Environmental Quality Protection Planning Bulletin/Manual

Prepared for:	U.S. Air Force/Directorate of Engineering and Services and Dept. of the Army HQ U.S. Army Corps of Engineers
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Introduction

CHAPTER 1

INTRODUCTION

A. PURPOSE OF THE BULLETIN/MANUAL

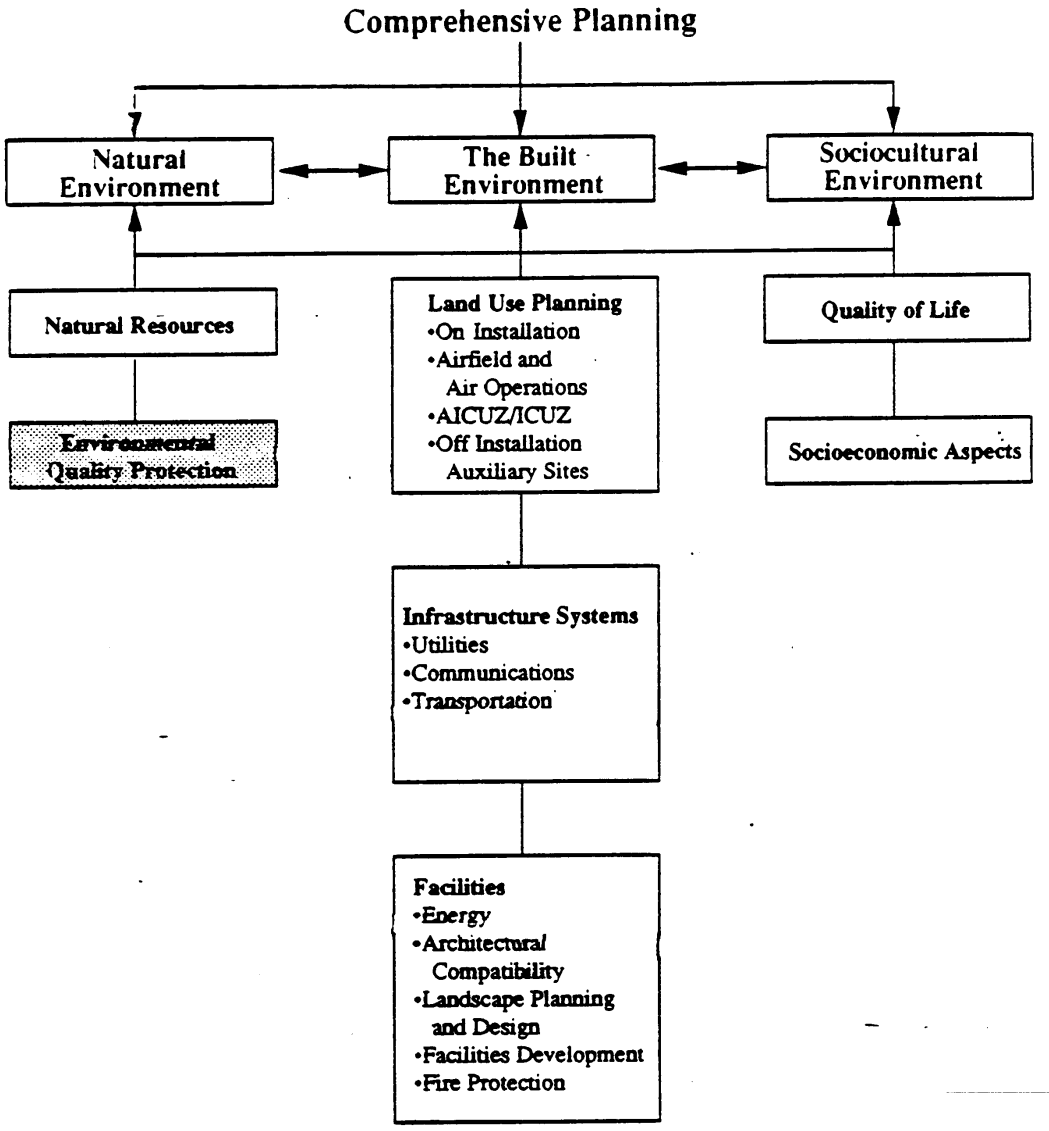
1-1. The purpose of this bulletin/manual is to provide the installation planner with a framework for defining and then incorporating environmental quality considerations into the development and implementation of near-term and long-term planning, design and construction programs. The bulletin/manual explains the concept of environmental quality protection planning and describes a process for developing, evaluating, implementing and updating the Environmental Quality Protection Plan component of the Base/Installation Comprehensive Plan (hereafter referenced to as The Plan). Figure 1-1 illustrates where the Environmental Quality Protection Plan fits into the comprehensive planning process, which is now being implemented throughout the Army and Air Force.

1-2. The primary purpose of the comprehensive planning process is to guide the development of the installation. The expressed Army and Air Force goals of this process are to:

- Provide effective and efficient use of installation resources to support the mission.
- Direct the long-range development of the installation.
- Integrate a number of interrelated functional programs derived from other components of The Plan.
- Relate mission planning to policies, programs and specific projects for an installation facilities systems.
- Relate the needs of the installation to the social, cultural and economic aspects of the surrounding civilian community.

Comprehensive Planning Components

Figure 1-1



- Provide the basis for all decisions on siting of facilities, setting of priorities, preparation of the Five-Year Defense Program (FYDP) and other capital improvement programs, and for long-range facilities renovations and replacements.

- Make optimal use of the latest developments in energy-efficient concepts/systems/technologies.

- Protect the natural and human environment.

- Provide the highest possible quality of-life for the Air Force/Army community.

B. HOW TO USE THE BULLETIN/MANUAL

1.3. This document is one of a series that serve the U.S. Air Force's and U.S. Army's planning processes. This document is a guide to the environmental quality protection planning process and its relationship to land use and facilities development planning as well as other related disciplines. The document provides specific direction to installation personnel and contractors for the preparation of an Environmental Quality Protection Plan as part of the comprehensive planning process for military installations.

1-4. Bulletin/Manual Organization

a. **Chapter 1. Introduction.** This chapter initially presents the purpose of the bulletin/manual and offers an overview of the text. It goes on to discuss the nature of environmental quality protection planning as well as its relationship to other component plans and the environmental impact analysis process under the National Environmental Policy Act (NEPA). A discussion of the principal actors involved in the environmental quality planning process, as well as the planning process itself, is also included.

b. **Chapter 2. Framework for Environmental Quality Protection Planning.** This chapter presents the overall goals of the comprehensive planning. process and specific environmental quality goals and objectives. The chapter also includes an

approach to obtaining and assessing elements of the environmental quality inventory including both on-site conditions as well as external regulations/considerations.

c. **Chapter 3. Forecasting and analysis.** This chapter addresses opportunities and constraints as well as the process for forecasting and analyzing future impacts.

d. **Chapter 4. Environmental Quality Protection Alternatives.** This chapter includes a discussion of possible alternatives from both site-specific and program perspectives. The process of determining environmental evaluation recommendations to minimize identified potential impacts is also described.

e. **Chapter 5. Implementation and Monitoring.** This chapter focuses on the implementation and monitoring process, which includes reference to the programmatic and operational responses that would allow for achievement of the environmental quality goals.

f. **Appendices.** A sample Statement of Work for preparation of the Environmental Quality Protection Plan is included in the Appendix, along with a list of applicable regulations to this component plan and references used to prepare this bulletin.

1-5. Terminology. Non-specific military terms have been used wherever possible in this document. In some cases, generic terms were devised to avoid using terms specific to the Army or Air Force. Please refer to the table below for the specific Army and Air Force definitions of these generic terms.

Generic	Army	Air Force
installation	post	base
The Plan (product)	the Installation Comprehensive Plan	the Base Comprehensive Plan (BCP)
comprehensive planning (process)	installation comprehensive planning	Base Comprehensive Planning
the planner	master planner	community planner
the Engineer	Director of Engineering and Housing (DEH)	Base Civil Engineer (BCE)
major command	MACOM	MAJCOM

C. WHAT IS ENVIRONMENTAL QUALITY PROTECTION PLANNING?

1-6. The Concept

a. Planning consists of the orderly development of policies, programs and plans to guide improvements and change. Environmental quality affects all physical and operational aspects of a military installation. The major thrust of environmental quality protection planning is pollution control and preventing potential environmental impacts before they occur (see Figure 1-2). The planner must realistically assess mission requirements and devise development alternatives which eliminate pollution where it can be eliminated and minimize pollution where its prevention is not possible.

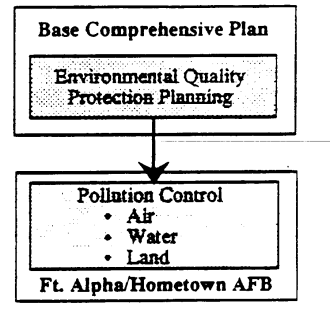
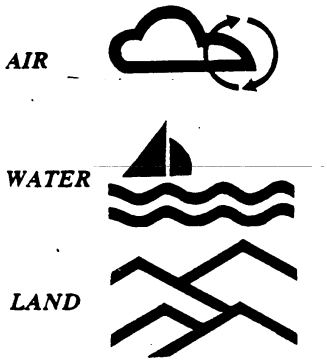


Figure 1-2

b. Environmental quality protection planning identifies existing conditions, problems and potential sources/generators of pollution in the air, water and on land. Alternative approaches and possible solutions are evaluated and implementation measures identified in order to achieve and/or maintain compliance with environmental regulations.



c. It should be noted that the Environmental Quality Protection Plan is not a compliance requirement, nor is it an impact assessment document. The purpose of the plan is to prevent or, at least, identify problems before they occur; and to incorporate pollution control measures into the comprehensive planning process. The plan, therefore, serves to provide long-range solutions to environmental problems rather than an immediate response to a specific problem, which other environmental compliance programs, such as the Environmental Compliance assessment and Management Program (ECAMP), address.

d. It is extremely important that environmental quality protection planning be incorporated into the development of other component plans. Through a series of feedback loops, new information may be incorporated and refinements/changes made to the benefit of the overall quality of the installation.

D. HOW IS ENVIRONMENTAL QUALITY PROTECTION PLANNING USED?

1.7. The Role of Environmental Quality Protection Planning in Comprehensive Planning

a. The Plan constitutes the basis for installation programming, design and construction activities. The Plan considers the three fundamental parts of installation community: the natural environment, the built environment and the sociocultural environment (see Figure 1-1). The product is a document that characterizes the unique circumstances and approaches necessary to guide development at each individual Installation. Environment quality protection planning must be included in the comprehensive planning process as early as possible to assure its timely influence and effectiveness.

b. The Natural Resources, Land Use, and Utilities component plans, in particular, must reflect consideration of environmental quality protection in their recommendations. Likewise, the Environmental Quality Protection Plan must respond to mission-generated requirements and the installation's future needs reflected in these components through the recommendation of feasible programs and mitigation measures. There is a constant feedback process that occurs, allowing for continuous modification and refinement of The Plan's components.

Environmental Quality Protection Plan is particularly influenced by:

- ***Natural Resources Plan***
- ***Land Use Plan***
- ***Utilities Plan***
- ***Transportation Plan***

c. The Natural Resources Plan shows the existing natural environmental features and conditions that set the parameters for planning on the installation. The Environmental Quality Protection Plan builds on this base of information and identifies particular pollution problems or environmentally sensitive issues associated with the natural resources on the installation.

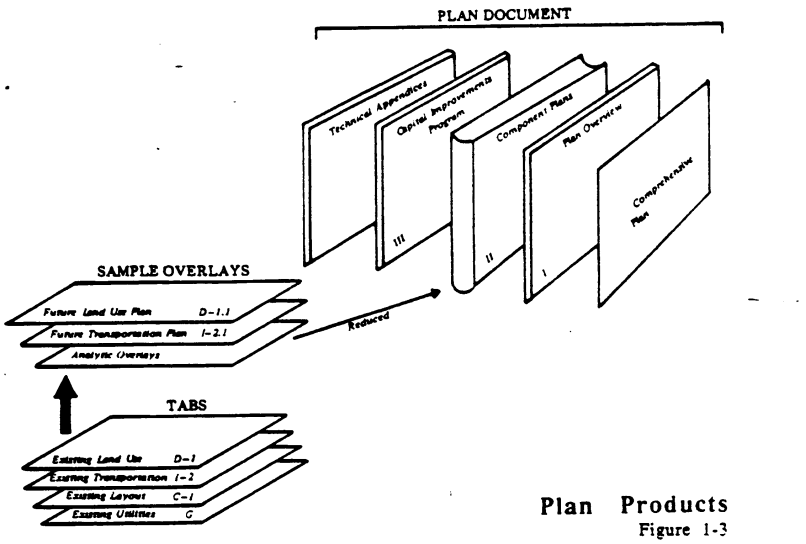
d. The Lad Use Plan identifies the functional land areas for all uses currently on the installation and those likely to be needed within the planning time frame. Existing and potential pollution considerations will have a significant affect on determining the location or possibly the use of certain functions on the installation. For example, land and groundwater near old underground fuel tanks may be contaminated. Construction in these areas may not be desirable or practical until the tanks are removed and a cleanup procedure initiated. Likewise, the level and location of industrial development proposed in the Lad Use Plan (responding to mission requirements) may require adjustment based on the findings and recommendations of the Environmental Quality Protection Plan regarding regional water and air quality concerns and standards.

e. The Utilities Systems Plan sets forth the potential system alternatives that respond to the existing, planned and future needs of the installation. The recommended distribution network, type of systems, materials used and level of treatment must also be

sensitive to the natural features and environmental quality issues early in the planning process.

f. Maps and Plans. The comprehensive planning process and preparation of The Plan are mandatory for each installation. The contents of The Plan may vary, however, depending on the size and complexity of the installation. Maps of existing facilities and resources typically are contained within The Plan. For the Air Force, the component plan Tabs and, for the Army, the existing conditions maps also serve as planning aids in preparation of The Plan (Figure 1-3). The Tabs and maps provide an inventory of existing and long-range facility requirements corresponding to the installation mission. Most Tabs are used to display existing conditions and baseline maps for use in analyzing constraints and opportunities and for showing future plans. In the Air Force, the Tab B series is devoted to environmental quality protection concerns. Further elaboration of Tab requirements appears in Appendix B of this Bulletin/Manual. These maps must be prepared as required by regulations and directives or when dictated by the local conditions.

TB ENG 353 contains instructions on preparing planning maps for Army installations



Plan Products
Figure 1-3
Source: AFR 86-4

1-8. Relationship of Environmental Quality Protection Plan to the Environmental Impact Analysis/Environmental Assessment Process

a. The National Environmental Policy Act (NEPA) of 1969 (PL 91-190) and the President's implementation of it through Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 through 1508) require federal agencies to analyze the potential environmental impacts of specific proposed actions, to develop alternatives to the proposed actions, and to use this information in making decisions or recommendations on whether and how to proceed with these actions. When a federal project or activity is undertaken, the regulations specify that a determination must be made whether an Environmental Assessment (EA) is required or whether the action is eligible for a categorical exclusion (CATEX). Categorical exclusion refers to a category of actions that do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect as defined by procedures adopted by a Federal agency in implementing environmental regulations. If an EA is required, this document in turn will describe the potential impacts of the proposed action and determine whether the action is a candidate for a Finding of No Significant Impact (FONSI) or for further environmental review which will be contained in an Environmental Impact Statement (EIS). The decision to prepare an EIS can be made without first preparing an EA. This is appropriate for actions that have an obvious significant environmental impact.

AFR 19-2 and AR 200-2 contain instructions for implementing NEPA.

b. The specific procedural requirements for implementing NEPA are provided within AFR 19-2 (Air Force) and AR 200-2 (Army). For the Air Force, AFR 19-2 addresses the Environmental Impact Analysis Process (EIAP) which is primarily project-specific. The Environmental Quality Protection Plan, on the other hand, recommends pollution control actions or programs for existing or potential problems for an entire installation. This

process is much more comprehensive in scope than that of AFR 19-2/AR 200-2. Nevertheless, the information and recommendations contained in the Environmental Quality Protection Plan can serve more definitively as the basis for determining the appropriate level of NEPA response for given specific projects, (i.e., EA, CATEX, etc.). Further, the greater the extent that the recommendations of the Environmental Quality Protection Plan are incorporated into the other component plans (e.g., Land Use, Utilities Systems) and become part of the design constraints for development projects, the easier it should be to meet environmental requirements.

c. Some overlap of the NEPA process and the comprehensive planning process occurs due to their nature. An installation may wish to prepare an installation-wide NEPA document concurrent with The Plan. This document would analyze the potential environmental impacts of actions contained in The Plan. If a NEPA document is not prepared at the time of The Plan, each individual decision to implement The Plan would be analyzed for environmental consequences in accordance with AFR 19-2 or AR 200-2 for its individual and cumulative impacts.

d. An important by-product of this level of analysis is “tiering”. Tiering, within the context of the CEQ regulations, refers to the coverage of general matters in broader environmental impact statements (such as program-wide or installation-wide environmental assessments) with subsequent narrower statements or environmental assessments (such as a military activity or site-specific statement) incorporating by reference the general discussions and concentrating solely on the issues specific to the latter environmental assessment. The purpose of tiering is to incorporate known discussions of environmental issues by reference or by summary and thereby focus the discussion or analysis on more immediate environmental issues.

E. WHO IS INVOLVED

1-9. Coordination

a. Cooperation, communication and coordination among key personnel both on and off the installation must occur early in the environmental quality protection planning process to ensure timely and meaningful inputs.

Environmental Quality Protection Plan includes involvement by:

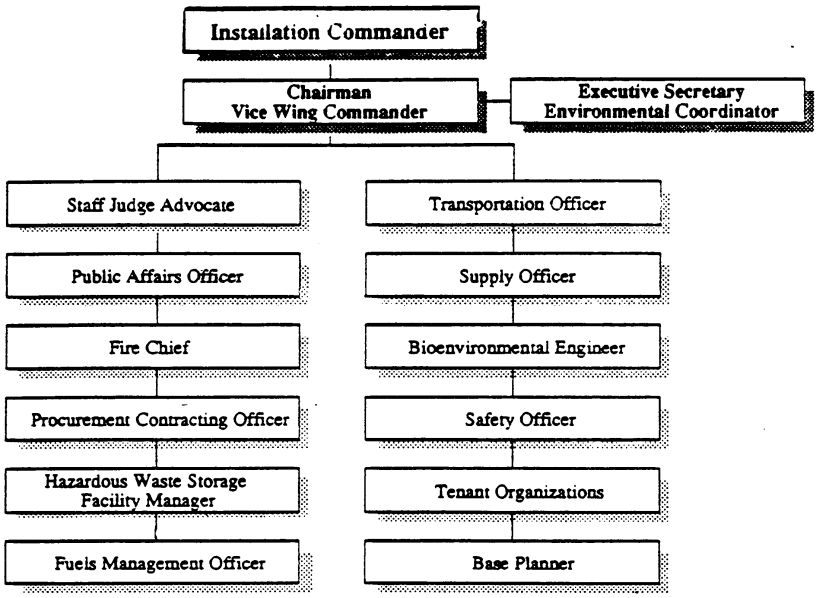
- ***EPC***
- ***Installation Commander***
- ***BCE/DEH staff***
- ***The Planner***

b. Environmental problems are broad in scope crossing functional area lines of responsibility and requiring a concentrated and coordinated effort for satisfactory resolution.

1-10. The Environmental Protection Committee (EPC)

a. Given the complexity of environmental issues and the cross-disciplinary nature of environmental problems, the Air Force has established environmental protection committees (AFR 19-8) at the installation level. These interdisciplinary bodies are set up to review environmental policy, facilitate coordination within the installation and with outside agencies, and serve as a steering group to monitor the overall conduct of the installation's environmental protection program. *A* graphic representation of an installation EPC is shown in Figure I-.

b. The effectiveness of this group can be increased by developing working groups/subcommittees around functional areas such as the environmental impact analysis process (EIAP), natural resources planning (if existing installation assets are sufficient to warrant special attention), toxic and hazardous materials, and the air and installation compatible use zone (AICUZ/ICUZ) plans.



Functional Components of Installation EPC

Figure 1-4

c. At Army installations, an Environmental Officer is designated usually within the Directorate of Engineering and Housing (DEH). This officer calls together the appropriate disciplines and officials needed to deal with environmental issues.

