STRATEGY RESEARCH PROJECT

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

CONSIDERATIONS FOR THE DEVELOPMENT OF A DoD POLICY FOR OPERATIONS OTHER THAN WAR

BY

COLONEL DAVID L. CARR
United States Army

DTIC QUALITY INSPECTED

DISTRIBUTION STATEMENT A:
Approved for public release.
Distribution is unlimited.

USAWC CLASS OF 1997

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

19970819 060

White Paper

Considerations for the Development of a DoD Environmental Policy for Operations Other Than War

DISTRIBUTION STATEMENT A:
Approved for public release. Distribution is unlimited.

Colonel David L. Carr
U.S. Army War College Fellow
U.S. Army Environmental Policy Institute

The views presented in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies, nor any of the persons, institutions, or staffs cited.

May 30, 1997

Considerations for the Development of a DoD Environmental Policy for Operations Other Than War

Colonel David L. Carr May 1997

Abstract

Since the end of the Cold War, the Department of Defense has evolved its warfighting strategy from traditional principles of land warfare to a new and decidedly more complex military strategy involving military operations other than war (OOTW). The strategic principles of OOTW require U.S. forces to achieve "full spectrum dominance" across a wide range of military operations, ranging from peace missions to operations short of war. Political imperatives are closely intertwined with this new military strategy, and the ultimate success of these missions may depend on a political outcome as much as a military victory.

In the past decade, concerns about the degradation of the world's environment and dwindling natural resources have become a politically sensitive issue, especially during operations other than war. The Department of Defense has made great strides in integrating environmental stewardship in all its military actions. Despite this emphasis on environmental protection, existing U.S. environmental laws and military regulations do not adequately cover OOTW. As a result, DoD has no strategic environmental policy, either Joint or Service, upon which it can base its environmental doctrine in OOTW.

This paper represents the first phase of an environmental policy development project being conducted by the Army Environmental Policy Institute (AEPI). This report assesses the need for a joint environmental policy for OOTW, identifies the key policy issues, and provides specific recommendations for future policy development. This report also emphasizes the need to integrate joint doctrine on environment, health, and safety issues during OOTW, and is intended to serve as the foundation for a Department of Defense Instruction on Environmental Policy for OOTW.

Acknowledgments

This paper is the result of the author's year-long Senior Service College Fellowship at the Army Environmental Policy Institute (AEPI). The principal author and analyst of this paper is Colonel David L. Carr.

This report would not have been possible without the superb assistance and guidance of Dr. Edward Novak and his entire staff at AEPI; Mr. Ray Fatz, Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), and his staff; Ms. Sherri Goodman, Deputy Undersecretary of Defense for Environmental Security, and her staff; Mr. David Neeley, U.S. Army TRADOC/U.S. Army Engineer School, and his staff; Mr. John Resta, Center for Health Promotion and Preventive Medicine; Mr. Steve Hearne, U.S. European Command; Major Donald Archibald and Mr. Garry Zettersten, U.S. Army Europe; Mr. James Wickemeyer, Defense Logistics Agency (Europe); Major Tom Ayres, Office of The Judge Advocate General; and Mr. Bill Mackie, The Joint Staff, J-4, and his staff. Additionally, Colonel Carr wishes to give special thanks to Mr. Bob Jarrett of AEPI for his wisdom, skill, and patience as an academic mentor. Finally, the author wishes to express his appreciation to Colonel Stephen Pryplesh and Ms. Michelle DeShong, Army War College (Senior Service College Fellowship Program), for their exceptional support during the Fellowship.

The views presented in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies, nor any of the persons, institutions, or staffs cited above.

Contents

List of Acronyms vii

1. Introduction 1
- 1.1 Statement of the Problem 1
- 1.2 Policy Development 1
- 1.3 Sponsors 2
- 1.4 Objective 2
- 1.5 Limitation of Work 2

2. Background 3
- 2.1 Changes in U.S. Military Strategy 3
- 2.2 Principles of Operations Other Than War 3
- 2.3 The Legal Basis for Environmental Protection Policy During OOTW 4
  - 2.3.1 Peacetime Environmental Laws 5
  - 2.3.2 Traditional Laws of War and the Environment 7
  - 2.3.3 The Void in Environmental Law 7

3. Current Joint Doctrine Affecting Environmental Protection 9
- 3.1 Joint Contingency Engineering Doctrine 9
- 3.2 Current Joint Environmental Doctrine 9
- 3.3 Future Joint Environmental Doctrine 9

4. Current Service Doctrine Affecting Environmental Protection During OOTW 11
- 4.1 Army Environmental Doctrine 11
- 4.2 Navy and Air Force Environmental Doctrine 13

5. Operation Joint Endeavor—A Case Study for Future Environmental Policy 14
- 5.1 Use of Civilian Contractors for Engineering and Environmental Services 14
- 5.2 The Army LOGCAP Program 14
- 5.3 Environmental Protection Program and Hazardous Waste Management 15
  - 5.3.1 Environmental Baseline Surveys 16
  - 5.3.2 Hazardous Waste Management Program 17
  - 5.3.3 Emergency Hazardous Materials Spill Response Program 17
  - 5.3.4 Hazardous Waste Disposal 17
- 5.4 Environmental Lessons Learned During Operation Joint Endeavor 18
  - 5.4.1 General 18
  - 5.4.2 Hazardous Waste Management and the Use of Contractors 20
  - 5.4.3 Hazardous Waste Disposal 21

6. Considerations in the Development of DoD Environmental Policy for OOTW 23
- 6.1 Issue: Command Authority for Environmental Protection 23
- 6.2 Issue: Reporting Procedures for Environmental Protection Issues 25
- 6.3 Issue: Risk Assessment—The Critical Link Between Environment, Health, and Safety 25
- 6.4 Issue: Training and Doctrine Development 27
- 6.5 Issue: Use of Reserve Forces in Environmental Protection Activities 28

6.6 Issue: Funding 29

7. Findings 31

8. Conclusions 34

Appendix A 35

Appendix B 36

Appendix C 37

Appendix D 38

Bibliography 39

List of Acronyms

AEPI	Army Environmental Policy Institute
AMC	Army Materiel Command
AR	Army Regulation
ASC	Army Safety Center
CHPPM	Center for Health Promotion and Preventive Medicine
CINC	Commander in Charge
CJCSM	Chairman of the Joint Chiefs of Staff Memorandum of Policy
DASA	Deputy Assistant Secretary of the Army
DENIX	Defense Environmental Network and Information Exchange
DLA	Defense Logistic Agency
DoD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DRMO	Defense Reutilization and Marketing Office
DRMR-E	Defense Reutilization and Marketing Region (Europe)
DUSD-ES	Deputy Undersecretary of Defense (Environmental Security)
EBS	Environmental Baseline Survey
EEA	Environmental Executive Agent
EO	Executive Order
EPPL	Environmental Protection Posture Level

ESOH	Environment, Safety and Occupational Health
EUCOM	U.S. Army European Command
FGS	Final Governing Standards
FM	Field Manual
FORSCOM	U.S. Forces Command
GAO	Government Accounting Office
IAW	In Accordance With
JEMB	Joint Environmental Management Board
JOPES	Joint Operation Planning and Execution System
JTF	Joint Task Force
LOGCAP	Logistics Civil Augmentation Program
MCWP	Marine Corps Warfare Publication
MOPP	Mission Oriented Protection Posture
NAVEUR	U.S. Navy Europe
NEPA	National Environmental Protection Act
NWP	Naval Warfare Publication
ODEP	Office of the Director for Environmental Programs
OEBGD	Overseas Environmental Baseline Guidance Document
OOTW	Operations Other Than War
SITREP	Situation Report
SOFA	Status of Forces Agreement
THREATCON	Threat Condition

TPFDD	Time-Phased Force and Deployment Data
TRADOC	Training and Doctrine Command
USAES	U.S. Army Engineer School
USAFE	U.S. Air Force Europe
USAREUR	U.S. Army Europe
USAREUR-E	U.S. Army Europe (Environmental Office)

1. Introduction

1.1 Statement of the Problem

In the past decade, the Department of Defense has made great strides in promoting environmental stewardship in military operations at home and abroad. Despite this emphasis on environmental protection, however, no strategic environmental policy, either at the Joint or Service level, applies specifically to operations other than war (OOTW). Existing environmental laws, policies, and regulations have established specific environmental protection standards and procedures for peacetime military operations worldwide. Unfortunately, most of these peacetime regulations and policies are inappropriate for use during OOTW.

In the absence of specific guidance from the Department of Defense, the Joint Task Force Commander must create his environmental doctrine by subjectively modifying existing peacetime environmental policy. Although a certain level of success in environmental protection has been achieved in past operations, the resulting policies are inherently inconsistent, confusing, and often ineffective. This lack of strategic guidance on environmental protection issues during OOTW creates an unnecessary burden on the operational commander, endangers the health and safety of U.S. forces, places environmental imperatives at risk, and exposes the United States to potential liability claims by host nations.

1.2 Policy Development

During Operation Joint Endeavor, the Commander in Chief (CINC) of the U.S. European Command (EUCOM) designated the U.S. Army Europe (USAREUR) as the Theater Environmental Executive Agent (EEA). In developing the Environmental Annex to the EUCOM Operations Plan, USAREUR reported the absence of a clearly defined strategic policy on environmental protection during OOTW, and requested that the Deputy Assistant Secretary of the Army for Environmental Safety and Occupational Health provide guidance on this issue. In turn, DASA (ESOH) tasked the Army Environmental Policy Institute (AEPI) to assess the requirements for an Army environmental policy for OOTW and to develop the required policy implementation document.

