr 84).

\+ - EPA has proposed to adjust the RQ for radionuclides by establishing RQs in units of curies; until then, the 1-pound RQ applies. See 52 CFR 41593 (16 March 87).

* - Indicates that the chemical is proposed for deletion from the Section 302 (a) extremely hazardous substances. See CFR 41593 (17 Nov 86).

** - Indicates that no RQ is assigned to this generic or broad class. See CFR 13456 (4 Apr 85).

*** - The chemical name associated with this CAS registry number is listed as hydrochloric acid under the CERCLA hazardous substances and the Section 313 toxic chemicals and as hydrogen chloride (gas only) under the Section 302 (a) extremely hazardous substances.

'' - Ferric dextran was designated as a hazardous substance under CERCLA solely because of its listing as a hazardous waste under Section 3001 of RCRA. EPA recently proposed to delist ferric dextran from Table 302.4 of CFR 302.4 and thereby remove its designation as a CERCLA hazardous substance. See 51 CFR 34541 (29 Sep 86).

''' - Uranyl acetate and uranyl nitrate are currently being evaluated for their radioactive properties. Their RQs may be further adjusted in future rulemaking, adjusting the RQ of radionuclides. See 51 CFR 34541 (29 Sep 86).

Appendix II-2 (continued)

SARA TITLE III
CONSOLIDATED CHEMICAL LIST

This is an alphabetical listing of the consolidated list of chemicals.
Numbered chemicals are listed first.

Chemical Name	302	CERCLA	313	RCRA	CAS No.
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimetho›y-		10	x	U091	119-90-4
(1,1'-Biphenyl)-4,4'diamine, 3,3'dichloro-		1	x	U073	91-94-1
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethyl-		10	x	U095	119-93-7
1,1-Dichloroethane		1000		U076	75-34-3
1,1-Dichloroethylene		100	x	U078	75-35-4
1,1-Dichloropropane		1000			78-99-9
1,2,4-Trichlorobenzene		100	x		120-82-1
1,2-Benzanthracene,7,12-dimethyl-		1		U094	57-97-6
1,2-Benzene dicarboxylic acid, diethyl ester		1000	x	U088	84-66-2
1,2-Benzenediol,4-[1-hydroxy-2-(methylamino) ethyl]-		1000		P042	51-43-4
1,2-Benzenedi carboxylic acid anhydride		5000	x	U190	85-44-9
1,2-Benzene dicarboxylic acid,[bis(2-ethylhexyl)]ester		100	x	U028	117-81-7
1,2-Benzisothiazolin-3-one,1,1-dioxide and salts		100	x	U202	81-07-2
1,2-Benzphenanthrene		100		U050	218-01-9
1,2-Butylene oxide			x		106-88-7
1,2-Dibromo-3-chloropropane		1	x	U066	96-12-8
1,2-Dichloroethane		100	x	U077	107-06-2
1,2-Dichloroethylene			x		540-59-0
1,2-Dichloropropane		1000	x	U083	78-87-5
1,2-Dihydro-3,6-pyridazinedione		5000		U148	123-33-1
1,2-Dimethylhydrazine		1		U099	540-73-8
1,2-Diphenylhydrazine		10	x	U109	122-66-7
1,2-Ethanediylbis-carbamodithioic acid		5000		U114	111-54-6
1,2-Oxathiolane,2,2-dioxide		10	x	U193	1120-71-4
1,2-trans-Dichloroethylene		1000		U079	156-60-5

Chemical Name	302	CERCLA	313	RCRA	CAS No.
1,2,7,8-Dibenzopyrene		10		U064	189-55-9
1,3-Benzenediol		5000		U201	108-46-3
1,3-Dichloropropane		1000			142-28-9
1,3-Dichloropropene		100	x	U084	542-75-6
1,4-Diethylene dioxide		100	x	U108	123-91-1
1,4-Naphthalenedione		5000		U166	130-15-4
1,Amino-2-methyl-anthraquinone			x		82-28-0
1-Butanamine,N-butyl-N-nitroso-		10	x	U172	924-16-3
1-Butanol		5000	x	U031	71-36-3
1-Methylbutadiene		100		U186	504-60-9
1-Naphthalamine		100	x	U167	134-32-7
1-Propanamine		5000		U194	107-10-8
1-Propanol,2,3-dibromo-phosphate (3:1)		10	x	U235	126-72-7
2,3,4-Trichlorophenol		10			15950-66-0
2,3,5-Trichlorophenol		10			933-78-8
2,3,6-Trichlorophenol		10			933-75-5
2,4,-D esters		100			25168-26-7
2,4,5-T esters		1000			25168-15-4
2,4,5-T salts		1000			13560-99-1
2,2-Dichloropropionic acid		5000			75-99-0
2,3,7,8-Tetrachlorodibenzo p-dioxin (TCDD)		1			1746-01-6
2,3-Dichloropropene		100			78-88-6
2,4,5-T amines		5000			1319-72-8
2,4,5-T amines		5000			3813-14-7
2,4,5-T amines		5000			6369-96-6
2,4,5-T amines		5000			6369-97-7
2,4,5-T amines		5000			2008-46-0
2,4,5-T esters		1000			93-79-8
2,4,5-T esters		1000			1928-47-8
2,4,5-T esters		1000			2545-59-7
2,4,5-T esters		1000			61792-07-2
2,4,5-T		1000		U232	93-76-5
2,4,5-TP acid esters		100			32534-95-5
2,4-D acid		100	x	U240	94-75-7
2,4-D esters		100			94-11-1
2,4-D esters		100			94-79-1
2,4-D esters		100			94-80-4
2,4-D esters		100			1320-18-9
2,4-D esters		100			1928-38-7
2,4-D esters		100			2971-38-2
2,4-D esters		100			53467-11-1
2,4-D esters		100			1928-61-6
2,4-D esters		100			1929-73-3
2,4-Diaminoanisole sulfate			x		39156-41-7
2,4-Diaminosole			x		615-41-7
2,4-Dichlorophenol		100	x	U081	120-83-2
2,4-Dimethylphenol		100	x	U101	105-67-9

Chemical Name	302	CERCLA	313	RCRA	CAS No.
2,4-Dinitrophenol		10	x	P048	51-28-5
2,5-Dinitrophenol		10			329-71-5
2,5-Furandione		5000	x	U147	108-31-6
2,6-Dichlorophenol		100		U082	87-65-0
2,6-Dinitrophenol		10			573-56-8
2,6-Xylidine			x		87-62-7
2-Aminoanthraquinone			x		117-79-3
2-Butanone peroxide		10		U160	1338-23-4
2-Butanone		5000	x	U159	78-93-3
2-Butene,1,4-dichloro-		1		U074	764-41-0
2-Chloroacetophenone			x		532-27-4
2-Chloroethyl vinyl ether		1000		U042	110-75-8
2-Chlorophenol		100		U048	95-57-8
2-Ethoxyethanol		100	x		110-80-5
2-Furancarboxaldehyde		5000		U125	98-01-1
2-Methoxyethanol			x		109-86-4
2-Naphthylamine		10	x	U168	91-59-8
2-Nitropropane		10	x	U171	79-46-9
2-Phenylphenol			x		90-43-7
2-Picoline		5000		U191	109-06-8
3,4,5-Trichlorophenol		10			609-19-8
3,5-Dichloro-N-(1,2-dimethyl-2-propynyl) benzamide		5000		U192	23950-58-5
3,4-Dinitrotoluene		10			610-39-9
4,4'-Diaminodiphenyl ether			x		101-80-4
4,4'-Isopropylidenediphenol			x		80-05-7
4,4'-Methylene bis(N,N-dimethyl) benzenamine			x		101-61-1
4,4'-Methylene dianiline			x		101-77-9
4,4'-Thiodianiline			x		139-65-1
4,6-Dinitro-o-cyclohexylphenol		100		P034	131-89-5
4-Amino-1-methyl benzene		100			106-49-0
4-Aminoazobenzene			x		60-09-3
4-Aminobiphenyl			x		92-67-1
4-Chloro-m-cresol		5000		U039	59-50-7
4-Chlorophenyl phenyl ether		5000			7005-72-3
4-Nitrobiphenyl			x		92-93-3
5-Nitro-o-anisidine			x		99-59-2
Acenaphthene		100			83-32-9
Acenaphthylene		5000			208-96-8
Acetaldehyde, trichloro-		5000		U034	75-87-6
Acetaldehyde		1000	x	U001	75-07-0
Acetamide-N-(4-ethoxyphenyl)-		100		U187	62-44-2
Acetamide,N-(aminothioxomethyl)-		1000		P002	591-08-2
Acetamide,N-9H-fluoren-2-yl-		1	x	U005	53-96-3

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Acetamide			x		60-35-5
Acetic acid, ethyl ester		5000		U112	141-78-6
Acetic acid, lead salt		5000#		U144	301-04-2
Acetic acid, thallium(I) salt		100		U214	563-68-8
Acetic acid		5000			64-19-7
Acetic anhydride		5000			108-24-7
Acetone cyanohydrin	1,000	10		P069	75-86-5
Acetone thiosemicarbazide	1,000/10,000				1752-30-3
Acetone		5000	x	U002	67-64-1
Acetonitrile		5000	x	U003	75-05-8
Acetophenone		5000		U004	98-86-2
Acetyl bromide		5000			506-97-7
Acetyl chloride		5000		U006	75-36-5
Acrolein	500	1	x	P003	107-02-8
Acrylamide	1,000/10,000	5000	x	U007	79-06-1
Acrylic acid		5000	x		79-10-7
Acrylonitrile	10,000	100	x	U009	107-13-1
Acrylyl chloride	100				814-68-6
Adipic acid		5000			124-04-09
Adiponitrile	1,000				111-69-3
Alanine,3-[p-bis(2-chloroethyl)amino]phenyl-,L-		1		U150	148-32-3
Aldicarb	100/10,000	1		P070	116-06-3
Aldrin	500/10,000	1	x	P004	309-00-2
Allyl alcohol	1,000	100		P005	107-18-6
Allyl chloride		1000	x		107-05-1
Allylamine	500				107-11-9
alpha-Endosulfan		1			959-98-8
alpha-BHC		10			319-84-6
alpha,alpha-Dimethyl-benzylhydroperoxide		10	x	U096	80-15-9
alpha,alpha-Dimethyl phenethylamine		5000		P046	122-09-8
Aluminum (fume or dust)			x		7429-90-5
Aluminum oxide (fibrous forms)			x		1344-28-1
Aluminum phosphide	500	100		P006	20859-73-8
Aluminum sulfate		5000			10043-01-3
Aminopterin	500/10,000				54-62-6
Amiton oxalate	100/10,000				3734-97-2
Amiton	500				78-53-5
Amitrole		10		U011	61-82-5
Ammonia	500	100	x		7664-41-7
Ammonium acetate		5000			631-61-8
Ammonium benzoate		5000			1863-63-4
Ammonium bicarbonate		5000			1066-33-7
Ammonium bichromate		10			7789-09-5
Ammonium bifluoride		100			1341-49-7
Ammonium bisulfite		5000			10192-30-0

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Ammonium carbamate		5000			1111-78-0
Ammonium chloride		5000			506-87-6
Ammonium chloroplatinate	10,000*				12125-02-9
Ammonium chromate		10			7788-98-9
Ammonium citrate,dibasic		5000			3012-65-5
Ammonium fluoborate		5000			13826-83-0
Ammonium fluoride		100			12125-01-8
Ammonium hydroxide		1000			1336-21-6
Ammonium nitrate (solution)			x		6484-52-2
Ammonium oxalate		5000			5972-73-6
Ammonium oxalate		5000			6009-70-7
Ammonium oxalate		5000			14258-49-2
Ammonium picrate		10		P009	131-74-8
Ammonium silicofluoride		1000			16919-19-0
Ammonium sulfamate		5000	-		7773-06-0
Ammonium sulfate (solution)			x		7783-20-2
Ammonium sulfide		100			12135-76-1
Ammonium sulfite		5000			10196-04-0
Ammonium tartrate		5000			14307-43-8
Ammonium tartrate		5000			3164-29-2
Ammonium thiocyanate		5000			1762-95-4
Ammonium thiosulfate		5000			7783-18-8
Ammonium vanadate		1000		P119	7803-55-6
Amphetamine	1000				300-62-9
Amyl acetate		5000			628-63-7
Analine,2,4,6-trimethyl-	500				88-05-1
Aniline	1000	5000	x	U012	62-53-3
Anthracene		5000	x		120-12-7
Antimony pentachloride		1000			7647-18-9
Antimony pentafluoride	500				7783-70-2
Antimony potassium tartrate		100			28300-74-5
Antimony tribromide		1000			7789-61-9
Antimony trichloride		1000			10025-91-9
Antimony trifluoride		1000			7783-56-4
Antimony trioxide		1000			1309-64-4
Antimony		5000	x		7440-36-0
Antimycin A	1,000/10,000				1397-94-0
Antu	500/10,000	100		P072	86-88-4
Aroclor 1016		1			12674-11-2
Aroclor 1221		1			11104-28-2
Aroclor 1232		1			11141-16-5
Aroclor 1242		1			53469-21-9
Aroclor 1248		1			12672-29-6
Aroclor 1254		1			11097-69-1
Aroclor 1260		1			11096-82-5
Arsenic acid		1		P010	1327-52-2
Arsenic acid		1		P010	7778-39-4

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Arsenic disulfide		1			1303-32-8
Arsenic pentoxide	100/10,000	1		P011	1303-28-2
Arsenic trisulfide		1			1303-33-9
Arsenic		1	x		7440-38-2
Arsenous oxide	100/10,000	1		P012	1327-53-3
Arsenous trichloride	500	1			7784-34-1
Arsine, diethyl-		1		P038	692-42-2
Arsine	100				7784-42-1
Asbestos		1	x		1132-21-4
Azaserine		1		U015	115-02-6
Azinophos-methyl	10/10,000				86-50-0
Azinophos-ethyl	100/10,000				2642-71-9
Barium and compounds			x		7440-39-3
Barium cyanide		10		P013	542-62-1
Benzal chloride	500	5000	x	U017	98-87-3
Benzamide			x		55-21-0
Benzenamine,2methyl, hydrochloride		100	x	U222	636-21-5
Benzenamine,2-methyl, 5-nitro-		100		U181	99-55-8
Benzenamine,3-(trifluoro-methyl)-	500				98-16-8
Benzenamine,1,4'-methylenebis-2-chloro		10	x	U158	101-14-4
Benzenamine,4-chloro-2-methyl-hydrochloride		100		U049	3165-93-3
Benz'zenamine-4-chloro		1000		P024	106-47-8
Benzenamine,4-nitro-		5000		P077	100-01-6
Benzenamine,NN-dimeth-yl-4-phenylazo		10	x	U093	60-11-7
Benzene,1,2,4,5-tetrachloro-		5000		U207	95-94-3
Benzene,1,2-dichloro		100	x	U070	95-50-1
Benzene,1,2-methylene-dioxy-4-allyl-		100	x	U203	94-59-7
Benzene-1,2-methylene-dioxy-4-propenyl-		100		U141	120-58-1
Benzene,1,2-methylene-dioxy-4-propyl-		10		U090	94-58-6
Benzene,1,3,5-trinitro-		10		U234	99-35-4
Benzene,1,3-dichloro		100	x	U071	541-73-1
Benzene,1,4-dichloro		100	x	U072	106-46-7
Benzene,1-(chloro-methyl)-4-nitro-	500/10,000				100-14-1
Benzene,1-bromo-4-phenoxy-		100		U030	101-55-3
BEnzene,1-methyl-2,2-dinitro-		10	x	U105	121-14-2
Benzene,1-methyl-2,6-dinitro-		100	x	U106	606-20-2
Benzene,1-methylethyl-		5000	x	U055	98-82-8

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Benzene,2,4-diisocyanatomethyl		100		U223	26471-62-5
Benzene,chloro-		100	x	U037	108-90-7
Benzene,dimethyl-		1000	x	U239	1330-20-7
Benzene,hexachloro-		10	x	U127	118-74-1
Benzene,hexahydro-		1000	x	U056	110-82-7
Benzene,m-dimethyl-		1000	x		108-38-3
Benzene,methyl-		1000	x	U220	108-88-3
Benzene,o-dimethyl-		1000	x		95-47-6
Benzene,p-dimethyl-		1000	x		106-42-3
Benzene,pentachloro-		10		U183	608-93-5
Benzene,pentachloronitro-		100	x	U185	82-68-8
Benzenearsonic acid	10/10,000				
Benzenesulfonyl chloride	10,000*	100		U020	98-09-9
Benzene		10	x	U019	71-43-2
Benzidine		1	x	U021	92-87-5
Benzimidazole,4,5-dichloro-2-(trifluoromethyl)	500/10,000				3615-21-2
Benzoic acid		5000			65-85-0
Benzo[b]fluoranthene		1			205-99-2
Benzonitrile		5000			100-47-0
Benzotrichloride	100	10	x	U023	98-07-7
Benzoyl chloride		1000	x		98-88-4
Benzoyl peroxide			x		94-36-0
Benzo[a]pyrene		1		U022	50-32-8
Benzo[ghi]perylene		5000			191-24-2
Benzo[jk]fluorene		100		U120	206-44-0
Benzo[k]fluoranthene		5000			207-08-9
Benzyl chloride	500	100	x	P028	100-44-7
Benzyl cyanide	500				140-29-4
Benz[a]anthracene		10		U018	56-55-3
Benz[c]acridine		100		U016	225-51-4
Benz[j]aceanthrylene,1,2-dihydro-3-methyl-		10		U157	56-49-5
Beryllium chloride		1			7787-47-5
Beryllium fluoride		1			7787-49-7
Beryllium nitrate		1			13597-99-4
Beryllium nitrate		1			7787-55-5
Beryllium		10	x	P015	7440-41-7
beta-Endosyulfan		1			33213-65-9
beta-BHC		1			319-85-7
beta-Chloronaphthalene		5000		U047	91-58-7
Bicyclo[2.2.1]heptane-2-carbonitrile,5-chloro-6-(((methyla	500/10,000				15271-41-7
Biphenyl			x		92-52-4
Bis(dimethylthiocarbmyol) disulfide		10		U244	137-26-8
Bis(2-chloroethoxy) methane		1000		U024	111-91-1
Bis(2-chloroisopropyl)		1000	x	U027	108-60-1

Chemical Name	302	CERCLA	313	RCRA	CAS No.
ether					
Bis(2-ethylhexyl)adipate			x		103-23-1
Bis(chloromethyl)ketone	10/10,000				534-07-6
Bitoscanate	500/10,000				4044-65-9
Boron trichloride	500				10294-34-5
Boron trifluoride compound with methyl ether (1:1)	1,000				353-42-4
Boron trifluoride	500				7637-07-2
Bromadiolone	100/10,000				18772-56-7
Bromine	500				7726-95-6
Bromoacetone		1000		P017	598-31-2
Bromoform		100	x	U225	75-25-2
Brucine		100		P018	357-57-3
Butadiene	10,000*		x		
Butanoic acid,4-[bis(2-chloroethyl)amino] benzene-		10		U035	305-03-3
Butyl benzyl Phthalate		100	x		85-68-7
Butyl acetate		5000			123-86-4
Butyl acrylate			x		141-32-2
Butyl isovalerate	10,000*				109-19-3
Butyl vinyl ether	10,000*				111-34-2
Butylamine		1000			
Butyraldehyde			x		123-72-8
Butyric acid		5000			107-92-6
CI Acid Blue 9,diammonium salt			x		2650-18-2
CI Acid Blue 9,disodium salt			x		3844-45-9
CI Acid Green 3			x		4680-78-8
CI Basic Green 1	10,000*		x		633-03-4
CI Basic Green 4			x		569-64-2
CI Basic Red 1			x		989-38-8
CI Direct Black 38			x		1937-37-7
CI Direct Blue 6			x		2602-46-2
CI Direct Brown 95			x		16071-86-6
CI Disperse Yellow 3			x		2832-40-8
CI Food Red 15			x		81-88-9
CI Food Red 5			x		3761-53-3
CI Solvent Orange 7			x		3118-97-6
CI Solvent Yellow 14			x		824-07-0
CI Solvent Yellow 34 (Auramine)		100	x	U014	492-80-8
CI Solvent Yellow 3			x		97-56-3
CI Vat Yellow 4			x		128-66-5
Cacodylic acid		1		U136	75-60-5
Cadmium acetate		10			543-90-8
Cadmium bromide		10			7789-42-6
Cadmium chloride		10			10108-64-2
Cadmium oxide	100/10,000				1306-19-0
Cadmium stearate	1,000/10,000				2223-93-0

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Cadmium		10	x		7440-43-9
Calcium arsenate	500/10,000	1			7778-44-1
Calcium arsenite		1			52740-16-6
Calcium carbide		10			75-20-7
Calcium chromate		10		U032	13765-19-0
Calcium cyanamide			x		156-62-7
Calcium cyanide		10		P021	592-01-8
Calcium dodecylbenzene sulfonate		1000			26264-06-2
Calcium hypochlorite		10			7778-54-3
Cantharidin	100/10,000				56-25-7
Captan		10	x		133-06-2
Carbachol chloride	500/10,000				51-83-2
Carbamic acid, ethyl ester		100	x	U238	51-79-6
Carbamic acid,methyl-nitroso-,ethyl ester		1		U178	615-53-2
Carbamic acid, methyl-o-(((2,4-dimethyl-1,3-dithiolan-2-y	100/10,000				26419-73-8
Carbamide,N-ethyl-N-nitroso-		1	x	U176	759-73-9
Carbamide,N-methyl-N-nitroso		1	x	U177	684-93-5
Carbamide,thio-		10	x	U219	62-56-6
Carbamimidoselenoic acid		1000		P103	630-10-4
Carbamoyl chloride, dimethyl-		1	x	U097	79-44-7
Carbaryl		100	x		63-25-2
Carbofuran	10/10,000	10			1563-66-2
Carbon disulfide	10,000	100	x	P022	75-15-0
Carbon oxyfluoride		1000		U033	353-50-4
Carbon tetrachloride		10	x	U211	56-23-5
Carbonyl sulfide			x		463-58-1
Carbophenothion	500				786-19-6
Carvone	10,000*				2244-16-8
Catechol			x		120-80-9
Chloramben			x		133-90-4
Chlordane	1,000	1	x	U036	57-74-9
Chlorfenvinfos	500				470-90-6
Chlorinated fluorocarbon (Freon 113)			x		76-13-1
Chlorine cyanide		10		P033	506-77-4
Chlorine dioxide			x		10049-04-4
Chlorine	100	10	x		7782-50-5
Chlormephos	500				24934-91-6
Chlormequat chloride	100/10,000				999-81-5
Chlornaphazine		100		U026	494-03-1
Chloroacetaldehyde	10,000*	1000		P023	107-20-0
Chloroacetic acid	100/10,000		x		79-11-8
Chlorodibromomethane		100			124-48-1
Chloroethane		100	x		75-00-3

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Chloroethanol	500				107-07-3
Chloroethyl chloroformate	1,000				627-11-2
Chloroform	10,000	10	x	U044	67-66-3
Chloromethyl ether	100	1#	x	P016	542-88-1
Chloromethyl methyl ether	100	10	x	U046	107-30-2
Chlorophacinone	100/10,000				3691-35-8
Chloroprene			x		126-99-8
Chlorothalonil			x		1897-45-6
Chloroxuron	500/10,000				1982-47-4
Chlorpyrifos		1			2921-88-2
Chlorsulfonic acid		1000			7790-94-5
Chlorthiophos	500				21923-23-9
Chromic acetate		1000			1066-30-4
Chromic acid		10			11115-74-5
Chromic acid		10			7738-94-5
Chromic chloride	1/10,000				10025-73-7
Chromic sulfate		1000			10101-53-8
Chromium		5000	x		7440-47-3
Chromous chloride		1000			10049-05-5
Cobalt carbonyl	10/10,000				10210-68-1
Cobalt,((2,2'-1,2-ethanediylbis (nitrilomethylidyne))bis(6)	100/10,000				62207-76-5
Cobaltous bromide		1000			7789-43-7
Cobaltous formate		1000			544-18-3
Cobaltous sulfamate		1000			14017-41-5
Cobalt	10,000*		x		7440-50-8
Colchicine	10/10,000				64-86-8
Copper cyanide		10		P029	544-92-3
Copper		5000	x		7440-50-8
Coumafuryl	10,000*				117-52-2
Coumaphos	100/10,000	10			56-72-4
Coumatetralyl	500/10,000				5836-29-3
Creosote		1		U051	8001-58-9
Cresol(s)		1000	x	U052	1319-77-3
Cresol,o-	1,000/10,000	1000	x	U052	95-48-7
Crimidine	100/10,000				535-89-7
Crotonaldehyde,(E)-	1,000	100		U053	123-73-9
Crotonaldehyde	1,000	100		U053	4170-30-3
Cupferron			x		135-20-6
Cupric acetate		100			142-71-2
Cupric chloride		10			7447-39-4
Cupric nitrate		100			3251-23-8
Cupric oxalate		100			5893-66-3
Cupric sulfate ammoniated		100			10380-29-7
Cupric sulfate		10			7758-98-7
Cupric tartrate		100			815-82-7
Cyanides (soluble cyanide salts		10	x	P030	57-12-5
Cyanogen bromide	500/10,000	1000		U246	506-68-3
Cyanogen iodide	1,000/10,000				506-78-5

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Cyanogen		100		P031	460-19-5
Cyanophos	1,000				2636-26-2
Cyanuric fluoride	100				675-14-9
Cyclohexanone		5000		U057	108-94-1
Cycloheximide	100/10,000				66-81-9
Cyclohexylamine	10,000				108-91-8
Cyclopentane	10,000*				287-92-3
Cyclophosphamide		10		U058	50-18-0
D-Glucopyranose,2-deoxy-2-(3-methyl-3-nitrosoureido)-		1		U206	18883-66-4
Daunomycin		10		U059	20830-81-3
DDD		1		U060	72-54-8
DDE		1			72-55-9
DDT		1		U061	50-29-3
Decaborane(14)	500/10,000				17702-41-9
Decabromodiphenyl oxide			x		1163-19-5
delta-BHC		1			319-86-8
Demeton-S-methyl	500				919-86-8
Demeton	500				8065-48-3
Di-n-propylnitrosamine		10	x	U111	621-64-7
Dialifos	100/10,000				10311-84-9
Diallate		100	x	U062	2303-16-4
Diaminotoluene		10	x	U221	95-80-7
Diaminotoluene		10	x	U221	25376-45-8
Diaminotoluene		10		U221	823-40-5
Diaminotoluene		10			496-72-0
Diazinon		1			5333-41-5
Diazinon		1			333-41-5
Diazomethane			x		334-88-3
Dibenzofuran			x		132-64-9
Dibenz[a,h] anthracene		1		U063	53-70-3
Diborane	100				19287-45-7
Dibutyl phthalate		10	x	U069	84-74-2
Dicamba		1000			1918-00-9
Dichlone		1			117-80-6
Dichlorobenzalkonium chloride	10,000*				8023-53-8
Dichlorobenzene (mixed)		100	x		25321-22-6
Dichloroethyl ether	10,000	10	x	U025	111-44-4
Dichloromethyl-phenylsilane	1,000				149-74-6
Dichloropropane-Dichloropropene (mixture		100			8003-19-8
Dichloropropane		1000			26638-19-7
Dichloropropene		100			26952-23-8
Dichlorobromomethane		5000	x		75-27-4
Dichlorodifluoromethane		5000		U075	75-71-8
Dichlorvos	1,000	10	x		62-73-7
Dicholobenil		100			1194-65-6

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Dicrotophos	100				141-66-2
Dieldrin		1		P037	60-57-1
Diepoxybutane	500	10	x	U085	1464-53-5
Diethanolamine			x		111-42-2
Diethyl chlorophosphate	500				814-49-3
Diethyl sulfate			x		64-67-5
Diethyl-p-nitrophenyl phosphate		100		P041	311-45-5
Diethyl-p-phenylenediamine	10,000*				93-05-0
Diethylamine		100			109-89-7
Diethylcarbamazine citrate	100/10,000				1642-54-2
Diethylstilbestrol		1		U089	56-53-1
Digitoxin	100/10,000				71-63-6
Diglycidyl ether	1,000				2238-07-5
Digoxin	10/10,000				20830-75-5
Dimefox	500				115-26-4
Dimethoate	500/10,000	10		P044	60-51-5
Dimethyl phosphorochloridothioate	500				2524-03-0
Dimethyl phthalate		5000	x	U102	131-11-3
Dimethyl sulfate	500	100	x	U103	77-78-1
Dimethyl sulfide	100				75-18-3
Dimethyl-p-phenylenediamine	10/10,000				99-98-9
Dimethylamine		1000		U092	124-40-3
Dimethylhydrazine	1,000	10	x	U098	57-14-7
Dimethyldichlorosilane	500				75-78-5
Dimetilan	500/10,000				644-64-4
Dinitrobenzene (mixed)		100			25154-54-5
Dinitrocresol	10/10,000	10	x	P047	534-52-1
Dinitrophenol		10			25550-58-7
Dinitrotoluene		10			25321-14-6
Dinoseb	100/10,000	1000		P020	88-85-7
Dinoterb	500/10,000				1420-07-1
Dioctyl phthalate		5000	x	U107	117-84-0
Dioxathion	500				78-34-2
Dioxolane	10,000*				646-06-0
Diphacinone	10/10,000				82-66-6
Diphosphoramide, octamethyl-	100	100		P085	152-16-9
Dipropylamine		5000		U110	142-84-7
Diquat		1000			85-00-7
Diquat		1000			2764-72-9
Disulfoton	500	1		P039	298-04-4
Dithiazinine iodide	500/10,000				514-73-8
Dithiobiuret	100/10,000	100		P049	541-53-7
Diuron		100			330-54-1
Dodecylbenzenesulfonic acid		1000			27176-87-0
Emetine,dihyrochloride	1/10,000				316-42-7

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Endosulfan	10/10,000	1		P050	115-29-7
Endosulfan sulfate		1			1031-07-8
Endothall		1000		P088	145-73-3
Endothion	500/10,000				2778-04-3
Endrin aldehyde		1			7421-93-4
Endrin	500/10,000	1		P051	72-20-8
Epichlorohydrin	1,000	100	x	U041	106-89-8
EPN	100/10,000				2104-64-5
Ergocalciferol	1,000/10,000				50-14-6
Ergotamine tartrate	500/10,000				379-79-3
Ethanamine,N-ethyl-N-nitroso-		1	x	U174	55-18-5
Ethane,1,1,1,2-tetrachloro-		1		U208	630-20-6
Ethane,1,1,1,2,2,2-hexachloro		100	x	U131	67-72-1
Ethane,1,1,1-trichloro-2,2-bis9p-methoxyphenyl)-		1	x	U247	72-43-5
Ethane,1,1,2,2-tetrachloro-		100	x	U209	79-34-5
Ethane,1,1,2-trichloro		100	x	U227	79-00-5
Ethane,1,1'-oxybis-		100		U117	60-29-7
Ethane,1,2-dibromo-		1	x	U067	106-93-4
Ethanesulfonyl chloride, 2-chloro-	500				1622-32-8
Ethanethioamide		10	x	U218	62-55-5
Ethanol,1,2-dichloro-acetate	1,000				10140-87-1
Ethanol,2,2'-(nitroso imino) bis-		1		U173	1116-54-7
Ethenamine,N-methyl-N-nitroso-		5000	x	P084	4549-40-0
Ethene,1,1,2,2-tetrachloro		100	x	U210	127-18-4
Ethene,chloro-		10	x	U043	75-01-4
Ethion	1,000	10			563-12-2
Ethoprophos	1,000				13194-48-4
Ethyl4,4'dichlorobenzilate		10	x	U038	510-15-6
Ethyl acrylate		1000	x	U113	140-88-5
Athyl chloroformate			x		541-41-3
Ethyl methacrylate		1000		U118	97-63-2
Ethyl methanesulfonate		1		U119	62-50-0
Ethyl thiocyanate	10,000				542-90-5
Ethylbenzene		1000	x		100-41-4
Ethylbis(2-chloroethyl)amine	500				538-07-8
Ethylene fluorohydrin	10				371-62-0
Ethylene glycol			x		107-21-1
Ethylene oxide	1,000	10	x	U115	75-21-8
Ethylenediamine	10,000	5000			107-15-3
Ethylenediamine tetra-		5000			60-00-4

Chemical Name	302	CERCLA	313	RCRA	CAS No.
acetic acid (EDTA)					
Ethyleneimine	500	1	x	P054	151-56-4
Ethylenethiourea		10	x	U116	96-54-7
Ethylene			x		74-85-1
Ethylmercuric phosphate	10,000*				2235-25-8
Famphur		1000		P097	52-85-7
Fenamiphos	10/10,000				22224-92-6
Fenitrothion	500				122-14-5
Fensulfothion	500				115-90-2
Ferric ammonium citrate		1000			1185-57-5
Ferric ammonium oxalate		1000			2944-67-4
Ferric ammonium oxalate		1000			55488-87-4
Ferric chloride		1000			7705-08-0
Ferric dextran		5000''		U139	9004-66-4
Ferric fluoride		100			7783-50-8
Ferric nitrate		1000			10421-48-4
Ferric sulfate		1000			10028-22-5
Ferrous ammonium sulfate		1000			10045-89-3
Ferrous chloride		100			7758-94-3
Ferrous sulfate		1000			7720-78-7
Ferrous sulfate		1000			7782-63-0
Florouracil	500/10,000				51-21-8
Fluenetil	100/10,000				4301-50-2
Fluometuron			x		2164-17-2
Fluoracetamide	100/10,000	100		P057	640-19-7
Fluorene		5000			86-73-7
Fluorine	500	10		P056	7782-41-4
Fluoroacetic acid	10/10,000				144-49-0
Fluoroacetyl chloride	10				359-06-8
Fonofos	500				944-22-9
Formaldehyde cyanohydrin	1,000				107-16-4
Formaldehyde	500	100	x	U122	50-00-0
Formetanate hydrochloride	500/10,000				23422-53-9
Formic acid		5000		U123	64-18-6
Formothion	100				2540-82-1
Formparanate	100/10,000				17702-57-7
Fosthietan	500				21548-32-3
Fuberidazole	100/10,000				3878-19-1
Fulminic acid, mercury(II) salt		10		P065	628-86-4
Fumaric acid		5000			110-17-8
Furan, tetrahydro-		1000		U213	109-99-9
Furan	500	100		U124	110-00-9
Gallium trichloride	500/10,000				13450-90-3
Glycidylaldehyde		10		U126	765-33-4
Guanidine,N-nitroso-N methyl-N'-nitro		10		U163	70-25-7
Heptachlor epoxide		1			1024-57-3
Heptachlor		1	x	P059	76-44-8
Hexachloro-1,3-butadiene		1	x	U128	87-68-3
Hexachloronaphthalene	10,000*		x		1335-87-1

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Hexachlorophene		100		U132	70-30-4
Hexachloropropene		1000		U234	1888-71-7
Hexachlorocyclopentadiene	100	10	x	U130	77-47-4
Hexaethyl tetraphosphate		100		P062	757-58-4
Hexamethylenediamine, N,N'-dibutyl-	500				4835-11-4
Hexamethylphosphoramide			x		680-31-9
Hydrazine sulfate			x		10034-93-2
Hydrazine	1,000	1	x	U133	302-01-2
Hydrochloric acid (Hydrogen chloride (gas only))***	500	5000	x		7647-01-0
Hydrocyanic acid	100	10	x	P063	74-90-8
Hydrogen fluoride	100	100	x	U134	7664-39-3
Hydrogen perioxide	1,000				7722-84-1
Hydrogen selenide	10				7783-07-5
Hydrogen sulfide	500	100		U135	7783-06-4
Hydroquinone	500/10,000		x		123-31-9
Indeno(1,2,3-cd)pyrene		100		U137	193-39-5
Indomethacin	10,000*				53-86-1
Iridium tetrachloride	10,000*				10025-97-5
Iron, pentacarbonyl-	100				13463-40-06
iso-Amyl acetate		5000			123-92-2
iso-Butyl acetate		5000			110-19-0
iso-Butylamine		1000			78-81-9
iso-Butyric acid		5000			79-31-2
Isobenzan	100/10,000				297-78-9
Isobutyl alcohol		5000		U140	78-83-1
Isobutyraldehyde			x		78-84-2
Isobutyronitrile	1,000				78-82-0
Isocyanic acid,3,4-dichlorophenyl ester	500/10,000				102-36-3
Isodrin	100/10,000	1		P060	465-73-6
Isofluorphate	100	100		P043	55-91-4
Isophorone diisocyanate	100				4098-71-9
Isophorone		5000			78-59-1
Isoprene		100			78-79-5
Isopropanolamine dodecylbenzene sulfonate		1000			42504-46-1
Isopropyl alcohol (mfg-strong acid processes)			x		67-63-0
Isopropyl chloroformate	1,000				108-23-6
Isopropyl formate	500				625-55-8
Isopropylmethylpyrazolyl dimethylcarbamate	500				119-38-0
Kelthane		10	x		115-32-2
Kepone		1		U142	143-50-0
Lactonitrile	1,000				78-97-7
Lasiocarpine		10		U143	303-34-4
lead arsenate		1			10102-48-4
Lead arsenate		1			7645-25-2

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Lead arsenate		1			7784-40-9
Lead chloride		100			7758-95-4
Lead Fluoborate		100			13814-96-5
Lead fluoride		100			7783-46-2
Lead iodide		100			10101-63-0
Lead nitrate		100			10099-74-8
Lead phosphate		1#		U145	7446-27-7
Lead stearate		5000#			1072-35-1
Lead stearate		5000			52652-59-2
Lead stearate		5000			7428-48-0
Lead stearate		5000			56189-09-4
Lead subacetate		100		U146	1335-32-6
Lead sulfate		100			15739-80-7
Lead sulfate		100			7446-14-2
Lead sulfide		5000#			1314-87-0
Lead thiocyanate		100			592-87-0
Lead		1	x		7439-92-1
Leptophos	500/10,000				21609-90-5
Lewisite	10				541-25-3
Lindane	1,000/10,000	1	x	U129	58-89-9
Lithium chromate		10			14307-35-8
Lithium hydride	100				7580-67-8
m-Cresol		1000	x	U052	108-39-4
m-Dinitrobenzene		100			99-65-0
m-Nitrophenol		100			554-84-7
m-Nitrotoluene		1000			99-65-0
Malathion		100			121-75-5
Maleic acid		5000			110-16-7
Malononitrile	500/10,000	1000		U149	109-77-3
Maneb			x		12427-38-2
Manganese and compounds			x		7439-96-5
Manganese, tricarbonyl methylcyclopentadienyl	100				12108-13-3
Mechlorethamine	10		x		51-75-2
Mephosfolan	500				950-10-7
Mercuric acetate	500/10,000				1600-27-7
Mercuric chloride	500/10,000				7487-94-7
Mercuric cyanide		1			592-04-1
Mercuric nitrate		10			10045-94-0
Mercuric oxide	500/10,000				21908-53-2
Mercuric sulfate		10			7783-35-9
Mercuric thiocyanate		10			592-85-8
Mercurous nitrate		10			7782-86-7
Mercurous nitrate		10			10415-75-5
Mercury		1	x	U151	7439-97-6
Mesitylene	10,000*				108-67-8
Methacrolein diacetate	1,000				10476-95-6
Methacrylic anhydride	500				760-93-0
Methacryloyl chloride	100				920-46-7
Methacryloyloxyethyl isocyanate	100				30674-80-7