1-11. Installation Commander. The ultimate responsibility for a comprehensive and coordinated planning effort in all areas resides with the installation commander, who must be kept current on progress and findings throughout the entire process. The commander is responsible for ensuring that total mission requirements are accommodated in the environmental quality protection plan component.

1-12. Air Force Base Civil Engineering (BCE)/Army Directorate of Engineering and Housing (DEH). This office is responsible for executing the comprehensive planning process as well as providing the environmental planning functions on the installation. The planning staff is the focal point for plan development. The planners, however, do not and cannot develop the Environmental Quality Protection Plan alone. They must obtain, coordinate, and consolidate information and inputs from a number of sources both within and outside the BCE/DEH organization. Early participation and review by key BCE/DEH personnel, including the technical engineers and designated environmental coordinators, is. particularly important.

1-13. State and Local Agencies

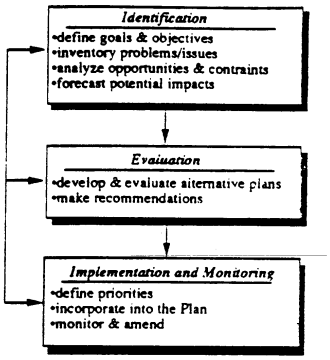
a. Cities, counties and states throughout the country have adopted and administer programs concerning environmental quality. As regulators, they can be good sources of technical information from defining parameters and standards to assisting in compliance with regulatory requirements. For example, some states have a broader definition of hazardous waste than others so that petroleum products may be regulated differently in some states than in others.

b. Most installations are adjacent to communities and depend on and share their resources. Often the installation and the community have common problems relating to pollution. Careful coordination is necessary to ensure that new development both on or off the installation or in the community will not exacerbate existing pollution problems or create new ones.

F. THE ENVIRONMENTAL QUALITY PROTECTION PLANNING PROCESS

1-14. The Process. The process for environmental quality planning is similar to that of other planning processes. Planning provides a process for problem-solving. It seeks to address both beneficial and harmful consequences of alternative futures and weighs them

carefully in order for decision makers to maximize the benefits and minimize the disadvantages (social, environmental or economic). The process is a sequential and logical one, which includes identification, evaluation, implementation, monitoring, and revisions to The Plan as shown in Figure 1-5.



The Planning Process
Figure 1-5

a. **Identification.** This phase sets the direction, documents the assets and establishes the needs. It includes the identification of:

- environmental quality goals and objectives of the installation;
- an inventory of the environmental issues and problems, constraints and opportunities, as well as the future mission and land use requirements;
- a profile of external forces - regulatory, political, social, economic - and their impact on plans for, development and management of the installation's resources.

b. **Evaluation.** This entails analysis of the information assembled in the identification phase, and the formulation and evaluation of alternative actions. Some of the important activities include:

- early identification of concepts for meeting objectives of the plan;
- evaluation of concepts against a set of constraints and opportunities, both on and off the installation, as appropriate;
- formulation of a list of feasible alternatives, limited by the constraints/opportunities screening process and by programmatic limits, such as time and funding.

c. **Implementation and Monitoring.** This is the decision phase in which those alternatives examined in the evaluation phase are presented to appropriate Boards and Commissions for selection. In this phase, the planner:

- develops detailed programs, policies, and projects required to implement the selected alternative course of action (or combination of alternatives);

- incorporates proposals into The Plan and coordinates implementation with off-site considerations;

- monitors progress of proposals and makes necessary adjustments to programs, policies and projects to better meet The Plan objectives.

1-15. **Feedback Loop.** The steps in each phase are not sharply separated. For example, findings in the evaluation of alternatives may affect the original determination of goals and objectives. The process therefore is iterative. A continuous feedback loop is required to reassess the validity of decisions made early in the process and to introduce new understanding of the planning issues or resource base.

2

Framework for Environmental Quality Protection Planning

CHAPTER 2

FRAMEWORK FOR ENVIRONMENTAL QUALITY PROTECTION PLANNING

A. GOALS AND OBJECTIVES

2-1. Comprehensive Planning Goals

a. The primary purpose of the comprehensive planning process is to support and enhance the operational mission(s) of the installation. This is accomplished by providing a plan that constitutes the framework for programming, design, and construction of facilities, structures and equipment. The long. range development of the installation, including the selection and siting of facilities, is guided by the Base/Installation Comprehensive Plan (The Plan). In the short-term, the planning process links mission planning to development of policies, programs and specific projects for facilities and systems.

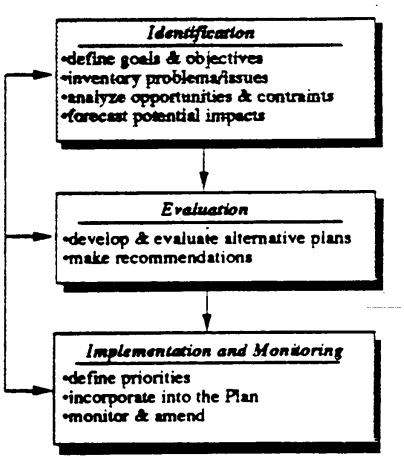


Figure 2-1

b. Goals have been developed for the comprehensive planning process by both the Air Force and the Army. The general contents of these goals art outlined below (specific Army and Air Force goals have been set forth in Chapter 1).

- Effective, orderly direction of the long-range development of the installation.
- A comprehensive procedure for relating mission planning to policies, programs, and specific projects for installation facilities and systems.
- A framework for integrating coherently the different component plans of The Plan.
- A complementary and harmonious relationship between the installation and the community, brought about and maintained through cooperative community planting.
- Provision of the basis for developing a capital improvement plan, including guidelines for the siting of facilities.

- Wise protection, use, and management of resources from the natural, built, and sociocultural environments.

- The highest possible quality of life for the Air Force and Army community.

2-2. Environmental Quality Goals and Objectives

a. An early step in the development of an Environmental Quality Protection Plan is to identify appropriate goals and objectives for maintaining or improving environmental conditions (Figure 2-1). These goals and objectives must be consistent with the mission and goals of the installation, as stated in The Plan, as well as with those of the land use, AICUZ, natural resources, utilities and other functional elements of The Plan.

b. Environmental quality protection goals are general statements of a desired end of the planning effort. Objectives are developed from the goals and should be carefully defined, specific, attainable and measurable. Each goal may include several objectives, and one objective may serve more than one goal. Table 2-1 depicts some sample goals and objectives for an installation.

c. The unique characteristics of the natural and built environment of each installation require customizing the environmental quality goals and objectives. A basic understanding of environmental conditions and issues, the regulatory framework and community context is essential to the formulation of well-conceived goals and objectives. Application of the environmental inventory process to identify goals and objectives will bring members of the Environmental Protection Committee or other appropriate task force up to a common level of knowledge, and thereby enhance the resulting goals and objectives.

TABLE 2-1

Environmental Quality Protection Plan
Sample Goals and Objectives

AIR QUALITY

Goal I:	**Minimize unavoidable generation of air pollutants through comprehensive planning, design and operational decisions.**
Objective 1:	Minimize unnecessary use of motor vehicles
Objective 2	Maximize transportation system efficiency to reduce motor vehicle emissions.
Objective 3	Reduce pollutant output from energy production and use through conservation n major facilities as well as overall structural design.
Objective 4	Within the range of feasible alternatives, select those systems which inherently minimize emissions.
Objective 5	Use construction practices which wig minimize "fugitive" dust.
Goal II:	**For unavoidable emissions sources, use cost-effective air pollution control technology.**
Objective 1:	(Mobile sources): Institute and maintain effective emission control programs to monitor and maintain emission control devices.
Objective 2:	(Stationary sources): Use and maintain appropriate emission control technologies/systems.
Objective 3	(Construction sources): Use effective, feasible fugitive dust control technologies in construction areas.

WATER QUALITY

Goal I:	**Avoid degradation of receiving water as a result of discharge of treated effluent from wastewater treatment facilities.**
Objective 1:	Minimize water use and the generation of wastewater.
Objective 2	Adopt wastewater reuse methods which will not result in significant water quality degradation.
Goal II:	**Prevent degradation of water quality from toxic or hazardous substances.**
Objective 1:	Ensure proper transportation, storage and use procedures for toxic and hazardous substances.
Objective 2	Develop and maintain effective spill-contingency plans.
Objective 3	Prevent adverse water quality impact from leachate or runoff from disposal sites for solid, toxic and/or hazardous waste.

Goal III: **Minimize the potential for adverse water quality effects from urban runoff.**

Objective 1: To the extent feasible and practical, consider pollution control in the design of installation drainage systems.

Objective 2 Initiate and maintain sedimentation and erosion control practices.

WASTE MANAGEMENT

Goal I: **Minimize the volume of solid and hazardous wastes requiring disposal.**

Objective 1: Maximize resource recovery and recycling or reuse of certain types of solid waste.

Objective 2 Maximize the reclamation and reuse of toxic and hazardous waste.

Goal II: **Develop management plans that will provide for safe storage, transport and disposal of waste which cannot be feasibly recycled or reused.**

Objective 1: Develop a safe, efficient and cost-effective solid waste management plan.

Objective 2 Develop a safe and efficient hazardous waste management plan.

NOISE MANAGEMENT

Goal I: **Minimize exposure of community and working environments to adverse noise levels.**

Objective 1: Plan spatial relationships among facilities in accordance with applicable criteria and expected emission levels.

Objective 2 Develop a range of noise impact mitigation measures to be applied when noise/land use incompatibilities are unavoidable or may occur because of changing operational or land use requirements.

B. EXTERNAL CONSIDERATIONS

2-3. Federal and State Environmental Laws/Regulations

a. Federal regulations are an important external consideration which have a direct bearing on environmental quality planning and an indirect impact on land use planning at the installation level.

b. Environmental laws did not significantly affect the Air Force and Army until after passage of the National Environmental Policy Act (NEPA) in 1969. The interrelated aspects of environmental problems led to the formation of the Environmental Protection Agency (EPA). This agency served to consolidate anti-pollution and related programs of the federal government that had been split among several different federal departments/agencies.

c. Today, every major installation has at least one environmental permit from the EPA and/or state or local environmental regulatory agency. Air Force/Army installations usually must obtain permits for the wastewater they discharge; permits under the Clean Air Act to construct and operate many facilities essential to the operational mission (such as fuel farms, aircraft painting facilities, and power plants); and hazardous waste permits are needed to deal with the handling and storage of chemical by-products from maintenance operations.

The three principal pollution control laws are:

- ***Air - Clean Air Act***
- ***Water - Federal Water Pollution Control Act***
- ***Land - Resource Conservation and Recovery Act***

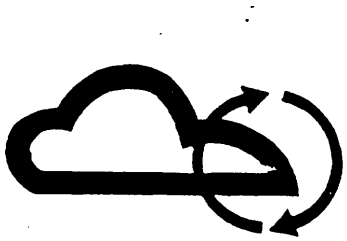
d. The three principal laws directed at controlling pollution of the air, water and land as individual environmental media are, respectively, the Clean Air Act (CAA), the Clean Water Act (CWA) and the Resource Conservation and Recovery Act (RCRA). The environmental coordinator/officer should be aware that a number of environmental issues, such as problems in the creation, transportation, use and disposal of hazardous substances, transcend these media-specific pollution abatement statutes

directed toward abatement of a certain type of pollution. Each of these statutes contain specific sections that pertain to hazardous or toxic substances. Other statutory and regulatory controls, including state and local controls, deserve review as well. To identify the appropriate and applicable statutes or regulations, the environmental coordinator may refer to the Computer-Aided Environmental Legislative Data System (CELDS), discussed in Section 2-7. The following sections of this document briefly discuss the major statutes pertaining to air, water and land pollution.

2-4. Air Quality Legislation

a. The Clean Air Act of 1970, as amended in 1977, and its implementing regulations set forth National Ambient Air Quality Standards (NAAQS) (refer to Table 2-2) and the mechanisms for meeting these standards. Potential sources of air pollution arising from military operations include emissions from fueling operations, painting operations, furnaces and boilers, vehicle operations and fugitive dust from clearing and demolition activities.

The Clean Air Act is implemented at the state level.



b. Each state, in cooperation with its local governments, is required to develop and implement a State Implementation Plan (SIP) by identifying, preventing and controlling air pollution sources. The SIP is the single document that charts the air pollution compliance requirements for Army and Air Force installations in that state.

c. Through monitoring, states have determined those regions which do not meet federal standards (non-attainment Air Quality Control Regions). The SIP must include an implementation program to assure timely attainment of the standards in these areas. Areas outside the region must be protected from significant deterioration of existing air quality.

National Ambient Air Quality Standards

(current as of February 1986)
Table 2-2

	Primary Standard	Secondary Standard
Sulfur Oxide (SO_2)	80 µg/m^3 annual arithmetic mean 365 µg/m^3 maximum 24-hour concentration not to be exceeded more than once per year	1,300 µg/m^3 maximum three-hour concentration not to be exceeded more than once per year
Particulate Matter	75 µg/m^3 annual geometric mean 260 µg/m^3 maximum 24-hour concentration not to be exceeded more than once per year	60 µg/m^3 annual geometric mean 150 µg/m^3 maximum 24-hour concentration not to be exceeded more than once per year
Carbon Monoxide	10mg/ m^3 maximum 8-hour concentration not to be exceeded more than one per year 40mg/ m^3 maximum 1-hour concentration not to be exceeded more than once per year	same as primary
Ozone	0.12 parts-per-million (235 µg/m^3)The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 parts-per-million is equal to or less than one.	same as primary
Nitrogen Dioxide	100 µg/m^3 annual arithmetic mean	same as primary
Lead	1.5 µg/m^3 maximum arithmetic mean averaged over a calendar quarter	same as primary

Source: 40 CFR, pt 50

d. The SIP may require the following pollution control strategies to meet federal air quality goals: pre-construction permits for facilities that might be major sources of air pollution emissions, a net reduction of emissions for major new sources in non-attainment areas, retrofitting of older vehicles with air pollution control devices, regulation of vehicle usage and traffic flows, regulation of parking, fuel vapor recovery and vehicle emission inspection and maintenance.

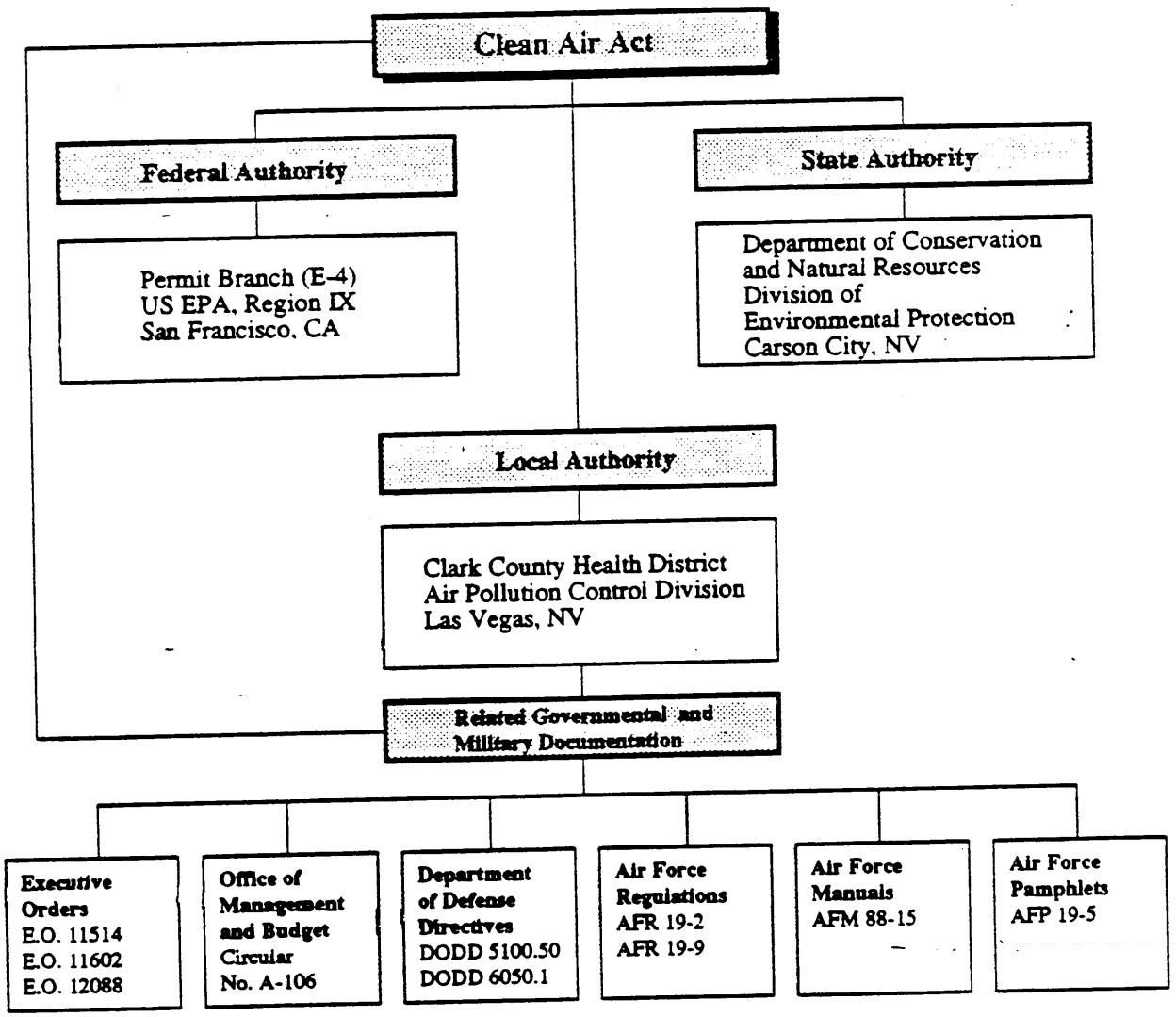
e. Figure 2-2 traces the principal air quality regulatory authorities for the sample state of Nevada and identifies applicable Executive Orders, DOD directives and regulations.

f. Compliance with air pollution abatement requirements at the installation level requires a multi-disciplinary effort. The installation environmental coordinator/officer, with assistance from major commands, regional civil engineers and other technical experts, is the key coordinator on air pollution issues. The major commands and regional civil engineers are experienced at interacting with the EPA and state environmental agencies. Major commands also program funds for pollution compliance programs. Therefore, they need-to be fully involved in negotiating compliance agreements. The responsibility for air emissions and air quality monitoring at the installation level rests with the servicing bioenvironmental engineer. Judge Advocates are involved in tracking legislation and in filings or proceedings before state and local administrative agencies, and can help to negotiate and monitor any needed compliance agreements. Along with other members of the Environmental Protection Committee, this team can provide the means of identifying and resolving other environmental issues.

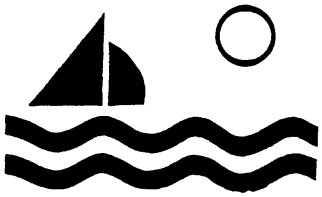
Example of Principal Air Quality Regulatory Authorities

Hometown AFB, Clark County , Nevada

Figure 2-2



2-5. Water Quality Legislation. The major acts covering the protection and enhancement of water quality are the Clean Water Act (CWA) of 1972 and the Safe Drinking Water Act (SDWA) of 1974. The Water Quality Act of 1987 augments certain provisions of the CWA.



a. **The Federal Water Pollution Control Act** , also known as the **Clean Water Act**, sets forth water quality goals, a discharge permit system and a regional planning process for assuring the clean-up of the nation's waters. The Clean Water Act regulates toxic and hazardous pollutants and potential polluting factors by setting several ambitious goals including the attainment of "survivable and fishable" waters, the elimination of the discharge of toxic pollutants, and the elimination of all pollution discharges into all waters of the nation.

b. Potential sources for water pollution from military activities include operation of wastewater treatment facilities, drainage from industrial activities into storm drains, spill prevention for oil and other hazardous substances, and non-point pollution sources. Figure 2-3 lists the types of pollutants generated by point and non-point sources of water pollution.

