STRATEGIC ENVIRONMENTAL APPRAISAL
FOR
ARMY TRANSFORMATION

SECOND REPORT

Prepared by

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Mobile District

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STRATEGIC ENVIRONMENTAL APPRAISAL FOR ARMY TRANSFORMATION

Most of the research for this report was undertaken prior to the terrorist attacks of September 11, 2001. The strategic environmental issues and conclusions contained herein remain a valid source of information for Army Transformation planners.

PREFACE

This Strategic Environmental Appraisal (SEA) report is an update of an ongoing effort to identify environmental factors to be considered during planning and implementation of Army Transformation. It is not a part of the Army's environmental impact assessment process in conformance with the National Environmental Policy Act (NEPA). Rather, it is a long-range compilation of information on potential environmental issues and trends that may require further consideration in transformation planning. To meet the legally mandated requirements of the National Environmental Policy Act (NEPA), the Army is preparing a Programmatic Environmental Impact Statement (PEIS), as well as several site-specific environmental analyses.

The preceding (initial) report to the Strategic Environmental Appraisal (SEA) was finalized on November 17, 2000, under the title *Strategic Environmental Assessment for Army Transformation*. Because of the resulting confusion between this data gathering mechanism intended for internal use by Army transformation planners and the more formal and public environmental impact analysis process required by the National Environmental Policy Act (NEPA), the title of this and subsequent reports have been changed to "Strategic Environmental Appraisal."

The major objective of this appraisal is to support successful Army Transformation planning through timely, "strategic level" identification of environmental issues. This second report in an on-going series is organized as follows:

Chapter 1, Introduction, provides an overall framework for the report. Topics discussed include (1) purpose of the report; (2) definition and purpose of SEA; (3) characteristics of Army Transformation; (4) characteristics of the SEA, including factors in planning and implementation; (5) SEA goals; (6) SEA methodology; and (7) differences between SEA and environmental analyses pursuant to NEPA.

Chapter 2, The Environment and Army Transformation, discusses the environmental challenge and context in which Army Transformation is unfolding. This chapter also presents Army responses to the challenge.

Chapter 3, SEA: Issues and Implications for Army Transformation, is the heart of this report. This chapter describes the activities undertaken in implementing the SEA process and presents the results to date. It refines, realigns, and reinforces environmental observations and implications contained in the Initial SEA Report (November 2000) while developing new insights and additional related special-interest topics.

Chapter 4, Management of Environmental Integration, describes efforts underway to improve management of the integration of environmental considerations into Army actions. Included in this chapter is a discussion of general approaches to environmental management, the requirements of an environmental management system, and the Army's Transformation Environmental Management Group (TEMG).

Chapter 5, Conclusions, Lessons Learned, and The Way Ahead, contains observations derived from the SEA process to date and offers a roadmap for future use of the SEA process.

Management and integration of the SEA and PEIS are being accomplished through a SEA/PEIS Integrated Process Action Team (IPAT). The IPAT is chartered and headed by the Army's Office of the Deputy Chief of Staff for Operations (ODCSOPS). IPAT members include operational and environmental managers from ODCSOPS, the Office of the Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health), the Office of the Assistant Chief of Staff for Installation Management (OACSIM), other key Army staff elements, and Major Army Command (MACOM) representatives. The IPAT maintains oversight of SEA and PEIS activities through meetings and progress reports.

Army organizations contributing to this report include the:

Office of the Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health),

Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS), Headquarters, Department of the Army,

Office of the Assistant Chief of Staff for Installation Management (OACSIM), Headquarters, Department of the Army,

U.S. Army Forces Command (FORSCOM),

U.S. Army Training and Doctrine Command (TRADOC),

U.S. Army Materiel Command (USAMC),

U.S. Army Environmental Center (USAEC),

U.S. Army Engineer School (USAES),

Army Environmental Policy Institute (AEPI),

U.S. Army Concepts Analysis Agency (CAA)

EXECUTIVE SUMMARY

Introduction

The Army's Strategic Environmental Appraisal (SEA) for Army Transformation is not a part of the environmental impact analysis process under the National Environmental Policy Act (NEPA). It is an internal planning tool roughly patterned on the "strategic environmental assessment" concept sometimes used within the international planning community to facilitate collaboration between operational and environmental planners. Its purpose is to provide information that can make consideration of environmental factors a more integral component of strategic level planning. In this respect, the Army's SEA for Army Transformation feeds the NEPA environmental impact analysis process.

The SEA concept is similar to the "intelligence preparation of the battlefield" or "mission area analysis" steps in the Army's deliberate planning process in that it gathers intelligence about the battlefield and presents to the commander an appraisal of conditions throughout the mission area, and opportunities for initiatives to assure success. In essence, SEA identifies at a very early stage, and throughout development of a strategic action, environmental issues and opportunities that could influence or be influenced by a major program such as Army Transformation.

This report is the second version of an ongoing series of periodic reports representing the Army's first attempt at conducting strategic level review of environmental issues and trends and their implications for a successful transformation. The initial report, through a series of issue papers, identified a broad range of environmental topics and was developed as an overview of potential environmental issues and opportunities. The four key areas that served as a framework for the observations made and the implications derived from the initial report included the following:

- **External Influences**. Army Transformation is unfolding during a period of heightened public concern and increasing environmental regulation. Specific environmental concerns include air emissions, the impacts of training ranges on ground water quality, demands for safe and effective demilitarization of munitions, hazardous waste management, stringent installation restoration requirements, and a myriad of issues that could affect Army planning and management.
- **Environmental Sustainability.** The preceding SEA report examined environmental sustainability in the context of its relative effects in the three interrelated areas of Systems Acquisition, Installations, and Training Lands. This report continues with that appraisal along with an extended discussion of Installation Sustainability developments. The sustainable operation of Army installations (including training lands) is affected by aging facilities, limited contiguous training lands, increased pressure from urban encroachment, the presence of threatened and endangered (T&E) species, air and water quality issues, transportation issues, and a number of community and regional issues that will determine installation viability in the long term. While the Army transitions to a medium-weight (lighter) force and incorporates more environmentally sound practices which will yield positive results, the near-term and mid-term effects of maintaining both a Legacy Force and

transforming units may contribute to unsustainable conditions given the need for base realignments and closures, compliance with quadrennial defense review mandates, competing pressures for the use of community and regional resources, and increased local, state, and federal regulatory requirements.

- **Health and Well-being.** The Army is committed to the protection of human health and a high quality of life for soldiers, their families, and neighboring communities, and will rigorously enforce regulations that support such goals. For example, Army employees who are exposed to hazardous materials and wastes will be properly trained, equipment will be maintained to minimize potentially hazardous releases, and hazardous or toxic materials such as radon, asbestos, and paints that contain lead will be properly managed and controlled.
- **Environmental Management.** Today's Army already has many of the essential components of an effective environmental management system (EMS). These components will be integrated through comprehensive Army EMS policies and guidelines that will ensure adequate resourcing and effective integration to effect emerging EMS standards.

As many of the initial observations of the first SEA report remain valid, this second effort seeks to add greater issue detail and further expand the environmental theme, "more than installations". Comprehensive, collaborative solutions are highlighted which promote a pollution/preventition adaptive management-oriented approach to environmental stewardship. This approach will become increasingly important as a means to effectively address cumulative installation sustainability challenges and their potential impact to transformation planning.

Second Report - Strategic Environmental Issues

This second iteration of SEA identifies the following six overarching and significant strategic environmental issues. These issues consist of multiple parts and are presented in some detail to highlight the interrelated and comprehensive nature of strategic environmental concerns. These issues and their accompanying recommendations for further consideration include:

Legislative and Regulatory Influences

Army planners and decision makers should be increasingly aware of emerging statutory and regulatory trends and incorporate them in long-term planning. This can be accomplished through increased investment in ongoing efforts such as the Army's Emerging Non-traditional Security Issue (ENSI) research program and it's Environmental Legislative and Regulatory Analysis and Monitoring Program (ELRAMP).

Strategic Outreach and Environmental Communication

The Army should establish an integrated outreach and strategic environmental communication plan, engaging all internal and external stakeholders in the long-term solution of the Army's sustainability issues.

Environmental Sustainability

The Army stands to benefit from the development of a strategic installation-based approach to sustainability that includes comprehensive solutions to multiple and diverse environmental challenges.

- **Systems and Materiel** (Pollution Prevention, Hazardous Material and Waste)
    - The Army acquisitions community must further integrate environmental considerations into the life-cycle planning of major systems, particularly those with the potential to cause environmental effects during field training. This should include the assessment of interactions between and among systems and their possible cumulative effects.
    - The Army should carefully integrate consideration of environmental issues into the modernization and recapitalization of the Legacy Force, including potential environmental issues associated with the digitization and the decommissioning and disposal of legacy facilities and equipment.
- **Sustainable Installations** (Facilities, Energy, and Water Resources)

The long-term viability (sustainability) of installations must become a major component in Army Transformation, stationing, and base realignment and closure (BRAC) decisions. The ability of installations to sustain the Army mission is defined, and often constrained by, numerous issues in addition to those that affect training lands, such as regional air quality (in current or emerging non-attainment areas), regional water quality or quantity (a growing issue in the semi-arid Southwest, and even in the relatively water abundant Southeast), and a myriad of other issues. While several laudable sustainability efforts have begun to emerge, they must focus on the concept of "installation sustainability" if they are to successfully support mission sustainability. A sustainable range, for example, is not viable if the installation is constrained by air, water, infrastructure, or other issues.

Similarly, more efficient energy use through sustainable buildings alone cannot assure a sustainable installation ready to meet mission needs. Moreover, sustainability cannot be achieved by the installation acting alone. Long-term solutions must encompass the needs and assets of the surrounding community and region. Past installation management, focused "within the fence line," will prove ineffective in sustaining installation missions. Unless the community and the region contribute to the installation's future (through land use controls, regional biodiversity initiatives, coordinated air and water quality management, etc), and the installation contributes to the solution of community issues, it is doubtful that sustaining the installation mission for the long-term will be possible.

- Develop installation-wide sustainability master plans to incorporate sustainability principles and environmentally friendly technology into all Transformation-initiatives

- The Army should ensure that stationing actions account for any increased demand for housing and support services, and the impact of existing facilities on the health and well being of Army members and their families.

- The Army should establish a joint (interservice) working group of energy, environment, operations and systems development subject matter experts (SMEs) to develop joint long-term solutions that support Transformation objectives and timelines.

- **Training Ranges and Areas** (Encroachment and UXO)

As never before, the Army faces fundamental challenges that threaten the long-term viability of critical Army installations and their ability to provide realistic training and force projection. This was evidenced by last spring's Congressional testimony by the military Services on "encroachment," which includes urban encroachment and other constraints placed on the use of Army training lands. Recent challenges to military training based on environmental concerns at the Massachusetts Military Reservation (MMR), the Makua Range in Hawaii, and Vieques Island in Puerto Rico are clear indicators that major power projection and training platforms may not always remain viable and available to support the Army mission.

- The Army should evaluate the total Army Training System, optimizing the use of available Army lands and, where necessary, increasing land available to support Army readiness. Such an optimization should also fully exploit alternative training technologies.

Increasing Conventional Munitions Demilitarization Requirements

The current Munitions Action Plan (MAP) should be reviewed, synchronizing environmental objectives and timelines with Transformation initiatives and schedules.

Overseas Environmental Impacts (Training and Operational Deployments)

A comprehensive strategy should be established which actively facilitates host-nation support and regional "buy-in" for environmental requirements and solutions that will affect Army Transformation training, deployments, and installation support.