Following its initial policy assessment, AEPI recommended that a DoD-level policy document would be more effective than having each Service develop a separate environmental doctrine for use during Joint Operations. It was further recommended that a DoD Working Group be authorized by the Deputy Undersecretary of Defense for Environmental Security (DUSD-ES) to allow the Services and select DoD agencies to collectively develop a Department of Defense Instruction on environmental policy for OOTW.

This recommendation was accepted by DUSD-ES, and the DoD Environmental Working Group was authorized in April 1997. The Army was named as the Executive

Agent for the group. As such, AEPI was directed to establish the general parameters of the proposed policy initiative, provide a preliminary policy assessment, identify key policy issues, and submit recommendations for policy development to the Working Group by mid-1997.

1.3 Sponsors

The primary sponsors involved in this project are the Office of the Deputy Assistant Secretary of the Army for Environment Safety and Occupational Health (DASA-ESOH), the United States Army Environmental Policy Institute (AEPI), and U.S. Army Europe (USAREUR). In addition, the Project Advisory Group for this AEPI initiative includes the Office of the Deputy Undersecretary of Defense for Environmental Security (DUSD-ES); the Office of the Director, Environmental Programs (ODEP); U.S. European Command (EUCOM); U.S. Army Central Command/Third U.S. Army; U.S. Army Forces Command (FORSCOM); the U.S. Army Training and Doctrine Command (TRADOC); the U.S. Army Engineer School (USAES); the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM); the U.S. Army Safety Center (ASC); and the Defense Logistics Agency (DLA). This report represents the major product of the author's Senior Service College Fellowship at AEPI.

1.4 Objective

This report represents the first phase of an environmental policy development project conducted by the Army Environmental Policy Institute. The purpose of this report is threefold: to assess the requirement for a DoD-level environmental policy for operations other than war, to identify key issues involved with this policy initiative, and to provide recommendations for policy development to the Deputy Assistant Secretary of the Army (ESOH) and the Deputy Undersecretary of Defense (Environmental Security). This report will be forwarded by DUSD-ES to the DoD Working Group during the second phase of this project and used as a base document in the creation of a Department of Defense Instruction (DODI) on Joint environmental policy for OOTW.

1.5 Limitation of Work

The following limits apply to the scope of this project:

This report addresses joint requirements and capabilities regarding environmental doctrine and emphasizes the need for integration and unity of effort between the Services. Although various references to Army environmental doctrine are highlighted, this report does not attempt to assess or compare individual environmental programs and policies among the Services. It does not attempt to address every aspect of this complex policy initiative, nor does it provide the final, definitive policy language of the proposed DODI.

2. Background

2.1 Changes in U.S. Military Strategy

Military doctrine must be capable of executing the strategy of its time...doctrine in the present and predicted strategic environments will be much less prescriptive and much less given to precise, scientific analysis than military doctrine of the Cold War.

TRADOC Pam 525-5
Force XXI Operations

With the end of the Cold War, the United States began a gradual shift in both its National Security Strategy and National Military Strategy in order to adjust to the rapid geopolitical changes of the 1990s. The Army characterized this shift as a change from a "threat based" strategy to a "capabilities based" strategy, as illustrated below:

Threat Based	Capabilities Based
Containment Strategy	Engagement & Enlargement Strategy
Forward-Based Forces	Power Projection Army
Global, Nuclear War Focus	Regional Conflict Focus
Monolithic Soviet/WP Threat	Major Regional Competitor Only
Deter and Defend	Peacetime Engagement & Preventive Defense
	Domestic Support

Whereas the threat-based strategy was designed to "deter or defeat" a single large adversary, today's capabilities-based strategy seeks to "compel, deter, reassure, or support" involved nations. This strategy coincides with the Joint Vision 2010 requirement for U.S. Armed Forces to achieve "full spectrum dominance" across a wide range of military operations, from peacetime engagements to fighting and winning an armed conflict (Joint Vision 2010, 1996). Recent operations in the Persian Gulf, Somalia, Haiti, Bosnia-Herzegovina, and Zaire serve to illustrate the broad range and complexity of missions facing U.S. forces today.

2.2 Principles of Operations Other Than War

While we have historically focused on warfighting, our military profession is increasingly changing its focus to a complex array of military operations -- other than war.

Gen. John M. Shalikashvili
Chairman, Joint Chiefs of Staff

The United States has deployed its military forces in over twenty-five operations since 1990. Nearly all of these operations fall under the category of "operations other than war." The underlying principles and types of OOTW are described in detail in Joint Pamphlet 3-07 and summarized in Appendices A and B.

Perhaps the most important aspect of OOTW is the emphasis placed on attaining specific political objectives. The success or failure of these military operations is often determined by the overall political outcome rather than a victorious military engagement. Operation Joint Endeavor is an excellent example of how the military mission, though critical to the overall success of the operation, played but one part of the larger U.S. national security (political) objective of deterring further war and promoting peace in the Balkans. Operation Joint Endeavor was an extension of the Dayton Peace Accords, a political agreement arranged by the State Department. The difficulty for the Unified Combatant Commander was to plan and execute a military operation that would not only involve the full range of military operations other than war, but was also flexible enough to adapt to the caprices of changing political imperatives. To further complicate the CINC's plan, the tactical situation could change from peaceful to hostile at any time during the operation.

With the continued degradation of the world's national resources, environmental concerns have increasingly become a volatile political issue between and within nations. Environmental protection is a politically sensitive issue in any operation other than war. Without question, the successful completion of the military mission and the protection of U.S. forces is the first priority of the CINC or Joint Task Force Commander during contingency operations. However, the political reality remains that any inappropriate action by U.S. Forces during OOTW which results in the degradation of the host nation's ecosystem or causes adverse effects to the health and safety of the civilian population is contrary to our national interest and may result in the failure to achieve the desired political victory. U.S. military forces must therefore balance the application of appropriate standards of environmental protection with mission accomplishment and force protection during OOTW.

2.3 The Legal Basis for Environmental Protection Policy During OOTW

The United States is providing the leadership to promote global peace and prosperity. We must also lead in safeguarding the global environment on which that prosperity and peace ultimately depend.

Warren Christopher
Former U.S. Secretary of State

The legitimacy of any U.S. military mission is directly related to compliance with national and international laws, treaties, and agreements. The politically sensitive nature of OOTW makes it imperative for U.S. forces to abide by both U.S. and host nation environmental laws to the extent that the tactical situation permits. The environmental

laws, policies, and regulations that apply to military operations are divided into two broad categories according to their application during peace and war.

2.3.1 Peacetime Environmental Laws

Most environmental laws that affect U.S. military operations during peacetime are primarily designed for use at the installation level, and are closely linked with local civilian environmental standards and subject to close scrutiny by local and national environmental authorities. The following are examples of peacetime laws applicable to the military, both in CONUS and overseas:

- National Environmental Protection Act (NEPA)—An example of U.S. domestic law that requires federal agencies to incorporate environmental considerations into the planning and decision-making process of all federal actions. In general terms, NEPA requires government leaders to "think before you act," and to carefully balance the operational requirements of a federal action or military operation against potential adverse effects on the environment. NEPA does not provide specific environmental standards, nor does it prohibit federal agencies from performing actions that are harmful to the environment. Rather, it is a decision process which does not mandate a particular result. It does, however, require that all federal agencies, including DoD, carefully assess the environmental impact of any proposed federal action prior to its inception, and to provide written documentation of these effects, generally through the creation of an Environmental Impact Statement or Environmental Assessment.

- Army Regulation 200-2, *Environmental Protection and Enhancement*—The Army implementation document for NEPA. It states that the "Department of the Army will carry out the mission of national security in a manner consistent with NEPA and other applicable environmental standards, laws, and policies."

- Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions* — Provides the requirement for NEPA-like environmental analysis and documentation of major federal actions overseas which have significant effects on the environment of a foreign nation or the global commons.

- DoD Directive 1650.7, *Environmental Effects Abroad of Major Department of Defense Actions*—This is the DoD implementation document for E.O. 12114. It "provides policy and procedures to enable Department of Defense officials to be informed and take account of environmental considerations when authorizing or approving certain major federal actions that do significant harm to the environment of places outside the United States." This Directive will be replaced by DoD

Instruction 4715.II, *DoD Policy for Analyzing Defense Actions with the Potential for Significant Environmental Impacts Outside the United States.*

- Overseas Environmental Baseline Guidance Document (OEBGD) and Final Governing Standards (FGS)— The OEBGD requires U.S. installations overseas to adhere to "generally accepted environmental standards" that are customarily applied to military installations in the United States. Final Governing Standards are established by comparing the OEBGD standards with the environmental standards of the host nation. In every category of environmental protection, the stricter of the two standards is generally used for the FGS. Once a consensus is reached, the FGS becomes the environmental standard required for U.S. forces in that country.

These and other peacetime laws and regulations illustrate the Department of Defense's continued commitment to incorporating environmental stewardship throughout its worldwide operations. However, recent changes in the National Military Strategy and the increase in military operations other than war are now necessitating changes in DoD environmental doctrine. Peacetime environmental laws like those described above have frequently been used as the basis for the Environmental Annexes found in Operations Plans in support of military operations in Somalia, Haiti, and Bosnia. Unfortunately, the use of these peacetime environmental laws is often inappropriate for use during OOTW, due primarily to lack of application or to specific exclusions and exemptions written into the documents:

- Lack of extraterritorial application:

  NEPA—The applicability of U.S. domestic environmental law is very questionable when applied outside U.S. borders. The "extra-territorial applicability" of NEPA continues to be debated extensively, but with few exceptions the courts have ruled that NEPA does not apply overseas, since it does not provide "a clear expression of Congress' intent for extraterritorial application" (Whitaker, 1995). Future federal legislation or court action may extend the applicability of NEPA to U.S. operations overseas. However, it is likely that exclusions (similar to E.O. 12114 and OEBGD below) will prevent its application to OOTW.