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Methacrylonitrile	500	1000		U152	126-98-7
Methamidophos	100/10,000				10265-92-6
Methane,chloro		100	x	U045	74-87-3
Methane,dibromo-		1000	x	U068	74-95-3
Methane,dichloro-		1000	x	U080	75-09-2
Methane,iodo-		100	x	U138	74-88-4
Methane,trichlorofluoro-		5000		U121	75-69-4
Methanesulfonyl fluoride	1,000				558-25-8
Methanol		5000	x	U154	67-56-1
Methapyrilene		5000		U155	91-80-5
Methidathion	500/10,000				950-37-8
Methiocarb	500/10,000	10			2032-65-7
Methomyl	500/10,000	100		P066	16752-77-5
Methoxyethylmercuric acetate	500/10,000				151-38-2
Methyl2-chloroacrylate	500				80-63-7
Methyl acrylate			x		96-33-3
Methyl bromide	1,000	1000	x	U029	74-83-9
Methyl chloroformate (Methylchlorocarbonate)	500	1000		U156	79-22-1
Methyl chloroform		1000	x	U226	71-55-6
Methyl disulfide	100				624-92-0
methyl isobutyl ketone		5000	x	U161	108-10-1
Methyl isocyanate	500	1#	x	P064	624-83-9
Methyl isothiocyanate	500				556-61-1
Methyl mercaptan	500	100		U153	74-93-1
Methyl methacrylate		1000	x	U162	80-62-6
Methyl phenkapton	500				3735-23-7
Methyl phosphonic dichloride	100				676-97-1
Methyl tert-butyl ether			x		1634-04-4
Methyl thiocyanate	10,000				556-64-9
Methyl vinyl ketone	10				78-94-4
Methylene-bis-(phenylisocyanate)(MBI)			x		101-68-8
Methylhydrazine	500	10	x	P068	60-34-4
Methylmercuric dicyanamide	500/10,000				502-39-6
Methylthiouracil		10		U164	56-04-2
Methyltrichlorosilane	500				75-79-6
Metolcarb	100/10,000				1129-41-5
Mevinphos	500	10			7786-34-7
Mexacarbate	500/10,000	1000			315-18-4
Michler's ketone			x		90-94-8
Mitomycin C	500/10,000	10		U010	50-07-7
Molybdenum trioxide			x		1313-27-5
Monocrotophos	10/10,000				6923-22-4
Monoethylamine		100			75-04-7
Monomethylamine		100			74-89-5
Muscimol	10,000	1000		P007	2763-96-4
Mustard gas	500		x		505-60-2

Chemical Name	302	CERCLA	313	RCRA	CAS No.
N,N'-Dimethyleniline			x		121-69-7
N,N'-Diethylhydrazine		10		U086	1615-80-1
N-Nitrosomorpholine			x		59-89-2
N-Nitrosonornicotine			x		16543-55-8
N-Nitrosopiperidine		10	x	U179	100-75-4
N-Nitrosopyrrolidine		1		U180	930-55-2
N-Nitrosodiphenylamine		100	x		86-30-6
Naled		10			300-76-5
Naphthalene		100	x	U165	91-20-3
Naphthenic acid		100			1338-24-5
Nickel ammonium sulfate		100			15699-18-0
Nickel carbonyl	1	10		P073	13463-39-3
Nickel chloride		10			37211-05-5
Nickel chloride		10			7718-54-9
Nickel cyanide		10		P074	557-19-7
Nickel hydroxide		100			12054-48-7
Nickel nitrate		1000			14216-75-2
Nickel sulfate		100			7786-81-4
Nickel	10,000*	100	x		7440-02-0
Nicotine sulfate	100/10,000				65-30-5
Nicotine	100	100		P075	54-11-5
Nitric acid	1,000	1000	x		7697-37-2
Nitric oxide	100	10		P076	10102-43-9
Nitrilotriacetic acid			x		139-13-9
Nitrobenzene	10,000	1000	x	U169	98-95-3
Nitrocyclohexane	500				1122-60-7
Nitrofen			x		1836-75-5
Nitrogen dioxide	100	10		P078	10102-44-0
Nitrogen dioxide		10		P078	10544-72-6
Nitroglycerine		10	x	P081	55-63-0
Nitrophenol (mixed)		100			25154-55-6
Nitrosodimethylamine	1,000	10	x	P082	62-75-9
Nitrotoluene		1000			1321-12-6
Norbormide	100/10,000				991-42-4
O,O-Diethyl S-methyl dithiophosphate		5000		U087	3288-58-2
o-Anisidine hydrochloride			x		134-29-2
o-Anisidine			x		90-04-0
o-Dinitrobenzene		100			528-29-0
o-Nitrophenol		100	x		88-75-5
o-Nitrotoluene		1000			88-72-2
o-Toluidine		100	x		95-53-4
Octachloronaphthalene			x		2234-13-1
Orotic acid	10,000*				65-86-1
Osmium tetroxide	10,000*	1000	x	P087	20816-12-0
Ouabain	100/10,000				630-60-4
Oxamyl	100/10,000				23135-22-0
Oxetane,3,3-bis(chloromethyl)-	500				78-71-7
Oxydisulfoton	500				2497-07-6
Ozone	100				10028-15-6

Chemical Name	302	CERCLA	313	RCRA	CAS No.
p-Anisidine			x		104-94-9
p-Benzoquinone		10	x	U197	106-51-4
p-Cresidine			x		120-71-8
p-Cresol		1000	x	U052	106-44-5
p-Dinitrobenzene		100			100-25-4
p-Nitrophenol		100	x	U170	100-02-7
p-Nitrosodiphenylamine			x		156-10-5
p-Nitrotoluene		1000			99-99-0
p-Phenylenediamine			x		106-50-3
Paraformaldehyde		1000			30525-89-4
Paraldehyde		1000			123-63-7
Paraquat methosulfate	10/10,000				2074-50-2
Paraquat	10/10,000				1910-42-5
Parathion-methyl	100/10,000	100		P071	298-00-0
parathion	100	10	x	P089	56-38-2
Paris green (Cuprie acetoarsenite)	500/10,000	1			12002-03-8
Pentaborane	500				19624-22-7
Pentachloroethane	10,000*	10		U184	76-01-7
Pentachlorophenol	10,000*	10	x	U242	87-86-5
Pentadecyclamine	100/10,000				2570-26-5
Peracetic acid	500		x		79-121-0
Perchloromethylmercaptan	500	100		P118	594-42-3
Phenanthrene		5000			85-01-8
Phenol,2,2'-thiobis (4,6-dichloro-	100/10,000				97-18-7
Phenol,2,2'-thiobis (4-chloro-6-methyl	100/10,000				4418-66-0
Phenol,2,3,4,5-tetrachloro		10		U212	58-90-2
Phenol,2,4,5-trichloro		10	x	U230	95-95-4
Phenol,3-(1-methylethyl), methylcarbamate	500/10,000				64-00-6
Phenol,2,4,6-trichloro		10	x	U231	88-06-2
Phenol	500/10,000	1000	x	U188	108-95-2
Phenoxarsine,10,10'-oxydi-	500/10,000				58-36-6
Phenyl dichloroarsine	500	1		P036	696-28-6
Phenylhydrazine hydro-chloride	1,000/10,000				59-88-1
Phenylmercury acetate	500/10,000	100		P092	62-38-4
Phenylsilatrane	100/10,000				2097-19-0
Phenylthiourea	100/10,000	100		P093	103-85-5
Phorate	10	10		P094	298-02-2
Phosacetim	100/10,000				4104-14-7
Phosfolan	100/10,000				947-02-4
Phosgene	10	10	x	P095	75-44-5
Phosmet	10/10,000				732-11-6
Phosphamidon	100				13171-21-6
Phosphine	500	100		P096	7803-51-2
Phosphonothioic acid methyl-O-(4-nitrophe-nyl)O-phenyl ester	500				2665-30-7

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Phosphonothioic acid, methyl-O-ethyl-O-(4-(methylthio)phen	500				2703-13-1
Phosphonothioic acid, methyl-,s-(20-(bis(1-methylethyl)amino	100				50782-69-9
Phosphoric acid, dimethyl 4-(methylthio)phenyl ester	500				3254-63-5
Phosphoric acid		5000	x		7664-38-2
Phosphorothioic acid,O,O-dimethyl-S-(2-methylthio)ethyl est	500				2587-90-8
Phosphorus exychloride	500	1000			10025-87-3
Phosporus pentachloride	500				10026-13-8
Phosphorus pentasulfide		100		U189	1314-80-3
Phosphorus pentoxide	10				1314-56-3
Phosphorus trichloride	1,000	1000			7719-12-2
Phosphorus	100	1	x		7723-14-0
Physostigmine	100/10,000				57-47-6
Phylloquinone	10,000*				84-80-0
Physostigmine, salicylate (1:1)	100/10,000				57-64-7
Picric acid			x		88-89-1
Picrotoxin	500/10,000				124-87-8
Piperidine	1,000				110-89-4
Piprotal	100/10,000				5281-13-0
Pirimifos-ethyl	1,000				23505-41-1
Platinous chloride	10,000*				10025-65-7
Platinum tetrachloride	10,000*				13454-96-1
Polychlorinated biphenyls (PCBs)		1	x		1336-36-3
Potassium arsenate		1			7784-41-0
Potassium arsenite	500/10,000	1			10124-50-2
Potassium bichromate		10			7778-50-9
Potassium chromate		10			7789-00-6
Potassium cyanide	100	10		P098	151-50-8
Potassium hydroxide		1000			1310-58-3
Potassium permanganate		100			7722-64-7
Potassium silver cyanide	500	1		P099	506-61-6
Promecarb	500/10,000				2631-37-0
Propargite		10			2312-35-8
Propargyl alcohol		1000		P102	107-19-7
Propargyl bromide	10				106-96-7
Propiolactone,beta-	500		x		57-57-8
Propionaldehyde			x		123-38-6
Propionic acid		5000			79-09-4
Propionic acid,2-(2,4,5-trichlorophenoxy)-		100		U233	93-72-1
Propionic anhydride		5000			123-62-6
Propionitrile,3-chloro-	1000	1000		P027	542-76-7

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Propionitrile	500	10		P101	107-12-0
Propiophenone,4'-amino-	100/10,000				70-69-9
Propoxur			x		114-26-1
Propyl chloroformate	500				109-61-5
Propylene (Propene)			x		115-07-1
Propylene glycol,allyl ether	10,000*				11331-17-5
Propylene oxide	10,000	100	x		75-56-9
Propyleneimine	10,000	1	x	P067	75-55-8
Prothoate	100/10,000				2275-18-5
Pseudocumene	10,000*		x		95-63-6
Pyrene	1,000/10,000	5000			129-00-0
Pyrethrins		1			121-21-1
Pyrethrins		1			121-29-9
Pyrethrins		1			8003-34-7
Pyridine,2-methyl-5-vinyl-	500				140-76-1
Pyridine,4-amino-	500/10,000	1000		P008	504-24-5
Pyridine,4-nitro-1-oxide	500/10,000				1124-33-0
Pyridine		1000	x	U196	110-86-1
Pyriminil	100/10,000				53558-25-1
Quinoline		5000	x		91-22-5
Reserpine		5000		U200	50-55-5
Rhodium trichloride	10,000*				10049-07-7
Salcomine	500/10,000				14167-18-1
Sarin	10				107-44-8
sec-Amyl acetate		5000			626-38-0
sec-Butyl acetate		5000			105-46-4
sec-Butyl alcohol			x		78-92-2
sec-Butylamine		1000			13952-84-6
sec-Butylamine		1000			513-49-5
Selenium dioxide		10		U204	7446-08-4
Selenium disulfide		10		U205	7446-56-4
Selenium oxychloride	500				7791-23-3
Selenium		100	x		7782-49-2
Selenous acid	1,000/10,000	10		U204	7783-00-8
Semicarbazide hydrochloride	1,000/10,000				563-41-7
Silane,(4-aminobutyl) diethoxymethyl-	1,000				3037-72-7
Silver cyanide		1		P104	506-64-9
Silver nitrate		1			7761-88-8
Silver		1000	x		7440-22-4
Sodium anthraquinone-1-sulfonate	10,000*				128-56-3
Sodium arsenate	1,000/10,000	1			7631-89-2
Sodium arsenite	500/10,000	1			7784-46-5
Sodium azide (Na(N3))	500	1000		P105	26628-22-8
Sodium bichromate		10			10588-01-9
Sodium bifluoride		100			1333-83-1
Sodium bisulfite		5000			7631-90-5
Sodium cacodylate	100/10,000				124-65-2

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Sodium chromate		10			7775-11-3
Sodium cyanide (Na(CN))	100	10		P106	143-33-9
Sodium dodecylbenzene sulfonate		1000			25155-30-0
Sodium fluoride		1000			7681-49-4
Sodium fluoroacetate	10/10,000	10		P058	62-74-8
Sodium hydrosulfide		5000			16721-80-5
Sodium hydroxide		1000	x		1310-73-2
Sodium hypochlorite		100			10022-70-5
Sodium hypochlorite		100			7681-52-9
Sodium methylate		1000			124-41-4
Sodium nitrite		100			7632-00-0
Sodium pentachloro-phenate	100/10,000				131-52-2
Sodium phosphate,dibasic		5000			10039-32-4
Sodium phosphate,dibasic		5000			10140-65-5
Sodium phosphate,dibasic		5000			7558-79-4
Sodium phosphate,tribasic		5000			10101-89-0
Sodium phosphate,tribasic		5000			10124-56-8
Sodium phosphate,tribasic		5000			10361-89-4
Sodium phosphate,tribasic		5000			7601-54-9
Sodium phosphate,tribasic		5000			7758-29-4
Sodium phosphate,tribasic		5000			7785-84-4
Sodium selenate	100/10,000				13410-01-0
Sodium selenite	100/10,000	100			10102-18-8
Sodium selenite		100			7782-82-3
Sodium sulfate(solution)			x		7757-82-6
Sodium tellurite	500/10,000				10102-20-2
Sodium		10			7440-23-5
Strannane,acetoxy-triphenyl-	500/10,000				900-95-8
Strontium chromate		10			7789-06-2
Strontium sulfide		100		P107	1314-96-1
Strychnine, sulfate	100/10,000				60-41-3
Strychnine	100/10,000	10		P108	57-24-9
Styrene oxide			x		96-09-3
Styrene		1000	x		100-42-5
Sulfotep	500	100		P109	3689-24-5
Sulfoxide,3-chloropropyl octyl	500				3569-57-1
Sulfur dioxide	500				7446-09-5
Sulfur monochloride		1000			12771-08-3
Sulfur tetrafluoride	100				7783-60-0
Sulfur trioxide	100				7446-11-9
Sulfuric acid	1,000	1000	x		7664-93-9
Sulfuric acid		1000			8014-95-7
Tabun	10				77-81-6
Tellurium hexafluoride	100				7783-80-4
Tellurium	500/10,000				13494-80-9
Tepp	100	10		P111	107-49-3
Terbufos	100				13071-79-9

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Terephthalic acid			x		100-21-0
tert-Amyl acetate		5000			625-16-1
tert-Butyl acetate		5000			540-88-5
tert-Butyl alcohol			x		75-65-0
tert-Butylamine		1000			75-64-9
Tetrachlorvinphos			x		961-11-5
Tetraethyllead	100	10		P110	78-00-2
Tetraethyltin	100				597-64-8
Tetramethyl Lead	100				75-74-1
Tetranitromethane	500	10		P112	509-14-8
Thallic oxide	10,000*	100		P113	1314-32-5
Thallium sulfate	100/10,000	100		P115	10031-59-1
Thallium(I)nitrate		100		U217	10102-45-1
Thallium(I)selenide		1000		P114	12039-52-0
Thallium		1000	x		7440-28-0
Thallous carbonate	100/10,000	100		U215	6533-73-9
Thallous chloride	100/10,000	100		U216	7791-73-9
Thallous malonate	100/10,000				2757-18-8
Thallous sulfate	100/10,000	100		P115	7446-18-6
Thiocarbazide	1,000/10,000				2231-57-4
Thiocyanic acid,2-(benzothiazolylthio) methyl ester	10,000*				21564-17-0
Thiofanox	100/10,000	100		P045	39196-18-4
Thiometon	10,000*				640-15-3
Thionazin	500	100		P040	297-97-2
Thiophenol	500	100		P014	108-98-5
Thiosemicarbazide	100/10,000	100		P116	79-19-6
Thiourea,(2-chlorophenyl)-	100/10,000	100		P026	5344-82-1
Thiourea,(2-methylphenyl)-	500/10,000				614-78-8
Thorium dioxide			x		1314-20-1
Titanium dioxide			x		13463-67-7
Titanium tetrachloride	100		x		7550-45-0
Toluene2,4-diisocyanate	500	100	x		584-84-9
Toluene2,6-diisocyanate	100	100	x		91-08-7
Toxaphene(Camopheclor)	500/10,000	1	x	P123	8001-35-2
Trans1,1-dichlorobutene	500				110-57-6
Triamiphos	500/10,000				1031-47-6
Triaziquone			x		68-76-8
Triazofos	500				24017-47-8
Trichloro(chloromethyl) silane	100				1558-25-4
Trichloro(dichlorophenyl) silane	500				27137-85-5
Trichloroacetyl chloride	500				76-02-8
Trichloroethylene		100	x	U228	79-01-6
Trichloronate	500				327-98-0
Trichlorophenol		10			25167-82-2
Trichlorophenylsilane	500				98-13-5
Trichlorophon	10,000*	100	x		52-68-6

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Trichloroethylsilane	500				115-21-9
Triethanolamine dodecylbenzene sulfonate		1000			27323-41-7
Triethoxysilane	500				998-30-1
Triethylamine		5000			121-44-8
Trifluralin			x		1582-09-8
Trimethylamine		100			75-50-3
Trimethylchlorosilane	1,000				75-77-4
Trimethylolpropane phosphite	100/10,000				824-11-3
Trimethyltin chloride	500/10,000				1066-45-1
Triphenyltin chloride	500/10,000				639-58-7
Tris(2-chloroethyl)amine	100				555-77-1
Trypan blue		10		U236	72-57-1
Uracil,5-[bis(2-chloroethyl)amino]-		10		U237	66-75-1
Uranyl acetate		100''			541-09-3
Uranyl nitrate		100''			10102-06-4
Uranyl nitrate		100''			36478-76-9
Valinomycin	1,000/10,000				2001-95-8
Vanadium(fume or dust)			x		7440-62-2
Vanadium pentoxide	100/10,000	1000		P120	1314-62-1
Vanadyl sulfate		1000			27774-13-6
Vinyl acetate monomer	1,000	5000	x		108-05-4
Vinyl bromide			x		593-60-2
Vinylnorbornene	10,000*				3048-64-4
Warfarin sodium	100/10,000				129-06-6
Warfarin	500/10,000	100		P001	81-81-2
Xylenol		1000			1300-71-6
Xylylene dichloride	100/10,000				28347-13-9
Zinc acetate		1000			557-34-6
Zinc ammonium chloride		1000			52628-25-8
Zinc ammonium chloride		1000			14639-97-5
Zinc ammonium chloride		1000			14639-98-6
Zinc borate		1000			1332-07-6
Zinc bromide		1000			7699-45-8
Zinc carbonate		1000			3486-35-9
Zinc chloride		1000			7646-85-7
Zinc cyanide		10		P121	557-21-1
Zinc fluoride		1000			7783-49-5
Zinc formate		1000			557-41-5
Zinc hydrosulfite		1000			7779-86-4
Zinc nitrate		1000			7779-88-6
Zinc phenolsulfonate		5000			127-82-2
Zinc phosphide	500	100		P122	1314-84-7
Zinc silicofluoride		5000			16871-71-9
Zinc sulfate		1000			7733-02-0
Zinc,dichloro(4,4-dimethyl-5(((methylamino)carbonyl)oxy)i	100/10,000				58270-08-9
Zinc		1000	x		7440-66-6

Chemical Name	302	CERCLA	313	RCRA	CAS No.
Zineb			x		12122-67-7
Zirconium nitrate		5000			13746-89-9
Zirconium potassium fluoride		1000			16923-95-8
Zirconium sulfate		5000			14644-61-2
Zirconium tetrachloride		5000			10026-11-6

Appendix II - 3

Maximum Allowable Capacity of Containers And Portable Tanks

Container Type	Flammable Liquids			Combustible Liquids	
	IA	*IB*	*IC*	*II*	*II*
Glass or approved plastic[1]	1 pt[2]	1 qt[2]	1 gal	1 gal	1 gal
Metal (other than DOT drums)	1 gal	5 gal	5 gal	5 gal	5 gal
Safety cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal drums (DOT specifications)	60 gal	60 gal	60 gal	60 gal	60 gal
Approved portable tanks	660 gal	660 gal	660 gal	660 gal	660 gal

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[1] Nearest metric size is also acceptable for the glass and plastic containers listed.
[2] One gallon of nearest metric equivalent size may be used if metal containers must be avoided because of chemical reaction with their contents.

Source: AFOSH Standard 127-43 page 5

Appendix II - 4

Storage in Inside Rooms

Fire Protection[1] *Provided*	*Fire Resistance*	*Maximum Size*	*Total Allowable Quantities*[2] *(gals/sq ft floor area)*
Yes	2 hours	500 sq ft	10
No	2 hours	500 sq ft	4
Yes	1 hour	150 sq ft	5
No	1 hour	150 sq ft	2

Source: AFOSH Standard 127-43 page 6

[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.

Source: AFOSH Standard 127-43 page 6

Appendix II-5

Placarding Guidelines

The following table specifies placards that should be used for the transportation of ANY QUANTITY of the listed hazardous material.

Hazardous Materials Classed or Described As	Placards
Class A Explosives	EXPLOSIVES A
Class B Explosives	EXPLOSIVES B
Poison A	POISON GAS
Flammable Solid (DANGEROUS WHEN WET label only)	FLAMMABLE SOLID W Radioactive material

RADIOACTIVE

The following table specifies placards that should be used for the transportation of 1,000 pounds or more of the listed hazardous materials.

Hazardous Materials Classed or Described As	Placards/fR
Class C Explosives	FLAMMABLE
Nonflammable Gas	NONFLAMMABLE GAS
Nonflammable Gas (Chlorine)	CHLORINE
Nonflammable Gas (Fluorine)	POISON
Nonflammable Gas (Oxygen, pressurized liquid)	OXYGEN
Flammable Gas	FLAMMABLE GAS
Combustible Liquid	COMBUSTIBLE
Flammable Liquid	FLAMMABLE
Flammable Solid	FLAMMABLE SOLID
Oxidizer	OXIDIZER
Organic Peroxide	ORGANIC PERIOXIDE
Poison B	POISON
Corrosive Material	CORROSIVE
Irritating Material	DANGEROUS

Appendix II-5
(Continued)

Placarding Guidelines

1. Placards should be affixed on both sides, rear, and front of the motor vehicle.

2. Place placards clear of ladders, pipes, and tarps.

3. Placards should be at least three inches away from advertising and markings.

4. The "DANGEROUS" placards may be used when a motor vehicle contains two or more classes of hazardous materials requiring different placards. The "DANGEROUS" placard may be used in place of the separate placards for each class.

5. Portable tanks having a rated capacity of 1,000 gallons or more must be placarded.

6. Cargo tanks having any quantity of hazardous material must be placarded.

INSTALLATION:	COMPLIANCE CATEGORY: HAZARDOUS MATERIALS MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):

STATUS NA C RMA	REVIEWER COMMENTS:

(1) LGS [Base Supply] (2) BCE [Base Civil Engineering] (3) Fire Department (4) Safety Officer (5) BEE [Bioenvironmental Engineering] (6) Disaster Preparedness Office (7) LGT [Transportation Officer] (8) LFM [Liquid Fuels Maintenance Shop]

Section III

Hazardous Waste Management

SECTION III

HAZARDOUS WASTE MANAGEMENT

A. Applicability of this Protocol

This protocol applies to U.S. Air Force installations that generate, store, treat, or dispose of any type of hazardous waste.

This protocol and its associated evaluation worksheets are necessarily more complex than other protocols in this volume. All evaluation items will not be applicable to all installations. Guidance is provided to direct the evaluator to the questions related to the type of hazardous waste activities/facilities on the installation.

The regulatory requirements in this protocol are based on Department of Defense (DoD) and Air Force regulations that apply at overseas installations. Good Management Practices (GMPs) are derived from U.S. Environmental Protection Agency (EPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force employees and protect the environment. Any procedural EPA requirements, such as permits and notifications, are not applicable overseas, and, therefore, are not in the worldwide manual. GMPs in the Hazardous Waste protocol are derived from the following EPA regulations: 40 CFR 261-265, 40 CFR 170-172, and 40 CFR 178-179.

B. DoD Regulations

- DoD 4160.21M, *Defense Demilitarization Manual*, gives guidance on waste turn-in for disposal at Defense Reutilization and Marketing Offices (DRMO).

C. U.S. Air Force Regulations

- Air Force Regulation (AFR) 19-11, *Hazardous Waste Management*, covers responsibilities of the various installation activities.

- Other Air Force regulations that indirectly address hazardous waste management are AFR 19-1, *Pollution Abatement and Environmental Quality*, and AFR 19-7, *Environmental Pollution Monitoring*. However, these regulations do not provide any substantive procedural guidance relative to hazardous waste management.

- Air Force Manual (AFM) 67-1, *USAF Supply Manuals*, establishes turn-in procedures for hazardous waste through Base Supply.

- AFR 71-4, *Preparing Hazardous Material for Military Air Shipment*, sets standards for placarding of vehicles, labeling and container requirements.

D. Responsibility for Compliance

- The Installation Commander - The installation commander is responsible for establishing and maintaining an active program of surveillance of the users of hazardous materials; generators, transporters, and storers of hazardous wastes; the waste minimization program; and disposal activities. By DoD direction, the installation commander is responsible for compliance with Host Nation regulations involving host and tenant organizations on the installation. In either case, operational responsibility for the hazardous waste program rests with the activities that generate, treat, store, transport, or dispose the waste and the activities responsible for implementing health, safety, and environmental protection programs.

- The Installation Environmental Protection Committee (EPC) - The EPC is responsible for reviewing and coordinating the installation commander's hazardous waste program. The EPC reviews summary data on waste generation, personnel training, and disposal practices.

- The Base Civil Engineer (BCE) or designated Environmental Management Office (EMO) - The BCE/EMO develops installation-specific policy for all aspects of hazardous waste management for all activities on the installation, including Air Force and non-Air Force tenants. The BCE/EMO also manages the hazardous waste program, reviews all hazardous waste storage, treatment, and disposal facilities and ensures their compatibility with hazardous waste regulations, serves as OPR for developing and implementing the hazardous waste management plan, identifies to the contracting office those hazardous wastes that the installation elects to dispose of by local contract along with the necessary conditions the contractor is required to meet, and approves siting and design of all hazardous waste management facilities.

- Base Fire Department - This department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department will be responsible to make periodic fire safety inspections of hazardous waste storage areas and accumulation points on the installation.

- Civil Engineering Environmental Planning Function or EMO Subgroup - The environmental planner is responsible for monitoring day-to-day hazardous waste management activities, maintaining hazardous waste files, and establishing

procedures for transfer of accountability and/or custody of hazardous waste from the generating activity to the DRMO.

- The Bioenvironmental Engineer (BEE) - The BEE reviews workplace processes and practices to ensure all hazardous materials/wastes are identified, conducts or arranges for environmental monitoring as required, interprets monitoring results for health risks, reviews plans to build or modify facilities used to treat, store, or dispose of hazardous wastes, reviews all material requests for issues of stock classes listed in Federal Standard 313, and maintains a master file of Material Safety Data Sheets (MSDS).

- The Environmental Health Officer (EHO) - The EHO conducts Hazardous Communication Training for all supervisors who have personnel who handle hazardous materials.

- The Supply Officer - The supply officer receives, stores, and issues hazardous materials; ensures that turn-in hazardous waste documents contain information necessary to comply with all regulatory requirements; and ensures all hazardous materials are properly labeled.

- The Ground Safety Officer - The ground safety officer performs workplace safety inspections, monitors hazardous conditions, and performs occupational safety training.

- The Transportation Officer - The transportation officer coordinates as necessary with shipping activities to ensure hazardous wastes are properly labeled, packaged, manifested, and transported in appropriate vehicles (contract or Air Force-owned vehicles).

- The Deputy Commander for Maintenance/Chief of Maintenance (DCM) - The DCM ensures that nonhazardous/nontoxic materials are used where possible, maintains a list of hazardous materials used in the work area by shop and maintenance-related task, ensures personnel are properly trained in ordering, using, handling, controlling, and storing hazardous materials and wastes, and ensures hazardous waste is properly labeled.

- Hazardous Waste Generators - Generators manage hazardous waste in their custody, including proper storage, inspection, recordkeeping, labeling of containers, and transfer for disposal.

- Hazardous Waste Treatment, Storage, and Disposal Facility (TSDF) Operators - Each TSDF operator is responsible for ensuring compliance with hazardous waste regulations applicable to the facility, including maintaining operational and training records.

- Defense Reutilization and Marketing Office (DRMO) - This agency may or may not be located on the installation, but, it is the single agency designated by DoD to provide hazardous waste disposal service on a pay for services rendered basis to the installation. The DRMO is responsible for compliance with all Host Nation, local, and Air Force (including base guidance) regulations at its storage/disposal facility. Unless the DRMO is located on the installation it is not in the scope of this assessment.

E. Key Compliance Definitions

These definitions were obtained from the Federal, DoD, and Air Force regulations.

- *Above-Ground Tank* - a device that meets the definition of a "tank" in 40 CFR 260.10 and 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 accessible to visual inspection.

- *Accumulation Point* - an area where hazardous waste is temporarily stored in tanks or containers for 90 days or less on an installation. A "satellite" accumulation area is an area where less than 55 gallons of hazardous waste, or one quart of acutely hazardous waste, is stored.

- *Acutely Hazardous Waste* - any waste listed under 40 CFR 261.31 - 261.33 with a hazard code of "H." These include EPA Hazardous waste numbers: F020, F021, F022, F023, F026, and F027.

- *Ancillary Equipment* - any device including, but not limited to piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of hazardous waste from its point of generation to a storage or treatment tank(s), between hazardous waste storage and treatment tanks to a point of disposal on-site, or to a point of shipment off-site.

- *Best Practically Available Treatment (BPAT)* - the treatment that yields the greatest environmental benefit.

- *Component* - either the tank or the ancillary equipment of a tank system.

- *Consignee* - the ultimate treatment, storage, or disposal facility in a receiving country to which the hazardous waste will be sent.

- *Container* - any portable device in which a material is stored, transported, treated, disposed, or otherwise handled.

- *Corrosion Expert* - a person who, by reason of knowledge of the physical sciences and the principles of engineering and mathematics, acquired by a professional education and related practical experiences, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks.

- *Debris* - materials that are primarily nongeologic in origin such as grasses, shrubs, and manmade materials such as concrete, clothing, partially buried whole or crushed empty drums, capacitors, and other synthetic manufactured items. This may also include geologic materials identified as not indigenous, or indigenous rocks exceeding a total size that will affect the performance of the available treatment technology.

- *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 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 groundwaters.

- *Elementary Neutralization Unit* - a device used for neutralizing only those hazardous wastes that exhibit corrosivity (as defined in 40 CFR 261.22) or are listed in Subpart D of 40 CFR 261 only because of corrosivity, and meet the definition of tank, tank system container, transport vehicle, or vessel in 40 CFR 261.10.

- *Full Regulation* - those regulations applicable to generators of greater than 1,000 kg of nonacutely hazardous wastes in a calendar month.

- *Generator* - any person, by site, whose act or process produces hazardous waste.

- *Incinerator* - an enclosed device using controlled flame combustion, the primary purpose of which is to thermally break down hazardous waste. Examples include rotary kiln, fluidized bed, and liquid injection incinerators.

- *Individual Generation Site* - the contiguous site at or on which one or more hazardous wastes are generated. An individual generation site, such as a large manufacturing plant, may have one or more sources of hazardous waste, but is considered a single or individual generation site if the site or property is contiguous.

- *Installation Inspector* - a person who by means of knowledge of the physical sciences and the principles of engineering, acquired by a professional education

and related practical experience, is qualified to supervise the installation of tank systems.

- *Land Disposal* - includes, but is not limited to, any placement of hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or placement in a concrete vault or bunker intended for disposal purposes.

- *Land Treatment Facility* - a facility or part of a facility at which hazardous waste is applied onto or incorporated into the soil surface; such facilities are disposal facilities if the waste will remain after closure.

- *Landfill* - a disposal facility, or part of a facility, where hazardous waste is placed in or on land and which is not a land treatment facility, a surface impoundment, or an injection well.

- *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 above-ground tanks) or consist of an interstitial monitoring devise designed to detect continuously and automatically the failure of the primary or secondary containment structure or the presence of release of hazardous waste into the secondary containment structure.

- *Liquid* - a material that has a vertical flow of more than 2 inches (50 mm) within a 3-minute period, or a material having 1 gram or more liquid separation, when determined in accordance with the procedures specified in (ASRMD) 4359-84 *Standard Test Method for Determining Whether a Material is a Liquid or Solid*, 1984 edition.

- *Miscellaneous Unit* - a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR 146, or eligible for a research, development, and demonstration permit under 40 CFR 270.65.

- *Movement* - transportation of a hazardous waste to a facility in an individual vehicle.

- *New Tank System, or New Component System* - a tank system or component that will be used for the storage and treatment of hazardous waste.

- *On-Ground Tank* - a device situated in such a way that the bottom of the tank is on the same level as the adjacent surrounding surface so the external tank bottom cannot be visually inspected.

- *On-Site* - the same continuous property, which may be divided by a public right-of-way with access between the separate portions by crossing, as opposed to going along the right-of-way.

- *Pile* - any noncontainerized accumulation of solid, nonflowing hazardous waste that is used for treatment or storage.

- *Practical Quantification Limits (PQLs)* - the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

- *Primary Exporter* - any person required to originate the manifest for a shipment of hazardous waste, that specifies a treatment, storage, or disposal facility in a receiving country as the facility to which the hazardous waste will be sent, and any intermediary arranging for the export.

- *Receiving Country* - a foreign country to which a hazardous waste is sent for the purpose of treatment, storage, or disposal (except short-term storage incidental to transportation).

- *Restricted Wastes* - those categories of hazardous wastes that are prohibited from land disposal either by regulation or statute.

- *Small Quantity Generator* - a business or organization that produces hazardous waste in quantities of more than 100 kilograms but less than 1,000 kilograms per month.

- *Soil* - materials that are primarily geologic in origin, such as silt, loam, or clay, and that are indigenous to the natural geologic environment. Soils DO NOT include wastes withdrawn from active hazardous waste management units.

- *Solid* - a material that has a vertical flow of 2 inches (50mm) or less within a 3-minute period when determined in accordance with the procedures specified for a transport vehicle or freight container in which hazardous materials are loaded with no intermediate form of containment and which has (1) an internal volume greater than 450 liters (118.8 gallons) as a receptacle for a liquid; (2) a capacity greater than 400 kilograms (881.8 lb) as a receptacle for a solid; or (3) a water capacity greater than 453.6 kilograms (1000 lb); (4) a capacity of 400 kilograms (881.8 lb) or less as a receptacle for a gas.

- *Spill* - the accidental spilling, leaking, pumping, pouring, emitting, or dumping of hazardous wastes into or on any land or water, or materials which, when spilled, become hazardous wastes.

- *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.

- *Surface Impoundment* - a facility or part of a facility that is a natural topographic depression, manmade excavation, or diked area formed primarily of earthen materials and is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well.

- *Tank* - a stationary device designed to contain an accumulation of hazardous waste and which 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.

- *Thermal Treatment* - the treatment of hazardous waste in a device that uses elevated temperature as the primary means to change the chemical, physical, or biological character of the waste.

- *Transit Country* - any foreign country, other than a receiving country, through which a hazardous waste is transported.

- *Transporter* - a person engaged in the off-site transportation of hazardous wastes by air, rail, highway, or water.

- *Treatability Study* - a study in which a hazardous waste is subjected to a treatment process to determine (1) whether the waste is amenable to the treatment process; (2) what pretreatment (if any) is required; (3) the optimal process conditions needed to achieve the desired treatment; (4) the efficiency of a treatment process for a specific waste or wastes; or (5) the characteristics and volumes of residuals from a particular treatment process.

- *Treatment* - a process that reduces the toxicity of a waste or the likelihood of migration of hazardous constituents from the waste.

- *Underground Tank* - a device whose entire surface area is below the surface and covered by the ground.

- *Underground Storage Tank (UST)* - any one or combination of tanks (including underground pipes connected thereto) used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground (Section 280.12 [9/23/88]).

- *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.

