






DEPARTMENT OF THE AIR FORCE

AIR UNIVERSITY

# AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

AFIT/GEM/DEM/91S-14

# EVALUATION OF MANAGERIAL CHALLENGES CREATED BY ACCELERATION OF THE INSTALLATION RESTORATION PROGRAM

THESIS

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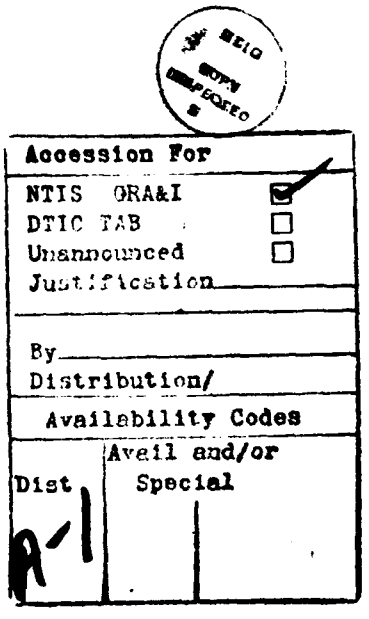

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THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Engineering Management

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September 1991

## Acknowledgments

I wish to extend my sincere appreciation to all those who contributed to the completion of my thesis project.

First, a special thanks to my advisor, Mr. Doug Osgood for his professional advice, technical expertise, and good humor in guiding me through the sometimes treacherous and frustrating AFIT thesis process.

I also want to thank all the Installation Restoration Program (IRP) managers interviewed during this research for the time taken from their busy schedules to answer my questions. In particular, I would like to thank Mr. Bill Pehlivanian, HQ ATC/DEEV, and Major Tim McLean, HQ TAC/DEVR, for the effort expended, and the patience shown, in explaining basic requirements of the IRP. Not only did they "volunteer" to serve as guinea pigs during development of my interview questions, they answered numerous questions and proved to be excellent sources for referrals.

Finally, I thank my wife, Jodi, for pats on the head when things were going good, and kicks upon my tail when I started to get lazy. Also, thanks to my daughters, Cassie and Leslie, for dragging me away from the desk to play baseball and for reminding me there are other things in life besides a thesis. Their faithful support and patience will never be forgotten.

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## Abstract

This study investigates the distribution of managerial tasks related to the Installation Restoration Program (IRP). Initiated in 1986, the IRP is the DoD program to identify and clean-up hazardous waste sites. Study areas include current distribution of managerial tasks, changes in task distribution needed to accelerate the program, and potential resource constraints. Additionally, the study considers how acceleration of Army and Navy restoration programs could impact the Air Force IRP.

The study reveals IRP management is heavily centralized at MAJCOM with most technical work being performed through contracts with service centers. Individual bases have little direct involvement in the program. Most MAJCOMs do not believe installations can adequately manage the IRP and anticipate retaining managerial control of the program.

Manpower is the most notable constraint. Organizations are operating below desired strength and experience high turnover. MAJCOMs, installations, and service centers need additional manpower for IRP acceleration to occur. Added constraints include money and time.

The Air Force IRP is ahead of other DoD IRP programs. However, the Air Force depends heavily on support from other agencies and could experience serious problems as DoD IRP programs expand and consume intra-service resources.

# EVALUATION OF MANAGERIAL CHALLENGES CREATED BY ACCELERATION OF THE INSTALLATION RESTORATION PROGRAM

## I. Introduction

### DoD Environmental Policy

> In a survey by the Roosevelt Center for American Policy Studies, Americans were asked to rank potential threats to U.S. security. Global environmental problems ranked first among "top priority" threats, being mentioned by 47 percent of those surveyed!
>
> By comparison, 46 percent of those surveyed felt the spread of nuclear and chemical weapons as serious, followed by 35 percent for domestic social concerns, and 15 percent or less for other issues which concern the Department of Defence, such as waste and corruption (14 percent) and Soviet or Chinese aggression in Asia (12 percent).
>
> This message has not been lost on DoD leaders. From the Secretary on down, we are committed to environmental quality and compliance (34:21).

With these words, William H. Parker III, Deputy Assistant Secretary of Defense (Environment), defined the future of Department of Defense (DoD) environmental policy.

Relaxation of Cold War tensions will produce smaller military budgets and serious reductions in force size. At the same time, public awareness of environmental issues is at an all time high. World opinion demands significant improvement in environmental practices (39:793-796). DoD leaders are faced with numerous difficult decisions as they strive to maintain a viable, yet environmentally conscious, military force.

Senator John Glenn, Chairman of the Committee on Governmental Affairs recently stated:

> The decisions made by the government over the next few years to address these problems will affect not only the size and scope of weapons production, but also the environmental quality and economic well-being of the nation (18:27).

## General Background Information

DoD is making significant progress in developing new, less hazardous methods of doing business and fostering environmentally sound practices. With this new emphasis, future generations should inherit a much cleaner, safer environment. Unfortunately, increased environmental awareness and improved management practices in the future will not eradicate environmental abuses of the past.

DoD Environmental Restoration Program. The program designed to correct past abuses is the Defense Environmental Restoration Program (DERP). The program was established in 1984 "to promote and coordinate efforts for the evaluation and clean-up of contamination at DoD installations" (30:1). The program consists of three sub-elements:

a. Installation Restoration Program (IRP): potential contamination at DoD installations and formerly used properties is investigated and, as necessary, site cleanups are conducted.

b. Other Hazardous Waste (OHW): research, development, and demonstration programs aimed at reducing DoD hazardous waste generation rates.

c. Building Demolition and Debris Removal (BDDR): demolition and removal of unsafe buildings, structures, and debris at installations and at formerly used properties (30:1).

No BDDR activities have been conducted since fiscal year (FY) 1987 because higher priority IRP and OHW projects needed the funds. OHW funding has ranged between $25-$40 million per year since 1984 (31:28).

Through the end of FY 1990, DoD had identified 17,482 sites at 1,855 installations for evaluation and potential clean-up action through the Installation Restoration Program (32:6). Some environmental officials predict the number of DoD sites requiring clean-up and restoration will eventually reach nearly 20,000 sites (23:82).

Annual IRP funding is growing steadily; starting with approximately $86 million in 1984 to just over $600 million in FY 1990. FY 1991 funding nearly doubled with $1.1 billion authorized by the FY 1991 DoD Authorization Act (32:30).

As the program shifts into the construction-oriented remedial action phase costs will climb even more rapidly. DoD estimates the total cost of future IRP activities at $14 billion in FY 87 dollars (32:30). However, should the number of sites continue to climb and reach the 20,000 site figure estimated by some environmental officials, the final bill in current year dollars, could easily reach the $20-25 billion range (23:82-84).

Air Force Specific Information. Overall responsibility for management of the Air Force IRP is placed on the Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health (SAF/RQ) and the Air Force Civil Engineer (HQ USAF/CE).

Responsibility for execution of the Air Force IRP is delegated to the Major Commands (MAJCOMs), who in turn are responsible for IRP management at bases under their jurisdiction. MAJCOMs have the option to retain primary control of the program or to delegate IRP management responsibility to individual bases. The MAJCOMs also determine what actions may be performed by others, e.g., technical service centers, civilian contractors, Army Corps of Engineers, etc., (9:17).

The United States Air Force (USAF) currently is responsible for environmental restoration at 4,513 sites. Preliminary assessments of clean-up requirements has been accomplished at 85 percent of the sites with all remaining sites scheduled for completion by the end of FY 91. However, comprehensive technical evaluation of potential hazards has been completed at only 16 percent of the sites where needed. Additionally, only 6 percent of sites needing physical clean-up have reached the stage where installation of treatment systems or physical clean-up is complete (32:7).

General Issue

Senior USAF leaders have publicly committed to accelerating the rate of IRP site clean-up. Major General Joseph A. Ahern, HQ USAF Civil Engineer, officially established the Air Force goal at completion of clean-up projects at 20 percent of Air Force IRP sites by the end of FY 1991, 30 percent completion by the end of FY 1992, and

100 percent completion of all Air Force IRP sites by the end of FY 2000 (33:3).

However, most managerial effort expended on the IRP so far has been in site investigation, technical evaluation of hazards, and development of remedial methods, with little actual progress made toward physical site clean-up. While significant managerial effort is still required on the technical studies in process, emphasis must soon shift to management of construction oriented remedial actions to meet the established goal.

As the pace of the IRP accelerates MAJCOMs will be required to dedicate more managerial skill and effort to remedial action projects. However, manpower resources at MAJCOMs are not unlimited. Delegation of more responsibility to installation level environmental managers and acquisition of additional manpower resources from other sources may be required. MAJCOM IRP managers must also be concerned with future funds allocations, potential program deadlines, and competition with other DoD services for resources.

**Specific Problem**

This study investigates how the responsibilities and tasks of MAJCOM and installation level IRP managers are currently distributed. The study then evaluates how this distribution would be changed by a shift from the current emphasis on technical studies to emphasis on remedial actions. Additionally, the study explores the resources

needed to manage an accelerated IRP program and determines if adequate resources are available. Finally, the study investigates the relationship between the Air Force, Army, and Navy restoration programs to identify and discuss any potential conflicts.

## Primary Research Objectives

To address the specific problem, the following areas are investigated and evaluated:

1. How are the tasks and responsibilities of the IRP currently distributed between IRP managers at major commands, individual installations, and technical service centers?
2. Will the current division of labor be restructured as the IRP shifts from technical evaluations to construction-oriented remedial action projects?
3. Do MAJCOMs, installations, and technical centers have sufficient resources to accelerate the IRP and meet the established goal of complete closure of all IRP sites by the year 2000?
4. What will be the impact on the Air Force IRP if the Army and Navy accelerate their respective installation restoration programs?

## Thesis Scope

This research investigates managerial challenges imposed by an accelerated IRP program. Detailed scientific, regulatory, and technical issues are not addressed except as needed to demonstrate how these issues impact managerial policies and actions.

The research focuses on IRP management at the MAJCOM, installation, and technical service center level. Managerial issues above this level are addressed only as needed to

illustrate how policies, responsibilities, and priorities are established.

Additionally, this research is limited to IRP management at installations located within the continental United States (CONUS). DoD environmental management policies at overseas locations frequently differ from the policies at CONUS locations. Overseas installations commonly are subject to treaties and agreements that may require significantly different environmental actions to comply with local host nation requirements (19:286).

## Organization of Thesis

The first chapter of this study is an introduction to the topic. The chapter provides a general overview of the scope of the IRP and how responsibility for IRP management is established. Additionally, the chapter introduces the researcher's initial perspective of the problem and poses investigative questions addressed by the research. Finally, the chapter defines the scope of the research.

The second chapter presents background information on the research problem. Information was gathered through review of published literature relevant to the subject. The chapter provides a more detailed review of the history of environmental restoration, defines current assignment of specific IRP responsibilities, and explores possible constraints on resource availability.

The third chapter is the methodology chapter. This chapter summarizes and outlines the research method. The chapter details the data collection method and discusses why the particular methods were chosen. Additionally, both the strengths and weaknesses of methods used are discussed.

The fourth chapter contains the research findings and data collected during the study.

The fifth chapter summarizes the data collected, draws conclusions from the research, and states the value of the research. Additionally, the chapter contains recommendations for further research.

## II. Background Review

### Overview

This chapter reviews the history of the Installation Restoration Program and the major legislative actions that drive the program. Next, the chapter provides a synopsis of IRP managerial responsibilities for personnel assigned to IRP management. Finally, the chapter explores constraints capable of impacting accomplishment of USAF IRP goals.

### Legal Foundation of the IRP

DoD involvement with environmental restoration can be traced to a 1975 program initiated by the U.S. Army. The program was aimed at assessment of possible hazards at Army installations suspected of having chemical, biological, and radiological contamination. In 1976, a joint memorandum issued by the Assistant Secretary of Defense (Installations and Logistics) and the Director of Defense Research and Engineering provided initial guidance for implementation of a DoD-wide Installation Restoration Program (45:8-10).

The memorandum established four basic objectives:

a. Identify contaminants by sampling and analysis of all DoD locations where contamination is known or suspected.

b. Determine restoration alternatives based on technical feasibility and economic acceptability.

c. Develop safety or toxicity criteria to which contaminants must be reduced.

d. Develop decontamination technology as needed.

The Department of the Army was designated as the lead agency to develop a conceptual remediation plan and to provide the preliminary cost estimates (45:8-10).

Despite the existence of the memorandum, the Air Force did not formally initiate the IRP until 1980. The driving force behind implementation at this time was passage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). More commonly known as the Superfund Act, the law makes owners of contaminated sites responsible for environmental clean-up costs and property damage.

The act dictates that federal agencies must comply with CERCLA requirements to the same extent as private entities. However, the law stops short of allowing the Environmental Protection Agency (EPA) to exercise direct enforcement of CERCLA provisions at federal facilities. In effect, CERCLA established guidelines for IRP administration but left DoD to pursue its own version of IRP execution (19:170-175).

Additionally, CERCLA specifically prohibits using Superfund money for remedial actions at federally owned facilities. Federal agencies were required to fund clean-up actions through their normal operations and maintenance (O&M) budget process. However, since IRP projects were forced to compete with other DoD priorities, this restriction severely limited IRP progress. DoD allocated only $475 million dollars of O&M funds for DoD IRP work over the 10 years from the inception of the program in 1975 through the end of FY 1984 (14:1-2).

The next major legislative action impacting the IRP was passage of the 1984 amendments to the Resource Conservation and Recovery Act (RCRA). This law primarily regulates current and future hazardous waste management processes and policies. However, RCRA contains several requirements that create problems for IRP managers.

Specifically, RCRA ties accomplishment of remedial action at hazardous waste sites to application for new permits, or renewal of existing permits, allowing treatment, storage, and disposal of new hazardous wastes generated at the same installation. In effect, local agencies charged with issuing permits can "hold the permit hostage" until remedial action at older sites is accomplished (19:167).