- Exclusions and exemptions written into these documents for hostile situations:

  E.O. 12114— Does not apply under the following circumstances: actions taken by the President or members of the Cabinet; DoD actions taken in response to orders by the President or members of the Cabinet during an armed conflict; actions taken by the President in the interest of national security; certain activities involving U.S. intelligence agencies; actions taken involving disaster and

emergency relief operations; and additional case by case exemptions and categorical exclusions as deemed necessary by the Secretary of Defense (Whitaker, 1995).

OEBGD—Not applicable during operations involving armed conflict or threat of hostile actions. Does not apply to naval operations, military deployments, or flight operations during contingency operations.

2.3.2 Traditional Laws of War and the Environment

Environmental considerations should not obstruct the application of the principles of war...environmental restraints should not increase the cost of victory to friendly forces, the probability of a prolonged conflict, or the probability of an unfavorable outcome.

BG Joseph G. Garrett, III

Designed for use during large-scale, sustained combat operations, the traditional laws of war and related conventions recognize that the purpose of an armed force in war is to achieve decisive victory by bringing concentrated and overwhelming force to bear against an enemy. Protection of natural and cultural resources, although a consideration during large-scale wars, becomes a secondary priority. However, provisions for protecting the environment are contained in laws of war, including the Hague IV and Hague Regulations, the Fourth Geneva Convention, and the ENMOD (Environmental Modification) Convention (Whitaker, 1995). The traditional laws of war give broad discretion to tactical commanders, who are bound by general rules of "military necessity," "proportionality," and the established Rules of Engagement. Although operations other than war are generally focused on promoting peace and deterring war, these operations occasionally involve brief episodes of fierce combat activity where the laws of war will apply.

2.3.3 The Void in Environmental Law

Clearly, the legal basis for environmental doctrine during OOTW remains elusive for operational commanders. Peacetime laws are well-suited for installations at home, but they are too restrictive or inappropriate for use across the full spectrum of contingency operations. Conversely, the laws of war do not provide an appropriate level of environmental protection during operations short of war. Until now, resolution of this "gray area" in environmental law has been left to the discretion of the individual CINCs.

In the absence of a clearly defined DoD environmental policy for OOTW, the CINCs have subjectively modified current peacetime laws in order to establish the legal basis for their Theater environmental protection policy. This method of determining environmental doctrine for OOTW is often ineffective and legally unsound. It results in doctrine that is incomplete, inconsistent, and confusing. This situation increases the potential for political embarrassment and increased liability for the U.S., unnecessary risk

to the natural and cultural resources of the host nation, and increased risk to the health and safety of U.S. forces, coalition forces, and civilians. Even if the military operation is successful, any inappropriate actions by U.S. forces could potentially deprive the U.S. of a successful political outcome.

3. Current Joint Doctrine Affecting Environmental Protection

3.1 Joint Contingency Engineering Doctrine

In May of 1996 the Engineer Interoperability Working Group, sponsored by the Joint Staff J-4, published a White Paper that called for the development of a comprehensive and integrated joint engineering doctrine for contingency operations. This White Paper indicated that current joint doctrine does not adequately reflect the full spectrum of roles, responsibilities, and capabilities of engineers during joint and combined operations. The Working Group found that "there is no clearly defined program of engineer doctrine in the joint publication hierarchy, [and] what doctrine does exist is incomplete and at times contradictory."

One of the key problems addressed by this report was that Joint Pub 4-04, *Joint Doctrine for Civil Engineering Support*, does not provide sufficient guidance to serve as the capstone document for engineering doctrine during joint operations. The report indicated that Joint Pub 4-04 focuses on civil engineering (construction of buildings, roads, etc.) and does not include sufficient guidance on other vital engineering functions such as topography, mobility/countermobility, engineering force assessment, engineer preparation of the battlefield, operational planning, and environmental support.

The report also indicated that "sufficient engineer resources to satisfy all requirements probably will not be available in all contingencies." Since environmental issues have traditionally been placed within the engineering domain, this statement is particularly disturbing, and highlights the inherent danger of "stovepiping" environmental compliance activities exclusively through engineering channels.

3.2 Current Joint Environmental Doctrine

Although environmental issues apply to many joint doctrinal areas other than Civil Engineering, they are restricted to a brief section in Joint Pub 4-04. An important provision of this environmental section is the requirement for a separate environmental annex or appendix to be included in all Joint Operations Plans and Operations Orders. (This environmental annex format is summarized in Appendix C.) In addition, this section emphasizes the importance of including environmental issues early in the operational planning stage. Aside from these two major provisions, the environmental section of Joint Pub 4-04 is woefully lacking in content, making it inadequate for use as the definitive source of joint guidance for environmental policy during OOTW.

3.3 Future Joint Environmental Doctrine

The Joint Staff is currently revising Joint Pub 4-04. This revision will describe environmental issues only as they relate to Civil Engineering operations. A broader scope of environmental issues will be addressed in a new Joint Publication, Joint Pub 3-34,

which is currently being developed. Joint Pub 3-34 will describe the full spectrum of Engineer functions that are more closely associated with J-3 (Operations) such as operational movement, maneuver and force protection, transition and redeployment operations, and environmental support. Environmental issues addressed in Joint Pub 3-34 will include operational planning, environmental stewardship, environmental compliance, mitigation and restoration, and waste disposal.

Joint Pub 3-34 will also establish a Joint Environmental Management Board (JEMB). One of the most significant functions of the JEMB will be to integrate the environmental protection programs of all the Services under a single authority, thus providing much needed unity of command to environmental protection activities during OOTW. The JEMB will include a director (the JTF Engineer), representatives from each of the service components, and representatives from special activities such as legal, preventive medicine, safety, comptroller, and logistics. The JEMB will participate in the operational planning process by providing environmental intelligence reports, assessments, and environmental management requirements to the JTF Commander. The JEMB will establish the CINC/JTF Commander's environmental policies, procedures and priorities, and provide oversight of environmental protection standards and compliance (Joint Pub 3-34).

Another joint doctrine initiative being developed by the Joint Staff is a standardized environmental annex which expands upon the current Joint Pub 4-04 format. "Annex L" will be the template for all Joint OPLAN and OPORD Environmental Annexes. It is described in CJCSM 3122.03, 1 June 1996, and is being developed for inclusion in the Joint Operational Planning and Execution System (JOPES) as a joint planning document.

4. Current Service Doctrine Affecting Environmental Protection During OOTW

Army operational doctrine is comprehensive. It integrates hundreds of subjects into a tightly crafted collection of writings that provide guidance to soldiers at every level. Mapping the requirements of the Army's environmental strategy into operational doctrine will entail a gradual process of introducing concepts and norms into capstone doctrinal manuals while simultaneously developing specific requirements in procedural publications.

BG Joseph G. Garrett, III
Director of Strategy, Plans, and Policy
DCSOPS

4.1 Army Environmental Doctrine

In 1993, as the Army implemented its new doctrine of full-spectrum operations, the U.S. Army Training and Doctrine Command (TRADOC) tasked the U.S. Army Engineer School (USAES) with developing and integrating environmental doctrine and training for Army tactical units (Garrett, 1996). Part of that effort was the creation of two White Papers published in 1995 and 1996. The more recent White Paper, *"Environmental Considerations in Army Operational Doctrine,"* represents the definitive background document for development of environmental doctrine for OOTW.

The purpose of this landmark document is to present the conceptual framework for new Army environmental doctrine, to establish the basic principles for doctrine development, and to act as a catalyst for future policy development. It so completely captures the essence of environmental protection imperatives during military operations that any subsequent doctrine or policy development will trace its origin to the philosophy and principles presented in this document. Its first principle, "Do not unnecessarily hinder the field commander in accomplishing the mission or in protecting his soldiers," recognizes that mission accomplishment and force protection are the prime considerations for tactical commanders in achieving success in any military operation. However, its second principle is equally valid, especially in politically sensitive OOTW: "Do not avoid environmental responsibilities by covering all conditions with the first principle."

In addition to establishing baseline requirements and objectives for the Army's new environmental doctrine, the White Paper provides many procedural guidelines that will be essential to the creation of future joint environmental policy. One such contribution is a standardized Environmental Annex that is designed for use in Joint Operations Plans. This Annex is derived from the basic policy guidance contained in Joint Pub 4-04 (see Appendix C), and has been expanded and developed into a viable template for use in OOTW.

A particularly significant contribution of this White Paper is the concept of establishing "Environmental Protection Posture Levels" (EPPL) for use during military operations (see Appendix D). This concept, similar to Mission Oriented Protection Posture (MOPP) levels for different NBC threats, would act as a definitive guide for ground commanders in applying the correct level of environmental protection in response to changing tactical situations. Level 1, the author suggests, can be applied to combat situations, where environmental protection procedures are less strict due to mission and force protection requirements. A Level 4 posture would apply to peace operations, where environmental protection requirements are more strictly enforced. Until this White Paper introduced the concept of linking well-defined environmental protection levels to different tactical threat conditions, ground commanders had to arbitrarily decide for themselves which environmental laws and regulations were applicable across the full range of military operations. The EPPL matrix in Appendix D was not intended to be a final guidance document, and will require further development. However, the idea of incorporating environmental protection posture levels into operational planning and linking it to the prevailing THREATCON level is a valid doctrinal concept that should be incorporated into joint policy for OOTW.