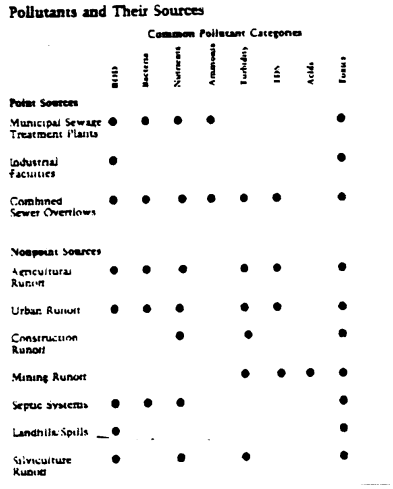
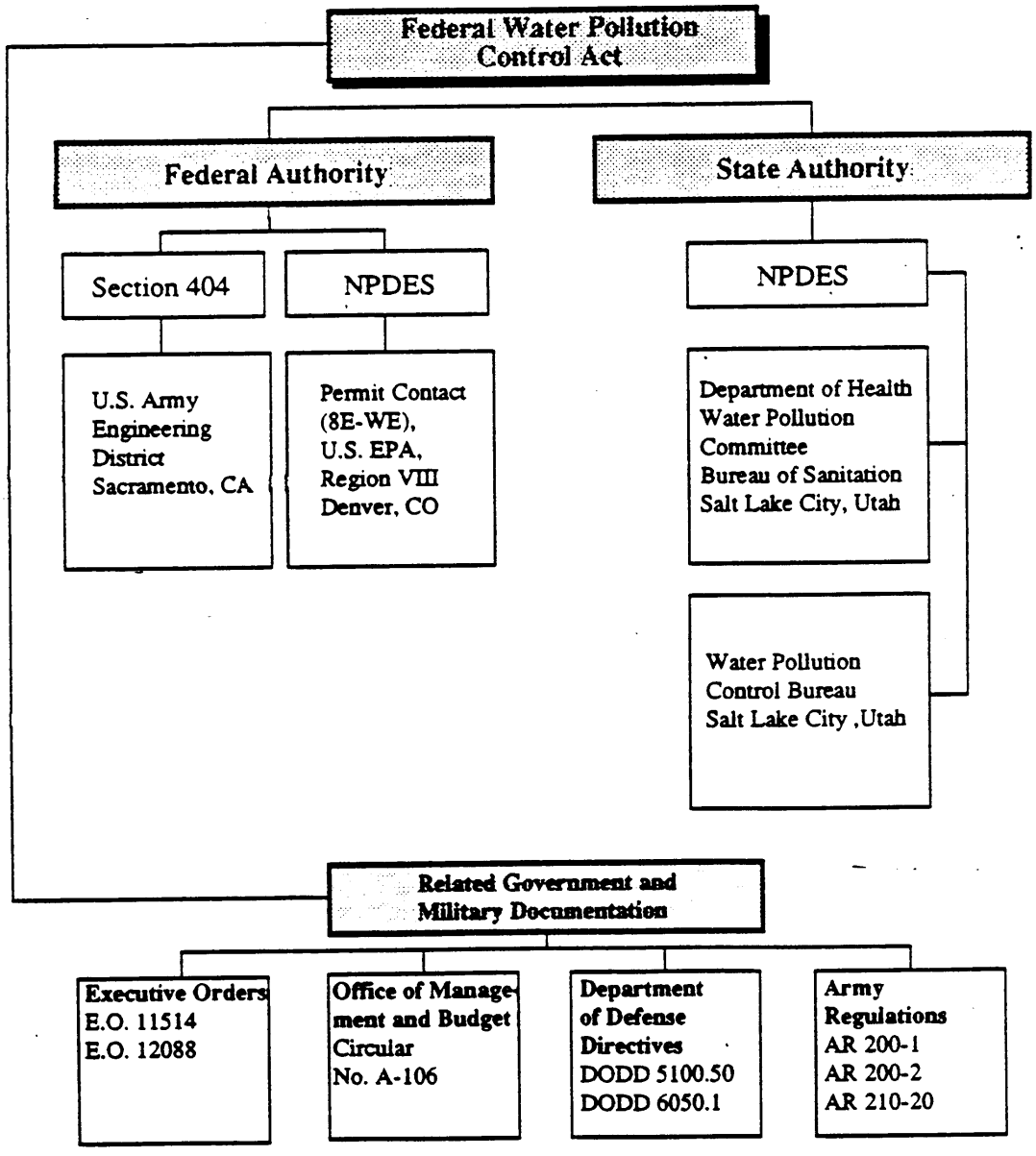


Figure 2-3

Source: Environmental Progress and Challenges: EPA's Update, U.S. Environmental Protection Agency 1988

c. Two important concepts are. embodied in the goals of the Clean Water Act: there is no inherent right to pollute the nation's waters and the States are the rightful administrators of water quantity and quality within their border. To achieve the overall programmatic goals, a National Pollution Discharge Elimination System (NPDES) permitting process has been developed which controls industrial wastes discharged directly into surface waters. The Water Quality Act of 1987 addresses the process of phasing out the construction grants program (Section 201) for publicly owned wastewater treatment plants. A new program to capitalize state revolving loan funds is substituted for the former Section 201 grant program. New requirements and funding authorization are established for area-wide planning and

Example of Principal Water Quality Regulatory Authority
Ft. Alpha, Salt Lake City, Utah
Figure 2-4



non-point source pollution management, for rural clean water programs, and for special issues such as national estuaries, the Great Lakes and Chesapeake Bay programs. Other sections of the Act regulate toxic pollutants of concern in Sewage sludge and provide EPA and the Secretary of the Army new authority for administrative and judicial penalties for Clean Water Act violations.

d. **The Safe Drinking Water Act** establishes standards for drinking water quality and requires all operators of public water systems to meet national primary drinking water standards. This has resulted in some modifications of standard water treatment systems to protect water users from cancer-causing substances, and has renewed attention to groundwater protection.

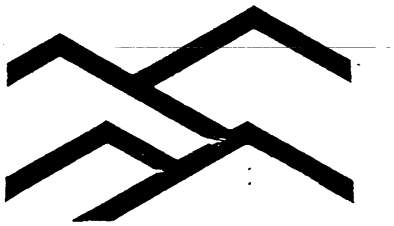
e. Federal facilities must meet applicable federal, state, interstate and local substantive and procedural regulations designed to assure compliance with the Clean Water Act and Safe Drinking Water Act, although exemptions for unique military situations may be requested from the EPA The ability to use water and to discharge treated wastewater in conformance with permit requirements is vital to the conduct of the installation's mission.

f. The importance of complying with applicable water quality regulations is illustrated by the following example, adapted from Air Force Research Report AU-ARI-86-12, Environmental Law for the Air Force. In the fall of 1985, a southwestern Air Force Base came within fours of a regulatory deadline that would have forced it to stop treated discharges of domestic and industrial sewage from its wastewater treatment facility. The installation had no legally acceptable technical alternatives for the discharge of its wastes, nor would most Air Force bases in a similar situation.

Fortunately for that base, an eleventh-hour compromise was negotiated and the base continued to function normally. The lesson to be learned is that the Air Force's/Army's ability to discharge treated wastewater is essential to the ability of each service to operate its installations and accomplish its assigned military missions.

2-6. Land Pollution: Solid and Hazardous Waste Management Legislation

a. Land pollution is very different from pollution in the media of air and water. The health-related problems associated with land pollution usually are caused through an intervening mechanism, unlike problems related to air and water pollution exposure which can lead directly to health hazards.



b. Probably the most serious problem today with solid and hazardous waste management is pollution of ground water from land disposal sites (see Figure 2-5). The threat to public health does not arise directly from the disposal site itself but rather from the proximity of the site to a groundwater source and intervening mechanisms that transfer materials from the site to the water source. Rainwater can mix with hazardous constituents in the site and percolate downward until the leachate pollutes an underlying water course. Also, liquids stored in the site itself can escape, mix with other substances and migrate, thus polluting nearby water sources. The possibilities are many but the common denominator is an intervening mechanism.

c. The primary statutory authority providing for federal regulation of both hazardous and non-hazardous solid wastes is the Resource Conservation and Recovery Act (RCRA). It focuses on, but is not exclusively limited to, land disposal of these wastes. Additional applicable statutes for hazardous waste include the Clean Air Act, Clean Water Act, Toxic Substances Control Act, Hazardous Materials Transportation Act, Safe Drinking Water

RCRA provides regulatory guidance for disposal of hazardous and non-hazardous solid

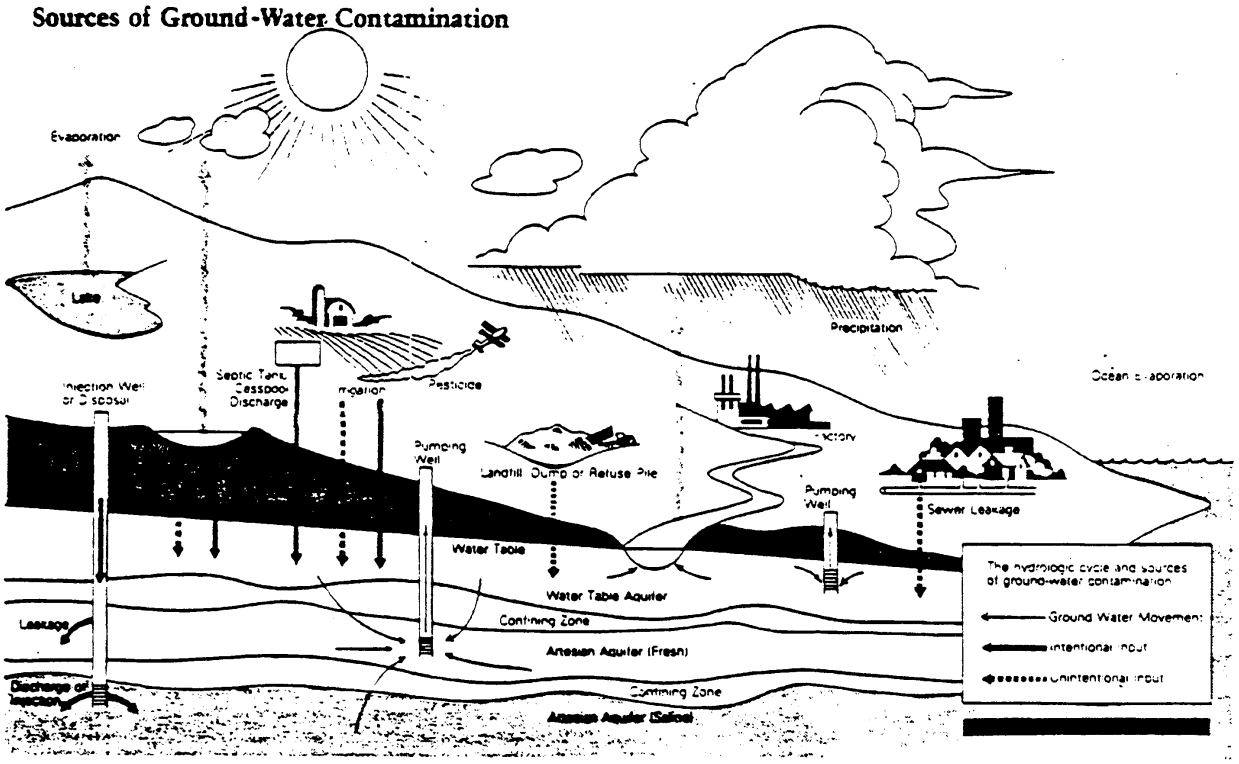


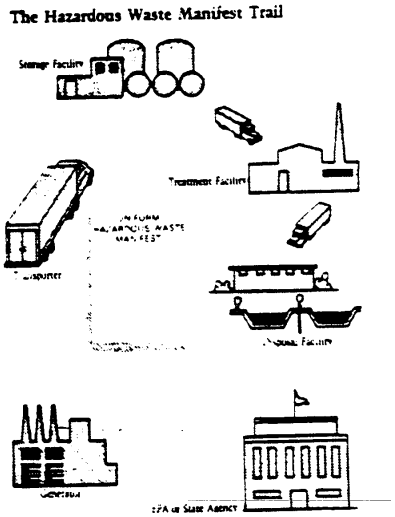
Figure 2-5

Source: Environmental Progress and Challenges: EPA's Update. U.S. Environmental Protection Agency 1988.

Act, Federal Insecticide, Fungicide and Rodenticide Ace and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The intent of RCRA is to regulate wastes that are not controlled by other pollution control statutes and to maintain continuous record and control over the handling, transport and disposal of hazardous substances. CERCLA, also known as Superfund, principally controls releases of hazardous substances into the environment. Further, the act establishes strict liability standards and provides a funding mechanism for clean-up of priority toxic waste disposal sites. A DOD-wide program, called the Installation Restoration Program (IRP), has been established with a separate funding mechanism to provide for CERCLA compliance on defense installations. This program is described in more detail in Appendix E.

d. The EPA Office of Solid Waste has responsibility for promulgating regulations and standards regarding solid waste; management. RCRA also establishes a major program to regulate hazardous waste from the time of generation to the time of its proper disposal (“cradle to grave"). Hazardous waste generation, treatment, storage, transport and disposal are now subject to permitting, reporting. and record-keeping requirements from the point of generation to the end disposal point at an approved site. The document recording/describing the life-cycle of a waste product is called a "manifest" (Figure 2-6).

e. Under RCRA, the Defense Logistics Agency (DLA) is the DOD-designated responsible agency for disposal of all hazardous materials. DLA responsibilities include management of waste-generation storage, handling transport and disposal. The Air Force/Army is responsible for providing necessary data to DLA for environmental documentation (e.g., environmental impact statements associated with disposal). Army and Air Force installations also are required to cooperate with, and may be subject to, requirements of state or regional solid waste management plans. Directive 60503 is the principal implementing



A one-page manifest must accompany every waste shipment. The resulting paper trail documents the waste's progress through treatment, storage and disposal. A missing form alerts the generator to investigate, which may mean calling in the state agency or EPA.

Figure 2-6
Source: EPA, 1988

document for handling and disposing of hazardous waste within the Department of Defense.

f. EPA also has authority for collecting, interpreting and disseminating information on toxic substances, as part of the Superfund Amendments and Reauthorization Act of 1986 (known as Title III of SARA) and Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986. Among other actions, the Agency is establishing the Toxic Releases Inventory, which is designed to assist citizen groups, local health officials, state environmental managers and EPA in identifying and controlling toxic chemical problems.

g. Emergency planning for toxic chemical releases is a responsibility of state and local governments to protect community environmental resources and health. Under Title III, each community must develop a plan for responding to chemical emergencies. Further, facilities using certain hazardous chemicals must report any production, use, and storage of these chemicals which exceeds a certain threshold level. Any spills or releases must be reported immediately and collaborative emergency response efforts implemented between local officials and industrial facilities. These emergency plans have relevance to installations using or storing hazardous chemicals, as well as those installations within the vicinity of other facilities producing, using or storing the regulated chemicals.

2-7. Legislative Information Sources

a. It should be apparent that there are a myriad of complex and interrelated statutes and permitting authorities which may apply to an installation (see Appendices C and D). This bulletin/manual does not attempt to describe each potential regulatory authority but touches on the major statutes in order to give an idea of the general composition and approach to environmental regulations. An efficient approach for the military environmental coordinator/officer to identifying applicable

environmental laws/regulation is, first, to inventory the existing, future and potential pollution sources at a particular installation and then compile a list of the regulatory authorities and permit requirements applicable to those sources.

b. Environmental legislative information may be obtained from military regulations, bulletins and manuals, technical experts at major commands and staff judge advocates.

c. A number of computer-aided data sources are available to planners. The Environmental Technical Information Service (ETIS) operated by the University of Illinois Department of Regional Planning is available from the Construction Engineering Research Laboratory (CERL) of the Army Corps of Engineers. Specific data bases which are part of EMS include:

- The Computer-aided Environmental Legislative Data System (CELDS) is a collection of federal and state environmental regulations (current to within three or four months) specifically compiled for the use of non-lawyers. The information obtained from CELDS must be supplemented by a review of the actual text of the statute or regulations involved.

- The Environmental Impact Computer Analysis System (EICS) assists the planner in preparation of environmental impact reports by means of word descriptors. These descriptors can be used to identify likely hypes and sources of military activities producing environmental impacts and isolates the nature of the effect. An Air Force version of EICS (AF-EICS) is also provided through EMS.

- For socio-economic planning activities, the Economic Impact Forecast System (EIFS) prides a broad data base including statistics for every U.S. county from the Bureau of the Census, Department of Labor, and Bureau of Economic Analysis. A forthcoming version of EIFS will include city data for those municipalities within counties.

- A number of natural resources-based data sources are included within EMS. These components include: Soil Information Retrieval System (SIR);

the Computer-Aided Lad Evaluation System (CALES); the Multi-Parameter Series Search (MPSS); and the Map Unit Use Files (MUUFS).

- The Hazardous Materials Management System (HMMS) is designed to provide environmental coordinators/officers with information necessary for compliance with environmental laws regulating the use, transportation and ultimate disposal of hazardous materials.

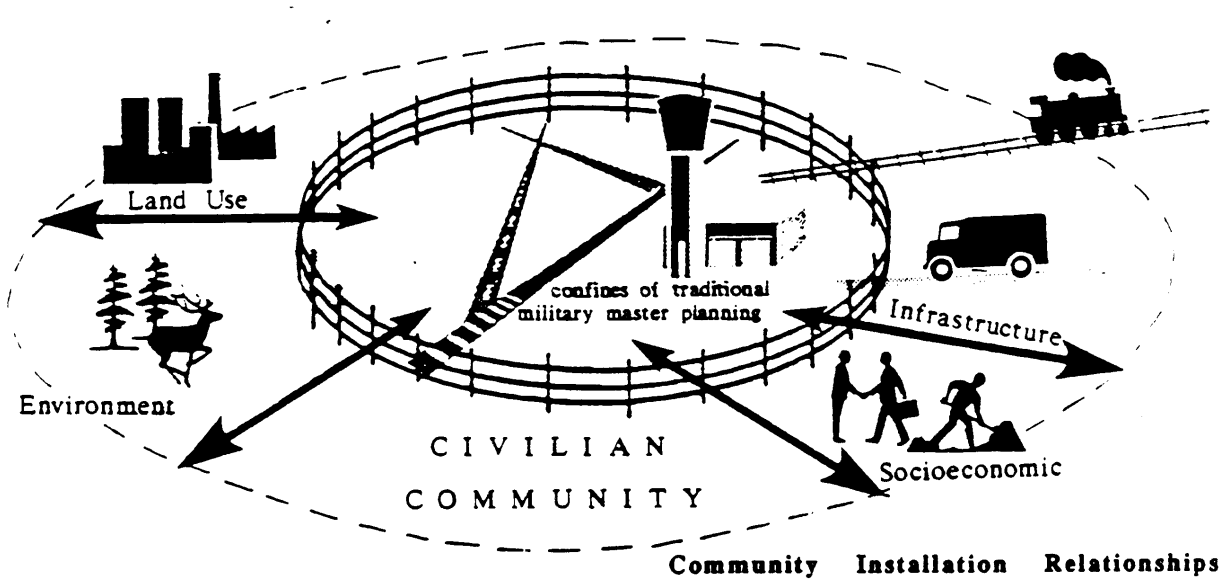
d. As the understanding of environmental problems and basic causes of pollution is -increased, installations must rapidly adapt to the evolving regulatory climate. The environmental coordinator/officer can anticipate upcoming regulatory requirements by systematically reviewing the Federal Register or the regulatory summaries provided through existing data bases.

2.8. Community Relations

a. The environmental quality protection planning process must relate to the needs of both the installation and the community for both development-related and response-related programs. Most installations are linked to the adjacent community for major pollution management programs, such as air quality, wastewater treatment and solid waste disposal. Often the installation and community have common problems relating to land use, transportation, utilities services and pollution control (Figure 2-7). Careful coordination is necessary in that new development either on the installation or in the community can result in more demand on services, or can divert the available supply from one area to another, with negative results. The planner and environmental coordinator/officer should coordinate the desire/needs of the installation with the Utilities Plan, Capitol Improvements Plan and environmental programs of the community.

b. Agreements with Local Agencies. It may not be feasible for each installation to develop emergency response teams to handle all possible catastrophic or near catastrophic

environmental events. For example, if a hazard has a remote probability of occurrence, providing a full on-site response capability could reveal very high costs and underused fire protection facilities, medical personnel and other necessary equipment anal personnel. An alternative may be to seek and use off-installation support or to participate as a designated member of a local emergency response team. Benefits to the installation may include improved community relations, enhanced protection of military facilities and personnel, and additional training and field experience for responders. An example of mutual support among several civilian jurisdictions and the military occurred as the result of a railroad collision between Conrail locomotives and an Amtrak passenger train. Local civilian medical facilities were inadequate to handle the number of injuries. Medical facilities from a nearby Army post were made available, as were Army personnel, to help control the scene and assist as required in the event of release of toxic materials.