Environmental Management Systems (EMS)

The Army should implement EMS, consistent with the International Organization for Standardization's Environmental Management System Standard 14001 (ISO 14001).

In addition to reviewing these major issues, this report provides a summary of on-going Army environmental management efforts, highlighting their comparative value as foundational elements for a comprehensive Army approach to EMS.

Throughout the SEA process, a continuously expanding group of environmental and operational professionals, both inside and outside of government, has contributed advice and

counsel. Such dialogue should be continuously sought to maintain the SEA process as an open dialogue on issues and an information collection mechanism subject to continuous improvement.

1 INTRODUCTION

1.1 Purpose

This second report further documents the continuing strategic environmental appraisal (SEA) process for Army Transformation, refining and expanding initial SEA results by:

- Incorporating the advice, experience, and insight of a broader segment of Army operational and environmental stakeholders.
- Examining additional environmental issues that may affect the Army's successful transformation; and
- Ensuring that strategic environmental information is incorporated early enough to assist planners throughout the life-cycle of Army Transformation.

This iteration of the Army's SEA is more detailed than the Initial SEA Report and examines further those environmental factors having the potential to significantly influence Army Transformation. Capitalizing on the long-term timeframe and aspects of Army Transformation, this report provides a strategic opportunity to devise and implement strategies and plans that will create a more complementary, productive, and sustainable integration of environmental stewardship throughout the Army.

1.2 Definition and Purpose of SEA

The Army's Strategic Environmental Appraisal (SEA) is a proactive and iterative process of collecting information to support making environmental considerations a more integral component of planning for an Army strategic action. The SEA process facilitates communication and collaboration between operational and environmental planners. The concept is similar to the "intelligence preparation of the battlefield" or "mission area analysis" steps in the Army's deliberate planning process in that it gathers intelligence about the battlefield and presents to the commander an appraisal of conditions throughout the mission area and opportunities for taking various initiatives to assure success. In essence, SEA identifies at a very early stage, and throughout development of a strategic action, environmental issues and opportunities that could influence or be influenced by a major program such as Army Transformation.

1.3 Characteristics of Army Transformation

1.3.1 Army Vision

As a land force, the Army's has an immediate and continuous relationship to the physical environment. The Army Transformation will unfold amid many opportunities and threats posed by this physical environment, and the Army must better manage its operations consistent with responsible, long-term environmental stewardship.

In October 1999, the Secretary of the Army and Chief of Staff of the Army unveiled the Army's vision for the 21st Century; a vision which focuses on taking care of people, maintaining readiness, and transforming the Army into a force that is strategically responsive

and dominant across the spectrum of conflict. Activities associated with transformation will result in a force that is more responsive, deployable, agile, versatile, lethal, survivable, and sustainable.

1.3.2 Total Transformation

Achieving this vision entails change, not only to the Army's operational forces, but also to everything the Army does. Functions to be transformed include force structure, systems acquisition, facilities, equipment, training, and doctrine. The Army plan for transformation addresses needed changes in these areas through fourteen lines of operation (LO), spread across three "axes" of transformation: Trained and Ready, Transforming the Operational Force, and Transforming the Institutional Army (see Figure 1-1 below). Army Transformation will occur in three major phases, an Initial Phase, an Interim Capability Phase, and an Objective Capability Phase.

AXIS	LINE OF OPERATION
1. Trained and Ready	(1) Strategic Requirements and Planning
	(2) Modernization and Recapitalization
	(3) Manning and Investing in Quality People
	(4) Maintain Unit Readiness and Training
	(5) Training and Leader Development
2. Transform Operational Army	(6) Joint/Army Strategy and Concepts
	(7) Army Doctrine
	(8) Operational Force Design
	(9) Deploying and Sustaining the Force
	(10) Develop and Acquire Advanced Technology
3. Transform Institutional Army	(11) Management of Force Programs
	(12) Installations
	(13) Strategic Communications (Affects all three Axes)
	(14) Resourcing (Affects all three Axes)

Figure 1-1: Transformation Axes and Lines of Operation

Initial Phase. The Initial Phase began with the October 1999 announcement of the Army Vision. During this phase, the Army continues to field two Initial Brigade Combat Teams (IBCTs) at Fort Lewis Washington. Equipped initially with available surrogate and loaned equipment, the IBCTs train to validate the organizational and operational model for the

Interim brigades while generating insights for future Transformation objectives. Concurrently, the Army continues to modernize and recapitalize the existing, or Legacy Force to ensure the maintenance of essential warfighting capabilities during the transition.

The Army will also use this period to challenge the science and technology community to develop solutions for the Objective Force. Exploitation of environmental technologies should figure prominently in this effort.

Interim Capability Phase. Once the Initial Brigade Combat Teams fields its first battalion of Interim Armored Vehicles (IAV), the Interim Capability Phase will begin. Multiple Interim Brigade Combat Teams will be organized and equipped during this phase as the Interim Armored Vehicle (IAV), already under production contract, replaces the surrogate and loaned equipment of the Initial Force. IAVs will be used to equip Interim Force units until the Army is ready to begin fielding the Objective Force. Throughout this period, recapitalization of aging equipment and fielding of some new equipment will remain necessary to sustain support to the Legacy Force. The Interim Force is designed to function across the full spectrum of operations to ensure combat "overmatch" of forces until Objective Force capabilities are fielded.

Objective Capability Phase. The Objective Capability Phase begins when techno-logy permits the fielding of systems that achieve the desired force characteristics. The characteristics of the Objective Force—responsiveness, deployability, agility, versatility, lethality, survivability, and sustainability—will guide development of the Objective Force doctrinal as well as scientific and technological underpinnings. Eventually, the Objective Capability Phase will result in the Army's total transformation.

Transformation of the Institutional Army. Transformation of the Institutional Army begins in the Initial Phase, already underway. This transformation addresses the systems, organizations, and processes by which the Institutional Army supports training, leader development, infrastructure management, sustainment, combat and materiel development, and soldier well being. Transformation of the Institutional Army is essential to sustain readiness while developing and fielding the Objective Force. Moreover, the Army's traditional focus on improving the quality of life of its members (military and civilian, Active and Reserve Component) and their families, and recruiting and retaining personnel in the required numbers and with the required talents, experience, and motivation will continue.

Continuous Evolution. The Army will also attempt to better align its infrastructure to mission requirements and explore new approaches at better leveraging the productivity of its full portfolio of resources—people, crucial physical assets, technology, and financial capital. Included in this requirement are adjustments by the Army and the other Services to appropriate base realignments and closures, as well as incorporating into its missions the result of major reviews of U.S. defense strategy such as the Quadrennial Defense Review.

Major Decision Points. The planning process is organized around major checkpoints and milestones that require decisions by the senior leadership for Army Transformation to continue. These decisions could involve a major commitment in resources, a decision for a major force transition or, if conditions change, could result in a significant departure from the original plan. Current decision points include extending the interim design beyond brigade echelon and transition from the Interim Capability Phase to the Objective Capability Phase.

An objective of SEA is to ensure that critical environmental considerations remain integral to these decisions.

1.4 Characteristics of SEA

Goals. Strategic Environmental Appraisal (SEA) provides the Army "environmental intelligence," integrating environmental criteria into Army Transformation, and incorporating principles of environmental and installation sustainability into institutional operations. Its goals include the following:

- Enable timely, comprehensive, coordinated, and proactive approaches to Army Transformation by providing planners with strategic environmental information that affects the Transformation.
- Increase environmental awareness of the total Army community and other key stakeholders through an active and continuous supply of information and analyses on strategic environmental issues and opportunities throughout the life-cycle of Army Transformation; and
- Provide input to the Programmatic Environmental Impact Statement (PEIS) and subsequent project-level environmental impact statements and environmental assessments (EISs/EAs).

Tiered Approach. SEA supports the "tiered" approach that the Army is employing for its analysis for Army Transformation. It provides information on issues during the initial stages of Army Transformation, and a continuous feed of information for programmatic and site-specific environmental analyses.

Programmatic Environmental Impact Statement (PEIS). The SEA helped to frame the analysis for the draft PEIS being coordinated with the other military Services, other agencies, and the public while this second SEA was readied for publication. The current PEIS could, if appropriate, be supplemented as the characteristics of the Objective Force, and accompanying processes and doctrine, become more clearly defined.

Site-specific Analyses. The PEIS identifies and assesses a broad range of probable activities and potential impacts associated with Army Transformation, establishing a process and environmental baseline from which subsequent site-specific and project-specific analyses can be conducted.

NEPA analysis for validating transformation concepts through the fielding of two initial brigades at Fort Lewis, Washington, is also underway. This analysis addresses the potential environmental effects of proposed Initial Brigade Combat Team activities at Fort Lewis, efforts that will test and confirm organizational and operational models relevant to the overall Army Transformation.

Subsequent site- or project-specific analyses (EISs/EAs) will be prepared to address potential environmental impacts that could result from other proposals for implementation of transformation Army-wide.

Continuous Process. Recognizing that the environment represents a dynamic and continuously changing set of conditions, the SEA process, in turn, is also continuous. Ideally, SEA professionals work "hand and glove" with operational planners throughout the life-

cycle of the strategic action; insuring that, as the action unfolds, relevant environmental information is available. Figure 1-2 helps depict the tiered environmental analysis process internal to Army Transformation.

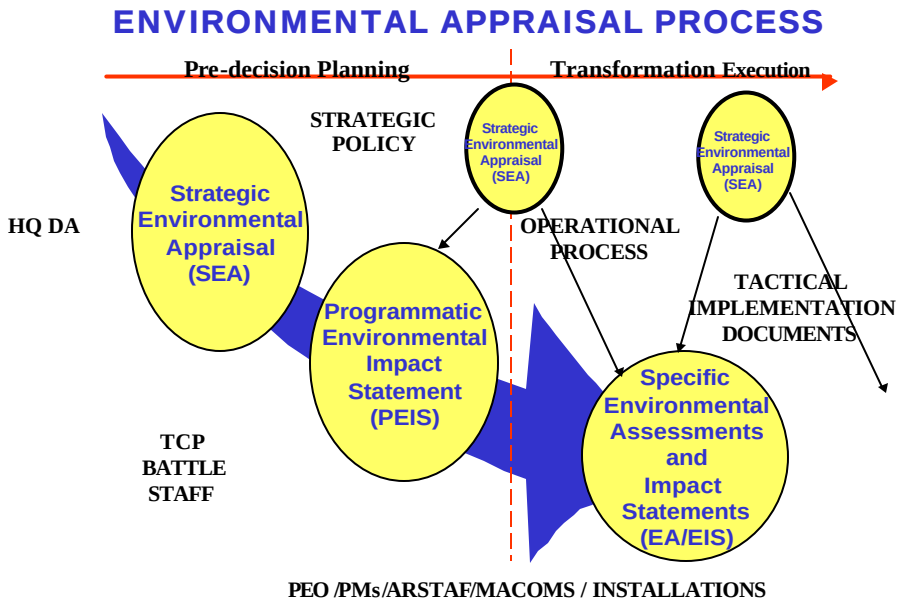

Figure 1-2: Environmental Appraisal Process

SEA Methodology. This second SEA report expands the approach of the initial report and is organized into six steps: (1) Confirm Scope of SEA; (2) Consult Relevant Bodies; (3) Gather Information and Conduct Analysis; (4) Prepare Reports; (5) Integrate Results into Planning Processes; and (6) Evaluate Findings. These steps are discussed in terms of their relationship to Army Transformation.