Once the White Paper set the basic parameters for environmental doctrine, the central task for the Army Engineer School was to integrate the concept of "environmental stewardship" throughout the Army. Environmental compliance issues at the operational and tactical levels were no longer to be restricted to engineering units. USAES sought to weave an "environmental ethic" throughout the fabric of Army doctrine, with the expectation that every soldier, at every level of the Army, would incorporate environmental protection measures as a matter of routine when completing military tasks. This is especially important at the operational and tactical level during OOTW, where Engineer units are heavily involved with civil engineering missions (e.g., facility and road construction), especially in the early phases of the operation.

An important step in this process was to revise Army capstone field manuals to incorporate environmental issues into Army doctrine. Examples of field manuals that are scheduled for revision by TRADOC include:

- FM 100-5, *Operations*
- FM 101-5, *Staff Organizations and Operations*
- FM 100-1, *The Army*; FM 22-100, *Military Leadership*
- FM 25-100, *Training the Force*
- FM 25-101, *Training the Force: Battle Focused Training*
- FM 100-10, *Combat Service Support*
- FM 34-130, *Intelligence Preparation of the Battlefield*

In addition to revising existing field manuals, a new field manual, FM 20-400, *Military Environmental Protection*, has been released in draft form and is expected to be published by mid-1997. It was developed as a collaborative effort between the Army and

Marine Corps (the Marine Corps will distribute this manual as MCWP 4-21.1). Once published, this landmark manual will represent the most comprehensive and detailed source of environmental protection Service doctrine for tactical land forces.

4.2 Navy and Air Force Environmental Doctrine

The Navy and Air Force are also developing environmental protection manuals that are nearly identical in philosophy and principles to FM 20-400 and MCWP 4-21.1. The Navy has a draft version of its Naval Warfare Publication (NWP) 4-11, *Environmental Protection,* nearly ready for publication, and the Air Force has developed the *Air Force Environmental Handbook for Contingency Operations* (Aug 96). Although these manuals were developed to support specific Service mission requirements, they are consistent with one another and demonstrate a remarkable unity of effort between the Services to provide environmental protection during military operations. By developing "interlocking" environmental Service doctrine, the Services have set the stage for the development of a Joint Environmental Policy for OOTW.

5. Operation Joint Endeavor—A Case Study for Future Environmental Policy

5.1 Use of Civilian Contractors for Engineering and Environmental Services

The use of civilian contractors to augment U.S. forces during military operations is not a new concept, nor is it unique to OOTW. However, recent reductions in the size and number of military units available for military deployments have resulted in an increasing trend towards the use of civilian contractors to augment military units in selected Combat Support and Combat Service Support missions. Since 1992, civilian contractors have been used to provide logistical and engineering services in support of military operations in Saudi Arabia, Kuwait, Somalia, Haiti, Bosnia, and Rwanda. This trend is likely to continue into the next century, as the use of contractors during OOTW is an effective means of providing logistical support across a broad range of military missions.

One of the primary reasons for using contracted logistical and engineering support is the insufficient numbers of active and reserve military forces available to provide such support. Political considerations, so pervasive during OOTW, also provide compelling reasons to use civilian contractors. In Bosnia, the Dayton Peace Accords placed a limit on the total number of U.S. military personnel that could deploy to the region. A lack of information about logistic support requirements within the region complicated early logistic planning. The changing political circumstances surrounding the military mission—such as determining the exact role the U.S. would play in the operation, the duration of the mission, the threat level facing U.S. forces, and the possible unwillingness of the warring factions to abide by the Peace Accords—made it very difficult for military planners to provide effective logistical and engineering support for Operation Joint Endeavor.

5.2 The Army LOGCAP Program

The Department of Defense has frequently used civilian contractors to augment its military forces in past wars and OOTW. In Bosnia, this was accomplished largely through the use of the Logistics Civil Augmentation Program (LOGCAP). This program was started by the Army in 1985 to provide advanced planning for the use of contractors during contingency operations and to coordinate sources of available civilian logistic support in the United States and overseas (GAO, 1997). During Operation Joint Endeavor, the LOGCAP contractor was Brown and Root Services Corporation, which was tasked to provide a wide range of logistic services, including civil engineering, laundry and food service, environmental support services, maintenance, and cargo handling services. This contracting firm had been awarded a "cost-plus-award-fee" contract, which allowed it to charge for "all reasonable, allowable, and allocable costs" incurred during the operation. This type of contract, although more costly than traditional "fixed-fee" contracts, is necessary for OOTW. Due to frequent and unexpected changes that occur

during these operations, the Scope of Work of the contract must allow flexibility for changes without requiring renegotiation of the contract.

In February 1997, the Government Accounting Office (GAO) issued a report on the effectiveness of the LOGCAP program during Operation Joint Endeavor. This report provided a comprehensive analysis of the LOGCAP program in Bosnia, and gave important guidance for improving the program for future contingency operations. GAO found that the contractor performed well, and that all services were completed in accordance with the terms of the contract. However, GAO also noted some concerns regarding operational planning, financial monitoring, and contractor oversight issues. Among GAO's comments were:

- Little or no guidance exists to assist the CINCs in managing the LOGCAP program and integrating it with the military force structure. EUCOM officials did not receive sufficient guidance from DoD or the Corps of Engineers on contract planning, the capabilities of the contractor, the management and integration of the contract, and oversight methods and responsibilities.

- The LOGCAP contractor was frequently not included in the operational planning process.

- The financial reporting and contract monitoring systems were inadequate. The systems failed to provide EUCOM officials with the information they needed to determine if the contract was being managed in a cost-effective manner and whether contract performance was adequate.

- The Air Force and Navy have implemented civilian logistics programs similar to the Army's program, despite the fact that the Army's LOGCAP program is capable of meeting all three Services' logistical requirements. The GAO considers such duplication of effort inappropriate and expensive.

At the end of Operation Joint Endeavor, the responsibility for the management of the LOGCAP program was transferred from the Corps of Engineers to the Army Materiel Command (AMC). AMC has already begun the process of developing new doctrine and guidance on LOGCAP management during contingency operations, providing training programs on LOGCAP for operational commanders and staffs, and developing improved systems of financial reporting and contractor oversight.

5.3 Environmental Protection Program and Hazardous Waste Management

At the onset of Operation Joint Endeavor, the U.S. Army Europe (USAREUR) was tasked by EUCOM to serve as the Environmental Executive Agent (EEA). Although the role and responsibilities of the EEA were not clearly defined in the early stages of the

operation, USAREUR quickly responded by developing and coordinating the Theater environmental policy, and established environmental standards and procedures for all U.S. forces in Operation Joint Endeavor.

Under the provisions of the LOGCAP program, the USAREUR Environmental Office (USAREUR-E) tasked Brown & Root to provide environmental services for all 20,000 U.S. personnel located at thirty bases in Bosnia, Hungary, and Croatia (Archibald and Hughes, 1996). The Scope of Work for this contract included:

- Environmental Baseline Surveys
- Hazardous Waste Management Program
- Hazardous Materials Emergency Spill Response Program
- Bio-Medical Waste Management Program
- Solid Waste Management Program
- Water and wastewater (sewage) transfer and treatment systems

These essential services were rapidly and effectively performed during the full course of the operation. The use of contractors (by both LOGCAP and host nation) in performing these time-consuming and laborious services allowed military engineer units to concentrate on their primary mission of civil engineering (facility, road, and bridge construction), mine clearing, etc.

5.3.1 Environmental Baseline Surveys

The first priority for USAREUR and the LOGCAP contractor was to complete Environmental Baseline Surveys (EBS) of all areas to be occupied by U.S. forces. These surveys were critical to the success of the operation in two ways. First, they determined whether an area contained an environmental hazard that would adversely affect the health and safety of the U.S. troops occupying the site. Second, the surveys documented the existing condition of the local environment, cultural resources, and facilities prior to the arrival of U.S. forces. This provided operational planners with vital information needed for site selection for U.S. base camps and protected the U.S. from the possibility of false liability charges by the host nation once U.S. forces withdrew.

Similar environmental, health, and safety surveys were conducted by U.S. military units as a part of standard military "risk assessment" procedures. Army Preventive Medicine teams conducted Environmental Exposure (Risk) Assessments and Medical Surveillance monitoring. Chemical Corps units, often in concert with the Preventive Medicine teams, engaged in environmental reconnaissance surveys using their state-of-the-art M93 NBC Reconnaissance System (better known as the "Fox" vehicle). Despite the similarity in their missions, however, the efforts by military and contractor survey teams were not integrated under the Environmental Executive Agent, and each survey team reported to separate chains of command (e.g., Engineer, Medical, Chemical, etc.).

5.3.2 Hazardous Waste Management Program

The contractor was responsible for the management of all hazardous waste, including biomedical, solid, and sanitary waste generated by U.S. forces. Brown & Root personnel were present at all military base camps, where they served as the de facto facility engineer. In addition to performing basic engineer services (construction, water supply, laundry operations, and sanitary waste disposal), Brown & Root was tasked to collect, package, label, store, and transport hazardous waste to the Defense Reutilization Marketing Office (DRMO) for proper disposal. The contractor also provided incineration of medical waste and solid waste, as necessary (Archibald and Hughes, 1996).