Another problem is overlapping of RCRA and CERCLA requirements. DoD normally considers the entire installation as a single facility when applying for a RCRA permit. This process simplifies record keeping, centralizes environmental management responsibility under the installation commander, and allows base organizations to move hazardous wastes from multiple generation points to final storage and disposal at a single location (19:168).

CERCLA allows installations to treat each individual IRP site as a separate case. However, under RCRA the entire installation is considered a single site, i.e., clean-up at all IRP sites on the installation might have to be completed before a RCRA permit is issued. RCRA also allows the EPA to delegate authority to issue permits to EPA approved state

environmental agencies. This requirement gives state EPA's much more control over DoD IRP execution plans than previously allowed under CERCLA (19:168).

Additionally, the two acts require different record keeping procedures, have differing terminology, and include different requirements for final site cleanup. Efforts are underway to resolve these differences. However, until a final solution is reached, DoD must attempt to comply with both laws. This increases costs, requires duplication of managerial effort, and restricts progress in IRP completion (15:2, 9-12). The primary concern with respect to this study is the amount of time and managerial effort required to deal with these complications.

Another significant milestone accomplished in 1984 was creation of the Defense Environmental Restoration Account (DERA). Established as a provision of the FY 1984 Defense Appropriations Bill, DERA is a fund of money designated specifically for environmental restoration projects. Creation of a separate pot of money eliminates competition for funds with other DoD priorities and has allowed rapid expansion of the IRP (23:83).

In 1986 Congress passed the Superfund Amendments and Reauthorization Act (SARA). Under SARA, DoD projects are required to use the step-by-step CERCLA regulations for site evaluation and remediation implementation processes. This provision gives the EPA much stronger influence on DoD programs. Additionally, SARA gives state and local agencies

legal right to review and comment on DoD plans prior to implementation of IRP work (19:214-217).

SARA also formally defined the scope of the Defense Environmental Restoration Program (DERP). Key provisions of the program include:

a. Overall administrative responsibility for DERP activities is centralized within the Office of the Secretary of Defense.

b. Requirement for submission of an annual report to Congress describing major DERP activities of the last year.

c. Expansion of the Defense Environmental Restoration Account (DERA) to allow research and development of waste minimization programs.

d. Establishment of special provisions to streamline military construction program requirements associated with remedial actions (4:4).

Additionally, SARA addresses numerous technical and procedural issues affecting the IRP. For example, SARA requires more detailed record keeping and increases the depth of remediation planning requirements.

The impacts of SARA requirements are increased costs and managerial effort. The legislation mandates that all remediation activities are permanent solutions and requires the approval of an increased number of state and local regulatory constituencies before a given site is considered "clean" enough not to require additional remedial action, and thus can be removed from the IRP.

On the other hand, the legislation establishes a structured format for accomplishment of remedial actions, provides the funding and high-level, executive exposure

needed for successful DERP execution, and helps to ensure all relevant regulatory officials are satisfied with the end product (4:1-5,16,B-2).

## Installation Restoration Program Growth

In 1985, DoD records indicated the IRP program contained 749 sites at 473 installations. DoD officials estimated the cost of the program at $5 billion (14:3).

By FY 1988 the program had grown to encompass 8,139 sites at 897 installations. In FY 1989, a number of small, non-industrial sites previously excluded from the IRP were reclassified and added to the program. This increased the program to 14,401 sites at 1,579 installations (31:3).

By the end of FY 1990, the program had nearly doubled to encompass 17,482 sites at 1,855 locations. Some of these sites, such as Army, Navy, and Air National Guard Centers, previously were excluded from the IRP. Other sites were added as contaminated areas were divided into individual sites to satisfy the new procedural requirements of SARA, or to meet RCRA permit application requirements (32:4).

DoD officials expect program growth will level off in the next few years. Total cost of the program is estimated at $14 billion adjusted to FY 1987 dollars (32:30).

## General IRP Management Responsibilities

The Air Force Installation Restoration Program Management Guidance handbook details a four phase approach

to IRP projects. The first phase of IRP work is Preliminary Assessment/Site Investigation (PA/SI). This phase consists of an installation-wide assessment of old landfills, fire training pits, fuel storage areas, etc., to determine if any of the sites present pose hazards to public health or the environment. Limited sampling and analysis is performed to establish the existence of actual contamination at the site. Uncontaminated sites not needing any clean-up are documented and closed out at this time.

Remedial Investigation/Feasibility Studies (RI/FS), the second phase of the IRP, involves a comprehensive, technical investigation of contaminated sites. A variety of sampling and investigative activities are used to determine the nature, extent, and significance of contamination. Feasible solutions are identified and one or more methods of remedial action proposed. After agreement on appropriate clean-up levels and methods is reached with EPA and state regulatory agencies, the technical study portion of the program is concluded and emphasis shifts to the construction-oriented clean-up phase of the program.

The third phase of the IRP, Remedial Design/Remedial Action (RD/RA), consists of using the information developed in the RI/FS study to design and execute detailed plans to accomplish physical site clean-up.

Finally, when a site does not pose a significant threat to public health or the environment, a finding of No Further Response Action is Planned (NFRAP) is published. A NFRAP

includes documentation of all activities accomplished and the removal of the site from the active IRP list (9:32-37).

Thru the end of FY 90, DoD had completed the PA/SI phase at 81.4 percent of the sites currently identified. RI/FS work was complete at 13.5 percent and underway at 64.7 percent of currently identified sites (32:7).

Unfortunately, the RD/RA phase, during which physical clean-up is actually accomplished, lags far behind. Only 29.3 percent of DoD sites currently identified have been started with only 7.3 percent of all sites completed and through the final NFRAP phase (32:7).

The USAF portion of the IRP consists of environmental restoration at 4,513 sites. PA/SI work has been accomplished at 85 percent of the sites with the remainder scheduled for completion by the end of FY 91. However, RI/FS work has been completed at only 16 percent of the sites. Additionally, only 6 percent of sites needing RD/RA work have reached the stage where treatment systems have been designed and installed or physical clean-up is complete (32:7).

**MAJCOM Responsibilities**

Responsibility for specific elements of IRP management are delineated in the Air Force Installation Restoration Program Management Guidance handbook. The work-horse of IRP management is the MAJCOM. Designated the Offices of Primary Responsibility (OPR) for the IRP, MAJCOMs are responsible for execution of DERP actions at installations under their

control. MAJCOM IRP management tasks are split along two broad lines: program management and site management.

Program management consists primarily of planning, coordination and administrative tasks. A partial list of these tasks includes:

a. Planning, Programming, and Project Prioritization

b. Budgeting and Cost Accounting

c. Reports of Activities and Information Exchange

d. Training and Resource Acquisition

Some of these tasks require input from others, e.g., reports from individual installations are compiled to develop a combined command project status report. However, most tasks must be accomplished by MAJCOM personnel.

Site management responsibilities defined in the IRP handbook include a wide range of activities depending on the specific phase the site is in. Technical requirements associated with PA/SI and RI/FS activities are beyond the scope of this study and will not be discussed in detail. However, it must be noted that management of these tasks currently consume most of a MAJCOM IRP manager's time.

Specific site management activities for which the MAJCOM has overall responsibility include:

a. Preparation of a pre-design report consisting of technical information compiled during the PA/SI and RI/FS phases.

b. Development of the Statement of Work (SOW) describing engineering parameters of the proposed remedial action, deliverable items such as plans, specifications, quality assurance plans, etc.

c. Architect-Engineer (A/E) selection.

d. Identification of required permits.

e. Review and approval of designs.

f. Construction monitoring and inspections.

g. Documentation and record keeping for all IRP actions through site closure.

MAJCOMs are required to designate an On-Scene Coordinator/Remedial Project Manager (OSC/RPM) for each installation. The OSC/RPM's responsibility is to direct response actions and coordinate IRP efforts on the base.

However, the OSC/RPM is not required to be physically assigned to the installation for which they are responsible. OSC/RPM responsibilities can be:

a. Retained by the MAJCOM IRP manager.

b. Delegated to installation personnel.

c. Delegated to a technical service center.

d. Performed by another agency. The agency may be governmental (Army Corps of Engineers) or non-governmental (civilian A/E firm). When this format is used a USAF employee must retain OSC/RPM authority as program manager.

MAJCOMs can also mix and match assignment of program responsibilities. For example, a MAJCOM choose to retain responsibility for design related activities but decide to delegate construction management responsibility to base level personnel. Additionally, the MAJCOM determines the amount of authority assigned to each party. In the example above, the MAJCOM could retain the authority to approve all proposed clean-up contract modifications (9:11-21,88-97).

Historically, HQ USAF policy has supported delegation of RD/RA activities to installation level personnel. During a 1986 review of the USAF IRP by the General Accounting Office (GAO), senior USAF officials indicated:

> The Base Civil Engineer is in the best position to manage the program because of the Engineer's first hand knowledge of requirements and on-site monitoring capability (16:5)

This theme has been maintained through several revisions of the IRP management handbook. The most current revision identifies the installation level OSC/RPM as the key employee for successful IRP activities (9:15-16).

## Potential Resource Constraints

Resources are the means by which proposed actions are made possible. Conventional models of resources include manpower, money, and time. IRP management requires all these resources with differing aspects in each major category. For example, manpower considerations address not only the number of personnel available but includes such areas as work experience, educational background, and technical skills.

This study seeks to identify areas where resource availability may be limited. Each of the areas will be addressed separately.

**Manpower Limitations**. The resource most likely to encounter significant shortages is manpower. The allocation process for manpower authorizations is detailed in Air Force Regulation 25-5: Management Engineering Procedures. Manpower authorization standards are based on historical records and

estimates of future work requirements. A manpower specialist determines the amount of time and/or dollars needed to perform each task in the work center description.

Thru use of statistical techniques, workload factors possessing strong causal relationship to historical manpower requirements are selected as variables in a manpower authorization equation. After the equation is validated and approved, manpower authorizations are distributed throughout the Air Force based on historical data for the organization under consideration (11:8-1 to 8-5).

The manpower standard in effect during the early days of the environmental movement was implemented in July 1979 (10:1). Reliance on historical data for workloads prior to 1979 has created severe manning problems in IRP management since the program effectively did not exist until 1984. Furthermore, the IRP has grown in scope from the 749 sites identified in 1984 to the 17,482 sites currently listed.

In 1988, Captain Michael L. DeWall, USAF, surveyed four MAJCOM IRP programs. Two MAJCOMs had only one authorized environmental management position each while the other two MAJCOMs had two authorized positions each. MAJCOMs had authority to obtain additional manpower through temporary overhires. However, authorizations for overhire positions were funded at GS-5 level technicians while actual job requirements called for GS-11/12 qualifications. MAJCOMs had all experienced considerable difficulty attracting qualified individuals under these conditions (12:68).

At installation level, the picture was even more grim. DeWall found that only 6 of 62 bases surveyed had one or more people dedicated to IRP management. DeWall comments:

> In many cases, multi-million dollar programs are assigned to overworked and understaffed Environmental and Contract Planning Sections buried deep within the civil engineering squadron. The IRP is often assigned as an "additional duty" to a staff member who has numerous other tasks to perform and is neither administratively or technically qualified to review environmental contractor proposals and resulting investigative data. Yet, these are the individuals who eventually make recommendations for decisions relating to further investigative and remedial activities (12:96).

Another concern identified by DeWall's study was the inability to keep qualified environmental personnel. At the MAJCOM level, years on staff for the people in-place ranged from 0.2 to 2.5. With the temporary positions authorized at only the GS-5 level, MAJCOM managers indicated they couldn't compete with industry to keep many of the positions filled. When higher paying jobs came along the workers left (12:75).

Air Force Engineering and Services Management Engineering (AFMEA) officials recognized a manpower problem existed and developed a new manpower standard for the Environmental & Contract Planning section. AFMEA officials recognized the environmental management workload was growing so fast that historical data was obsolete before it could be accumulated and acted upon. Accordingly, the new manpower authorization equation was designed to include both work actually performed and "<u>work not accomplished but judged to be a responsibility of this work center</u>" (42:1).

Evaluation of "required work not accomplished" was based on best estimates of task times and frequencies. The AFMEA reported:

> This measurement varied greatly, ranging from just slightly above the work actually performed to more than 200 percent of current work accomplishment. While this data was analyzed and its extreme points adjusted, the measurement was simply to variable to obtain acceptable correlation.
>
> On the average, this second measurement indicates that 28 percent of all required workload is not currently being accomplished (42:2).

Inability of the federal employee management system to compete with industry is not restricted to the Air Force. A 1988 GAO study of the EPA work force indicated the EPA was 36 percent undermanned. The survey also indicated over one-third of current Superfund employees planned to look for other jobs within the next year. Additionally, 77 percent of employees surveyed felt their workload was too heavy to "perform accurately and efficiently". The study indicated 45 percent of employees leaving took jobs in private industry and nearly 30 percent took similar, but better paying jobs, with state and local regulatory agencies (17:20,37,50-52).

Compounding the problem is the lack of environmental management professionals being educated in the university system. A recent study by Wayne State University indicates over 82 percent of the universities in the U.S. did not offer hazardous waste or environmental management training of any kind at any level (24:33).

Approximately 15 percent of the universities in the U.S. offer one or more environmental management courses as part of traditional degree programs but do not have a formal environmental management program. The 3 percent offering specialized environmental management programs award primarily undergraduate level degrees; only 3 of the 732 universities surveyed offer a Masters Degree encompassing Environmental or Hazardous Waste Management (24:32-37).

A recent employer survey of 70 commercial, consulting, and industrial firms estimates demand for environmental management personnel will increase by 40 percent in the next 5 years. Additionally, the survey found the current work force is comprised primarily of individuals holding only bachelor's degrees and newly hired employees requiring substantial on-the-job training (38:224-229).