Community Installation Relationships
Figure 2-7

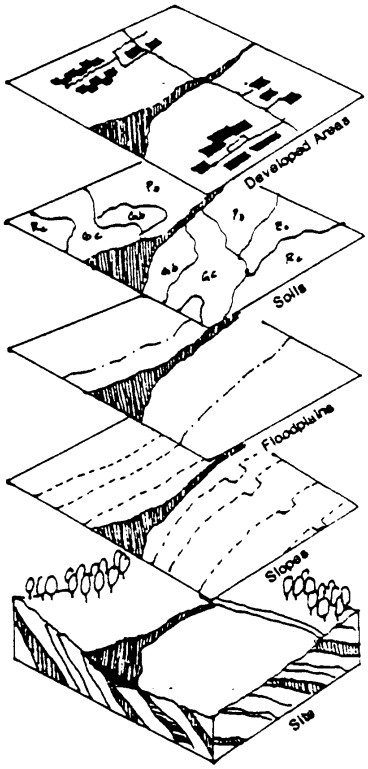
C. INVENTORY

2-9. The Baseline: The Natural Resource Setting

a. In order to begin the process of environmental quality protection planning, a baseline of current environmental conditions must be established. The planner needs to know:

- what data are necessary to complete the inventory;
- where to go for the applicable data;
- how to evaluate data.

b. The first step in preparing an inventory of environmental quality/conditions is to assess the natural resource setting of the installation. Environmental factors to be considered include location, climate, geology, topography, hydrology, soil suitability, floodplains, wetlands, coastal zone designations, vegetation, wildlife, energy and noise. These are important parameters in assessing environmental quality on an installation. For example, soil information is needed in order to design on-site septic systems, solid waste disposal sites and spill-containment programs. Climatological data, particularly rainfall data, can be used to determine the relative importance of runoff pollution. Climatological factors must also be considered in the siting and design of facilities. When new facilities are proposed, areas where thermal inversions are common may be particularly problematic from an ambient air quality standpoint. Geological data can identify the presence of local groundwater aquifers and possible avenues for groundwater contamination such as faults and porous soil and rocks.



The Overlay Map Process
Figure 2-8

c. Natural resource data are generally contained and mapped as part of the Natural Resources Component of the Plan. Environmental assessments prepared for proposed projects or activities on the installation are another prime source for natural resource information. Other sources of data are listed in Table 2-3. The Comprehensive Planning Data Sources and Applications

TABLE 2-3
Sources of Environmental Quality Baseline Data

Source	Air	Water	Land	Biota
U.S. Department of Interior				
• Geological Survey		•	•	
• National Park Service		•	•	•
• Bureau of Land Management		•	•	•
• Bureau of Mines			•	
• Fish and Wildlife Service		•	•	•
U.S. Department of Commerce				
• National Oceanic and Atmospheric Administration	•	•		
U.S. Department of Agriculture				
• Soil Conservation Service		•	•	•
• Agricultural Resources Service		•	•	•
• Forestry Service		•	•	•
U.S. Army Corps of Engineers District Engineer		•	•	
U.S. Army Environmental Hygiene Agency	•	•		
Local Universities, Architectural/ Engineering/Planning Firms, Interest Groups	•	•	•	•
Aerial Photography		•	•	
Museums, Libraries, Newspapers, Local Experts	•	•	•	•
County Tax Records			•	
State Water Resources Agencies		•		•
Local Soil and Water Conservation Districts		•	•	
State and Local Environmental Health Public Works Agencies	•	•	•	•
Air Pollution Control Districts	•		•	
State Transportation Departments			•	
Regional, State, and Federal EPA	•	•	•	•
Local and Regional Planning Agencies	•	•	•	•

Bulletin/Manual should also be consulted for a description of the data collection process for natural resource information.

d. The natural environment data should be summarized and mapped on appropriately scaled base maps of the installation showing the major features (roads, drainage ditches, water courses). Digitizing the data and entering it into a computer provides the benefit of being able to manipulate the map scales and facilitates the development of map overlays (see Figure 2-8).

2-10. Existing Environmental Quality/Conditions

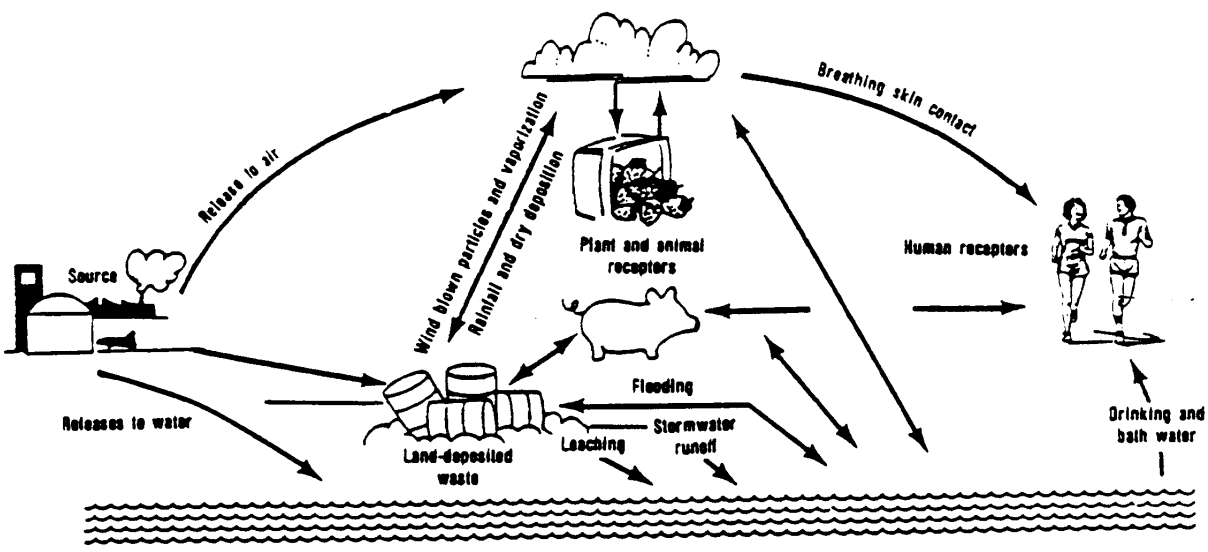
a. The next step in the inventory process is to determine the effects of existing installation facilities and operations on the quality of the air, water and land media. Pollution occurs when these natural resources decline in quality or are rendered unfit for their intended uses. There are many types of pollution that the environmental coordinator/officer must address in providing this information for the Environmental Quality Protection Plan, including:

- Air Pollution
- Water Pollution
- Land Subsidence
- Solid Waste
- Radiation
- Thermal Pollution
- Noise
- Toxic and Hazardous Material
- Fuels and Oils
- Pesticides
- Others as required (e.g., animal wastes)

b. Sources of pollutants which are typically present at military installations include aircraft operations, heating and power generation plants, dining halls, living quarters, munitions/weapon testing, landfill operations, construction activities and Motorola and maintenance operations. The characteristics, sources and importance of pollutants varies between installations, depending on each installation's facilities, operations, and natural resource setting.

c. All personnel involved with environmental quality protection need to understand the interdependent nature of pollution problems. Air, water, land and living organisms are unalterably interrelated (see Figure 2-9). The attempt to control one source of pollution may result in another form of pollution. This is illustrated by attempts to minimize discharge into a water course, resulting in increased air pollution or volume type of solid waste. However, physical pollution considerations are just one aspect of pollution. The economic costs of pollution and pollution control technologies must also be analyzed.

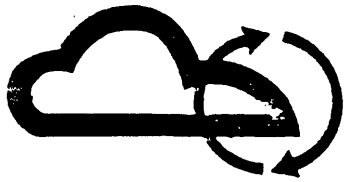
d. There are numerous potential environmental/health effects and sources of pollution which may be applicable to an installation. As an example, Section 2-11 describes the effects and sources of air pollution. The environmental coordinator/officer must determine which pollution types are present at his/her installation and develop an inventory of the sources. This inventory should be available to the planner from the environmental officer or from environmental management staff in the BCE/DEH office.



Interdependencies of Pollution Sources
Figure 2-9
Source: Environmental Law for the Air Force, 1987

2-11. Air Pollution as an Example of Sources and Effects of Pollution

a. Under the Clean Air Act, the EPA is responsible for identifying substances that can be designated as air pollutants. Air pollutants are divided into two basic categories, hazardous and ambient air pollutants.



b. Certain pollutants, even though they may be present only in localized areas, are regulated because they present an unacceptable risk to health and the environment. To date, only a handful of these hazardous air pollutants are regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP). However, development of additional NESHAPs is likely because of the growing concern over hazardous substances.

c. An important NESHAP for Army and Air Force. installations is the one dealing with asbestos, a substance commonly used in structures built or altered between the 1930s and 1970s, which includes many existing Air Force and Army buildings. The asbestos NESHAP defines specific procedures for demolition and renovation of structures containing asbestos and for acceptable disposal of construction debris containing asbestos.

NESHAPs have been developed for:

- ***asbestos***
- ***beryllium***
- ***mercury***
- ***vinyl chloride***
- ***benzene***
- ***arsenic***
- ***radionuclides***
- ***coke oven emissions***

d. Ambient air pollutants can be found anywhere in the air of the United States. Once ambient air pollutants are identified by EPA, maximum concentrations of allowable pollution are designated, in accordance with the standards as shown in Table 2-2. Currently six substances are regulated as ambient air pollutants, also referred to as criteria pollutants under this program. Table 2-4 describes their sources and health effects leading to regulation of these pollutants.

TABLE 2-4

Sources and Effects of Ambient Air Quality Pollutants

Criteria Pollutant	Sources	Health Effect
Particulates	Industrial processes, motor vehicles, windblown dirt	Eye and throat irritation, bronchitis, lung damage, and impaired visibility.
Ozone	Volatile organic compounds (VOCs)	Respiratory tract problems such as difficulty in breathing and reduced lung function. Asthma eye irritation, nasal congestion, reduced resistance to infection, and possibly premature aging of lung tissue.
Carbon Monoxide	Motor vehicles	Impaired ability of blood to carry oxygen; cardiovascular, nervous, and pulmonary systems problems.
Sulfur Dioxide	Fossil-fuel combustion	Respiratory tract problems; permanent harm to lung tissue.
Lead	Leaded gasoline, lead smelting	Retardation and brain damage, especially in children.
Nitrogen Dioxide	Transportation systems, fossil-fuel burning	Respiratory illness and lung damage.

TABLE 2-5
Typical Sources of Air Pollutant Emissions
for Military Installations

Sources	Types of Emission
Aircraft Operations	Particulates, sulphur dioxide, nitrogen dioxide, carbon monoxide. Potentially, lead and volatile organic compounds.
Motor Vehicles	Particulates, sulphur dioxide, nitrogen dioxide,. carbon monoxides. Potentially, lead.
Energy Generators and Boilers	Particulates, sulphur dioxide, carbon monoxide, nitrogen dioxide, volatile organic compounds. Improper operation may result in products of incomplete combustion.
Incinerators	For domestic waste: particulates, some hydrogen dioxide from plastics. For industrial or pathological waste: hydrogen chloride, non-criteria pollutants.
Firefighting-Training Facilities	Particulates, and, potentially, sulphur dioxide, nitrogen dioxide based on fuel source.
Industrial Processes, such as Plating, Spray-Painting and Abrasive-Blasting	Volatile organic compounds
Volatile Fuels and Solvents (Storage and Handling)	Volatile organic compounds
Jet and Rocket Engine Test Facilities	Particulates, sulphur dioxide, nitrogen dioxides, carbon monoxide, lead, volatile organic compounds.
Construction and Demolition Work	Fugitive dust. Asbestos may be involved in demolition activities.
Asphalt/Concrete Plants	For concrete plants: particulates, fugitive dust. For asphalt plants: Particulates, fugitive dust, volatile organic compounds.
Parking Lots/Parking Structures	Particulates, sulphur dioxide, nitrogen dioxide, carbon monoxide. Potentially, lead.
Wastewater Treatment Facilities	For domestic waste: odorous emissions. For industrial waste: volatile organic compounds,
Bakeries and Laundries	For bakeries: Particulates For laundries: volatile organic compounds

e. Criteria pollutants may originate from widely separated mobile or stationary sources or from a combination of both. Sources of air pollutant emissions from military installations are summarized in Table 2-5.

Criteria ambient air pollutants include:

- ***Particulates***
- ***Ozone***
- ***Carbon Monoxide***
- ***Sulfur Dioxide***
- ***Lead***
- ***Nitrogen Dioxide***

f. Federal or state permits must be obtained for all stationary sources emitting air pollution over a certain threshold amount. Therefore, mapping the major stationary sources can be relatively easily accomplished by reviewing the list of permits. These permits set forth emission standards which must be met.

2-12. Information Sources for Pollutants

a. "Good" data that are timely, reliable and at the appropriate level of detail is essential for the command decision process to work property. In some instances there may be several sources of information to choose from. The following chart (Figure 2-10) should be kept in mind when evaluating data sources.

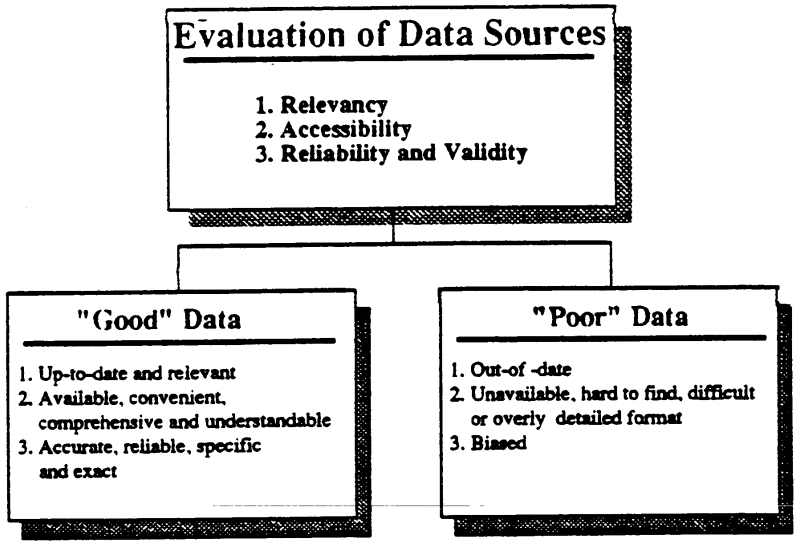


Figure 2-10

b. The planner starts with the BCE/DEH for information about existing and projected conditions at the installation including existing pollution sources, as this office will have records of pollutant emission permits, such as NPDES permits. The sources of baseline information listed in Table 2-3, such as regulatory agencies, may also have data pertaining to air, water and land quality. Land and regional planning offices often will have an environmental planner able to provide information or able to refer the installation planner to other reliable sources.

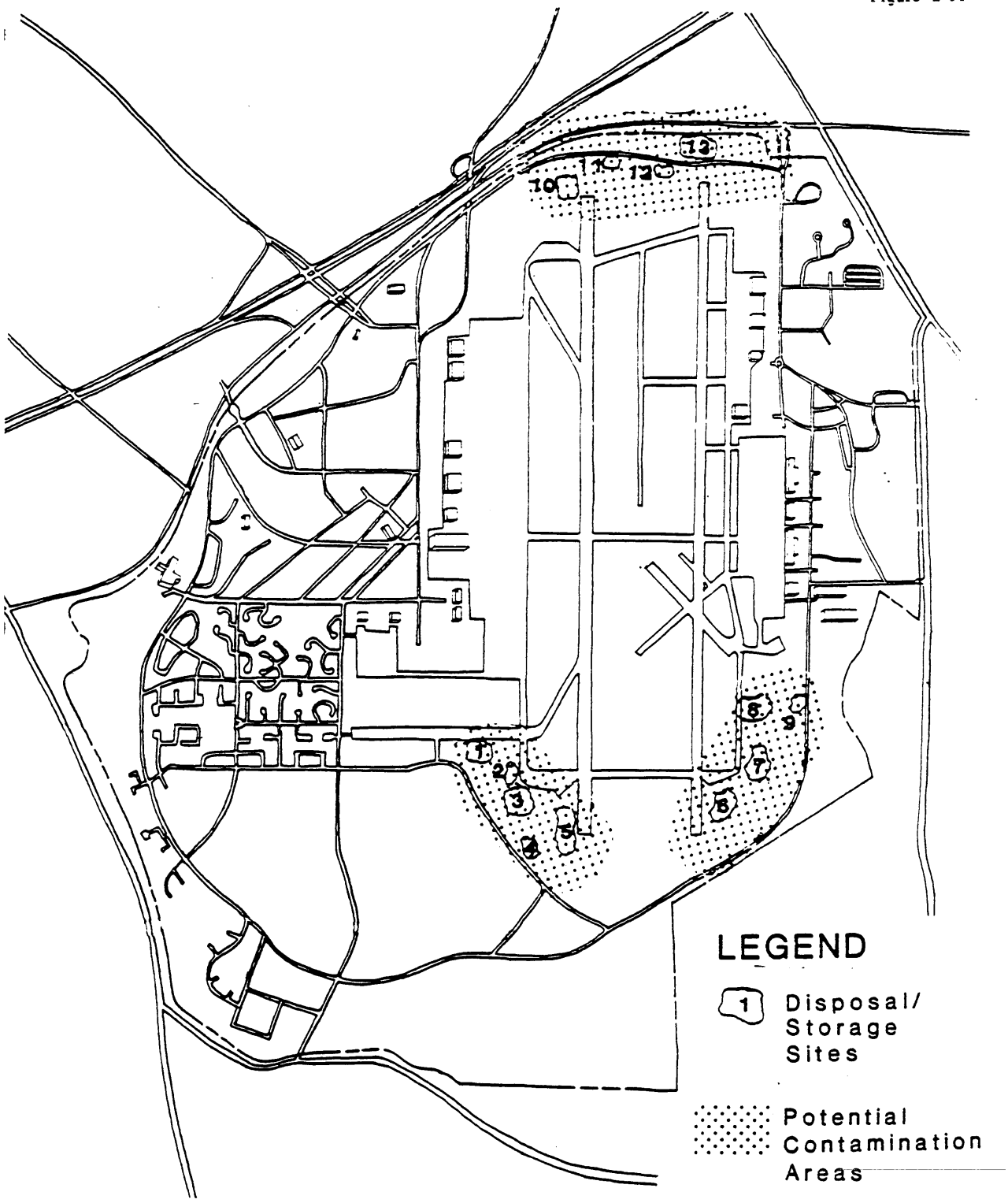
c. Prepared Tabs and Maps, including these for natural resources, land use, AICUZ/ICUZ and others, serve as information sources and should be evaluated for completeness and accuracy as part of the environmental quality protection planning process. Ultimately, the result of the inventory will be a completed Tab B (or its Army equivalent) which graphically depicts the locations of potential environmental problems, such as emission plumes, leachate patterns, and environmentally-sensitive receptors (see Appendix B).

d. To address health-threatening hazardous waste sites on military installation the Installation Restoration Program (IRP) has been implemented by the Department of Defense. The first two steps of the IRP entail identification and confirmation of the presence of contaminants. Identified sites should be mapped as part of the environmental quality protection planning inventory process (see Figure 2-11). For the Air Force, IRP sites should be included in the Tab B series as well as Tabs D and M for existing and future land use.

e. Another source of information about hazardous wastes illustrated in Figure 2-11 is the Hazardous Materials Technical Center sponsored by the Defense Logistics Agency. All data sources should be evaluated for validity, reliability, relevancy, and accessibility.

Map of Hazardous Waste Sites

Figure 2-11



2-13. Pollution Control Facilities

a. Commonly used pollution management facilities include sanitary landfills, wastewater treatment plants, stormwater detention systems, water treatment plants, air emission scrubbers and vapor control systems.

b. The treatment loadings and available capacity of these systems need to - be determined in the inventory process. Information about pollution control facilities can be obtained from the Utilities Systems Plan and the BCE/DEH. Coordination or discussion with the local community is often needed to determine the treatment capacity for community owned facilities used by the installation, such as sewage treatment plants, or where the installation is part of an area-wide control strategy such as the air quality control regions.

3

Forecasting & Analysis

CHAPTER 3

FORECASTING AND ANALYSIS

A. PURPOSE

3-1. Scope. Planning studies and analyses are performed to identify current circumstances, including current needs, as a basis for anticipating and projecting future needs. This chapter provides guidance in identifying current and future environmental constraints and opportunities, and in forecasting future impacts on the current operations and planning of the installation (Figure 3- 1).