5.3.3 Emergency Hazardous Materials Spill Response Program

Accidental spills of hazardous materials are inevitable during large-scale military operations. When these spills occur during OOTW, however, U.S. forces must immediately take appropriate spill response and remediation measures to avoid political and legal ramifications with the host nation. During Operation Joint Endeavor, Brown & Root was tasked with this important assignment for several reasons. First, Brown & Root personnel were already present at all base camps and could respond to a hazardous material spill on a twenty-four-hour-a-day basis. Second, these personnel possessed the specialized skills and training to handle hazardous waste spills. Additionally, they provided the heavy equipment necessary to handle large spills, therefore eliminating the need to divert military equipment employed elsewhere (Archibald and Hughes, 1996).

5.3.4 Hazardous Waste Disposal

EUCOM assigned the mission of waste management and disposal to the Defense Logistic Agency (DLA) during the early planning stages of Operation Joint Endeavor. In turn, DLA tasked its responsible activity, the Defense Reutilization and Marketing Region Europe (DRMR-E), with the disposal mission. DRMR-E dispatched its forward disposal team, designated Task Force Disposal Eagle (TFDE), to the Intermediate Support Base at Kaposvar, Hungary, where it set up a local Defense Reutilization and Marketing Office (DRMO).

DLA and DRMR-E faced the same problem as USAREUR-E in determining which environmental protection standards should be in effect for Operation Joint Endeavor. In the absence of a DoD-level guidance document, DRMR-E and USAREUR-E carefully developed a set of environmental standards based on modifications of existing peacetime laws and regulations, particularly the Overseas Environmental Baseline Guidance Document (OEBGD). DRMR-E eventually developed "treatment based" recovery and disposal standards for Operation Joint Endeavor, since these were nearly identical to those included in the OEBGD (McDavit et al., 1996).

Just as USAREUR had decided to use the LOGCAP contractor instead of expending military assets to collect and transport hazardous waste for disposal, DRMR-

E made the decision to offer contracts to local (European or host nation) contractors for disposal of the waste. This was possible since Hungary had existing waste facilities that could be used for disposing DoD waste in accordance with U.S. and local environmental laws. Two separate fixed-fee contracts were awarded to a German firm, one for the disposal operations in Hungary and the other for disposal of waste generated in Croatia and Bosnia.

In Hungary, DRMR-E provided the entire range of waste management, from collection through disposal. In Bosnia and Croatia, however, Brown & Root consolidated their hazardous waste at specified collection sites in each country. Since there were no approved disposal sites available in Bosnia or Croatia, DRMR-E's contractor either processed the waste locally (e.g., burning used petroleum products as fuel at a power plant, incinerating medical and solid waste, etc.) or arranged for its removal and proper disposal elsewhere.

The transporting of hazardous waste out of Bosnia and Croatia to other countries for proper disposal caused serious and unexpected problems for DRMR-E. Transboundary shipments of hazardous wastes are regulated by an international agreement called the Basel Convention. This agreement requires prior notification and consent of all involved countries (origin, transit, destination) before the waste can be lawfully transported. Since Bosnia is not a signatory of the Basel Convention, Croatia did not permit DRME's contractor to transport hazardous waste from U.S. collection points in Bosnia through Croatia for disposal in other countries. After lengthy negotiations with EUCOM, NATO, and several U.S. embassies, the Croatian government finally approved the required "transit agreement" after receiving assurances from other countries that they would accept the hazardous waste that passed through Croatia and across their borders. In the meantime, military transportation assets were used to transport hazardous waste from Bosnia through Croatia, since military vehicles were exempt from transboundary restrictions on hazardous waste.

5.4 Environmental Lessons Learned During Operation Joint Endeavor

5.4.1 General

- A clearly defined DoD Environmental Policy for OOTW is needed to provide specific guidance to the Unified Commands on environmental standards and procedures.

- Environmental stewardship must be a command priority, beginning at DoD and being clearly articulated through the CINC/JTF Commander to subordinate commands.

- The CINC must pre-designate an Environmental Executive Agent responsible for establishing environmental standards and procedures, coordinating environmental protection activities, and assuring compliance of environmental policies.

- Environmental Points of Contact (Officer/NCO) must be appointed within each subordinate unit.

- The environmental protection activities performed by separate units (e.g., engineer, chemical, preventive medicine, DRMO, and contractors) must be integrated to ensure unity of effort.

- Unified Combatant Commands must be familiar with all environmental laws and regulations of countries within their area of responsibility. The Staff Judge Advocate must be consulted on matters of environmental law prior to any contingency operation.

- Environmental protection issues must be incorporated into the operational planning process at the earliest stage possible.

- Environmental risk factors must be included as part of the threat assessment during the IPB process.

- Unified Combatant Commands should include a standardized Environmental Protection Posture Level (EPPL) plan in the Operation Order.

- The Environmental Annex to the Operations Plan should use the Annex L format from the JOPES planning document.

- Each Unified Combatant Command must develop and maintain an environmental profile of every country within its area of operations. This is essential for pre-planning of operations, collecting intelligence data, identifying environmental, health, and safety threats (environmental risk assessment), and analyzing the need and scope of work for contractors. EUCOM is currently considering an initiative that would allow the CINC to assign a service component to serve as the "lead environmental service" for each country in EUCOM's area of responsibility. That service would be responsible for collecting all environmental intelligence data on its assigned countries prior to a contingency operation. Such information would include host nation environmental laws, evaluation of each nation's level of environmental expertise, local hazardous waste contractors, location of hazardous waste sites, water sources, waste disposal sites, wildlife habitats, cultural resources, nuclear power plants, munitions storage areas, etc. During contingency operations, this information would be used by the CINC's staff in developing the

Operations Plan (OPLAN), and by the Environmental Executive Agent and Joint Environmental Management Board to establish the Theater environmental policy and Environmental Annex to the Operations Order (OPORD).

- Maximum use should be made of new information technology, such as the Defense Environmental Network and Information Exchange (DENIX) system, for environmental planning and operations.

- Training of leaders and troops on environmental protection requirements and procedures during OOTW should be accomplished prior to deployment. Ideally, the principles and standards should be nearly identical to those performed at installation level.

- Units need to deploy with a basic load of environmental protection supplies (containers, absorbent, spill containment materials, etc.). Re-supply in Theater should be made through DLA or designated contractor at collection points.

- During contingency operations, the CINC must establish a standardized reporting system for initial and final environmental baseline assessments, incident reports, environmental SITREPS, and environmental compliance reports.

- Unit leaders must be trained on the importance of Environmental Baseline Surveys, storage of hazardous materials, collection of hazardous waste, and spill response procedures, as well as site closure and remediation requirements.

5.4.2 Hazardous Waste Management and the Use of Contractors

- The use of private contractors (LOGCAP and host nation) was absolutely essential in providing the full range of environmental protection services. Given the current mission requirements already placed on military units during contingency operations, the use of contractors must be seriously considered during operational planning in future OOTW.

- Unified Combatant Commands must analyze the environmental profile of countries within their jurisdiction before contingency situations arise, and pre-plan for anticipated engineering and environmental services by civilian contractors. This includes establishing an estimated "scope of work," and including contractors in operational planning as early as possible prior to any deployment.

- "Cost-plus" and "fixed-fee" contracts are both appropriate for use in OOTW. Although cost-plus (e.g., LOGCAP) contracts have been criticized for being expensive and difficult to monitor, they are essential in OOTW, where the scope

of work must be adapted to sudden changes in the political or military situation. The less costly fixed-fee contracts are appropriate for more predictable tasks where the operational situation is more stable.

- Unified Combatant Commands must establish a close working relationship with the Department of State and local U.S. embassies in acquiring environmental intelligence data, estimating environmental protection requirements, and developing comprehensive Status of Forces Agreements, which include collection, handling, transport, and disposal of hazardous waste materials.

- Train tactical commanders and staffs on how to interact with LOGCAP contractors. Inexperience of military leaders in requesting additional services has proven costly.

5.4.3 Hazardous Waste Disposal

- Hazardous waste disposal is a decidedly joint operation. Early planning and close cooperation with the involved Unified Combatant Command/Joint Task Force staff, DLA/DRMO, U.S. State Department, the individual Services, contractor representatives, Non-Government Organizations, etc., is absolutely essential.

- A Joint Disposal Doctrine needs to be developed and implemented by DoD as soon as possible. The waste disposal standards that were established during Operation Joint Endeavor should be used as a template for this policy document.

- The hazardous waste disposal program for contingency operations must be planned early and implemented at the very start of the operation. It should not be delayed until large quantities of waste have accumulated after deployment. Operational commanders understandably focus on their primary mission requirements early in the operation, but must not wait for an environmental crisis to occur before implementing appropriate hazardous waste collection and disposal programs.

- The lack of appropriate transit agreements complicated the movement of hazardous waste across international borders during Operation Joint Endeavor. The effects of international agreements like the Basel Convention can significantly impair U.S. efforts in dealing with hazardous waste disposal during OOTW. During Operation Joint Endeavor, the Dayton Peace Accords provided an alternative protocol to the Basel Convention, allowing U.S. forces to freely transport whatever cargo was necessary for the operation. As such, U.S. military transportation assets had no trouble when crossing international borders. However, the Accords did not provide for the same unrestricted movement of

cargo by U.S. commercial contractors, nor did it specifically mention the hauling of hazardous waste. For this reason, DoD and the State Department spent considerable effort in negotiating acceptable transit agreements with Croatia (McDavit et al., 1996). In future operations, therefore, DoD and the State Department must carefully craft appropriate transit agreements that include hazardous waste/hazardous materials movement by both U.S. military and U.S. contracted carriers prior to deployment.