(1) Confirm Scope of SEA. Development of requirements, parameters, and the methodology of SEA as they pertain to Army Transformation were completed in a series of meetings involving the Army's Programmatic Environmental Impact Statement (PEIS) Integrated Process Action Team (IPAT), the Army's contractor team, and the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS) in the summer and fall of 2000. This effort culminated in an internal white paper on "SEA for Army Transformation." Further focusing took place in workshops with IPAT and ODCSOPS members leading up to publication of the first SEA report on Army Transformation in November 2000.

(2) Consult Relevant Bodies. As the SEA process continues, the range and depth of consultation is expected to increase substantially by incorporating the knowledge, experience, and insights of broader segments of the Army population (in both the operational and environmental communities). Subsequent iterations may expand inputs of other defense and government agencies, academia, and nongovernmental organizations.

(3) Gather Information and Prepare Appraisal. Tools and techniques for collecting information involve those normally associated with other types of intelligence gathering. These include personal and group interviews, participation in conferences and key planning events, and the review of available documents and trends analyses, including exploitation of information sources available on the World Wide Web.

(4) Prepare Reports and Recommendations. Information gathering culminates in preparation of approved reports (including recommendations to decision-makers, coordinated with the appropriate planners and other staff organizations). These reports are also prepared in briefing- and executive summary-type formats and communicated in appropriate operational and environmental forums. An underlying aim of this activity is to keep communication channels open, and build the constituency necessary for effective implementation of report recommendations. Major issues resulting from this continuing iteration of SEA are discussed in *Chapter 3 SEA: Issues and Implications for Army Transformation*.

(5) Integrate Results into Planning Processes and Environmental Impact Analysis (NEPA). This is perhaps the most critical phase in the SEA process; it takes what could easily remain a theoretical construct and translates it into concrete steps. The objective of this effort is to use information derived from SEA to update Army plans and drive agendas for major planning events associated with the environment and Army Transformation. The ultimate goal is to more thoroughly integrate environmental considerations into the overall transformation process.

(6) Evaluate Findings. Synchronized with meetings of the Army's Senior Environmental Leadership Conference (SELC), SEA reports will be evaluated, comparing accomplishments to schedules. New information from the continuous SEA process will also be introduced to the senior Army leadership through the SELC, and its management arm, the TEMG.

The SEA Methodology, depicted in Figure 1-3, is cyclical. Step 6, Evaluate Findings, provides a continuous process of assessment [Steps 1 through 4], planning and implementation of programs and actions resulting from the assessment [Step 5], and, finally, to tracking and evaluating performance against the identified expectations, established during the planning and implementation phases.

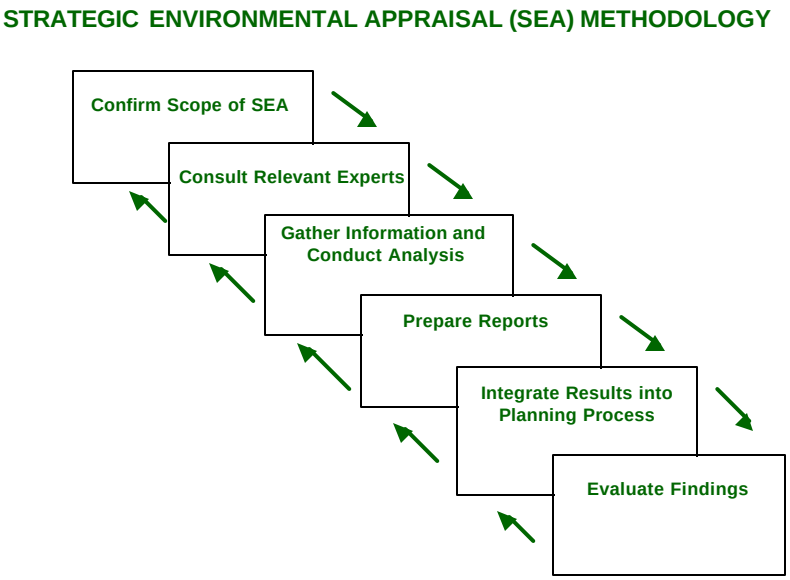

Figure 1-3: SEA Methodology

1.5 SEA and NEPA

Environmental impact analyses to support proposed plans, programs, and other strategic analyses are required under the National Environmental Policy Act (NEPA). Although SEA and NEPA share certain characteristics—both, for example, rely on information gathering and analysis and the preparation of reports for planners and decision-makers—they differ from each other in one fundamental respect: Traditional project-specific NEPA analysis is commonly triggered by a proposal for a major action, such as Army Transformation, and evaluates the potential impacts associated with that action.

The SEA process represents an inverse. It provides planners with a continuous flow of environmental information that should be used to identify and frame future actions and projects. Such information would ideally be available early in the planning process, before strategic actions are completely defined.

1.6 Key Points

- The Army's Strategic Environmental Appraisal (SEA) is a proactive and iterative process of collecting information to assist in making environmental considerations a more integral component of planning for an Army strategic action. It also facilitates communication and collaboration between operational and environmental planners.
- Army Transformation activities are designed to create a force that is more responsive, deployable, agile, versatile, lethal, survivable, and sustainable across the full spectrum of operations. The achievement of this vision will change in every aspect of

the Army, including force structure, systems acquisition, facilities, equipment, training, and doctrine.

- While focusing on the broad, far-reaching environmental challenges and opportunities that could influence Army Transformation, the SEA process enables planners to influence, early in the process, the design of transformation programs and activities, effecting sound environmental stewardship, minimizing adverse environmental effects, and insuring long-term installation sustainability.
- The SEA approach implicitly commits to learning first about the environment, the Army's effects on the environment, and the means to shape Army Transformation to optimize results, rather than committing resources to support sub-optimal performance stemming from environmental constraints. New information from the continuous SEA process will be introduced into overall Army planning, ensuring that environmental considerations remain an essential component of Army Transformation.

2 THE ENVIRONMENT AND ARMY TRANSFORMATION

2.1 Introduction

A SEA process description, in the introductory chapter of this report, can be expanded to more extended discussion of the environmental backdrop against which Army Transformation is unfolding. This chapter provides that expansion, reviewing critical environmental challenges and the Army's response.

2.2 Environmental Challenges

Army Transformation will unfold in a threatened world environment. Overpopulation remains a serious problem, as some regions in the world, such as parts of Africa, cannot support existing populations; and natural resources—water, wood, arable land, etc.—are being consumed faster than they can be replenished.

Human activities; deforestation, desertification, industrial pollution, hazardous waste disposal, the burning of fossil fuels, etc.; are contributing to a gradual rise in the earth's temperature— commonly identified as "global warming"—threatening the security of regions whose ecosystems and life systems depend on stable environmental conditions. Grasslands, forests, and deserts may shift and sea levels may rise due to these evolving climates; and the changing frequency and intensity of weather events—rain, snow, and periods of drought—are already attributed to these trends. The resulting imbalances are potentially injurious to the people, physical environment, and economy of affected regions.

Such conditions constitute national security threats, as clean air, water, croplands, and forests are difficult to replace, and their degradation can lead to economic disintegration and regional instability. Some natural resources such as oil often possess strategic economic significance, and access to sufficient energy supplies is commonly accepted as a vital national interest, particularly when required for industrial or economic development.

Americans, as well as an increasing share of the world's population, are searching for solutions to these sustainability problems, demanding institutional responses to these issues. In response, U.S. military forces must increasingly incorporate environmental and sustainability considerations as an integral component of mission planning. As discussed in FM 3-100.4, *Environmental Considerations in Military Operations*:

> "Operational readiness depends on sufficient lands for training individuals and units. The military services manage large training and testing areas, which are increasingly valuable as part of the diminishing inventory of undeveloped land. Often the health of the surrounding natural ecosystem also depends on the natural habitat of these training and testing areas. Fortunately, protecting and preserving these undeveloped spaces serves the interests of both operational readiness and the natural habitat. Good conservation techniques preserve training areas for future military use and reduce compliance and restoration costs."

Environment protection and enhancement must not only include the protection of national security and the sustained availability of resources for future generations, but also must ensure human health and safety, as well. The natural environment is inextricably linked

to health and safety; requiring management approaches that incorporate a comprehensive and coordinated approach to environmental, safety, and health.

These long-term sustainability issues are leading all federal agencies, including the Department of Defense, toward the increased consideration of the environmental consequences in the framing and analysis of proposed actions; searching for increased efficiencies, sustainable institutions and living spaces, and the avoidance of costly litigation and environmental remediation.

2.3 Army Responses

2.3.1 Army Environmental Strategy

Over the past decade, the Army has shifted its environmental policies from compliance oversight and reaction to frame environmental of environmental programs to an approach that incorporates environmental stewardship and sustainability into proactive programs that can assure long-term mission success. This paradigm shift reflects a transition from problem-and compliance-based reaction—that is, threat of sanction and cost avoidance—to one that employs a more business-like, proactive approach, focused on long-term objectives.

The framework for this approach is highlighted in *U.S. Army Environmental Strategy into the 21st Century*, published in 1992, in which the Army communicates a vision of being "…a national leader in environmental and natural resource stewardship for present and future generations."

The strategy provides a "four-pillar" framework for ensuring that environmental considerations are made integral to the Army mission, and that an ethic of environmental stewardship is a key consideration in all Army actions. These pillars consist of the following:

(1) Compliance	Obeying the law, taking care of today's problems.
(2) Restoration	Continuing to restore previously contaminated sites as quickly as resources permit.
(3) Prevention	Eliminating pollution at the source, making tomorrow's problems less severe and constraining.
(4) Conservation	Balancing the need "to use" with the need "to preserve," ensuring the availability of resources for future generations.

This strategy commits the Army chain of command to spreading the environmental ethic as it trains and educates the force, leverages resources, and harnesses market forces to ensure that environmental requirements are an integral, life-cycle component of materiel acquisition management to include working with suppliers to develop more environmentally sound products and services. Under this strategy, leaders at all levels are expected to set the pace and standard for environmental stewardship and sustainability.

2.3.2 Army Environmental Campaign Plan

The *Army Environmental Campaign Plan* and its supporting *Operational Directive* extends the Army's environmental strategy to the objectives and practices of Army Transformation. They do this by integrating and linking environmental stewardship concepts with the Army's transformation strategy, and by implementing the SEA methodology for early response to new challenges. Principal focus areas include Requirements, Acquisition, and Logistics; Training and Doctrine; Installation Management; and Military Operations.

The *Campaign Plan* requires all leaders and other members of the Army to understand that environmental stewardship is an integral component of their respective responsibilities. Ensuring that environmental stewardship is included in the full spectrum of military operations, this plan supports increased readiness through better business investments based on long-term sustainability of the Army mission, including the economic, natural, and human components of capital.

The plan requires the Army to practice outreach to become more accepted and trusted by the American people and global community as an effective steward of the environment, and an organization that continuously promotes the health of its members, their families, and surrounding communities. These responsibilities are viewed in a total Army context, both in the United States and in support of multinational coalitions in which Army forces and the nation participates.

2.3.3 Senior Environmental Leadership Conferences

The campaign plan and operational directive were created through deliberations at the Senior Environmental Leadership Conference (SELC) 2000, held at Fort Myer, Virginia in March 2000. This conference convened senior leaders from throughout the Army to develop plans and implementation strategies that will inculcate environmental considerations as an integral component of Army missions.

In contrast to earlier SELCs, centered mainly on implementing the Army's environmental strategy, SELC 2000 used the Army's Transformation planning framework to assess its environmental implications; an operational focus, which will likely continue at future SELCs, as depicted in Figure 2.1.