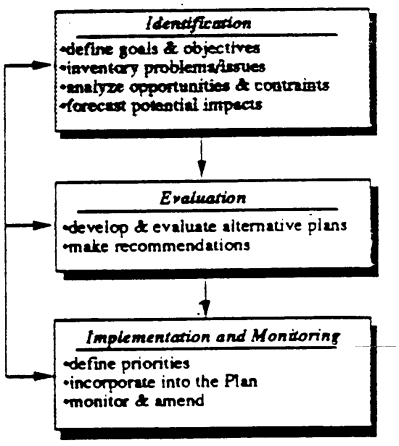


Figure 3-1

B. DETERMINING OPPORTUNITIES AND CONSTRAINTS

3-2. Consolidation of the Inventory

a. Each installation has environmental characteristics that may either constrain development or present unique opportunities. The planner and environmental coordinator/officer must identify and understand the extent of these constraints and opportunities before developing alternate courses of action in the Environmental Quality Protection Plan. For example, factors such as steep slopes, floodplains, wetlands, soil types and drainage patterns may limit the ability to construct a road or site a housing development. Conversely, an installation may have an opportunity to conserve energy and reduce pollutant emissions by locating future development on south-facing slopes, which optimizes solar heating opportunities.

b. Opportunities and constraints also are inherent to pollution control systems themselves. For example, the size of the present sewage treatment facility may limit the development capacity of that portion of the installation it serves. In another case, the adequacy and capacity of EPA-approved hazardous waste sites may limit those activities which produce wastes requiring this type of treatment and/or storage.

c. Many natural resource and environmental quality features will have been identified during the inventory phase or taken into consideration and mapped as part of the land use planning process. The planner and the environmental coordinator/officer should coordinate the collection of information to ensure quality and applicability in the development of environmental management approaches.

d. The results of these investigations usually are mapped, thereby providing overlays of the separate environmental quality issues relevant to the comprehensive planning process (as recommended in the USAF Tab B series). Primary environmental quality attributes to be mapped include air quality, water quality, land/soils conditions, and solid/hazardous/toxic waste sites. Other environmental quality attributes may be applicable at an installation, such as noise or electromagnetic radiation. Each attribute may be broken down into environmental factors and mapped as a series of overlays. For example, air quality may include point sources, vehicle corridors, aircraft emissions and air quality isopleths (plumes).

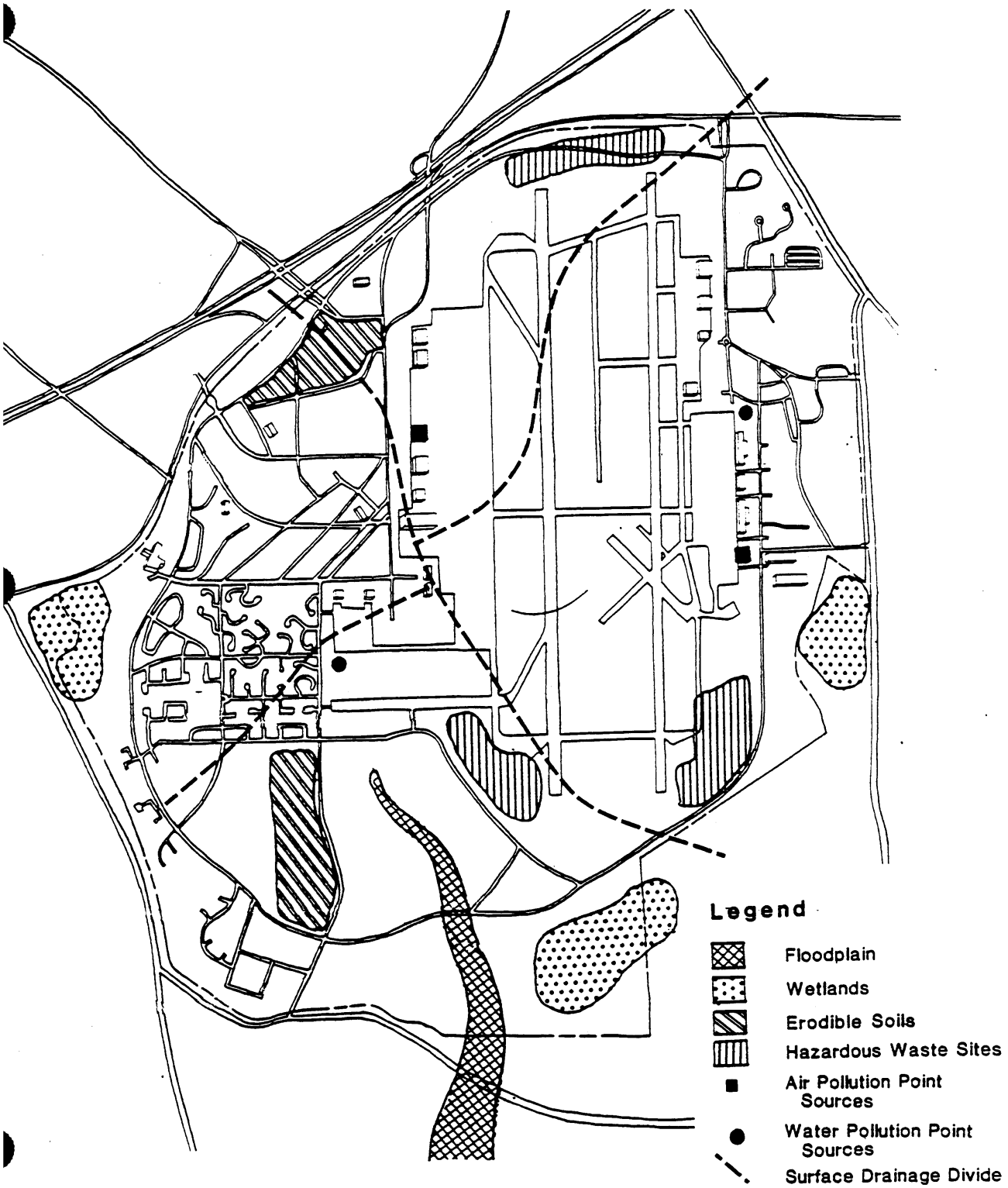
e. A standard method of bringing multiple environmental factors to bear on locational decisions is through the composite overlay technique. One factor, such as steep slopes, can be overlaid with others, such as floodplain delineation, so that developable land or land that is relatively free of constraints will appear. Opportunities may not be as readily apparent as constraints but should be mapped if possible. The composite overlay can be relatively simple, using colored pencils, or very sophisticated, with computer code attributes and assigned attribute values (e.g., Geographic Information Systems). The AF Composite Tab is one example of a composite overlay (Figure 3-2). Even in the simplest form, such an assessment of environmental factors is essential to the planning process.

Primary environmental quality attributes to map include:

- ***air quality***
- ***water quality***
- ***land/soils quality***
- ***toxic/hazardous/ waste sources & disposal sites***
- ***solid waste disposal sites***
- ***hazardous substance transport routes***
- ***radiation sources, disposal sites & transport routes***

Combined Constraints Map

Figure 3-2



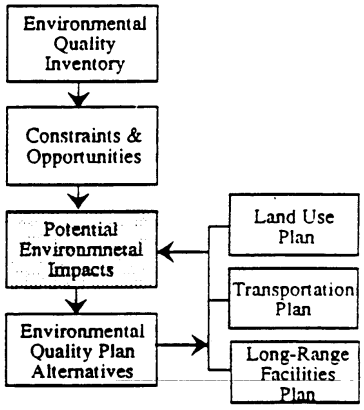
3-3. Analysis of Environmental Factors

a. By analyzing the inventory of existing conditions, the planner can determine, in conjunction with the environmental coordinator/officer, whether or not the existing and future facilities and proposed actions comply with applicable environmental regulations and standards. Problems or issues may occur when a planned development is in conflict with identified environmental constraints. Conversely, opportunities arise when development is able to take advantage of one or more environmental features. By using the composite overlays and the analysis of applicable environmental regulations, the planner/environmental officer can assess environmental quality opportunities and constraints. Tables 3-1 and 3-2 contain examples of air and water quality opportunities and constraints, respectively.

C. FUTURE ENVIRONMENTAL IMPACTS

3-4. Forecasting

a. Forecasting of future conditions is a critical element of the environmental quality planning process. As shown in Figure 3-3, forecasting consists of predicting future environmental impacts based on the extent and location of future development The other component plans developed as part of the comprehensive planning process are used to predict these impacts. For the Air Force, the Tabs which show future development include the Future Land Use Plan (Tab D-1.1), the Future Transportation Plan (Tab I-2.1), and the Long-Range Facilities Development Plan (Tab M-1.1) (reference AFR 86.4). For the Army, the Future Development Plan provides the long-range development plan and program which can be used to predict potential effects on environmental resources (reference AR 210-20). Once these effects are identified, alternatives can be developed to avoid or minimize adverse impacts, thereby incorporating environmental quality objectives in the comprehensive planning process.



Relationship of Forecasting to Environmental Quality Planning Process

Figure 3-3

TABLE 3-1

Example of Air Quality Opportunities and Constraints

Opportunities:

- Since the burning of fuel is often a source of air pollution, reductions in fuel use often must be achieved to meet air quality standards. Reduction of excessive fuel use and increased efficiency conserves energy and reduces overall fuel costs. For example, implementation of a vehicle inspection and maintenance program nearly always results in more efficient use of fuel.

- Traffic control strategies for air pollution reduction result in better traffic flow in and around military installations.

- Cooperation with adjacent communities in pollution abatement programs helps in the achievement of better air quality, thus providing more healthful conditions for military personnel and the reduction of property damage caused by air pollution.

Constraints:

- The emissions of significant amounts of suspended particulates, hydrocarbons, sulfur dioxide, nitrogen dioxide, carbon monoxide, lead, and toxic or hazardous substances from military facilities are regulated by the Clean Air Act.

- Permits are required for all existing stationary sources emitting significant amounts of air pollutants. Air pollution control devices often must be installed.

- New facilities must be approved by the state. Disapprovals may occur when: a performance or emission standard cannot be met; the facility would interfere with the attainment or maintenance of a national ambient air quality standard; or the facility would contribute to the degradation of existing air quality. In some instances, installation of the facility may require offsetting action(s) to reduce emissions from other sources in the area (emissions offsets).

- Sources of clean fuels, which may be required, must be available to the site.

Source: Environmental Impact Computer Analysis System (EICS) output

TABLE 3-2

Example of Water Quality Opportunities and Constraints

Opportunities:

- Cooperation with adjacent communities in pollution control programs helps in the achievement of better water quality, reducing treatment costs for drinking water. protecting local fisheries, and protecting the recreational values of local waterways.

- Large natural areas and water-edge buffer areas on installations often provide important protection from non-point source pollution to local waterways.

Constraints:

- National Pollution Discharge Elimination System (NPDES) permits are required for all point source wastewater discharges. The permit sets effluent standards and the type of treatment technology that must be used.

- Industrial wastewater often must be pretreated before discharge to the wastewater treatment plant to ensure that biological and other treatment processes of the plant are not damaged.

- Drinking water must meet the standards of the Safe Drinking Water Act before distribution to users.

- Injection of fluids underground is regulated by the Safe Drinking Water Act to protect groundwater which may be used as a source of drinking water.

- Areawide 208 Plans may require measures to control non-point source pollution. Stormwater -management measures designed to reduce pollutant loadings may be required, such as stormwater detention ponds, stormwater retention areas, infiltration pits, French drains and porous pavement.

- Sedimentation and erosion controls must be implemented during construction if sedimentation pollution to local streams is to be prevented. Measures include: limiting the disturbed area, temporary retention structures and prompt seeding or surface stabilization.

- Master plans should consider cost and land needs for water pollution treatment.

Source: EICS output

b. The forecasting included in the environmental quality planning process should not be confused with impact assessment requirements which are part of the Environmental Impact Analysis Process (EIAP). Forecasting, as described here, is installation- wide and based on the future land use plan. EIAP is project-specific and related to individual projects which may or may not have resulted from long-range planning recommendations. One of the end results of the Environmental Quality Protection Plan is to identity those recommendations contained in The Plan which may require the installation to initiate the EIAP when the recommendations are implemented.

c. Future environmental impacts can be forecast using several methods:

(1) In the case of near-term actions, a project-specific preliminary environmental assessment may have already been performed and can be used.

(2) By directly comparing proposed actions contained in The Plan with comparable existing actions at the installation. Environmental impacts may be determined by reviewing the environmental documentation associated with the existing action.

(3) By using the Environmental Impact Computer-Aided System (EICS) program of the Army Corps of Engineer's Environmental Technical Information System to identity potential impacts. EICS builds a matrix of all likely environmental problems associated with the proposed activity; these should be considered using descriptions and data supplied by the planner or environmental coordinator/officer. Figure 3-4 is an example of typical EICS output.

d. The following questions provide general guidance to the planner In evaluating the relative impacts of planned development on air, water and land resources. This list is by no means all inclusive, but is intended to serve as an example when forecasting impacts associated with plan recommendations.

Typical EICS Output: The ecological impacts of a mission change

Figure 3-4

Basic Activity	attributes 1	2	3	4	5	0	1 1	1 2	1 ramifications/ mitigations
167	B	B	A	C		B	B	A	2135
244	C		A	B	C		B	C	2244
245	C	C		C	C		B	C	2245
255								C	2292
292	C							C	2292

ATTRIBUTES

1 natural setting
2 game animals
3 game fish
4 rare or endangered species
5 increase in undesirable species
* 10 impacts on game animals
* 11 encroachment on natural habitats
* 12 threatened species

* preceding attributes are CONTROVERSIAL

ACTIVITIES

167 change time of vehicle operation
244 increase sewer usage
245 increase refuse disposal usage
255 decrease refuse disposal usage
292 demolish facilities

ENVIRONMENTAL IMPACT

A definite impact
B probable impact
C possible impact
BLANK no obvious impact

RAMIFICATIONS/MITIGATIONS

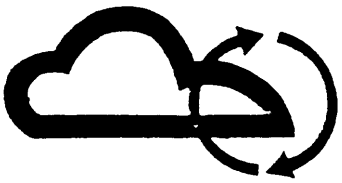
2135 RAMIFICATIONS

CHANGING THE TIME OF TROOP OR VEHICLE MOVEMENT FROM DAY TO NIGHT WILL INTERRUPT NOCTURNAL ANIMALS WHICH ARE NORMALLY INACTIVE DURING THE DAY, BUT MAY HELP ANIMALS WHICH ARE ACTIVE IN DAYLIGHT. CHANGING OPERATION TIME TO A DIFFERENT SEASON CAN CAUSE NEGATIVE IMPACTS IF THE CHANGE IS TO A FLOWERING OR FRUITING SEASON FOR PLANTS WHOSE FRUITS OR SEEDS FURNISH IMPORTANT ANIMAL FOOD. OPERATIONS IN RAINY CONDITIONS HAVE INCREASED LIKELIHOOD OF VEGETATION DESTRUCTION DUE TO SOIL INSTABILITY, AND EROSION AND ITS EFFECTS WILL BE INCREASED AS WELL. OPERATIONS IN CRITICAL BREEDING OR NESTING SEASONS CAN CAUSE BIRDS AND SMALL ANIMALS TO FAIL TO MATE OR TO ABANDON THEIR NESTS OR YOUNG.

2135 MITIGATIONS

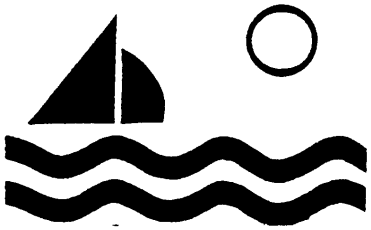
CHANGES IN TIME OF DAY RESULT IN SOME UNAVOIDABLE IMPACTS. CHANGE OF SEASON SHOULD BE PLANNED TO AVOID ACTIVITIES IN THE CRITICAL PHASES OF REPRODUCTIVE CYCLES. DETERMINATION OF SUCH CRITICAL PERIODS WILL REQUIRE CONSULTATION WITH LOCAL, STATE, OR FEDERAL FORESTERS, BOTANISTS, AND WILDLIFE BIOLOGISTS. SOIL CONSERVATION SERVICE PERSONNEL CAN DETERMINE WHICH SOILS MAY BE MOST READILY ERODED IN WET SEASON OPERATIONS.

(1) Air Quality



- Are existing or predicted installation air pollution levels above National Air Quality Standards?
- Is the installation located in a non-attainment area or in an area requiring the prevention of significant deterioration?
- Will the state require stricter emission levels for new facilities, to offset existing emission sources that do not meet air quality standards?
- Open burning of refuse, trees and shrubs, and munitions can have adverse effects on local and regional air quality. Is there or will there be open burning associated with future development?
- Does the proposed development require new fossil fuel-burning boilers for heating, incineration and air conditioning?
- "Fugitive" dust as a result of construction activities or military maneuvers can degrade local and regional air quality. Such activities include demolition, drilling, excavation, cement handling, blasting, aggregate crushing, traffic on unpaved roads, grading or any other action which exposes large amounts of bare earth to the wind. Will any of these activities occur with this plan?
- Motor vehicles generate significant amounts of carbon monoxide and nitrogen dioxide emissions. Will the plan result in increased motor vehicle use and will the percentage increase significantly affect air quality?
- Will any increases in industrial activity produce significant air pollution as a result of the planned development?
- Will any action-generated emissions contain radioactive or toxic air pollutants?

(2) Water Quality



- Is sewage to be treated on the installation, either by a wastewater treatment plant or by on-site septic systems?

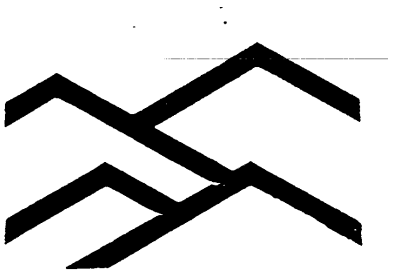
- Are any industrial discharges expected to be produced? How is this effluent to be treated? Will industrial pretreatment be required?

- Will the plan result in an increase in pollutant discharges to local water bodies?

- Will a new NPDES permit be required or will an existing permit need to be modified or amended?

- Will the plan increase impermeable surfaces on site, thus increasing stormwater runoff pollution? What plans are there for the control of sedimentation and erosion during construction? What local or state regulations regarding non-point source pollution control must be followed?

(3) Land/Soil Conditions
Solid/Hazardous Wastes



- Are the slopes on or adjacent to future development sites classified as generally unstable?

- Is there a history of or potential for either earthquake or volcanic activity in this area?

- Certain construction activities result in severe erosion and stream siltation if vegetation is disturbed and highly eroduble soils are invoked. Is any blasting or excavation or grading likely in connection with this plan?

- Is there evidence that there may be problems with soil permeability on the installation in terms of either excessive runoff or contamination of groundwater from septic system infiltration fields?

- Are any solid waste or sludge disposal sites needed? How is the quality of seepage runoff or leachate to be controlled?

- What provisions must be made to control spills of toxic or hazardous substance produced, stored or transported?

- Is there past evidence that chemicals or other harmful industrial substances were buried on the installation? (Refer to Installation Restoration Program.)

3-5. Environmental Assessment

a. Based on the analysis and conclusions of the composite constraints/opportunities overlays, an installation-wide Environmental Assessment (EA) could be prepared in conjunction with the Plan for the installation. This document serves to evaluate all the relevant problems/capabilities associated with existing/future land development issues identified in the Plan and to recommend potential mitigation measures. The EA is prepared in accordance with AFR 19-2 (Air Force) and AR 200-2 (Army) to serve as the legal basis for land use decision-making.

b. A checklist of factors which may be considered in the EA is provided in Figure 3-5. If this matrix is used, the narrative portion of the EA should focus on those environmental impacts which are significant and for which mitigation is required. Mitigation measures could include relocation or reconfiguration of proposed land uses which will have implications to the I-and Use Plan.

c. As discussed in Chapter 1 (Section 1-8), project-specific environmental assessments or statements may tier from generic environmental documents such as an installation-wide EA. These more specific assessments/statements can refer to pertinent data from the installation EA and focus on the specific impacts (and mitigation measures) of the proposed project. Tiering is recommended by both the Air Force and Army in their respective environmental regulations (AF 19-2 and AR 200-2).