- Although U.S. military transportation assets are capable of hauling hazardous waste during contingency operations, it is not recommended that they be tasked to do so if contracted services are available. Hazardous waste contractors provide their own vehicles, allowing military vehicles to remain in support of the tactical mission. If it becomes necessary to use military transportation assets, only those drivers who possess special training and skills in the handling of hazardous materials should be used for this tasking. Military Transportation units and other specialty units (such as the Technical Escort Unit) possess the expertise to safely transport hazardous waste and other dangerous materials during contingency operations.

6. Considerations in the Development of DoD Environmental Policy for OOTW

The environmental protection and hazardous waste lessons learned from Operation Joint Endeavor are strikingly similar to those reported from recent operations in Saudi Arabia, Kuwait, Somalia, and Haiti. These lessons learned and the general issues listed below represent trends that are likely to reappear during future contingency operations. Although each Unified Command faces environmental protection issues that are unique to a specific region of the world, those who would write the new DoD Environmental Policy for operations other than war should incorporate these issues in future joint doctrine.

6.1 Issue: Command Authority for Environmental Protection

Who is responsible for environmental protection issues? Environment does not easily fit into a single functional staff area at any level. The development and implementation of joint and Service environmental doctrine for OOTW is not well coordinated between military stakeholders.

Comment: Currently, development of strategic environmental doctrine is primarily an engineering responsibility. As noted previously, the Joint Staff considers environmental issues to be a function of the J-4 (Logistics), as indicated in Joint Pub 4-04. However, with new joint environmental doctrine being written into Joint Pub 3-34, it is recognized that environmental protection issues are also a J-3 (Operations) function. As a matter of strategic doctrine, environment must be part of J-2 (intelligence and risk assessment), J-3 (operational planning), and J-4 (logistics and hazardous waste management). As such, environmental issues must be carefully integrated throughout joint doctrine, and not limited as a sub-topic of Civil Engineering in J-4.

At the operational (Unified Combatant Command) and tactical levels, oversight responsibility for environmental protection during OOTW remains with engineers but becomes blurred among many organizations with parallel or overlapping environmental missions, including Preventive Medicine, Chemical, Occupational Health and Safety. Although the CINC may designate an Environmental Executive Agent for an operation, the authority of this EEA to integrate and centralize environmental protection efforts among the separate Services and their subordinate units remains unclear.

As described earlier, however, the development of Joint Pub 3-34 introduces the concept of establishing a Joint Environmental Management Board. Although the link between the EEA and JEMB during contingency operations has not been established in doctrine at this time, it is logical to believe that the EEA (which is a single Service component of the Unified Command) would be a member of the JEMB. If so, the JEMB would be responsible for overall coordination and oversight of the environmental activities of all board members, and the EEA would likely be delegated to implement the CINC/JTF Commander's environmental program.

Recommendations:

- DoD and the CINCs must establish the definitive authority for environmental protection issues during OOTW, and establish a chain of command for subordinate units with environmental related missions.

- Require each CINC to appoint a service component as Environmental Executive Agent. Define and standardize the authority and responsibilities of the EEA during OOTW.

- Each Unified Combatant Command should establish a Joint Environmental Management Board as described in Joint Pub 3-34 (Draft). The essential task of this environmental authority is to include environmental issues early in JTF operational planning, develop the environmental protection management plan, and integrate the environmental activities of the Services and those units with environmental protection missions.

- Subordinate unit commanders should appoint an Environmental Compliance Officer who will act as a point of contact to the Environmental Executive Agent, and will oversee environmental training and compliance at the unit level.

- Rewrite Joint Doctrine for Environmental Protection. In the short term, rewrite the Environmental section in Joint Pub 4-04, *Civil Engineering*, and include environmental protection issues in the new Joint Pub 3-34, *Engineer Doctrine for Joint Operations*. In the long term, create a single Joint Doctrine Publication exclusively for Environmental Protection as a J-3 (Operations) document.

- Use FM 20-400/MCWP 4-21.1 as a template for future Joint Environmental Doctrine.

- Do not "stovepipe" responsibility for environmental issues. Environmental protection is no longer the exclusive responsibility of one organization or staff officer. The revised version of FM 101-5 and the new FM 20-400 describe how environmental planning considerations affect *all* units and staff functions. This concept should be reflected in future joint policy guidance.

6.2 Issue: Reporting Procedures for Environmental Protection Issues

Environmental lessons learned are not being reported uniformly or effectively to the Joint Uniform Lessons Learned System (JULLS) and the Services Lessons Learned Centers.

Comment: This issue is an extension of the previous one. Environment has become a function of many different units and staff sections, but which is ultimately responsible for environmental issues remains unclear. A major obstacle in obtaining environmental lessons learned is that environmental issues are not listed as a separate entity under "Environment," but are scattered among the After Action Reports of many different units within each Service (e.g., Legal, Engineer, Preventive Medicine, Chemical/NBC, Safety, Logistics, Occupational Health, etc.). To complicate matters, the word "environment" does not always refer to the ecosystem or "natural environment" in military documents. Computer searches requesting information on "environment" to JULLS frequently come back with references to "command environment," "combat environment," "NBC environment," and "political environment."

Recommendations:

- Environmental Lessons Learned should be submitted through environmental channels to JULLS (and appropriate Service agencies) under the title "Natural Environmental Protection."

- Common terminology must be established within DoD regarding environmental terms used in reports, field manuals, and directives. Reference manuals such as FM 22-100 should be used as a template. (If there is confusion about the definition of "environment," then there is likely to be confusion between the Services on terms such as "hazardous waste," "hazardous material," "spill," "medical waste," "solid waste," "release," etc.)

6.3 Issue: Risk Assessment—The Critical Link Between Environment, Health, and Safety

Environmental risk assessment is a concept that brings together environment, health, and safety in a collective effort to safeguard the lives and well-being of deployed U.S. troops. Although Engineers have traditionally played a dominant role in environmental issues, other organizations, such as the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) and the Army Safety Center (ASC) play critically important roles as well, especially during OOTW.

Comment: While most military personnel are unfamiliar with terms such as "risk assessment," "medical surveillance," "medical intelligence," "environmental threat assessment" and "disease non-battle injury," these are the parameters by which Preventive Medicine assets keep U.S. forces safe from disease and injury. While it is not within the scope of this report to describe the full range of CHPPM's capabilities and contributions to the health of military personnel worldwide, it is important for designers of future environmental policy to understand the vital importance of including preventive medicine and safety as part of any joint policy document.

Preventive medicine has three principal functions: assess the health threat, identify and recommend countermeasures, and conduct medical surveillance. During contingency operations, Preventive Medicine personnel assess the health threat by analyzing medical intelligence information, conducting Environmental Baseline Surveys, and accompanying Chemical Corps units on environmental reconnaissance missions. The information gathered is analyzed, all significant health threats identified, and recommendations and guidance are disseminated to the CINC and subordinate commanders regarding appropriate countermeasures (such as immunizations, protective equipment, and special training). Medical surveillance involves the continuous identification and analysis of potential health threats facing U.S. forces before, during, and after the operation, with timely guidance being given to tactical commanders regarding appropriate countermeasures. Furthermore, the medical surveillance program links all medical intelligence information, exposure data, geographical and environmental data, clinical data, etc., with shared medical databases in the United States to assess the effects of deployment on the health of participating military personnel.

The Services and Joint Staff have worked diligently to develop appropriate Joint Doctrine for environmental and preventive medicine issues. In this regard, a Joint Preventive Medicine Working Group was recently chartered by DoD, which includes representatives from each of the Services and the Joint Staff. A new Department of Defense Instruction (DODI) 6490.AA on "Implementation and Application of Joint Medical Surveillance for Deployments" is currently being developed and is expected to be released by mid-1997. This DODI will formally define Joint policy and procedures, and assign responsibility for medical surveillance programs in support of military operations.

Recommendations:

- Coordinate the activities of the Joint Preventive Medicine Working Group with the proposed DoD Environmental Policy for the OOTW Working Group being formed now.

- Link the philosophy and principles of the new DODI 6490.AA (Joint Medical Surveillance for Deployments) with the proposed DODI for Environmental Policy for OOTW.

- During OOTW, integrate environment, preventive medicine, and safety under a single authority (e.g. the JEMB or EEA).

- Foster cooperation in environmental risk assessment activities. Link environmental, health, and safety assessment activities of engineers, contractors, preventive medicine personnel, safety personnel, and chemical units. Share resources and databases to disseminate results and recommendations.

- Joint Planning Documents (J-5) must include the requirement for early deployment of Preventive Medicine assets during OOTW. In their effort to get troops on the ground rapidly during a deployment, tactical commanders may not realize that the most dangerous threat to their troops could be an environmental or health threat (disease, non-battle injury). The time-phased force and deployment data (TPFDD)—the JOPES database portion of an operation plan—must reflect this requirement.

- Include representatives from Preventive Medicine organizations of each Service (such as CHPPM and its counterparts in the Air Force and Navy) as members on the DoD Working Group for the development of the proposed DODI on Environmental Policy for OOTW.

6.4 Issue: Training and Doctrine Development

Environmental responsibility involves all of us. The environmental ethic must be part of how we live and how we train. We must seize the opportunities to do things smarter and better. By working together, we can forge a premiere Environmental Stewardship Program. Protection of the environment is the key to ensuring we can continue to conduct tough, realistic training and keep the Army trained and ready in the future.

General Dennis J. Reimer
Army Chief of Staff

Comment: When environmental awareness was introduced as a doctrinal concept, it was perceived by many as an additional responsibility—a burden indirectly related to the unit's mission which took time and resources away from more essential activities. This perception changed in 1992 when the Army issued its *Environmental Strategy Into the 21st Century*. In its vision statement, the Army declared that it would be a national leader in environmental stewardship and incorporate this environmental ethic in all Army missions. Clearly, environmental compliance could no longer be the sole responsibility of facility or civil engineers.