- *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 MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS: (*)
All Installations	3-1 through 3-2	(1)(2)
All Generators	3-3 through 3-8	(1)(2)(7)(9)(10)
Program Management	3-9 through 3-14	
Accumulation Point Sites	3-15 through 3-20	
Installations that are TSD Facilities	3-21 through 3-44	(1)(2)(4)(5)(6)

(*)CONTACT/LOCATION CODE:

(1) BCE [Environmental Planning]
(2) DRMO [Defense and Reutilization Marketing Office]
(3) Accumulation Point Managers
(4) Fire department
(5) TSD [Treatment, Storage, Disposal] facility officer
(6) Safety manager
(7) BEE [Bioenvironmental Engineer]
(8) Transportation officer
(9) Base Supply
(10) Generating activities

HAZARDOUS WASTE MANAGEMENT

Records to Review:

- Generator (including TSDFs if they are also considered generators)

  Hazardous waste manifests
  Manifest exception reports
  Employee training documentation
  Contingency plan
  Notifications of hazardous waste oil fuel marketing or blending activity
  Hazardous waste disposal turn-in document (DD Form 1348-1)

- In addition to the above, TSDFs would be required to have:

  Unmanifested waste reports
  Facility audit reports (inspection log)
  Waste analysis plan(s)
  Operating record
  Groundwater monitoring records and annual reports
  Closure/Post-closure plans
  Closure/Post-closure notices (where applicable)
  Other documents as required by the permit

Physical Features to Inspect:

- Disposal sites
- Generating areas
- Accumulation points
- Incinerators
- Vehicles used for transport
- Storage facilities (including drums)

Sources to Interview:

- Base Civil Engineering (Environmental Coordinator)
- Defense Reutilization and Marketing Office (DRMO)
- Accumulation Point Managers/Operators
- Fire Department
- Treatment, Storage, and Disposal Facility (TSDF) Operators
- Safety Manager
- Base Bioenvironmental Engineer
- Base Supply

COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-1. Determine actions or changes since previous review of hazardous waste management.	• Obtain copy of previous hazardous waste review and determine if noncompliance issues have been resolved. (1)(2)
...	...
3-2. Copies of all relevant Host Nation and local regulations, DoD and USAF directives, and guidance documents on hazardous waste should be maintained at the installation (AFR 19-1, Section C).	• Determine if copies of the following documents are maintained and kept current at the base: (1)(2)(4) - AFR 19-1, *Pollution Abatement and Environmental Quality.* - AFR 19-11 (GMP overseas), *Hazardous Waste Management and Minimization.* - DoD 4160.21, M-1, *Defense Demilitarization Manual.* - National Fire Protection Association (NFPA), *Fire Protection Guide of Hazardous Materials.* • Determine if copies of Host Nation and local hazardous waste management regulations are maintained at the installation. • Examine regulations with base environmental staff. Determine if staff is familiar and knowledgeable of hazardous waste management regulatory requirements. (1)(2)
...	...
3-3. Installations that generate wastes must determine if the wastes are hazardous (AFR 19-11).	• Installations should have a hazardous waste management plan. (1) • Determine if there is a master list of the types and quantities of hazardous wastes generated, treated and disposed of on the base. (1) • Discuss with BCE staff how wastes generated on the installation were identified and classified. (1) • Determine if installation follows host nation, USEPA criteria, or the more stringent for identifying the characteristics of hazardous waste. • Compare the master list of wastes to Appendix III-1 (typical hazardous wastes generated at Air Force installations) to verify that the master list contains appropriate wastes. • Record any inconsistencies.
...	...
3-4. Installations that generate hazardous wastes should actively seek to minimize waste production (DoD 4160.21-M, Chapter 21, B1a).	• Determine if hazardous waste management includes recycling hazardous material to greatest extent possible. (1)

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
3-5. Installations may need to notify appropriate host nation agency of their hazardous waste activities (GMP).	• Review Notification of Hazardous Waste Activity to Host Nation agency (if applicable), with either MAJCOM or subunified command. (1)
...	...
3-6. Installations that use the DRMO for disposal of hazardous waste should follow established procedures (HQ USAF/LEEV policy letter, 15 Aug. 1988; HQ USAF/LEEV message 232135z May, 1988; HQ SSC/SMS message 271412z Sept., 1988; HQ SSC/SMS letter 28 July, 1988; and DoD 4160.21-M, Chapter 21, B1d, D).	• Examine records and interview generators to determine if: (1)(9)(10) - generators provide Base Supply with required data to establish the hazardous waste stock number - generators hand-carry AF Form 2005 to Base Supply to initiate timely action - generators hand-carry DD Form 1348-1 when received from Base Supply to Environmental Planning for certification - generators hand-carry certified DD Form 1348-1 from Environmental Planning to DRMO. • Examine records and interview Base Supply (Customer Service Unit) to determine if: (1)(9) - computer records of all hazardous waste transfer actions are maintained - monthly reports (M15/GV912) are provided to BCE and BEE - a DD Form 1348-1 is processed for each transaction that includes the Defense Turn-in Document (DTID) Number, waste quantity, and cost of disposal - transactions for hazardous waste are kept separate from other turn-ins. • Examine records and interview BCE to determine if: (1)(2) - a letter identifying personnel eligible to certify hazardous waste disposal turn-in documents (DD Form 1348-1) is current and on file at the servicing DMRO - all DD Forms 1348-1 are properly certified indicating that hazardous waste is properly identified, labeled, and packaged - new DLA billing process MILSTRIP/MILBILLS procedure - billings from DRMS on an SF 1080 and through the Accounting and Finance Office (AFO) are reviewed and certified for payment by BCE - the predominant local language is not English, markings are also in the local language.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
3-6. (continued)	• Examine records and interview BEE to determine if: (7)(9) - BEE conducts a semiannual review of the health hazard listing to review all Issue Exception Code (IEX) 8 and 9 items to determine if health hazard items produce a specific hazardous waste - nomenclatures are included in the health hazard listing - hazardous waste numbers are verified for specific wastes, if applicable.
...	...
3-7. Installations must not offer hazardous wastes to transporters or to TSD facilities that are not qualified by Host Nation regulations (GMP).	• Examine records pertaining to disposal contract awards; verify that all transporters of hazardous wastes have appropriate verification. (1)(2)
...	...
3-8. Installations that generate hazardous wastes should have a waste minimization program in place. BCE is responsible to maintain generating data for measuring waste minimization goals (HQ USAF/LEEV message 232135z, May 1988).	• Examine hazardous waste records and determine if at minimum the following information is maintained: (1) - type and quantity of waste generated - generating activity - disposal activity - dates transferred - ultimate disposal. • A log of generator's turn-ins is maintained using turn-in documents as a source of data according to AFM 67-1, Volume II, Chapter 21). (1) • Determine if each facility that produces hazardous waste has a hazardous waste minimization program in place. • BCE provides summaries of generation data, prior year data, and waste minimization baseline year data (normally calendar year 1986) to the EPC for evaluating progress in hazardous waste minimization.
...	...
3-9. Installations should maintain copies of records and reports with regard to hazardous waste disposal for at least 3 years (GMP).	• Examine records for a period of 2 years prior to date of review; check for records of waste disposal. These may include: (1)(2) - manifests and/or signed copies from designated facilities which received the waste - records of transport - receipts for hazardous waste from appropriate facilities - records of test results, waste analyses, or other determinations.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-10. Hazardous waste may be temporarily stored at sites on the installation if certain standards are met (DoD 41620.21-M).	• Determine from interviews and/or a review of the installation hazardous waste management plan the locations of all hazardous waste accumulation points on the base. (1) • Determine if the installation hazardous waste management plan contains the names and assigned duties of accumulation point managers. (1)
...	...
3-11. Accumulation Point Site Managers should conduct regular inspections of their facilities in accordance with written schedules and checklists (GMP).	• Examine installation hazardous waste management plan for inspecting guidelines, schedules and checklists. (1) • Determine if accumulation point inspections are conducted at least as often as the frequencies specified below: (3) - containers and container storage area (to look for leakage and signs of deterioration) - weekly - tank waste feed cutoff systems and bypass systems - daily - tank monitoring equipment (e.g., pressure and temperature gauges) - daily - waste levels in uncovered tanks - daily - above-ground tank's integrity (for signs of corrosion, erosion, leakage of fixtures or seams) - weekly - area surrounding tank for signs of leakage (wet spots, dead vegetation) - weekly.
...	...
3-12. The installation safety manager (Tech Services) is responsible for conducting safety evaluations and inspections of the handling and storage of hazardous materials/wastes (AFR 127-12 and AFR 127-2).	• Interview with safety officer and determine command inspection requirements, forms and reporting procedures. (6) • Obtain list of buildings, shops, and material inspected by the safety officer. (6) • Review safety reports for hazardous waste treatment, storage, and disposal facilities. (6) • Verify that any corrective actions recommended in the safety reports have been implemented. (6)
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-13. Each storage site should be included in a contingency plan (GMP).	• Determine if accumulation points are addressed in the base contingency plan or emergency response plan. (1) • Review the plan to determine if it contains: (1) - descriptions of actions to be taken in response to fires, explosions, or any unplanned release of hazardous waste - descriptions of arrangements with base security, base fire department, and hospital officials - list of emergency and decontamination equipment - an evacuation plan for facility personnel - a plan showing location of emergency equipment - notification procedures for local community. • Determine if the base security, fire department, and hospital have received copies of the contingency plan. (4) • Determine if spill exercises are conducted annually and that the contingency plan is reviewed and updated. (1)(4) • Determine if records containing the time, date, and details of an incident that requires implementation of the contingency plan are kept for any incident. (1)(4) • Review the contingency plan to determine if it requires the following actions for spills: (1)(4) - providing of immediate first aid and evacuation - securing of site by roping off and posting warning signs - containment and control of spilled chemicals by: - -putting on protective equipment - -preventing further leakage by repositioning containers - -trenching or encircling area with sand, soil, rags, or absorbent materials - -covering liquid spills with absorbent material - -covering solid spills with polyethylene bags - -report accidents - cleanup of various types of spills: - -dry spills - -liquid spills - decontamination procedures - disposal - post-spill activities (sampling to ensure decontamination, investigation of cause of spill, full spill documentation). ... ...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
3-14. Accumulation point sites managers, all workers, and their supervisors who handle hazardous waste should successfully complete a training program (GMP).	• Determine if the installation has a training program directly related to the operation of the storage site(s). Determine if the program includes: (1) - equipment operations - contingency plan implementation - emergency response procedures: - -emergency/monitoring equipment use, inspection and repair - -communications and alarms - -response to fire, explosion, groundwater contamination incidents - facility shutdown procedures. • Examine training records to determine if they include: - employee name - description of the type and amount of training required for each position - documentation of training completed and annual training reviews - a copy of the training plan. • Determine if training records are maintained.
...	...
3-15. Hazardous wastes at storage sites in containers and tanks should be properly labeled (DoD 4145.19-R-1, 4160.21-M).	• Inspect each accumulation point and interview the accumulation point manager. (3) Observe that: - each container and tank is clearly labeled - each container and tank is labeled or marked clearly with the words "HAZARDOUS WASTE," National Stock Number (NSN), or Federal Stock Class (FSC), and name of item and/or chemical constituents - if the predominant local language is not English, markings are in the local language.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
3-16. Hazardous waste at accumulation points should comply with certain storage practices or as required by the Host Nation (DoD 4160.21-M, 4145.17-M).	• Inspect the containers and look for the following: (3) - Containers are tightly sealed and not leaking, bulging, rusting or badly dented. - Examine end seams for minor weeping which indicates drum failure. - Containers are compatible with waste (in particular, check condition of containers which hold strong caustics or acids and ensure solvents are not stored in plastic drums). - Containers are closed (check bungs on drums; look for funnels). - A drum dolly and bung wrench are available. - Brass or non-sparking. - Containers stored on top of each other have pallets between them (GMP). - Containers of highly flammable wastes are electrically grounded; check for grounding clips and wires, make sure wires actually lead to a ground rod or system (GMP). - Incompatible wastes are not placed in the same container or unwashed containers that previously held incompatible wastes; check for hydrocarbons in acid drums and other incompatible waste mixing, as indicated in Appendix III-2. - Containers holding hazardous wastes incompatible with wastes stored nearby in other containers, open tanks, piles, or surface impoundments are separated or protected from each other by a dike, berm, wall, or other device. - At least 3 feet of aisle space is provided between rows of containers to allow access for inspections and emergency response (GMP). - Full containers are moved to a hazardous waste TSDF within 90 days (includes all containers ready for disposal, even if not 90% or more filled).
...	...
3-17. Containers previously holding hazardous wastes may be reused for other purposes or discarded as a solid waste if certain standards are met as required by Host Nation regulation or GMP listed here.	• Inspect empty containers found at accumulation points that are not labeled as hazardous to ensure: (3) (5) - All wastes have been removed by pouring, pumping, aspirating, or other practice commonly employed to empty that type of container. - No more than 3% by weight of total capacity and no more than 1 inch of residue remains in the container or inner liner. - Containers or inner liners holding acutely hazardous waste have been triple rinsed using a solvent capable of removing the material, or have been cleaned by another method that achieves equivalent removal.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
3-18. Waste in tanks at storage sites should comply with certain storage regulations as required by Host Nation or GMP. (NOTE: If tanks are not used for storage of hazardous wastes at accumulation points, go to the next item number.)	• Inspect any accumulation points tank storage. (3) • Inspect each tank for ruptures, leaks, corrosion, or other signs of failure (dead vegetation. wet spots, etc). (3) • Inspect each uncovered tank to ensure: (3) - it is operated with at least 2 feet of freeboard - it is equipped with: - -a dike, trench, or other containment structure - -a drainage control system - -a diversion structure (e.g., standby tank) with a capacity that equals or exceeds the volume of the top 2 feet of the tank. • Inspect each continuously fed tank to ensure it is equipped with a waste feed cutoff system or a bypass system to a standby tank. (3) • Inspect each covered tank used to store ignitable or reactive wastes to ensure it complies with buffer zone requirements specified in NFPAs *Flammable and Combustible Liquids Code*. (3) • Inspect tanks to ensure they do not contain reactive waste unless: (3) - The waste has been treated, rendered, or mixed so it is no longer ignitable or reactive. - The waste is stored or treated to protect it from any materials or conditions that may cause it to ignite or react. - The tank is used solely for emergencies. ...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
3-19. All storage sites should be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste (GMP).	• Inspect the accumulation point to determine if the following required equipment is easily accessible and in operating condition: (3) - a telephone or hand-held two way radio - portable fire extinguishers and special extinguishing equipment (foam, inert gas, or dry chemicals) - spill control equipment - decontamination equipment - fire hydrants or other source of water (reservoir, storage tank, etc.) with adequate volume and pressure within 500 feet of facility, or foam producing equipment. • Make a spot check to assess condition of equipment (boots without holes, respirators with unused cartridges, etc.) (GMP). • Determine if at least 3 feet of aisle space is provided between rows of drums to allow checks for leakage, corrosion, proper labeling, etc. (GMP). • Determine by interviews if base security, fire department, and hospital are familiar with the facility layout and properties of wastes handled and associated hazards. • Determine if emergency response drills or exercises are held.
...	...
3-20. A master listing of all hazardous waste treatment, longer-term storage, and disposal facilities should be maintained at the installation (GMP).	• Determine from interviews and/or a review of the waste management plan, the locations of all the hazardous waste, treatment, longer-term storage, and disposal facilities on the base. (1)(2)
...	...
3-21. Installations with treatment or disposal facilities should control entry to the active portion of each facility (GMP).	• Inspect each treatment, storage, and disposal facility on the installation. Observe the following features: (5) - The facility is surrounded by a fence or natural barrier. - Entrances are locked or monitored. - Signs with wording "Danger - Unauthorized Personnel Keep Out" are posted at each entrance and other locations as appropriate. - Signs with wording "Hazardous Waste Area, are posted (in two languages, if necessary). - Communications equipment (telephone/radio) is present and capable of contact with police, fire, and emergency personnel.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-22. TSD facilities should record inspections in a log with specific entries (GMP).	• Examine the inspection log. (5) • Verify that entries are included as follows: - date/time of inspection - name of inspector - notation of observations. • Determine if the inspection logs are maintained.
...	...
3-23. All installation personnel who work in a treatment, storage, and disposal facility should receive certain training (GMP).	• Interview with the treatment, storage, and disposal operator/ supervisor. Determine if a formal training program is in place. Suggest the following: (5) - contingency plan implementation - procedures for using, inspecting and repairing the treatment, storage, and disposal facility emergency and monitoring equipment - operation of communications and alarm systems - response to fire or explosion - response to groundwater contamination - limits for automatic waste systems - facility shutdown procedures.
...	...
3-24. Training records should be maintained for all installation staff at the treatment, storage, and disposal facility (GMP).	• If available, examine training records. Verify they include documentation of training received by name. • Determine if each employee's training is updated annually. • Determine if training records are retained for 3 years.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-25. All TSD facilities must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste (GMP).	• Inspect the treatment, storage, and disposal facility to determine if the following required equipment is easily accessible and in operating condition: (5) - internal communications or alarm system, such as a horn, klaxon, or PA system within 10 feet of waste-handling areas - a telephone or hand-held two-way radio - portable fire extinguishers and special extinguishing equipment (foam, inert gas, or dry chemicals) - spill control equipment - decontamination equipment - fire hydrants or other source of water (reservoir, storage tank, etc.) with adequate volume and pressure within 500 feet of facility, or foam-producing equipment. • Make a spot check to assess condition of equipment (boots without holes, respirators with unused cartridges, etc.). • Determine if at least 3 feet of aisle space is provided between rows of drums to allow checks for leakage, corrosion, proper labeling, etc. (GMP). • Determine by interviews if base security, fire department, and hospital are familiar with the facility layout and properties of wastes handled and associated hazards. • Determine if emergency response drills or exercises are held.
...	...
3-26. Installations with TSD facilities must have a contingency plan (GMP). (NOTE: Treatment, storage, and disposal facilities may be addressed in the installation's Spill Prevention Control and Countermeasure (SPCC) plan, or other emergency plan, or if none exists, in a separate contingency plan.)	• Examine the Spill/Accident Contingency Plan. Verify that separate sections of the plan identify actions/procedures for the following: (5) - fire - explosion - release of hazardous waste.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-26. (continued)	• Verify that the plan describes arrangements agreed to by the following local organizations: - police - fire departments - hospitals - contractors. • Verify that emergency equipment listed in plan is consistent with what physically is found in the TSD facility, including: - fire extinguishers - spill-control equipment - alarm systems - decontamination equipment. • Verify if evacuation procedures and routes for facility personnel are necessary and included in the plan. Treatment, storage, and disposal facilities located in remote locations of the installation may not require an evacuation plan. • Verify that copies of the contingency plan are maintained at the TSD facility and also have been submitted to the following: - base security - base fire department - base safety manager. • Determine if the contingency plan is routinely reviewed and updated. (1) (4) • Determine if records containing the time, date and details of any incident that requires implementation of the contingency plan are kept. (1)(4)(6)
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-27. TSD facility emergency coordinators must follow certain emergency procedures whenever there is an imminent or actual emergency situation (GMP).	• Review the contingency plan for the TSD facility. Verify that the emergency coordinator, in case of an emergency, follows these emergency procedures: (1)(4) - Identify the character, exact source, amount, and a real extent of any released materials. - Assess possible hazards to human health or the environment, including direct and indirect effects (e.g., release of gases, surface runoff from water or chemicals used to control fire or explosions, etc.). • Verify that during an emergency the emergency coordinator follows these emergency procedures: (1)(4) - Stop processes and operations at the facility. - Collect and contain the released waste. - Remove or isolate containers. - Monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment whenever appropriate. - Provide for treatment, storage, or disposal of recovered waste, contaminated soil or surface water, or other material. - Ensure that no waste that may be incompatible with the released material is treated, stored, or disposed until cleanup is completed. - Ensure that all emergency equipment is cleaned and fit for its intended use before operations are resumed.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-28. TSD facilities should have specific procedures for responding to spills and accidents (GMP). (NOTE: The review items listed are not required by regulations, but are considered good management practices. A good contingency plan should have these or similar procedures.) ...	• Examine the contingency plan for the following typical good management practices: (5) - Determine the chemical involved (including, if possible, formulation, manufacturer, and percent active ingredient). - Provide immediate first aid and evacuation around spill area. - Secure the spill site by roping off area and posting warning signs. - Contain and control spilled chemical by: - -putting on protective equipment - -preventing further leakage by repositioning containers - -covering the spill (if liquid) with absorbent material or (if solid) with polyethylene bags - -trench or encircle area with a dike of sand, absorbent material, soil or rags - Cleanup procedures for dry spills are specified: - -Roll up bags slowly and sweep. - -Collect residue in heavy duty plastic bags. - Cleanup procedures for liquid spills are specified: - -Work absorbent material into spill. - -Collect absorbent material into properly labeled leakproof container. - -Remove contaminated soil to a depth 3 inches below wet surface lining. - Decontamination procedures are specified: - -Remove the bulk of the spill. - -Apply decontamination solution. - -Allow 1 to 6 hours reaction time. - -Apply absorbent material. - Disposal procedures are specified: - -Remove all contaminated materials and place in a sealed, leakproof drum. - -Dispose of drum in same manner as waste. - Post-spill procedures are specified: - -Sample affected areas to ensure effective decontamination. - -Investigate cause of the spill. - -Fully document spill for future reference. ...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-29. TSD facility operators should keep written operating records at the facility (GMP).	• Review the operating records for the treatment, storage, and disposal facility to determine if they include: (5) - description and quantity of waste - location of each waste within the facility - records and results of waste analyses - reports on incidents - records/results of inspections - monitoring, testing and analytical data (where required).
...	...
3-30. Installations with hazardous waste facilities that store containers of hazardous waste should comply with certain storage regulations. Permits may be required by Host Nation (GMP).	• Determine if the facility stores hazardous waste in containers. If not, go to Item 3-34. (5) • Inspect the containers and look for the following good management practices: (5) - Containers are tightly sealed and not leaking, bulging, rusting, or badly dented. - Containers are compatible with waste; in particular, check condition of containers which hold strong caustics or acids and ensure solvents are not stored in plastic drums. - Containers are closed; check bungs on drums; look for funnels. - A drum dolly and bung wrench are available. - Containers stored on top of each other have pallets between them (GMP). - Containers of highly flammable wastes are electrically grounded; check for grounding clips and wires; make sure wires actually lead to a ground rod or system (GMP). - Incompatible wastes are not placed in the same container or unwashed containers which previously held incompatible wastes; check for hydrocarbons in acid drums and other incompatible waste mixing as indicated in Appendix III-2. - Containers holding hazardous wastes incompatible with wastes stored nearby in other contained tanks, piles, or surface impoundments are separated or protected from each other by a dike, berm, wall, or other device. - Aisle space is provided between rows of containers to allow access for inspections and emergency response (GMP). - If the predominant local language is not English, markings should also be in the local language.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
3-31. TSD facilities with container storage area should have a containment system (GMP).	• Inspect the container storage area. Observe that the following criteria are met: (5) - Containers are stored on a base free from cracks or gaps and impervious enough to contain leaks, spills, and precipitation. - The base is sloped (or otherwise designed) to drain and remove liquids resulting from leaks, spills, or precipitation; or, containers are elevated or protected from contact with accumulated liquids. - Containment system has adequate capacity to contain 10% of the volume of the containers or the volume of the largest container (whichever is greatest) (GMP). - Run-on into the containment system is prevented, or the system has sufficient capacity to contain any run-on that might enter the system.
...	...
3-32. Installations should conduct weekly inspections of container storage areas and the containment system (GMP).	• Determine if inspections are conducted at least weekly to look for leaking containers and signs of deterioration of containers or the containment system. (5)
...	...
3-33. Installations with hazardous waste facilities that use tank systems to treat or store hazardous waste should prevent any migration of wastes or accumulated liquid to the soil, groundwater, or surface water (GMP).	• Determine if the installation treats or stores hazardous wastes in tanks. If not, go to the next item. • Conduct an inspection of each tank which does not have secondary containment for ruptures. • Conduct an inspection of each tank for ruptures, leaks, corrosion, or other signs of failure (dead vegetation, wet spots, etc). (5) • Inspect each uncovered tank to ensure that it is operated with sufficient freeboard. • Check each tank that does not have secondary containment to ensure: - Design and strength is adequate and compatible with wastes stored. - Corrosion-protection measures are in place (e.g., cooling, cathodic protection).

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
3-33. (continued)	• Inspect tanks to ensure that they do not contain ignitable or reactive waste unless: - The waste has been treated, rendered, or mixed so it no longer is ignitable or reactive. - The waste is stored or treated to protect it from any materials or conditions that may cause it to ignite or react. - The tank is used solely for emergencies.
...	...
3-34. Installations that use surface impoundments to treat, store, or disposed of hazardous wastes should comply with certain requirements (GMP).	• Determine if the base treats, stores or disposes of wastes in surface impoundments. If not, go to the next item. • Inspect each surface impoundment. Observe the following criteria are met: (5) - The impoundment has a liner designed, constructed, and installed to prevent any migration of waste out of the impoundment. - The impoundment has at least 2 feet of freeboard and shows no sign of overtopping by overfilling, wave action, or a storm. - The impoundment has a containment system, such as an earthen dike, covered with grass, rock or shale, that shows no signs of erosion. - The impoundment does not contain ignitable or reactive waste, unless: - The waste has been treated, rendered, or mixed so it is no longer ignitable or reactive. - The waste is managed in a way that it is protected from materials or conditions that may cause it to ignite or react. - The impoundment is used solely for emergencies.
...	...
3-35. Installations must conduct inspections while surface impoundments are in operation (GMP).	• Determine if the impoundment is inspected at least daily to check the freeboard level. (5) • Determine if inspections are conducted at least weekly and after storms to detect evidence of the following: (5) - deterioration, malfunctions or improper operation of overtopping control systems - sudden drops in the level of the impoundment contents - severe erosion or other signs of deterioration in dikes or other containment devices.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-36. Installations that dispose of hazardous waste in landfills must comply with certain requirements (GMP).	• Determine if the base disposes of hazardous wastes in an on-site landfill (if not, go to the next item). • Inspect the landfill. Observe the following criteria are met: - A liner designed, constructed, and installed to prevent any migration of waste out of the landfill is in place. - There is adequate control of leachate; no visual evidence of leachate seeps, stressed vegetation, etc. - Site is surrounded by sound run-on diversion system with capacity to prevent flow during peak discharge of 25-year storm; there is no ponding of water on site. - There is adequate collection and control of run-off; no indication improper or inadequate drainage; adequate capacity to collect and control water from a 24-hour, 25-year storm. - There is adequate control of wind dispersal. - There is no blowing debris. - There is adequate cover of waste material.
...	...
3-37. Installations should maintain a landfill map depicting the waste cells, and the type and location of hazardous waste in each cell (GMP).	• Determine if a landfill map is available and if it contains: (5) - the exact location and dimensions of each cell, including depth with respect to a permanently surveyed benchmark - contents of each cell and approximate location of each waste type within each cell.
...	...
3-38. Installations should eliminate land disposal of certain wastes (GMP).	• Determine if the installation disposes of any of the following in a landfill: - EPA land-banned wastes (see Appendix III-3) - restricted wastes (based on concentration) (see Appendix III-4 and III-5) - California-listed liquid hazardous wastes (see Appendix III-6) - other restricted wastes in 40 CFR 261 (see Appendix III-7). • If the installation disposes of any of the above by landfill, determine their plan to eliminate land disposal of those wastes.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-39. Installations that use incinerators to incinerate hazardous waste should comply with certain requirements.	• Determine if the base incinerates hazardous waste. • Inspect each hazardous waste incinerator and interview operators. Determine that the following criteria are met: (5) - The incinerator is operating at steady-state conditions (temperature and airflow) before adding waste. - Waste analysis is performed on waste not previously incinerated at the facility which includes: - heating value - halogen content - sulfur content - concentration of lead - concentration of mercury.
...	...
3-40. Installations should conduct inspections while waste piles are in operation (GMP).	• Determine if the waste pile is inspected at least weekly and after storms to detect evidence of the following: (5) - deterioration, malfunctions or improper operation of run-on and runoff control systems - proper functioning of wind dispersal control system - presence of leachate in, and proper functioning of, leachate control system.
...	...
3-41. Installations with land treatment systems should meet certain standards (GMP).	• Determine if the base operates a land-treatment facility; if not, go to the next item. • Inspect each land-treatment facility. Observe that the following standards are met: (5) - The treatment zone is no more than 5 feet from the initial soil surface. - The treatment zone is more than 3 feet above the seasonal high water table. - Only wastes that are degraded chemically or biologically in the soil are disposed of in the facility. - Wastes disposed of in the facility do not exceed maximum concentration of certain constituents to ensure groundwater protection (see Appendix III-8). - Runon is diverted away from the active portion of the site. - Runoff collection and treatment systems are in place and in operation. - Wind dispersal is controlled.

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
3-41. (continued)	• If food chain crops are grown at the site, the following requirements must be met: - Prior to planting, the base must demonstrate that hazardous constituents will not be transferred to the food, ingested by animals, or occur in greater concentrations in the crops when compared to crops grown in similar conditions on untreated soils. - Crops grown with cadmium-contaminated wastes meet special requirements. • Determine that each land-treatment system has a written unsaturated zone monitoring plan. (5)
...	...
3-42. Installations should conduct inspections while land treatment facilities are in operation (GMP).	• Determine that the land-treatment system is inspected weekly and after storms to detect evidence of: (5) - deterioration, malfunctions, or improper operation of runon and runoff control systems - improper functioning of wind dispersal control measures.
...	...
3-43. Installations with chemical, physical, and biological treatment facilities should meet certain requirements (GMP).	• Determine if the base operates a chemical, physical, or biological treatment facility to treat hazardous wastes. If not, the hazardous waste review is completed. • Inspect each chemical, physical, or biological treatment facility Observe that the following criteria are met: (5) - Wastes or treatment reagents are not placed in treatment process or equipment if they could cause ruptures, leaks, corrosion, or other failures. - Continuously fed systems are equipped with waste feed cutoff or bypass system. - Waste analyses and treatment tests (e.g. bench scale or pilot plant tests) are performed, or written.
...	...

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COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
3-44. Installations with chemical, physical, and biological treatment facilities should conduct regular inspections (GMP).	• Determine if the chemical, physical and biological treatment facility is in accordance with the following: (5) - At least daily, discharge control and safety equipment (e.g., waste feed cutoff system, bypass system, drainage systems, and pressure relief systems) is checked to ensure good working order. - At least daily, data from monitoring equipment is checked to ensure process is operated in accordance with its design. - At least weekly, equipment is inspected to detect corrosion, leaks, etc. - At least weekly, dikes or other discharge confinement structures are inspected to detect erosion or signs of leakage (dead vegetation, wet spots, etc.).

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Appendix III-1

Typical Hazardous Wastes Generated at Air Force Installations*

Organization	Shop	Waste Generated
Base Civil Engineering	Diesel maintenance shop	Trichloroethane Contaminated diesel fuel Carburetor cleaner Used lube oil Used crankcase oil
	Entomology shop	Various pesticides and herbicides
	Interior electric shop	PD-680 solvent
	Paint shop	Lacquer thinner Mineral spirits Alipatic naptha Unusable paints
	Power plant	Morpholine Sulfuric acid Sodium hydroxide Trichloroethane Acetone Toluene Used lube oil PD-680 solvent Waste paints
	Power production	Used hydraulic oil Contaminated diesel fuel
	Sheet metal shop	PD-680 solvent

*Source: *Law, Regulations, and Guidelines for Handling of Hazardous Waste*, California Department of Health, February 1975. (As referenced in 40 CFR, Part 264, Appendix V.)

Appendix III-1 (Continued)

Organization	Shop	Waste Generated
Aircraft Maintenance	Jet engine shop	Carbon remover Used hydraulic oil Contaminated JP-4 PD-680 solvent, used lube oil
Aircraft Maintenance	Electronic shop	Toluene PD-680 solvent, used
	Welding shop	Ferric chloride Acetic acid Sulfuric acid Cadmium cyanide Trichloroethylene Caustic cleaning tank waste
	Battery shop	Sulfuric acid
Aircraft Wings	Tire shop	PD-680 solvent, used
	Corrosion control shop	Methyl ethyl ketone Aliphatic naptha Lacquer thinner Mineral spirits Paint remover Unusable paints
Medical Facility	Laboratory	Formalin

Appendix III-2

Potentially Incompatible Hazardous Wastes

Below are examples of potentially incompatible wastes, waste components, and materials, along with the harmful consequences that result from mixing materials in one group with materials in another group. The list is intended as a guide to indicate the need for special precautions when managing these potentially incompatible waste materials or components. This list is not intended to be exhaustive. Operators must, as the regulations require, adequately analyze their wastes so they can avoid creating uncontrolled substances or reactions of the type listed below, whether listed below or not.

In the lists below, the mixing of a *Group A* material with a *Group B* material may have the potential consequences as noted.

Group 1-A	Group 1-B
Acetylene sludge Alkaline caustic liquids Alkaline cleaner Alkaline corrosive liquids Alkaline corrosive battery acid Caustic wastewater Lime sludge and other corrosive alkalies Lime wastewater Lime and water Spent caustic	Acid sludge Acid and water Battery acid Chemical cleaners Electrolyte, acid Etching acid liquid or solvent Pickling liquor and other corrosive acids Spent acid Spent mixed acid Spent sulfuric acid

Potential Consequences: Heat generation, violent reaction.

Group 2-A	Group 2-B
Aluminum Beryllium Calcium Lithium Magnesium Potassium Sodium Zinc powder Other reactive metals and metal hydrides	Any waste in Group 1-A or 1-B

Potential Consequences: Fire or explosion; generation of flammable hydrogen gas.

Group 3-A	Group 3-B
Alcohols Water	Any concentrated waste in Groups 1-A or 1-B Calcium Lithium Metal hydrides Potassium SO_2Cl_2, $SOCl_2$, PCl_3, CH_3SiCl_3 Other water-reactive waste

Potential Consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.

Group 4-A	Group-4-b
Alcohols Aldehydes Halogenated hydrocarbons Nitrated hydrocarbons Unsaturated hydrocarbons Other reactive organic compounds and solvents	Concentrated Group 1-A or Group 1-B wastes Group 2-A wastes

Potential Consequences: Fire explosion, or violent reaction.

Group 5-A	Group 5-B
Spent cyanide and sulfide solutions	Group 1-B wastes

Potential Consequences: Generation of toxic hydrogen cyanide, or hydrogen sulfide gas.

Appendix III-2 (Continued)

Group 6-A	Group 6-B
Chlorates Chlorine Chlorites Chromic acid Hypochlorites Nitrates Nitric acid, fuming Perchlorates Permanganates Perioxides Other strong oxidizers	Acetic acid and other organic acids Concentrated mineral acids Group 2-A wastes Group 4-A wastes Other flammable and combustible wastes

Potential Consequences: Fire, explosion, or violent reaction.

Appendix III-3

40 CFR 261, *Identification and Listing of Hazardous Waste*

TABLE I

Hazardous Waste from Nonspecific Sources

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
Generic		
F001	the spent halogenated solvents used in degreasing. Trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and the chlorinated fluorocarbons; all spent solvent mixtures or blends used in degreasing containing before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents listed in F002, F004, 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-1,1,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures or blends containing, before use, a total of ten 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)

* HAZARD CODES (Column 3)

t = toxic waste
i = ignitable waste
r = reactive waste
h = acute hazardous waste

** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
F003	the spent non-halogenated solvents, xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures or blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures or blends containing, before use, one or more of the above non-halogenated substances, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; the still bottoms from the recovery of these solvents and spent solvent mixtures.	(i)
F004	the spent non-halogenated solvents, cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures or blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures or blends containing, before use, one of the above non-halogenated substances, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and the still bottoms from the recovery of these solvents.	(t)
F005	the following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbons disulfide, isobutanol, pyridine, benzene, 2-ethoxylethanol, and 2-nitropropane; all spent solvent mixtures or blends containing, before use, a total of ten percent or more by volume of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these solvents.	(i,t)
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-	

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Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*

F006	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 solution 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.	(t)
F020	wastes from use of tri- or intermediates used to produce its derivatives. **	(h)

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** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
F021	wastes of pentachlorophenol, or intermediates used to produce its derivatives. **	(h)
F022	wastes, of tetra-, penta-, or hexachlorobenzenes under alkaline conditions. **	(h)
F023	wastes, of tri and tetrachlorophenols. **	(t)
F024	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 (Omits light ends, spent filters and filter aids, spent dessicants, wastewater, wastewater treatment sludges, spent catalysts and wastes listed in 40 CFR 261,32).	(t)
F026	wastes of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(h)
F027	discharded unused formulations containing tri-, tetra-, or pentachlorophenol or discharded unused formulations containing compoun ds derived from these chlorophenols (does not include hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.	(h)
F028	residues from incineration or thermal treatment of soil contaminated with EPA hazardous waste Nos. F020, F021, F022, F023, F026 and F027.	(t)

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r = reactive waste
h = acute hazardous waste

** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
K009	distillation bottoms from the production of acetaldehyde from ethylene.	(t)
K010	distillation side cuts from the production of acetaldehyde from ethylene.	(t)
K011	bottom stream from the wastewater stripper in the production of acrylonitrile.	(r,t)
K013	bottom stream from the acetonitrile column in the production of acrylonitrile.	(r,t)
K014	bottoms from the acetronitrile purification column in the production of acrylonitrile.	(t)
K015	still bottoms from the distillation of benzyl chloride.	(t)
K016	heavy ends or distillation residues from the production of carbon tetrachloride.	(t)
K017	heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.	(t)
K018	heavy ends from fractionation in ethyl chloride production.	(t)
K019	heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.	(t)

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r = reactive waste
h = acute hazardous waste

** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
K020	heavy ends from the distillation of vinyl chloride in vinyl chlride monomer production.	(t)
K021	aqueous spent antimony catalyst waste from fluoromethanes production.	(t)
K022	distillation bottom tars from the production of phenol/acetone from cumene.	(t)
K023	distillation light ends from the production of phthalic anhydride from naphthalene.	(t)
K024	distillation bottoms from the production of phthalic anhydride from naphthalene.	(t)
K025	distillation bottoms from the production of nitrobenzene by the nitration of benzene.	(t)
K026	stripping still tails from the production of methyl ethyl pyridines.	(t)
K027	centrifuge residue from toluene diisocyanate production.	(r,t)
K028	spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.	(t)
K029	waste from the product stream stripper in the production of 1,1,1-trichloroethane.	(t)
K030	column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.	(t)

* HAZARD CODES (Column 3)
t = toxic waste
i = ignitable waste
r = reactive waste
h = acute hazardous waste

** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
K083	distillation bottoms from aniline production.	(t)
K085	distillation of fractionation column bottoms from the production of chlorobenzene.	(t)
K103	process residues from aniline extraction from the production of aniline.	(t)
K104	combined wastewater streams generated from nitrobenzene or aniline production.	(t)
K105	separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.	(t)
K093	distillation light ends from the production of phthalic anydride from erthoxylene.	(t)
K094	distillation bottoms from the production of phthalic anhydride from orthozylene.	(t)
K095	distillation bottoms from the production of 1,1,1-trichloroethane.	(t)
K096	heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.	(t)
K111	product washwaters from the production of dinitrotoluene via nitration of toluene.	(c,t)

* HAZARD CODES (Column 3)

t = toxic waste
i = ignitable waste
r = reactive waste
h = acute hazardous waste

** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
K112	reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.	(t)
K113	condensed liquid light ennation of dinitrotoluene.	(t)
K114	vicinals from the purification of toluenediamine in the production of toluenediamine.	(t)
K115	heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	(t)
K116	organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.	(t)
K117	wastewater from the reactor vent gas scrubber in the production of ethylene dibromide via bromination of ethene.	(t)
K118	spent adsorbent solids from purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.	(t)
K136	still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.	(t)

* HAZARD CODES (Column 3)

t = toxic waste
i = ignitable waste
r = reactive waste
h = acute hazardous waste

** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Industry and EPA Hazardous Waste Number	Hazardous Waste	Hazard Code*
	INORGANIC CHEMICALS	
K071	brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.	(t)
K073	chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.	(t)
K106	wastewater treatment sludge from the mercury cell process in chlorine production.	(t)
	Hazardous Waste from Explosives Manufacturing	
K044	wastewater treatment sludge from the manufacturing and processing of explosives.	(r)
K045	spent carbon from the treatment of wastewater containing explosives.	(r)
K046	wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.	(t)
K047	pink/red water from TNT operations.	(r)

* HAZARD CODES (Column 3)

t = toxic waste
i = ignitable waste
r = reactive waste
h = acute hazardous waste

** (except wastewater and spent carbon from hydrogen chloride purification); the manufacturing or production use: as a reactant, chemical intermediate, or component in a formulating process. The listing for F020 and F023 does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.