The study indicates employers are seeking individuals with previous experience and training and prefer to hire employees educated at the master's level or higher. The authors conclude:

> Resources constraints appear quite real in limiting the more rapid growth of the hazardous and toxic substances work force. Respondents indicated that there would be a substantial increase in the number individuals hired if they had the optimal resources.
>
> With the growth in resources expected to be allocated to the hazardous and toxic substances fields, it is likely that the actual resources will more closely approximate the optimal. If that is the case, there is likely to be an even greater growth in the demand for trained personnel in the hazardous and toxic substance work force (38:227).

Given the explosive growth of the IRP in recent years, the number of DoD environmental management personnel needed to complete the IRP has increased substantially. However, the number of individuals available may not be sufficient to fulfill DoD's manpower requirements.

Money Limitations. Funding for environmental clean-up projects has increased steadily. DoD allocated only $475 million for all environmental management work from 1975 through 1984 (14:1-2). In FY 1985, IRP funding alone was $86 million; by FY 1990, IRP funding had grown to just over $600 million. Congress continued this historical pattern by increasing the DERA authorization to $1.1 billion in the FY 1991 DoD Authorization Act (32:30).

Availability of environmental clean-up funds has actually increased faster than DoD has been able to spend the money available. Each year since FY 1987 DoD has had unspent DERA funds carried over to the next year (31:28).

DoD currently estimates total IRP costs at $14 billion. However, this amount is indexed to 1987 dollars (32:30). Real costs in then current year dollars will be much higher when the money is actually spent. A survey of non-DoD environmental experts predicts actual costs could easily reach the $20-25 billion range (23:82-84).

Time Constraints. The legislative actions controlling the IRP do not establish specific deadlines for completion of IRP activities. Provisions of SARA place restrictions on specific actions required for sites placed on the National

Priority List (NPL). However, the length of allowable project completion is negotiated as part of the inter-agency agreement and not specified by law. Furthermore, SARA does not place time restrictions on sites not on the NPL (4:1-9).

Consequently, pressure to accelerate IRP progress comes from within the DoD community. In a 1989 report to Congress, William H. Parker III, Deputy Assistant Secretary of Defense (Environment) states:

> Our mission is clear. We must remain committed to completing actions at sites as quickly and cost-effectively as possible, starting with those presenting the highest risk to public health and the environment. We also must continue to expand our technical capabilities for site remediation and further improve our management procedures.
>
> Most importantly, we must build on the momentum established thus far. These goals represent significant challenges to the Department. But they can and will be accomplished (31:vii).

Accordingly, senior USAF leaders established the USAF goal at 1) finish 20 percent of all USAF IRP sites by the end of FY 1990, 2) finish 30 percent of the sites by FY 1991, and 3) complete 100 percent of the sites by FY 2000. Finished is defined as:

a. All required clean-up is complete and documented in a close out decision document.

b. Work at the site is finished except for long-term monitoring or long-term remediation systems in place.

c. No Further Response Action is Planned (NFRAP) and all actions required to remove the site from the IRP have been properly documented (43:1-2).

However, the FY 1990 report to Congress indicated only 6 percent of Air Force IRP sites had actually been completed

and the necessary NFRAP documentation finalized (32:7). Given this slow start, Air Force IRP managers will be under even greater pressure to accelerate the IRP.

Impact of Other DoD IRP Programs

A significant wild card in the deck is the status of the Army and Navy IRP programs. The Air Force IRP contains approximately 26 percent of the sites cataloged within the total DoD restoration program. However, over 48 percent of the sites currently scheduled for RD/RA work are USAF sites (32:6). Furthermore, nearly 50 percent of sites still in the RI/FS phase belong to the Air Force. Based on historical trends, approximately 65 percent of these sites will require RD/RA work in the future (32:8).

Currently, none of the other branches have made public announcements regarding their clean-up goals. However, it is reasonable to assume they have established internal goals similar to the stated USAF goals.

The status of the IRP in other branches could affect the Air Force IRP in a number of different ways. First, all branches compete equally for DERA funds. Should the other branches commit to acceleration of their own programs, less DERA money will be available for the Air Force IRP.

Secondly, all branches must compete within the same manpower restrictions. Given that manpower resources are already in short supply, accelerated programs in the other DoD branches could make it very difficult for the Air Force

to obtain the additional manpower resources needed to effectively accelerate the IRP.

Finally, the Air Force does not have the internal capacity needed to award and manage large engineering and construction contracts. Projects completed with Military Construction (MILCON) program funds are normally accomplished with the Army Corps of Engineers (COE) or Naval Facilities Engineering Command (NAVFAC) acting as the design and construction agent for the Air Force.

Remedial Action clean-up projects primarily consist of engineering and construction related work. Accomplishment of IRP projects requires design, contracting, and construction management skills similar to the MILCON program. Execution of the IRP will rival DoD's MILCON program in both size and complexity with both the COE and NAVFAC being primary players in future Air Force clean-up projects.

However, both COE and NAVFAC have significant environmental management obligations within their own services. If resources, particularly manpower, are in short supply it is not unreasonable to expect the COE and NAVFAC will be required reduce the amount of support available for the Air Force IRP in order to meet their own respective inter-service IRP goals.

**Summary**

Environmental management is rapidly becoming one of DoD's top priorities. Faced with increased public scrutiny

and increasingly more complex environmental regulations, senior DoD officials have committed to expanding programs designed to clean-up mistakes and abuses of the past.

The Defense Environmental Restoration Program is the DoD mechanism accomplish the required clean-up. The principal component of this DoD restoration program is the Installation Restoration Program (IRP). The IRP program has grown from 749 sites in 1984 to over 17,000 sites in 1990.

Projected cost of the program has grown from $5 billion to $14 billion. However, the $14 billion figure is indexed to FY 1987 dollars; the actual dollar cost in current year dollars will be considerably higher. Furthermore, the magnitude of the difference between the FY 1987 index and current year cost index will increase much faster the longer it takes to complete the IRP.

Successful completion of this program will be an immense undertaking requiring many dedicated environmental management personnel. However, studies indicate the number of environmental management personnel available may not be sufficient to properly execute the program. Additionally, the Air Force must compete with industry and the other DoD services to keep the resources currently on hand. Additional constraints may include time and funding limitations.

# III. Methodology

## Research Objective

The objective of this study is to explore IRP management responsibilities and how these tasks currently are currently allocated. The study then investigates how managerial responsibilities might be altered as the pace of the IRP increases. Additionally, the study evaluates factors that may constrain IRP manager's ability to execute an accelerated program. Finally the study investigates how acceleration of the Army and Navy restoration programs could impact execution of the Air Force IRP.

## Selection of Data Collection Methods

Data collection for the study consists of two methods: literature reviews and interviews. Selection of these methods is based on the nature of the investigative questions outlined in Chapter 1.

**Literature Review**. The nature of research question #1 is historical. Most of the information needed to address the question is found in published form. Collection of secondary data is in the form of a literature review. Accomplishment of this objective forms the basis for Chapters 1 & 2. Additional information from the literature is inserted in Chapters 4 & 5, where appropriate, to clarify points.

Library research centered around the AFIT Library. The library was the primary source of engineering journals,

commercial periodicals, and some military literature, i.e., Air University publications. Literature not available at the AFIT library was obtained through inter-library loans.

Additional information was obtained through access to electronic databases. Publications were obtained from the Defense Technical Information Center and Dialog databases. Uniquely military publications (regulations, manuals, policy letters, etc.) were obtained through HQ AFLC Environmental Management Branch, Wright-Patterson AFB, and the AFIT School of Civil Engineering and Services.

Interviews. The research questions are primarily exploratory in nature. Emory defines exploratory studies as "loosely structured with an objective of learning what the major research tasks are to be. In fact, the immediate purpose of exploration is usually to develop hypotheses or questions for further research" (13:60).

Some secondary information relevant to the study was available in published form. For example, commercial periodicals containing information on the number of colleges offering environmental courses provided information relevant the availability of environmental management professionals.

However, most of the information needed to explore the research objectives was not readily available in published form. Questions about how a specific policy was implemented at a particular MAJCOM or how IRP acceleration will affect future command policies are best answered by interviewing individuals directly responsible for IRP management. These

individuals are privy to the most current published and unpublished information available, have the capacity to evaluate current practices, and are the most qualified to predict future impacts.

Individuals interviewed were selected based on their position as IRP managers directly responsible for execution of the program. Additionally, each interviewee selected had adequate authority to formally represent their organization in the interview.

Interview Methods. Interview methods included personal and telephone interviews. Time and distance constraints restricted personal interviews to individuals located in the Wright-Patterson AFB area.

Potential interviewees were contacted in advance and queried about their willingness to participate in the study. A list of interview questions was mailed, or transmitted electronically, to the interviewees approximately two weeks prior to the scheduled interview. Use of an interview question list ensured coverage of all topics, standardized the wording of questions, and ensured the questions were asked in the same order.

Additional topics introduced by interviewee's were included in the data when the researcher determined the information was relevant or provided additional depth of knowledge in an area related to the research objectives. However, horizontal expansion into additional topic areas was limited to prevent information overload.

Interview Schedule. The interview process consisted of three steps. The initial interview schedule consisted of six MAJCOM IRP managers. Organizations selected included:

a. Strategic Air Command (SAC) and Tactical Air Command (TAC): Selected to represent large, operational commands with numerous installations throughout the U.S.

b. Air Training Command (ATC) and Air Force Space Command (AFSPACECOM): Selected to represent smaller commands with a limited number of installations.

c. Air Force Logistics Command (AFLC) and Air Force Systems Command (AFSC): Included because they control virtually all USAF industrial process facilities.

Questions at this stage were developed around the research objectives previously introduced in Chapter 1. The questions directed to the MAJCOM IRP managers are attached as Appendix A.

Specifically, MAJCOM IRP managers were asked to define how IRP tasks are distributed in their organization, how would this division of labor would be affected by an IRP accelerated program, and which tasks would most likely be delegated to installation level.

MAJCOM IRP managers were also asked to identify tasks currently assigned to bases, technical centers, or other organizations. Finally, MAJCOM IRP managers were asked to identify the type and amount of support they needed from other organizations to accelerate the IRP program.

The information was used to identify organizations for a second series of interviews. Interview questions for these

organizations were individually tailored to the amount and type of support provided by the organization.

IRP managers in these organizations were asked to verify the level of support currently provided to MAJCOMS. These managers were then asked to evaluate the organizations capacity to provide the level of support desired by the MAJCOMs. Finally, agencies outside the Air Force were asked to evaluate how much support they could provide the Air Force if other DoD restoration programs were accelerated. Differences between the level of support desired by the MAJCOMs and the amount of support available in the secondary organizations were identified and used to develop the third series of interview questions.

In this step, MAJCOM IRP managers were re-contacted and asked to comment on the differences between MAJCOM support requirements and the projected support available from the secondary organizations. The MAJCOM IRP managers were asked to comment on how they would obtain additional resources needed to execute an accelerated program and what MAJCOM policy changes might be required.

## Analysis and Evaluation

Once information from the literature review and interviews had been gathered the information was reviewed and analyzed. Similarities and significant differences in IRP management between the various commands are presented and discussed in Chapter 4.

Using the current allocation of responsibilities as a baseline, reasonable allocation of responsibilities for an accelerated program was evaluated. Specific emphasis was placed on the type of tasks suitable for delegation to base level personnel. Additionally, serious dependence on support from other organizations was identified.

Differences in levels of resources available and projected resource demands were identified. Areas where significant shortages could occur and potential sources for additional resources are addressed in Chapters 4 and 5.

Finally, the researcher states his conclusions about the strengths and weaknesses of current IRP management programs, potential problem areas, and identifies areas where additional research is deemed relevant and desirable.

# IV. USAF IRP Management Policies

## Overview

This chapter contains information on current MAJCOM IRP management policies and procedures. Information was obtained through interviews with MAJCOM and installation level IRP managers and with personnel representing the organizations providing technical services to the MAJCOM IRP programs. Discussion of the information follows the general format of the research objectives developed in Chapter 1.

## MAJCOM IRP Management Policies

> How are the tasks and responsibilities of the IRP currently distributed between IRP managers at major commands, individual installations, and technical service centers?

IRP management in most major commands is heavily centralized at the MAJCOM level. Given the historical record of other major Civil Engineering programs, retention of total program control is at the MAJCOM somewhat unusual. As Major Tim McLean, Chief, Environmental Restoration Division, HQ TAC/DEVR, put it:

> Normally the MAJCOM decides what command policy will be and sets guidelines for the guys in the field to follow. Then we would turn most of the workload over to the bases, send money when it was needed, and track their progress. But with the IRP, the program is so complex and the interest is so high, we have to keep our hands on what's going on all the time (28).

The degree to which IRP functions are centrally managed varies between the commands. The MAJCOMs representing the

smaller commands, ATC and AFSPACECOM, control all funding, programming, contracting, and manning issues exclusively at the MAJCOM. Base level environmental managers have no direct responsibility for IRP management other than to act as points of contact (POC) for regulatory agencies.

Air Training Command. Mr. Bill Pehlivanian, Chief, Environmental Restoration Branch, HQ ATC/DEEV, cited numerous advantages to keeping control of the IRP at MAJCOM level. Foremost is the ability to maintain a centralized pool of technical expertise. Mr Pehlivanian feels the technical complexity of IRP related work and numerous regulatory provisions require much greater depth and breath of knowledge than normally available at base level.

Mr. Pehlivanian indicated most of the effort involved in determining the nature and scope of work for any given site is performed by contractors. The pool of environmental experts at HQ ATC/DEEV review and approve all technical reports and have final authority on all decisions involving projected clean-up methods, scope of work, and adequacy of compliance with regulatory requirements.