The U.S. Army Training and Doctrine Command was assigned the task of incorporating environmental stewardship at every level of the Army and of providing

doctrinal guidance and training on environmental skills and responsibilities for every leader and soldier. To accomplish this, TRADOC published its Environmental Training and Doctrine Action Plan (ETAP) to "provide comprehensive guidance and delineate procedures for the integration of environmental considerations and doctrine" (Neeley, 1995). The ETAP was based on principles taken from the *U.S. Army Environmental Strategy Into the 21st Century*: commit the chain of command, organize for success, spread the environmental ethic, and train and educate the force.

TRADOC then tasked the U.S. Army Engineer School (USAES) to develop and integrate Army environmental doctrine and training issues and to assist TRADOC in coordinating environmental training protocols throughout the Army's service schools and training centers. USAES accomplished this by incorporating the tenets of environmental stewardship into the six TRADOC imperatives of Doctrine, Training, Leader Development, Organization, Material Development, and Soldiers Support (DTLOMS). Through the application of these new doctrinal changes and training techniques, Army personnel will come to view environmental protection as an institutional value as they incorporate responsible environmental practices in their everyday tasks.

Recommendations:

- TRADOC and USAES are the cornerstones of knowledge and experience in the development and application of military environmental doctrine and training. It is imperative that these organizations participate in the development of any DoD environmental policy for OOTW.

- The Environmental DTLOMS Integration Plan (EDIP) should be used as a template for the integration of environmental considerations in joint doctrine and training.

- The newly developed FM 20-400 should be used as a blueprint by the DoD Working Group in creating DoD Environmental Protection Policy for OOTW.

- Train as you will fight—Commanders must ensure that environmental stewardship is practiced during contingency operations, not just at installations and training areas.

6.5 Issue: Use of Reserve Forces in Environmental Protection Activities

The use of Reserve Forces is essential in conducting environmental protection activities during OOTW.

Comment: The drawdown of active duty military forces since the Persian Gulf War has caused an increasingly greater requirement for Reserve Engineer assets during OOTW.

Engineer Commands such as the 412th ENCOM and 416th ENCOM provided exemplary civil engineering and environmental protection services during Operation Joint Endeavor. These Reserve units augmented and expanded the capabilities of the active duty engineer units and provided oversight for logistic support contracts. Their participation in providing environmental protection services was absolutely essential, as there were only a few environmental officers available from USAREUR, NAVEUR, and USAFE at any one time to manage the entire environmental protection program during the operation.

The real strength of Reserve and National Guard engineer units is their ability to be task organized for specific engineering and environmental missions. Each OOTW is unique, and the environmental protection requirements across the full spectrum of operations will not always be the same. Reservists possess an incredible depth and range of talent and experience in environmental security and protection that are particularly well suited for the requirements encountered during OOTW. Specialized Facility Engineer TDA (FETDA) teams of five to ten persons can be task organized and deployed during contingency operations to complete specific engineering and environmental missions that would be difficult or impossible for active duty units to perform.

In an era of downsizing and reorganization, Reserve forces are re-defining roles and missions of individual units and personnel. Because of their broad technical experience and flexible organizational structure, Reserve Engineer units are an essential component of any OOTW.

Recommendations:

- Designers of joint environmental doctrine should coordinate operational strategy with Army, Navy and Air Force Reserve and National Guard commands (such as USARC, OCAR, and NGB).

- Reserve Engineer Units (ENCOMs, FETDAs, etc.) should continue to redesign their organizational structure to include specialty environmental protection teams.

- Use Reserve FETDAs to provide planning and oversight for contracted logistics services during OOTW.

6.6 Issue: Funding

Environmental Protection Programs often lack enough funding to be effective.

Comment: The weakest aspect of providing adequate environmental protection in OOTW is funding. Lack of funding not only compromises the ability of soldiers to accomplish environmental protection tasks, it also undermines the importance of environmental programs for operational and tactical commanders. The recent military drawdown has had a significant effect on defense spending. Commanders are hard-

pressed to find sufficient funds to cover essential training requirements and still have enough for routine operations and maintenance. A recent AEPI report stated that "Commanders at lower levels cannot be expected to resource these initiatives at the expense of accomplishing their other mission-essential requirements (which have a higher priority), especially when environmental requirements are not a specific component of the mission statement of the organization" (Keenan et al., 1994).

Ironically, the lack of a clearly defined DoD environmental policy on OOTW sends the wrong message to operational and tactical-level commanders, and discourages them from allocating appropriate funds from their operating budgets for environmental protection equipment, supplies, and training. To these commanders, "the Army does not appear serious about funding its environmental strategies, because it does not provide commanders with appropriate guidance for planning that will establish a higher priority for environmental requirements in the Army budget" (Keenan et al., 1994).

Despite the fact that defense spending has been cut significantly and is not expected to see any substantial increases in the foreseeable future, the funding of environmental programs from the existing budget is cost-effective. The wisdom of pollution prevention and the value of including environmental protection in the early planning stages of military operations has saved the Department of Defense untold millions of dollars that would be spent on remediation, fines, and lawsuits. Military leaders must comprehend this important concept—especially during OOTW, where the penalty for environmental failures is not limited to harming the ecosystem but could also adversely affect the health of U.S. forces and contribute to the political failure of the operation.

Recommendations:

- Environmental Security issues must have the support of DoD, the Joint Staff, Unified Commands and MACOMs in order to obtain congressional funding.

- The Department of Defense must make environmental protection a part of OOTW mission requirements before funding will be perceived as a priority.

Environmental protection requirements for OOTW should be incorporated into every commander's Mission Essential Task List (METL), and then be funded appropriately.

7. Findings

The findings of this report confirm the need for a DoD Environmental Policy for operations other than war. A clearly defined DoD environmental policy is needed to ensure consistent, effective application of environmental protection standards across the full range of operations other than war.

Major findings of this paper include:

- The individual Services and the Joint Staff are committed to integrating environmental stewardship throughout the Department of Defense and incorporating environmental protection measures in all military operations.

- The Services and Joint Staff are rapidly developing environmental protection doctrine in response to DoD guidelines, regulations, and directives. Environmental issues are being particularly well addressed in the areas of environmental law, occupational health, preventive medicine, engineering, hazardous waste management, NBC (Nuclear, Biological, and Chemical) assessment, intelligence, acquisition, logistics, training, and safety.

- The development of a DoD environmental policy for OOTW can be based on existing environmental standards, policies, and procedures. The Overseas Environmental Baseline Guidance Document (OEBGD) is a comprehensive environmental protection document that is already being used by the CINCs at military installations and during military training exercises. Although it is too restrictive for use during OOTW in its present form, it is an excellent document upon which the DoD Working Group can base the proposed DODI.

  In addition to the OEBGD, new or revised policies on environmental training, preventive medicine, and hazardous waste management can be used as technical references for the DODI. It was noted that TRADOC and USAES have already taken the lead in revising capstone field manuals on environmental protection issues and integrating environmental stewardship into all military training. It has created a joint Army/Marine Corps manual on Military Environmental Protection (FM20-400/MCWP 4-21.1), the tenets of which are reflected in Navy and Air Force training doctrine as well. This manual should serve as the standard for environmental training and operational planning for the DODI.

  The U.S. Army CHPPM and its counterparts in the Navy and Air Force have developed excellent environmental health and preventive medicine programs and protocols for use during OOTW. These organizations can provide the DoD Working Group with exceptional guidance on all preventive medicine issues, including environmental risk assessment and medical surveillance standards and

procedures. The new DODI 6490.AA on *Medical Surveillance for Deployments* will certainly serve as the definitive reference on this issue.

Hazardous waste management has been well documented, especially during Operation Joint Endeavor. The Lessons Learned from this and other operations give the DoD Working Group clear indications of hazardous waste standards and procedures. The Army Materiel Command, now in charge of the LOGCAP program, is revising the protocols for the use of contractors during contingency operations. The Defense Logistics Agency (and its subordinate agency DRMR-E) have assembled considerable information and recommendations on hazardous waste disposal, which will be essential for inclusion in the DODI.

- Environmental protection is a universal issue affecting all DoD operations. Although there is no lack of expertise or effort on the part of the Services or Joint Staff in developing environmental doctrine for military operations, they have not achieved unity of effort in establishing and implementing a joint policy for OOTW. In the past, the Services have incorporated environmental protection into their doctrine according to their separate mission requirements. Fortunately, the trend today is one of interservice cooperation in the development of compatible environmental doctrine. The creation of the DoD Working Group exemplifies this trend.

- The Joint Staff has rapidly responded to changes in the National Military Strategy by revising, and, where appropriate, creating new joint doctrine. The creation of Joint Pub 3-34 is an important step in assuring the effective application of environmental protection programs during OOTW. It also validates the concept that environmental protection issues are a function of operations (J-3) as well as logistics (J-4).

- In order for environmental protection doctrine to be effective at the operational and tactical levels, three things must occur. First, DoD must provide definitive and comprehensive guidance to the Unified Combatant Commands regarding environmental protection requirements during OOTW. Environmental issues must be given command emphasis from the top down. Second, the CINC/JTF commander must include environmental protection as an integral part of overall operational planning. The CINC must designate a single environmental authority to direct and coordinate all environmental protection activities in the area of operations. Third, environmental activities must be properly funded. Funding is the practical application of command emphasis. Creating a mission requirement without providing the means to accomplish it sends the wrong message to tactical commanders about the importance of environmental protection.