Installation EA Checklist

Figure 3-5

ENVIRONMENTAL FACTOR	LEVEL OF IMPACT				MITIGATION		COMMENTS
	NO NEGATIVE IMPACT	MINOR IMPACT	MODERATE IMPACT	SEVERE IMPACT	NEEDED	POSSIBLE	
Historic Resources							
Archaeological Resources							
Population Density/Trends							
Regional Development							
Transportation Systems							
Cultural Patterns							
Economic Conditions							
Air Quality							
Surface Water Quality							
Groundwater Quality							
Sanitary and Solid Waste Disposal							
Pesticide and Herbicide Use							
Aircraft & Operations							
Explosives Handling and Storage							
Industrial, Nuclear, or Other Hazards							
Topography and Soils							
Trees and Other Vegetation							
Streams, Floodplains, and Wetlands							
Endangered Species							
Noise							
Odor							
Land Use Relationships							
Community Facilities							
Recreation							
Other:							

Source: HQ US Army Corps of Engineers, Washington, D.C.

4

Environmental Quality Protection Alternatives

CHAPTER 4

ENVIRONMENTAL QUALITY PROTECTION ALTERNATIVES

A. PURPOSE

4-1. Context

a. The planner has reached the stage in the planning process where the current and future environmental protection problems/capabilities are evident. The next step is to identify appropriate alternative actions to resolve problems associated with large-range development (Figure 4-1).

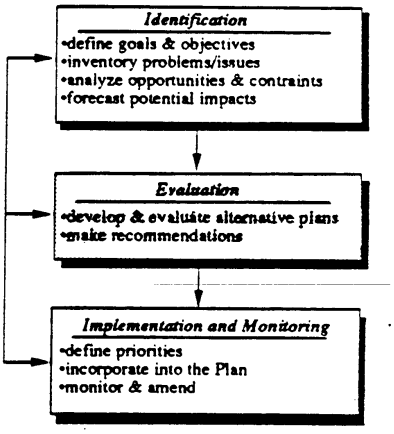


Figure 4-1

b. Once identified, alternatives are evaluated on the basis of how well they meet the future mission and installation needs. The recommendation phase identifies and supports "preferred" alternative(s) as determined through selection criteria.

c. It is important to realize that there are no absolutes in resolving environmental problems. Mostly, there are compromises that provide the best balance among the essential factors of mission accomplishment, installation goals and objectives, and the protection and preservation of installation life and property. All must be considered in the context of the complete comprehensive planning efforts on the installation.

B. DEVELOPMENT OF ENVIRONMENTAL PROTECTION ALTERNATIVES

4-2. Identification

a. Normally, more than a single alternative action is possible for solving problems and/or meeting objectives. It is not enough to examine just one alternative if there are others which could provide equal or better environmental protection. To

develop meaningful alternatives requires creativity, imagination, sensitivity to environmental issues, and an awareness of limitations imposed by the installation mission, socio-economic constraints and regulatory requirements.

b. The potential list of alternatives should correspond to a wide variety of actions including a "no action" alternative. Early in the process, it is only necessary to identify potential alternatives in general terms to ensure that none is overlooked.

c. Environmental pollution control alternatives can be categorized according to time and cost requirements. Generally, short-term actions to meet existing deficiencies and current needs would be lower in initial cost, while major changes requiring more time to implement would tend to cost more. However, sometimes short-term solutions do not provide costeffectiveness over the economic life of the system.

Environmental pollution control alternatives include:

- ***physical/locational actions such as cleaning up waste disposal sites or reducing point sources of pollution***
- ***programs such as ridesharing or waste recycling.***

d. Environmental pollution control alternatives include both alternative courses of action (such as installing air pollution abatement devices or removing underground storage tanks) or programmatic alternatives. Examples of programmatic alternatives may include a combination of ride-sharing, subsidized vandals and staggered work hours to reduce overall vehicle emissions. A second programmatic example is the initiation of a waste recycling program to reduce over time the volume and type of solid and hazardous waste.

e. The preferred method of resolving or abating environmental problems is to eliminate the cause. However, this may at times be impossible or impractical. One of the advantages of developing the Environmental Quality Protection Plan is the ability to identify necessary changes to The Plan at an early enough stage to be feasible. In this regard, one of the overall alternatives might be to make changes to The Plan itself (i.e., decrease level of

deployment, alter locations of facilities). The expertise of the environmental officer is needed, particularly with respect to the individual system alternatives.

f. Most installations are located adjacent to or near communities that provide support services such as solid waste or wastewater disposal. Where municipal services are adequate and future capacity is available, the installation normally should use the community resources. The installation should not duplicate community resources with respect to pollution control but, rather, should attempt to increase service efficiencies and otherwise coordinate facilities.

g. Figure 4-2 gives an example of air pollution control alternatives on a military installation, using the goals and objectives outlined in Chapter 2, Table 2-1. The systematic identification of opportunities and constraints in the inventory and forecasting/analysis stages (Chapters 2 and 3) may result in modification of the original environmental quality goals and objectives.

4-3. Screening of Alternatives

a. Early in the selection process it is advisable to identify the most feasible alternatives from among a range of alternatives. Examine the list of alternatives relative to the current and future needs and the existing constraints on the installation. Although the number of potential alternatives on the list may be extensive, usually no more than two or three alternatives are fully responsive to the identified needs and in keeping with the identified constraints. If a particular pollution control alternative is incompatible with the installation's goals and objectives, it should not be considered further.

Figure 4-2: Alternative Air Pollution Control Measures

Typical Problem	Alternative	Goal	Objective 1	Objective 2
Air pollution levels are projected to exceed standards	• Encourage use of bicycles and pedestrian circulation	x	x	
	• Provide mass transit and ride sharing	x	x	
	• Improve vehicle emission performance	x		
	• Use access controls along arterials and collectors to minimize conflicts with free-flowing traffic	x		x
	• Implement Transportation System Management (TSM) measures to reduce use of motor vehicles	x	x	x
	• No action			

Goal: Minimize unavoidable generation of air pollutants through comprehensive planning, design and systems selection decisions.

Objective 1: Minimize unnecessary use of motor vehicles.

Objective 2: Maximize transportation system efficiency to reduce motor vehicle emissions.

b. Once the potential alternatives have passed through this initial screening, prepare a Project Description consisting of the following items:

- Description of project characteristics, requirements, problems
- Location of need (preferably shown on a map), both site-specific and area-specific
- Applicable objectives to be met
- Potential alternatives
- Data requirements
- Applicable regulations

The advantage of preparing a project description is to determine if the alternatives really appear feasible or should be dropped from consideration. Keep in mind that the alternatives that pass this screening will be included in the detailed evaluation.

C. EVALUATION AND RECOMMENDATION OF ALTERNATIVES

4-4. The Evaluation Process

a. A systematic approach should be used for evaluation of environmental alternatives. The process should involve both the planner and the environmental coordinator/officer with the environmental officer applying his/her systems knowledge and experience and the planner primarily responsible for consistency in land use, policy and mission requirements. The process involves proper consideration of each objective, use of an appropriate methodology to compare alternatives, accurate predictions of impacts, and the taking of steps to ensure that the resulting plan is implementable.

b. It is also necessary to consider the timing of The Plan. As the time period from plan to construction may be several years, it is important to determine whether The Plan will have merit now

or several years in the future. Select alternatives that best meet the objectives and comply with the findings/recommendations of the other plan components.

4-5. Measuring Performance

a. The most direct way of evaluating an alternative is to determine how well it meets the environmental quality planning goals and objectives. The specific means of compassion are called criteria or measures of effectiveness. The criteria may be very simple or quite detailed but in all cases should be measurable either quantitatively or subjectively. Minimum or maximum allowable values for criteria are called standards. In practice, only a few criteria are used in evaluation. However, attempts should be made to have a variety of criteria that address pertinent concerns about each project. Examples of technical and subjective criteria include:

Criteria are specific means of comparison.

Standards are minimum or maximum values for criteria.

Technical Criteria	Subjective Criteria
• Amount of pollutant	• Reliability
• Concentration of pollutant	• Disruption to Quality of life
• Cost	• Orderliness
• Capacity	• Appearance

4-6. Evaluation Techniques

a. To select from among several feasible alternatives, the planner and related experts will need to systematically compare the advantages and disadvantages of all feasible alternatives. Many factors may be involved in the evaluation of environmental quality system alternatives and the best solution is not likely to be readily apparent or immediately attainable. While other basic analytical

Evaluation techniques include:

- ***Professional judgment***
- ***Cost-effective analysis***
- ***Cost-Benefit analysis***

evaluation techniques (cost-benefit analysis, determinations of cost-effectiveness) may be used, the end result of any evaluation will be the combined judgment of those making the decisions. The analytical use of technical and subjective criteria, along with consideration of costs and potential environmental impacts, will facilitate informed decision-making.

b. As an introduction to analytical evaluation, the following techniques may be used by the planner to select from among various environmental alternatives:

1) **Cost-Benefit Analysis.** A method used to determine the relationship of costs associated with a particular action to the benefits received by those expenditures. Both costs and benefits are assigned monetary values which can be used to compare the desirability of a certain course of action throughout an identified time span. One limitation to cost-benefit analysis is the difficulty in assigning a monetary value to intangible effects such as an improved quality of life or improved health conditions.

2) **Determination of Cost-Effectiveness.** A method used to analyze the consequences of an action in terms of the results produced compared to the resources required to produce the results. Impacts for various alternatives can be compared by displaying them side by side in a comparative analysis table. Impacts may also be analyzed individually as an overall total "score" for each alternative. This technique is particularly useful in selecting among various closely related alternatives and in determining the merit of a course of action with respect to expected results of the action.

c. Conformance to Existing Regulations, Technical Orders, Codes, Standards and Procedures. Given the increasing technological advances and growing attention to pollution effects, there is a need to constantly refer to existing regulations and emerging standards as guidance in decision-making.

d. Figure 4-3 illustrates an example of using the cost-effectiveness method to evaluate air quality alternatives by means of previously identified criteria and standards.

4-7. Measuring the Costs

a. In all cases, cost will be a major factor in the decision-making process. An alternative that exceeds the possible budget or takes too large a portion may have to be- dropped from consideration, thereby focusing the evaluation on other alternatives. Accurate cost estimates are needed to evaluate alternatives. These can be determined by the environmental officer or pollution control cost experts.

b. The environmental coordinator/officer should include costs that are readily attributable, using the best estimates available at the time. Where there is uncertainty, a range of values to span the uncertainty should be included.

c. There are two basic types of cost to be considered - initial capital and operating:

Costs include:

- ***capital costs***
- ***operating & maintenance costs***

1) Capital costs are usually the easiest to measure as they are one-time expenditures and can be based on prior experience. For planning purposes, detailed estimates of each capital cost item are not required. The method used generally is to estimate the lump sum cost, which includes most of the items associated with the system.

2) Operating costs consist of maintenance and operation charges that recur throughout the life of the investment Maintenance costs include upkeep, replacements and repair. Operating costs include the day-to-day operating needs of a project In practice, these costs often can be lumped together with maintenance costs for estimating purposes. Such operating costs can be determined by the environmental officer or from the public works department in the source community. Indirect costs should be considered also, since a project often creates secondary or unforeseen expenditures such as the requirement for additional maintenance personnel.

Figure 4-3: Sample Evaluation Chart for Air Pollution Control Alternatives

Feasible Alternatives	Low Cost	Reduction in Pollution Concentration	Reduction in Pollutant Amount	Disruption of Quality of Life	Reliability	Appearance
(1) Encourage use of bicycles and pedestrian circulation	●	●	●	○	○	n/a
(2) Provide mass transit and ride sharing	●	◒	◒	◒	○	n/a
(3) Improve vehicle emissions through retrofit/inspection	○	◒	◒	○	◒	n/a
(4) Implement TSM measures to reduce motor vehicle use	◒	○	○	◒	n/a	n/a

CRITERIA ACHIEVEMENT

High Degree ●

Medium Degree ◒

Low Degree ○

Not Applicable n/a

4-8. Recommendation of Alternatives

a. After completing the evaluation, the planner and the environmental coordinator/officer must make a recommendation regarding the preferred alternative. Complex problems may require several actions. Recommendations should include:

- Need for the project
- Description of the project
- Schedule or Phasing
- Costs (capital, operating)
- Organizational or management plan

The recommended action(s) should be thoroughly described and supported so that decision-makers can make intelligent decisions whether or not to implement The Plan. Also, adequate detail should be provided to obtain the needed programming and budget commitments.

b. Although most projects will be located on the installation, some will pertain to the environmental opportunities and constraints surrounding the installation. For example, a requirement for expanded wastewater treatment capacity may require actions for off-installation wastewater treatment plant expansion. Likewise, off-installation mass transit may be needed to link the installation with civilian communities in order to minimize air pollution. In each case, coordination and cooperation with civilian agencies is necessary to ensure that the recommendations can be incorporated into the work program for those agencies.

5

Implementation & Monitoring

CHAPTER 5

IMPLEMENTATION AND MONITORING

A. PURPOSE

5-1. Scope

a. Implementation is the result of matching recommended projects with available funds to accomplish both the short and long-range objectives of the installation. As shown in Figure 5-1, the three elements that comprise the implementation process are:

- incorporating new resource information and determinations into The Plan;
- prioritizing of recommended projects and policies;
- coordination with on- and off-installation interests.

b. Monitoring is an ongoing activity to ensure that the projects are provided and programs administered in accordance with the Environmental Quality Protection Plan, that they perform as expected, and they are modified as necessary to achieve the required compliance.

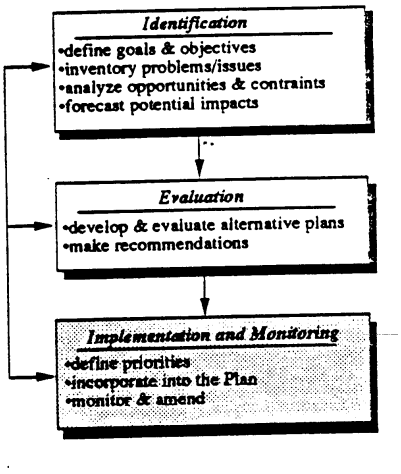


Figure 5-1

c. The current regulatory process, with the focus on the media- or receptor-specific nature of the federal environmental laws (e.g., Clean Air Act, Clean Water Act), does not lend itself to analysis of environmental issues which cross over environmental resource types. Although federal and state regulatory agencies are making progress in this area, responsible environmental personnel should be alert to the need for integrating cross-media pollution concerns into pollution control programs. Environmental quality planning brings together elements from other planning programs that are not based on one resource.

B. MAKING IT HAPPEN: IMPLEMENTATION

5-2. Establishing Priorities

a. Prioritization is the process used to determine a ranking of recommended projects in the long-range facilities development plan. It also establishes a schedule and costing plan for inclusion of short-range recommendations in the five-year Capital Improvements Program (CIP) required in The Plan. Prioritization consists of these elements:

- Fulfillment of installation goals
- Planned projects (5-year C.I.P.)
- Mid-range development (6-10 years)
- Long-range development (10 years)

The goals and related policies help match project priorities with available funds to produce an effective program of environmental quality improvements.

b. At this point in the process, the programmers on the installation will take a lead role. Their efforts include mailing the appropriate presentations and submittals to the Facilities Development Board/Installation Planning Board.

c. The priority ranking is based in part on the relative effects of each project on other projects on the installation. As the land use component of The Plan will often drive the implementation of other plan components (including environmental quality protection), the environmental coordinator/officer and planner should recommend higher priority for those environmental quality projects that have a more direct relationship to land use plan elements. Projects that could disrupt the timing or feasibility of land use development should receive a lower ranking than a project that is fully supportive of other components.

d. It will be advantageous to have worked closely with the development of other elements of The Plan because proposed projects often are prioritized together. For example, plans for new land use developments on the installation may have construction schedules that can be related to an environmental quality project's needs for a regional stormwater facility or wastewater treatment pumping station.

5-3. Funding

a. The programmer considers various funding sources for desirable projects. The typical funding arrangements include the Military Construction (MILCON) Program/Authorization. Other funding sources exist for environmental quality improvements, such as the Defense Environmental Restoration Program which supports the Installation Restoration Program (IRP). Provisions of this latter program contain a special category of defense environmental restoration account (DERA) funds that can be used for environmental restoration activities, in coordination with EPA regional offices and state and local authorities. For DOD agencies, IRP parallels the EPA superfund program under CERCLA The IRP provisions and recent CERCLA amendments overlap considerably, particularly with respect to identifying priority DOD sites for clean-up. See Appendix E for further explanation of the IRP.

Funding sources:

- ***Separate MILCON project***
- ***Included in facility MILCON project***
- ***O&M funding***

b. For MILCON funding, the DD 1391 process normally would be used. Eligible projects can include installation-wide upgrading of the pollution control systems or small projects limited to a specific upgrade of a single point source. Operations and Maintenance (O&M) funding is available for utility system improvements up to the installation's funding limits. Projects requiring higher limits may be funded by the Major Command O&M function.

c. As funding usually is insufficient to meet all the needs, and as it is physically impossible to undertake all work simultaneously, it is important to prioritize recommendations. The programmer, with assistance from the planner, prepares a prioritized list of projects, keeping in mind the services that are critical to the military mission. Therefore, interaction with the appropriate civilian agencies is necessary to coordinate community or regional projects with those expected to occur within the installation.

5-4. Incorporation into The Plan

a. It is important to emphasize again that environmental quality protection planning for an installation is not an independent task, but part of an overall comprehensive planning process and feedback loop.

b. Once a prioritized set of policies and projects have been developed, the Environmental Quality Protection Plan should be integrated into The Plan. The series of maps (tabs, drawings) that represent the recommended environmental quality systems becomes a part of this package (reference Figure 1-3).

c. All environmental quality projects should be part of and consistent with the other components of The Plan, particularly the Land Use, Natural Resources, Utilities, Transportation, and Long-Range Facilities Development Plans. For example, in the area of water resources management, the Utilities Systems Plan encompasses the entire water supply and wastewater management system for the installation and would thereby include provisions for such resource management actions as groundwater-level and water quality monitoring, achievement of desired or required wastewater effluent quality standards, water conservation systems, etc. The Environmental Quality Protection Plan should address water quality resource concerns in conjunction with the Utilities Systems Plan.

The Environmental Quality Protection Plan should be consistent with other component plans, particularly:

- ***Land Use***
- ***Long-Range Facility Development***
- ***Natural Resources***
- ***Transportation***
- ***Utilities***

d. It is essential to coordinate with civilian agencies responsible for implementing environmental quality projects and programs outside the installation. Most communities prepare capital improvement programs for five-year periods. To the extent possible, the installation's approach should be compatible with these outside projects. Protection of the health of its personnel and those of the surrounding community, through careful adherence to environmental safeguards, is critical to the military mission. Therefore, interaction with appropriate civilian agencies is vital, to ensure that capital improvements projects in the community and region reinforce those expected to occur within the installation.

C. MONITORING THE ENVIRONMENTAL QUALITY PROTECTION PLAN

5-5. Measuring Progress

a. The environmental quality planning process also includes the means to monitor conditions after implementation. Actual progress on specific pollution control projects should be compared with the scheduled progress as shown in the installation CIP. When monitoring indicates serious discrepancies in a project's implementation schedule, the program should be modified as necessary.

5-6. Compliance Management

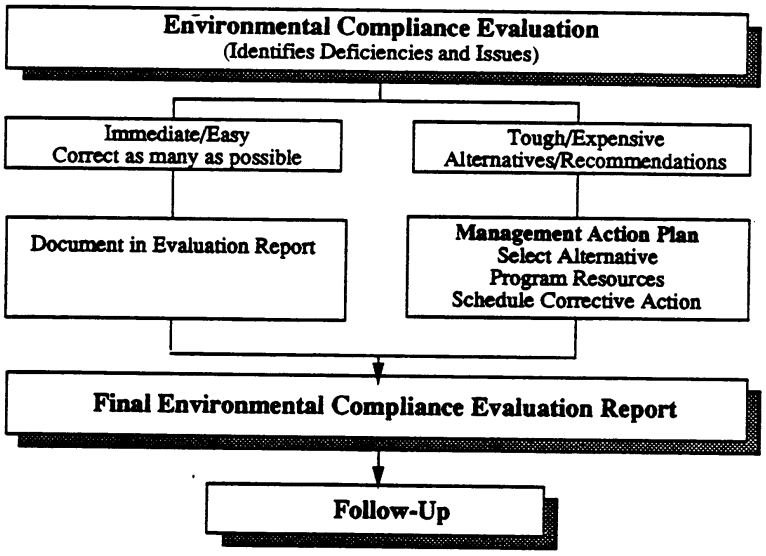
a. The Air Force has initiated a systematic monitoring and compliance program called the Air Force Environmental Compliance Assessment and Management Program (ECAMP). ECAMP is intended to establish the use of environmental compliance evaluations conducted at each installation to achieve Air Force compliance with all applicable Federal, state, local, DOD and USAF environmental laws and regulations.