Appendix III-4

F-solvent Waste Constituents

CONSTITUENTS OF EPA HAZARDOUS WASTES F001-F005	EXTRACT CONCENTRATIONS[a] (in miligrams per liter)	
SPENT SOLVENT WASTE	WASTEWATER[b]	OTHER[c]
Acetone	0.05	0.59
n-Butyl alcohol	5.00	5.00
Carbon disulfide	1.05	4.81
Carbon tetrachloride	0.05	0.96
Chlorobenzene	0.15	0.05
Cresols (cresylic acid)	2.82	0.75
Cyclohexanone	0.125	0.75
1,2-Dichlorobenzene	0.65	0.125
Ethyl acetate	0.05	0.75
Ethylbenzene	0.05	0.053
Ethyl ether	0.05	0.75
Isobutanol	5.00	5.00
Methanol	0.25	0.75
Methylene chloride	0.20	0.96
Methyl ethyl ketone	0.05	0.75
Methyl isobutyl ketone	0.05	0.33
Nitrobenzene	0.66	0.125
Pyridine	1.12	0.33
Tetrachloroethylene	0.079	0.05
Toluene	1.12	0.33
1,1,1-Trichloroethane	1.05	0.41
1,1,2 Trichloro-1,2,2-trifluoroethane	1.05	0.96
Trichloroethylene	0.062	0.091
Trichlorofluoromethane	0.05	0.96
Xylene	0.05	0.15

[a] An extract of the waste is obtained by employing the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP is an analytical method used to determine whether the concentrations of hazardous constituents in the waste extract or an extract of the treatment residual meet the treatment standards.

[b] For determining the applicable treatment standard, F-solvent wastewaters are defined as solvent-water mixtures containing less than or equal to 1% total organic carbon (TOC).

[c] Wastewaters that contain > 1% TOC solvent-containing solids, solvent-containing sludges, and solvent-contaminated soils.

Appendix III-5

Dioxin Treatment Standards

F020-F023 and F026-F028 DIOXIN-CONTAINING WASTES	EXTRACT[a] CONCENTRATION
HxCDD - All Hexachlorodibenzo-p-dioxin	< 1 ppb
HxCDF - All Hexachlorodibenzofurans	< 1 ppb
PeCDD - All Pentachlorodibenzo-p-dioxins	< 1 ppb
PeCDF - All Pentachlorodibenzofurans	< 1 ppb
TCDD - All Tetrachlorodibenzo-p-dioxins	< 1 ppb
TCDF - All Tetrachlorodibenzofurans	< 1 ppb
2,4,5-Trichlorophenol	< 0.05 ppm
2,4,6-Trichlorophenol	< 0.10 ppm
2,3,4,6-Tetrachlorophenol	< 0.10 ppm
Pentachlorophenol	< 0.01 ppm

EFFECTIVE DATES FOR SOLVENT-DIOXIDE RULE

WASTES	EFFECTIVE DATE
F001-F005 Solvent Wastes	
F001 - F005	8 Nov 86
F001 - F005 from small quantity generators (100-1000 kg per month)	8 Nov 88
F001 - F005 generated via RCRA or CERCLA corrective or remedial action	8 Nov 88
< 1% total F001 - F005 soil and debris resulting from RCRA or CERCLA corrective or remidial action.	8 Nov 90[b]
Dioxin-Containing Wastes	
Dioxin wastes F020 - F023, F026 - F028	8 Nov 88
F020 - F023, F026 - F028 soil debris resulting from RCRA or CERCLA Corrective or remedial action	8 Nov 90[b]

[a] As with the solvent wastes, the TCLP method is used to derive a waste extract which is analyzed to determine if treatment standards have been met.

[b] Between 11/08/88 - 11/08/90, if disposed in landfill or surface impoundment, the unit must meet the minimum technology requirements.

Appendix III-6

California List Rule

On 8 July 1987 the EPA promulgated the second phase of the Land Disposal Restrictions (LDR) program which restricts the land disposal of the California List wastes. The California List consists of liquid hazardous wastes containing certain metals, free cyanides, polycholoronated biphenyls (PCBs), corrosives with a pH of less than or equal to 2.0, and liquid and nonliquid hazardous wastes containing halogenated organic compounds (HOCs) as described below:

A. Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing free cyanides at concentrations greater than or equal to 1000 mg/l.

B. Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing any of the following metals (or elements) or compounds of these metals (or elements) at concentrations greater than or equal to those specified below:

Arsenic (as As)	500 mg/l
Cadmium (as Cd)	100 mg/l
Chromium (as Cr VI)	500 mg/l
Lead (as Pb)	500 mg/l
Mercury (as Hg)	20 mg/l
Nickel (as Ni)	134 mg/l
Selenium (as Se)	100 mg/l
Thallium (as Tl)	130 mg/l

C. Liquid hazardous wastes having a pH less than or equal to 2.0.

D. Liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm.

E. Hazardous wastes containing HOCs in total concentrations greater than or equal to 1,000 mg/l.

Although these liquid wastes can be treated using solidification techniques such that they no longer meet the statutory definitions of California List wastes, it is not EPA's intent that simple absorption be used instead of permanent treatment. Where physical or chemical changes do not occur, or where hazardous constituents are not otherwise immobilized, "solidification" techniques may be possibly considered "dilution as a substitute for adequate treatment", a prohibited activity in the LDR program.

The rule requires that the Paint Filter Liquids Test be used to determine whether a waste is considered to be a liquid or nonliquid. This procedure is method 9095 in EPA Publication No. SW-846, *Test Methods for Evaluating Solid Waste*.

Collectively, these hazardous wastes are referred to as the California List because the State of California developed regulations to restrict the land disposal of hazardous wastes containing these constituents. Congress adopted these prohibitions in the 1984 Amendments to RCRA.

Cyanides and Metals. Liquid hazardous wastes containing cyanide and metals exceeding the levels listed above may not be land-disposed as of 8 July 1987. Any applicable treatment method, except dilution, may be used to treat these wastes to achieve the levels noted above, prior to land disposal.

Halogenated Organic Compounds Under the July 1987 California list rule, the HOCs subject to the LDR are in Appendix III of Part 268. The final rule specifies that hazardous wastes containing HOCs in total concentrations greater than or equal to 1000 mg/l (or 1000 mb/kg), must be incinerated or burned in boilers or industrial furnaces in accordance with existing RCRA regulations. If, however, the HOC waste is also subject to the F-solvent restrictions, the more stringent treatment standard applies.

Corrosives. On 8 July 1987, liquid wastes having a pH of 2.0 or less were prohibited from land disposal. Any applicable, legitimate treatment method may be used to achieve a pH greater than 2.0 prior to land disposal.

Polychlorinated Biphenyls. As of 8 July 1987, liquid hazardous wastes containing PCBs in concentrations exceeding 50 ppm must be incinerated or burned in high efficiency boilers in accordance with the technical standards of 40 CFR 761.70. Additionally, restricted wastes with PCBs may only be stored for up to one year.

EFFECTIVE DATES FOR CALIFORNIA WASTES

WASTES	DATE
Liquid hazardous wastes containing >= 1,000 mg free cyanides	07/08/87
Liquid hazardous wastes having a pH <= 2.0	07/08/87
Liquid hazardous wastes containing >= 5.0 ppm PCBs	07/08/87
Liquid hazardous wastes, primarily water, containing >= 1,000 mg HOCs, <= 10,000 mg/l HOCs	07/08/87
Liquid hazardous wastes >= 1,000 mg/l HOCs	11/08/88 a
Nonliquid (non-RCRA/CERCLA) hazardous wastes >= 1,000 mg/kg HOCs	11/08/88 a
California waste contaminated soil and debris resulting from RCRA/CERCLA corrective/remedial actions	11/08/90 b

a Between 07/08/87 - 11/08/88, if disposed in landfill or surface impoundment, the unit must meet minimum technology requirements. [268.5 (h) (2)]

b Between 11/08/88 - 11/08/90, if disposed in landfill or surface impoundment, the unit must meet minimum technology requirements. [268.5 (h) (2)]

Appendix III-7

Restricted Wastes

Wastes to be Evaluated by 8 August 1988

Wastes identified under 261.31

F006	F007	F008	F009	F009

Wastes identified under 261.32

K001	K004	K008	K011	K013
K014	K015	K016	K017	K018
K019	K020	K021	K022	K024
K030	K031	K035	K036	K037
K044	K045	K046	K047	K048
K049	K050	K051	K052	K060
K061	K062	K069	K071	K073
K083	K084	K085	K086	K099
K101	K103	K104	K106	

Wastes identified in 261.33 (e)

P001*	P004	P005	P010	P011
P012	P015	P016	P018	P020
P030	P036	P037	P039	P041
P048	P050	P058	P059	P063
P068	P069	P070	P071	P081
P082	P084	P087	P089	P092
P094	P097	P102	P105	P108
P110	P115	P120	P122**	P123

* when present at concentrations greater than 0.3%
** when present at concentrations greater than 10%

Wastes identified in 261.33 (f)

U007	U009	U010	U012	U016
U018	U019	U022	U029	U031
U036	U037	U041	U043	U044
U046	U050	U051	U053	U061
U063	U064	U066	U067	U074
U077	U078	U086	U089	U103
U105	U108	U115	U122	U124
U129	U130	U133	U134	U137
U152	U154	U155	U157	U158
U171	U177	U180	U185	U188
U192	U200	U209	U210	U211
U219	U220	U221	U223	U226
U227	U228	U237	U248	U249

Wastes to be evaluated by 8 June 1989

Wastes identified under 261.31

F010	F011	F012	F024	K009
K010	K019	K025	K027	K028
K029	K038	K039	K040	K041
K042	K043	K095	K096	K097
K098	K105			

Wastes identified under 261.33 (e)

P003	P003	P007	P008	P014
P026	P027	P029	P040	P043
P044	P049	P054	P057	P060
P062	P066	P067	P072	P074
P085	P098	P104	P106	P107
P111	P112	P113	P114	

Wastes identified under 261.33 (f)

U002	U003	U005	U008	U011
U014	U015	U020	U021	U023
U025	U026	U028	U032	U035
U047	U049	U057	U058	U059
U060	U062	U070	U073	U080
U083	U092	U093	U094	U095
U097	U098	U099	U101	U106
U109	U110	U111	U114	U116
U119	U127	U128	U131	U135
U138	U140	U142	U143	U144
U146	U147	U149	U150	U161
U162	U163	U164	U165	U168
U169	U170	U172	U173	U174
U176	U178	U179	U189	U193
U196	U203	U205	U206	U208
U213	U214	U215	U216	U217
U218	U235	U239	U244	

Wastes to be evaluated by 8 May 1990

Wastes identified under 261.32

K002	K003	K005	K006	K007
K023	K026	K032	K033	K034
K093	K094	K100		

Wastes identified under 216.33 (e)

P006	P009	P013	P017	P021
P022	P023	P024	P028	P031
P033	P034	P038	P042	P045
P046	P047	P051	P056	P064
P065	P073	P075	P076	P077
P078	P088	P093	P095	P096
P099	P101	P103	P109	P116
P118	P119	P121		

Wastes identified under 261.33 (f)

U001	U004	U006	U017	U024
U027	U030	U033	U034	U038
U039	U042	U045	U048	U052
U055	U056	U068	U069	U071
U072	U075	U076	U079	U081
U082	U084	U085	U087	U088
U090	U091	U096	U102	U112
U113	U117	U118	U120	U121
U123	U125	U126	U132	U136
U139	U141	U145	U148	U152
U153	U156	U160	U166	U167
U181	U182	U183	U184	U186
U187	U190	U191	U194	U197
U201	U202	U204	U207	U222
U225	U234	U236	U240	U243
U246	U247			

Appendix III-8

Maximum Concentration of Constituents for Groundwater Protection

(Table 1 from 40 CFR 264.94)

Constituent	Maximum Concentration (mg
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Lead	0.05
Mercury	0.002
Selenium	0.01
Silver	0.05
Endrin	0.0002
Lindane	0.004
Methoxychlor	0.01
2,4,5-TP	0.01

INSTALLATION:	COMPLIANCE CATEGORY: HAZARDOUS WASTE MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

(1) BCE [Environmental Planning] (2) DRMO [Defense and Reutilization Marketing Office] (3) Accumulation Point Managers (4) Fire department (5) TSD [Treatment, Storage, Disposal] facility officer (6) Safety manager (7) BEE [Bioenvironmental Engineer] (8) Transportation officer (9) Base Supply (10) Generating activities

Section IV

Natural & Cultural

Resources Management

SECTION IV

NATURAL AND CULTURAL RESOURCES MANAGEMENT

A. Applicability of this Protocol

This protocol applies to any Air Force installation with improved, semi-improved and unimproved grounds. Plans and programs for protection and management of natural resources such as soil, water, plants, wildlife, and cultural resources, which include historic and prehistoric properties, are included in this protocol.

The regulatory requirements in this protocol are based on Department of Defense (DoD) and Air Force regulations that apply at overseas installations. Good Management Practices (GMPs) are derived from DoD and Air Force regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force employees and protect the environment. GMPs in the Natural and Cultural Resources protocol are derived from the following: DoD Directive 4700.4, Air Force Regulations (AFR) 19-4, AFR 19-9, and AFR 126-1,chapters 1, 3-6.

B. DoD Regulations

- 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.

- DoD Instruction 4710.1, *Archaeological and Historic Resources Management*, 21 June 1984, provides policy, prescribes procedures, and assigns responsibilities for the management of archaeological and historic resources located in and on waters and lands under DoD control. It establishes the policy that DoD components will integrate the archaeological and historical preservation requirements of applicable laws with the planning and management of activities under DoD control.

- DoD Instruction 7310.5, *Accounting for Production and Sale of Forest Products*, 25 January 1988, provides policy on DoD Forestry accounting procedures.

C. U.S. Air Force Regulations

- AFR 19-4, *Use and Control of Off-Road Vehicles (ORVs)*, establishes policies, procedures, and criteria for off-road travel by ORVs. It prescribes operating conditions and restrictions for such vehicles on Air Force lands.

- AFR 19-9, *Interagency and Intergovernmental Coordination of Land, Facility, and Environmental Plans, Programs, and Projects*, assigns responsibilities for the implementation of Air Force policy for floodplain management and wetland protection. It gives the guidelines for the decisionmaking process when analyzing potential adverse effects of Air Force projects in floodplains and wetlands.

- AFR 126-1, *Conservation and Management of Natural Resources*, gives policies, procedures, and functional responsibilities for managing and conserving soil, water, forest, fish, wildlife, and outdoor recreation resources on Air Force lands. It establishes the requirement to manage these resources under the principles of multiple-use and sustained yield, consistent with the military mission.

- AFR 126-7, *Historic Preservation*, provides Air Force policies, procedures, and responsibilities for protecting and managing cultural resources.

D. Responsibility for Compliance

- Base Civil Engineering (BCE) is responsible for funding, supervising, controlling, and managing installation natural resources and historic preservation programs.

- 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.

- Base Historic Preservation Officer is responsible for implementing the historic preservation program, and locates, inventories, and evaluates installation cultural resources. This is usually an additional duty assignment within BCE.

E. Key Compliance Definitions

- *Action* - all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (1) actions intended to conserve listed species or their habitat; (2) the promulgation of regulations; (3) the granting of licenses, contracts, leases, easements, right-of-way, permits, or grants-in-aid; and (4) actions directly of indirectly causing modifications to the land, water, or air.

- *Action Area* - all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

- *Adverse Affect* - changes that diminish those attributes of a property.

- *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 or piece of any of the foregoing items.

- *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.

- *Conservation* - wise management and use of natural resources to provide the best public benefits for present and future generations.

- *Destruction or Adverse Modification* - a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

- *District* - a geographically definable area, urban or rural, that possesses a significant concentration, linkage or continuity of sites, structures, buildings, or objects united by past events or aesthetically by plan or physical development. A district may also compromise individual elements separated geographically but linked by association or history.

- *Effect* - any condition of a project or undertaking that may cause any change in the quality of the historical, architectural, archaeological, or cultural character of a property that qualifies for the National Register. An undertaking is considered to have an effect when any aspect of the undertaking changes the integrity of location, design, setting, materials, workmanship, feeling, or association of the property that contributes to its significance according to the National Register criteria. Direct effects are caused by the undertaking and occur at the place and time of the undertaking. Indirect effects are those caused by the undertaking that are later in time or further removed in distance, but are still reasonably foreseeable.

- *Environmental Assessment* - refers to the statement prepared by the installation in order to determine whether an environmental impact statement must be prepared. It contains an evaluation of the proposed action and the effects it would have on the environment.

- *Floodplain* - the 100-year floodplain is the lowland area adjoining inland and coastal waters, including flood prone areas of offshore islands, that would be inundated by the base (100-year) flood. The critical actions (or 500-year) floodplain is the area that would be inundated by a 500-year flood.

- *FONSI (Finding Of No Significant Impact)* - a document that briefly presents the reasons why an action not otherwise excluded does not need an Environmental Impact Statement (EIS).

- *Historic Preservation* - identification, evaluation, recording, documentation, curation, acquisition, protection, rehabilitation, restoration, management, stabilization, maintenance, and reconstruction of cultural resources, and any combination of the foregoing.

- *Inventory* - to determine the location of cultural resources that may have significance.

- *Jeopardize the Continued Existence of* - to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

- *Material Remains* - physical evidence of human habitation, occupation, use, or activity, including the site, lock, 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; and (10) any portion or piece of any of the foregoing.

- *MOA (Memorandum of Agreements)* - the documentation of mutually agreed to statements of facts, intentions, procedures, and parameters for future actions and matters of coordination.

- *MOU (Memorandum of Understanding)* - Memorandums of Understanding are used for the documentation of mutually agreed parameters within which interservice, interdepartmental/agency and/or intraservice support agreements will be developed.

- *Mitigation* - lessening of the adverse effects an undertaking may cause on historic properties. Mitigation can include: (1) limiting the magnitude of the action; (2) repairing, rehabilitating, or restoring the effected property; (3) recovering and recording data from cultural properties that may be destroyed or substantially altered; (4) avoiding the effect altogether by not taking an action, or part of an action, or by relocating the action; (5) reducing of eliminating the effect over time

by preservation and maintenance operations during the life of the actions; and (6) compensation for effect by providing substitute resources or environments.

- *Multiple Use* - the integrated, coordinated, and compatible use of various natural resources to derive the best benefit while perpetuating and protecting those resources.

- *Natural Resources Management - action taken to manipulate, alter, or manage environmental, human, and natural resources in harmony with each other to meet present and future needs.*

- *Negligible Impact* - an impact that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

- *Nonpoint Source Pollution* - a diffuse source of water pollution that does not discharge through a pipe, such as runoff from construction activities and agricultural, silvicultural (forestry), and urban areas.

- *NOI (Notice Of Intent)* - a notice that an EIS will be prepared and considered. It should contain: (a) a description of the proposed action and possible alternatives, (b) the proposed scoping process and schedule, and (c) the name and address of the person who can give more information.

- *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.

- *Property* - a site, building, object, structure, or a collection of the above that forms a district.

- *Protection* - the act or process of applying measures designed to affect the physical condition of a property by defending or guarding it from deterioration, loss, or attack, or to cover or shield the property from danger or injury. In the case of buildings and structures, such treatment is generally of a temporary nature and anticipates future historic preservation treatment; in the case of archaeological sites, the protective measure may be temporary or permanent.

- *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.

- *Sustained Yield* - production of renewable natural resources at a level where the productive capacity of the resource is not reduced. Sustained yield management

provides an annual or periodic yield and perpetuation of the managed resource.

- *Wetlands* - areas inundated by surface water or groundwater with a frequency sufficient to support (and under normal circumstances does or would support) a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, mud flats, and natural ponds.

NATURAL AND CULTURAL RESOURCES MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS	CONTACT THESE PERSONS OR GROUPS(*)
All installations	4-1 through 4-2	
All the installations with natural resources to manage	4-3 through 4-6	(1)
If the installation has recreation resources	4-7	(1)
If the installation has commercial forests to manage	4-8	(1)
If the installation has fish and wildlife	4-9	(1)
If the installation has endangered or threatened species	4-10	(1)
If the installation has cultural resources	4-11 through 4-12	(2)

(*) CONTACT/LOCATION CODE:

(1) Natural Resources Manager [or Environmental Coordinator]
(2) Historic Preservation Officer [or Environmental Coordinator]

NATURAL AND CULTURAL RESOURCES MANAGEMENT

Records to Review:

- For construction activities: documentation of finding of no adverse effect.
- Environmental Impact Statement
- Installation Master Plan
- Land Use Plan
- Historic Preservation Plan
- Fish and Wildlife Plan
- Outdoor Recreation Plan
- Cropland and Grazing Plan
- Forest Management Plan

Physical Features to Inspect:

- Construction sites
- Site or landmark of historic of archaeological interest
- Facilities constructed in the past 2 years
- Wildlife containment areas
- Wildlife habitat, and land and water resources
- Equipment which could damage wildlife, its habitat, or land and water resources

Sources to Interview:

- Natural Resources Manager (or Environmental Coordinator)
- Historic Preservation Officer (or Environmental Coordinator)

COMPLIANCE CATEGORY NATURAL & CULTURAL RESOURCES MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
4-1. Determine actions or changes since previous evaluation of natural and cultural resources management.	• Obtain copy of previous review to determine whether noncompliance issues have been resolved. (1)
...	...
4-2. Copies of all relevant Federal, DoD, and Air Force regulations, directives and guidance documents on natural and cultural resources should be maintained at the installation (GMP).	• Copies of the following documents are maintained and kept current at the installation: (1)(2) - AFR 126-1, *Conservation and Management of Natural Resources* - AFR 19-9, *Interagency and Intergovernmental Coordination of Land, Facility, and Environmental Plans, Programs, and Projects* - AFR 19-3, *Environmental Impact Analysis Process (EIAP) Overseas* - DoD Directive 4700.4, *Natural Resources Management Program* - DoD Directive 4700.7, *Natural Resources* - DoD Instruction 4710.1, *Archaeological and Historic Resources Management* - local regulations.
...	...
4-3. The installation should have a current and approved, integrated natural resources plan consistent with local policy on conservation and management of natural resources (DoD Directive 4700.4, AFR 126-1).	• A current and approved consolidated natural resources plan is encouraged by Air Force policy to coordinate all aspects of natural resources management. The plan should include: (1) - land management - grazing and cropland management - forest management - fish and wildlife management - outdoor recreation.
...	...
4-4. Personnel should be designated and trained for natural resources responsibilities (DoD Directive 4700.4).	• Determine if authorized natural resources positions are filled and the personnel are assigned natural resources duties. (1) • Since professionally trained personnel are required to manage natural resources programs, installations must obtain professional help in at least one of the following ways: - professionally trained staff - contract consultants - outside agencies - specific continuing education for nonprofessionally trained staff. • Determine if personnel assigned natural resources duties are adequately trained.
...	...

(1) Natural Resource Manager [or Environmental Coordinator] (2) Historic Preservation Officer [or Environmental Coordinator]

COMPLIANCE CATEGORY NATURAL & CULTURAL RESOURCES MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS**	**REVIEWER CHECKS:**
4-5. Installations must have land management plans which are in harmony with modern conservation practices and that are continuously applied in an orderly and timely manner (DoD Directive 4700.4, AFR 126-1).	• Obtain a copy of the land management plan and determine if:(1) - There is a program for controlling noxious weeds. - There is a program for controlling nonpoint source pollution. - The land management plans are current and have been approved by Major Command (MAJCOM) within the previous five years.
...	...
4-6. Floodplains and wetlands should be identified and protected (DoD Directive 4700.4, AFR 19-9).	• Review the Base Comprehensive Plan (BCP) and land management plan and determine if floodplains and wetlands are identified and protected. (1) • Determine if the Land Management Plan is current. • Determine if floodplains and wetlands are identified, and guidelines are given for their protection and management in the Land Management Plan.
...	...
4-7. Installations with recreation resources will develop outdoor recreation plans (DoD Directive 4700.4, AFR 126-1).	• If survey indicates recreation resources are present, obtain a copy of the outdoor recreation plan and determine if: (1) - The plan is current and has been approved by the MAJCOM within the previous 5 years. - Land is designated according to its suitability and availability for outdoor recreation. - The carrying capacity (maximum allowable, nondestructive level of use) of recreation areas and procedures for monitoring use and condition are given. - When ORV use is permitted, an ORV plan that protects natural and cultural resources has been developed and approved, and the installation has an ORV regulation.
...	...

(1) Natural Resource Manager [or Environmental Coordinator] (2) Historic Preservation Officer [or Environmental Coordinator]

COMPLIANCE CATEGORY NATURAL & CULTURAL RESOURCES MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
4-8. Installations with 50 acres of commercial forest land should develop a forest management plan that provides for the sustained yield of timber and related natural resource values (DoD Directive 4170.7, AFR 126-1).	• Determine if the installation has 50 acres of forest land available for land management. • Determine if the installation has a written forest management plan. • Review the plan and determine if: (1) - The forest management plan is current and has been approved by the MAJCOM within the last 5 years. - All forest lands suitable and available are identified. - Spot-checks are made at least once a week during active operations, and at least one systematic inspection is made of each sale over $2000, and the findings are documented and filed with the sales contract. - AF Form 2693 (Forest Management Budget) is prepared. - Forestry funds are only used for approved forestry work. - All income from the forest product sales is properly accounted for and deposited.
...	...
4-9. Installations with fish and wildlife habitat should develop fish and wildlife management plans to improve habitat (DoD Directive 4700.4, AFR 126-1).	• Determine if the installation has been surveyed to identify presence of fish and wildlife habitat, including endangered species. • If the installation has fish and wildlife habitat, obtain a copy of the installation fish and wildlife management plan and determine if: (1) - The cooperative agreement has been signed by the U.S. Fish and Wildlife Service (USFWS) and local wildlife management agency. - The fish and wildlife plan is current and approved by the MAJCOM within the previous 5 years. - Wildlife habitat for specific species has been identified. - Permits for hunting, fishing, and trapping are issued on an impartial basis; Club membership cannot be a prerequisite. - Fees for hunting, fishing, and trapping are collected, properly accounted for, deposited. - All users are charged the same fee (except for youths and senior citizens). - AF Form 2639 (Fish and Wildlife Budget) is submitted. - Funds are only used for approved fish and wildlife projects.
...	...
4-10. All installations with endangered species must carry out programs for their conservation (DoD Directive 4700.4, DoDI 4170.6, AFR 126-1).	• Obtain a copy of the fish and wildlife management plan and documentation. Determine if:(1) - Endangered species habitat has been identified. - A program to protect critical habitat and to conserve the species has been developed.
...	...

(1) Natural Resource Manager [or Environmental Coordinator] (2) Historic Preservation Officer [or Environmental Coordinator]

COMPLIANCE CATEGORY NATURAL & CULTURAL RESOURCES MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
4-11. The installation must identify all cultural resources prior to beginning any undertaking that can result in changes in the character or use of these properties.	• Determine whether the agency has actions that would constitute an undertaking (including construction, repair, demolition, rehabilitation, etc.). • Confirm that the installation routinely determines the area of potential effects for any undertaking. (2) • Determine whether all sources of information about the area of potential effect are routinely consulted (local governments). • Determine whether the installation makes a good-faith effort to locate and collect data on all potential cultural properties (surveys). • Verify that the installation assesses the proposed undertakings effect on the properties to determine if the criteria of effect and adverse effect apply.
...	...
4-12. Any sites of known archaeological, historical, or cultural significance should be managed appropriately and treated with respect (GMP).	• Verify that archaeological sites are protected from destruction by erosion and/or by human activities. • Determine if historic structures are maintained without destroying their integrity. Repairs and remodeling should match original material and style. • Verify that grave sites, monuments, and other culturally significant sites are maintained and treated with respect.
...	...

(1) Natural Resource Manager [or Environmental Coordinator] (2) Historic Preservation Officer [or Environmental Coordinator]

INSTALLATION:	COMPLIANCE CATEGORY NATURAL & CULTURAL RESOURCES MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

(1) Natural Resource Manager [or Environmental Coordinator] (2) Historic Preservation Officer [or Environmental Coordinator]

Section V

Environmental Noise Management

SECTION V

ENVIRONMENTAL NOISE MANAGEMENT

A. Applicability of this Protocol

This protocol applies to all Air Force installations that have aircraft operations, including airfields, ranges, military operating areas (MOAs), military training routes (MTRs), and small-arms training, or other aircraft-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. Noise effects are addressed by Base Comprehensive Planning (BCP), Air Force Regulation (AFR) 55-34, the Environmental Impact Analysis Process (EIAP), Air Force Manual 19-10, and Host Country regulations.

B. DoD Regulations

- None.

C. U.S. Air Force Regulations

- AFR 50-46, *Weapons Ranges*, provides instructions for the planning, acquisition, construction, operation, and maintenance of training ranges.

- AFR 55-34, *Reducing Flight Disturbances*, establishes practices to decrease disturbances from flight operations. It provides guidelines for planning operations with consideration for noise.

D. Responsibility for Compliance

- The Airspace Manager under the Deputy Commander for Operations is responsible for managing special use airspace and MTRs.

- The Public Affairs Office (PAO) is responsible for making all public releases of information about Air Force activities.

- The Range Management Agency is responsible for activities at an air-to-ground range, including planning for the range.

E. Key Compliance Definitions

- *Airspace Management* - AFR 55-34 requires planning of flight operations to minimize adverse public relations. Air Force operations must be planned to avoid noise-sensitive areas.

- *Range Planning* - AFR 50-46 requires planning for air operations and land use on air-to-ground test and training ranges for safety, prevention of encroachment, optimal use, and avoidance of conflicts. Each plan must include all reasonable, economical, and practical measures to control aircraft noise. Plans must be updated at least every 2 years, or sooner if required.

ENVIRONMENTAL NOISE MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
All installations	5-1 through 5-3	(1)
If the installation has active runways	5-4 through 5-12	(1)(2)(4)
If the installation operates an air-to-ground range	5-9 and 5-10	(1)(4)
If the installation has highway transport	5-11 and 5-12	
If the installation has MTRs or special airspace	5-13 and 5-14	(1)(2)(3)(4)
If the installation has special noise restrictions	5-15 through 5-18	(2)(3)

(*) CONTACT/LOCATION CODE:

(1) BCE [Base Civil Engineering (Environmental/Community Planning)]
(2) Deputy for Operations [Air Space Manager]
(3) Public Affairs Office
(4) Range Operating Agency

ENVIRONMENTAL NOISE MANAGEMENT

Records to Review:

- Facility Master Plan Document
- Complaint log from local community

Physical Features to Inspect:

- Power generators or other noise
- Emergency generators
- Test tracks

Sources to Interview:

- BCE [Base Civil Engineering (Environmental/Community Planning)]
- Deputy for Operations [Air Space Manager]
- Public Affairs Office
- Range Operating Agency

COMPLIANCE CATEGORY: ENVIRONMENTAL NOISE MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS:**	**REVIEWER CHECKS:**
5-1. Determine actions or changes since previous review of noise management.	• Review copy of previous report and determine if noncompliance issues have been resolved. (1)
...	...
5-2. Copies of all Federal, DoD, and Air Force regulations, directives, and guidance on noise management should be maintained at the installation (GMP).	• Copies of the following regulations are maintained and kept current at the installation: (1)(2) - AFR 50-46, *Weapon Ranges* - AFR 55-34, *Reducing Flight Disturbances.*
...	...
5-3. If noise from other than aircraft operations can be heard outside the facility boundary, review Host Nation, and local requirements.	• Tour populated areas adjacent to base boundary. (A recommendation for further study will usually be appropriate since noise measurements will not usually be available to the evaluator). (1)
...	...
5-4. Each installation with an active runway should prepare and maintain a map defining aircraft noise levels and accident potential areas in and around the installation (AFR 19-9, para 3-1).	• Determine if the installation has prepared a noise contour map. (1)
...	...
5-5. The installation should review noise contour maps biennially, and update as necessary (GMP).	• Verify date of last review/update. (1)
...	...
5-6. Aircraft noise disturbances are minimized through the application of the planning checklist (AFR 55-34).	• Determine how the installation complies with AFR 55-34. (1)(2)
...	...

(1) BCE [Base Civil Engineering (Environmental/Community Planning)] (2) Deputy for Operations [Airspace Manager] (3) Public Affairs Officer (4) Range Operating Agency

COMPLIANCE CATEGORY: ENVIRONMENTAL NOISE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
5-7. Local noise-sensitive areas are identified in the Flight Information Publication (FLIP) and Chapter 8 of the Local Operating Procedure (AFR 55-34).	• Review maps and lists of areas. (2)
...	...
5-8. Pilots are kept informed on measures to reduce noise disturbance (AFR 55-34, para 7).	• Obtain copy of pilot information file. (2) • Review local noise abatement instructions for pilots regarding approaches and departures.
...	...
5-9. A range plan that addresses noise problems is recommended for all air-to-ground training and test ranges (AFR 19-9, Chapter 6).	• Review copy of range plan. (1)(4)
...	...
5-10. The range plan will be updated at a minimum of every 2 years, or as required (AFR 50-46, para 1-3).	• Determine date of last revision. (4)
...	...
5-11. Motor carriers operating on public roads must control their noise pollution emissions (GMP).	• Check that noise emission levels are not exceeded where required.
...	...
5-12. All motor vehicles to be operated on the highway should be equipped with a muffler or other type of exhaust system to prevent excessive or unusual noise (GMP).	• Check if motor vehicles have exhaust system.
...	...

(1) BCE [Base Civil Engineering (Environmental/Community Planning)] (2) Deputy for Operations [Airspace Manager] (3) Public Affairs Officer (4) Range Operating Agency

COMPLIANCE CATEGORY: ENVIRONMENTAL NOISE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
5-13. Each installation commander will establish a program to distribute information on noise-sensitive areas under MTRs (Military Training Routes), special-use airspace, and supersonic areas, and routes to air crews (AFR 55-34, para 3g).	• Review scheduling procedures for MTRs and special-use airspace with regard to noise-sensitive areas. (2)(4)
...	...
5-14. Each installation commander will establish procedures for researching aircraft noise, sonic boom, or small-arms training inquiries and complaints (AFR 55-34, 3g[6]).	• Review copy of procedures. (1)(3) • Review sonic boom logs. (3) • Review small-arms training schedule, and inquiry and complaint replies as to date/time of incident. (3)
...	...
5-15. The installation may need to comply with noise restrictions for engine run-up pads.	• Inspect engine run-up pads for site location and for noise suppression equipment. • Determine if there have been any complaints about noise. (3)
...	...
5-16. Host country or local ordinance may impose quiet-hours on the base.	• Determine if the installation has quiet hours. (2)(3) • Determine whether these hours are imposed or voluntary. (2)(3) • Determine if the installation has received complaints from local people for not following the quiet hour policy. (3)
...	...
5-17. The installation may have restrictions imposed on low-flying aircraft.	• Determine if the installation is required to follow restrictions regarding low-flying aircraft (e.g., minimum altitude, seasonal restrictions, etc). (2)(3) • Determine if the base has a complaint procedure and if any complaints have been received. (3)
...	...

(1) BCE [Base Civil Engineering (Environmental/Community Planning)] (2) Deputy for Operations [Airspace Manager] (3) Public Affairs Officer (4) Range Operating Agency

COMPLIANCE CATEGORY: ENVIRONMENTAL NOISE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
5-18. Installations may be required by Host Nation to avoid flying over certain areas.	• Determine if the installation is required to avoid certain areas during flight maneuvers (e.g., populated areas). (2)(3) • Review records for violations of these requirements and determine whether they were resolved. (3)
...	...

(1) BCE [Base Civil Engineering (Environmental/Community Planning)] (2) Deputy for Operations [Airspace Manager] (3) Public Affairs Officer (4) Range Operating Agency

INSTALLATION:	COMPLIANCE CATEGORY: ENVIRONMENTAL NOISE MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

(1) BCE [Base Civil Engineering (Environmental/Community Planning)] (2) Deputy for Operations [Airspace Manager] (3) Public Affairs Officer (4) Range Operating Agency

Section VI

Pesticide Management

SECTION VI

PESTICIDE MANAGEMENT

A. Applicability of this Protocol

This protocol applies to any U.S. Air Force (USAF) installation that uses, stores, or handles pesticides. This protocol integrates the requirements of Department of Defense (DoD) and USAF regulations into a single document that normally will apply to any installation which handles pesticides.

Much of the guidance for pest management involves operations 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, and personnel qualifications.

The regulatory requirements in this protocol are based on DoD and Air Force regulations that apply at overseas installations. Good Management Practices (GMPs) are derived from U.S. Environmental Protection Agency (EPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force employees and protect the environment. Any procedural EPA requirements, such as permits and notifications, are not applicable overseas, and, therefore, are not in the worldwide manual. GMPs in the pesticides protocol are derived from the following EPA regulations: 40 Code of Federal Regulations (CFR) 165 and 40 CFR 171.

B. DoD Regulations

- DoD Directive 4150.7, *Department of Defense Pest Management Program*, 24 October 1983 sets forth the policy, responsibilities, and procedures for pest management programs. This directive 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 or damage structures, material, or property. The DoD Plan for the Certification of Pesticide Applicators stipulates the certification of U.S. Air Force military and civilian pest managers.

- DoD Directive 4150.7 is supplemented by Technical Information Memoranda (TIM) that provide specific criteria and procedures for the operation of pesticide spill prevention and management, which addresses cleanup procedures for pesticide spills. The TIMs are guidance only, and nonregulatory. The following are appropriate to have on hand: TIM 14 *Protective Equipment for Pest Control Personnel*; TIM 15 *Pesticide Spill Prevention and Management*; TIM 16 *Pesticide Fires: Prevention, Control, and Cleanup*; TIM 17 *Pest Control Facilities*; TIM 18

Installation Pest Management Program Guide; TIM 21 *Pesticide Disposal Guide for Pest Control Shops*.

- Assistant Secretary of Defense (ASD) Letter, *DoD Building Construction and Use of Termiticides*, 14 June 1984, prohibits the use of termiticides in buildings with sub-slab or intra-slab heating, ventilation, or air conditioning ducts.