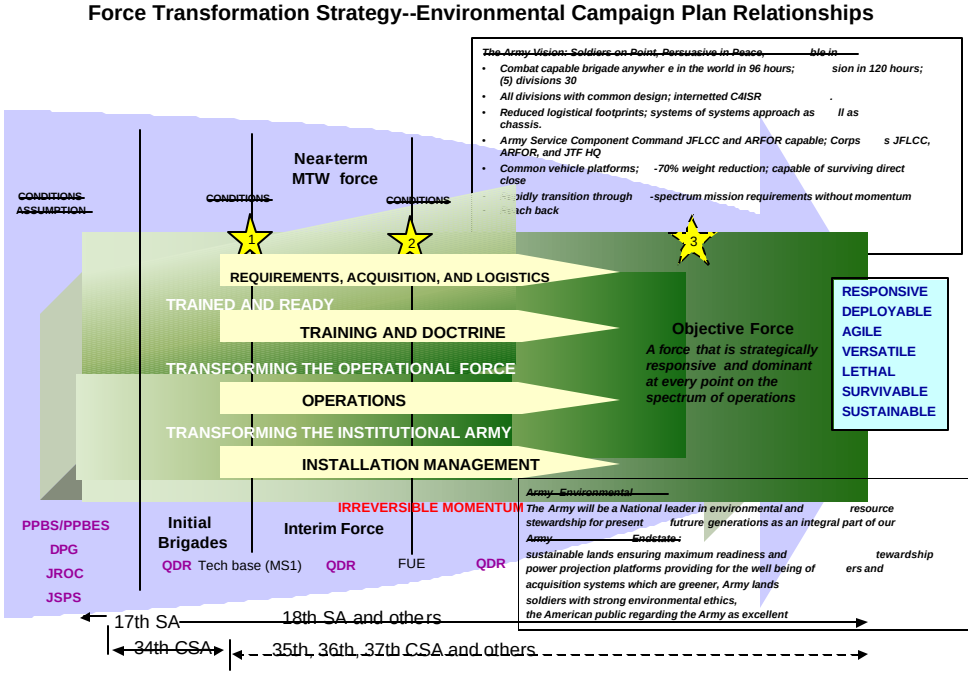

Figure 2.1

Transformation Strategy –Environmental Campaign Plan Relationships

The Senior Environmental Leadership Conferences (SELCs) will be held on an annual basis, and, together with meetings of the Army Energy and Environmental Policy Board (chaired by the Vice Chief of Staff of the Army)—provides a mechanism for tracking and evaluating progress in the implementation of the *Army Environmental Campaign Plan* and *Operational Directive.*

This SEA report will provide a basis for the SELC 2002 agenda (currently projected for the 2002 spring/summer). After deliberations and further analysis at SELC 2002, the campaign plan and operational directive will be updated. Major Army Commands (MACOMs) will likely hold individual environmental conferences, subsequent to future SELCs, organizing them around assigned implementation responsibilities and SELC capstone events.

2.4 Key Points

Key points discussed in this chapter include the following:

- Concern for the environment, and growing global community awareness and concern for environmental degradation, is leading all federal agencies, including the Department of Defense (DoD), to more effectively consider the environmental consequences of their proposed actions. Such consideration can avoid costly environmental damage, environmental remediation requirements, and litigation. DoD has committed to a more aggressive approach that moves "beyond compliance" and

helps develop processes and products that prevent pollution at the source while providing for a sustainable approach to resource management and environmental stewardship.

- The Army's response to this challenge, embodied in the *Army Environmental Strategy for the 21st Century* and *Army Environmental Campaign Plan*, sets the Army on a clear path toward environmental stewardship; outlining goals in the areas of compliance, restoration, prevention, and conservation, and applying these goals to Army transformation, respectively.
- The Senior Environmental Leaders Conferences (SELCs) will continue to be organized around information resulting from the SEA process and other relevant environmental analyses, (e.g. the PEIS, EISs, and EAs.) The SELCs will track and evaluate progress in the implementation of the Army's environmental campaign plan and operational directive.

3 SEA: ISSUES AND IMPLICATIONS FOR ARMY TRANSFORMATION

3.1 Introduction

A key requirement of the Army Transformation SEA is identification of high-priority environmental issues that may affect Transformation planning. Chapter 3 identifies several key issues and describes the activities and results of the appraisal process. It refines environmental observations and implications contained in the Initial SEA Report (November 2000), develops new insights, and examines related topics of special interest. This chapter also links these issues and corresponding opportunities to Army Transformation through a summary list of recommended actions.

3.2 Initial SEA Report: Approach and Results

3.2.1 Interviews and Research

Initial SEA efforts included interviews with Army Transformation Lines of Operations (LO) Staff Officers, MACOM Transformation personnel, and Army environmental organization staffs. These individuals provided the SEA support team with relevant data, briefings, and publications, which were compiled along with other documents from public and private data sources.

3.2.2 Initial SEA Report

Drafts of the first SEA report were coordinated with the Programmatic Environmental Impact Statement (PEIS) Integrated Process Action Team (IPAT) and reviewed through small group exchanges, culminating in publication of the initial SEA report (November 2000). That report grouped environmental observations and implications for Army Transformation into four major appraisal categories: External Influences; Environmental Sustainability; Health and Well-Being; and Environmental Management. These categories provided a strategic framework for information gleaned from staff interviews and document research. Forty-four (44) environmental issue papers supplemented basic observations and implications, and were included as an appendix to the report.

External Influences. Early SEA efforts revealed that the Army's transformation was unfolding during a time of increasing regulatory and public scrutiny, including a plethora of legislative requirements warranting Army consideration. Such pressures were identified as potentially significant influences on the pace and success of the Army's Transformation to the Objective Force, as well as the continued operation of the Legacy Force during the interim period. Study activities used to produce this second iteration of SEA also validated the importance of these external influences.

Environmental Sustainability. Systems Acquisition, Installations, and Training Lands, were three distinct, yet interrelated, sustainability components previously examined, and retained as part of a fuller appraisal. Specific attention is directed at the evolving concept of "Installation Sustainability". This more comprehensive view of sustainability provides a fuller appraisal of long-term installation viability (sustainability), including the ability to serve as a power projection or training platform. Additional issues become part of this

broader concept, including pollution prevention, hazardous waste effluents and emissions, availability of water, energy and its related environmental effects, as well as the ability of the installation infrastructure and real estate to support long-term mission objectives, and the provision of an adequate quality of life for soldiers and their families.

Health and Well-being. The health and well-being of Army soldiers, families, supporting personnel, and the surrounding community are key imperatives of a viable and effective force. The initial SEA explained the value of trained environmental personnel, environmentally safe installations, and environmentally-sound systems design; all contributing to effective personnel health and well-being.

Environmental Management. Environmental management, first addressed in the initial SEA, is further assessed in Chapter 3, through a brief discussion of Environmental Management Systems (EMS) as a distinct issue. Chapter *4 Management of Environmental Integration*, provides a more in-depth look at EMS and its relation to other ongoing efforts designed to ensure successful environmental integration within the transformation process.

Special-interest Areas. The initial SEA identified numerous special-interest environmental areas. Two of these issues (Overseas Environmental Impacts and Conventional Demilitarization), receive additional appraisal in this report.

3.3 Second SEA Report: Workshop Implications and Refined Issues

3.3.1 Environmental Workshop

After the initial SEA was completed, a "mid-course" environmental workshop (February 2001) was held to facilitate increased interaction of Army environmental experts in the Army Transformation process. The workshop facilitated a better understanding of Transformation requirements and processes, a review and refinement of the initial SEA, and the identification of key environmental concerns, actions, and activities for future SEA focus.

During the workshop, representatives from the Army's environmental community identified several of the 44 issues noted in the initial report as near-term priorities. Key strategic implications that reach beyond Army Transformation were also identified.

Implications beyond Army Transformation. Many SEA issues identified in the initial SEA report may affect Army Transformation, but some will likely have implications that extend to all aspects of the Army business process paradigm. One such example is the concept of installation sustainability and its implications for future installation management. Changes in this installation management paradigm will be dictated by growing national environmental concerns, the expanding costs of infrastructure (facility) operations and management (O&M), and the ability of ranges and maneuver areas to effectively and efficiently support the Army mission.

The development of Installation Sustainability Master Plans (the first will be developed at Fort Bragg) will provide a mechanism to prioritize and focus installation resources on those issues that matter, eliminating the existing "stovepipe" approach and incorporating the community into sustainable solutions. As the global business environment changes in response to the economics of non-sustainable resource exploitation, surviving organizations must adapt to a new (sustainable) resource paradigm, and the Army Transformation provides such an opportunity.

The Senior Environmental Leadership Conference (SELC) 2000 theme, "more than installations," highlighted this new paradigm and its value as a comprehensive, resource-oriented approach to sustainability. It also validated some initial and interim SEA conclusions. Through greater emphasis on long-term installation sustainability, commanders can be afforded relief from the traditional task of "damage control" through "end of pipeline" management; and, by incorporating the surrounding community, can be more assured of an installation's long-term ability to support assigned missions.

Workgroup participants repeatedly expressed the need for more comprehensive, Army-wide training programs to instill the ethic of environmental sustainability across all aspects of Army leadership.

3.3.2 Second SEA Report Issues

The full gamut of environmental issues facing Army Transformation is beyond the scope of any single study. However, this report presents six major areas of concern, which include the key strategic environmental issues that are most immediately applicable to Army Transformation. They are based on the following four criteria:

- The issue, if not actively addressed, could pose a significant risk to the successful Army Transformation.
- The issue represents a special opportunity for a more successful transformation.
- The issue supports principles of sustainability and should therefore be incorporated into the transformation process.
- The issue illustrates Army commitment to environmental stewardship and sustainability, and involvement of diverse groups of stakeholders.

Specific issues include the following:

1. Legislative and Regulatory Pressures
2. Outreach and Environmental Communication
3. Environmental Sustainability
   - 3.1. Sustainable Systems and Materiel (Pollution Prevention, Hazardous Material and Waste Reductions)
   - 3.2. Sustainable Installations (Facilities, Energy, and Water Resources)
   - 3.3. Sustainable Ranges and Training Areas (Encroachment and UXO)
4. Conventional Munitions Demilitarization Requirements
5. Overseas Environmental Impacts (Training and Operational Deployments)
6. Environmental Management Systems

3.4 Legislative and Regulatory Influences

3.4.1 Background

Statutory and regulatory requirements impacting the Army have dramatically increased over the decades to include numerous mandates designed to protect, conserve and enhance

natural and cultural resources as well as related environmental media essential to human existence and quality of life. From clean air and water to the protection of endangered species and ecosystems, these environmental factors will affect all three Transformation Axes (Trained and Ready, Transformed Operational Force, Transformed Institutional Army) and must be accounted for if a sustainable transformation is to be achieved.

Strategically, these trends—commonly manifested in international, national, and regional requirements for resource conservation—will continue to affect all aspects of Army Transformation as they become more recognized by the public. Threats to the environment include global climate change; stratospheric ozone depletion; control of nuisance and alien plant and animal species; over harvesting of fish, forests, and other natural resources; and the transnational movement of hazardous chemicals and waste. Within the United States alone, over 50 pending Federal environmental statutes could directly or indirectly affect Army operations.

Specific impacts on Army operations include the following:

- More stringent air emissions standards that could affect the use of fossil fuel in transportation and power generation;
- Limitations on training ranges as a result of ground water contamination;
- Demands for greater controls on conventional munitions demilitarization;
- Requirements for more intensive hazardous waste management;
- Concerns over the degradation of natural and cultural resources; and
- More rigorous restoration (cleanup) of contaminated lands.