HQ ATC/DEEV believes maintaining a diverse staff of environmental experts at the MAJCOM ensures adequate technical expertise is available to accomplish reviews and make the appropriate decisions. The process also prevents "re-inventing the wheel" at each base. Methods and processes tested and refined at one location are used as foundations for similar IRP sites at other ATC installations (35).

Another advantage is the ability of the MAJCOM staff to stay focused on IRP work. Mr. Pehlivanian explained at most ATC bases the local environmental management personnel are simply to busy to effectively manage IRP sites. Typically, base level environmental managers spend most of their time to other areas, such as RCRA compliance and hazardous waste minimization programs. While these aspects of environmental management are important and necessary, HQ ATC/DEEV feels the time needed to manage these areas restricts the ability of the installation environmental manager to effectively manage IRP work at base level (35).

The most significant disadvantage of the process is keeping bases level officials informed. As the point of reference for regulatory agencies, local commanders often are contacted by these agencies with demands for action or are expected to supply information upon request.

Mr. Pehlivanian concedes local commanders are not always happy about lack of control over actions at their bases. However, Mr. Pehlivanian emphasized that HQ ATC/DEEV personnel maintain frequent contact with local regulatory officials to keep everybody informed of any changes in program status. Additionally, HQ ATC/DEEV personnel attend all scheduled meetings with regulatory officials and respond to requests for information from regulatory officials (35).

ATC uses the Department of Energy (DoE) to obtain most of the support needed for technical studies. DoE established two environmental management technical service operating

agencies, Environmental Management Operations (EMO), managed by Battelle, Inc., at Pacific Northwest Laboratory in Richland WA, and Hazardous Waste Remedial Actions Program (HAZWRAP), managed by Martin Marietta Energy Systems, Inc., at Oak Ridge National Laboratory, Oak Ridge TN.

The MAJCOM communicates their requirements to DoE, who in-turn assigns the work to one of the operating agencies. The agency develops a SOW for the site and forwards the SOW to both DoE and the MAJCOM for review and approval. Once the MAJCOM accepts the proposal, funds are transferred from the MAJCOM to DoE who then authorizes the operating agency to begin the project (1).

The agencies have established a series of indefinite delivery, indefinite quantity Architect-Engineer (A/E) contracts for RI/FS studies. The agency selects one of the on-call A/E firms and provides the A/E with the MAJCOM approved SOW. DoE provides contract administration services for the operating agency contracts. In turn, the operating agencies administer the A/E contracts and act as the technical representative of the MAJCOM by reviewing and evaluating the work performed by the A/E firm (1).

Mr. Pehlivanian indicated ATC prefers to use DoE for RI/FS work citing DoE's responsiveness and low management fees as the primary reasons. However, ATC uses the Army Corp of Engineers (COE) for RD/RA work. Mr. Pehlivanian stated they feel more comfortable with the extensive design and construction experience accumulated by the COE (35).

The COE accomplishes a limited amount of RD work using in-house personnel. However, most designs are contracted out to qualified A/E firms. The COE serves as the technical representative for the MAJCOM and performs the detailed technical reviews in addition to providing administration the A/E contract. The A/E design firm is normally retained to provide construction inspection services when the construction contract for the actual clean-up starts (8).

Once the remedial design is approved by all appropriate officials, the COE advertises, awards, and administers a construction contract for the clean-up. Additionally, the COE performs quality control checks on both the A/E and the construction contractor (8).

HQ ATC also has a professional and technical advisory services contract. Under this contract, consultants with various technical specialties work directly with HQ ATC/DEEV personnel at Randolph AFB, TX. Additionally each ATC base on the NPL has a full-time, contractor supplied site manager dedicated to IRP work at the site. The site manager performs as a Quality Assurance Evaluator (QAE) for both the A/E and construction contracts. At non-NPL bases, the QAE function is performed by personnel from HQ ATC/DEEV on a temporary duty basis (35).

Air Force Space Command. The other small command reviewed, AFSPACECOM, centralizes IRP management at the MAJCOM for similar reasons. Colonel Martin Byrne, Chief, Environmental Compliance Branch, explained that some of

AFSPACECOM's IRP sites were located at small, isolated Air Force Stations. These stations have an operations and maintenance contract for work normally accomplished a Base Civil Engineering. USAF presence consists of a limited staff of QAEs responsible for evaluation of the O&M contractor. Because these stations are usually considered CONUS remote for assignment purposes, normal assignment length for a military only QAE is 12-18 months (3).

Colonel Byrne indicated the on-site contractors are not normally involved in IRP management. He said IRP projects are excluded from O&M contracts because of the finite nature of IRP work and regulation prohibiting mixing of DERA and O&M funds. Additionally, Colonel Byrne indicated most O&M contractor's staffs lack the technical and environmental expertise the IRP requires and are not usually willing to obtain the necessary personnel for a number of reasons, with contractual liability being the most common (3).

AFSPACECOM also has a number of operations at bases where the base belongs to another command and AFSPACECOM is a tenant unit. At these locations, the host base provides O&M support for AFSPACECOM units but does not include AFSPACECOM IRP sites as part of host base responsibilities.

The local AFSPACECOM workforce force is normally very small and have numerous assigned duties. Colonel Byrne indicated maintaining control of the IRP at the MAJCOM is preferred to maintain continuity. Additionally, he cited the ability to maintain a higher level of technical expertise at

the MAJCOM as the key to effective IRP management at these small sites (3).

The final type of AFSPACECOM installation consists of a conventional, full size base. Prior to 1989, all AFSPACECOM bases in this class were located in the "Peterson Complex" at Colorado Springs CO, consisting of Peterson AFB, Falcon AFB, and the NORAD Cheyenne Mountain complex. Each base has a separate Civil Engineering organization but the proximity to HQ AFSPACECOM makes it convenient to retain IRP management functions at HQ AFSPACECOM (3).

In 1990, AFSPACECOM assumed accountability for two additional full size bases, Patrick AFB and Vandenberg AFB. Colonel Byrne indicated both new AFSPACECOM bases have been assigned a full-time, on-site IRP manager to coordinate future work. However, control of funding and approval of technical issues will be retained at the MAJCOM (3).

Colonel Byrne stated all IRP work at AFSPACECOM's small sites has been completed and the sites are closed out. Most of the work was accomplished with contracts obtained through the Human Services Division (HSD) of Air Force Systems Command, primarily with the Occupational and Environmental Health Laboratory (OEHL) at Brooks AFB.

Additional services were obtained through the Bureau of Reclamation (BUR), US Geological Service (USGS), and Bureau of Land Management (BLM). Colonel Byrne indicated HSD will remain as the technical service center for bases in the Peterson complex and will also pick up future IRP work at

Patrick AFB. BUR will be used to accomplish future IRP work at Vandenberg AFB (3).

Tactical Air Command. Major Tim McLean, Chief, Environmental Restoration Division, describes the TAC program as centrally managed but emphasized that individual bases are key players in the IRP. Base level environmental managers are the POC for regulatory agencies and surrounding communities. Each base also develops the initial IRP project programming documents, decides which technical service center to use, and coordinates on-site work.

Additionally, each base has the option to accept responsibility as the primary IRP manager for installation. However, Major McLean indicated HQ TAC has not actively encouraged most TAC installations to exercise this option. He stated that MAJCOM officials do not believe most bases have a sufficient number of technically qualified personnel to properly manage the IRP (28).

Most of TAC's IRP work has been accomplished through a Memorandum of Understanding (MOU) with the Omaha District of the COE. The MOU is centrally managed by HQ TAC/DEVR who controls funding and places task orders against the MOU for individual bases. HQ TAC/DEVR provides all of the managerial over-site and retains the right of final approval for all work accomplished under the MOU (28).

The COE either accomplishes the work with it's own in-house forces or contracts for A/E services. The COE provides contract acquisition and administration a the full range of

services ranging from the initial site investigation through physical clean-up and closure (8).

Two TAC bases, McDill AFB, and Moody AFB, have been allowed to exercise the option to manage IRP projects at base level. At McDill AFB, USGS and HSD jointly accomplished the RI/FS study for a contaminated groundwater site. After the study was completed, the base contracted with DoE to provide and administer an A/E contract for design of a pump and treat system (41).

The project was advertised, and a firm-fixed-price contract awarded, through the local Base Contracting office. Contractor over-site was provided by the Construction Management section of Civil Engineering with assistance from the A/E firm who designed the project (41).

Moody AFB developed a project to remove underground storage tanks and accomplish thermal treatment of fuel contaminated soil. The project specifications were written by the local environmental management section working with EPA and state regulatory agencies. A contract was then advertised, awarded, and administered through the local base contracting office. Contractor over-site was performed by the base environmental management section (7).

RI/FS studies at some TAC bases are currently being accomplished with A/E contracts acquired and administered by DoE. HQ TAC/DEVR assists the base by providing funding and initial guidance but allows the base to assume primary responsibility for dealing with DoE. Additionally, three TAC

installations will start using the Navy as their primary technical service agent in FY 1992 (28).

Strategic Air Command. According to Mr. Bill Buchanns, Environmental Engineer, SAC centrally manages IRP functions at non-NPL bases. However, he indicated most bases have a full-time position in the Environmental Planning Branch designated as the base IRP manager. The local IRP manager develops programming documents, coordinates on-site work, and is the POC for regulatory agencies. However, acquisition and evaluation of technical support agencies, review and approval of technical proposals, and contracting for IRP activities are controlled at the MAJCOM (2).

When a SAC base is placed on the NPL the number of environmental management personnel at the base is increased. The base assumes responsibility for future IRP management functions with base personnel developing SOW's for technical studies and remedial designs, accomplish necessary reviews, and coordinate the work with regulatory agencies. Base personnel also perform QAE duties for A/E firms involved in technical studies and remedial designs. However, HQ SAC/DEV retains final authority for all actions accomplished at the installation (2).

A/E services for technical studies are normally obtained by HQ SAC/DEV through a technical service center. Mr. Buchanns indicated the COE has been used most often but other agencies used for RI/FS work include DoE, USGS, HSD, BUR, and NAVFAC. However, 2 SAC bases, Grissom AFB and

Offutt AFB, have been allowed to acquire A/E services for RI/FS studies through local base contracting offices.

Ms. April Lewis, Environmental Engineer at Grissom AFB, developed a SOW for A/E services following EPA guidelines and previously accomplished COE contracts. The SOW contains options to extend the contract by including follow-up remedial designs and contract over-site for remedial actions in the A/E contract (26).

The contract was advertised and awarded through the Base Contracting Office. A separate contract was negotiated with COE to provide on-site QAE and laboratory services. Ms. Lewis explained local contracting officials will perform contract administration duties for both contracts (26).

Offutt AFB has essentially the same contract in place. The Offutt SOW was written at about the same time as the Grissom SOW and shares most of the same characteristics. In both cases, response to the solicitation was very good with a number of A/E firms responding (5).

RD/RA work has primarily been accomplished through COE. The A/E firm developing the remedial design is normally retained to perform contractor over-site. However, on some smaller projects the base Construction Management section has been allowed to accomplish contractor over-site (2).

Air Force Systems Command. An industrial command, AFSC is responsible for both bases and Air Force plants. The diverse nature of these operations dictate separate management policies. Mr John Julius, HQ AFSC/DEV, indicates

IRP management policies at AFSC bases is very similar to the TAC policies detailed above. The MAJCOM retains primary control of most IRP management functions with the bases designated POC for regulatory agencies.

Additionally, base level personnel accomplish the preliminary programming documents and provide on-site coordination of support for technical services obtained by HQ AFSC/DEV. One significant difference is that AFSC bases do not have the option to accomplish IRP projects using local environmental management personnel (22).

HQ AFSC/DEV delegated technical service acquisition to the Aeronautical Systems Division (ASD) at Wright-Patterson AFB. In turn, ASD contracts with DoE or HSD to obtain A/E services for technical studies and remedial design. ASD planned to use DoE to obtain construction-oriented clean-up contracts. However, AFSC is in the process of merging with AFLC and will turn responsibility for site clean-up at AFSC bases over to the new combined command in 1992 (22).

ASD has also been delegated IRP management authority for Air Force plants. Major Terry Stoddart, ASD Director of Environmental Management, explains the plants are government owned, contractor operated (GOCO). The plant operator is only responsible for environmental activities directly related to plant support, i.e., waste management, occupational health evaluations, etc., included the requirements of the O&M contract.

In a few cases, ASD has modified the O&M contract to allow the plant operator to manage IRP work. The plant operator is required to sub-contract with an A/E firm specializing in environmental work for technical studies and remedial designs. ASD/DEV reviews all the information developed by the A/E firm and retains right of final approval for all proposed actions (40).

The plant operator is responsible for over-site of the A/E firm. The plant operator also performs contractor over-site on subsequent clean-up contracts. Contract award and administration is performed by the Administrative Contracting Officer located at the plant. Major Stoddart emphasized contracts awarded in through this process are required to follow federal contracting regulations (40).

Major Stoddart indicated technical service centers were utilized at the remaining plants. Organizations used include DoE, OEHL, and COE. ASD/DEV develops a SOW and sends it to the service center. The service centers accomplish the work in-house or award A/E contracts for the work. On-site construction management is performed by the A/E firm or by personnel from technical service centers. Personnel from ASD/DEV provide managerial over-site and perform QAE duties on a temporary assignment basis (40).

IRP management at GOCO facilities will not be affected by the merger with AFLC. Major Stoddart explained that the new combined command headquarters will program IRP projects and budget for DERA funds. However, ASD/DEV will keep it's

identity as a separate office and remain the primary environmental management function at GOCO plants (40).

Air Force Logistics Command. The AFLC approach to environmental management is significantly different than the other commands reviewed. At AFLC installations a separate Environmental Management (EM) division is established. The EM is independent from the Civil Engineering function with the EM division chief reporting directly to the Air Logistics Center Commander or Base Commander. Additionally, AFLC developed a command specific manpower standard with EM staff sizes ranging from 30-75 people. AFLC pays for the additional manpower positions with command funds (27).