C. U.S. Air Force Regulations

- Air Force Regulation (AFR) 91-21, *Pest Management Programs*, provides the functional requisites for the operation of pest management programs at Air Force installations. The standards, procedures, and requirements identified in this regulation provide a large portion of the criteria for the assessment of compliance. AFR 91-21 and DoD 4150.7 require a Major Command (MAJCOM) professional pest management person (PPMP) to do an on-site consultant review of each installation annually or bi-annually. The ECAMP assessment does not preclude this PPMP consultant visit.

- AFR 91-22, *Aerial Dispersal of Pesticides*, details the policies and responsibilities for aerial spray of pesticides.

D. Responsibility For Compliance

- Base Civil Engineering (BCE) assures that pest management facilities comply with all applicable USAF, DoD, and Host Nation regulations and standards; submits annual reports; assumes responsibility for the completion of daily records, inspections, requests for additional support, biennial physical examinations, notifications to Director of Base Medical Services (DBMS), the protection of the health and safety of pest management personnel, and the required training and certification/recertification of pesticide applicators. The pest management shop within BCE is the principal department charged with proper pesticide management at Air Force installations.

- DBMS identifies and characterizes pests; recommends measures for personal protection and pest control; monitors pests of medical importance; provides industrial hygiene and environmental sanitation assistance; and assures that pest management personnel are physically qualified to work with pesticides.

E. Key Compliance Definitions

These definitions were obtained from DoD and Air Force regulations previously cited in this protocol.

- *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").

- *Commercial Applicator* - a certified applicator, other than a private applicator, who uses or supervises the use of any pesticide, for any purpose, on any property, or performs other pest-control-related activities.

- *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").

- *Fumigant* - any pesticide which by itself, or in combination with any other substance, emits or liberates a gas, gases, fumes, or vapors, and which gas, gases, fumes, or vapors when liberated and used will destroy, control, or mitigate a pest, and is usually lethal, poisonous, noxious, or dangerous to human life.

- *Imminent Hazard* - a situation which exists when the continued use of a pesticide during the time required for cancellation proceedings would be likely to result in unreasonable adverse effects on the environment or will involve unreasonable hazard to the survival of a species declared endangered by the Department of the Interior under Public law 91-135.

- *Pesticide* - any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate any pest; also any substance or mixture of substances as a plant regulator, defoliant, or dessicant.

  1. "Excess pesticides" means all pesticides that cannot be legally sold pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) or which are to be discarded.

  2. "Organic pesticides" means carbon-containing substances used as pesticides, excluding metallo-organic compounds.

  3. "Inorganic pesticides" means noncarbon-containing substances used as pesticides.

  4. "Metallo-organic pesticides" means a class of organic pesticides containing one or more metal or metalloid atoms in the structure.

- *Professional Management Personnel* - military officers commissioned in the Medical Services 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 should also meet appropriate Office of Personnel Management qualification standards.

- *Restricted-Use Pesticides* - pesticides designated for restricted use under the provisions of Section 3 (d)(1)(c) of FIFRA. These pesticides should only be used by certified applicators or by persons working under their supervision (40 CFR 162.30). Restricted-use pesticides are identified on the label (see Appendix VI-1).

- *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 by any of the indicators in the table listed in 40 CFR 162.10.

- *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" (see definition of "Toxicity Category").

PESTICIDE MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
All the installations that apply, store, mix, prepare, or dispose of pesticides	6-1 and 6-2	(1)(2)(4)
If the installation engages in application of pesticides	6-3 through 6-10	(1)(3)(4)(5)
If the installation has facilities which store, mix, or prepare pesticides	6-11 through 6-23	(1)(4)(5)(6)
If the installation disposes of pesticide wastes	6-24 through 6-27	(1)(4)(5)
If the installation uses pesticides which meet the criteria of Toxicity Category I, II, III, or IV	6-28	(1)(4)(5)

(*)CONTACT/LOCATION CODE:

(1) BCE [Base Civil Engineering]
(2) BEE [Bioenvironmental Engineering]
(3) BMS [Base Medical Services]/EHO [Environmental Health Office]
(4) Pest Management Shop
(5) Golf Course Maintenance
(6) Base Fire Chief
(7) Base Contracting Office

PESTICIDE MANAGEMENT

Records to Review:

- Records of pesticides purchased by the facility (purchase orders, inventory)
- Pesticide application records
- Description of the facility's pest control program
- Certificates of applicators of restricted-use pesticides
- Facility applicator certification and training program, including documentation of federal approval program
- Pesticide disposal manifests
- Any emergency exemption granted to the Federal agency by the EPA

Physical Features to Inspect:

- Pesticide application equipment
- Pesticide storage areas, including storage containers
- Golf course maintenance areas

Sources to Interview:

- BCE [Base Civil Engineering]
- BEE [Bioenvironmental Engineering]
- BMS/EHO [Environmental Health Office]
- Pest Management Shop
- Golf Course Maintenance
- Base Fire Department
- Base Contracting Officer

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
6-1. Determine actions or changes since previous review of pesticide management. (NOTE: The term "pesticide" in this protocol refers to insecticides, herbicides, rodenticides, and other pest control chemicals.)	• Obtain copy of previous review and determine if noncompliance issues have been resolved. (1)(2)
...	...
6-2. Copies of all relevant Host Nation and local regulations, and DoD and USAF directives and guidance documents on pesticide management should be maintained at the installation (AFR 19-1, Section C).	• Determine if the following documents are available at the installation: (1)(4) - AFR 91-21, *Pest Management Program* - Armed Forces Pesticide Management Board (AFPMB) TIM 11, 13, 14, 15, 16, 17, 18, 19, 20, 21 - AFOSH Standard 161-1, *Respiratory Protection Program.* • Determine if copies of Host Nation and local pesticide regulations are maintained at the installation. (1) • Examine regulations with base environmental staff. Determine if the staff is familiar and knowledgeable of pesticide management regulations.
...	...
6-3. Application of pesticide may require a permit.	• Identify pest control operations undertaken at base. (4)(7) • Review requirements of relevant regulations and determine if permit is required. (4)(7) • Determine if permit is current and applicable to the base's pest control operations. (4)(7) • Determine if pesticide applications are performed by base golf course personnel.(5) (NOTE: The storage, application, and disposal of pesticides by golf course personnel may be regulated. Inspect any pesticide storage facilities operated by golf course personnel and include in review all aspects of such pesticide applications.)
...	...

(1) BCE [Base Civil Engineering] (2) BEE [Bioenvironmental Engineering] (3) BMS [Base Medical Service]/EHO [Environmental Health Office] (4) Pest Management Shop (5) Golf Course Maintenance (6) Base Fire Chief (7) Base Contracting Office

COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-4. Application of pesticides must be conducted by a person who is a certified applicator, or by a person acting under the direct supervision of a certified applicator (AFR 91-21, para 2c(6), 2c(9), 2d(1)(b); and DoD 4150.7).	• Review the certification status of pesticide applicators. Determine if a sufficient number of applicators are certified (Appendix VI-1). (4)(7) • Verify that recertification is scheduled and performed every 3 years and that certification is relevant to the pest management activities which are undertaken. (4) • Determine if contractors are utilized for pest management and verify certification status. Interview Base Contracting Officer and determine if all pest control contracts, including grounds maintenance and termiticiding, are renewed and approved by the MAJCOM, PPMP, and the Pest Management Shop. (1)(4)(7)
...	...
6-5. Health monitoring must be provided for all persons involved in the management or application of pesticides (AFR 91-21, para 2d[l][k]).	• Verify that all pest management personnel have received baseline physical examinations within 30 days of starting pest management work. (3)(4) • Determine if pest management personnel receive additional physical examinations twice each year. (3)(4) • Check that cholinesterase tests are given to pest management personnel working regularly with pesticides which contain organophosphates or n-alkylcarbamates. (3)
...	...
6-6. Records must be maintained and summary reports written for pest management activities (AFR 91-21, para 2d[l][e] and [h], and para 9).	• Verify that daily pesticide application records are maintained by use of DD Forms 1532, 1532-1 and AF Form 290. (4) • Determine that the Pest Control Summary Report (RCS: DD-M [A&AR or DoD Form 1532 or Work Information Management System (WIMS) equivalent]) (1080) is prepared quarterly. (1)(4) • Check that the Annual Review of Pest Control (RCS: DD-M[A] 1224) and that the Pest Management Program Review (AF Form 646) (or WIMS equivalent) are completed and forwarded to MAJCOM by 1 December of each year. The shop should have verification of MAJCOM approval for the current year program. (1)(4)
...	...

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-7. Notification and/or approval must be made for certain pesticide application activities (AFR 91-21, para 2d[1]).	• Review procedures to ascertain whether BMS is notified prior to any pesticide applications in food preparation, consumption or storage areas and areas where a high risk exists for human contact with applied pesticides. (3) • Verify that BMS is notified of all pesticides procured for pest management use. (3)(4) (NOTE: BMS does not approve or direct what pesticides are produced and used. MAJCOM PPMP is responsible.) • Check that BMS is notified prior to the performance of any fumigation activities. (3)(4)
...	...
6-8. Equipment used for pesticide applications must be dedicated only to the pest management operation and may be required to be specifically equipped (AFR 91-21, para 5c).	• Verify that vehicles and dispersal equipment are solely used in support of pest management activities. (4)(5) • Verify that vehicles (prime movers) used for fogging, misting, dusting or ultra-low volume (ULV) application are equipped with air conditioning. (4)(5)
...	...
6-9. Pesticide residues should be monitored as required by DoD and USAF to determine the impact of pesticides on the environment (AFR 91-21, para 2c[5]).	• Interview with BCE and BEE to determine if monitoring of pesticide residues is performed. (1)(4)
...	...
6-10. Insecticides must not be injected into the soil to control subterranean termites in any military buildings with sub-slab or in-slab heating systems unless such systems are made inoperable and duct registers are blocked to prevent air flow (AFR 91-21, para 2d[1][o]).	• Determine if pesticide applications are undertaken to control subterranean termites. (4) • Determine if any structures on base have in-slab or sub-slab heating systems. (1)(4) • Determine if subterranean termite control is undertaken at any building within slab or sub-slab heating systems. (1)(4)
...	...

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-11. Facilities used for the storage, mixing, and preparation of pesticides must be constructed in a manner that promotes cleanliness, safety, and environmental protection (AFR 91-21 para 2d[1][a]).	• Assess whether the pesticide storage facility is co-used with other non-related functions. (4)(5) • Verify that pesticide storage, mixing, and preparation are undertaken in an enclosed area separate from all other facilities including laundry, office and shower. (4)(5) • Assess whether office, locker, changing rooms, laundry, and toilet facilities are adequately sealed or separated from pesticide storage, mixing, and preparation areas so that pesticide vapors and dusts are excluded. (4)(5) • Determine whether pesticide application and support equipment is stored as follows: - Small equipment should be stored in an enclosed indoor area. (4)(5) - Large equipment should be stored in a covered or enclosed area. (4)(5)
...	...
6-12. Concentrated pesticides should not be released to sanitary wastewater or storm water drains (AFR 91-21, para 2d[1][a][3]).	• Determine if a system or set of procedures exist to prevent spilled or excess pesticides from entering the sanitary wastewater or storm water systems. (4)(5) • Locate pesticide mixing areas and assess proximity and accessibility to wastewater or storm water system. (4)(5) • Observe drains and floors for evidence of spills or improper disposal practices. (4)(5) • Emergency eyewash and emergency shower should not be connected to the sanitary or storm sewer system.
...	...
6-13. A spill containment system constructed of impervious materials shall exist to effectively provide containment for pesticide storage, mixing, preparation, and management areas (AFR 91-21, para 2d[1][a][4]).	• Inspect for curbing around the required areas. (4)(5) • Inspect for drains and cracks in floors. (4)(5) • Interview pest management personnel as to spill response procedures. (4)(5) • Verify that response procedures are understood by staff.
...	...

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-14. Storage, mixing or preparation areas for pesticides bearing the "warning" or higher toxicity symbol shall have absorbent material for spill control (GMP).	• Inspect for clay, hydrated lime, sodium hypochlorite or other suitable spill-absorbent material. (4) (5)
...	...
6-15. Pesticide containers must be stored in good condition and stored in a manner that promotes safe storage, handling, and transportation (GMP).	• Inspect storage facilities and observe if pesticides are maintained in strong boxes or other adequate containers. (4)(5)
...	...
6-16. Facilities used for storing pesticides bearing the "warning" or higher toxicity symbols must provide additional safeguards for safe storage (GMP).	• Inspect pesticide containers and determine if pesticides bearing the "warning" or higher toxicity symbols are present. (4)(5) • Inspect pesticide storage areas and determine that: (4)(5) - All pesticide containers are kept closed when not in use. - Pesticide storage is in a dry, well ventilated area that is separate from other operations. - Pesticide containers are stored upright, above the facility floor level and arranged according to type, with labels plainly visible. - lids, bungs, and seams of pesticide containers, rigid or otherwise, are tight so no leakage of pesticides occurs.
...	...

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-17. Pest management programs which use pesticides bearing the "warning" or higher toxicity symbols should have decontamination facilities (AFR 91-21[2]d[1]a[4]).	• Determine if facilities are available for personnel decontamination. Ask where this activity is performed. (4)(5) • Check if facilities are available for the decontamination of vehicles used for pesticide application. (4)(5) • Inspect for berms, curbing, impervious surfaces, and catchment drains used to impound wash water resulting from decontamination. (4)(5) • Verify that drains impound wash water and do not connect to the sanitary sewer (if the sewage treatment plant is not capable of taking vehicle rinse water) or storm water systems. (4)(5) • Determine the procedure for disposal of wash water resulting from decontamination activities. Wash water must be disposed of through Defense Reutilization Marketing Office (DRMO) or reused as part of the mixing water. (4)(5)
...	...
6-18. Storage, mixing, and preparation facilities that handle pesticides bearing the "warning" or higher toxicity symbols shall comply with certain standards (GMP).	• The following facility standards apply: - Site location, where possible, shall be in an area where flooding is unlikely and where hydrogeologic conditions will prevent the contamination of any water system by runoff or percolation (GMP). - An environmental monitoring system should exist for facilities that do not have a spill management system when such facility handles large quantities of pesticides and is located near a sensitive environmental receptor (GMP). - Storm water runoff collection should be performed at facilities from which pesticide-contaminated runoff could emanate (GMP). - Fire protection equipment should be provided at appropriate locations (GMP).

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-18. (continued)	• Inspect area surrounding facilities and determine proximity to surface water. (4) • Inquire with BCE as to location of floodplains, depth to groundwater, general soil types, and typical permeabilities. (1) • Determine if spill management plan exists and if it is tested. (1) • Review installation spill plan for pesticides. • Identify the approximate quantity of pesticides and location of sensitive environmental receptors. (4) • Determine if groundwater, or surface water, or air monitoring program exists to determine the effect, if any, caused by pesticide storage, mixing, and preparation. (4) • Assess facility operations and layout and determine if operations are likely to allow the runoff of water that may have contacted pesticides. (4) • Inspect storm water runoff collection system and ascertain whether the system is adequate and if it is properly working. (4) • Look for discolored/stained pavement and soil along drainage pathways. (4) • Look for fire extinguishers rated to exterminate chemical-type fires. (4) • Check location and accessibility in proximity to storage and mixing areas. (4)
...	...
6-19. Pesticide storage, mixing, and preparation facilities must provide facilities and procedures to ensure the safety of personnel (GMP and AFR 91-21, para 2d[1][a]).	• Determine if a ventilation system is specifically provided for all indoor pesticide mixing/preparation areas. (4)(5) • Determine if mixing area ventilation is designed for six air changes per hour. (4)(5) • Determine if storage area ventilation is designed for two air changes per hour. (4)(5) • Determine if the ventilation system is periodically assessed by base medical services for compliance with Air Force Occupational safety and Health (AFOSH) Standard 161.2. (3) • Check to see that an emergency deluge shower and eye wash station is present at the facility and located to provide immediate access to all personnel performing mixing. (4)(5)

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-19 (continued)	• Check to see that personal protective clothing and equipment is provided and regularly used by the pest management personnel. This equipment should consist of the following depending upon the magnitude and type of operations: (4)(5) - respirators - masks - gloves - safety shoes - coveralls - specialized personal protective equipment for fumigation. • Observe facilities and operations and determine if health and safety procedures emphasize good work habits, reduce or eliminate hazards, and assure the use of personal protective equipment. (4)(5)
...	...
6-20. Storage, mixing, and preparation facilities that handle pesticides bearing the "warning" or higher toxicity symbols must provide facilities and procedures to ensure the safety of personnel (GMP).	• Observe the pest management facilities and verify that no food consumption, drinking, smoking, or tobacco use is undertaken in any area where pesticides are present. (4)(5) • Observe pest management operations to determine if the following practices are performed: (4)(5) - Persons handling pesticides keep hands away from mouths and eyes and wear rubber gloves during all pesticide handling. - Persons handling pesticides wash hands immediately upon completion of working with pesticides and always prior to eating, smoking, or using toilet facilities. - Persons handling concentrated pesticides wear protective clothing, which shall be removed if contaminated. - A stock of protective clothing is available. - Self-contained breathing apparatus and impermeable suits worn when handling pesticides that present the potential of being absorbed through the skin. - Inspections are made periodically to determine if any pesticide containers are leaking.
...	...
6-21. Storage, mixing, and preparation facilities and equipment which contain or use pesticides bearing the "warning" or higher toxicity symbols should have signs and safety procedures posted (GMP).	• Look for bilingual (English and common language of host nation) signs that read "Danger: Poison" and "Pesticide Storage" on the near entries to storage facilities. (4)(5) • Determine if safety precautions and accident-prevention measures are posted. (4)(5) • Check that mobile equipment used for pesticide applications is labeled "Contaminated With Pesticides." (4)(5)
...	...

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-22. Security measures shall be provided to assure that only authorized persons can access pesticide storage, mixing, and preparation areas (AFR 91-21, para 2d[1] and para 5a).	• Check to see that a climb-resistant fence completely encloses the facility. (4)(5) • Verify that vehicles used to transport pesticides have locking compartments. (4)(5)
...	...
6-23. Firefighting plans may be required for pesticide facilities that store pesticides bearing the "warning" or higher toxicity symbols (GMP).	• Interview base fire chief and determine if a firefighting plan exists.(6) • Evaluate the firefighting plan and determine if it complies with the following regulatory requirements: - Firefighting personnel shall wear supplied air units and rubberized clothing. - Firefighting personnel wash completely as soon as possible after contacting smoke/vapors. - Persons near a fire who may come in contact with fumes or contaminated surfaces are evacuated. - Water generated during fires is contained. - Firefighting personnel heavily exposed to smoke from burning pesticides that contain organo-phosphates or N-alkyl carbamates receive cholinesterase tests.
...	...
6-24. Disposal must be initiated for all pesticides or pesticide containers that have deteriorated and are not eligible for return to depot stocks (AFR 91-21, para 5e).	• Inquire as to procedures for disposal of pesticides and pesticide containers. (4)(5) • Inspect containers in storage for signs of deterioration. (4)(5)
...	...
6-25. Specific procedures should be followed when disposing of any pesticides or pesticide containers (GMP).	• Determine how pesticides and pesticide containers are disposed of. (4)(5) • Verify that all pesticides and pesticide containers are disposed of in a manner consistent with the label or labeling provided on the container. (4)(5) • Verify that no pesticides or pesticide containers are disposed of by open dumping. (4)(5)
...	...

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COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
6-26. Excess pesticides and/ or pesticide containers that bear the "warning" or higher toxicity symbols should be segregated according to disposal method, and should be disposed of properly (GMP).	• Determine if any pesticide wastes are awaiting disposal. (4) • Observe pesticide wastes and/or inquire as to disposal method and determine if wastes are segregated properly and manifested as a hazardous waste. (1)(4)
...	...
6-27. Certain pesticides contain ingredients that should be carefully monitored to ensure their restricted use (GMP).	• Determine if pesticide products listed in Appendix VI-2 are stored or applied at the installation. (4)(5) • Verify that use of these products is carefully monitored. (4)(5)
...	...
6-28. Pesticides which meet certain toxicity categories shall bear markings on the panel on the front (GMP).	• Inspect pesticide containers to ensure they are appropriately marked: Toxicity Category — Markings I — Danger II — Warning III or IV — Caution • If any base employees from the Host Nation apply, store, mix, prepare, or dispose of any pesticides, the labels should be in English and the Host nation's native language.

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Appendix VI - 1

Requirements for Installation Pest Management Programs

Pest Control Requirement (Productive Man-Years)[1]	*Minimum Number of DoD-, State-, or EPA-Certified Applicators*	*Installation Pest Management Plan*	*On-Site Program Review*[2]
Less than 0.25	None, unless restricted-use pesticides are used or unusually sensitive environmental conditions exist, including those involving endangered species	Individual plan not required, but included in supporting installation pest management plan	Requirements established by pest management consultant reviewing supporting installation's pest management plan
0.25 to 0.49	One	As above	As above
0.50 to 1.49	One	Individual pest management plan required	Annual or biennial
1.50 to 3.99	Two	As above	As above
4 or more	50 percent of the pest management work force	As above	As above

[1] Multiply by a DoD Component constant for nonproductive time, such as annual leave or sickness, to determine the appropriate number of certified and uncertified personnel required.

[2] Applicable sections of TIM 18 (reference [h]) shall be used during each on-site program review.

APPENDIX VI - 2

The following provisions were effective as of 12 August 1988. The table below lists uses of pesticide products containing the active ingredients specified which 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	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.
Acrylonitrile	In combination with carbon tetrachloride. No registrations as the sole active ingredient.	Do	Do	Other hazards accident history of acrylonitrile and carbon tetrachloride products.
Aldicarb	As sole active ingredient	Ornamental uses (indoor and outdoor).	Do	Other hazards accident history.
	No mixtures registered	Agricultural crop uses	Under further evaluation	
Allyl alcohol	All formulations	All uses	Restricted	Acute dermal toxicity.
Aluminum phosphide	As sole active ingredient. No mixtures registered.	Do	Do	Inhalation hazard to humans.
Azinphos methyl	All liquids with a concentration greater than 13.5 %.	Do	Do	Do
	All other formulations.	Do	Under further evaluation	

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
Calcium cyanide	As sole active ingredient. No mixture registered.	Do	Restricted	Do
Carbofuran	All concrete suspensions and wettable powders 40% and greater.	Do	Do	Acute inhalation toxicity.
	All granular formulations	Rice	Under evaluation	
	All granular and fertilizer formulations.	All uses except rice	Do	
Chlorfenvinphos	All concentrate solutions or emulsifiable concentrates 21% and greater.	All uses (domestic and non-domestic).	Restricted	Acute dermal toxicity.
Clonitralid	All wettable powders 70% and greater	All uses	Do	Acute inhalation toxicity.
	All granulars and wettable powders.	Molluscide uses	Do	Effects on aquatic organisms.
	Pressurized sprays 0.55% and less.	Hospital antiseptics	Unclassified	
Chloropicrin	All formulations greater than 2%	All uses	Restricted	Acute inhalation toxicity.
	All formulations	Rodent control	Restricted	Hazard to non-target organisms
	All formulations 2% and less	Outdoor uses (other than rodent control)	Unclassified	
Cycloheximide	All formulations greater than 4%	All uses	Restricted	Acute dermal toxicity
	All formula-	All uses	Under evalu-	

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	tions 0.027% to 4%		ation.	
	All formulations 0.027% and less	Domestic uses	Unclassified	
Demeton	1% fertilizer formulation, 1985% granular	All uses, including domestic uses.	Restricted	Domestic uses: Acute oral toxicity Acute dermal toxicity. Nondomestic outdoor uses. Residue effects on avian and mammalian species.
	All granular formulations, emulsifiable concentrates and concentrated solutions.	All uses	Do	Acute dermal toxicity. Residue effects on mammalian and avian species.
Dicrotophos	All liquid formulations 8% and greater	All uses	Restricted	Acute dermal toxicity; residue effects on avian species (except for tree injections).
Dioxathion	All concentrate solutions or emulsifiable concentrates[2] greater than 30%.	All uses	Restricted	Acute dermal toxicity.
	Concentrate solutions or emulsifiable concentrates[2] 30% and less and wettable powders 25% and less.	Livestock and agricultural uses (non-domestic uses only).	Unclassified	
	All solutions[2] 3% and greater	Domestic	Restricted	Do
	2.5% solution[2] with toxaphene and malathion.	All uses	Under evaluation	
Disulfoton	All emulsifiable con-	Do	Restricted	Do

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	centrates 65% and greater, all emulsifiable concentrates and concentrate solutions 21% and greater with fensulfothion 43% and greater, all emulsifiable concentrates 32% and greater in combination with 32% fensulfothion and greater.			Acute inhalation toxicity.
	Non-aqueous solution 95% and greater.	Commercial seed treatment	Restricted	Acute dermal toxicity.
	Granular formulations 10% and greater.	Indoor uses (greenhouse)	Do	Acute inhalation toxicity.
	All granular and fertilizer formulations including cartridge injection.	All uses except indoor greenhouses.	Under evaluation	
Endrin	All emulsions, dusts wettable powders, pastes, and granular formulations 2% and above.	All uses	Restricted toxicity. Hazard to nontarget organisms.	Acute dermal
	All concentrations less than 2%	Do	Do target organisms.	Hazard to non-
EPN	All liquid and dry formulations greater than 4%	All uses	Restricted	Acute dermal toxicity; acute inhalation toxicity; residue effects on avian species.
		Aquatic uses	Restricted	organisms.
Ethoprop	Emulsifiable concentrates 40% and	Do	Do	Acute dermal toxicity.

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	greater.			
	All granular and fertilizer formulations.	Do	Under Evaluation	
Ethyl parathion	All granular and dust formulations greater than 2%, fertilizer formulations, wettable powders, emulsifiable concentrates, concentrated suspensions, concentrated solutions.	Do	Restricted	Inhalation hazard to humans. Acute dermal toxicity. Residue effects or mammalian, aquatic, avian species.
	Smoke fumigants	Do	Do	Inhalation hazard to humans.
	Dust and granular formulations 2% and below.	Do	Do	Other hazards-accident history.
Fenamiphos	Emulsifiable concentrates 35% and greater.	Do	Do	Acute dermal toxicity.
	All granular formulations	Do	Under Evaluation	
Fensulfothion	Concentrate solutions 63% and greater, all emulsifiable concentrates and concentrate solutions 43% and greater with disulfoton 21% and greater, all emulsifiable concentrates 32% and greater in combination with disulfoton 32% and greater.	Do	Restricted	Do Acute inhalation toxicity.
	Granular	Indoor uses	Do	Do

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	formulations 10% and greater.	(greenhouse)		
	All granular and fertilizer formulations.	All uses except indoor greenhouses.	Under evaluation	
Fluoroacetamide/1081	As sole active ingredient in baits. No mixtures registered.	All uses	Restricted	Acute oral toxicity.
Fonofos	Emulsifiable concentrates 44% and greater.	All uses	Do	Acute dermal toxicity.
	Emulsifiable concentrates 12.6% and less with pebulate 50.3% and less.	Tobacco	Unclassified	
	All granular and fertilizer formulations.	All uses	Under evaluation	
Hydrocyanic acid	As sole active ingredient. No mixtures registered.	Do	Do	Inhalation hazard to humans.
Methomyl	As sole active ingredient in 1% to 2.5 baits (except 1% fly bait).	Nondomestic outdoors agricultural crops, ornamental and turf. All other registered uses.	Do	Residue effects on mammalian species.
	All concentrated solution formulations.		Do	Other hazards-accident history.
	90% wettable powder formulations		Do	Do

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	(not in water soluble bags).			
	90% wettable powder formulation in water soluble bags.		Unclassified	
	All granular formulations 25% wettable powder formulations.		Do	
	In 1.24% to 2.5% dusts as sole active ingredient and in mixtures with fungicides and chlorinated hydrocarbon, inorganic phosphate and biological insecticides.		Do	
Methamidophos	Liquid formulations 40% and greater	All uses	Restricted	Acute dermal toxicity; residue effects on avian species.
	Dust formulations 2.5% and greater.	All uses	Restricted	Residue 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	
Methyl bromide	All formulations in containers	All uses	Restricted	Other hazards-accident history.

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	greater than 1.5 lb			
	Containers with not more than 1.5 lb of methyl bromide with 0.25% 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
Merhyl parathion	All dust and granular formulations less than 5%.	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% and greater and all wettable powders and liquids.	Do	Do	Residue effects on avian species. Hazard to bees. toxicity. Residue effects on mammalian and avian species.
Mevinphos	All emulsifiable concentrates and liquid concentrates.	Do	Do	Do
	Psycodid filter fly liquid formulations.	Do	Do	Acute dermal toxicity.
	2% dusts	Do	Do	Residue effects on mammalian and avian species.

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
Monocrotophos	Liquid formulations 19% and greater.	Do	Do	Residue effects on avian species. Residue effects on mammalian species.
	Liquid formulations 55% and greater.	Do	Do	Acute dermal toxicity. Residue effects on avian species. Residue effects on mammalian species.
Nicotine (alkaloid)	Liquid and dry formulations 14% and above	Indoor (greenhouse	Restricted	Acute inhalation toxicity.
	All formulations	Applications to cranberries	Restricted	Effects on aquatic organisms.
	Liquid and dry formulations 1.5% and less	All uses (domestic and non-domestic)	Unclassified	
Paraquat (dichloride) and paraquat bis(methyl sulfate).	All formulations and concentrations except those listed below.	Do	Do	Other hazards. Use and accident history, human toxicological data.
	Pressurized spray formulations containing 0.44 % Paraquat bis(methyl sulfate) and 15% petroleum distillates as active ingredients.	Spot weed and grass control	Unclassified	
	Liquid fertilizers containing concentrations of 0.025% paraquat dichloride and 0.03	All uses	Do	

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	% atrazine; 0.03% paraquat dichloride and 0.37% atrazine, 0.04 % paraquat dichloride and 0.49% atrazine.			
Phorate	Liquid formulations 65% 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.
	All granular and fertilizer formulations.	All uses except rice	Under evaluation	
Phosacetim	Baits 0.1% and greater	All uses	Restricted	Hazard to non-target species. Residues effects on mammalian species. Residue effects on avian species.
Phosphamidon	Liquid formulations 75% and greater.	Do	Do	Acute dermal toxicity. Residue effects on mammalian species. Residue effects on avian species.
	Dust formulations 1.5% and greater.	Do	Do	Do Residue effects on mammalian species.
Picloram	All formu-	Do	Do	Hazard to non-

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
	lations and concentrations except tordon 101R.			target organisms (specifically nontarget plants both crop and noncrop).
	Tordon 101 R forestry herbicide containing 5.4% picloram and 20.9% 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 fluoro-	All solutions and dry baits	Do	Do	Acute oral toxicity. Hazard to nontarget organisms. Use and accident history.
Strychnine	All dry baits, pellets and powder formulations greater than 0.5%.	Do	Do	Acute oral toxicity. Hazard to nontarget avain 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% and below.	All uses except subsoil	Do	Do
	Do	All subsoil uses	Unclassified	Do
Sulfotepp	Sprays and smoke generator	All uses	Restricted	Inhalation hazard to humans.
Tepp	Emulsifiable concentrate formulations.	Do	Do	Inhalation hazard to humans. Dermal hazard to humans.

Active Ingredient	Formulation	Use Pattern	Classification	Criteria Influencing Restriction
				Residue effects on mammalian and avian species.
Zinc Phosphide	All formulations 2% and less	All domestic uses and non-domestic uses in and around buildings.	Unclassified	
	All dry formulations 60% and greater	All uses	Restricted	Acute inhalation toxicity.
	All bait formulations	Non-domestic outdoor uses (other than around buildings).	Restricted	Hazard to non-target organisms.
	All dry formulations 10% and greater	Domestic uses	Restricted	Acute oral toxicity.

[1] "Under evaluation" means no classification decision has been made and the use/formulation in question is still under active review within EPA.

[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.

INSTALLATION:	COMPLIANCE CATEGORY: PESTICIDE MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):

STATUS NA C RMA	REVIEWER COMMENTS:

(1) BCE [Base Civil Engineering] (2) BEE [Bioenvironmental Engineering] (3) BMS [Base Medical Service]/EHO [Environmental Health Office] (4) Pest Management Shop (5) Golf Course Maintenance (6) Base Fire Chief (7) Base Contracting Office

Section VII

Petroleum Oil and Lubricant (POL) Management

SECTION VII

POL MANAGEMENT

A. Applicability of this Protocol

This protocol applies to U.S. Air Force (USAF) installations that store, transport, dispose, or use petroleum, oils and lubricants (POLs), including petroleum-based fuels. 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 to control volatile organic compounds (VOCs) from POL sources are addressed in Section I, Air Emissions.

This protocol covers management of above- and below-ground POL bulk storage tanks, organizational tanks, pipeline delivery systems, truck fill stands, immediate operating storage areas, and fueling/ defueling flightline operations. POL materials addressed include jet fuel (JP-4, fuel oil, JP-8), aviation gasoline (AVGAS), motor gasoline (MOGAS), diesel fuel, and lubricating oils. Waste petroleum-based solvents (including PD-680) are addressed in Section III, Hazardous Waste Management.

Some local requirements for POLs may vary in important ways, and the evaluator 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 quantities and the specific procedures for reporting spills that may exist in local regulations.

Many local governments have active underground storage tank (UST) programs. These various governments have developed regulations specific to the physical environment and the regulated community's needs. It is important to review regulations at the national and local level to ensure that any differences, such as reporting notice requirements, and monitoring requirements can be complied with.

The regulatory requirements in this protocol are based on Department of Defense (DoD) and Air Force regulations (AFRs) that apply at overseas installations. Good Management Practices (GMPs) are derived from U.S. Environmental Protection Agency (EPA) regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force employees and protect the environment. Any procedural EPA requirements, such as permits and notifications, are not applicable overseas, and, therefore, are not covered in the worldwide manual. GMPs in the POL protocol are derived from the following EPA regulations: 40 Code of Federal Regulations (CFR) 112, 40 CFR 264, 40 CFR 280, and 40 CFR 300.

B. DoD Regulations

- DoD Manual 4140.25 M, *Procedures for Management of Petroleum Products*, describes procedures for the management of petroleum products on military installations.

- DoD Directive 5030.41, *Hazardous Substance Pollution Prevention and Contingency Plan*, addresses requirements for compliance with the National Oil and Hazardous Substances Pollution Contingency Plan.

C. U.S. Air Force Regulations

- AFR 19-1, *Pollution Abatement and Environmental Quality*, outlines the general requirements for the preparation of Oil and Hazardous Substance Pollution Contingency (OHSPC) plan and Spill Prevention Control and Countermeasure (SPCC) plans.

- AFR 19-8, *Environmental Protection Committee and Environmental Reporting*, outlines the requirements for an annual review of the OHSPC and SPCC plans and gives requirements for reporting spills.

- AFR 19-14, *Management of Recoverable and Waste Liquid Petroleum Products*, describes the management of recoverable and waste liquid petroleum products and governs the maintenance of permanently installed storage and dispensing systems for petroleum and unconventional fuels.

- Air Force Manual (AFM) 85-16, *Maintenance of Petroleum Systems*, governs the maintenance of permanently installed storage and dispensing systems for petroleum and unconventional fuels.

- AFM 85-5, *Maintenance and Operation of Cathodic Protection Systems*, provides guidance for maintenance and operation of cathodic protection systems.

- AFR 144-16, *Organization Fuel Tanks*, provides the policies and procedures for establishing and operating organizational fuel tanks.

- Air Force Technical Order (AFTO) 37-1-1, *General Operation and Inspection of Installed Fuel Storage and Dispensing System*, provides fuels management personnel guidance in the operation, inspection, and operator maintenance of permanently installed fuel facilities.

- AFTO 42B-1-23, *The Management of Recoverable and Waste Liquid Petroleum Products*, provides guidelines for collecting, segregating and processing reclaimed, recoverable, and waste petroleum products.

- Headquarters U.S. Air Force (HQ USAF)/LEE Letter, *Air Force Underground Storage Tank (UST) Management Strategy*, 30 May 1990, provides guidance on the management of the Air Force's UST program worldwide.

D. Responsibility for Compliance

- Base Environmental Protection Committee (EPC) is usually responsible for drafting and reviewing the Spill Prevention and Response (SPR) Plan prior to its promulgation by the Base Commander and for the annual review and update of the SPR Plan. Often, the EPC delegates the specific preparation of the plan to the Base Civil Engineer (BCE) for implementation by the Base Environmental Coordinator (BEC). The EPC also is responsible for review and implementation of the Base Plan for Recoverable and Waste Petroleum.

- Spill Response Team (SRT) is tasked to respond to spills when requested by an On-Scene Commander (OSC), and to perform spill containment, recovery, cleanup, disposal, and restoration activities as directed by the OSC. The SRT is a multidisciplinary team often includir the following persons: BCE, BEC, Bioenvironmental Engineer (BEE), Fire Chief, Security Police Chief, Public Affairs Officer, Base Fuels Officer, Safety Chief, and Staff Judge Advocate.

- Base Fire Department provides support in emergency response, spill events, exercises, and fire protection activities. In addition, the department will be responsible to make periodic fire safety inspections of flammable/combustible storage and handling areas, hazardous waste storage areas, and accumulation points on the installation.

- Safety Manager is responsible for conducting workplace safety evaluations and inspections of the handling and storage of hazardous materials and waste. The Safety Manager will provide the appropriate manager with a report of their findings and recommended corrective actions. The Safety Manager is also responsible for ensuring the prompt and accurate investigation of any hazardous material mishaps that result in injury or property damage.

- Base Fuels Management Officer (BFMO is responsible for the safe and efficient receipt, storage, handling, issuing, and accounting of all petroleum products to include all general operations and inspections.

- Base Civil Engineer (BCE) 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 BCE also is responsible for the calibration of permanently installed meters.

- Base Environmental Coordinator (BEC) monitors all POL activities that may affect the environment and usually is responsible for the coordination of the EPC review and updates of the SPR Plan. The BEC also often coordinates the reportable spills notification of appropriate Federal and State agencies on behalf of the Base OSC.

- Base Bioenvironmental Engineer (BEE) takes samples to determine the chemical nature, pollutant concentration, and extent of each reportable-quantity spill as required for response actions and documentation.

E. Key Compliance Definitions

These definitions were obtained from the various Federal, DoD and U.S. Air Force regulations cited previously in this section.

- *Above-ground Release* - any release to the surface of the land or to surface water. This includes, but is not limited to, releases from the aboveground portion of a UST system and above-ground releases associated with overfills and transfer operations as the regulated substance moves to or from a UST system.

- *Ancillary Equipment* - any devices including, but not limited to, pipings, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from the UST.

- *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.

- *Below-Ground Release* - any release to the subsurface of the land and to groundwater. This includes, but is not limited to, releases from the below-ground portion of a UST system and below-ground releases associated with overfills and transfer operations as the regulated substance moves to or from a UST.

- *Cathodic Protection* - a system that prevents corrosion of a metal surface by making that 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.