Implications. Without a strategic appreciation of such statutory and regulatory environmental trends, Army Transformation planning and decision-making will either fall short of success, or be difficult to achieve. To facilitate this appreciation and improve planning, DOD and EPA partnering programs should improve implementation at the national policy level. The Army could also better use trend analysis and "futures" oriented research to shape and form an improved paradigm; that of a sustainable Army. The "futures" orientation of such trends analysis is already underway through the Emerging Non-Traditional Security Issues (ENSI) process (managed by ODCSOPS) and the Environmental Legislative and Regulatory Analysis and Monitoring Program (ELRAMP), headed by the Army Environmental Policy Institute (AEPI).

The National Environmental Policy Act (NEPA), as implemented through *AR 200-2*, is an effective mechanism for the timely consideration of environmental issues and involvement of both internal and external stakeholders. If used as the statute intends, NEPA compliance (initiated in a timely and coordinated fashion) can provide needed support to Army Transformation decision-making, and the entire process can mirror the intent of the law. Through the use of programmatic approaches that document headquarters-level decisions, required site-specific analyses at installations selected to host Interim Forces could be accomplished more efficiently. Additionally, use of a programmatic approach can significantly reduce the traditional time frames associated with individual NEPA analyses for transformation-related actions, which, if done on a case-by-case basis, could each take 12-18 months.

3.5 Outreach and Environmental Communication

3.5.1 Background

External influences can shape the pace and eventual success of Army Transformation. Army installations and tenant organizations, though once isolated, are now integral components of the surrounding ecosystem and local community. Consequently, clear, honest, and open communications must replace any misperceptions of actions that could damage public health and well-being, or irreversibly alter the environment the Army shares with both the surrounding community and follow-on generations. Public outreach and involvement are not optional activities but are in fact required by various government laws, executive orders (EOs), and DOD and Army regulations. The goal of outreach is to share information, initiate dialogue, and partner with stakeholders in reaching sustainable solutions. Without such communication, public support diminishes, time delays increase, project costs grow, and, in the long-term, installation survival is threatened.

While external communication is important, increased emphasis must also be placed on improving internal (Army) communications between various organizational elements. Far too frequently "stove-piped" information flows within the Army lead to a fragmented process that wastes valuable environmental and operational resources. As a result, many Army operators and other stakeholders (both internal and external) remain unaware of supporting internal environmental organizations roles and responsibilities, resources, lessons learned and best practices, and ongoing initiatives that could have an adverse or positive effect on proposed actions and public involvement requirements.

In response to such inefficiencies, improvements in outreach and environmental communication can inform, educate, and garner support from stakeholders—internal and external to the Army—leading to sound environmental stewardship and long-term installation sustainability as an integral component of Army Transformation.

Outreach, a new focus area for the *Army Environmental Campaign Plan*, was added as a new panel to the 2001-2002 Senior Environmental Leadership Conference (SELC) as a means of reinforcing and enhancing the probability of success for actions developed by other core focus areas and leadership panels. This new focus area will require synchronizing and coordinating environmental communications efforts with both internal and external audiences; informing, educating, and building consensus; garnering support; and acquiring the required resources to support Army Transformation sustainability objectives.

Through synchronization of activities within the Army Transformation Campaign Plan, the strategic communications/outreach LO is expected to support the three transformation axes: Trained and Ready; Transform Operational Force; and Transform Institutional Army. Such support for environmental-related issues (both aspects of the affected environment and aspects of the proposed action) can best be accomplished by ensuring they are addressed early and completely. Proactive, comprehensive, and innovative use of the entire transformation information spectrum will help ensure that stakeholders are engaged throughout the entire life cycle of Army Transformation. This full dissemination of information must also be extended into future transformation activities, ensuring that "lessons learned," best practices in environmental management, and Army commitments to stewardship and sustainability are shared among all planners and decision-makers (inside and outside the Army) implementing Army Transformation.

3.5.2 Implications

The Army can expect increased public interest in environmental stewardship. If ignored, or half-heatedly addressed, these pressures can affect established transformation timelines. Increased coordination and partnerships with external organizations will become a commonplace means to expedite future Army actions. The Army should anticipate the need for environmental reviews and planning, and act early in the transformation planning/decision making cycle. While, in some cases, the costs of doing business can be identified earlier in the process, these costs are best addressed at a time when optional approaches to outreach are possible. Presently, the Army needs a central organizing capability to focus and coordinate public outreach programs. Three actions are recommended:

1. Communication and outreach plan. A strategic plan is needed to integrate internal and external communication requirements. This plan should draw from a review of completed and ongoing environmental analyses (EAs and EISs) that identify and define relevant concerns for Army Transformation. Source documents for this review include, but are not limited to, the following:

- SEA reports and supportive issue papers;
- The Draft Programmatic Environmental Impact Statement (PEIS) for Army Transformation;
- The Ft. Lewis Initial Brigade Combat Team Environmental Assessment/Environmental Impact Statement (EA/EIS)
- The Ft. Polk and Ft. Irwin land expansion EA/EISs;
- Environmental documents related to Makua Military Range, Hawaii, and the Massachusetts Military reservation—reservations where the military's use of training lands lies at the center of many public and environmental regulator concerns;
- Army holdings at the NEPA Repository of the Transportation Library at Northwestern University.
- On-going "hot spot" developments (Vieques bombing range in Puerto Rico).

2. Public involvement training. Policy guidance should be developed to address public involvement during Army Transformation. This guidance, leadership training, and orientation should define the rationale and process of public involvement regarding environmental and other transformation matters.

3. Outreach and environmental communication program. This program should focus internally on installation commanders, their staffs, and the local military population at affected Army installations. Externally, the program should inform the public and the regulator community. Across the board (both internally and externally), emphasis should be placed on fully integrating environmental stewardship and sustainability with all three transformation axes, and not restricted to installation-level impacts.

3.6 Environmental Sustainability (Systems and Materiel, Installations, Ranges and Training Areas)

3.6.1 Background

The Army must embrace the principles of stewardship and sustainability, managing all resources to ensure that they remain available for use by future generations. A sustainable Army will require institutional change and redesign, focused on minimal resource consumption (to include both economic and natural capital). Against a backdrop of widespread resource depletion and pollution, the Army cannot indefinitely depend on unlimited and inexpensive fossil fuel use, the economics of which will shift dramatically over the next decades.

The long-term regional competition for scarce resources will dictate a shift to values expressed in the emerging sustainability business paradigm. Over the past two decades, U.S. environmental concerns have altered how the Army manages the natural/cultural and man-made resources under its control. Traditional "end-of-the-pipe" treatment of pollution is giving way to more-compelling approaches that prevent pollution and waste through proactive planning, design, construction, and management, and disposal of facilities and equipment.

Such early, "whole system " or life-cycle consideration of environmental consequences prior to and during design, construction and development, can eliminate many negative impacts on the environment, as well as the costs associated with their mitigation. This dual "payback" is the essence of the sustainable principles that are emerging in industry. Sustainability must transcend Army "stovepipes" by integrating environmental stewardship and installation sustainability into mission success. In order to do so, soldier/civilian training, leadership development, and all aspects of Army leadership and management must consider and adopt the sustainability approach.

3.6.2 Sustainable Systems and Materiel (Pollution Prevention and Hazardous Material and Waste Reduction)

Army acquisition processes for systems and commodities and implementation of improved industrial pollution prevention processes can have long-term effects on Army Transformation. These effects occur at all stages of a product/system life-cycle, and an early evaluation of their associated environmental consequences could significantly reduce the problems and costs associated with subsequent Army-wide implementation. A more rigorous assessment of alternatives during system design can assist in achieving the long-term goal of a sustainable Army Transformation.

Pollution Prevention. Pollution Prevention (P2) is a prominent consideration in the acquisition and fielding of new systems. Army Transformation presents an opportunity to maximize the return on sound investments in the science and technology (S&T) for new systems through application of P2 and sustainability principles.

Although it is commonly accepted that pollution prevention is readily adopted in the acquisition of new systems, it is the Army's legacy systems that will remain an integral part of the Army inventory well into the future. Consequently, the Army stands to benefit from incorporating P2 and other environmental criteria into the recapitalization, decommissioning, and disposal plans for all systems. In addition to older legacy systems, Initial Force "off-

the-shelf" combat systems and interim armored vehicles (IAVs) would also be eventually considered. The timely completion of appropriate environmental analyses for systems acquisition is essential for informed and productive development, testing, and fielding.

Sustainable P2 efforts can also be enhanced through improved industrial processes that are often a significant source of pollution. Greater coordination of funding and mission responsibilities between installation and weapons system (acquisition) program managers (PMs) are needed to make meaningful progress in this area of concern.

Implications. System developers should initiate appropriate environmental analyses (including pollution prevention) as early as practicable, enabling the analysis and selection of the most desirable alternatives early in the process, before such decisions become expensive and difficult to implement. Army sustainability thus stands to benefit through the promotion of:

- Timely environmental assessment of new and recapitalized systems;
- Army-wide procurement and use of materials that do not pollute;
- Integration of pollution prevention principles into training;
- Programming and funding of installation pollution prevention plans;
- Programming and funding of industrial pollution processes; and
- Partnering with federal, state, and local regulatory officials to arrive at mutually acceptable solutions.

Efforts are underway at the Army Environmental Center (AEC) to develop a systematic means to determine the total life-cycle environmental costs associated with various weapons systems alternatives. These life-cycle environmental cost considerations should be incorporated into the decisions (milestones) associated with major systems.

Hazardous Materials and Waste. Reduction and elimination of hazardous materials and waste streams should be a major focus during the Army Transformation. Too often, the exorbitant costs of mismanagement of such materials and wastes have proven the fallacy of the "end of pipe-line" paradigm. Additionally, expressed community alarm over the storage and transport of hazardous materials can easily lead to regulatory actions restricting such operations.

Over the past decade, substantial progress has been made toward pollution prevention measures that meet or exceed waste reduction goals established in Executive Orders and DoD implementation guidance. Much of this progress is attributable to the elimination of excess explosives manufacturing facilities; improved management of hazardous materials at installations; and non-hazardous material substitutions across the Army. These gains notwithstanding, a sustainable Army will use less hazardous materials and generate far less hazardous wastes.

The Army needs to focus additional P2 efforts on its production and maintenance facilities and operations where major opportunities exist for reductions in the use of hazardous materials and generation of hazardous wastes. Through Transformation, the Army can shift from a focus on compliance to a focus on the emerging business approach based on the reduction of waste and long-term sustainability.

An Army Audit Agency (AAA) report (February 1997) faulted the Army for a lack of full integration of the Pollution Prevention Program into its operations. This same report recommended a more proactive business investment strategy, consistent with the principles of sustainability. Such a business investment strategy can reduce environmental costs and help eliminate root causes of environmental noncompliance. To this end, the Army has actively supported installation-level promotion of improved hazardous materiel business practices and the fielding of automated hazardous substance tracking systems.

Implications. Status quo management of hazardous materials and wastes will continue to siphon resources from Army Transformation objectives unless a sustainable, business-like approach is adopted. A sustainable business strategy would encompass policies, goals, and objectives to reduce the Army's reliance on hazardous materials across all aspects of its enterprise: weapon system design, production, operations and maintenance, and disposal; munitions demilitarization; installation operations and maintenance; troop deployments; and other Army mission activities.

3.6.3 Sustainable Installations (Facilities, Energy, Water Resources)

The effects of the current acquisition system and stove-piped business practices are felt mostly at Army installations. While "green" materiel, system design, and acquisition will reduce many negative environmental impacts at installations, the long-term sustainability of those installations will only be realized through installation-wide planning and collaboration with community, regulatory, and other regional stakeholders.