Mr. Wayne Ratliff, AFLC IRP Program Manager, explained the MAJCOM is responsible for IRP program management activities such as budgeting, management of funds and manpower, and establishment of general policy. However, primary site management responsibility IRP execution is delegated to installation level. Each base is responsible for IRP programming actions, development of site specific SOWs, managerial and technical over-site of technical services, and interaction with regulatory agencies (36).

Mr. Ratliff indicated most IRP work has been accomplished through DoE and COE. However, several AFLC bases are developing in-house contracting capability and will start direct acquisition of technical expertise and construction services in the near future (36).

Mr. Ron Lester, Chief, Restoration Branch, for the 2750 ABG/EMR at Wright-Patterson AFB explains the local EM office decides which technical service centers to use at their location. Additionally, the EM function develops the SOW for services desired and performs QAE duties over A/E firms and the service centers (25).

The installation coordinates review of all technical studies and remedial designs with appropriate regulatory agencies. Once approved locally, the project is forwarded to the HQ AFLC for final approval and funding. Remedial Action contracts are advertised and awarded through local contracting officials. Contractor over-site is performed by the A/E firm accomplishing the design with local EM personnel providing QAE services for all RD/RA work (25).

## Delegation of IRP Responsibility to Bases

> Will the current division of labor be restructured as the IRP shifts from technical evaluation to construction-oriented remedial action projects?

Delegation of authority for IRP management functions to base level personnel is supported by some commands but flatly rejected by others.

Mr. Pehlivanian stated ATC is quite happy with their current set-up and had no intention of delegating any additional responsibility to base level. He indicated the current professional and technical services contract provides ready access to highly qualified environmental management personnel. He anticipates additional contractor

supplied personnel will be assigned as site managers at individual installations as the pace of clean-up projects increase but primary control of the program will be retained at the MAJCOM (35).

ATC plans to continue using DoE as their primary supplier of technical studies. Mr. Pehlivanian expects DoE to expand the HAZWRAP and EMO functions as the IRP grows. ATC also anticipates using the COE to provide most of their RD/RA design and construction requirements (35).

However, Mr. Pehlivanian indicated ATC was considering taking direct control of RD/RA work at several smaller installations using the professional and technical services contract to obtain the personnel needed. He believes using additional personnel obtained through the technical advisory contract provides HQ ATC more direct control over the final outcomes than using DoE or COE (35).

Colonel Byrne stated IRP work has been completed, or is nearly complete, at all AFSPACECOM bases except the newly acquired Vandenberg AFB and Patrick AFB. He believes the current system, assigning a dedicated IRP site manager at each location, will improve the rate of IRP progress (3).

Colonel Byrne indicated HQ AFSPACECOM plans to retain primary responsibility for acquisition of IRP related technical services and future construction contracts. He believes centralized management is crucial for continuity and feels the working relationships already established with the technical service centers should be continued (3).

Colonel Byrne also feels centralized management is more beneficial in dealings with regulatory agencies. He feels the lack of technical expertise found at most bases make it difficult for bases to challenge excessive demands from low level regulatory officials. Colonel Byrne stated base level personnel frequently don't deal with the right people. He emphasized that most of the time we should be dealing with higher level officials, i.e., the EPA Regional Director, but to often base level officials are reluctant to go that high up the managerial ladder (3).

In contrast, Major McLean indicated TAC would like to transfer more IRP management responsibility to base level. In theory, bases already have the option to accept primary responsibility for IRP projects but only McDill AFB and Moody AFB have been allowed to exercise the option so far.

However, he feels personnel at base level often are not capable of dealing with RI/FS work because they lack the technical expertise needed to understand what is going on. Major McLean indicated as more RI/FS studies are completed and the IRP moves into the RD/RA phase he expects the bases will be more involved. Since RD/RA work is more engineering and construction-oriented, he thinks base level personnel will be more comfortable with the work and will be more capable of getting involved (28).

Mr. Buchanns indicated the RI/FS contracts at Grissom AFB and Offutt AFB will be closely monitored. If successful, Mr. Buchanns expects a number of other bases will be allowed

to follow the example and obtain RI/FS contracts of their own. He also expects base level personnel at SAC bases will be more involved in RD/RA work for much the same reasons stated by Major McLean (2).

Mr. Julius indicated the intent at AFSC was to maintain control of IRP management at the MAJCOM. However, the merger with AFLC will transfer managerial responsibility to the new combined command. Both Mr. Julius and Mr. Ratliff expect the new command to adopt the current AFLC system with separate Environmental Management offices with primary IRP management being delegated to base level (22 & 36).

## Resource Constraints

> Do MAJCOMs, installations, and technical service centers have sufficient resources to accelerate the IRP and meet the established goal of complete closure of all IRP sites by year 2000?

In Chapter 2, resources were defined as manpower, money, and time. The study revels potentially significant shortages exist in all cases.

**Manpower Constraints**. The factor with the greatest potential impact is manpower availability at all levels of IRP management. All IRP managers interviewed feel additional manpower in needed to adequately manage the current workload let alone accelerate the program. Major Stoddart expressed the general feelings of IRP managers when he stated:

> We're just trying to keep on top of the flames let alone getting down to the hands-on management. We really need to have an IRP guy at each plant but we just don't have the staff to do it (40).

Ironically, several MAJCOMs already have more people working in environmental management then they have positions authorized for. Mr. Julius revealed AFSC does not have any permanent positions currently authorized for IRP management. He stated that his position, and those of 3 other employees in IRP management at HQ AFSC, are "term employees" (22).

The situation in some other commands is only slightly better. HQ AFSPACECOM has only 1 permanent authorization despite having 4 people working in the environmental management branch. Likewise, HQ TAC has 8 people working, including 2 term employees, but has only 1 authorized environmental management position.

A term employee is an individual hired to fill a specific job but on a temporary basis. Term employees does not acquire career status and cannot accrue civil service retirement benefits. Term employees also cannot compete for vacant positions within the civil service system nor can they be promoted to a higher grade regardless of the quality of their work (27).

Mr. Julius believes temporary status with it's lack of visible career progression opportunities make it difficult to retain term employees. He said often individuals filling a term position are simply waiting for a better offer to come along. Usually, the better offer comes from civilian industry and the Air Force loses the time and effort spent on employee training and education. With tongue in cheek, Mr. Julius stated "We're becoming a breeding ground to train

qualified people for civilian firms who turn around and charge us twice as much to do the same job" (22).

Besides term employees, another source of temporary manning is the intern program. Interns are individuals with scientific or engineering degrees who are recruited right out of college. The intern program is designed to supply entry level (GS-7/9) employees who then get job experience and additional training on the job. Intern positions are considered temporary (6 to 12 months) but there is no actual time limit on employment. Interns are not counted against authorized manning because of their temporary status (27).

Interns already working in an organization are usually the first choice for hiring when a permanent position becomes vacant. However, when permanent authorizations are not readily available, the turnover rate is extremely high because of the low pay grades and lack of visible career paths associated with the program. Additionally, the program provides excellent entry level training for individuals with desire to move on to one of the many civilian firms looking for young, mobile professionals with experience in environmental management (27).

Major McLean said HQ TAC has had a couple of people come through the intern program and do very good work. Unfortunately, these interns left to take jobs with civilian industry because HQ TAC doesn't have any permanent position at grades commiserate with the work they're actually doing

(28). Colonel Byrne indicated HQ AFSPACECOM has had similar experiences with intern positions in his organization (3).

Several MAJCOMs are supplementing their manning by "borrowing" people from other civil service organizations. HQ TAC currently has 2 people on loan from the Tennessee Valley Authority and 1 individual on loan from COE (28). Colonel Byrne at HQ AFSPACECOM is an Air Force Reserve asset on extended active duty. Additionally, AFSPACECOM has an individual on loan from DoE (3). HQ SAC has also established an agreement to provide COE supplied site managers at SAC bases on the NPL (2).

The final option currently being exploited in the hodgepodge of temporary personnel acquisition is to obtain contractor supplied personnel. HQ ATC/DEEV has a technical and professional services contract currently providing 8 additional people, 5 at the MAJCOM and 1 at each base on the NPL. Mr. Pehlivanian indicated more contractor supplied personnel will probably be needed in the near future (35). HQ TAC has a contractor supplied program manager acquired through Battelle (28).

At the opposite end of the spectrum, other MAJCOMs have a number of authorized slots but have been unable to hire the people needed to fill the slots. Major Stoddart said ASD has 24 authorized positions but has only been allowed to fill 8 slots (40). Likewise, Mr. Buchanns indicated HQ SAC has 5 authorized positions they have not been allowed to

fill (2). Both situations are related to expected cuts in future manning levels and the resulting hiring freezes.

Environmental management manning at base level is not in any better condition. Mr. Pehlivanian indicated most ATC bases have only 1 authorized environmental management slot at base level. This single individual is responsible for a wide range of environmental management functions including compliance reporting, waste minimization programs, hazardous materials training, etc., in addition to any effort expended on IRP management. Mr. Pehlivanian categorizes the situation by stating:

> "The guys at base level already have to much to do. They're just barely keeping their heads above water. Asking them to pick up the full workload of the IRP is just asking for a catastrophe (35).

Mr Julius of AFSC and Colonel Byrne of AFSPACECOM indicated base level manning, and the associated workload, in their commands was very similar to the situation in ATC. Mr. Julius indicated several small AFSC bases currently do not have any authorized environmental positions. Larger AFSC bases typically have 1 authorized environmental management position but many of these positions are often vacant (22).

At AFSPACECOM sites, environmental management is usually assigned to the Engineering QAE. However, Colonel Byrne explained on-site QAE's lack the skills needed to manage IRP work. Colonel Byrne emphasized the QAE has many other areas of responsibility and simply does not have sufficient time available to be deeply involved in IRP

management. Also, the QAE normally is assigned to the site for only 12-18 months so it is difficult to maintain program continuity (3).

The larger commands typically have 3-5 permanent positions authorized in the base environmental management function. However, many of the positions are often vacant. Mr. Buchanns said SAC has over 100 authorized environmental management positions but seldom has more than 70 positions filled at any given time (2). Likewise, Major McLean said base level manning in TAC typically runs 60 to 70 percent of authorized levels (28).

Both Major McLean and Mr. Buchanns indicated low manning levels negatively impacted their desire to delegate more IRP responsibility to base level. Major McLean stated:

> We would like the bases to get involved earlier but they just don't have the people or skills needed for PA/SI or RI/FS type work. If we can get more people we plan to start giving the bases a bigger piece of the IRP when we get to the clean-up type work. But if we don't find ways to get more people we may end up still doing most of the RD/RA work from headquarters (28).

AFLC also has significant manpower problems. Authorized manning levels in base environmental management divisions range from 35-75 positions. However, actual manning levels range from 70-80 percent most of the time. Ms. Susie Linthicum, AFLC Environmental Manpower Manager, explains local commanders make the final decision at what level manning is actually funded. Environmental management manning at most AFLC bases is typically funded at 85 percent of the

authorized level. However, bases usually have some funded positions open due to turnover so actual manning normally is about 75 percent (27).

Since the MAJCOMs and bases regularly experience lower than desired manning levels, much of the actual workload of the IRP is shifted to technical service centers. However, manpower problems also exist at most of the service centers.

Mr. Dappen, Program Manager with the Omaha district of the COE, indicated his office was fully manned but several other COE district offices are very short on people. He explained the Omaha district and the Kansas City district were originally structured as COE's primary centers of technical expertise for environmental restoration projects associated with the Superfund; responsibility for the DoD IRP program was added as an afterthought (8).

Since the pace of IRP work has picked up, 6 additional districts have been designated as regional centers of technical expertise. Unfortunately, most the other districts have not been able to develop the cadre of environmental experts needed to handle IRP work. Mr. Dappen explained a "Catch 22" situation exists where the offices need IRP work to justify hiring additional personnel. However, because the offices don't have the people needed to accomplish IRP work, few organizations are willing to commit any significant IRP work to the offices. In the mean time, both the Omaha and Kansas City offices are saturated and cannot accept enough additional work to significantly accelerate the IRP (8).

Turnover is also a problem. Mr Dappen indicated hiring and keeping qualified employees is difficult in high cost areas. He cited the example where the Omaha office, in a relatively low cost area, is able to stay fully manned most of the time. In contrast, the Kansas City office is in a high cost area with competition from a number A/E firms. Mr. Dappen said the Kansas City office typically has only 50-60 percent of its authorized environmental positions filled at any given time (8).

Mr. Dappen indicated the situation is slowly getting better but does not expect any dramatic improvement soon. He explained while the COE currently has an overall surplus of people, many are in the wrong disciplines for environmental projects. He indicated contract administrators and program managers are being transferred to the IRP as the MILCON and Civil Works programs are reduced. However, he conceded real shortages exist in technical environmental fields, such as chemists, geologists, etc. (8).

Mr. Zagrobelny, Director, IRP Division at HQ Naval Facilities Engineering Command, indicates the Navy is experiencing similar problems hiring environmental specialists. He said the Navy recently increased their authorized environmental management workforce by 30 percent but have only filled about half the positions. Additionally, he concedes turnover is a significant problem and a number of existing positions are open at any given time (44).

To address the problem, the Navy developed a new contracting method to obtain the technical skills needed. The new strategy involves award of 8 Comprehensive Long-term Environmental Action, Navy (CLEAN) contracts potentially worth a total of $920 million. Mr. Zagrobelny indicated CLEAN contracts are competitively solicited, indefinite quantity, indefinite delivery contracts with 1 basic year and 9 option years. CLEAN contracts are cost plus fixed fee with an award fee available for superior performance.

The technical study phase of the Navy IRP program will be accomplished by A/E firms under CLEAN contracts awarded in 1990. Mr. Zagrobelny says the goal of CLEAN contracts is to get a qualified A/E firm involved from the beginning of RI/FS process through the end of the RA work.