- *Cathodic Protection Tester* - a person who can demonstrate understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

- *Compatible* - the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of a tank system under conditions likely to be encountered in the UST.

- *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.

- *Dielectric Material* - a material that does not conduct direct electrical current. Dielectric coatings are used to electrically isolate UST systems from the surrounding soils. Dielectric bushings are used to electrically isolate portions of a UST system (e.g., tank from piping).

- *Excavation Zone* - the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches, into which the UST system is placed at the time of installation.

- *Free Product* - a regulated substance that is present as a nonaqueous phase liquid (i.e., liquid not dissolved in water).

- *Gathering Lines* - any pipeline, equipment, facility, or building used in the transportation of oil or gas during oil or gas production.

- *Hazardous Substance UST System* - any underground storage tank system that contains a hazardous substance defined in Section 101 (14) of the *Comprehensive Environmental Recovery, Compensation, and Liability Act of 1980* (CERCLA), (but not including any substance regulated as a hazardous waste under Subtitle C), or any mixture of such substances and petroleum, and which is not a petroleum UST system.

- *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. Heating oil is typically used in the operation of heating equipment, boilers, or furnaces.

- *Hydraulic Lift Tank* - a tank holding hydraulic fluid for a closed-loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

- *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* - the normal operational upkeep to prevent an underground storage tank system from releasing product.

- *Motor Fuel* - petroleum or a petroleum-based substance that is MOGAS, AVGAS, No. 1 or No. 2 diesel fuel, or any grade of gasohol, and is typically used in the operation of motor engines.

- *Oil and Hazardous Substance Site* - any location where petroleum products or hazardous substances are used and/ or stored in quantities which, if spilled, would constitute a reportable quantity.

- *Oil Separator* - a wastewater pretreatment device or fuel recovery device which is installed to remove oils from water before the water is released to the environment.

- *Operator* - any person in control of or having responsibility for the daily operation of a UST system.

- *Organizational Issue Tank* - a tank not permanently connected to any facility or equipment and used to issue fuel to vehicles, equipment, or portable containers.

- *Organizational Support Tank* - a tank permanently connected to the using facility or equipment, such as facility/housing heating oil tanks and heating plant tanks.

- *Overfill Release* - a release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the regulated substance to the environment.

- *Petroleum UST System* - an underground storage tank system that contains petroleum or a mixture of petroleum with *de minimis* quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

- *Pipeline Facilities* - (including gathering lines) are new and existing pipe rights-of-way and any associated equipment, facilities, or buildings.

- *Reclaimed Product* - product of known or determinable quality that can be used for the original grade or a lower grade without reprocessing except for settling, filtration, and/or blending.

- *Recoverable Product* - product that has served its intended purpose or contains foreign matter that renders it unfit for original or alternate use, but which through processing or re-refining can be reclaimed for other use by the Air Force or commercial industry.

- *Recyclable Materials* - materials that normally have been or would be discarded, and that may be reused after undergoing some type of physical or chemical processing. Recyclable materials do not include precious metals and similar materials that may be used again for their original purposes without any special processing.

- *Release* - any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from a UST into groundwater, surface water, or subsurface soils.

- *Release Detection* - determining whether 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 secondary containment around it.

- *Repair* - to restore a tank or UST system component that has caused a release of product from the UST system.

- *Residential Tank* - a tank located on property used primarily for dwelling purposes.

- *Resource Recovery* - the process of obtaining materials or energy from solid waste. Most common type of resource recovery facility is an incinerator that co-produces electricity for sale to a commercial utility and steam for use as a heating source or industrial energy source.

- *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 receptacles is distributed through the soil and settled solids and scum from the tank are pumped out periodically and hauled to a treatment facility.

- *Storm Water 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 storm water and wastewater does not include treatment except where incidental to conveyance.

- *Surface Impoundment* - a natural topographic depression, manmade excavation, or diked area, formed primarily of earthen materials possibly lined with manmade materials) and is not an injection well.

- *Tank* - a stationary device designed to contain an accumulation of regulated substances and constructed of non-earthen materials (i.e., 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 a tank situated on or above the surface of the floor.

- *Underground Release* - any below-ground release.

- *Underground Storage Tank (UST)* - any one or a combination of tanks (including underground pipes connected thereto) used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10% or more beneath the surface of the ground. This term does not include any: (a) farm or residential tank of 1100 gallons or less capacity used for storing motor fuel for noncommercial purposes; (b) tank used for storing heating oil for consumptive use on the premises where stored; (c) septic tanks; (d) pipeline facility (including gathering lines) which are regulated by other acts; (e) surface impoundment, pit, pond, or lagoon; (f) storm water or waste water collection system; (g) flow-through process tank; (h) liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or (i) storage tank situated in an underground area if the storage tank is situated upon or above the surface of the floor.

  (NOTE: The definition of UST does not include any pipes connected to any tank described in items (a) through (i) of this definition.)

- *Upgrade* - the addition or retrofit of systems such as cathodic protection, lining, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of product.

- *UST System or Tank System* - underground storage tank, connected underground piping, underground ancillary equipment, and containment system (if any).

- *Waste Petroleum Product* - product 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.

POL MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
All installations	7-1 through 7-2	(1)(2)(3)(4)
To address SPCC, OHSPC, and SPR plans	7-3 through 7-5	(1)(2)(3)(4)(6)
Safety and Training	7-6 through 7-10	(1)(3)(6)
Treatment, recovery and disposal of wash water, sludges, and petroleum products	7-11 through 7-13 7-18 and 7-19	(1)(3)(4)(5)
Inspections and integrity testing of tanks and pipelines	7-14 through 7-17	(1)(2)(3)(4)(5)
Underground storage tanks	7-18 through 7-21	(1)(3)(4)
Buried fuel piping	7-22	(1)(4)
New USTs	7-23 through 7-25	(1)(3)(4)
Steel and metal USTs	7-28 through 7-30	(1)(3)(4)
Out of service and closed USTs	7-31 through 7-33	(1)(4)
Leaking USTs	7-34 and 7-35(1)(6)(7)(8)	
Army and Air Force Exchange Service (AAFES) Station USTs	7-36	(1)(4)(9)
Hydrant Fuel Systems	7-37	(1)(4)

(*)CONTACT/LOCATION CODE:

(1) BEC [Base Environmental Coordinator]
(2) BCE [Base Civil Engineer]
(3) BFMO [Base Fuels Management Office]
(4) LFM [Liquid Fuels Maintenance]
(5) BEE [Base Bioenvironmental Engineer]
(6) Base Fire Department
(7) Heat Shop
(8) Power Production
(9) AAFES Service Station Manager

POL MANAGEMENT

Records to Review:

- Records of all spills, leaks, and associated site assessment/cleanup activities (for 3 years)
- Spill Prevention and Response Plan
- Records of spill response training

Physical Features to Inspect:

- Refueling facilities, including:
  - above-ground storage tanks and dikes
  - venting
  - fill pipe
  - gauges
- Washrack areas
- Vehicle maintenance areas
- Oil separators
- Oil and hazardous substance site

Sources to Interview:

- BEC [Base Environmental Coordinator]
- BCE [Base Civil Engineer]
- BFMO [Base Fuels Management Officer]
- LFM [Liquid Fuels Maintenance]
- BEE [Bioenvironmental Engineering]
- Base Fire Department

COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
7-1. Determine actions or changes since previous review of POL management and storage tanks.	• Obtain copy of previous POL Management and determine if non-compliance issues have been resolved. (1)(3)
...	...
7-2. The installation should have on file all U.S. Air Force, DoD, and appropriate local POL and storage tank regulations (AFR 19-1).	• Examine file of OHSPC regulations. Determine if copies of the following regulations are maintained and kept current on the installation: (1)(2)(3)(4) - Defense Environmental Quality Program Policy Memorandum (DEQPPM) 79-3, *Management of Recoverable and Waste Liquid Petroleum Products* - AFR 19-1, *Pollution Abatement and Environmental Quality* - AFR 19-8, *Environmental Protection committees and Environmental Reporting* - AFR 19-14, *Management of Recoverable and Waste Liquid Petroleum Products* - AFR 144-16, *Organizational Fuel Tanks* - AFM 67-1, *Maintenance of Petroleum Systems* - AFM 85-16, *Maintenance of Petroleum Systems* - Air Force Technical Orders (AFTO) 35-1-3, 36-1-3, 37-1-1, 42B-1-1, 42B-1-23, and 00-25-172 - HQ USAF/LEE Letter, *Air Force Underground Storage Tank (UST) Management Strategy*, 30 May 1990 - appropriate Host Nation and local regulations. • Examine regulations with base environmental staff. Determine of staff is familiar and knowledgeable of POL and UST requirements.
...	...
7-3. Installation should have current Base Comprehensive Plan Tabs for all real-property-installed POL systems (AFR 86-4).	• Examine Base Comprehensive Plan (BCP) to ensure all real-property-installed POL systems are included. (1)(2)(3)(4)
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
FUEL MANAGEMENT	
7-4. Air Force installations that store, transport, or dispense petroleum products are required to prepare and review annually SPCC and OHSPC plans (AFR 19-1, AFP 19-5).	• Verify that the SPCC and OHSPC plans have been prepared and adopted. In some cases, these two plans may have been combined into a single SPR plan. Obtain a copy for review. (1)(2) • Review SPCC plan for completeness. It should address petroleum products and chemical substances. Key review items include: (1) - command approval - spill prevention planning for major potential spill areas - spill response procedures - spill containment and cleanup equipment/ facilities - spill reporting procedures - oil spill contingency plan - training procedures.
...	...
7-5. The SPCC or SPR plan should be amended whenever there is a material change in facility design, construction, operations, or maintenance, that alters the potential for an oil spill (GMP).	• Determine if plan was subject to amendment for reasons of installation POL operation changes. (1)(2)(3)
...	...
7-6. All suspected releases, leaks, spills or overfills should be investigated and a report on a spill of petroleum products with potential for entering navigable waters should be prepared for the USAF for each incident (AFR 19-8).	• Review reports of suspected releases, as well as positive results from release detection systems. Note if these were immediately reported, as may be required, and whether an investigation was performed and followed through by immediate corrective action. (1)(5)(6) • Conduct interviews with Base Fire Department to determine if spills or overfill events have occurred.(6) • Interview Environmental Coordinator to determine if an investigation of suspected or known incidents took place and what the investigation entailed. (1) • Determine if a plan of corrective action for leaking USTs has been implemented, including: - safety and fire hazards - scheduled repairs and/or removal of tank - removal of saturated soils and floating free product, along with an assessment of further action needed. • Examine records in spill incident files to verify that proper notification and followup reports were performed as required. (1)(2)

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
...	...
7-7. The base safety officer is responsible to conduct workplace safety evaluations and inspections of the handling and storage of hazardous materials (AFR 127-12, AFR 127-2).	• Interview with base safety officer. Determine command inspection requirement, forms and reporting procedures. • Obtain list of facilities inspected by safety officer. • Review safety records for POL facilities and determine if recommended corrective actions have been implemented.
...	...
7-8. Base Fire Department should inspect all flammable/combustible storage (AFR 92-1).	• Review inspection records and discuss with agencies that have flammable/combustible storage.
...	...
7-9. The base fuels management office is required to have a quality control and inspection program (AFR 144-1, Chapter 8).	• Interview with base fuels management office and determine that the internal quality inspections are being conducted. (3) • Review AF Forms 2419 and 2420, used to record the results of internal quality inspections. Determine if at least five spot check inspections are being conducted per week. (3) (NOTE: A base with less than 20 full-time fuels personnel may conduct as few as two spot checks per week.) • Review AF Forms 2419 and 2420 and verify that quality control and inspection personnel are conducting external inspections annually. (3)
...	...
7-10. All base personnel involved with the management and handling of oil and hazardous substances should take part in periodic training in spill prevention and response (GMP).	• Interview staff in BFMO and LFM. (3)(4) • Spot check training records to verify that proper training has been conducted.
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS**	**REVIEWER CHECKS:**
7-11. Appropriate containment divisionary structures, and cleanup equipment to prevent discharged petroleum products from contaminating surface and groundwater should be readily available on the installation (GMP).	• Determine the locations, types, and quantities of materials: (1)(6) - absorbent material - -oil retention booms - -divisionary - -absorbent - sandbags/temporary curbing devices - fuel recovery pumps/collection hoses - fuel recovery tank trucks - spill response team personnel gear: - -boots; - -gloves; - -respiratory gear. • Inspect each oil storage area for following items: (1)(3)(6) - adequacy of material types and quantities - accessibility of storage location - condition of equipment.
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
7-12. A product recovery system should be installed at the tank water drainoff valve for tanks storing aviation fuels (AFM 88-16).	• Inspect aviation fuel tanks to verify that product recovery systems are in place and operating correctly. (3)(4)
...	...
7-13. Drainage and wash water determined to contain petroleum products in harmful quantities must be treated prior to discharge to meet applicable water quality standards (AFR 19-1; AFR 19-14; AFTO 42B-1-23; AFM 88-16).	• Confirm through interview and records inspection that discharges containing harmful quantities of petroleum products were properly treated, recovered, or disposed of. Test records should be maintained by BEE. (1)(4)(5) • Determine that residues from tank cleaning operations were properly disposed as specified in AFM 85-16, Chapter 11. (1)(4)(5) • Inspect areas that regularly use petroleum products to determine if their drainage systems contain appropriate systems to prevent discharge of harmful quantities of petroleum products (usually using an oil/water separator). • Ensure oil/water separators are cleaned and maintained on a regular basis to ensure proper operation. (1)(2)
...	...
7-14. Installations are required to have in place a plan for the management of reclaimed, recoverable, and waste liquid petroleum products. The plan must be prepared in accordance with AFR 19-14.	• Verify that a Management of Recoverable and Waste Liquid Petroleum Products Plan has been prepared and adopted. (1)
...	...
7-15. Petroleum products not utilized for their intended purpose should be reclaimed, recovered, or disposed of as waste (AFR 19-14; AFTO 42B-1-23, AFM 67-1).	• Inspect accumulation points to confirm that containers are properly marked and in good condition. (1)(3) • Confirm that mixed petroleum liquids that are contaminated by halogenated solvents or industrial chemicals are disposed of as hazardous waste. (1)(3) • Inspect vehicle hobby shops to verify that used crankcase oils/lubricants are being collected. (1)
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
STORAGE TANKS	
7-16. All organizational fuel tanks must be inspected Interim Message Change (IMC) 86-2 to AFR 144-16 deletes annual inspection requirements but replaces them with routine surveillance by refueling operators during normal tank servicing. Routine inspection and maintenance is responsibility of owning organization (AFR 144-16 and AFR 144-1, Chapter 8).	• Inspect AF Forms 2419, 2420, and AF Form 500, to confirm the following: (4) - Certified tank calibration charts to measure fuel volumes are present on all tanks of 661 gallons and over. - Condition of tanks, piping, and dikes is noted. - Verify that any confirmed leaking tanks were repaired or replaced. • All tanks over 661 gallons must be diked (AFM 85-16).
...	...
7-17. Above-ground storage tanks should be subject to periodic integrity testing (AFTO 37-1-1 and AFM 85-16, Chapter 10, AFM 85-5 Cathodic Protection).	• Inspect for cathodic protection presence and condition. (3) • Inspect AFTO Form 39 to confirm that leak tests have been conducted. (3) • Review "remarks" section of AFTO Form 39 for results of leak test. A decrease in converted fuel volume equal to or greater than 1/4 inch constitutes a suspected leak. • Inspect records (AF Form 172) to confirm that internal physical entry inspections of bulk storage tanks have taken place according to AFM 85-16, Chapter 10. • Confirm through interview that the BCE, BEE, and Safety Office have been notified of all confirmed leaks. (2)(3)(5) • Verify that leaking tanks have been repaired or replaced. (2)(4)
...	...
7-18. Periodic inspection of MOGAS, diesel, kerosene, and aviation fuel test cell storage tanks is required (AFTO-37-1-1, Section 3-14).	• Confirm through records review and interviews that inspections have been conducted as required (AF Form 172 should be examined). (4) • Confirm that leaking or deteriorated tanks have been repaired or replaced. (2)(4) • Verify that confirmed leaks were reported to the BCE, BEE, and Base Safety Office. (4)
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
7-19. Installations using fuel bladders for field training exercises or temporary storage should use liners and diking (GMP). ...	• If possible, examine fuel bladders for liners and diking. (4) • If bladders are not in use, discuss setup procedures. ...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
7-20. UST owners and operators should keep records.	• Review base UST records for the following required documents: (1) - complete current inventory of all USTs - a corrosion expert's analysis of the site's corrosion potential if no corrosion protection is used - documentation of corrosion protection operation - documentation of all UST repairs - documentation of compliance with release detection requirements - results of site investigation at the time of permanent closure of the UST - all written claims that pertain to the release detection system used - results of any sampling, testing, or monitoring (1 year) - written documentation of all calibration, maintenance, repair, or release detection equipment (for at least 1 year after the work has been completed). • Review base UST records for required documentation. (1)
...	...
7-21. The filling of a UST should include the prevention of overfilling and spilling of the substance. New USTs should have devices that will prevent and control, or contain spills (GMP).	• If possible observe the filling operations, otherwise review records for reports of overfills or spills resulting from operations, and check grounds around fill lines for visible or odorous indications of contamination. (1) • Determine whether the level of the UST is checked before a transfer is made. (1)(3) • Site check for safety features of new or upgraded UST as follows: - spill prevention equipment, i.e., catchment basin - overfill prevention equipment such as automatic shut-off at $\leq 95\%$ - full, alert transfer operator at $\leq 90\%$ capacity by restrictive flow or triggering an alarm mechanism. (1)(3) (NOTE: If an approved alternative is used that is no less protective to human health or environment or if the transfer is ≤ 25 gallons, the use of other specified spill/overfill prevention devices is not needed.)
...	...
7-22. USTs containing petroleum should meet certain release detection requirements (GMP). (NOTE: Piping should also meet release detection requirements.)	• Check release detection includes the following: (1)(4) - Tanks smaller than 550 gallons may use manual tank gauging. - Tanks 551 to 2000 gallons may use manual and inventory control. - Tanks larger than 2000 gallons may use other method of detection. • Check that tanks are monitored on a regular basis (Once a month in most cases).
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
7-23. Repairs to USTs should be performed according to industry code (GMP).	• Check records for repairs. (1)(3)(4) • Inquire about who repairs to USTs and the procedure used to repair USTs: (1)(4) - Fiberglass reinforced tanks should be repaired by the manufacturer's authorized representative or according to industry standards. - Metal pipe fittings and sections that have leaked due to corrosion should be replaced, whereas fiberglass may be repaired according to manufacturer's specifications. • Tanks and piping that have been replaced or repaired should be tested for tightness. • Records of repairs should be maintained for the life of the tank. (1)(4)
...	...
7-24. Buried fuel piping installations should have a protective wrapping and coating and should be cathodically protected if soil conditions warrant (GMP and AFM 85-15; AFM 85-5).	• Confirm through interviews and records review that buried fuel piping is properly protected from corrosion. (1) • For impressed current system, examine AF Form 491, columns H, I, J, and K, to determine if the voltage is greater than -0.85 volts, but not more than -3.0 volts (monthly). (1)(4) • For sacrificial anode system, examine AF Form 1686, column C, to determine if the voltage is greater than -0.85 volts, but not more than -3.0 volts (biannually). (1)(4) • Examine AF Form 1688, *Annual Cathodic Protection Survey*, to determine if the voltage is greater than -0.85 volts, but not more than -3.0 volts. (1)(4) • Determine if AF Form 1687 is being completed to report leak detection and failure. (1)(4)
...	...
7-25. Installations should incorporate the Air Force's UST Management Strategy in their planning, programming, and budgeting activities (AF/LEE Letter 30 May 90).	• Confirm through interviews that the installation has incorporated the Air Force's UST Management Strategy into its UST program. (1)(2) • Review construction plans for future projects (especially MILCON) to determine if installation is: - seeking to eliminate USTs in their designs whenever possible - where USTs are required, using tanks with secondary containments - removing closed USTs.
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
7-26. Owners and operators of steel UST systems should comply with certain requirements to ensure the prevention of release of regulated substances (GMP).	• Determine whether the installation follows these guidelines: (1)(7) - Corrosion protection systems should be operated and maintained to continuously provide corrosion protection to the metal portions of the tank that routinely contain regulated substances. - All USTs with cathodic protection should be inspected for proper operation by a qualified tester within 6 months of installation and at least every 3 years after - Criteria used for inspection must coincide with nationally recognized code of practice - USTs with impressed current cathodic protection should be inspected every 60 days for proper operation. - Records of cathodic protection should be maintained.
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
7-27. UST systems (including piping) newly installed should be constructed in such a manner that they will remain structurally sound for their operating life (GMP).	• Review UST plans to see if they conform to industry standards. (1) • Check USTs and piping for leak / spill prevention protection. • Tank must be constructed of one of the following materials: - fiberglass-reinforced plastic - steel or fiberglass with cathodic protection of one of the following kinds: - -coated with a suitable dielectric material - -field-installed cathodic protection (expert installed) - -impressed current systems that allow determination of current operating status - steel fiberglass reinforced plastic composite - metal without additional corrosion protection, provided that: - -the site has been determined not to cause corrosion to the tank by a corrosion expert - records are maintained for the life of the tank that it is in a corrosion free environment • Cathodic protection systems on steel tanks are operated and maintained. • Construction is in a manner deemed to prevent release of the regulated substance. (NOTE: Piping should also meet these criteria, with the exception of being constructed of steel fiberglass reinforced plastic composite.)
...	...
7-28. New UST systems should be tested for tank tightness every 5 years (GMP).	• Review status of USTs on installation. (1)(4) • Ensure that tank tightness testing has been or will be conducted by inventory control, conducted monthly. (1)(4) • Check records for plans that outline testing dates and procedures. (1)(3)(4)
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
7-29. Underground metallic storage tanks should be protected from corrosion by coatings, cathodic protection or other effective methods (GMP and AFM 88-29; AFM 88-15; AFM 88-45; AFM 85-5).	• Inspect records and conduct interviews to verify that new underground storage tanks are appropriately protected from corrosion. (1)(3)(4) • For impressed current system, examine AF Form 491, columns H, I, J, and K, to determine if the voltage is greater than -0.85 volts, but not more than -3.0 volts (monthly). (1) • For sacrificial anode system, examine AF Form 1686, column C, to determine if the voltage is greater than -0.85 volts, but not more than -3.0 volts (biannually). (1) • Examine AF form 1688, *Annual Cathodic Protection Survey*, to determine if the voltage is greater than -0.85 volts, but not more than -3.0 volts. (1)(3)(4) • Determine if AF form 1687 is being completed to report leak detection and failure. (1)(3)(4)
...	...
7-30. USTs put out of service temporarily should have continued maintenance on certain controls (GMP).	• Inspect out-of-service UST facilities to ensure proper maintenance is being performed for the following: - corrosion protection - release detection. • Note how long the UST has been out of service. If it has been near or over 1 year, discuss whether plans have been made for permanent closure. (1)(4) • If the UST is empty, release detection is not required. (NOTE: An empty UST is one which has no more then 2.5 cm (1 inch) of residue or less than 0.3 percent by weight of total capacity of the UST system.)
...	...
7-31. UST closure should be done by removal from the ground. Old USTs may have been closed and left in the ground with POLs removed and filled with an inert substance. These should be removed from the ground whenever possible.	• Review USTs that are closed, or in the process of being closed, and identify if proper closure procedure is being followed. (1)(6) • Check for possible abandoned USTs and whether or not there are plans to close off in an appropriate manner. (1)(3)(6) • Review records after closure of UST. Determine if a site assessment was made to ensure that no releases to the environment have occurred. (1)
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
7-32. All UST systems should be leak tested by a specified time depending on their date of installation (see Appendix VII-1) and annually thereafter until upgraded, replaced, or removed (AF/LEE Policy Letter 30 May 90).	• Determine that the installation has leak tested all tanks by the appropriate date by one of the methods in Appendix VII-2. (1)(4) • Verify that any leaks discovered were stopped within 24 hours and that actions were taken to correct the leaks. (1)(4) • Review upgrade plans to ensure that all UST systems are upgraded to the new standards for corrosion protection, spill protection, and overfill protection by 22 Dec 1998. (1)(2)
...	...
7-33. Owners/ operators of leaking USTs should take corrective action (GMP).	• Interview BEC to determine if there are any leaking USTs and what steps are being taken to correct the problem. (1)(6) (8) • Review future plans for such USTs, including repairs scheduled and the removal of the UST from service. (1)(8) • Determine if a plan of corrective action has been implemented, including: (1) - mitigation of safety and fire hazards - removal of saturated soils and floating free product, along with an assessment of further action needed. (NOTE: If further action is needed, a corrective action plan should be implemented.)
...	...

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COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
7-34. Air Force policy states that the Air Force will inspect, maintain, repair (including repair by replacement), upgrade, clean up leaks, and be responsible for environmental reporting and recordkeeping associated with existing and future (once installed) UST systems at AAFES Stations. AAFES is responsible for programming and funding the installation of new USTs as part of new construction and cleanup of above-ground fuel spills that occur within the installation boundaries during AAFES delivery and fuel transfer operations. Where cleanup is beyond AAFES' local capability, the Host installation must assist but AAFES will reimburse the Host for costs incurred (AF/LEE Policy Letter, 30 May 1990).	• Determine whether AAFES service station USTs are included in the installation inspection and maintenance program. (1)(4) • Review inspection records and determine if they indicate maintenance, repair, or upgrade of AAFES USTs is required to meet AF UST standards. (1)(4) • If repair or upgrade is indicated, identify project in Civil Engineering Contract Reportings (CECORs) and on A-106 pollution abatement report. • Interview service station manager to determine if spills have occurred in the past year, and what cleanup/reporting procedures followed. (9)
...	...
7-35. Air Force installations are encouraged to leak test airfield hydrant fuel systems (AF/LEE Policy Letter, 30 May 1990).	• Determine if installation has a program to leak test hydrant fuel systems on a periodic basis. (1)(4)
...	...

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Appendix VII-1

Deadlines for Leak Protection

Tank or Piping Installation Date	Leak Detection Required by 22 Dec of:
Before 1965	1989
1965-1969	1990
1970-1974	1991
1975-1979	1992
1980-Dec 1988	1993

NOTE: All pressure piping, regardless of age, must be leak tested by 22 Dec 90.

Appendix VII - 2

Leak Detection Methods

A variety of leak detection technologies are available for new and existing tanks and piping that meet the EPA's testing requirements. A brief summary of each technology is described in the table below.

New and existing tanks with corrosion protection and spill and overfill devices installed only require tank tightness testing every 5 years together with monthly inventory control for the first 10 years after installation or upgrade. At that time, some form of monthly monitoring system must be installed.

After 22 Dec 90, all leak detection methods used or installed must be capable of detecting the leak detection rate specified by EPA for that method. When contracting for leak testing, Air Force installations should ask if the contractor's method has been evaluated (and should get a copy of the evaluation).

LEAK TESTING METHOD DESCRIPTIONS

Inventory control	A physical accounting system in which records are kept of inputs, outputs, and daily tank inventories. Used together with other methods.
Manual Tank Gauging	Measures a tank's liquid level at the beginning and end of a 36-hour time period and calculates the change in volume. Limited to 550 gallon or smaller USTs when used alone or 2000 gallons when combined with tightness testing.
Automatic Tank Gauging	Collects leak detection and inventory information by continuously monitoring product level. Currently good for tanks up to 12,000 gallons and piping.
Volumetric Tank Tightness Testing	Measures change in product volume over time to determine if there is a leak. Results must be adjusted for temperature, structural deformation, trapped air, etc.
Non-Volumetric Tank Tightness Testing	Includes a variety of methodologies. Some determine soundness of tank by injecting a tracer gas and monitoring for its presence outside tank. Others track sound of product or bubbles leaving tank. Verify reliability. Good for tanks of any size and piping.

Appendix VII - 2 (Continued)

Secondary Containment with Interstitial Monitoring	Measures presence of product in space between wall of tank and secondary containment liner or wall. Includes a variety of methodologies. Good for tanks of any size and piping.
Groundwater Monitoring	Measures the presence of fuel in the groundwater. Can be difficult to differentiate between new and old contamination. Good for tanks of any size and piping.
Vapor Monitoring	Measures presence of fuel vapors in soil above groundwater table. Reliability is variable. Good for tanks of any size and piping.

INSTALLATION:	COMPLIANCE CATEGORY: POL MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

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Section VIII

Solid Waste Management

SECTION VIII

SOLID WASTE MANAGEMENT

A. Applicability of this Protocol

This protocol addresses the collection, storage, and disposal of solid waste on Air Force installations.

Solid waste is considered to be nonhazardous trash, rubbish, garbage, bulky wastes, liquids or sludges generated by any Air Force installation operations and activities. It also includes any medical/pathological wastes generated by the base hospital (some countries classify medical/pathological wastes as hazardous waste; consult local requirements). The handling and disposal of asbestos waste materials are addressed in Section IX *Special Programs*.

Recycling and resource recovery activities are also included in this protocol, since this form of solid waste management is required by Department of Defense (DoD) and United States Air Force (USAF) directives.

The regulatory requirements in this protocol are based on DoD and Air Force regulations that apply at overseas installations. Good Management Practices (GMPs) are nonregulatory but are important to follow to preserve the health and safety of Air Force employees and protect the environment.

B. DoD Regulations

- DoD Directive 4165.60, *Solid Waste Manufacturing, Disposal, Resource Recovery and Recycling Program*, provides guidance and direction to all DoD facilities relative to solid waste collection, disposal, material recover, and recycling in agreement with the Solid Waste Disposal Act (SWDA).

C. U.S. Air Force Regulations

- Air Force Regulation (AFR) 19-1, *Pollution Abatement and Environmental Quality*, directs Air Force installations to use municipal or regional waste disposal systems for the disposal of solid waste whenever feasible. When the use of such facilities is not feasible, Air Force installations must do whatever is necessary to comply with all applicable laws, rules, and regulations.

- Air Force Pamphlet (AFP) 19-5, *Environmental Quality Control Handbook*, discusses the general background of solid waste problems at Air Force installations, types of pollutants produced, and their environmental effects. Regulatory standards

for solid waste management, design and operating guidelines for landfills and incinerators, and proper control of solid wastes are also addressed.

- Air Force Manual (AFM) 88-11, *Sanitary and Industrial Wastewater Collection*, contains chapters on incineration (Chapter 4), sanitary landfills (Chapter 5), and industrial waste (Chapter 6).

- AFP 91-8, *Solid Waste Management*, contains comprehensive information concerning types of equipment, operating procedures, and implementation procedures for solid waste programs at Air Force installations.

D. Responsibility for Compliance

- Base Civil Engineering (BCE) is responsible for site location, licensing, construction, and operation of on-base landfills, and for the storage and transportation of solid wastes to either on-base or off-base disposal activities.

- Bioenvironmental Engineering (BEE) is responsible for reviewing and coordinating asbestos disposal plans and operations.

E. Key Compliance Definitions

These definitions were obtained from the DoD and USAF regulations cited previously in this protocol.

- *Leachate* - water that percolates through a landfill and contains soluble contaminants, some of which may be hazardous or toxic. Leachate is often characterized by a strong odor and is often a highly concentrated organic waste containing dissolved metals and salts.

- *Recyclable Materials* - materials that normally have been or would be discarded, and that may be reused after undergoing some type of physical or chemical processing. Recyclable materials do not include precious metals and similar materials that may be used again for their original purposes without any special processing.

- *Resource Recovery* - the process of obtaining materials or energy from solid waste. Most common type of resource recovery facility is an incinerator that co-produces electricity for sale to a commercial utility and steam for use as a heating source or industrial energy source.

- *Solid Waste* - garbage, refuse, sludge, and other solid, liquid, semisolid, or contained gaseous material that is discarded, has served its intended purpose, or is a mining or manufacturing byproduct. For the purposes of this protocol, the definition

includes all waste materials not defined by regulation to be either hazardous or toxic and which are normally disposed of by landfilling, incineration, or are recycled or recovered. Demolition wastes are not included.

- *Source Separation* - the separation of materials with marketable residue value at their point of generation by the generator.

SOLID WASTE MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
All installations	8-1 through 8-4	(1)(2)
If the installation disposes of waste in on-base landfills	8-5 and 8-6	(1)(2)
If the installation disposes of waste in off-base landfills	8-7	(1)
If the installation operates solid waste receptacles	8-8 through 8-10	(1)(2)
If the installation disposes of medical/ pathological, or infectious wastes	8-11 through 8-14	(1)(3)
If the installation incinerates classified material	8-15	(3)

(*)CONTACT/LOCATION CODE:

(1) BEC [Base Environmental Coordinator]
(2) BCE [Base Civil Engineer]
(3) BEE [Bioenvironmental Engineering]

SOLID WASTE MANAGEMENT

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
- Records of resource recovery practices, including the sale of materials for the purpose of recycling
- Solid waste removal contracts and inspection records

Physical Features to Inspect:

- Resource recovery facilities
- Incineration and land disposal facilities (active and inactive)
- Areas where hazardous and nonhazardous wastes are disposed of
- Construction debris areas
- Waste receptacles
- Solid waste vehicle storage and washing areas

Sources to Interview

- BEC [Base Environmental Coordinator]
- BCE [Base Civil Engineer]
- BEE [Bioenvironmental Engineering]

COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
8-1. Determine actions or changes since previous review of solid waste management.	• Obtain a copy of the previous review report and determine if non-compliance issues were resolved. (1)
...	...
8-2. The installation should maintain copies of all relevant Host Nation and local regulations, and DoD and USAF directives and guidance documents on solid waste management at the installation (AFR 19-1).	• Determine if copies of the following regulations are current and available at the installation: (1) - AFR 19-1, *Pollution Abatement and Environmental Quality* - AFP 19-5, *Environmental Quality Control Handbook* - AFP 91-8, *Solid Waste Management* - AFM 88-11, *Sanitation and Industrial Wastewater Collection (2 Volumes)* - AFM 91-11, *Solid Waste Management.* • Determine if copies of Host Nation and local solid waste management regulations are maintained at the installation. • Examine regulations with base environmental staff. Determine if staff is familiar and knowledgeable of solid waste management requirements.
...	...
8-3. Air Force installations are required to participate in any local recycling programs and to reduce the volume of solid waste materials at the source whenever practical (DoD 4165.60; AFR 19-8).	• Conduct interviews to verify that recycling programs are complying with applicable Host Nation or local requirements. (1)(3)
...	...
8-4. If no recycling program exists, economic analyses should be performed routinely to verify that a recycling program could not be beneficial to the base (GMP).	• Determine if economic analyses are performed routinely (once every 3 years, at the minimum) to justify not having a recycling program. (1)(3)
...	...
8-5. Existing on-base landfills may need to be licensed or permitted (local regulations).	• Verify that all on-base landfills are properly licensed or permitted. (1) • Examine license or permit for operating conditions or requirements.
...	...

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
8-6. On-base landfills should be inspected quarterly to verify that permit conditions (if applicable) and proper management procedures are being met (GMP).	• Determine through interviews and records that on-base landfills have been inspected quarterly. (1) • Verify that any noted variances from permit conditions have been corrected. (1) • Inspect on-base landfills to verify that permit conditions are currently being met and that sound environmental management practices are observed. (1)
...	...
8-7. Off-base landfills should be inspected quarterly to verify that good management techniques are being used (GMP).	• Determine through interviews and records that off-base landfills have been inspected quarterly. (1) • Verify that any noted variances have been called to the attention of the landfill operators and that appropriate steps to protect the interests of the base have been taken. (1)
...	...
8-8. Solid waste receptacles should comply with good design and operations specifications (GMP).	• Inspect receptacle locations for evidence of improper disposal practices or maintenance: (1) - Wastes should be totally contained within receptacle. - Receptacles must be vermin-proof and waterproof. - Waste receptacles should have functional lids. - Only minimal odors should be present.
...	...
8-9. On-base industrial shop waste receptacles should be inspected quarterly to verify that hazardous wastes are not being deposited (GMP).	• Interview and examine records to verify that receptacles were inspected. (1) • Verify that corrective actions were taken where indicated. (1) • Inspect a sample of solid waste receptacles at shops for presence of hazardous waste.
...	...
8-10. Base personnel should be periodically informed about materials that are prohibited from disposal in solid waste receptacles (GMP).	• Determine if a program exists at the installation to keep personnel informed about proper waste disposal practices. (2)
...	...

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
MEDICAL/ PATHOLOGICAL WASTES	
8-11. Medical/ pathological wastes should be disposed of in accordance with local regulations (GMP).	• Determine quantities and types of medical/ pathological wastes generated on the installation. (1)(2) • Interview to verify that medical/ pathological wastes are being properly disposed of. (1) (2) • Inspect solid waste receptacles at base hospital for medical/ pathological wastes. These receptacles should not contain blood, bloodstained items, sharps, or body parts.
...	...
8-12. Incinerators that handle medical/ pathological wastes should maintain a temperature of 1500^0 F for a minimum of 0.3 seconds retention time (GMP).	• Check controls of pathological incinerator to see if temperature is monitored. If it is, check to see if "1500^0 F for a minimum of 0.3 seconds" criterion is achieved (or appropriate other limitation). (2)(3)
...	...
8-13. Both pathological and classified material incinerators should be secured to prevent unauthorized use (GMP).	• Check the incinerators for fenced-in areas or locks on doors and control cabinets. (3)
...	...

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COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
8-14. Infectious wastes must be managed to minimize amount generated as well as reduce risk to human health and the environment (GMP).	• Review segregation practices to reduce plastic, glass, and domestic trash from being mixed with pathological wastes. Verify that tissue specimens in formalin are handled as hazardous waste. Petri dishes can be autoclaved and disposed of as domestic trash. (3) • Determine whether the installation has an infectious waste management plan and whether all medical facilities follow the plan (i.e., Veterinary, Dental, and Medical). • Determine if containers/vehicles used to transport infectious waste are periodically cleaned and if they are only used for this activity. • Determine if infectious waste bags, containing sharp objects or liquid, are placed in rigid containers to reduce puncture or leaking. • Determine whether infectious waste handlers are properly trained on how to handle wastes and clean up procedures. • Review used sharps management procedures to ensure that they are properly secured while awaiting disposal to reduce unauthorized use. If disposal is contracted, make sure followup inspections of contractor are performed.
...	...
8-15. Infectious waste incinerator operations must meet certain requirements (GMP).	• Check chamber temperature to ensure that it exceeds 1500^{0} F (816^{0}C). • Review the infectious waste incinerator standards operating procedures. Verify that it includes startup, shutdown, and troubleshooting procedures. • Review infectious waste loading procedure to verify if it meets manufacture's guidelines. • Determine whether operators have received training in infectious waste incinerator operation. (There are EPA/military courses for this.) • Inspect the personnel protective and cleanup equipment available for operators (eye protection, thick rubber gloves, rubber shoes over safety shoes, bleach solution, scrub brushes, water source, and fire extinguishers).
...	...