ECAMP can serve as a monitoring program for the Environmental Quality Protection Plan.

b. The implementing policy for ECAMP provides for a systematic, documented, periodic and objective assessment of installation operations and practices subject to environmental requirements. The ECAMP management process outlined in Figure 5-2 identifies deficiencies and categorizes them as significant, major or minor. Significant deficiencies and those which are easily corrected are targeted for initial action in order to correct as many items as possible.

c. The compliance evaluation is directed toward ten environmental factors, called protocols. These include:

- Air Emissions
- Wastewater Discharge
- Solid Waste Management
- Hazardous Waste Management
- Pesticides
- Polychlorinated Biphenyls (PCB) Management
- Drinking Water
- Petroleum-Based Fluids Management
- Hazardous Materials Management
- Cultural and Historic Resources Management



ECAMP Management Process

Figure 5-2
Source: ECAMP Training Materials

A sample compliance evaluation report is shown in Figure 5-3. Irregularities noted in the report are categorized as significant, major or minor according to their level of severity. They are further classified according to whether the irregularities are substantive or procedural. This also distinguishes requirements that are external or internal to the Air Force.

5-7. Updating the Plan

a. The initial environmental quality planning process must be accompanied by a corresponding effort to keep it current with new issues, conditions and requirements. As new facilities are constructed or programs are implemented, the Environmental Quality Protection Plan will have to be modified to reflect the improvements resulting from these changes.

b. Changes in mission also can have significant impacts in terms of the facilities and supporting systems to support new direction. Expansion of an installation's mission and the corresponding assignment to an installation of substantial numbers of new military personnel will place significant new demands on or require changes to facilities and the pollution control facilities/measures that serve them. Such changes will also affect project-specific EA's.

c. Advances in technology, evolution of the surrounding region and the accumulation of new resource information can have impacts that must be accounted for in the environmental plan. For example, advances in resource-recovery techniques and energy management may make it possible to defer or eliminate expansion of a solid waste landfill or a new power plant.

Environmental Compliance Status
Hometown AFB
Figure 5-3

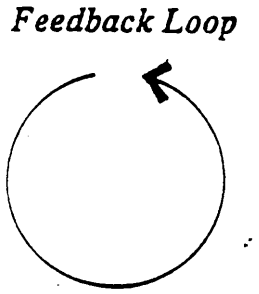
Compliance Area	Compliance Summary
Air Emissions	
Wastewater Discharge	
Solid Waste Management	
Hazardous Waste Management	
Pesticides	
PCB Management	
Drinking Water	
POL Management	
Hazardous Materials Management	
Natural and Historic Resources Management	

Key

- At least one Significant Irregularity
- Major and Minor Irregularities only
- Minor Irregularities
- No Irregularities
- Not Applicable

d. The Environmental Quality Protection Plan is uniquely influenced by external factors. Changes in environmental regulations or deterioration in environmental conditions resulting from regional growth (such as increases in air pollution) may have an impact on the installation's environmental quality planning process.

e. It is extremely important that the environmental quality planning process include a feedback loop so that new information can be incorporated. The acquisition of more current data may require planners to reformulate some original goals and objectives in order to encompass more accurately the needs of the changing installation community. Adopting a particular policy or program called for by the Environmental Quality Protection Plan may lead to the discovery of unanticipated adverse impacts that have to be corrected, or it may turn out that a particular project has created an unanticipated opportunity for improving the installation's quality of life.



Appendices

Appendix A

Model Statement of Work for an Environmental Quality Protection Plan

The purpose of the Environmental Quality Protection Plan (EQPP) component of the Base/Installation Comprehensive Plan is to document and describe the environmental conditions occurring on the installation and any off-site environmental conditions affecting installation operations and development. Such environmental conditions include air and water quality, land and soils conditions, toxic materials and hazardous waste storage and management, recycling and solid waste management, the Installation Restoration Program, oil and hazardous substances spill prevention, and radiation control.

The work to be performed in conjunction with the Environmental Quality Protection Plan component includes the following items:

1. Introduction and methodology of the EQPP, how the EQPP is to be used and a summary of the EQPP process;

2. Statement of environmental quality protection planning goals and objectives;

3. Review and evaluation of existing environmental conditions and inventory of pollution control facilities;

4. Identification of environmental problems, opportunities and constraints;

5. Development and assessment of environmental quality protection alternatives;

6. Selection of a recommended alternative;

7. Determination of plan implementation strategies;

8. Identification of the monitoring and updating process for the EQPP.

These sections take the user of the EQPP through an orderly, sequential process of understanding the context for the EQPP, recommended approaches to be used, a summary of the existing conditions and anticipated problems and opportunities, alternative environmental quality protection approaches to the identified problems, the final plan and a process for monitoring attainment of the goals and objectives by the plan and how the plan is to be updated.

1. Introduction and methodology of the EQPP, how the EQPP is to be used and a summary of the EQPP process.

The introduction should describe the purpose of the EQPP, the installation location and relation to external environmental conditions, points of contact on the installation, a summary of installation needs, the recommended methodological approach, relationship of the EQPP to other component plans, a summary of the environmental quality protection planning process and a summary of findings. Users of the EQPP should be able to read only the introduction and be able to understand the primary elements of the plan.

2. Statement of environmental quality protection planning goals and objectives.

Present overall environmental quality protection planning goals and objectives. These goals and objectives guide development of the EQPP and ensure that the plan is consistent with the overall Base/Installation Comprehensive Plan.

3. Review and evaluation of existing environmental conditions and inventory of pollution control facilities.

Describe existing environmental conditions within the installation and any conditions external to it that affect military operations using text, maps and illustrations as appropriate. The narrative should cover the important aspects of the physical and natural environment including any aspects or off-site environmental conditions that affect military operations. Accompanying maps, figures or illustrations should further elaborate on important environmental factors affecting future installation development.

Prepare the Tab B: Environmental Quality series to include the following Tab/maps. With the exception of Tab B-6 Installation Restoration Program, these Tabs/maps are optional.

- Tab B-1 Air Quality
- Tab B-2 Water Quality
- Tab B-3 Land and Soils Quality
- Tab B-4 Toxic and Hazardous Wastes
- Tab 3-5 Recycling and Solid Wastes
- Tab B-6 Installation Restoration Program
- Tab B-7 Oil and Hazardous Spill Prevention
- Tab B-8 Radiation Control
- Tab B-9 Composite Constraints and Opportunities

As a minimum, incorporate Tab B-6 Installation Restoration Program covering the location of abandoned sanitary landfills, buried tanks, unburnable trash such as stumps or broken concrete, chemical burial pits and other sites used to dispose of expended waste into the environmental conditions inventory.

4. Identification of environmental problems, opportunities and constraints.

Describe the current problems, constraints and opportunities identified during the existing conditions inventory to include a detailed accounting of what the problems are and the probable causes. Any physical, legal, operational or other constraints on planning or development due to environmental concerns are to be noted. Identify opportunities or conditions to enhance environmental protection. Include off-site problems and opportunities to the extent they will affect future installation development and current military operations.

5. Development and assessment of environmental quality protection alternatives.

Review each environmental condition affecting the installation for importance to the performance of the military mission. For each current and future problem/opportunity, describe the full range of feasible environmental quality protection alternatives. A tabular or summary format may assist in arraying alternatives and may be augmented by sketches, maps or other illustrations to visualize the alternatives. Potential alternatives can be physical systems, alterations to current procedures, or new programs instituted to address environmental pollution.

Screen the range of alternatives to isolate several alternatives that are most responsive to the identified needs and constraints. Prepare a full project description of these alternatives to include a description of the need characteristics, location, applicable objectives, data requirements and applicable regulations. Analyze the most feasible alternatives using professional judgment or recognized analytical techniques. Include the list of criteria and standards used for evaluation purposes.

6. Selection of a recommended alternative.

Analyze the most feasible alternatives based on professional judgment or recognized analytical techniques. Include the list of criteria and standards used for evaluation purposes. Rank the most feasible alternatives to identity the preferred alternative(s). Support the selection of-the preferred alternative(s) by a recommendation that includes the need for the project(s), project or program description(s), schedule or phasing recommendations, capital and operating costs, and an organizational or management plan.

7. Determination of plan implementation strategies.

Describe steps that should be taken to implement the recommended environmental quality protection alternatives. Include coordination needed among installation personnel and off- installation agencies. To the extent possible, also describe known off-site projects that would influence environmental conditions on the installation. Provide illustrations or maps to supplement the narrative. Develop specific policies, programs and supporting projects that will implement the EQPP.

8. Identification of the monitoring and updating process for the EQPP.

Describe necessary steps to achieve plan objectives on a regular basis, or at a minimum, during the five year capital improvements planning process so that potential pollution control projects can be considered in the funding cycle. Determine the application of the Environmental Compliance Assessment and Management Program (ECAMP) process as a means of monitoring installation pollution control programs, hazardous waste site clean-up efforts and other remedial plans and programs developed as part of the EQPP. Revise the EQPP when technology advances are noted or when local conditions or mission changes occur. The EQPP should otherwise be revised on a regular schedule of three to five years.

Appendix B

Tab B: Environmental Quality

Air Force and Army regulations for preparing Base Comprehensive Plans and Installation Comprehensive Plans stipulate preparation of Tabs to support the Plan. Most of the Tabs display existing conditions and include baseline maps for use in analyzing constraints and opportunities.

The following series of Tabs (series B) maps may be included in the Environmental Quality Protection Plan. Inclusion of the various map contents and scale will be determined based on the conditions at each installation. Not all Tabs are applicable to all installations.

Tabs/maps shown without an asterisk are required elements while those with an asterisk are optional unless required by other regulations and directives or dictated by local conditions.

Tab B-1 Air Quality*

The purpose of this Tab/map is to show the geographic distribution of point sources of air pollution and the extent of air quality control systems on the installation.

Tab B-2 Water Quality*

This Tab/map identifies the location, size and treatment location for sewage collection and stormwater management systems on the installation. Existing point sources and locations for pre-treatment facilities are appropriate. Where necessary, smaller units of analysis, such as installation quadrants or sections should be used to assist in map readability and level of detail.

Tab B-3 Land and Soils Quality*

The land-based aspects of environmental quality protection planning are shown on this map consisting of topography, major land formations, subsurface conditions and surface soil types. Any areas of steep slopes, unstable soil conditions, areas with soil indicators for wetland or floodplain conditions or where rock outcroppings occur should be displayed on the map.

Tab B-4 Toxic and Hazardous Wastes*

This Tab/map shows the types of toxic or hazardous wastes occurring at the installation and the location of these waste generators and disposal areas. The classification system for wastes defined as toxic or hazardous should be included.

Tab B-5 Recycling and Solid Wastes*

The purpose of this Tab/map is to identify existing sites where recycling of fuels, waste products, glass, metals, paper or other materials are generated, stored or disposed. The Tab/map should use a coding or other visual identification system to show such sites.

Tab B-6 Installation Restoration Program

The Installation Restoration Program (IRP) is a required element designed to cleanup past waste disposal or spill sites. The program addresses identification, investigation, research and development and cleanup of contaminants and correction of environmental damage.

The IRP covers four functional stages: Identification of potential sites by Preliminary Assessment/Site Inspection activities; investigation of alternative treatment options through Remedial Inspection/Feasibility Study; cleanup of the site by implementing the Remedial Design/Remedial Action; and closeout of the site so that No Further Action is required.

The No Further Action decision may include removal of the contaminants or isolation of the contaminated area. Monitoring may be warranted for closeout sites throughout a predetermined, fixed interval of time.

Tab B-7 Oil and Hazardous Spill Prevention*

Locations of oil and spill prevention programs can be shown on maps of the installation in this Tab. Tab B-7 may be combined with other Tabs/maps related to toxic and hazardous wastes or the recycling of fuels and other detrimental liquids.

Tab B-8 Radiation Control*

This Tab/map relates to the location of electromagnetic and nuclear radiation sources on each installation and the required clear zones or zones where interference fields present operational limitations.

Tab B-9 Composite Constraints and Opportunities

The purpose of this Tab/map is to display the location of all areas where operations may be limited due to-environmental factors. The intent is to show all such limitations on the same map to indicate areas which are free of any limitations as well as those areas where development should be discouraged. In some cases, the limitations due to environmental factors may not be complete and certain kinds of development may be accommodated. One example of this can be seen in Figure 3-2 on page 3-3 of this bulletin/manual.

Appendix C: Environmental Laws

	ACT	Dept. or Agency of Jurisdiction	Cite to U.S. Code
1.	Atomic Energy Act	NRC	42:2011
2.	Bald Eagle Protection Act	Interior	16:668
3.	Coastal Zone Management Act	Commerce	16:1451-64
4.	Comprehensive Environmental Response Compensation and Liability Act (Superfund)	EPA	42:9601
5.	Clean Air Act	EPA	42:7401
6.	Deep Seabed Hard Mineral Resources Act	State	30:1401
7.	Deep Water Ports Act	Transportation	33:1501
8.	Endangered Species Act	Interior, Commerce Agriculture (Note 3)	16:1531
9.	Federal Food, Drugs and Cosmetic Act	H & HS	12:321
10.	Federal Hazardous Substances Act	H & HS	15:1261
11.	Federal Insecticide, Fungicide and Rodenticide Act (FlFRA)	EPA	7:136
12.	Federal Land Policy and Management Act	(Note 1)	43:1739/1751
13.	Federal Mine Safety and Health Act	Labor, H & HS	30:801
14.	Federal Power Act	FERC	16:791
15.	Federal Water Pollution Control Act	EPA	33:1251
16.	Fish Wildlife Coordination Act	Interior	16:662
17.	Fishery Conservation and Management Act	Commerce	16:1801
18.	Golden Eagle Protection Act	(See #2 above)	
19.	Hard Rock Mining	Interior	30:21

20.	Hazardous Materials Transportation Act	Transportation	49: 1762;1801
21.	Historic Sites, Buildings, and Antiquities Act	Interior	16:461
22.	Lead-based Paint Poisoning Prevention Act	H & HS	42:4801
23.	Low Level Radioactive Waste Policy Act	Energy (Note 3)	42:2021
24.	Marine Mammal Protection Act	Interior, Commerce	16:1361;1401
25.	Marine Protection Research and Sanctuaries Act	Commerce	16:1431
26.	Migratory Bird Conservation Act	(Note 3)	16:715
27.	Mineral Lends Leasing Act	Interior (Note 1)	30:22-263
28.	Mineral Leasing Act For Acquired Lends	Interior (Note 1)	30:352
29.	Multiple Use-Sustained Yield Act (Forest)	Agriculture	16:528
30.	National Environmental Policy Act (NEPA)	EPA	42:4321
31.	National Forest Management Act	Agriculture	16:1601
32.	National Monuments	President, Interior	16:431
33.	National Parks and Recreation Act	Interior	16:1;45; 396-470 1241-1287 (Note 2)
34.	National Wildlife Refuge Refuge Administration Act	Interior	16:668dd
35.	Noise Control Act Noise Control Act: Aircraft	EPA FAA/EPA	42:4901 49:1431
36.	Occupational Safety and Health Act	Labor	29:651
37.	Oil Pollution Act	Coast Guard (DOT)	33:1001
38.	Outer Continental Shelf Lends Act	Interior (Note 1)	43:1331;1801
39.	Power Plant Industrial Fuel Use Act	Energy	42:8301

40.	Radiation Control For Health and Safety Act	H & HS	42:263b
41.	Resource Conservation and Recovery Act (RCRA)	EPA	42:6901
42.	Rivers and Harbors Act of 1899	Corps of Engineers/EPA	33:701
43.	Safe Drinking Water Act	EPA	42:300f
44.	Soil and Water Conservation Act	Agriculture	16:2001
45.	Soil Conservation and Domestic Allotment Act	Agriculture	16:590a
46.	Solid Waste Disposal Act	See #41 above	-------
47.	Submerged Lends Act	(Note 1)	10:7221 43:1301
48.	Surface Mining Control and Reclamation Act	Interior	30:1201
49.	Taylor Grazing Act	Interior	43:315
50.	Toxic Substances Control Act (TSCA)	EPA	15:2601
51.	Uranium Mill Tailing Radiation Energy, NCR, EPA Control		42:7901
52.	Wild and Scenic Rivers Act	Interior	16:1271
53.	Wild Free-Roaming Horses and Burro Act	Interior, Agriculture	16:1331
54.	Wilderness Act	(Note 1)	16:1131

ONLY THOSE ACTS WHERE CONTROLS, LICENSES, OR PROHIBITIONS ARE PRESENT HAVE BEEN INCLUDED.

NOTE 1: Agency having jurisdiction over land involved.

NOTE 2: Each National Park has its own organic act.

NOTE 3: Committee of several heads of departments or close coordination between same.

Appendix D: Environmental Regulations

Statute/Subject	Relevant Federal Agency Regulations		Related Orders Directives and USAF Regulations	
National Environmental Policy Act	40 CFR 1500	Purpose, Policy, and Mandate	E.O. 12114 Abroad of Major Federal Actions	Environmental Effects
	40 CFR 1501	NEPA and Agency Planning	E.O. 11988	Floodplain Management
	40 CFR 1502	Environmental Impact Statement	E.O. 11990	Protection of Wetlands
	40 CFR 1503	Commenting	AFR 19-2 Analysis Process	Environmental Impact
	40 CFR 1504	Predecision Referrals to CEQ		
	40 CFR 1505	NEPA and Agency Decisionmaking	AFR 19-3 Analysis Process Overseas	Environmental Impact
	40 CFR 1506	Other Requirements of NEPA		
	40 CFR 1507	Agency Compliance	AFR 19-4 Off-Road Vehicles	Use and Control of
	40 CRF 1508	Terminology and Index		
Resource Conservation and Recovery Act	40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program	E.O. 12088	Federal Compliance Pollution Control Standards
	40 CFR 240	Guidelines for Thermal Processing of Solid Wastes		
	40 CFR 241	Guidelines for Disposal of Solid Waste		
	40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial and Industrial Solid Waste		
	40 CFR 245	Promulgation Resource Recovery Facilities Guidelines	DOD Consolidated Hazardous Material/ Hazardous Waste Disposal Guidance	
	40 CFR 260	Hazardous Waste Management System: General	DODD 6050.8, of Non-DOD-Owned Hazardous or Toxic Materials on DOD Installations	Storage and Disposal
and Use	40 CFR 261	Identification and Listing of Hazardous Waste	AFR 19-1	Pollution Abatement Environmental Quality
	40 CFR 262	Standards Applicable to Generators	APR 19-11 Management and Minimization	Hazardous Waste
	40 CFR 263	Standards Applicable to Transporters		
	40 CFR 264	Standards for O/O of Hazardous Waste TSD Facilities	APR 87-3	Granting Temporary of Real Property
	40 CFR 265	Interim Status Standards for O/O of Hazardous Waste TSD Facilities		
	40 CFR 267	Interim Standards for O/O of New Hazardous Waste and Disposal Facilities		

Statute/Subject	Relevant Federal Agency Regulations	Related Orders Directives and USAF Regulations		
Substances With Control	40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distr. in Commerce, and Use Prohibitions	E.O. 12088	Federal Compliance Pollution Control Standards
PCBs Oversee	40 CFR 775	Storage and Disposal of Waste Material; Prohibition and Disposal of Tetrachlorodibenzo-P-Dioxin	DEQPPM 81-4	DOD Management of and PCB Items
	(Note: EPA has propose to regulate dioxin under RCRA, 40 CFR Parts 261,264, & 265. See 40 Fed. R- 14514, 4 April 83).			
Comprehensive Environmental Compensation and Liability Act	46 F.R 22143	Hazardous Waste Site Reporting Form	E.O. 12316 Environmental Damage	Responses to
	40 CFR 300	National Contingency Plan	DEQPPM 81-5 Restoration Program	DOD Installation
	40 CFR 302	Designation, Reportable Quantities, and Notification		
Safe Drinking With Water Act	40 CFR 144	Underground Injection Control Program	E.O. 12088 Pollution Control Standards	Federal Compliance
	40 CFR 141	National Interim Primary Drinking Water Regulations	AFM 88-10	Water Supply
	40 CFR 142	National Interim Primary Drinking Water Regulations Implementation		
	40 CFR 143	National Secondary Drinking Water Regulations		
	40 CFR 146	Underground Injection Control Program: Criteria and Standards		
Hazardous Hazardous Materials Transportation Act	49 CFR 171	General Information, Regulations, and Definitions	APR 71-4	Preparation of Materials for Air Shipment
	49 CFR 172	Hazardous Materials Tables and Hazardous Materials Communications Regulations		
	49 CFR 173	Shippers-General Requirements For Shipments and Packagings		
	49 CFR 174	Carriage by Rail		
	49 CFR 175	Carriage by Aircraft		
	49 CPR 176	Carriage by Vessel		
	49 CFR 177	Carriage by Public Highway		
	49 CFR 178	Shipping Container Specifications		
	49 CFR 179	Specifications for Tank Cars		