The A/E firm conducts technical studies and analysis needed to categorize the site, identifies and evaluates potential clean-up options, performs the remedial project design, and provides contractor over-site of construction contracts for the actual clean-up. He emphasized NAVFAC officials retain right of final approval for all proposed actions. The contract requires the A/E to provide most of the actual site management effort with Navy personnel concentrating on the program management and contract administration aspects (44).

Construction projects for the actual site clean-up work will primarily be awarded and administered NAVFAC contract administration and project management personnel already on

hand. Mr Zagrobelny feels the slowdown in MILCON work will allow enough movement of personnel from the MILCON program to the IRP without adversely draining either program.

Mr. Zagrobelny believes the CLEAN contracts will let the Navy execute their IRP with the currently authorized manning. However, Mr. Zagrobelny concedes that the program will be delayed if they can't find the people needed to fill to open positions (44).

Manpower availability problems extend into the civilian operating agencies under contract to DoE. Mr. Jacobsen, Manager EMO Contracts for Battelle, Inc., explains that he is not constrained by federal civil service system rules and can hire additional personnel as the workload increases. However, he conceded that it is difficult to find personnel with the right combination of qualifications and experience needed to manage government contracts (21).

Mr. Jacobsen said the operating agencies must use DoE approved acquisition and contract administration procedures. He stated the DoE approved procedures are very similar to the requirements of the Federal Acquisition Regulations. So similar in fact, Mr. Jacobsen indicated several of his most effective program managers and contracting specialists are retired military employees (21).

Mr. Jacobsen indicated turnover was a relatively minor problem. Since he isn't limited to civil service pay scales, Mr. Jacobsen said he is able to compete with A/E firms in the salary arena. However, Mr. Jacobsen said he frequently

loses his most experienced people to A/E firms offering partnerships and other lucrative incentives (21).

Money Constraints. Casual observers might not believe IRP funding limitations exist. After all, DERA funding has increased every year and is expected to continue increasing in the near future. Lt Col Cornelius of the Office of the Deputy Secretary of Defense (Environment) verified the DERA account for FY 1991 was $1.1 billion. Projected DERA funding for FY 1992 and FY 1993 is $1.25 billion and $1.45 billion respectively (6).

Additionally, the FY 1991 DoD Appropriation Act included a $100 million Base Realignment and Closure (BRAC) fund. This money is designated for remediation and clean-up work at installations on the Phase 1 base closure list. These funds are independent from DERA and can only be utilized at closure bases (6).

Unfortunately, having money available and being able to spend it are two different things. Several MAJCOM IRP managers stated their programs have been underfunded for the last several years. Mr Buchanns indicated the SAC program received only 60 percent of their total IRP requirement for FY 1990 (2). Colonel Byrne at AFSPACECOM believes his program needs 50 percent more funding to move along at the pace he would like to see (3).

A related issue is when funds are made available. Major Stoddart indicated ASD/DEV received over 70 percent of his total FY 90 funds in the last fiscal quarter. As a result,

ASD was unable to obligate all the funds available and did not obligate their annual program though funds technically were available (40).

Another common problem expiration of contracts. Major Stoddart indicated on several occasions he has not received funds in time to exercise option years on A/E contracts. A new A/E contract was obtained but 6-8 months of time was lost in the procurement process. In two cases, a different A/E firm was awarded the new contract. Major Stoddart stated another 6 months were lost getting the new firm established and over the learning curve (40).

Several MAJCOM IRP managers expressed concern about running out of money before the IRP program is completed. Mr. Pehlivanian pointed out the 1990 Report to Congress still estimates total IRP program costs at $14 billion dollars indexed to FY 1897 dollars; actual program costs will be significantly higher in actual year dollars when the funds are actually spent. Mr. Pehlivanian feels as military budgets shrink in the future the amount of money set aside for IRP work will also shrink (35).

Time Constraints. As previously indicated, pressure to accelerate the IRP is primarily internal to DoD. However, capacity to accelerate the program is limited by a number of factors where DoD has no direct control.

One potentially significant factor is increasing stringent legislation. Mr. Julius indicated several AFSC bases have had to go back and re-accomplish PA/SI work done

before passage of SARA to comply with the more stringent standards incorporated in the new law. He stated in several cases they just about had to throw out all the data and start over. As a result, the bases are 2-3 years behind where they should to be (22).

A related issue is conflicting regulations. RCRA and CERCLA requirements overlap at locations with both active and inactive hazardous waste sites. Detailed discussion of the differences exceeds the scope of this study. However, IRP managers at all levels indicated the problem frequently delays progress. Mr. Pehlivanian indicated these differences create real problems determining who are the appropriate regulatory agencies at some locations and what standards apply at that particular location. He indicated it often takes longer to obtain approval for proposed remedial actions and implementation of clean-up activities has been delayed by as much as 3 years at some ATC sites (35).

Another potential roadblock occurs when state and federal regulatory officials disagree. Mr. Lester related the situation where Ohio EPA officials have declined to participate in the inter-agency agreement between Wright-Patterson AFB and the federal EPA. Unfortunately, the Ohio EPA has also refused to accept some of the proposed remedial actions that have been approved by the federal EPA. Mr. Lester explained the base is caught in the middle and has lost significant time implementing clean-up activities while the regulatory agencies work out their differences (25).

As a result of manpower shortages, funding restrictions and regulatory conflicts, most IRP managers feel General Ahern's goal of closing out all Air Force IRP sites by the end of Year 2000 is unrealistic. All IRP managers agree that having an established goal is a good idea but most feel the problems detailed prohibit accomplishment of the goal.

## Impact of Army and Navy IRP

> What will be the impact on the Air Force IRP if the Army and Navy accelerate their respective installation restoration programs?

Air Force IRP managers do not feel the Army and Navy are far enough along with their respective IRPs to have significant impact on the Air Force IRP. Several MAJCOM IRP managers think future competition for DERA funds could delay the Air Force IRP but none felt there would be any serious, immediate impact. Major McLean summed up the general attitude of the MAJCOM IRP managers by stating:

> We're light years ahead of the Army. They are right now where we were 4-5 years ago in terms of people, training, and skills. They also have twice as many sites as we do. It's going to take them a long time to get their system built up to process all the sites they need to process before they start spending any serious money.
>
> The Navy is a lot better off. The don't have as many sites and they are farther down the road. With their new CLEAN contracts they should be able to get through the RI/FS phase pretty fast. We may well end up competing with them for RD/RA funds but their program is a lot smaller than ours. There should be enough money to go around (28).

MAJCOM IRP managers also did not foresee any serious drain of manpower or technical resources. Major McLean

pointed to development of the CLEAN contracts as the primary tool for Navy IRP work. He feels that with these contracts in place depletion of DoD manpower and technical resources by the Navy has been effectively avoided (28).

Most Air Force IRP managers feel the Army program is too far behind to worry about competing for the same resources. Major Stoddart stated:

> We're rapidly approaching the top of the hill for RI/FS type work. The Army is just starting to climb the hill. We'll be doing RD/RA while the Army is still working on RI/FS. By the time they are ready to really get into RD/RA, we will be finished with a large majority of our clean-up work and be winding down with the rest (40).

Data from the technical service centers support the Air Force IRP managers. Mr. Jacobsen reports 80 percent of all RI/FS work being done by Battelle is Air Force work (21). Likewise, Mr. Blair indicated approximately 75 percent of HAZWRAP's work is for the Air Force (1).

Mr. Dappen said 60-65 percent of the IRP work being done at the COE Omaha office is for the Air Force. He also indicated a significant portion of the IRP work done at the Kansas City office was Air Force work but did not know what percentage of the total it represented (8).

**Summary**

Air Force IRP management in most commands is heavily centralized at MAJCOM level and will probably remain at the MAJCOM in the future. The only notable exception is at AFLC where primary responsibility for all management functions

has been delegated to base level. AFLC is able to take this route because base level environmental management has been separated from the Civil Engineering organization and a command specific manning standard dramatically increased the size of the environmental management function.

The smaller commands plan to keep tight control of the program citing continuity and higher levels of technical expertise at MAJCOMs as primary reasons. Additionally, base level manning is severely limited. MAJCOM IRP managers feel base level personnel are too busy with other environmental management duties to adequately manage the IRP.

The larger commands would like to delegate more responsibility to base level. However, low manning prevents many bases from being more active in the IRP. The few bases have accomplished IRP actions locally and have generally done very well and are looking forward to doing more.

The most significant resource constraint is manpower. All levels of IRP management need additional personnel to needed to adequately manage the current program. Most IRP managers do not feel it is possible to accelerate the IRP because of the manning shortage.

Most Air Force IRP managers do not feel the Army and Navy are far enough along with their respective IRPs to significantly impact the Air Force IRP. Data from technical service centers managing IRP work supports the consensus.

## V. Conclusions and Recommendations

### Overview

This study indicates IRP management currently is concentrated at MAJCOMs and technical service centers. However, future MAJCOM force reductions and decentralized management initiatives could easily force a shift of much of this responsibility to installation level personnel.

### Evaluation of Research Objective No. 1

> How are the tasks and responsibilities of the IRP currently distributed between IRP managers at major commands, individual installations, and technical service centers?

The findings detailed in Chapter 4 indicate IRP management is heavily centralized at the MAJCOM level with technical service centers accomplishing most of the actual work associated with the IRP. With the exception of AFLC installations, very few bases are actively involved in primary IRP management activities.

Retention of total program control represents a notable departure from past managerial practices. Historically, MAJCOMs perform major program management responsibilities, such as establishing command policies, controlling program funding, and providing guidance, while delegating primary site management responsibilities to installation level.

Of the commands studied, only AFLC has elected to delegate all primary site management responsibilities to

installation level. SAC delegates primary site management responsibility only to installations on the NPL and still retains final approval authority for proposed actions at these locations.

TAC expressed a desire to delegate more responsibility to base level. However, TAC has allowed only two bases to accept IRP site management responsibilities and has not yet actively encouraged other bases to get more heavily involved. ATC, AFSPACECOM, and AFSC have elected to retain primary site management responsibility at the MAJCOM and do not anticipate any further delegation will occur.

Given recent initiatives to reduce MAJCOM staff size and eliminate layers of authority, one would expect to find much greater delegation of IRP responsibility from MAJCOM to installation level personnel. Additionally, since MAJCOMs expect local base personnel to provide the primary interface with regulatory agencies it seems reasonable base level officials should be more heavily involved in all IRP actions at their installation.

Reliance on non-USAF service centers to obtain technical support, design, and construction services is consistent with historical execution of the MILCON program. The Air Force has always needed the COE and NAVFAC since the USAF lacks internal capacity exists to perform these services. Extending this concept to include DoE, USGS, etc., does not appear to represent any significant change from previous management policies for major programs.

**Evaluation of Research Objective No. 2**

Will the current division of labor be restructured as the IRP shifts from technical evaluations to construction-oriented remedial action projects?

AFLC expects to keep their current structure with the installation level Environmental Management divisions as the primary site management officials. Given the size of AFLC bases, and the extent of their environmental problems, the AFLC system with separate Environmental Management divisions makes a lot of sense.

Separation from the Base Civil Engineering organization provides the visibility needed to ensure environmental problems are addressed at the proper level. Additionally, the large environmental staff size allows acquisition of the wide range of technical and managerial skills needed to see the IRP through completion while providing sufficient manning to adequately manage the program.

With the merger of AFLC and AFSC into a single command, environmental management at bases currently owned by AFSC will probably become very similar to the existing AFLC structure. While base level environmental managers at AFSC currently have little IRP management responsibility, these same managers will pick up primary site management responsibilities in the near future.

Fortunately, along with the additional responsibility comes the organizational realignment and increased staff size associated with the AFLC system. Installations will

need time to hire and train the additional personnel so execution of the IRP will probably experience a temporary slowdown. However, once the expanded staff is in place, execution of the IRP should accelerate considerably.

The other commands studied expect to retain their current structures with installation level officials having little direct control of IRP actions at their bases. The primary arguments for this approach are 1) the MAJCOM can develop and maintain a larger pool of technical expertise and 2) MAJCOM control improves continuity.

However, interviews with the MAJCOM IRP managers indicated actual manning at some MAJCOMs was considerably less than their authorized manning level. At other MAJCOMs, actual manning exceeds unrealisticly low authorized levels only because IRP managers have found innovative ways to get the additional people needed. In either case, all the MAJCOM IRP managers believe additional manpower is needed to adequately manage the current IRP.

Additionally, all MAJCOMs experience high turnover rates and the actual IRP experience of personnel currently on staff is limited. Installation level interviewees also felt MAJCOM turnover created significant problems at installation level. As one base level IRP manager explained:

> We're not allowed to do anything without getting MAJCOM approval first. The problem is that the guys at MAJCOM move around so much you never know who to talk to. When you finally do figure out who is supposed to be responsible, they don't know anything about our program.

> We waste a lot of time while the new guys figure out what's going on. Then, just about the time we get the new guys up to speed they leave and we have to start all over (5).

Given these conditions, the argument for retaining IRP control at MAJCOM seems rather weak. Future MAJCOM manning reductions seem inevitable as USAF policy shifts toward a smaller force with fewer layers of authority. It will become increasingly difficult for MAJCOMs to retain large technical manpower pools.

Additionally, the total number of IRP sites, and the associated workload, is increasing and will continue to increase for some time. The combination of increased workload, reduced staffing, and continuous turnover make it difficult for MAJCOMs to maintain effective continuity.

MAJCOM IRP managers should limit their efforts to the more traditional structure, i.e., where the MAJCOM performs primarily program management functions and delegates site management responsibilities to installation level personnel. The increased number of environmental management personnel available at installation level could then provide the manpower needed to accelerate the IRP.

Finally, MAJCOM IRP managers must resist the tendency to micro-manage the program or risk becoming the most significant obstacle in acceleration of the program.