Aging and deteriorating infrastructure and facilities, inefficient energy use, and competing and conflicting demands for natural resources will dictate that installations adopt a regional sustainability approach. Critical assets include power projection platforms, training (readiness) and testing installations, and production and maintenance facilities. Installation demands for energy, clean and adequate water, and supplies and materials, may increasingly compete with the same demands of surrounding communities and thus create conflicts between the needs of the community and the installation mission.

Any new range facilities required for Army Transformation must incorporate environmental stewardship and sustainability. They must also reduce the consumption of natural resources as they provide the necessary characteristics to support transformation doctrine. These sustainability efforts must begin immediately, given the lead-times required for planning, programming, and budgeting resources, and the design and construction of required facilities.

Facilities. An outdated Army facility management approach, coupled with inadequate resourcing and "stovepiping", has led to a tremendous backlog of maintenance and repair (BMAR), and a deteriorated, aging infrastructure that cannot sustain the demands of the Interim and Objective forces. During the January 2001, Senior Installation Leaders' Conference (SILC), concern was raised that Army installations had reached crisis conditions – excess infrastructure, deteriorating facilities, a substantial backlog of building maintenance and repair, and pending new requirements for transformation.

Consequently, resolution of this concern may require disposal of excess capacity through Base Realignment and Closure (BRAC) while at the same time making better use of remaining assets. Utilities privatization, expanded residential community initiatives, and

increased public-private partnerships are some of the key alternatives to be considered in consonance with incorporation of environmental stewardship and installation sustainability concepts.

Some inroads in this direction have already begun with the Army issuing and reinforcing various Sustainable Design and Development (SDD) policies and programs. Leadership in Energy and Environmental Design (LEED) rating standards are also being applied in the enactment of new building standards.

Implications. Army installations will require new planning and management approaches with increased investment in more efficient facilities and infrastructures if they are to sustain the Interim and Objective forces. In support of these goals, the Army should:

- Develop installation-wide sustainability master plans to incorporate the principles of sustainable business practice and environmentally-friendly technology into all Transformation actions.
- Modify operations and maintenance activities to minimize potential environmental impacts and significantly reduce the consumption and cost of energy, water and other natural resources.
- Incorporate Sustainable Design and Development practices in all new facility construction and renovation.

Energy Many forms of installation-level environmental pollution can often be traced to the demand and use of energy resources. Increasing dependency and vulnerability to energy demand and supply constraints will affect the U.S. national security posture and military readiness. The Army's ability to sustain its current energy use paradigm will be challenged.

Non-renewable energy directly impacts the environmental resources that ultimately constrain military operations, training, or installation support. To illustrate, much of today's air and water pollution is a direct product of power and fuel extraction, distribution, generation, and consumption. Consequently, as the Army transforms, demands for increased energy supplies and environmental resource conservation can best be addressed through a new sustainable approach to problem solving.

Although the Army has significantly reduced environmental pollution through its established energy conservation program, a more aggressive posture is required in order to achieve installation sustainability. Future reductions in energy demands and resultant decreases in environmental effects will require dedicated funding and technology investments.

Looking into the future, the earth's limited supply of fossil fuel must be factored into the new family of vehicles and facilities that support Army Transformation. Failure here could significantly constrain future military operations.

Implications. The Army has established energy and environmental management programs that, unfortunately, are often managed as independent "stovepipes". This approach may fall short in meeting the total needs of Army Transformation. New efforts are needed to capitalize on the systemic relationships between energy and environmental issues. A joint

working group, consisting of energy, environment, operations, and systems development subject matter experts could facilitate the development of joint energy and environmental strategies to support transformation objectives and timelines. Such an effort should be supplemented with sufficient S&T investments to promote renewable energy, alternative fuels, sustainable design and facility operations, and pollution prevention.

Water Resources. Adequate water supply is another key concern for sustainable installations. Even where water resources are abundant, the use of surface waters or groundwater may be limited by contamination. Communities have often grown around and adjacent to most Army installations, and the affected watersheds and aquifers may no longer support the multiple uses required.

As an example, Ft. Bragg, a major Army power projection platform undergoing sustainability planning, draws its water from local rivers adjacent to the installation because ground-water aquifers are contaminated. Compounding this situation is the fact that Ft. Bragg has increased its water consumption 39 percent since 1992, without a concurrent rise in installation population. Drought or emergency conditions render current water supplies incapable of supporting the demand and additional water, up to three million gallons per day, must be purchased from the local community.

Further, the population of the local communities that use the same or contiguous watersheds has doubled since 1970. This continued growth pressures Ft. Bragg, as a responsible member of the community, to better conserve its supply of water.

Implications. Given the importance of adequate water supply to all Army operations and training, the Army should analyze the availability of water resources for all installations that are potential power projection platforms for the Objective Force. The Army, of necessity, should develop a strategic regional watershed management approach to meeting installation water needs, partnering with local communities, businesses, and other government interests.

3.6.4 Sustainable Ranges and Training Areas (Encroachment and UXO)

Access to adequate training lands is essential to the readiness of the Transformed Army and the ability of that Army to respond to the National Military Strategy. As Army Transformation generates a new force structure, new weapon systems, and new training and warfighting doctrine, the nature and intensity of maneuver training and live-fire exercises will change. A strategy to ensure access to training lands is essential to success.

Encroachment. Encroachment is the sum of external factors, impacting ranges and land, that have the potential to limit the Army's capability to accomplish its mission and maintain ready forces (see also, DAMO-TS, SRM information paper, 1 Jun 2001.) Growing community concerns over noise, air/water/light pollution, soil erosion, overflights, and other factors already challenge the Army's access to (and use of) vital training lands. Increased urban sprawl, increased regulatory requirements, and competing economic demands have resulted in major community focus on the migration of pollution from Army installations and training lands. These encroachment concerns, along with heightened sensitivities over unexploded ordinance (UXO), threaten access to critical Army training lands and ranges.

Unexploded Ordnance (UXO) and Munitions Constituents. When military munitions do not fully detonate, they create unexploded ordnance (UXO). Munitions constituents are generally those chemical elements that are found in munitions. Life-cycle management of

both UXO and munitions constituents will have direct impacts on the Army's access to (and use of) training ranges and areas. The potential environmental, safety, and human health effects associated with these factors have increased the alarm of Congress, government regulators, and local officials. As a result, Army training has already been severely curtailed at key training activities such as the Massachusetts Military Reservation, where munitions constituents have resulted in severe contamination of the local communities' sole-source aquifer.

In response to such issues, the Army has initiated the research and development of "green" munitions and improved UXO detection and remediation technologies, as well as expanding communications efforts through greater outreach and community involvement. These actions, coupled with new Sustainable Range Management (SRM) techniques, will help to ensure that required training lands remain available.

As part of transformation planning, a comprehensive strategy for improving access to, and increasing the availability of, required training lands must be clearly articulated and maintained. Part of this strategy would require installations to engage local and regional communities with complete and accurate information on the nature of and requirements for sustainable military operations, now and into the future.

Under this scenario, installations would work with their communities to create solutions that meet the multiple goals of military readiness, installation sustainability, and regional environmental stewardship. A comprehensive land use and acquisition strategy should also evaluate the future BRAC (or Efficient Facilities Initiative-EFI) efforts as an opportunity to exchange excess lands for needed land near those Army installations supporting transformation.

Implications. Training lands are finite resources and must be sustained for continued use. Long-term environmental sustainability enhances the Army mission and lowers necessary operating costs. Army Transformation provides a unique opportunity to develop new weapon systems that have reduced environmental impacts, as well as promote a management paradigm that ensures the availability of current and future training lands. This comprehensive approach would include design of alternative fuel engines, better use of "green materials", improved maintenance procedures, increase use of training simulators, and reduced sprawl-induced encroachment around key installations.

3.7 Increasing Conventional Munitions Demilitarization Requirements

3.7.1 Background

Increased concern (both inside and outside the Army) regarding DoD's munitions program management, including operation of key range infrastructures, has led to the establishment of the Operational and Environmental Executive Steering Committee (OEESCM). As noted in a recent DoD action plan, "The effective and efficient life-cycle management of munitions is key to maintaining the war fighting capability of our armed forces" (*DoD Draft Munitions Action Plan, July, 2000*).

As DoD's Single Manager for Conventional Ammunition (SMCA), the Army performs primary oversight through the role of the ODASA (ESOH) as permanent co-chair of the committee. OEESCM is chartered to address munitions lifecycle management that

effectively protects and enhances readiness, maximizes safety, and minimizes adverse impacts to human health and the environment.

In May 2000, the OEESCM published a Draft Munitions Action Plan (MAP) composed of six major areas of responsibility (AORs). Most relevant to this issue are stockpile management and demilitarization. The MAP recognizes that real or perceived safety and environmental concerns could stop or interrupt the development, testing, and fielding of systems, as well as installation operations. Potential disruption becomes more likely as regulators and the public seek to restrict Open Burning/Open Detonation (OB/OD) of military munitions.

Although DoD uses OB/OD methods only 30 per cent of the time, compared to 80 per cent previously, communities are increasingly concerned over the health effects of OB/OD operations--a concern exacerbated as communities allow development adjacent and increasingly closer to critical military testing, training, and disposal facilities.

Challenged by the need to develop new demilitarization technologies, the Army is concerned over the increasing conventional munitions inventories resulting from the effects of changing global threats, obsolescence of current ammo types, and downsizing of the force, an inventory that has grown 40 per cent over the last five years and projected to increase as transformation introduces new weapons systems and improved munitions.

3.7.2 Implications

Munitions life-cycle management is becoming critical and requires effective problem resolution. Conventional and chemical demilitarization issues can potentially impact Army Transformation, both directly and indirectly, through increased restrictions on training and testing lands, or through increased funding demands that could siphon resources from other transformation requirements.

Intense pressure on the Army to close many OB/OD sites can be further exacerbated by BRAC. Although numerous munitions initiatives are underway, comprehensive insight and planning will be required.

The Army should actively review the current MAP-defined environmental objectives and timelines and incorporate them into transformation initiatives and schedules. Specific attention should be given to the following:

- Verification of projected “demil” inventory levels;
- Completion of a baseline assessment of demilitarization environmental initiatives to eliminate duplicative efforts and fill technology data gaps;
- Assessment of the environmental and human health effects of OB/OD operations; and
- Determination, establishment, and operation of optimal OB/OD facility infrastructure. Joint solutions should be maximized to the greatest extent possible.

3.8 Overseas Environmental Concerns

3.8.1 Background

Overseas environmental influences, such as changes in environmental laws, will affect the training of forward-deployed forces, overseas installation support, and operational deployment for both the current and transformed force. As an example, the primary Army Combat Maneuver Training Center (CMTC) at Grafenwoehr-Hohenfels, Germany, has experienced increased restrictions resulting from heightened environmental concerns over flora, fauna, and associated habitat protected by the European Union (EU).

Subject to applicable country-specific Final Governing Standards (FGS), the Army's overseas stewardship requirements are likely to grow, as host nations become increasingly sophisticated in their environmental protection requirements.

Similarly, previous U.S. deployments to the Balkans and other contingency operations were hindered by insufficient consideration of environmental constraints in the host counties. Rapid response and force power projection for participating combatant commands are affected by such concerns that increasingly merit greater environmental considerations in comprehensive mobilization planning and training. A lack of country-specific environmental strategies within operational plans (OPLANS) and operational orders (OPORDS) can lead to inadequate field sanitation support, conflicts with international conventions on hazardous materials and waste storage, transport, and disposal; insufficient water supplies; and degradation of water resources and fragile ecosystems.