Statute/Subject	Relevant Federal Agency Regulations	Related Orders Directives and USAF Regulations		
Clean Water Act With Pollution Control; Protection and Sewers; Control	40 CFR 122	National Pollutant Discharge Elimination System	E.O. 12088 Standards AFR 19-7 AFR 19-8 AFM 88-11 Chapter 3, Domestic Waste Water Treatment AFR 91-9 Facilities	Federal Compliance Pollution Control Environmental Monitoring Environmental Chapter 1, Sanitary Industrial Waste Water Pollution
	40 CFR 104	Public Hearings on Effluent Standards for Tic Pollutants		
	40 CFR 110	Discharge of Oil		
	40 CFR 112	Oil Pollution Prevention		
	40 CFR 113	Liability Limits For Small Onshore Storage Facilities		
	40 CFR 114	Civil Penalties For Violation of Oil Pollution Prevention Regulations		
	40 CFR 116	Designation of Hazardous Substances		
	40 CFR 120	Water Quality Standards		
	40 CFR 121	State Certification of Activities		
	40 CFR 125	Criteria and Standards For The National Pollutant Discharge Elimination System		
	40 CFR 129	Toxic Pollutant Effluent Standards		
	40 CFR 133	Secondary Treatment Information		
	40 CFR 135	Prior Notice of Citizens Suits		
	40 CFR 136	Guidelines Establishing Test Procedures For the Analysis of Pollutants		
	40 CFRS30	Navigable Waters		
	40 CFR 231	Section 404(c) Procedures		
Ocean Dumping Act	40 CFR 220	General		
	40 CFR 221	Applications for Ocean Dumping Permits Under Section 102 of the Act		
	40 CFR 222	Action on Ocean Dumping Permits Under Section 102 of the Act		
	40 CFR 222	Action on Ocean Dumping Permit Applications Under Section 102 of the Act.		
	40 CFR 223	Contents of Permits, Revision, Revocation or Limitations of Permits Ocean Dumping Permits Under Section 104(d) of the Act		
	40 CFR 224	Records and Reports Required of Ocean Dumping Permittees Under Section 102 of the Act		

Statute/Subject	Relevant Federal Agency Regulations	Related Orders Directives and USAF Regulations	
	40 CFR 225	Corps of Engineers Dredged Material Permits	
	40 CFR 227	Criteria for the Evaluation of Permit Applications for Ocean Dumping of Materials	
	40 CFR 228	Criteria for the Management of Disposal Sites for Ocean Dumping	
	40 CFR 229	General Permits	
	40 CFR 230	Section 404(b) (1) Guidelines for Specification or Disposal Sites for Dredged of Fill Material	
	40 CFR 230	Navigable Waters	
	40 CFR 231	Section 404(c) Procedures	
	40 CFR 50	National Primary and Secondary Ambient Air Quality Standards	E.O. 12088 Federal Compliance With Pollution Control Standards
	40 CFR 53	Ambient Air Monitoring Reference and Equivalent Methods	AFR 19-6 Air Pollution Control Systems for Boilers and Incinerators
Pollution	40 CFR 56	Regional Consistency	AFR 19-7 Environmental Monitoring
	40 CFR 58	Ambient Air Quality Surveillance	
Incinerators	40 CFR 60	Standards of Performance for New Stationary Sources	AFR 88-11 Chapter 4,
	40 CFR 61	National Emission Standards for Hazardous Air Pollutants	
	40 CFR 65	Delay Compliance Orders	
	40 CFR 66	Assessment and Collection of Noncompliance Penalties by EPA	
	40 CFR 81	Designation of Areas For Air Quality Planning Purposes	
Noise	32 CFR 256	Air Installations Compatible Use Zones	AFR 55-2 Airspace Management
Disturb-	14 CFR 91.301 (Civilian et seq. Aircraft)	Operating Noise Limits AFR 55-48	AFR 55-34 Reducing Flight ances Airfield Management
	AFR CFR 150	Airport Noise Compatibility Planning (Civilian Aircraft)	AFR 86-8 Airfield and airspace Criteria
Zone	AFR CFR 209	Rules of Practice Governing Proceedings Under the Noise Control Act	AFR 19-9 Chapter 3, Air Installatin Compatible Use
	AFR CFR 210	Prior Notice of Citizen Suits Air Installation Compatible Use Zone (AICUZ) Handbook, June 1979	AFM 19-10 Planning in the Noise Environment

Statute/Subject	Relevant Federal Agency Regulations	Related Orders Directives and USAF Regulations		
Historic Preservation Enhance-ment of the Cultural Environment	36 CFR 65	National Historic Landmarks Program	E.O. 11593	Protection and
	36 CFR 800	Advisory Council on Historic Preservation, Protection of Historic and Cultural Properties	President's Memorandum on Environmental Quality and Water Resources Management, 12 July 1978	
	36 CFR 63	Determinations of Eligibility For Inclusion in the National Register	AFR 19-9	Interagency/Intergovernmental Coordination
			Environmental Plans, Programs and Plans (Chapter 6)	Land Facility and
	36 CFR 69	Protection of Archeological Resources		
	36 CFR 60	National Register of Historic Places		
	36 CFR 805	NEPA Implementation Procedures		
Federal Insecticide, Fungicide and Rodenticide Act Program	40 CFR 170	Worker Protection Standards For Agricultural Pesticides	AFM 91-16	Military Entomology k Operational Handbook
	40 CFR 171	Certification of Pesticide Applicators	AFM 91-19 Noncropland Weeds	Herbicide Manual For
	40 CFR 172	Experimental Use Permits	AFR 91-21	Pest Management
		AFR 91-22	Aerial Dispersal of Pesticides	
		AFR 91-23	Operations and Maintenance Guide Specifications	
		AFM 116-18	Use of Potentially Toxic	
Coastal Zone Management Act	15 CFR 909	Coastal Zone Management	DODI 4165~9	
		AFR 19-9	Chapter 4, Coastal Zone Management	
		AFR 126-1	Conservation and Management of Natural Resources	
Occupational Occupational Safety	29 CFR 1903	Inspections, Citations, and Proposed Penalties	AFR 127-12	Air Force
			Program	Safety and Health
	29 CFR 1905	Rules of Practice for Variances, Limitations, Tolerances, and Exemptions		
	29 CFR 1910	Occupational Safety and Health Standards		

Statute/Subject	Relevant Federal Agency Regulations	Related Orders Directives and USAF Regulations		
Endangered Species Resources	50 CFR 17	Endangered and Threatened Wildlife and Plants	AFR 126	Series covers Natural Resources
	50 CFR 424 Threatened S and Designating Critical Habitat	Listing Endangered and		
	50 CFR 450 et seq.	Endangered Species		
	50 CFR 227	Threatened Fish and Wildlife		

Appendix E: Installation Restoration Program

Program Summary

The Department of Defense (DoD) has implemented a service-wide program to address past occurrences of hazardous waste contamination through the Installation Restoration Program (IRP). The intent of the DoD-wide hazardous waste program is to "identify and evaluate suspected problems associated with past hazardous waste disposal sites on DoD facilities, control the migration of hazardous contamination from such facilities and control hazards to health or welfare that resulted from past operations" (Defense Environmental Quality Policy Program Memorandum 81-5).

As an example of the implementation of the IRP, the Air Force program is summarized in this Appendix. "The U.S. Air Force (USAF) has long been engaged in operations involving toxic and hazardous materials. These materials, if released into the environment, could harm human, animal or plant life, or damage water supplies and other resources of value to the nation. Actions are being taken to address not only current and future hazardous waste operations, but to eliminate the threat posed by previously disposed, potentially hazardous materials." (Draft Air Force Installation Restoration Program Management Guidance, July 1988).

The Comprehensive Environmental Response, Compensation and liability Act of 1980 (CERCLA) and the Superfund Amendment and Reauthorization Act of 1986 (SARA) establish a series of programs to cleanup hazardous waste disposal and spill sites nationwide. The primary responsibilities and authority delegated to the DoD for implementing the IRP are designated in four primary source documents:

- **SARA Section 211** describes the actions and responsibilities incumbent upon DoD for implementing Defense Environmental Restoration Programs (DERP). These actions must be consistent with CERCLA Section 120.
- **CERCLA Section 120** describes the responsibilities incumbent upon all Federal departments (including DoD) to ensure that their facilities are in compliance with CERCLA
- **Executive Order 12580** delegates to different departments and agencies specific responsibilities which have been assigned to the President within CERCLA
- **National Contingency Plan (NCP)** specifies the responsibilities of DoD and of the person(s) it designates to conduct response actions on its installations.

Federal agencies, including DoD are now required to comply both procedurally and substantively with CERCLA and with its associated guidelines, rules, regulations and criteria. The IRP is subject to and must be consistent with CERCLA and the NCP.

The overall program, DERP, includes specific actions of the IRP as codified in SARA Section 211. The objectives stated in Section 211, are:

"(1) The identification, investigation, research and development, and cleanup of contamination from hazardous substances, pollutants, and contaminants.

(2) Correction of other environmental damage (such as detection and disposal for unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment.

(3) Demolition and removal of unsafe buildings and structures, including building and structures of the Department of Defense at sites formerly used by or under the jurisdiction of the Secretary."

The IRP is designed to cleanup past hazardous waste disposal or spill sites. The sites may result from operations that were in full compliance with laws and proper procedures of the time, but which have since been found to be inadequate. Current hazardous materials/hazardous waste operations and spills on an installation are handled under other programs such as RCRA and the Spill Prevention, Containment and Control (SPCC) program.

The IRP is a sub-element of DERP that addresses only issues related to identification, investigation, research and development, and cleanup of contaminants and the correction of environmental damage. The IRP and other DERP programs are funded by a special transfer account called the Defense Environmental Restoration Account (DERA), also codified in SARA Section 211.

The IRP is not an all-encompassing environmental program but deals only with the cleanup of hazardous waste from past operations. Considerations as to whether a particular site falls within the IRP include:

Timing - The IRP primarily addresses the cleanup of contamination and damage resulting from past, not current, disposal operations. The enactment date of CERCLA (11 December 1980) serves at the cutoff date distinguishing past and current operations. Current operations are subject to the conditions of SARA.

Type of Substances - The IRP is primarily intended to cleanup hazardous materials but may address any pollutants or contaminants that endanger public health, welfare or the environment. Although each installation contains unique conditions, some of the potential IRP candidate sites include: landfills; fire training areas; sludge or waste lagoons; waste pits; spill sites from fueling operations; leaks in petroleum, oil and lubricant systems; underground storage tanks abandoned prior to 1984; disposal or spills from painting, stripping, cleaning or degreasing operations; spills in aircraft and vehicle maintenance areas, faulty oil/water separators; disposal of batteries and battery acids; aircraft crash sites; entomology lab or photography lab waste disposal.

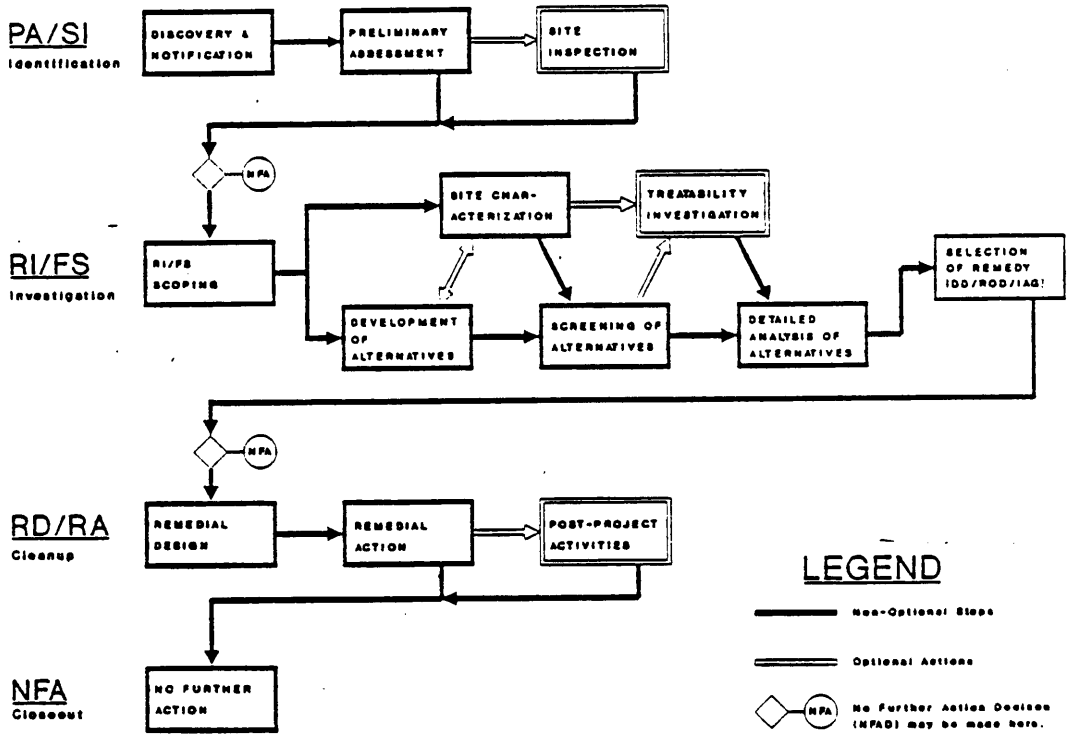
Quantity - Reportable quantities of hazardous substances trigger IRP requirements. These quantities vary due to the type of substance identified.

NPL Listing - The IRP addresses sites that are listed on the National Priority List (NPL) generated by EPA as well as those sites not listed. The NPL-listed sites are considered to pose the greatest hazard to public health and therefore warrant a priority response.

Location - The IRP includes sites that are currently owned or leased by the Air Force within the United States, its territories or possessions. Sites which have never been owned or operated by the Air Force but where Air Force operations have contributed hazardous wastes are designated as Third-Party Sites (TPS). Third-party sites are eligible for funding-under DERA but require actions-that are related to, but distinct, from IRP sites. Formerly-owned Air Force sites are DERA-eligible but cleanup operations are delegated to the U.S. Army Corps of Engineers. Air Force installations outside of the United States are subject to relevant Status of Forces Agreements (SOFA) and therefore not subject to IRP requirements.

Stabs of the Installation Restoration Program

The IRP covers three response actions: the remedial action process, removals, and monitoring. The remedial action process is the primary response action of the IRP. Other actions are grouped functionally by stages as shown in Figure E-1.



Air Force Installation Restoration Program

Figure E-1

Source: Draft Air Force Installation Restoration Program Management Guidance, July 1988

The Preliminary Assessment/Site Inspection (PA/SI) stage identifies potential sites and determines whether the site merits further consideration in the IRP and whether the site should be placed on the NPL maintained by EPA.

At the completion of the PA/SI stage, several courses of action are available: further investigation, removal, monitoring, or no further action. If the decision at the end of this stage is to proceed with further investigation, the Remedial Inspection/Feasibility Study (RI/FS) stage begins. This stage is used to investigate the alternative treatment options for each site. A Feasibility Study is performed to select a remedial action that will best mitigate any hazards to public health, welfare or the environment. The two aspects of this stage, the Remedial Investigation and the Feasibility Study are interdependent and conducted concurrently. In remedial actions that are EPA lead, requirements for an Environmental Assessment or Environmental Impact Statement may be fulfilled by their functional equivalency to RI/FS documents.

Based on the findings of the RI/FS stage and in accordance with criteria set forth in the SARA and NCP, a remedial action alternative is selected. The formal document presenting the decision is called the Decision Document for non-NPL sites and the Record of Decision for NPL sites. EPA must concur with the selected remedial action for NPL sites via an Interagency Agreement.

The Remedial Design/Remedial Action (RD/RA) stage incorporates the steps necessary to cleanup the study site by implementing the selected remedial action. Cleanup may be done as a removal or remedial action and may involve source cleanup (removal, treatment or containment of contaminants at the source), pathway cleanup (cleanup of contaminants that have migrated from the source into the soil, groundwater, surface water or air) or receptor cleanup (to protect people or the environment impacted by direct contact with the released contaminants). When the remedial action includes continuing operation of treatment equipment, this stage, may also involve monitoring activities.

The final stage, No Further Action (NFA) is taken to closeout remedial actions. The NFA step involves making, documenting and having appropriate authorities accept the decision that no further action is warranted. The NFA decision may be made when:

(a) There is no threat to public health, welfare or the environment posed by the site, or

(b) Contaminant standards are not exceeded, or

(c) No appropriate response actions exist, or

(d) The potential response actions are not justified by the potential threat, or

(e) No appropriate response actions remain.

To arrive at the NFA stage, removals or monitoring may be warranted. Removals provide a means of responding to an immediate threat. Removal may either supplement or take the place of a remedial action response. Removal may involve physically removing a hazardous substance from the environment, isolating a community from potential impact by means of security fencing or containment measures or providing alternative drinking water supplies, or monitoring and assessing the impact of a release on the public and the environment. A removal may lead directly to a NFA decision or be followed by additional remedial action steps or by monitoring.

Monitoring may be implemented when it is not clear whether there is a threat posed by the site. Monitoring operations should address the concentrations and spread of contamination from a site, whether as interim monitoring (between the investigation and cleanup stages of the IRP), post-closure monitoring (implemented after a response action to determine whether the action was effective), or long-term monitoring (implemented in place of other response actions at the site.

Monitoring is conducted for predetermined, fixed intervals of time. A decision is documented and made on whether to continue the monitoring or to implement either another response action or a NFA decision.

Public Participation

Primary source documents related to the IRP (SARA, CERCLA, Executive Order 12580 and NCP) have requirements for public participation and review and comment on IRP actions and decisions by EPA, State and local authorities. Involvement by other agencies is intended to introduce their technical expertise to the problem and to facilitate the consensus process and concurrence in the selected course of action. Establishing a Technical Review Committee comprised of EPA, State and local authorities and representatives from the local community is one means of public involvement that an installation may follow.

Appendix F: References

Air Force Manuals

Handbook for Interagency/Intergovernmental Coordination for Environmental Planning (Preliminary Draft), 1987.

Land Use Planning Bulletin: Base Comprehensive Planning, 1 August 1986

Transportation Planning Bulletin, May, 1984.

Installation Commander's Hazardous Materials and Hazardous Waste Guide, December, 1987.

Utilities Systems Planning Bulletin/Manual, 1988.

Long Range Facility Development Planning Bulletin/Manual, 1988.

Fire Protection Planning Bulletin/Manual, 1988.

Army Manuals

TM 5-800-1 Construction Criteria for Army Facilities

TM 5-803-1 Installation Master Planning

TM 5-803-81-and Use Planning

TM 5-803-9 Transportation

TB ENG 353 The Overlay - Composite Method of Master Plan Preparation

Air Force Regulations

AFR 19-2 Environmental Impact Analysis Process (EIAP)

AFR 19-9 Interagency and Intergovernmental Coordination of Land, Facility, and Environmental Plans, Programs and Projects

AFR 86-t Base Comprehensive Planning

Army Regulations

AR 200-1 Environmental Protection and Enhancement

AR 200-2 Environmental Effects of Army Actions

AR 210-20 Master Planning for Army Installations

AR 414-15 Military Construction, Army (MCA) Program Development

Other Documents

M-X Base Comprehensive Plan: Environmental Quality Plan, Deliverable 12, Interim Report 1, U.S. Air Force, Regional Civil Engineer. Prepared by EDAW, Inc.

USAF Course Notes, Base Comprehensive Planning Management 520, Air Force Institute of Technology, School of Civil Engineering and Services, Wright-Patterson Air Force Base, Ohio, February, 1988.

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