One exception is the situation experienced at AFSPACECOM and AFSC locations where civilian contractors operate and maintain the base/plant. HQ USAF policy clearly

states overall managerial responsibility for IRP actions must remain with an Air Force employee. At these locations, IRP site management should be retained at MAJCOM.

The record at the limited number of installations currently allowed control of IRP site management should be reviewed. The installations in this study seem to be doing a good job and want to do more. Dave Stokes, Chief of Environmental Compliance at McDill AFB, summarized the opinion of IRP managers at several bases:

> We went into this IRP thing with a little fear and a lot of ignorance. A lot of different agencies were involved and it got frustrating at times because it took so long for everybody to review and approve the deliverables. Once we got through the study phase and started installing the equipment things went pretty well.
>
> The second project we did went a lot smoother. We learned from our mistakes on the first project and did more research before we started. We actually expected it to be worse than it was. Now that we know we are capable of handling the work we would like to do more of it (41).

One area needing additional study is the lack of knowledge transfer to installations. Personnel at base level generally knew about other bases in their own command managing IRP work. However, few base level personnel knew anything about successful restoration programs at bases outside of their own command.

**Evaluation of Research Objective No. 3**

> **Do MAJCOMs, installations, and technical centers have sufficient resources to accelerate the IRP and meet the established goal of complete closure of all IRP sites by the year 2000?**

Significant constraints exist in all areas affecting the IRP. A few IRP managers cautiously expressed belief General Ahern's year 2000 goal could be obtained. However, these same IRP managers also indicated everything had to work just right for it to happen.

The majority of IRP managers believe the year 2000 goal is unrealistic. IRP managers believe the constraints surrounding the program are to large to overcome within the given time frame. Most feel having a goal admirable and supported the idea even though they believe the goal is overly optimistic. A few managers expressed concern the goal puts too much additional pressure on an already tight program and might lead to the situation where people start trying to cut corners.

Manpower Constraints. The most serious constraint is lack of adequate manpower at all levels of IRP management. None of the MAJCOMs had all the manpower they would like to have for the current program let alone an accelerated program. However, if the MAJCOMs delegate site management responsibility to installation level the current MAJCOM manning levels seem adequate to handle the program management responsibilities for an accelerated IRP.

Additional manning is needed at base level and the turnover problem must be addressed. Most installations had at least one authorized environmental management position open at least part of the time. Delegation of IRP site management responsibilities to base level is not precluded,

but is much less likely without additional installation level positions.

The number of bases in this study was too limited to draw significant conclusions but the turnover rate at installation level seems lower than at the MAJCOM level. Additional evaluation of the grade structure at installation level positions is also needed. Some permanent environmental management positions apparently have been established at pay grades below that needed to attract qualified applicants.

Another problem needing immediate attention is how hiring freezes currently prevent filling authorized positions. Mr. Andrew Jackson, Manpower Consultant, Air Force Engineering and Services Center, explained the new Air Force Manning Standard authorized 217 additional base level environmental management positions. Unfortunately, many of the new positions have not been filled. Mr. Jackson said most commands are withholding implementation of the manning standard, or allowing only partial implementation, pending the outcome of expected manning reductions (20).

Major Stu Nelson, HQ USAF DERA Program Manager, indicated a few commands have applied for, and obtained, waivers to the hiring freezes allowing the command to hire additional environmental management personnel. However, Major Nelson indicated there currently is no active HQ USAF/CEV effort to obtain exemptions for environmental management personnel from upcoming manning reductions. While he does not think it is likely, Major Nelson conceded it is

possible the environmental management positions recently created by the new manning standard could be eliminated in the near future (29).

A related area is funding for environmental management manpower. Major Nelson indicated approximately 170 temporary positions are currently being funded with DERA money. Most of the positions are for environmental managers with a few IRP dedicated contracting officers and lawyers included.

Major Nelson indicated the number of DERA funded positions allowed in the future may be reduced as funding requirements for projects increase. Additionally, he said it is becoming difficult to justify spending DERA money to supply a large number of temporary employees when most AF organizations are facing severe manning reductions (29).

Unfortunately, this represents a double edged problem. If the Air Force is unable to retain the temporary employees currently authorized, the workload on other IRP managers will increase. However, currently vacant environmental management positions, including the permanent positions just created by the new manning standard, are prime targets for elimination since physical personnel lay-offs can be avoided by eliminating vacant positions. However, if both permanent and temporary environmental management positions are cut, the number of IRP managers available to execute the program could be significantly less than needed.

Manning shortages at technical service centers also preclude acceleration of the IRP. The primary USAF service

center, HSD, has reached saturation and is not accepting significant quantity of new work. Likewise, NAVFAC and the COE have limited the amount of new Air Force work they are currently accepting.

The civilian service centers managed by DoE, i.e., EMO and HAZWRAP, are capable expanding their staffs. However, the amount of new work assigned to these agencies is limited by the capacity of USAF IRP managers to provide the general over-site and coordination required. AS USAF environmental management manpower is reduced, the amount of IRP work actually accomplished at the civilian service centers would also be reduced.

Another technical service center will soon to be available to MAJCOMs thru the new Air Force Environmental Support Organization (ESO) being activated at Brooks AFB in July 1991. Colonel Saenz, ESO Commander, explained the ESO will incorporate the IRP division of OEHL with a staff of Contracting Officers, Bio-Environmental Engineers, and Program Managers to create a new full service technical service center (37).

Colonel Saenz indicated the new organization will provide another option for MAJCOM IRP managers. The ESO will be involved in acquisition of A/E and construction contracts for all phases of IRP work from PA through RA. Additionally, the ESO will be the exclusive service center for AF bases projected for closure (37).

However, the initial staffing of the ESO is 145 people with only 53 personnel dedicated to the IRP (37). The ESO will not be able to replace the amount of support currently being provided by other technical service centers without a significant increase in authorized strength.

Money Constraints. The amount of DERA money authorized for the IRP has increased significantly. However, DERA funding has not increased as fast as IRP requirements. Major Nelson, HQ USAF DERA Program Manager, indicated the USAF portion of the $1.1 billion authorized by the FY 91 DoD Appropriations Act was $401 million (29).

At the beginning of FY 91, this represented 100 percent of the USAF projected requirement for the year. However, as unforeseeable conditions occur on clean-up projects the requirement increases. Major Nelson expects the $401 million authorized will cover approximately 75 percent of the final FY 91 requirement. Major Nelson believes some additional money may be available through end of year funds from the other services. However, he does not expect to end up with more than 85 percent of the total amount needed (29).

Another problem is the increase in the number of IRP sites in the program. For example, Major McLean said TAC started the year with 620 IRP sites on record. By the end of the year, the TAC program will be about 650 sites (28). While nobody expects the program to double in size like it did from 1988 to 1990, everyone expects some growth. Obviously, a bigger program requires more money.

**Time Constraints**. The decade of the 1990's will bring renewal, and probable revision, of current environmental legislative requirements, such as SARA and RCRA. It seems likely the revised legislation will be even more stringent and create additional requirements for IRP managers.

Faced with serious manpower and funding constraints, environmental managers will be hard pressed to keep up with any new requirements. Even relatively small legislative revisions could create potentially significant extension of the time required to accomplish the IRP.

Another serious problem could be duplication of work. Both SARA and RCRA give state and local authorities limited control over execution of the IRP. Future legislation is likely to provide even more control to state and local regulatory agencies. IRP managers in the future may be forced to meet the requirements of an increased number of environmental agencies before IRP work can be accomplished. Additionally, the probability of being caught in the middle between two or more of these agencies will increase.

## Evaluation of Research Objective No. 4

> What will be the impact on the Air Force IRP if the Army and Navy accelerate their respective installation restoration programs?

Air Force IRP managers do not believe acceleration of the Army and Navy IRP programs would have significant impact on the Air Force IRP. The primary basis for this attitude is a belief the Air Force is considerably farther along than

either of the other services and will not be competing for the same resources.

DoD IRP managers don't believe there is a shortage of qualified A/E firms to perform technical studies and develop remedial design projects. As an example, Ms Lewis indicated over 60 A/E firms responded to the RI/FS solicitation at Grissom AFB. Ms Lewis indicated over half of the respondents were judged capable of performing the work (26).

Nor does there seem to be a shortage of construction firms to accomplish clean-up contracts. Mr Dappen indicated the COE's experience is that most solicitations bring in a large number of offers and awarding contracts has not been a problem. Mr Dappen said a number of A/E and construction firms are adjusting to reductions in the MILCON program by becoming more active on environmental projects (8).

With the number of A/E and construction firms available seems sufficient to handle the IRP workload, competition among the services for these resources should not be a constraining factor on any of the service specific IRPs.

The area where potential problems exist is the shortage of project management and contract administration personnel. Mr Dappen indicated much of work currently accomplished by COE is for the Air Force. However, he also warned that the COE can not refuse Army IRP work, nor can they accept additional Air Force work unless all Army requirements are being handled and the COE has excess capacity. Mr Dappen feels the COE will have excess capacity for the near future

but expects most of this capacity will be consumed as the Army expands their IRP (8).

Mr. Zagrobelny indicated a similar situation exists with the Navy. With the Navy IRP is in a relatively infant stage, the Air Force currently has access to both the CLEAN contracts and the NAVFAC personnel managing CLEAN contracts. However, Mr Zagrobelny believes with the CLEAN contracts now in place the Navy IRP will accelerate quite rapidly. He stated the Navy will continue to support the Air Force while excess capacity exists but will probably stop accepting USAF work at some point in the future (44).

Given the desires of senior DoD officials, it seems very likely the Army and Navy must try to accelerate their respective IRP's. Mr. Zagrobelny indicated the Navy has not established a formal goal but conceded the Year 2000 goal established by General Ahern put pressure on the other services to match Air Force progress (44). Additionally, it seems highly coincidental the CLEAN contracts awarded in 1990 are structured as 10 year contracts.

As the Army and Navy expand their IRP's, the ratio of Air Force IRP work handled by NAVFAC and the COE versus work on their own IRPs will shift against the Air Force. Because the Air Force does not have internal capacity to award and administer large A/E and construction contracts, the Air Force will be forced to 1) slow the pace of the Air Force IRP consistent with the capacity allowed by NAVFAC and the COE, 2) develop the internal capacity of a full service,

major projects organization, or 3) extend the amount of work currently being performed by DoE and other non-DoD agencies.

Extending the time required to complete the IRP is totally contrary to the stated goals of senior DoD and USAF officials; therefore the first option does not seem viable.

The new ESO organization at Brooks AFB will have capability to accept some project management responsibility as an internal full service major projects organization. However, the initial staffing of the ESO is 145 people with only 53 personnel dedicated to the IRP (37). The ESO cannot replace the amount of support currently being provided by NAVFAC and the COE without a significant increase in authorized strength.

By the process of elimination, the most likely option is to extend the amount of IRP work accomplished by DoE and other non-DoD agencies. Since the number of qualified A/E and construction firms accessible by these agencies seems sufficient to handle the workload, the ability to farm out additional Air Force IRP work is limited only by the managerial over-site capacity of Air Force IRP managers.

Unfortunately, this means acceleration of the IRP seems very unlikely; most MAJCOM IRP managers believe they are already at or near their managerial capacity. Since most commands do not allow installation level personnel direct involvement in IRP management, no excess managerial capacity currently exists to allow increased workload be assigned to the service centers.

Another significant concern is increasing costs. IRP work accomplished through DoE includes at least one, and possibly two, layers of additional overhead. With each project costing more, the number of projects accomplished per year could be reduced. Air Force IRP managers must be aware of these increased costs and ensure their programming and budgeting actions are modified accordingly.

The added layer also creates at least one more review step. Additionally, extra time and managerial effort is required to award and administer contracts when more levels are involved. These actions extend the time required to get from project start to project completion. USAF IRP managers must find ways to streamline all steps in the acquisition process in order to prevent unnecessary time extensions.

The end result of IRP expansion by the Army and Navy could easily be extension of the total time required to complete the Air Force IRP. The extent of the additional time required will depend heavily on the ability of Air Force IRP managers to hold delays to a minimum.

MAJCOMs must delegate site management responsibilities to installation level. The increased number of IRP managers then available would allow significant expansion of the amount of work assigned to the ESO, HAZWRAP, and EMO service centers. However, the existing, vacant installation level positions must be filled with qualified personnel and a major shift in MAJCOM managerial policy must occur for any significant IRP acceleration to happen.

## Recommendations for Future Study

The most significant findings of this study involve manpower considerations. One concern is the problem of employee turnover. Given the current environment with a low number of environmental management personnel being produced by the university system, DoD hiring freezes, and severe competition from civilian A/E firms, retention of the limited environmental managers currently on hand should be given high priority.

However, development of pro-active retention programs can not be initiated without additional information on the primary causes of turnover. A study of turnover, similar in nature to the study conducted at the EPA, could provide much of this information. Topics of the study should include quantification of the turnover problem, investigation of the primary causes of turnover, and identification of incentives capable of inducing employees to remain in their positions.

Additionally, the study should investigate the link between availability of permanent positions and retention of temporary employees (term employees and interns). The study should evaluate ways to reduce the impact of education and training lost when these employees move on to other jobs. It may be possible to develop a model to predict turnover prone employees or working conditions.

A related area is comparison of current authorizations versus actual manning at all levels of IRP management. This study identified manpower shortages but in a qualitative

manner. Additionally, the number of MAJCOMs, installations, and technical service centers studied was limited.

A more detailed study concentrating on manpower authorizations should use quantitative methods to develop a baseline of existing authorizations versus the actual manning. Also, the experience level of personnel filling authorized positions at MAJCOMs, installations, and service centers should be determined. Additionally, the study should investigate how implementation of the new manpower standard is being handled by MAJCOMs and report on the probable net gain or loss of environmental management positions with respect to projected manning reductions.