3.8.2 Implications

Global integration within the economic, political, military and communication spectrums not only causes the world to seem smaller, but also results in the development of common expectations. The overseas Army will encounter varying and changing environmental standards. Sustainable training lands, installations, systems and materials must all be assessed in the context of overseas deployment and training doctrine and plans. Potential impacts may best be resolved through a comprehensive strategy that engages host-nation support and regional "buy-in" for those environmental requirements that affect Army Transformation training and installation support. This is particularly important for those installations that will be returned to the host nation.

3.9 Environmental Management Systems

3.9.1 Background

An environmental management system (EMS) describes how an organization manages its internal operations to identify objectives and measure progress that contributes to overall sustainability. Through the use of EMS, the Army can systematically manage its environmental and operational activities, products, and services to ensure long-term sustainability, as part of an overarching Army strategy.

EMS is an approach that combines the management of environmental and operational responsibilities while enhancing both organizational effectiveness and environmental stewardship. An EMS can improve business practices and support leadership priorities, both essential to the success of Army Transformation.

Executive Order 13148 of April 22, 2000, *Greening the Government Through Leadership in Environmental Management,* mandates implementation of environmental management systems. The current Army EMS is being developed as a dynamic performance-based system, which can continually evolve to meet changing Army needs.

Continuous process improvement is a central tenet of the 1996 International Organization for Standardization (ISO) 14001 model, the basis for the Army EMS. It encompasses the development of policy, planning, implementation, corrective actions, management review, and feedback into policy development. An EMS is designed to create a standardized methodology for management, not standardized results.

EMS provides the necessary framework through which Army Transformation can achieve long-term sustainability, ensuring conformance to Army policies to promote environmental stewardship and improve mission performance. In addition, an effective EMS can provide the Army a mechanism to demonstrate, to regulators and concerned publics, the Army's commitment to environmental stewardship and sustainability.

The *U.S. Army Environmental Strategy into the 21st Century* identifies policies and goals for the Army's environmental program, the first step in EMS development. In addition, the Army has numerous existing databases and management structures that support sound environmental management. The Army's Environmental Compliance Assessment System (ECAS) is already used to audit environmental program performance and monitor the status of results. Such capabilities and experiences can be leveraged to support development of a comprehensive EMS, thus eliminating the need for whole new programs.

The Army has already initiated an EMS pilot study at six installations: Fort Bliss, Fort Lewis, Letterkenny Army Depot, Tobyhanna Army Depot, Radford Army Ammunition Plant, and Yuma Proving Ground. Lessons learned from these efforts will be used in shaping the final Army policy and approach, currently under development through the Army Environmental Management Steering Committee.

3.9.2 Implications

The Army has begun the work to address Environmental Management System (EMS) requirements. The fruition of such efforts will support sustainability objectives, and also form the cornerstone for corporate management of Army Transformation activities. As an improved business practice, an EMS can integrate and upgrade overall mission performance; and, as a leadership initiative, can target specific leadership priorities. Special mitigation efforts can also be targeted to address impacts that are critical to Transformation success.

3.10 Proposed Action List

As with the traditional "intelligence preparation of the battlefield," the following recommendations stemming from this SEA provide a quick snapshot of key environmental issues discussed in this chapter, along with a list of relevant implications. This list provides a basis for assigning actions and tracking accomplishments.

(1) Legislative and Regulatory Influences

- Increase Transformation planners' awareness of emerging environmental trends and legal and regulatory pressures through enhanced investments in Non-

traditional Security Issue (ENSI) program and the Environmental Legislative and Regulatory Analysis and Monitoring Program (ELRAMP).

- Improve implementation of DOD and EPA partnering programs at the national policy level.
- Maximize effectiveness of the NEPA process throughout transformation by appropriate use of programmatic environmental analyses.

(2) Outreach and Strategic Environmental Communications

- Establish an Outreach and Strategic Environmental communication plan to identify and integrate internal and external requirements for environmental communication.
- Educate and train for public involvement through the development of appropriate handbooks, training courses, and regulations.

(3) Environmental Sustainability

Sustainable Systems and Materials (Pollution Prevention -- Hazardous Material and Waste Reduction)

- Develop a strategic installation/regional approach to installation sustainability in conjunction with local communities, businesses, and other government interests.
- Integrate early, life-cycle environmental requirements and their cumulative effects into major Army system acquisitions associated with transformation.
- Improve the integration of pollution prevention and environmental criteria into modernizing and re-capitalizing the Legacy Force. Include potential environmental issues associated with the digital force and decommissioning and disposal of legacy facilities and equipment.
- Increase investments in "green systems and materiel development", industrial pollution prevention research, and hazardous materials and waste management technologies.

Sustainable Installations (Facilities, Energy, and Water Resources)

- Incorporate Sustainable Design and Development practices into all new facility construction and renovation.
- Develop installation-wide sustainability master plans to incorporate sustainability principles and environmentally friendly technology into all Transformation-initiatives.
- Establish a joint working group of energy, environment, operations and systems development subject-matter experts to develop joint solutions supporting transformation objectives and timelines.
- Supplement current S&T investments in renewable energy, alternative fuels, sustainable design, and pollution prevention initiatives

- Ensure Interim Brigade Combat Team planning accounts for increased demand for housing and support services and the impact of existing facilities on the health and well-being of Army members and their families.

Sustainable Training Ranges and Areas (Encroachment and UXO)

- Develop and clearly articulate a comprehensive strategy for improving access to, and increased availability of required training lands.
- Evaluate the total Army Training land requirement focusing on maximizing use of available lands and the use of alternative training technologies.
- Improve consideration of the environmental consequences of increased training at installations where significant environmental concerns or sustainability issues exist.
- Increase investments in promising UXO detection and remediation technologies
- Expand community involvement while reinforcing Sustainable Range Management approaches.

(4) Increasing Conventional Demilitarization Requirements

Review the current MAP-defined environmental objectives and timelines and incorporate into ongoing transformation initiatives and schedules.

(5) Overseas Environmental Concerns

- Establish a comprehensive strategy to incorporate host-nation support and "buy-in" regarding the environmental requirements affecting overseas Army training, deployments, and installation support.
- Ensure that country-specific environmental constraints are adequately incorporated in appropriate OPLANS and OPORDS.

(6) Environmental Management Systems (EMS)

Implement Army EMS to comply with the ISO 14001 standard.

Summary Institutional Recommendation

Accomplishment of sustainability objectives throughout Army Transformation could possibly be enhanced through wide-scale consideration and adoption of the FORSCOM Installation Sustainability Master Plan initiative. The first Installation Sustainability Workshop was held in the spring of 2001 at Fort Bragg. Individual workgroups were charged with developing sustainability plans for the following areas: water supply, water quality, energy, air, material procurement, buildings, and sustainable ranges.

The Army Environmental Policy Institute (AEPI) facilitated this workshop, and Fort Bragg is working with the local community and regulators in evaluating its overall sustainability as a power projection platform. Such an installation-driven approach addresses the mission and environmental sustainability goals while accomplishing the outreach and communication objectives along the way.

FORSCOM plans call for sustainability workshops at all power projection platforms, with Fort Lewis scheduled for the next workshop (January 2002). Additionally, the Army's Assistant Chief of Staff for Installation Management (ACSIM) is evaluating the benefits of a Garrison Commander's Sustainability Workshop. Based upon recent business literature, these workshops, and their subsequent implementation plans, provide a unique opportunity to marry mission requirement and environmental stewardship, focusing installation activities on the central goal of sustainability.

4 MANAGEMENT OF ENVIRONMENTAL INTEGRATION

4.1 Introduction

This chapter provides a general context and strategy for effective integration of Army environmental management. Against this backdrop, Army efforts to integrate environmental stewardship and installation sustainability with transformation are described and related to the key components of an effective Environmental Management System.

4.1.1 Context

Environmental management in the military, as in most businesses and government organizations, can be viewed as a stand-alone strategy for the management of the Army environmental program or an integrated strategy that melds the environmental program into all other major business processes.

Stand-alone. In the stand-alone strategy, environmental programs are managed and executed through an environmental organization (stovepipe) whose hierarchical status is equal to (or sometimes a tier below) the major staff functions of the organization, such as Research and Development, Financial Planning, Information Technology, Human Resources Management, and Public Affairs. This strategy results in functional line elements complying with policies, directives, and findings emanating from the environmental organization. Depending on organization size and environmental staffing, responsibility for environmental requirements (e.g., site remediation, technology transfer of new environmental technologies, environmental compliance) is shared by components within the broader environmental organization and affected business element(s). The stand-alone strategy's language of choice leans heavily toward enforcement and environmental jargon.

Integrated. Within a broader, integrated strategy, environmental stewardship becomes a component of the overall Army strategy. It has an "up front" life-cycle affect on multiple elements of the organization, to include strategic planning, programming, budgeting, and execution. Broad environmental responsibilities are embedded in each line and staff business process and specific environmental requirements emanate from the overarching and integrated *environmental-business* strategy.

The relative size of the environmental office in the integrated strategy is much smaller than the environmental organization in the stand-alone strategy. The integrated office sets broad goals and objectives and establishes the overall importance of the environmental program to the Army organization and its business practices. Unlike the stand-alone strategy, the integrated approach primarily uses the *language of the business* to communicate environmental requirements.

One significant consequence of the stand-alone strategy is that environmental organizations are often cast as "regulators" and "watch dogs," perceived by other Army elements as competing for time and resources needed to respond to more pressing mission requirements. An integrated strategy, in contrast, establishes greater organizational ownership of environmental issues that affect mission success. Environmental requirements are no longer challenged as they become part of the early, real-time strategic planning for the entire organization. The organization survives, in part, because environmental (and other)

issues are considered and addressed before becoming unmanageable problems. This shift in thinking and activity is increasingly reflected in the growing body of literature dealing with "sustainable business practices." Figure 4-1 is a visual depiction of the stand-alone versus integrated approach.

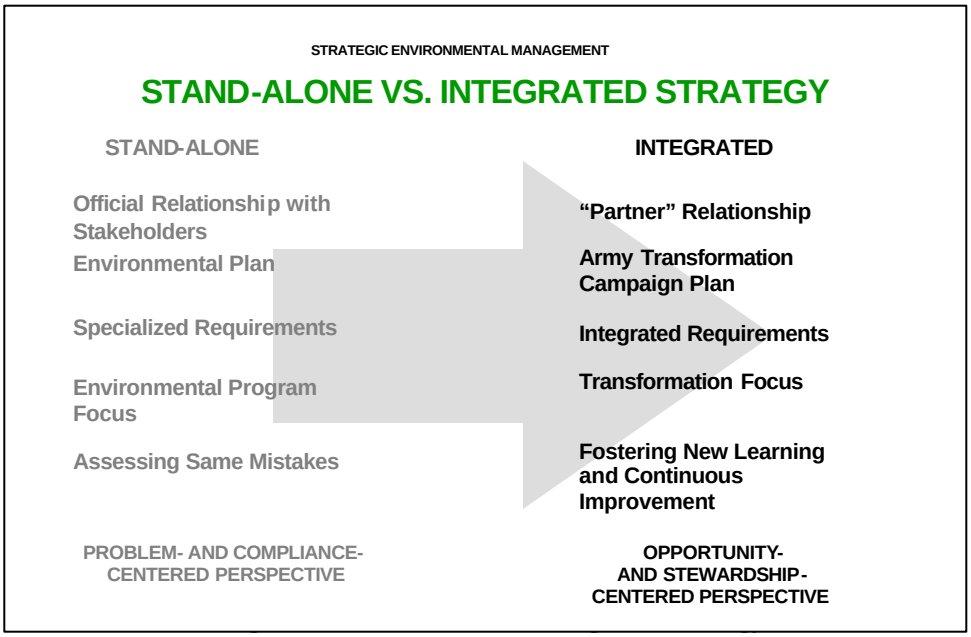

Figure 4-1 Stand-Alone vs. Integrated Strategy

4.2 Transformation Environmental Management

This section summarizes various Army initiatives designed to fully integrate environmental stewardship with Transformation objectives. These initiatives directly represent some of the necessary components of an effective environmental management system (EMS), and can thus serves as a partial foundation for a more integrated Army environmental-operational approach.