- The key word in environmental protection during OOTW is **integration**. A recurring theme in this report has been the need to combine and coordinate the efforts of all environmental-related activities towards a common goal, regardless of Service or organizational boundaries. As noted previously, DoD and the CINCs no longer have the manpower or funding to support the duplication of environmental support services. Integration of environmental activities will be difficult to achieve, however, as many organizations may perceive integration as a threat to organizational command and control, manpower requirements, or funding. Nevertheless, the realities of the military drawdown and the subsequent drop in the Defense budget has made duplication of effort between the Services cost-prohibitive. A joint contingency policy under the direction of a single authority on the CINC/JTF commander's staff is the correct management option for environmental protection during OOTW.

- The Department of Defense must work closely with the Department of State in developing an environmental protection policy for OOTW. The political imperatives imposed upon the operational commander during contingency operations require continuous coordination between these two agencies. The CINCs, Joint Staff, and the U.S. State Department must work closely to develop new protocols for international agreements, Status of Forces (SOFA) agreements, and Transit Agreements for future OOTW.

- The use of civilian contractors for logistical support is an integral part of OOTW. Recent experiences have shown that operational and tactical commanders are still very unfamiliar with the concept of contracted services. The inexperience that was shown by many commanders in Bosnia (deviating from the initial scope of work, errors in operational planning, contractor oversight and reporting procedures) indicate that unit leaders need to receive in-depth training on how to interact with contractors.

8. Conclusions

Environmental security issues have become an integral part of a changing National Military Strategy. New military doctrine must be written to reflect the critical role that environmental protection plays throughout the full spectrum of operations other than war. This paper has confirmed the need for a DoD environmental policy for operations other than war, identified the key issues involved in the writing of such a policy document, and given specific recommendations for future policy development. Although it was not possible to identify all conceivable issues on this subject, this paper will serve as a platform upon which the DoD Working Group can create a comprehensive DODI on environmental protection issues for OOTW.

The selection of this DoD Working Group by the Deputy Undersecretary of Defense for Environmental Security (DUSD-ES) is the next critical step in this policy development process. This Working Group should include representatives from the Services, the Joint Staff, and other select DoD and non-DoD government agencies. The purpose of this Working Group will be to apply collective knowledge and experience to the creation of a Department of Defense Instruction on Environmental Protection for Operations Other Than War.

Although it is an enormous undertaking, the need for this environmental policy is critical. The political and military imperatives affecting future contingency operations will require a joint approach in the application of environmental stewardship. The creation and implementation of a Department of Defense Instruction for Environmental Protection during Operations Other Than War will ensure that future Joint Task Force commanders have the appropriate DoD-level guidance to provide a flexible environmental program that balances mission and force protection requirements with those of environmental protection.

Appendix A

Principles of Military Operations Other Than War

(From Joint Publication 3-07)

- **Objective**—Direct every military operation toward a clearly defined, decisive, and attainable objective.

- **Unity of Effort**—Seek unity of effort in every operation

- **Security**—Never permit hostile factions to acquire a military, political, or informational advantage.

- **Restraint**—Apply appropriate military capability prudently.

- **Perseverance**—Prepare for the measured, protracted application of military capability in support of strategic aims.

- **Legitimacy**—Committed forces must sustain the legitimacy of the operation and of the host government, where applicable.

Appendix B

Types of Military Operations Other Than War

(From Joint Publication 3-07)

- Arms Control
- Combatting Terrorism
- DoD Support to Counterdrug Operations
- Enforcement of Sanctions/Maritime Intercept Operations
- Enforcing Exclusion Zones
- Ensuring Freedom of Navigation and Overflight
- Humanitarian Assistance
- Military Support to Civil Authorities (MSCA)
- Nation Assistance/Support to Counterinsurgency
- Noncombatant Evacuation Operations (NEO)
- Peace Operations (PO)
- Protection of Shipping
- Recovery Operations
- Show of Force Operations
- Strikes and Raids

Appendix C

Elements of Environmental Planning

(From Joint Publication 4-04)

- Policies and responsibilities to protect and preserve the environment during the deployment
- Certification of local water sources by appropriate medical field units
- Solid and liquid waste management:

  Open dumping
  Open burning
  Disposal of gray water
  Disposal of pesticides
  Disposal of human waste
  Disposal of hazardous waste

- Hazardous materials management including the potential use of pesticides
- Flora and fauna protection
- Archeological and historical preservation
- Base field spill plan

Appendix D

Environmental Protection Posture Level

(From "Environmental Considerations in Army Operational Doctrine". Used with permission)

Environmental Protection Posture Level				
Area	**1**	**2**	**3**	**4**
1. Field Sanitation				
a. Human waste	Unit Field SOP	Silt trench	Burnout latrine	Sanitary system
2. Waste Management				
a. Solid Waste	Unit Field SOP	Unit incineration or burial	Incineration	Landfill
b. Gray water	Unit Field SOP	Effluent down- stream from water sources	Primary treatment (collection basin, oxidation pond, wetland treatment)	Sanitary system
c. Medical waste	Incineration/auto- clave	Same	Same	Same, sanitary system disposal when approved
d. Hazardous waste	Due care, avoid water contamination	Field collection, battalion-level disposal	Unit collection point, classification, label, and return (DLA or contract)	RCRA or host nation procedures
3. Hazardous Materials	Unit Field SOP	Spill response, report water contamination	HM tracking, spill response, report spills > 50gal	Spill prevention plans, response teams
4. Natural Resources				
a. Water	N/A	Due-care	Erosion control measures, monitor sw quality	No degradation of water quality due to erosion or effluent
b. Vegetation	N/A	Due care in clearing for fields of fire/ camouflage	Clearing in excess of 100 acres requires JTF approval	Clearing requires environmental assessment
c. Wetlands	N/A	Due care in operations and logistics	Avoid operations which degrade wetlands	Damage to wetlands requires environmental assessment
d. Air	N/A	Dust suppression- non-hazardous only	Control open fires, fugitive dust	Controls on incineration and traffic
e. Wildlife	N/A	Due care in avoiding takings and habitat destruction	Note and avoid specific habitats; due care for TES	Taking of TES prohibited
5. Cultural and historical preservation	Due care in planning	Minimize damage if possible	Division-level approval required for operations in area	JTF approval required for operations in area
6. Assessments	N/A	Exercise due-care in planning and operations	Assessments required for activities resulting in major damage	EO 12114 or governing standards
7. Installation Operations	N/A	Note environmental conditions before and after occupation	Operate IAW governing environmental standards	Same

Bibliography

Archibald, Donald F., and Hughes, Stephen W. *Environmental Activities in Support of Operation Joint Endeavor*. (Unpublished Report) U.S. Army Europe, 1996.

Christopher, Warren. "American Diplomacy and the Global Environmental Challenges of the 21st Century", address to Stanford University, 1996.

Conrad, Chris. Interview with author, 25 November 1996.

Contingency Engineering Doctrine Subgroup. *A White Paper From the Joint Engineer Community on the Need For Joint Contingency Engineering Doctrine.* Posture Statement presented at the Joint Engineer Doctrine Conference, Washington, D.C., 1996.

Department of the Army. U.S. Army Training and Doctrine Command/U.S. Army Engineer School. *Environmental DTLOMS Integration Plan.* Ft. Leonard Wood, MO: USAES, 1996.

Department of the Army Regulation (AR) 200-2, *Environmental Effects of Army Actions*, 1988.

Department of the Army Regulation (AR) 200-1, *Environmental Protection and Enhancement,* 1997.

Department of the Army. Posture statement, *U.S. Army Environmental Strategy Into the 21st Century.* Washington, D.C., 1992

Department of the Army. TRADOC Pamphlet 525-5, *Force XXI Operations*, 1994.

Department of Defense, DoD Directive 6050.7, *Environmental Effects Abroad of Major Department of Defense Actions*, 1979.

Department of Defense, Joint Publication 3-07, *Joint Doctrine for Military Operations Other Than War*, 1995.

Department of Defense, Joint Publication 3-34 (Draft), *Engineer Doctrine for Joint Operations,* 1997.

Department of Defense, Joint Publication 4-04, *Joint Doctrine for Civil Engineering Support,* 1995.

Department of Defense. *Joint Vision 2010.* Washington: The Joint Staff, 1996.

Department of Defense. DoD Overseas Environmental Task Force. *Overseas Environmental Baseline Guidance Document,* Washington: GPO, 1992.

General Accounting Office (GAO). *Contingency Operations: Opportunities to Improve the Logistics Civil Augmentation Program*: GAO/NSIAD-97-63. Washington, D.C., 1997.

Garrett, Joseph G., III. *The Army and the Environment: Environmental Considerations During Army Operations*. available from <http://www.wood.army.mil>, 1996

Keenan, Robert, Fittipaldi, John, and Natoli, Nancy. *Systemic Army Environmental Issues: Priorities and Remedies*. Atlanta: Army Environmental Policy Institute, 1994.

McDavit, W. Michael, Fukumoto, Scott K., Wickemeyer, James. *Hazardous Waste Disposal in Operation Joint Endeavor: Hungary, Croatia, Bosnia-Herzegovina,* (Unpublished Report) Defense Reutilization & Marketing Region - Europe, 1996.

Neeley, David R. Telephone conversation with author, 25 April 1997.

Neeley, David R. *U.S. Army Training and Doctrine Command: Implementing the Army's Environmental Strategy*. (Unpublished Report) U.S. Army Engineer School, 1995.

Whitaker, Richard M. "Environmental Aspects of Overseas Operations." *The Army Lawyer*, 1995.

White Paper: Environmental Considerations in Army Operational Doctrine. available from <http://www.wood.army.mil>, 1996.