(1) BEC [Base Environmental Coordinator] (2) BCE [Base Civil Engineer] (3) BEE [Bioenvironmental Engineering]

INSTALLATION:	COMPLIANCE CATEGORY: SOLID WASTE MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):
STATUS NA C RMA	REVIEWER COMMENTS:		

(1) BEC [Base Environmental Coordinator] (2) BCE [Base Civil Engineer] (3) BEE [Bioenvironmental Engineering]

Section IX

Special Programs Management

SECTION IX

SPECIAL PROGRAMS MANAGEMENT

A. Applicability of this Protocol

This protocol applies to all U.S. Air Force (USAF) installations. Currently this section contains protocols for polychlorinated biphenyls (PCBs), asbestos, radon gas, A-106 Pollution Abatement Plan, and Environmental Impact Analysis Process (EIAP). The Special Programs protocol is written in response to regulations and policy which are applicable to the conduct of activities which involve these programs.

Specific Host Nation and local regulations are not included in this protocol.

The Special Programs protocol is used to determine the compliance status of the management activities associated with: PCBs and in-service and out-of-service PCB items; asbestos in schools and on the installation, the Air Force Radon Assessment and Mitigation Program (RAMP); the EIAP Overseas; and the A-106 Pollution Abatement Plan.

The regulatory requirements in this protocol are based on Environmental Protection Agency (EPA), Department of Defense (DoD), and Air Force regulations that apply at overseas installations. 40 Code of Federal Regulations (CFR) 763, *The Asbestos Hazard Emergency Response Act (AHERA)*, is applicable at schools overseas. Good Management Practices (GMPs) are derived from 1 EPAa regulations that are not mandatory overseas but are important to follow to preserve the health and safety of Air Force employees and protect the environment. Any procedural EPA requirements, such as permits and notifications, are not applicable overseas, and, therefore, are not in the worldwide manual. GMPs in the Special Programs protocol are derived from 40 CFR 61, *National Emission Standards for Hazardous Air Pollutants*(asbestos), and 40 CFR 761 (PCBs).

B. Applicable EPA Regulations (DoD Regulations not applicable))

Asbestos

- *The Asbestos Hazard Emergency Response Act* (AHERA) requires local education agencies to inspect their local school buildings for asbestos-containing materials (ACM), develop asbestos management plans, and implement response actions in a timely fashion. By definition, "local education agency" includes the governing authority of any school operated under the Defense Department's

education system provided for under the Defense Department's Education Act of 1978. Regulations under AHERA for schools are contained in 40 CFR 763, Subpart E.

A-106 Pollution Abatement Plan

- Office of Management and Budget (OMB) Circular A-106 implements the requirement in Executive Order (EO) 12088, *Federal Compliance with Pollution Standards*, for assuring that Federal agencies, facilities, programs, and activities meet Federal, State, and local environmental requirements, or to correct situations that are not in compliance with such regulations.

EIAP Overseas

- EO 12114 directs establishments of EIAP-type procedures at all Federal installations overseas.

C. U.S. Air Force Regulations

PCBs

- There are no Air Force regulations on PCBs, but several policy letters have been issued:

1. HQ USAF/LEEV, letter, 29 Apr 1986, *Removal of Polychlorinate Biphenyl (PCB) Equipment from Air Force Installations*. The letter requires all major commands to draft management plans for removing all PCB equipment from AF installations by FY 92.

2. HQ USAF/LEEV, letter, 05 Apr 1988, *Removal of Polychlorinated Biphenyls (PCB) Items from Air Force Installations*. The letter requires an update on major command plan to remove all PCB items by FY 92 including:

   - all PCB items (>500 ppm)
   - all PCB-contaminated items (50-499 ppm)
   - reclassifications (retrofilling, filtering, and treatment processes)
   - funding requirements and program approach
   - A-106 report inputs.

3. HQ USAF/LEE/SGP, letter, 24 July 1987, *Polychlorinated Biphenyls (PCB) Spill Clean-up Policy*. The letter requires all PCB releases be cleaned up in accordance with EPA standards.

Asbestos

- Air Force Regulation (AFR) 91-42, *Facility Asbestos Management*, outlines procedures for developing a base facility asbestos management program. It also contains optional guidance to help the Base Civil Engineer (BCE)) administer plan to incorporate facility asbestos management procedures and practices into Air Force Military Construction Program (MCP) and Operations and Maintenance (O & M) projects.

- Air Force Occupational Safety and Health (AFOSH) Standard 161-4, also contains information for asbestos requirements and control.

Radon

- *The Radon Assessment and Mitigation Program* (RAMP) was initiated by the Assistant Vice Chief of Staff of the Air Force (USAF/CV) by policy letter on 23 Oct 1987. This letter transmitted the RAMP Implementation Plan to Air Force activities for implementation.

A-106 Pollution Abatement Plan

- AFR 19-8, *Environmental Protection Committees and Environmental Reporting*, briefly outlines the A-106 procedure. The report is due to HQ USAF/LEEV in June and November. HQ USAF/LEEV gives detailed instructions in a semiannual call that includes the *Instruction Kit for Completion EPA Form 3500-7 for New Pollution Abatement and Prevention Projects*.

EIAP Overseas

- AFR 19-3, *Environmental Impact Analysis Process (EIAP) Overseas*, contains the policies, procedures, and responsibilities required to ensure consideration of the effects on the environment by major Air Force actions outside the United States.

D. Responsibility for Compliance

PCBs

- *Base Civil Engineer (BCE)*, through the Exterior Electrical Shop or the Base Environmental Coordinator, is responsible for identifying, inspecting, marking (labeling), and properly servicing PCB electrical equipment (transformers and capacitors).

- *Base Environmental Coordinator (BEC)*, is responsible to ensure that out-of-service items are located in a licensed and technically adequate PCB storage facility. Normally, such facilities are located at a Defense Reutilization and Marketing Office (DRMO) and the DRMO is responsible for storage, disposal transportation, and contracting for disposal.

- *Bioenvironmental Engineer (BEE)*, is responsible to arrange for chemical analytical support in screening electrical equipment for PCBs and for cleanup verification.

Asbestos

- *BCE* appoints an Asbestos Program Officer to prepare the Asbestos Management Plan and an Asbestos Operations Officer to prepare the Asbestos Operating Plan. BCE ensures a sufficient number of in-house technicians and supervisors are trained and equipped to remove, repair, and control ACM.

- *Asbestos Program Officer* prepares the Asbestos Management Plan, which contains documentation on all asbestos management efforts and the mechanism for oversight of the program.

- *Asbestos Operations Officer* prepares and implements the Asbestos Operating Plan.

- *BEE* takes air samples, evaluates friable materials for the preservation of asbestos, and assigns Risk Assessment Codes (RACs).

Radon

- *BCE* is responsible for review of Radon assessments planning, programming, and institutionalizing radon mitigation features for existing and future facility projects.

- *BEE* is responsible for sampling radon gas levels at installation offices, housing, day care facilities, etc. BEE provides these sample results to the BCE. The BEE is also responsible for for mitigation.

A-106 Pollution Abatement Plan

- *BEC* is responsible for managing the A-106 program, including updating the current plan, inputting new projects, and coordinating with the Civil Engineering Programmer to ensure projects are included in the Civil Engineering Contract Reporting System (CECORS) or the Programming Design and Construction (PDC) System.

- *Civil Engineering Programmer (CEP)* is responsible for getting projects into the CECORS or the PDC.

- *Environmental Protection Committee (EPC)* is responsible for coordinating and approving the A-106 Plan.

E. Key Compliance Definitions

- *Active Waste Disposal Site* - any disposal site other than an inactive site.

- *Adequately Wetted* - sufficiently mixed or coated with water or an aqueous solution to prevent dust emissions.

- *Asbestos* - substances comprised of, or derived from, actinolite, amosite, anthophyllite, chrysotile, crocidolite, or tremolite.

- *Asbestos-Containing Waste Materials* - any waste that contains commercial asbestos. This term also includes asbestos waste from control devices, friable asbestos waste material, and bags or containers that previously contained commercial asbestos. However, as applied to demolition and renovation operations, this term includes only friable asbestos waste and asbestos waste from control devices.

- *Asbestos-Containing Material (ACM)* - asbestos or any material containing asbestos.

- *Asbestos Waste From Control Devices* - any waste material that contains asbestos and is collected by a pollution control device.

- *Capacitor* - a device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric. Types of capacitors are as follows: (1) small, a capacitor that contains less than 1.36 kg (3 lb) of dielectric fluid: (2) large high-voltage, a capacitor thatch contains 1.36 kg (3 lb) or more of dielectric fluid and operates at 2000 volts (AC or DC) or above; and (3) large low-voltage, a capacitor that contains 1.36 kg (3 lb) or more of dielectric fluid and operates at 2000 volts (AC or DC) or below.

- *Class I* - includes projects that are out of compliance, have been the subject to an enforcement action, or that involve a signed consent order or compliance agreement with EPA or a government agency. These projects are of critical priority.

- *Class II* - includes projects that must be dealt with in an agency's current planning cycle to meet a compliance deadline in the immediate future. If projects in this class are not programmed for funding during the current budget cycle, they may be out of compliance before needed money can be provided.

- *Class III* - includes other projects that the individual Federal agencies believe are important but are not related to an imminent compliance requirement. Projects that will prevent pollution through changes in process technology, redesign, etc., are also included.

- *Cost* - the amount of funds required for putting in place the necessary environmental protection measures, irrespective of the appropriation chargeable.

- *Demolition* - the wrecking or taking out of any load-supporting structural member of a facility, together with any related handling operations.

- *Disposal* - to intentionally or accidentally discard, throw away, or otherwise complete or terminate the useful life of PCBs and PCB items.

- *Emergency Renovation Operation* - a renovation operation that was not planned but results from a sudden, unexpected event. This term includes operations necessitated by nonroutine failures of equipment.

- *Emergency Situations* - when continuing use of a PCB transformer exists: (1) neither a non-PCB transformer nor a non-PCB contaminated transformer is currently in storage for reuse or readily available within 24 hours for installation, or; (2) immediate replacement is necessary to continue service for power users.

- *Facility* - any institutional, commercial, or industrial structure, installation, or building (excluding apartment buildings having no more than four dwelling units).

- *Facility Component* - any pipe, duct, boiler, tank, reactor, turbine, or furnace at or in a facility; or any structural member of a facility.

- *Federal Action* - an action implemented or funded directly by the U.S. Government. It does not include: (1) action in which the United States takes part in an advisory, information-gathering, representational, or diplomatic capacity, but does not implement or fund the action; (2) action taken by a foreign government or in a foreign country, in which the United States is a beneficiary of the action, but does not implement or fund the action; or (3) action in which foreign governments use funds derived indirectly from United States funding.

- *Friable Asbestos Material* - any material that contains more than 1 percent asbestos by weight and can be crumbled, pulverized, or reduced to powder, when dry, by hand pressure.

- *Good Management Practice* - practices that, although not mandated by law or regulation, are encouraged to promote safe operating procedures.

- *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 meters of a nonindustrial, nonsubstation building.

- *Inactive Waste Disposal Site* - any disposal site or portion of one where additional asbestos-containing waste material will not be deposited and where the surface is not disturbed by vehicular traffic.

- *Industrial Building* - a building directly used in manufacturing or technically productive enterprises.

- *Leak or Leaking* - any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

- *Major Action* - an action of considerable importance that involves substantial amounts of time, money, and resources, and affects the environment on a large geographic scale, or has substantial environmental effects on a more limited geographical area. The action is substantially different from other actions, previously analyzed and approved, with which the action under consideration may be associated. Deployment of ships, aircraft, or other mobile military equipment is not a major action for purposes of this regulation.

- *Major Air Force Action* - a major Federal action implemented or funded directly by the Air Force, or a major Federal action for which the Air Force has been designated as the lead agency.

- *Mark* - the descriptive name, instructions, cautions, or other information applied to PCBs and PCB items, or other objects subject to these regulations.

- *Marked* - 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 requirements of these regulations.

- *Mineral Oil PCB Transformers* - any transformer originally designed to contain mineral oil as the dielectric fluid and which has been tested and found to contain 500 ppm or greater PCBs.

- *Non-PCB Transformers* - any transformer that contains less than 50 ppm PCB.

Any transformer that has been converted from a PCB transformer or a PCB-contaminated transformer *cannot* be classified as a non-PCB transformer until reclassification has occurred in accordance with the requirements of CFR 40:761.30 (a)(2)(v).

- *Outside Air* - the air outside buildings and structures.

- *PicoCurie (pCi)* - quantity of radioactive material producing 2.22 nuclear transformations/minute.

- *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.

- *PCB Article* - any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) has been in direct contact with PCBs.

- *PCB Article Container* - any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment, but whose surface(s) has not been in direct contact with PCBs.

- *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.

- *PCB Equipment* - any manufactured item, other than a PCB container or a PCB article container, that contains a PCB article or other PCB equipment, including microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

- *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 500 ppm or greater.

- *PCB Transformer* - any transformer that contains 500 ppm PCB or greater.

- *Particulate Asbestos Material* - finely divided particles of asbestos material.

- *Planned Renovation Operations* - a renovation operation, or a number of such operations, in which the amount of friable asbestos material that will be removed or stripped within a given period of time can be predicted. Individual nonscheduled operations are included if a number of such operations can be predicted to occur during a given period of time based on operating experience.

- *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.

- *Remove* - to take out friable asbestos materials from any facility.

- *Renovation* - altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are excluded.

- *Retrofill* - to remove PCB or PCB contaminated dielectric fluid and to replace it with either PCB, PCB contaminated, or non-PCB dielectric fluid.

- *Rupture of a PCB Transformer* - a violent or non-violent break in the integrity of a PCB transformer caused by an overtemperature and/or overpressure condition that results in the release of PCBs.

- *Strip* - to take off friable asbestos materials from any part of a facility.

- *Structural Member* - any load-supporting member of a facility, such as beams and load-supporting walls; or any nonload-supporting member, such as ceilings and nonload-supporting walls.

- *Visible Emissions* - any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed water vapor.

SPECIAL PROGRAMS MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
All installations	9-1	(1)(2)(3)
PCBs		
Installations with PCBs	9-2	(1)(3)
Installations with PCB transformers	9-3 through 9-10	(1)(2)(3)
Installations with electromagnets, switches, or voltage regulators	9-11	(1)(3)
Installations with capacitors containing PCBs	9-12	(1)(3)
Installations that operate a facility for the storage of PCBs and PCB items	9-13 through 9-15	(1)(3)(4)
Installations that dispose of PCBs or PCB items	9-16 through 9-19	(4)

(*)CONTACT/LOCATION CODE:

(1) BCE [Environmental Planning]
(2) BEE [Bioenvironmental Engineering]
(3) BCE [Exterior Electric Shop]
(4) DRMO [Defense Reutilization and Marketing Office]
(5) BCE [Contract Programmer]
(6) BCE [Contract Management]
(7) BCE [Chief of Operations and Maintenance]
(8) School Principal
(9) Asbestos Program Officer
(10) Asbestos Operating Officer

GUIDANCE FOR CHECKLIST USERS
(Continued)

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
Asbestos		
Installations with asbestos	9-20	(1)
Installations with DoD-owned primary or secondary schools	9-21	(1)(2)(7)(8)
All installations with civil engineering responsibilities	9-22	(1)(2)(9)(10)
Installations that demolish or renovate a structure containing friable asbestos	9-23 through 9-26	(1)(2)(3)(5)(6)
Installations that dispose of asbestos	9-27 and 9-28	(1)(3)
Radon		
Installations that monitor for radon	9-29 through 9-31	(1)(2)
A-106		
All installations	9-32 through 9-35	(1)(5)
EIAP		
All installations	9-36	

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(8) School Principal
(9) Asbestos Program Officer
(10) Asbestos Operating Officer
(11) Vehicle Maintenance Shops

SPECIAL PROGRAMS MANAGEMENT

Records to Review:

- Inspection, storage, maintenance and disposal records for PCBs/PCB items
- PCB equipment inventory and sampling results
- Asbestos management plan
- Documentation of asbestos sampling and analytical results
- Documentation of preventative measure or action
- Results of air sampling at the conclusion of response action
- Records of asbestos training program
- List of buildings insulated with asbestos or housing asbestos-containing materials
- Record of demolition or renovation projects completed in the past 5 years that involve friable asbestos

Physical Features to Inspect:

- PCB storage areas
- Equipment, fluids, and other items used or stored at the facility containing PCBs
- Pipe, spray-on, duct, and troweled cementitious insulation and boiler lagging
- Ceiling and floor pipes

Sources to Interview:

- BCE [Environmental Planning]
- BEE [Bioenvironmental Engineering]
- BCE [Exterior Electric Shop]
- DRMO [Defense Reutilization and Marketing Office]
- Asbestos Program Officer
- Asbestos Operating Officer
- School Principal

COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-1. Determine actions or changes since previous review of Special Programs Management.	• Obtain copy of previous review report and determine if non-compliance issues have been resolved. (1)(2) • Determine whether facility changes relative to PCB equipment have occurred since previous review which would affect the scope of the review. (1)(3)
...	...
PCBs	
9-2. The installation should maintain copies of all relevant Host Nation and local regulations, and DoD and USAF directives and guidance documents on PCB management at the installation (AFR 19-1, Section C).	• Determine if copies of the following policy letters are maintained on the installation: - HQ USAF/LEEV letter, 29 Apr 86, *Removal of Polychlorinated Biphenyl (PCB) Equipment from Air Force Installations.* - HQ USAF/LEEV letter, 5 Apr 88, *Removal of Polychlorinated Biphenyl (PCB) Equipment from Air Force Installations.* - HQ USAF/LEE/SGP letter, 24 Jul 87, *Polychlorinated Biphenyls (PCB) Spill Clean-up Policy.* • Determine if copies of Host Nation and local PCB management regulations are maintained at the installation. (1)(3) • Examine regulations with base environmental staff. Determine if the staff is familiar and knowledgeable of PCB management requirements. (1)(3)
...	...
9-3. A base-wide inventory should be conducted to identify the location and PCB concentrations for all PCB transformers (GMP).	• Examine PCB Inventory. • Identify the criteria and scope for PCB transformer inventory (i.e., nameplate survey, pad-mounted, pole-mounted, dielectric fluid analyses). (1)(3) • Insure all PCBs and PCB materials used and/or processed on the installation are done so in accordance with their concentrations. • Inspect a sample of transformers on base to determine if any PCB transformers exist that are not included in the inventory or have not been labeled. (see Appendix IX-1 as guidance for nameplates indicating PCB content; installations are encouraged to modify the sample nameplate for local conditions, response requirements, and bilingual labeling). Include PCB transformers in service and those stored for reuse. • Verify that all combustible materials have been removed from the area within a PCB transformer former enclosure (i.e., vault or partitioned area) and the area within 5 meters of a PCB transformer or PCB transformer enclosure.
...	...

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-4. Inspections should be performed once every 3 months for all in-service PCB transformers (greater than 500 ppm PCB) (GMP). (NOTE: A reduced visual inspection frequency of at least once every 12 months is OK for PCB transformers that have impervious, undrained secondary containment capacity of 100% of the dielectric fluid and/or PCB transformers that have been tested and found to contain less than 60,000 ppm PCBs.)	• If a leaking transformer is discovered, make sure proper reporting procedure is followed. (1)(3) • Review inspection records to verify that applicable transformers are inspected at least once every 3 months. (1)(3) • Determine whether any PCB transformers have been found to be leaking. (1)(3)
...	...
9-5. PCB transformers found to be leaking during an inspection must be repaired or replaced to eliminate the source of the leak (GMP).	• Determine if cleanup and/or containment of released PCBs has been initiated within 48 hours of its detection. (3) • Determine if leaking PCB transformers are inspected daily. (3) • Determine if plans exist to repair or replace transformers to eliminate the source of the leak. (3)
...	...
9-6. PCB transformers inspection records should be maintained for at least 3 years after disposing of a transformer (GMP).	• Verify that PCB transformer inspection records are retained for inspections made during the periods of useful life and storage for disposal, and at least 3 years after disposal. (1)(3)
...	...
9-7. PCB transformer inspection records should include certain information (GMP).	• Determine if the following information is recorded for each PCB transformer inspection: (1)(3) - location of transformer - date of inspection - date when any leak was discovered - name of person conducting inspection - location and estimate of the dielectric fluid quantity for any leaks - date and description of any cleanup, containment, or repair - results of any daily inspections for transformers with uncorrected active leaks.

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-8. PCB transformers should not be stored where they pose an exposure risk to food and feed (GMP).	• Review the inventory of PCB transformers and verify that no PCB transformers exist on base, in use, or in storage for reuse, that pose an exposure risk to food and feed. (1)
...	...
9-9. PCB transformers may be serviced and may be "topped off" with dielectric fluid at any PCB concentration, but the removal of the coil from a PCB transformer should be prohibited (GMP).	• Interview persons performing transformer servicing and determine what servicing activities are conducted. (3)
...	...
9-10. Dielectric fluids used in or removed from PCB transformers and PCB-contaminated transformers, or any fluids with PCB concentrations between 50 and 500 ppm and fluids with greater than 500 ppm PCB, must be kept separate and not mixed together, and must be stored in an area that meets storage-for-disposal requirements (GMP).	• Inquire with electrical system servicing personnel and determine if PCB dielectric fluid is used for servicing PCB transformers, PCB contaminated transformers, or any PCB items, and determine if PCB dielectric fluids with 50-500 ppm PCB are kept separate from dielectric fluids that contain greater than 500 ppm. (1)(3) • Identify the locations where any PCB dielectric fluids greater than 50 ppm PCB are stored. (1)(3)
...	...

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-11. Electromagnets, switches, and voltage regulators containing PCBs at any concentration may be subject to certain requirements (GMP).	• Determine if any electromagnets, switches, and voltage regulators present on base contain PCBs. (1)(3) • Verify that no electromagnets present on base that contain greater than 500 ppm PCB pose an exposure risk to food or feed. (1)(3) • Verify that all electromagnets that contain greater than 500 ppm PCB are inspected at least weekly to determine if they are leaking. (1)(3) • Verify that electromagnets and voltage regulators that contain greater than 500 ppm PCB are not serviced or rebuilt in any manner. (1)(3) • Verify that electromagnets, switches, and voltage regulators that contain between 50 and 500 ppm PCB (PCB-contaminated electrical equipment) are only serviced with dielectric fluid that contains less than 500 ppm PCB. (1)(3)
...	...
9-12. Capacitors containing PCBs at any concentration may be subject to certain requirements (GMP).	• Determine if any capacitors on base contain PCBs. (1)(3) • Ascertain whether the BEC and the Exterior Electric Shop are aware that all PCB large high and low voltage capacitors that pose an exposure risk to food and feed should be removed by 1 October 1988. (1)(3) • Determine if the BEC and the Exterior Electric Shop are aware that all PCB large high and low voltage capacitors should only be in use in restricted-access electrical substations after 1 October 1988. (1)(3)
...	...
9-13. PCB items may be stored in storage areas (GMP).	• Inspect areas used for storage and verify that leaking PCB articles and PCB equipment are placed in a non-leaking PCB container that contains sufficient absorbent material to absorb the liquid contained in the PCB article or equipment. (1)(3)(4) • Storage over 30 days should meet the following criteria: - located outside of 100-year floodplain - enclosed by roof, walls, and impervious floor with curbs.
...	...
9-14. The storage of PCBs and PCB items may be subject to certain marking and inspection requirements (GMP).	• Verify that the following practices are conducted at any areas where PCBs or PCB items are stored: (1)(3)(4) - movable equipment used for handling PCBs and PCB items that directly contact PCBs must not be removed from the storage area unless decontaminated per appropriate regulations - inspections for leaks should be done every week of all PCB articles and PCB containers in storage - any leaked PCBs should be cleaned up immediately and any spill-absorbent material should be properly disposed of.

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
...	...
9-15. Containers used for the storage of PCBs shall comply with the shipping container specification of the host country (GMP and DoD 4160.21-M, Chapter 6 B80 and Chapter 21 D26).	• Inspect PCB storage area for containers. (1)(3)(4) • Verify that DOT specs are on the drums/containers. Typical specs are 5, 5B, 17C. (1)(3)(4) • Containers used for storage of liquid PCBs must be containers without removable heads. (1)(3)(4) (Note: Containers larger than those specified in DOT specs 5, 5B, or 17C may be used for nonliquid PCBs when such containers provide as much protection against leaking and exposure to the environment as the DOT specified containers.)
...	...
9-16. PCB liquids greater than 500 ppm should be disposed of in an incinerator which is designated to incinerate PCBs or by an approved method at a properly licensed facility (GMP).	• Check base PCB records from the past 3 years to ensure that PCBs are turned in to DRMO or contracted for disposal by an approved method at a properly licensed facility. (4)
...	...
9-17. PCB contaminated fluids (500 ppm > PCB > 50 ppm) should be incinerated in a PCB incinerator, burned in a high efficiency boiler, or buried in a chemical waste landfill (GMP).	• Inquire with DRMO and determine if any PCB fluids meeting these criteria were processed for disposal in the last year. (4) • Determine if such PCB fluids were disposed of by an approved method at a properly licensed facility. (4)
...	...
9-18. Rags, soils, and other debris contaminated with PCBs should be disposed of in a PCB incinerator or in a chemical waste landfill (GMP).	• Determine if any contaminated soil or debris has been disposed of and that disposal was conducted at a properly licensed facility. (4)
...	...

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
9-19. PCB transformer and capacitor hulks can be landfilled in a chemical waste landfill if they are drained of PCB fluids, filled with solvent, and allowed to stand for 18 hours. PCB fluids and solvents should be incinerated (GMP).	• Verify that contractors and personnel involved with the disposal of PCB transformers, drain, rinse, and dispose of the transformer hulks in accordance with these regulations. (4)
...	...
ASBESTOS	
9-20. The installation should maintain copies of all relevant Host Nation and local regulations, and DoD and USAF directives and guidance documents on asbestos management at the installation (AFR 19-1, Section C).	• Determine if AFR 91-42, *Air Force Facility Asbestos Management*, is maintained on the installation. (1)(9)(10) • Determine if copies of Host Nation and local asbestos management regulations are maintained at the installation. (1)(9)(10) • Examine regulations with base environmental staff. Determine if the staff is familiar and knowledgeable of asbestos management requirements. (1)(9)(10)
...	...
9-21. Installations with primary or secondary schools must adhere to the Asbestos-in-Schools rule (GMP).	• Determine if friable materials have been sampled and analyzed for asbestos and findings documented. (1)(8) • All school employees and organized parent groups have been informed of the location of friable ACM (asbestos containing materials). (8) • Each custodial worker has a copy of the EPA publication, *A Guide for Reducing Asbestos Exposure*. (8) • Management plans are available in the school office for inspection, and notification has been provided. (8)
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) BCE [Exterior Electric Shop] (4) DRMO [Defense Reutilization and Marketing Office] (5) BCE [Contract Programmer] (6) BCE [Contract Management] (7) BCE [Chief of Operations and Management] (8) School Principal (9) Asbestos Program Officer (10) Asbestos Operations Officer (11) Vehicle Maintenance Shops

COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-22. Each installation having maintenance responsibility must develop a written management plan and operating plan to carry out facility asbestos management (AFR 91-42). (NOTE: the MAJCOM can exempt small installations from in-house training and equipment requirements. In such cases, the asbestos management plan and asbestos operations plans must contain a viable alternate program (such as contract or other government support) for the satisfactory removal, repair, and control of ACM in facilities.) (1)(2)(9)(10)	• Review the Asbestos Management Plan to determine if the plan contains a current permanent record on the status and condition of all ACM in the installations' facilities, and that: - It is updated on a continual basis, including recording of charges due to removal projects. - The plan is based on a complete installation-wide asbestos facility survey. - The survey was used to prepare an asbestos register that indicates the location, type, condition, and all events affecting the ACM: - -Corrective actions have been initiated by preparation of AF Form 332 or DD Form 1391 for each facility where damaged friable asbestos material has been identified. - -The plan contains a priority listing of all asbestos projects identified in the survey. - Review the Asbestos Operating Plan to determine if it: - -assigns responsibilities - -establishes inspection and repair teams - -gives repair procedures and personnel protection instructions - -includes references to and explanations of applicable EPA and OSHA regulations and AFRs 19-1, 127-12, and AFOSH 161-4. The plan should address: (1)(2)(9)(10) - --the organizational structure for carrying out asbestos related work - --personnel training programs - --equipment and supply requirements - --identification of worker manuals or other written procedures - --yearly budget estimates - --procedures for interim control measures and extraordinary precautions - --procedures for asbestos certification and asbestos disposition statements on programming documents - --requirements for a special response team and in-house inspection capability - --contractor requirements to perform analytical work and asbestos abatement. • Hazards due to the potential release of asbestos fibers must be eliminated by repairing or removing the damaged ACM.

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-23. Asbestos emissions should be controlled during facility demolition or renovation operations (GMP).	• Inspect facility during demolition or renovation operation. Determine if procedures to prevent emissions of particulate asbestos to outside air are being followed. (1)(2)(10) . • If the temperature at the point of wetting is above 32 °F, determine that: (1)(2)(10) - Asbestos is removed prior to wrecking or dismantling. - Asbestos is encased in concrete or similar material and is adequately wet when exposed during cutting or joining operations. - Facility components are lowered carefully (not dropped or thrown) to the ground. • If the temperature at the point of wetting is below 32 °F, observe that asbestos materials are removed in sections or units to the maximum extent possible. (1)(2)(10)
...	...
9-24. In renovation operations, wetting of asbestos materials before removal from the facility may not be required if certain standards are met (GMP).	• Inspect facility during renovation operation. If asbestos materials are not adequately wet, determine that: (1)(2)(10) - Operator has requested and received determination from the appropriate agency that wetting would unavoidably damage equipment. - A local exhaust ventilation and collection system designed and operated to capture asbestos emissions is in use. - The exhaust system exhibits no visible emissions to outside air.
...	...
9-25. Asbestos emissions should be controlled during stripping of facility components (GMP).	• Inspect facility components removed from facility as units or in sections for stripping. Observe that: (1)(2)(10) - Friable asbestos is adequately wet during stripping operation. - A local exhaust ventilation and collection system designed and operated to capture emissions is in use. - The exhaust system exhibits no outside air.
...	...
9-26. Emissions from asbestos materials that have been removed or stripped should be controlled (GMP).	• Inspect asbestos materials that have been removed or stripped. Observe that: (1)(2)(10) - Materials are adequately wet, and remain wet until collected for disposal. - Materials are carefully lowered to the ground or lower floor (not dropped or thrown). - Materials not removed as units or in sections are transported to the ground via dust-tight chutes or containers if they are removed more than 50 feet above ground level.
...	...

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
9-27. Waste materials containing friable asbestos should be sealed in leakproof containers, labeled with hazard warning, and disposed of at approved disposal sites (GMP).	• Verify that asbestos wastes were sealed in leakproof containers and properly labeled. (1)(2)(10)(11) • Confirm that only approved asbestos disposal sites have been used for disposal. (1)
...	...
9-28. No visible emissions should result from any asbestos disposal operation (GMP).	• Interview to determine that landfill accepting installation asbestos wastes was observed during disposal. (1)
...	...
RADON GAS	
9-29. Determine actions or changes since last review of radon gas management.	• Obtain copy of previous review report and determine if non-compliance issues have been resolved. (1)(2) • Determine facility changes relative to radon gas monitoring that have occurred since previous review and would impact the scope of the current review. (1)(2)
...	...
9-30. The installation should have relevant Host Nation and local regulations, DoD and USAF directives, guidance documents and current policy letters on radon gas management.	• Determine if the installation has a copy of policy letter from USAF/CV dated 23 October 1987 and any relevant updates. (1)(2) • Determine if copies of Host Nation and local radon gas regulations are maintained at the installation. (1)(2) • Examine documents with base environmental staff. Determine if staff is familiar with and knowledgeable of radon gas requirements. (1)(2)
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) BCE [Exterior Electric Shop] (4) DRMO [Defense Reutilization and Marketing Office] (5) BCE [Contract Programming] (6) BCE [Contract Management] (7) BCE [Chief of Operations and Management] (8) School Principal (9) Asbestos Program Officer (10) Asbestos Operations Officer (11) Vehicle Maintenance Shops

COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-31. Air Force policy requires sampling for and mitigation of radon gas levels in certain structures at radon concentrations above 4 Picocuries per Liter (pCi/L) (HQ USAF/CV Policy letter 23 October 1987).	• Review radon sampling records with the BEE to determine if any mitigation actions are required. Initial sample results were to be completed in May 1988. Detailed assessment results should be available approximately May 1990 for high and some medium risk bases, and in December 1990, February 1991, and August 1992 for the rest of the medium risk bases. (2) • Review any needed radon mitigation projects with the contract programmer in Civil Engineering. All mitigation projects should be prioritized according to their radon level (pCi/L) as follows: (1) - > 200 -- within several weeks - < 200 but > 20 -- within 6 months - < 20 but > 4 -- within 5 years. • Determine if the programmed mitigation projects meet the goals listed above. • Determine if BCE has received radon diagnostic and mitigation training. • Check if residents were informed of the radon levels in their residences, and measures being taken for correction.
...	...
A-106 REPORT	
9-32. Determine actions or changes since last review of the A-106 Pollution Abatement Report Submission.	• Obtain a copy of previous review report and determine if noncompliance issues have been resolved. (1)
...	...
9-33. The installation should have copies of all relevant Federal, DoD; US Air Force, and host country/ local regulations on the A-106 Pollution Abatement Plan.	• Determine whether copies of the following regulations and publications are maintained and kept current at the installation: (1) - AFR 19-8, *Environmental Protection Committees and Environmental Reporting* - latest version of the *Instruction Kit for Completing EPA Form 3500-7 for New Pollution Abatement and Prevention Projects.*
...	...

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
9-34. The A-106 process must be incorporated into the Air Force planning, programming, and budgeting system.	• Obtain a copy of the previous year's A-106 Report. • Determine if the installation A-106 Report reflects installation environmental requirements. (1)(5) • Compare the A-106 Plan with requirements in the CECORS, and the Programming, Design, and Construction (PDC) System. • Determine if the A-106 Plan includes all projects involving costs that are necessary to comply with environmental standards. (1)(5) • Check to ensure projects resulting from previous ECAMP evaluations or regulatory inspections are included in the A-106 Plan. Management action plans from ECAMP will give projects required to get installation back in compliance. • Determine if the A-106 Plan includes all funds required for studies, management, and monitoring associated with the definition and development of corrective measures and necessary equipment to assure compliance with standards. (1)(5) • Determine if the installation budgets for the environmental requirements recorded in the installation A-106 Plan. (1)(5) • Compare listings in the A-106 Plan with the CECORS and PDC listings in BCE.
...	...
9-35. Current year Class I and Class II requirements should be in the execution range.	• Determine if current year Class I and Class II requirements are being executed. (1)(5) • Check progress code in the A-106 Plan to ensure projects are under construction or work – ongoing.
...	...

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COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
ENVIRONMENTAL IMPACT ANALYSIS PROCESS (EIAP) OVERSEAS	
9-36. Any office, unit, or activity initiating an action on an overseas installation must determine if the action is a major Air Force action with potential for significant harm to the environment in places outside the United States (AFR 19-3).	• Interview the BCE to determine if any major Air Force actions have recently occurred or are due to occur. Potential major actions include mission changes, real estate acquisition or sales, base closure, MILCON projects, etc.). • Review the process used to determine if a major Air Force action is being undertaken. • If a major Air Force action is underway or being considered, determine if appropriate process is being used to determine whether no action is required, or an environmental impact statement, environmental study, or environmental review is needed. • Evaluate progress in accomplishing actions required.
...	...

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Appendix IX-1

PCB Label Format

CAUTION

CONTAINS

PCBs

(POLYCHLORINATED BIPHENYLS)

A toxic environmental contaminant requiring special handling and disposal in accordance with U.S. Environmental Protection Agency Regulations 40 CFR 761. For Disposal Information contact the _____ _____ or nearest U.S. EPA office.

In case of accident or spill, call the or the U.S. Coast Guard National Response Center: 800: 424-8802

Appendix IX-2

Dielectric Fluid Trend Names and Manufacturers

1. U.S.-Manufactured Dielectrics:

Name	Manufacturer
Aroclor	Monsanto
Aroclor B	Mallory
Sbestol	American Corporation
Askarel Hevi-Duty	Hevi-Duty Corporation
Askarel *	Ferranti-Packard,Ltd.
Askarel	Universal Mfg. Co.
Chlorextol	Allis-Chalmers
Chlorinol	Sparagoe Electric
Chlorphen	Jard Company
Diaclor	Sangamo Electric
Dykanol	Cornell Dubilier
Elemex	McGraw Edison
Eucarel	Electric Utilities Co.
Hyvol	Aerovox
Inerteen	Westinghouse Electric
No-Flamol	Wagner Electric
Pyranol	General Electric
Saf-T-Kuhl	Kuhlman Electric

* Generic name used for insulating liquids in capacitors and transformers.

2. Non-U.S.-Manufactured Dielectrics:

Name	Manufacturer
Clophen	Bayer (Germany)
Fenclo	Caffaro (Italy)
Kennechlor	Mitsubishi (Japan)
Phenoclor	Prodelec (France)
DK	Caffaro (Italy)
Pyralene	Prodelec (France)
Solvol	USSR
Santotherm	Mitsubishi (Japan)

3. Transformers that list other dielectrics or do not bear a manufacturer's identification or service plate on the transformer: if the transformer contains any of the dielectrics (commonly referred to as askarels), it is to be certified as a PCB transformer containing in excess of 500 ppm PCB and no laboratory testing is necessary.

INSTALLATION:	COMPLIANCE CATEGORY: SPECIAL PROGRAMS MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):

STATUS NA C RMA	REVIEWER COMMENTS:

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) BCE [Exterior Electric Shop] (4) DRMO [Defense Reutilization and Marketing Office] (5) BCE [Contract Programmer] (6) BCE [Contract Management] (7) BCE [Chief of Operations and Management] (8) School Principle (9) Asbestos Program Officer (10) Asbestos Operations Officer (11) Vehicle Maintenance Shops

Section X

Water Quality Management

Section X

WATER QUALITY MANAGEMENT

A. Applicability of this Protocol

This protocol identifies regulations, responsibilities, and compliance requirements applicable to all water use, management, and discharge on U.S. Air Force (USAF) installations, which includes activities and procedures involved in the collection, treatment, storage and distribution of drinking water and the collection, treatment, and discharge of wastewater.

The regulations and requirements associated with drinking water are applicable to any installation which has jurisdiction over any public water supply system. A public water system is defined as "any collection, treatment, storage, or distribution facility for the provision of piped water for human consumption, provided that the system for which it exists has at least 15 service connections or regularly serves at least 25 individuals daily for a total of at least 60 days per year."