Another manpower related question is how future IRP workloads will affect the workloads of other Air Force organizations. It seems likely more IRP site management responsibility will be delegated to installation level, particularly as installations enter the active site clean-up phase. In addition to impacting the environmental managers in Civil Engineering, this shift will create additional workloads for contracting officers, public affairs officers, bio-environmental engineers, etc..

Installation level environmental managers will be required to work closely with, and in some cases be heavily dependent upon, people from these other organizations. The effectiveness of installation level environmental managers, and the rate of program accomplishment, may depend on how well personnel in these other organizations can absorb the

additional workload created by their increased involvement in environmental management programs.

A study investigating potential workloads, how well prepared other organizations are to accept the workloads, and the impact of the workloads on their existing operating procedures could identify potential problem areas and provide a springboard for corrective actions before serious operational problems are encountered.

Another area touched only briefly in this study is the potential impact on the IRP of future base realignments or closures. Currently are only 5 USAF bases on the Phase 1 base closure list. However, a much larger number of installations are being considered for realignment or closure in the near future.

The final number of installations identified for closure, and the distribution of installations among the various commands, could have significant impact on the IRP workload of one or more MAJCOMs. Additionally, the newly formed ESO has been designated as OPR for IRP sites at bases on the closure list.

If a command has a number of installations on the closure list, the workload on that particular MAJCOM's IRP managers would be significantly reduced when the bases are handed over to the ESO. However, the increased workload at the ESO will reduce the amount of support the ESO can provide to other commands. This places even more emphasis how much work may be shifted to the service centers.

Other aspects of the closure issue are timing and availability of funds. When bases are placed on the closure list a closure date is specified. This establishes a deadline for completion of IRP actions where no deadline had previously existed unless the installation was on the NPL. MAJCOMs and the ESO may find it necessary to shift resources from non-closure installations to closure installations to meet the deadlines.

Once the Phase II closure list is finalized and published, the study could be initiated. The study should identify projected changes in IRP workload distribution, evaluate the capacity of the ESO, MAJCOMs, and other affected organizations to adjust to the workloads, and investigate how the realignment of resources (manpower, funding, etc.) will impact the rest of the IRP.

## Author's Final Comments

Increased environmental awareness and public concern over the quality of health and welfare demand abandonment of time-worn, often abusive, DoD environmental practices of the past in favor of more responsible methods and improved environmental management in the future.

Senior government officials have demonstrated a strong commitment to improved environmental practices. The Congress of the United States has enacted a number of far reaching environmental laws designed to require correction of past abuses and will probably strengthen the existing laws in the

near future. Additionally, Congress has authorized extensive expenditure of funds to pay for needed clean-ups.

Improving the quality of environmental management through out the Air Force is one of the toughest challenges facing Air Force leaders. Faced with shrinking budgets and significant force reductions, Air Force leaders must balance the national security needs of the nation with the public's demands for environmental quality.

The Installation Restoration Program is a crucial element in the development of this new, environmentally conscious corporate culture. The public acknowledgement of past environmental abuses, and the ernest commitment to restore the abused sites, demonstrates acceptance of this increased environmental responsibility.

Execution of the IRP is one of the most significant challenges facing Air Force leaders of the future. Managers at all levels and in many organizations will be impacted, either directly as IRP managers, or indirectly by providing support to the program.

While the goal of completing the IRP by end of FY 2000 seems unlikely, the commitment of the senior DoD leadership to complete the program quickly and efficiently remains very strong. Junior level managers would do well to recognize the strength of the foundation currently being laid and prepare themselves for the time when they are required to step up and assume senior managerial and leadership roles in execution of the IRP.

## Appendix A: MAJCOM IRP Manager Interview Questions

1. Could you briefly describe how program management responsibilities for the Installation Restoration Program (IRP) are distributed in your command?

2. What specific responsibilities have you delegated to base level environmental managers?

3. What organization(s) are involved in procurement and administrative management for IRP projects?

4. Who is responsible for technical approval of the work and on-site construction management of IRP contractors?

5. General Ahern has established the Air Force goal to have 100 percent site closeout by year 2000. Are the manpower authorizations at MAJCOM and base level sufficient to assume the requirements of an accelerated IRP program? How have the recent hiring restrictions affected your program?

6. What areas do you feel you are likely to encounter shortages of the resources (people, funds, technical expertise, etc.) needed to accelerate the IRP program to meet Gen. Ahern's goal?

7. What non-USAF agencies are you using to obtain needed resources? What USAF specialty organizations are you using in your program?

8. What would be the effect on your program if the Army and Navy accelerate their respective IRP programs?

9. What are the most critical challenges you face as an IRP manager?

## Appendix B: Persons Interviewed

### MAJCOM IRP Managers

Colonel Martin J. Byrne
Chief, Environmental Compliance Branch
HQ AFSPACECOM/DEPV, Peterson AFB CO

Major Timothy J. McLean
Chief, Installation Restoration Division
HQ TAC/DEVR, Langley AFB VA

William A. Buchanns
Environmental Engineer
HQ SAC/DEV, Offutt AFB NE

John F.K. Julius
Environmental Planning Branch
HQ AFSC/DEV, Andrews AFB MD

William Pehlivanian Chief
Chief, Environmental Restoration Branch
HQ ATC/DEEV, Randolph AFB TX

Wayne T. Ratliff
Installation Restoration Program Manager
HQ AFLC/CEVR, Wright-Patterson AFB OH

### Additional USAF IRP Managers

Colonel Jose T. Saenz
Commander, Environmental Service Organization
Brooks AFB TX

Lt Col Kenneth Cornelius
Environmental Restoration Division
Office of the Assistant Secretary of Defense (Environment)
Pentagon, Washington DC

Major Stuart A. Nelson
DERA Program Manager
HQ USAF/CEVR, Bolling AFB, Washington DC

Major Terry G. Stoddart
Director, Environmental Management
Aeronautical Systems Division
ASD/DEV, Wright-Patterson AFB OH

Phillip E. Cork
IRP Project Manager
55 CSG/DEEV, Offutt AFB NE

Charlton Crenshaw
Chief, Environmental Management
347 CSG/DEV, Moody AFB GA

Andrew R. Jackson
Industrial Engineer
Air Force Engineering and Services Center
HQ AFESC/DEMG, Tyndall AFB FL

Ronald P. Lester
Chief, Installation Restoration Division
2750 ABW/EMR, Wright-Patterson AFB OH

April G. Lewis
Environmental Engineer
305 CSG/DEEV, Grissom AFB IN

Susan E. Linthicum
AFLC Environmental Manpower Manager
HQ AFLC/CEV, Wright-Patterson AFB OH

David W. Stokes
Chief, Environmental Compliance
56 CSG/DEV, McDill AFB FL

## Non-USAF IRP Managers

Jimmy A. Blair
Manager of Scientific and Technical Contracts
Hazardous Waste Remedial Actions Program (HAZWRAP)
Martin-Marietta Energy Systems, Inc.
Oak Ridge National Laboratory, Oak Ridge, TN

Paul E. Dappen
Project Manager, Hazardous & Toxic Waste Branch
United States Army Corps of Engineers
Missouri River Division, Omaha District, Omaha NE

Jim L. Jacobsen
Manager EMO Contracts
Environmental Management Operations (EMO)
Battelle, Inc.
Pacific Northwest National Laboratory, Richland WA

Ted J. Zagrobelny
Director, IRP Division
Naval Facilities Engineering Command Headquarters
Alexandria VA

## Appendix C: List of Acronyms

| | |
|---|---|
| ABG | Air Base Group |
| ABW | Air Base Wing |
| A/E | Architect/Engineer |
| AFB | Air Force Base |
| AFESC | Air Force Engineering and Services Center |
| AFIT | Air Force Institute of Technology |
| AFLC | Air Force Logistics Command |
| AFMEA | Air Force Management Engineering Team |
| AFSC | Air Force Systems Command |
| AFSPACECOM | Air Force Space Command |
| ASD | Aeronautical Systems Division |
| ATC | Air Training Command |
| BDDR | Building Demolition and Debris Removal |
| BLM | Bureau of Land Management |
| BRAC | Base Realignment and Closure |
| BUR | Bureau of Reclamation |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CLEAN | Comprehensive Long-term Environmental Action, Navy |
| COE | Army Corp of Engineers |
| CONUS | Continental United States |
| CSG | Combat Support Group |
| DERA | Defense Environmental Restoration Account |
| DERP | Defense Environmental Restoration Program |
| DoD | Department of Defense |

| | |
|---|---|
| DoE | Department of Energy |
| EM | Environmental Management |
| EMO | Environmental Management Operations |
| EPA | Environmental Protection Agency |
| ESO | Environmental Support Organization |
| FY | Fiscal Year |
| GAO | General Accounting Office |
| GOCO | Government Owned - Contractor Operated |
| GS-xx | General Schedule Employee Level |
| HAZWRAP | Hazardous Waste Remedial Action Program |
| HQ | Headquarters |
| HSD | Human Services Division |
| IRP | Installation Restoration Program |
| MAJCOM | Major Command |
| MILCON | Military Construction Program |
| MOU | Memorandum of Understanding |
| NAVFAC | Naval Facilities Engineering Command |
| NFRAP | No Further Response Action Planned |
| NORAD | North American Aerospace Defense |
| NPL | National Priority List |
| O&M | Operations and Maintenance |
| OEHL | Occupational and Environmental Health Laboratory |
| OHW | Other Hazardous Waste |
| OPR | Office of Primary Responsibility |
| OSC/RPM | On-Scene Coordinator/Remedial Project Manager |
| PA/SI | Preliminary Assessment/Site Investigation |

| | |
|---|---|
| POC | Point of Contact |
| QAE | Quality Assurance Evaluator |
| RCRA | Resource Conservation and Recovery Act |
| RD/RA | Remedial Design/Remedial Action |
| RI/FS | Remedial Investigation/Feasibility Study |
| SAC | Strategic Air Command |
| SAF | Secretary of the Air Force |
| SARA | Superfund Authorization and Reauthorization Act |
| SOW | Statement of Work |
| TAC | Tactical Air Command |
| USAF | United States Air Force |
| USGS | United States Geological Service |

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## Vita

Captain Robert L. Vinson III was born 10 June 1955 in Gunnison, Colorado. He graduated from Gunnison High School in 1973 and enlisted in the U.S. Air Force as a Vehicle Operator in 1974. After assignments in Texas, South Dakota, and Ohio, he transferred to the Engineering Technician field in 1980 and served with the 341 Civil Engineering Squadron, Malmstrom AFB, Montana as NCOIC, Construction Management. In 1983 he was selected to participate in the Airman Education and Commissioning Program and attended the University of Colorado, Boulder, graduating with a Bachelor of Science in Civil Engineering in June 1986. Upon graduation, he attended Officers Training School and was commissioned into the USAF. His first assignment was with the 47 Civil Engineering Squadron at Laughlin AFB, TX, where he held positions as Design Civil Engineer, Environmental Coordinator, Chief of Design, and Chief, Engineering and Environmental Planning Branch. In February 1989 he reported to 1012 Air Base Wing, Thule AB, Greenland, where he served as Chief, Engineering and Programs Branch until entering the School of Systems and Logistics, Air Force Institute of Technology, in May 1990.

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# REPORT DOCUMENTATION PAGE

*Form Approved*
*OMB No. 0704-0188*



| 1. AGENCY USE ONLY *(Leave blank)* | 2. REPORT DATE | 3. REPORT TYPE AND DATES COVERED |
|---|---|---|
| | September 1991 | Master's Thesis |

**4. TITLE AND SUBTITLE**
EVALUATION OF MANAGERIAL CHALLENGES CREATED BY ACCELERATION OF THE INSTALLATION RESTORATION PROGRAM

**5. FUNDING NUMBERS**

**6. AUTHOR(S)**
Robert L. Vinson III, Captain, USAF

**7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)**
Air Force Institute of Technology, WPAFB OH, 45433-6583

**8. PERFORMING ORGANIZATION REPORT NUMBER**
AFIT/GEM/DEM/91S-14

**9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)**

**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**

**11. SUPPLEMENTARY NOTES**

**12a. DISTRIBUTION/AVAILABILITY STATEMENT**
Approved for public release; distribution unlimited

**12b. DISTRIBUTION CODE**

**13. ABSTRACT** *(Maximum 200 words)* This study investigates the distribution of managerial tasks related to the Installation Restoration Program (IRP). Initiated in 1986, the IRP is the DoD program to identify and clean-up hazardous waste sites. Study areas include current distribution of managerial tasks, changes in task distribution needed to accelerate the program, and potential resource constraints. Additionally, the study considers how acceleration of Army and Navy restoration programs could impact the Air Force IRP. The study reveals IRP management is heavily centralized at MAJCOM with most technical work being performed through contracts with service centers. Individual bases have little direct involvement in the program. Most MAJCOMs do not believe installations can adequately manage the IRP and anticipate retaining managerial control of the program. Manpower is the most notable constraint. Organizations are operating below desired strength and experience high turnover. MAJCOMs, installations, and service centers need additional manpower for IRP acceleration to occur. Added constraints include money and time. The Air Force IRP is ahead of other DoD IRP programs. However, the Air Force depends heavily on support from other agencies and could experience serious problems as DoD IRP programs expand and consume intra-service resources.

| 14. SUBJECT TERMS | 15. NUMBER OF PAGES |
|---|---|
| Environmental Engineering, Environmental Protection, Hazardous Materials, Installation Restoration Program, Management Engineering, Manpower Studies | 108 |
| | 16. PRICE CODE |

| 17. SECURITY CLASSIFICATION OF REPORT | 18. SECURITY CLASSIFICATION OF THIS PAGE | 19. SECURITY CLASSIFICATION OF ABSTRACT | 20. LIMITATION OF ABSTRACT |
|---|---|---|---|
| Unclassified | Unclassified | Unclassified | UL |

AFIT Control Number AFIT/GEM/DEM/91S-14

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