Air Force installations that meet all the criteria listed below are not required to comply with the requirements of the Safe Drinking Water Act since, by definition, they are not "*public water systems*":

1. System consists only of distribution and storage facilities and does not have any collection and treatment facilities.

2. Installation gets all of its water from a public water system that is owned or operated by another party (non-Air Force).

3. Installation does not sell water to any party.

Even though the above criteria may apply to an Air Force installation, as a practical matter, Air Force Regulation 161-44, ***Management of the Drinking Water Surveillance Program,*** requires compliance with drinking water standards and monitoring requirements. Therefore, this protocol should be used to determine compliance with drinking water requirements even though some items may be noted as not applicable (N/A) by the evaluator.

The regulations, responsibilities, and compliance requirements associated with wastewater discharge at Air Force installations include, but is not limited to, the following examples:

- sanitary or industrial wastewater discharge directly to a receiving stream, or through an on-base treatment facility

- sanitary or industrial wastewater discharge to an off-base publicly owned treatment works (POTW) or to a treatment plant of another Department of Defense (DoD) activity

- storm runoff from industrialized areas of the installation to a receiving stream or water body.

Most Air Force installations have wastewater discharge of one type or another, therefore this protocol will be applicable to most installations.

The regulatory requirements in this protocol are based on DoD and Air Force regulations that apply at overseas installations. Good Management Practices (GMPs) are derived from U.S. Environmental Protection Agency (EPA) regulations that are not mandatory overseas but are important to preserve the health and safety of Air Force employees and protect the environment. Any procedural EPA requirements, such as permits and notifications, are not applicable overseas, and, therefore, are not in the worldwide manual. GMPs in the Water Quality protocol are derived from the following EPA regulations: 40 CFR 122, 40 CFR 136, 40 CFR 141, 40 CFR 143, and 40 CFR 403.

B. DoD Regulations

- DoD Directive 6230.1 of 24 April 1978 sets forth DoD policy for provisions of adequate safe drinking water and compliance with the Safe Drinking Water Act and the standards established by 40 CFR 141. Outside of the United States, the provisions of this directive apply consistent with international agreements, SOFA, or Host Country laws.

- DoD Instruction 4120.14, *Environmental Pollution Prevention, Control, and Abatement* (NOTAL), implements within DoD policies provided by Executive Order (EO) 12088, *Federal Compliance with Pollution Standards*, and Office of Management and Budget (OMB) Circular A-106 and establishes policies for developing and submitting plans for installing improvements needed to abate water pollution emanating from DoD facilities.

C. U.S. Air Force Regulations

- Air Force Regulation (AFR) 19-7, *Environmental Pollution Monitoring*, specifies requirements for establishing water quality surveillance and monitoring to ensure compliance with appropriate Host Nation and local requirements. All Air Force installations are required to issue supplements to AFR 19-7 that identify specific monitoring locations and frequencies of sampling at the installation.

- AFR 86-4, *Base Comprehensive Plan*, requires Base Comprehensive Plans to be reviewed and revised as appropriate every 5 years. The Base Comprehensive Plan includes master plans for the drinking water system and wastewater and storm water systems.

- AFR 91-5, *Utility Services*, AFR 91-10, *Operation and Maintenance of Air Force Water Works Facilities*, and AFR 91-26, *Maintenance and Operation of Water Supply, Treatment, and Distribution Systems*, contain pertinent standards related to operation and maintenance of drinking water systems.

- AFR 91-10 also defines required procedures for dealing with regulatory authorities requesting access to facilities and information or conducting inspections, and for conflict resolution.

- AFR 91-9, *Water Pollution Control Facilities*, specifies additional requirements relative to proper operation of waste treatment works at Air Force installations. Requirements for training and certification of treatment plant operators are also included along with requirements for a base wastewater regulation and plant-specific Operations and Maintenance (O & M) manuals.

- Air Force Manual (AFM) 91-32, *Operation and Maintenance of Domestic and Industrial Wastewater Systems*, specifies detailed operational and maintenance guidelines and requirements for water pollution control plants on Air Force installations. In particular, requirements for maintenance of operating logs, maps, and records are specified in these AFMs.

- AFR 161-44, *Management of the Drinking Water Surveillance Program*, is the operative regulation for the management of drinking water programs at all Air Force installations. It implements the Safe Drinking Water Act (SDWA) (Pub. Law 93-523), the EPA Primary Drinking Water Regulations, and DoD Directive 6230.1. It is the key regulation against which compliance with all appropriate standards, procedures, and requirements for drinking water systems will be measured at Air Force installations. As EPA finalizes rules for specific contaminants (i.e. synthetic volatile organics, lead, microbiologicals, etc.), HQ USAF/SG will publish policy letters to supplement AFR 161-44. Revision of AFR 161-44 is planned in late FY90, after EPA has final rules for all requirements as mandated by the SDWA. To date, HQ USAF/SG policy letters have been issued for volatile synthetic organic chemicals (28 December 1987) and public notice pertaining to lead (28 December 1987).

- HQ USAF/LEE Policy Letter, *Nonpoint Source Pollution Policy*, 5 May 1987, outlines USAF policy and GMPs.

D. Responsibility for Compliance

- Air Force Systems Command (OEHL), Brooks Air Force Base, Texas, provides services to complete all required laboratory, chemical, physical and radiological analyses for drinking water. It also establishes a water supply sampling schedule for each installation to conform to the frequency established in AFR 161-44. OEHL maintains a potable water quality data repository of the last ten years of data and disseminates analytical results as required to the using activities and commands.

- Base Civil Engineer (BCE) designs, constructs, and operates the water supply system to provide sufficient drinking water to installation personnel. The BCE is responsible for providing adequate water treatment to assure that drinking water does not exceed the maximum contaminant levels established 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 BCE. BCE maintains an up-to-date map of the complete potable water system, makes repairs, and maintains the systems. BCE is also responsible for negotiating and maintaining the base's water supply contract. BCE is also responsible for preparing applications for monitoring compliance with, and reporting deviations from minimum standards outlined in wastewater discharge permits of Host Nation (or Host Nation equivalent). BCE design departments are responsible for the design and construction of wastewater collection and treatment systems as needed on the installation.

- Bioenvironmental Engineering (BEE) has the responsibility for monitoring wastewater discharge and stream water quality at selected locations around the installation, according to the installation's supplement to AFR 19-7.

- Director of Base Medical Services, through BEE, is responsible for proper sample collection from drinking water systems at Air Force installations and determining compliance with drinking water standards. Coordination with OEHL, interpretation of results of water analyses, and notifications to State regulatory authorities when maximum contaminant levels are exceeded are also the responsibilities of the Director of Base Medical Services.

- Individual shop supervisors and superintendents have the responsibility to ensure that prohibited, unpermitted discharge of wastewater containing toxic or hazardous substances are not discharged to the sanitary or storm water systems on the installation.

- The Water and Waste Shop within BCE has responsibility for operations and maintenance of sewer lines, pretreatment facilities, pump stations, oil/water separators, and other associated facilities around the installation, including taking timely and appropriate corrective actions when deficiencies are discovered.

E. Key Compliance Definitions

These definitions were obtained from the regulations and compliance requirements listed previously.

- *Approved Municipal Facility* - a water treatment facility that has been inspected and approved by a Host Nation, local authority, or other regulatory agency that has jurisdiction.

- *Best Available Technology (BAT)* - the best technology treatment techniques or other means that the administrator finds, examination for efficacy under field conditions, and not solely under lab conditions, that are available (taking cost into consideration). For the purposes of setting Maximum Contaminant Level (MCLs) for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon or air stripping.

- *Community Water System* - a public water system that serves at least 15 service connections used by full-time residents, or regularly serves at least 25 of the same persons over 6 months per year.

- *Composite Sample* - a combination of individual samples obtained at regular intervals over a time period. Either the volume of each individual sample is proportional to discharge flow rates or the sampling interval (for constant volume samples) is proportional to the flow rates over the time period used to produce the composite. The maximum time period between individual samples shall be 2 hours.

- *Contaminated Water* - water that has been intruded by microorganisms, chemicals, wastes, or wastewater in a concentration that makes the water unfit for its intended use.

- *Daily Average Concentration* - the arithmetic average of all the daily determinations of concentration made during a calendar month. Daily determinations of concentrations made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily determination of concentration shall be the arithmetic average of all the samples collected during that calendar day.

- *Daily Average Discharge* - the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.

- *Daily Average Temperature* - the arithmetic mean of temperature measurements made on an hourly basis, or the mean value plot of the record of a continuous automated temperature recording instrument, either during a calendar month, or during the operating month if flows are of shorter duration.

- *Daily Maximum Concentration* - the daily determination of concentration for any calendar day.

- *Daily Maximum Discharge* - the total discharge by weight during any calendar day.

- *Daily Maximum Temperature* - the highest arithmetic mean of the temperatures observed for any two consecutive hours during a 24-hour day, or during the operating day if flows are of shorter duration.

- *Direct Discharger* - any point source discharger who discharges directly into any stream, river, bay, ocean, or any other watercourse.

- *Erosion* - the wearing away of a land surface by wind or water.

- *Grab Sample* - an individual sample collected in less than 15 minutes.

- *Gross Alpha Particle Activity* - the total radioactivity due to alpha particle emissions as inferred from measurements made on a dry sample.

- *Immersion Stabilization (i-s)* - a calibrated device immersed in the effluent stream until the reading is stabilized.

- *Indirect Discharger* - a point-source discharger whose discharge is conveyed directly to a publicly or privately owned waste treatment facility and not directly to a watercourse.

- *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, except in the cases where the maximum permissible level is measured at the point of entry to the distribution system.

- *Nonpoint Source* - a diffuse source of water pollution that does not discharge through a pipe (e.g., runoff from construction activities and agricultural, silvicultural, and urban areas).

- *Non-Transient Non-Community Water System (NTNCWS)* - a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year.

- *Palatable Water* - water that is pleasing to the taste and free of objectionable color, turbidity, taste, or odor. Palatability does not imply potability.

- *PicoCurie (pCi)* - quantity of radioactive material producing 2.22 nuclear transformations/minute.

- *Point of Entry Treatment Device* - a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

- *Point-of-Use Treatment Device* - a treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap.

- *Point Source* - any discernible confined and discrete conveyance including but not limited to a pipe, ditch, channel, or conduit, from which pollutants are or may be discharged.

- *Population Served* - the number of base residents served plus one-third of the non-residents usually served by the system. (Revised rules are under consideration.)

- *Potable Water* - water that has been examined and treated to meet the proper standards and declared by responsible authorities to be fit for drinking.

- *Public Water System* - a system for providing to the public 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 out of the year.

- *Raw Water* - (1) Untreated water that enters the first unit of a water treatment plant or (2) water used as a source of water supply taken from a natural or impounded body of water, such as a stream, lake, pond, or underground aquifer.

- *Runoff* - water from rain, snow melt, or irrigation that flows over the ground surface to streams. It can collect pollutants from land and air and carry them to receiving waters.

- *Sediment* - solid material such as silt, sand, and organic matter, that moves from its site of origin and settles to the bottom of a watercourse or water body. Excessive amounts of sediment can clog a watercourse and interfere with navigation, fish migration, or spawning, etc. If disturbed, sediment can be resuspended in the water column, where it contributes to turbidity.

- *Silviculture* - management of forest land for timber. Some silvicultural practices, such as clearcutting, may contribute to water pollution by increasing the erodibility of the land.

- *Soil Stabilization* - a nonstructural GMP that involves the use of mulches and ground covers, reduces precipitation velocity, and effectively decreases the amount of sediment in runoff, thus reducing the volume of runoff.

WATER QUALITY MANAGEMENT

GUIDANCE FOR CHECKLIST USERS

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
All installations	10-1 and 10-2	(1)(2)(3)
If the installation operates a public water system	10-3 through 10-7	(1)(2)
Contaminant Monitoring	10-8 through 10-10	(1)(2)(4)
Notification Requirements	10-11 through 10-13	(1)(2)
If the installation supplies water to aircraft	10-14	(2)
If the installation operates ice machines	10-15	(2)
If the installation has had a pollution incident	10-16	
If the installation has any permitted discharges of sanitary or industrial wastewater or storm water	10-17 through 10-19	(1)(2)(3)

(*)CONTACT/LOCATION CODE:

(1) BCE [Environmental Planning]
(2) BEE [Bioenvironmental Engineering]
(3) Wastewater Treatment Plant Superintendent
(4) BCE [Natural Resources Planner]
(5) BCE [Water Treatment Plant Supervisor]

	REFER TO WORKSHEET ITEMS:	CONTACT THESE PERSONS OR GROUPS:(*)
If the installation has a wastewater treatment facility	10-20 through 10-26	(3)
If the installation has unpermitted storm water discharge	10-27	(1)(2)
If the installation discharges wastewater to an off-base POTW or other treatment facility	10-28 through 10-30	(1)(2)
If the installation has sources of nonpoint pollution	10-31	(1)(4)
If the installation conducts live fire training activities	10-31 through 10-33	(1)(2)(4)

(*)CONTACT/LOCATION CODE:

(1) BCE [Environmental Planning]
(2) BEE [Bioenvironmental Engineering]
(3) Wastewater Treatment Plant Superintendent
(4) BCE [Natural Resources Planner]
(5) BCE [Water Treatment Plant Supervisor]

WATER QUALITY MANAGEMENT

Records to Review:

- Bacterial and chemical analyses of drinking water, including sampling dates and locations, dates of analyses, analytical methods used, and results of analyses
- Monthly operating reports (flow, chlorine residual, etc)
- Records of planning and construction of injection wells
- Results of injection well monitoring
- Records, of facility projects, including any petition for review, that may potentially cause contamination of a sole source aquifer through its recharge zone
- Discharge monitoring reports for the past year
- Laboratory records and procedures
- 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
- Spill Prevention, Control, and Countermeasures (SPCC) Plan
- All records required by SPCC
- Sewage treatment plant operator certification
- Sewer and storm drain layout

Physical Features to Inspect

- Drinking water collection, treatment, and distribution facilities
- On base laboratory analysis facilities
- Underground injection wells
- Discharge outfall pipes
- Wastewater treatment facilities
- Industrial treatment facilities
- Streams, rivers, open waterways
- Floor and sink drains (especially in industrial areas)
- Storm water collection points (especially in industrial areas)
- Oil storage tanks
- Oil/water separators

Sources to Interview:

- BCE [Base Civil Engineer]
    - Environmental Planning
    - Environmental Coordinator
    - Collection, Treatment, and Distribution facility operators
- BEE [Bioenvironmental Engineering]
- Wastewater Treatment Plant Superintendent

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS:**	**REVIEWER CHECKS:**
10-1. Determine actions or changes since previous review of water quality management.	• Obtain copies of previous water quality review and determine if non-compliance issues have been resolved. (1)(2)
...	...
10-2. The installation should maintain copies of all relevant Host Nation and local regulations, DoD, and USAF directives and guidance documents on water quality at the installation (AFR 19-1, Section C).	• Determine if copies of the following are maintained at the installation: (1)(2)(3) - AFR 19-7 (Supplement), *Environmental Pollution Monitoring* - AFR 86-4, *Base Comprehensive Plan* - AFR 91-9, *Water Pollution Control Facilities* - AFR 161-44, *Management of the Drinking Water Surveillance Program* - AF Manual (AFM) 91-32, *Operation and Maintenance of Domestic and Industrial Wastewater Systems* - Base Water Regulation and site-specific O & M manual and Operating Instruction (OI) or Standard Operating Procedure (SOP). • Determine if current Host Nation and local water quality regulations are maintained at the installation. (1) • Examine the regulations with base environmental staff. Determine if they are familiar and knowledgeable of water quality regulatory requirements. (1) • Review contract for purchase of water. Determine if contract conditions (e.g. quality, quantity, connections, etc.) are being complied with at the installation.
...	...
DRINKING WATER	
10-3. BCE must keep records of actions taken to correct or repair any part of the treatment and distribution system (AFR 161-44, Section 7-3).	• Determine whether installation or operational changes to the water system have taken place since the previous review. Review map of complete potable water system. (1) • Examine water system records to determine operational changes. Records must be maintained for at least 3 years. (1) • Assure as-built drawings are updated to reflect changes in the water supply. (1) • Determine if water supply system master plan has been updated every 5 years in accordance with AFR 86-4.
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
10-4. BEE must review plans for water system modifications (AFR 85-21, Chapter 1, Section C).	• Determine if BEE has been requested by BCE to review plans for water system modifications. (1)(2) • Determine if BEE has conducted this review to ensure that potential cross connections are identified and proper control devices are installed as needed. (1)(2)
...	...
10-5. Regulations may require installations to conduct periodic surveys of water system operation and maintenance procedures (e.g., emergency procedures, facility cross connections, etc.) (appropriate Host Nation regulations).	• Determine if Host Nation agencies perform water plant surveys. (1)(2) • If applicable, review the results of the survey and determine if recommended corrective actions have been made. (1)(2) • Records of actions taken to correct violations of Host Nation drinking water standards shall be kept for 3 years. • Records of water distribution system surveys shall be kept for 10 years.
...	...
10-6. Water treatment plant operators must be properly trained and certified to maintain, operate, and report if necessary on that installation drinking water system (applicable Host Nation regulations).	• Interview with BCE determine if water treatment plant operators are certified to Host Nation or equivalent U.S. standards. (1) • Verify that certified operators receive periodic refresher training. (1)
...	...
10-7. Local regulations may require groundwater withdrawal permits and may require reports of quantities of water used to be submitted (appropriate local regulations).	• Examine withdrawal permit, if available, and check effective dates; verify that allocations in permit reflect actual usage. (1) • Verify reporting is current in accordance with the permit. • Verify gallons withdrawn have not exceeded maximum 1-day appropriation and average daily appropriation listed on the permit. (1) • Examine any relevant Host Nation/local permits, notification procedures, recordkeeping requirements, etc., for using water from neighboring community systems whether on a continuing or as-need basis. • Examine any mutual assistance agreements.
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
10-8. Sampling of drinking water must be conducted in accordance with AFR 161-44.	• Interview BEE and Water Treatment Plant the determine if the drinking water is monitored for the following: (1)(2)(4)(5) -Nitrates - -water systems using surface sources - (annually) - -water systems using ground water sources - (every 3 years). -Fluoride - -Water Treatment Plant - (daily) - -representative points in the distribution system -(weekly). -Bacteriological Analysis - -representative points in the distribution system - (monthly). (See Appendix X-1 for the number of samples required per month according to the population served.) (NOTE: Chlorine residual monitoring may be substituted for not more than 75 percent of the bacteriological samples required, provided (1) samples are taken at points representative of the conditions in the distribution system at the frequency of at least four for each substituted microbiological sample, (2) there are at least daily determinations of chlorine residual, and (3) a free chlorine residual of at least 0.2 mg/l is maintained.) -Corrosivity - -water systems using surface sources - (bi-annually) - -water systems using ground sources - (one sample). (NOTE: determinations of corrosivity characteristics includes measurement of pH, calcium hardness, alkalinity, temperature, total dissolved solids, and calculation of the Langelier Index. Installations with asbestos cement pipe should calculate the Aggressive Index.) -Turbidity - -representative entry points - (daily). -Radiological Sampling - -gross alpha - (quarterly) - -Radium 226 - (every 4 years) - -Radium 228 - (every 4 years). (NOTE: A single sampling may be substituted for quarterly composite sampling, provided that average annual concentration is not less than half the Maximum Contaminant Level Unit (MCLUs). Gross alpha monitoring may be substituted for Radium 226 and Radium 228 if analysis proved that gross alpha does not exceed 5 pci/L.)

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY **REQUIREMENTS:**	**REVIEWER CHECKS:**
10-8. (continued)	-Trihalomethane (THM) - -water systems that serve 10,000 or more persons and add a disinfectant to the water in any part of the system (4 samples/quarter) - -water systems which serve less than 10,000 persons and use ground water sources (annually) - -water systems which serve less than 10,000 persons and use surface water sources (annually). -Complete inorganic chemical analysis - -water systems using surface water sources (annually) - -water systems using ground water sources (once every 3 years). • Determine if the results are within the parameters listed at Appendix X-2. (1)(2) • If the installation has failed to comply with the standards and monitoring requirements of AFR 161-44, determine if they have notified the surgeon general and the director of engineering and services of their Major Command (MAJCOM). (1)(2)
...	...
10-9. Fluoride sampling records should be maintained on DD Form 686. Copies must be sent to the dental section and the BCE (AFR 161-44, Section 6-5).	• Interview with BEE to verify required fluoridation sampling is being done and reports are being submitted to the dental section and the BCE as required. (2) • Visit the Water Treatment Plant and observe that the operators are conducting daily sampling and analysis. (1) • Verify that plant operators are recording and reporting quantities of fluoride added and the average results of daily fluoride tests (in mg/L to the nearest tenth). AF Form 1460 or AF Form 1461 should be examined for these entries. (1)
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
10-10. Results of bacteriological lab analysis are to be reported on DD Form 686 or equivalent log book or Host Nation form and a duplicate copy furnished to the BCE (AFR 161-44, Section 6-2).	• Review representative sample of DD Form 686 or other reporting forms. Verify that duplicate copies are maintained by BCE. (1) • Verify that BEE keeps records of bacteriologic analysis for at least the past 5 years. (2)
...	...
10-11. Installations with public water systems must notify their users about lead in drinking water systems (HQ USAF/SG Policy letter, 28 Dec 87).	• Determine if the notice was provided to all persons (one- time users) using the drinking water. There are three options to provide notice: (2) - newspaper notice once a month for 3 consecutive months - separate mail notices to each user - hand-delivered notice to each user.
...	...
10-12. Installations that operate public water systems must send to the MAJCOM Surgeon reports that include results of bacteriological and turbidity monitoring and are supplemented when necessary to include results of annual composite radiological and chemical analyses (AFR 161-44, 7-1).	• Examine file of reports to the MAJCOM Surgeon. (2)
...	...
10-13. When Primary Drinking Water Standards are violated, notifications must be made to the public and certain base personnel (AFR 161-44, 7-2).	• Verify from a review of records that any violations were reported to appropriate persons (see Appendix X-3 for specific requirements). (1)(2)
....	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
10-14. Aircraft watering points should be sampled at least monthly for coliform. Water trucks or tanks that service aircraft should be sampled at least quarterly (AFR 161-44, Appendix X-1).	• Inspect service connection on the distribution system that provides water to aircraft. (2) • Determine if monthly bacteriological surveillance is being done. (2) • Examine documentation to verify that each water tank or truck is sampled quarterly from discharge points and that a water sample from the discharge point of one tank or truck is obtained and analyzed at least once a month. (2)
...	...
10-15. Ice samples should be taken, as requested by the Environmental Health Officer, from icemakers and ice storage chests and analyzed for total coliform (AFR 161-26, paragraph 76).	• Determine if ice samples are periodically requested by the Hospital Environmental Health Officer. (2) • Review analytical results to determine if coliform levels are in compliance. (2)
...	...
10-16. All pollution incidents caused by an Air Force activity or occurring on an Air Force installation that contaminates, or threatens to contaminate, surface water, or ground water, must be investigated, and a pollution incident report (RCS:HAF LEE (AR) 7139) prepared (AFR 19-8).	• Verify that no spills of Petroleum, Oil, and Lubricants (POL) or hazardous substance have occurred that could contaminate ground or surface water sources. • If a spill has occurred, verify that spill has been reported and actions are taken to identify extent of spill contamination. Check to see that installation has a plan for removing the contamination or threat of contamination.
...	...

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
WASTEWATER **10-17.** Discharge points on the installation, except uncontaminated storm water runoff, should be managed (GMP).	• Interview with BCE to determine the location of sanitary, industrial and storm water runoff discharges. Identify these discharge points on a base map. (1) • Determine if sewer and storm system master plan has been updated every 5 years in accordance with AFR 86-4. (1) • Interview BEE and plant operator; examine supplement to AFR 19-7 relative to discharge monitoring to determine whether: - locations of sampling points result in representative samples - parameters and sampling frequency are acceptable - installation is using the method of sample collection required: (2)(3) __Grab __Manual Composite __Automatic Composite __Frequency __Weir __Parshall Flume __Magmeter __Venturi meter • Verify that flow measurement meets the requirements: (2)(3) - Primary measuring device properly installed. - Determine whether type of device is acceptable. - Determine if primary flow measuring device is properly operated and maintained, and calibration records are kept. - Determine whether secondary instruments (totalizers, recorders, etc.) are properly operated and maintained. • Interview with BEE staff. Determine the following: (2) - Proper sample containers are used. - Samples are refrigerated during compositing. - Proper preservation techniques are used. - Flow-proportioned samples are obtained where required by permit (or Host Nation equivalent).

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS**
10-17. (continued)	- Sample holding times before analyses are in conformity with requirements. - Monitoring and analysis are being performed more frequently than required by permits (or Host Nation equivalent), if yes, make sure results reported in installation's self-monitoring report. (Discharge Monitoring Report [DMR].) Permit Limit / DMR #1 / DMR #2 BOD _____ ___ ___ COD _____ ___ ___ SS _____ ___ ___ pH _____ ___ ___ Other _____ ___ ___ _____ _____ ___ ___ _____ _____ ___ ___ _____ _____ ___ ___ _____ _____ ___ ___ • Interview BEE to determine the following: (2) - Calibration and maintenance of instruments and equipment is satisfactory. - Quality control procedures are used. - Duplicate samples are analyzed. - Spiked samples are used.
...	...
10-18. Various records should be maintained.	• Examine operator and BEE monitoring records. Determine if adequate documentation is being made including: (1)(2)(3) - sampling date, time, exact locations - analyses dates, times - name of individual performing analysis - analytical methods/techniques used - analytical results (i.e. they are consistent with self-monitoring report data). • Determine if lab equipment calibration and maintenance records are kept. • Determine if quality assurance records are kept. • Determine from BCE if records of major industrial processes contributing to effluent discharges are maintained.
...	...

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
10-19. Evaluators should physically observe each permitted (or Host Nation equivalent) discharge point (GMP).	• Inspect each permitted effluent discharge point on the installation. Note appearance, odors or other observed characteristics (e.g, oil sheen, visible grease, turbidity, visible foam, visible floating solids, color). (1)(2)
...	...
10-20. Installations that have treatment facilities should have efficient operation (AFR 91-9).	• Physically inspect any treatment facilities on the installation. Have the supervisor of the plant accompany evaluator on a tour and explain how the plant operates. • Check for the following: (3) - standby power or other equivalent provisions provided - adequate alarm system for power or equipment failures available - general housekeeping - presence of odors - all treatment units in service - established procedures available for training new operators - files maintained on spare parts inventory, major equipment specifications, and parts and equipment suppliers - O&M manual maintained and kept current - site-specific O&M manuals - treatment systems operating instructions (OI) - standby pumping capability.
...	...
10-21. Operators and superintendents should be trained (GMP).	• Request copy of operator training records. (3)
...	...
10-22. Personnel engaged in or to be employed in the O&M of water pollution control facilities should be trained according to AFR 50-9 and Chapter 400, AFM 40-1 as appropriate (AFR 91-9).	• Interview O&M staff at the plant; determine if periodic refresher training is conducted. (3) • Examine operating staff training records to verify training is being conducted. (3)
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS	**REVIEWER CHECKS:**
10-23. Supervisors at Air Force treatment plants are required to provide training in safety and occupational hazards to operating staff (AFM 121-101 and 91-32).	• Observe if safety and occupational hazards instructions are posted around the plant or readily available to plant personnel. (3) • Determine if training on proper safety practices at the plant is conducted. (3)
...	...
10-24. Treatment plant supervisors are required to maintain certain operating logs and records (AFM 91-32, AFR 91-9).	• Interview treatment plant supervisor. Examine AF Form 1462 (Utility Operating Log) and AF Form 1463 (Plant Operating Log) for domestic wastewater plants. • Determine if these forms are posted daily and are neat and legible. (3) • Determine if copies are distributed as follows: (3) - original retained by BCE - duplicate to MAJCOM.
...	...
10-25. Air Force treatment plants are required to be operated in accordance with all design parameters (GMP and AFR 91-9).	• Discuss with plant supervisor any instances when readings exceeded remedial action taken. (3) • Determine instances of effluent bypasses. (3) • Determine instances and causes of any hydraulic and/or organic overloads at the plant. (3) • Assure that there is no provision for automatic bypass of untreated wastewater. (3)
...	...
10-26. Sludge from wastewater treatment plants must be disposed of in accordance with local regulations (Applicable local regulations).	• Interview superintendent of treatment plant. Determine quantities and method of sludge disposal. (3) • Examine records of analyses of sludge for heavy metals or other parameters. (3) • Inspect sludge land application site. Look for evidence of disease vectors (rodents, flies, etc.). Determine whether: - Surface runoff at site is controlled. - Seeding or other cover measures are utilized.
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	REVIEWER CHECKS:
10-27. Storm water discharge on the installation must be uncontaminated and periodic surveillance of this discharge must be completed (AFR 19-7).	• Interview BEE; examine supplement to AFR 19-7 for storm water surveillance locations. (2) • Examine analytical records and discuss any instances of elevated readings for any parameters. (2) • Obtain plan of storm sewer system and location of all outfalls and discharge points. (1) • Physically inspect areas of storm water discharge. Look for evidence of contamination (oil sheen, discoloration, etc.). (1) • Inspect any oil/water separators on the installation for proper operation and maintenance. Review recurring maintenance program for inspection and cleaning of oil/water separators. (1) • Physically inspect major industrial shops or industrial areas. Look for evidence of contaminated waste streams discharging to floor drains to storm system or catch basins. Key shops to be visited include: - engine shop - motor pool - paint shop - plating shop - corrosion control - POL area - arts and crafts shops - print shop/photo lab.
...	...
10-28. Installations that discharge wastewater to an off-base POTW or a treatment plant of another DoD activity are normally required to meet certain categorical discharge limitations and other discharge requirements (GMP and appropriate local regulations).	• Determine if monitoring is being done to comply with these discharge limitations. (1)(2)
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
10-29. The introduction of pollutants that cause the following is prohibited: (a) fire or explosion hazards; (b) corrosive problems (or as stated in 403.5 (b)(2) - corrosive structural damage); (c) viscous obstructions; (d) sludge discharges; (e) excessive heat (GMP).	• The evaluator should inspect selected industrial shops and areas on the base and look for evidence of prohibited discharge (examples are given below): - Inspect maintenance areas (engine shops, hangers, motor pool). Look for evidence of oils, greases, antifreeze, and fuels draining into sanitary lines. - Inspect corrosion control and cleaning shops. Look for oils, greases, and detergents discharging to sanitary lines. - Inspect paint shops. Look for solvents, stripping compounds, and paint solids discharging to sanitary lines. • Inspect any areas on the installation that may contribute high temperature discharge (40oC) to the POTW. Examples are: - scrubber water - boiler blow down - laundries. • Inspect for discharges with a flow rate and/or pollutant concentration that will cause flow interference. Examples are: - garbage shredded in cafeterias, dining halls - pieces of metals, rubber, wood from shops - grease traps in cooking facilities. • Inspect for any discharge with a pH lower than 5.0, unless the works are specifically designed to accommodate such discharge.
...	...
10-30. Industrial hazardous wastewater must be treated and disposed of in accordance with certain requirements (AFR 91-32, Chapter 15).	• Interview BCE. Determine if industrial wastewater survey has been conducted to determine source, composition, and pattern of discharge. (1) • Determine if industrial shop operators are trained to operate industrial wastewater equipment and manage industrial wastewater in accordance with AFR 91-32, Chapter 15. (1)(2)
...	...
10-31. AF policy is to reduce nonpoint pollution through increased management and planning (HQ/ USAF/LEE Policy Letter 5 May 1987).	• Interview to determine if the installation: - has up-to-date regulations - obtains assistance in reviewing management plans - includes stipulations in construction, fish and wildlife management, grazing, and forest harvest contracts to reduce erosion - includes GMPs in land-use plans for grazing and cropland lease - implements erosion control measures in military training and recreation areas. (1)(4)
...	...

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COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	
REGULATORY REQUIREMENTS:	**REVIEWER CHECKS:**
10-32. Discharge of wastewater from live fire training may be regulated (Host Nation, local regulations).	• Visit the site of the live-fire training area. • Determine if the fire training burn area is lined.
...	...
10-33. If discharge from the live-fire training facility is connected to an on-base wastewater treatment plant, the flow containing should be discharged gradually to avoid adverse impact on wastewater treatment plant (GMP).	• Determine if there is an effective fuel/water separator. • Determine if maintenance of the fuel/water separator is adequate and that there is no visible discharge of fuel in the effluent. • Determine if the on-site storage/treatment of wastewater is adequate before discharging to on-base wastewater treatment plant or directly to surface water sources. • Check the type and quality of fuel used for fire training. Fuel used should be free from contaminants that could cause an adverse environmental impact on the natural environment. • Determine if waste fuel is recycled/disposed of according to Host Nation and local regulations.
...	...

(1) BCE [Environmental Planning] (2) BEE [Bioenvironmental Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Water Treatment Plant Supervisor] (5) BCE [Water Treatment Plant Supervisor]

Appendix X - 1

Coliform Bacteria Sampling Frequency

Table X - 1

Population served per month	Minimum number of samples per month
25 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 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
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

Appendix X-1 (continued)

Monitoring Requirements Following a Total Coliform-Positive Routine Sample

No. samples/month	No. repeat samples	No. routine samples next month
1 or less	4	5
2	3	5
3	3	5
4	3	5
5 or more	3	See Table X - 1

NOTE: Facilities testing ≤ 40 samples/month may have one total coliform-positive result. Those testing > 40 samples/month may have no more than 5% total coliform-positive results.

Appendix X-2

Primary Drinking Water Standards, 40 CFR 141

Inorganic Chemicals (AFR 161-44, 5-5)

Contaminant	*MCL (mg/L)*
Arsenic	1.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate	10.0
Selenium	0.01
Silver	0.05

Maximum Contaminant Levels for Fluoride

Temperature (^{O}F)	*Temperature(^{O}C)*	*Level (mg/L)*
53.7 and below	12.0 and below	2.4
53.8 to 58.3	12.1 to 14.6	2.2
58.4 to 63.8	14.7 to 17.6	2.0
63.9 to 70.6	17.7 to 21.4	1.8
70.7 to 79.2	21.5 to 26.2	1.6
79.3 to 90.5	26.3 to 32.5	1.4

Appendix X-2 (continued)

Organic Chemicals (40 CFR 141.12, 141.61, & 141.50, AFR 161-44, 5-5)

Contaminant	*MCL (mg/L)*
Endrin	0.0002
Lindane	0.004
Methoxychlor	0.1
Toxaphene	0.005
2,4-D	0.01
2,5,6-TP Silvex	0.01
Benzene *	0.005
Vinyl Chloride *	0.002
Carbon tetrachloride *	0.005
1,2-Dichloroethane *	0.005
Trichloroethene *	0.005
1,1-Dichloroethylene *	0.007
1,1,1-Trichloroethane*	0.020
para-Dichlorobenzene *	0.075

	MCL (mg/L)
Trihalomethanes**	0.10 mg/L

	MCL
Turbidity (AFR 161-44, 5-6)	1 TU (monthly average) or 5 TU (2 consecutive-day average)

Natural radioactivity (AFR 161-44, 5-8)	MCL
Combined radium 226 and radium 228	5 pci/L
Gross alpha particle activity	15 pci/L

Appendix X-2 (continued)

Manmade Radioactivity (AFR 161-44, Att 5)

1. Average annual concentrations assumed to produce a total body or organ dose of 4 mrem/year

Radionuclide	*Critical Organ*	*pci/l*
Tritium	total body	20,000
Strontium-90	bone marrow	8

2. Detection Limits for Manmade Beta Partical and Photon Emitters

Radionuclide	*Detection Limit in pci/l*
Tritium	1,000
Strontium-89	10
Strontium-90	2
Iodine-131	1
Cesium-134	10
Gross Beta	4
Other	10% of the applicable limit

Additional standards for radioactivity from manmade radionuclides may be applicable where the source water is contaminated by effluent from nuclear facilities.

Appendix X-2 (continued)

Bacteriological Analysis (AFR 161-44, 5-7)

Analytical technique	Maximum Number Coliform Bacteria
Membrane filter	1/100 ml as the arithmetic mean of all samples examined each month
	4/100 ml in more than one sample, when less than 20 are examined per month
	4/100 ml in more than 5% of the samples, when 20 or more are examined per month.
Fermentation tube and 10 ml standard portion	More than 10% of the portions in any month
	Three or more portions in more than one sample when less than 20 samples are examined per month
	Three or more portions in more than 5% of the samples when 20 or more are examined per month
Fermentation tube and 100 ml standards portion	More than 60% of the portions in any month
	Five portions in more than one sample, when less than five samples are examined per month
	Five portions in more than 20% of the samples when five or more samples are examined per month

* The effective date for these organic contaminants is 9 January 1989 for community waste systems and nontransient, noncommunity systems.

** For systems that serve a population of 10,000 or more and add a disinfectent to any part of the drinking water system.

*** Turbidity Unit (TU).

Appendix X-3

Notification Requirements (AFR 161-44)

Condition	Personnel to be Notified	Notify Within
Inorganic and Organic Chemicals (except Nitrates):		
- concentration exceeds maximum levels	Select Base Personnel*	7 days
- average concentration of original and 3 additional samples exceeds maximum levels	Select Base Personnel* Public	**
Nitrates:		
- mean of original and second analysis exceeds maximum levels	Select Base personnel*	**
Turbidity:		
- repeat sample confirms maximum level exceeded	Select Base Personnel*	48 hours
- monthly average of daily samples adjusted to include repeat samples exceeds maximum level	Select Base Personnel*	**
Radioactivity:		
- average annual maximum contaminant level exceeded	Select Base Personnel*	48 hours
Bacteriological (Coliform):		
- first check sample confirms coliform colonies exceed maximum level	Select Base Personnel*	48 hours
- sample results for the month (not including check samples) exceed maximum level	Select Base Personnel*	**
Bacteriological (Chlorine Residual Measurements):		
- retest water confirms free chlorine residual < 0.2 mg/l	Base Civil Engineer Dir of Base Medical Service	48 hours

* Director of Base Medical Services
MAJCOM Surgeon
Base Civil Engineer
Office of Information
Base Staff Judge Advocate
Base Commander

** not specified in AFR 161-44

INSTALLATION:	COMPLIANCE CATEGORY: WATER QUALITY MANAGEMENT Worldwide ECAMP	DATE:	REVIEWER(S):

STATUS NA C RMA	REVIEWER COMMENTS:

(1) BCE [Environmental Planning] (2) BEE [Bioenvironments' Engineering] (3) Wastewater Treatment Plant Superintendent (4) BCE [Natural Resources Planner] (5) BCE [Water Treatment Plant Supervisor]