Environmental Policy *(U.S. Army Environmental Strategy into the 21st Century).* Army environmental management policy is clearly stated in the *U.S. Army Environmental Strategy into the 21st Century*, published in 1992. This policy establishes four distinct environmental pillars for the management of the Army environmental program: Compliance, Restoration, Pollution Prevention, and Conservation. This strategy was validated recently at the 2000 Senior Environmental Leadership Conference.

In its evaluation of alternative Courses of Action (COA) implementing a corporate wide Environmental System (EMS), the Army adopted International Organization for Standardization (ISO) 14001 as the appropriate framework for Army environmental management. ISO 14001, published in September 1996, provides overall standards for environmental management, addressing such key areas as policy, planning, implementation, performance evaluation, and corrective action.

ISO 14001 attempts to create a policy specific enough to generate concrete, proactive environmental management actions throughout the Army. Guidance for EMS

implementation was communicated within the Army via a July 2001 policy memorandum from the Office of the Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health, ODASA (ESOH). This action illustrates commitment and support from the highest levels of Army leadership. The Army EMS policy incorporates tenets of ISO 140001 and the emerging business focus of long-term sustainability and continuous process improvement.

Planning (*Army Environmental Campaign Plan)*. Army Transformation provides an opportunity for new approaches to integrated planning. As such, the current *Army Environmental Campaign Plan* forms the basis for integrating environmental stewardship into the Army strategy and transformation vision. It establishes the objectives and goals of the environmental program as well as the roles and responsibilities for the principal Army organizations.

Implementation *(Operational Directive and Front Line Execution*). The Army must develop institutional capabilities and support mechanisms to achieve environmental and sustainability policies, objectives, and targets at all levels of responsibility. An *Operational Directive* published in support of the Army environmental campaign plan serves as the "front line" for execution. The *Operational Directive* identifies the Army organizations (and commands) responsible for developing, implementing, and overseeing specific action plans within their respective lines of authority (LOA). Successful implementation rests within the MACOMs and other organizations selected for their particular experiences, resources, and insights.

Checking and Corrective Action (*Transformation Environmental Management Group).* The Army must measure, monitor, and evaluate its environmental performance, as well as ensure continuous process improvement. Accordingly, through the Environmental Compliance and Audit System (ECAS) program, routine environmental and management audits are performed periodically. Results are captured in an Army database that forms the basis for analysis, mid-course correction, and process improvements.

Beyond ECAS, the Transformation Environmental Management Group (TEMG) was chartered at SELC 2000 to ensure successful implementation of the Army Environmental Strategy and Campaign Plan. It enforces the Operational Directive; oversees successful implementation of each focus area; better links the Army Planning, Programming, Budgeting, and Execution System (PPBES) to environmental requirements; and develops the capability for continuous improvement and innovation, including corporate measures of success.

Through the TEMG, lead agencies and commands report progress on completion of assigned actions to the ACSIM and DCSOPS or other designated Army Staff agency. The TEMG's Council of Colonels reviews the status of actions, and reports issues and recommendations consistent with review and approval procedures established by the TEMG.

Management Review *(AEEPB).* The Army EMS process will be used to improve overall environmental program performance. The EMS will be reviewed periodically by the Army Energy and Environmental Policy Board (AEEPB) to ensure that the EMS process is both efficient (providing sufficient returns for the resources expended) and effective (contributing to continuous improvement and support for Army sustainability). Key senior

Army leadership chairs the AEEPB Board of Directors (BOD) for the TEMG. The BOD is a top-level decision forum for strategic environmental and sustainability concerns.

The DCSOPS, ACSIM, and other Army staffs link the AEEPB to the Army Resource Management System [Army Planning, Programming, Budgeting, and Execution System (PPBES)]. AEEPB decisions and guidance are published as executive directives to the Director, Program Analysis and Evaluation (DPA&E), the Comptroller of the Army, and DCSOPS. These directives form the basis for the Army Program Guidance Memorandum and budget guidance, as well as more specific implementing directives to the MACOMs and other designated activities.

The U.S. *Army Environmental Strategy into the 21st Century*, reflected in the Army Environmental Campaign Plan, forms the basis for corporate-level senior leadership involvement in environmental issues. As the Army EMS evolves and incorporates existing systems and procedures (such as ECAS), it will move closer to meeting more of the ISO 14001 requirements. Although much work remains, increased focus on EMS, sustainability, and environmental stewardship, will move the Army well forward toward making environmental considerations an integral component of Army Transformation.

5 CONCLUSIONS, LESSONS LEARNED, AND THE WAY AHEAD

5.1 Introduction

This chapter presents conclusions resulting from this second SEA report, provides SEA lessons learned, and outlines a way ahead for future iterations of SEA.

5.2 Conclusions

This report, much like the initial report that precedes it, provides a representative sample of the many important environmental issues applicable specifically to both the legacy and transforming Army force. Army Transformation planners should keep the following considerations in mind:

- *Transformation is unfolding during a period of increased legislative and regulatory environmental pressure, suggesting the importance of proactive and comprehensive environmental planning.* Regulators and watchdog organizations will scrutinize any transformation-related activity that is viewed as contributing to environmental degradation, whether increased emissions, greater noise, damage to natural or cultural resources. Or a myriad of other environmental issues. Permits, licenses, and other approvals will be required, and site-specific and project-specific NEPA analyses will require completion prior to transformation decisions.
- *Sustainability – in systems and materials, in installations, and in training lands – is fast becoming the organizing business imperative for Army Transformation.* Noncompliance fines, lengthy environmental cleanups, inadequate facilities and equipment, the limited availability of land, increased urban sprawl (encroachment) and ill-will (resulting from protracted environmental problems or unanticipated environmental consequences) represent impediments to the Army, and degrade both the pace and standard of transformation. Both sustainable program development and the incorporation of sustainability principles into Army business practices are critical to the success of current and future Transformation actions.
- *Systems acquisition for transformation, as well as Legacy Force recapitalization, must incorporate the environmental life-cycle effects of materials, their configurations, their footprints and their use*. Soldier (and non-combatant) health and well-being can be affected by systems that do not adequately consider their manpower and personnel integration (MANPRINT) and collateral damage implications. Systems that require hazardous materials in their production and maintenance may produce hazardous pollutants during operation, and may require the development of training surrogates.
- *Implementation of various Transformation initiatives at Army installations must embrace the principles of sustainability, consider the full range of military operations, not simply current/Legacy Force activities; and assess the overall ability of an installation to sustain those activities*. This will require the re-invigoration of existing installation master plans and their external coordination/commitments with

local communities; adequacy of supporting infrastructure; energy use, potential susceptibility to base realignment and closure; local regulatory conditions/constraints; and overseas returning unit and quadrennial defense review considerations. Many, if not all, of these concerns carry with them environmental implications. This approach is epitomized in the current evolution of an Installation Sustainability Master Plan (ISMP), currently under development at Fort Bragg.

- *Acquisition of additional or increased "OPTEMPO" to existing training lands can expect to be met with varying degrees of opposition and restriction by some community groups.* Encroachment and unexploded ordnance issues continue to restrict use of existing Army training lands. Additionally, there is no national consensus or constituency for the expanded use or acquisition of training lands resulting from increased transformation demands. The Army—in partnership with the other Services and government agencies—must adopt a more leveraged and coordinated approach to the limited availability of land.

  Training requirements for a transforming force must also consider a rigorous transformation of the training structure. Training requirements that cannot be met on existing or accessible training lands must consider a greater use of virtual reality simulation. For some scenarios, the soldier of the transformed Army must be capable of being trained to full readiness in a simulated environment that provides a high degree of combat realism.

- *Environmental leadership and management, coupled with sustainability principles, must support, and remain an integral component of, Army Transformation.* At this early stage in Army Transformation, the opportunity exists to further improve the integration of environmental criteria into *all* planning and decision-making for training, maintaining and transforming both the institutional and operational force. To date, environmental responsibilities are relegated primarily to the installation-level, thus denying the Army opportunities for a more complete and coordinated response in such areas as –training and doctrine; requirements, acquisition, and logistics; and military operations and deployments. The Army's *Environmental Campaign Plan* seeks to redress this inadequacy by providing a mechanism, not fully leveraged at present, for continuous and systematic management and oversight of environmental issues as they affect Army Transformation.

- *The Army has many components of an effective EMS already in place.* The challenge lies in effective integration of these capabilities. This process must leverage existing resources – people, land, materiel, technology, finances, and collaborative relationships – to create a total and coordinated capability for sustaining the environmental aspects of Transformation. Key planning considerations include the following:

  - Funding and emphasizing environmental programs at a level comparable to other transformation requirements;

  - Ensuring a Army workforce with the requisite technical skills, experience, and insight to address the full range of environmental issues and opportunities;

- Implementing an "eco-systems" approach to environmental management, whereby natural, man-made, and cultural resources are managed, not as separate, stove-piped programs, but as a seamless whole, including the management of resources beyond the installation fence line;
- Taking into account the unique environmental issues of the Reserve Components, ensuring continuous evaluation of Reserve, Joint Services, and coalition perspectives on the environmental impacts of transformation; and
- Further improving the Army capacity to share and profit from lessons learned, and remaining vigilant for new insights and innovations.

- *Comprehensive, proactive community outreach and environmental communication are valuable tools for gaining, garnering, and maintaining public support for Army Transformation.* American communities expect, as part of a democratic political process, to participate in decisions that affect the communities where they live, work, and play and spend their tax dollars. As the Army adopts a transformed CONUS-based force, the Army needs robust power projection and training capabilities that must be acquired through a balanced and collaborative dialogue in concert with the needs and desires of the local community, eliminating the dependence on simple public notices and information campaign plans. Effective outreach should and will demand community involvement to insure the long-term sustainability of the mission and garner the public support for Transformation.

5.3 Lessons Learned

Three critical lessons have to date emerged from the continuing evolution of SEA: the importance of a common approach to SEA objectives, the need for an expanded and coordinated research effort, and the importance of maintaining a distinction between the SEA "process" and "product."

(1) Ensure a commonly accepted approach to SEA. The pressures of daily routine, differing organizational cultures, and separate professional development and organizational assignment tracks will often cause environmental and operational planners to differ in their interpretation of key SEA requirements. It is essential, therefore, that SEA objectives and methodologies be explicitly stated, understood at the outset, and accepted by all parties to the SEA process. Critical information requirements must be identified early, providing stakeholders common, uniform measures for success. Such a process will facilitate greater active cooperation among environmental and operational professionals throughout the process and leverage their different, but equally valuable, portfolios of information, insight, and experience.

(2) Expand and coordinate the research process. Within and outside the Army, there is an extraordinary range and depth of environmental expertise, insight, and experience. SEA analysts should exploit this resource, both early and often, to review, comment on, and assist in the preparation of future SEA reports.

This effort can build on previous and related environmental efforts and initiatives, such as the results of Defense and privately-sponsored assessments of emerging non-traditional security issues, proceedings from the annual Senior Environmental Leaders Conferences,

Army Worldwide Environmental and Energy Conferences, and Department of Defense-Industry Roundtables on environmental, safety, and health matters, and the planning documents of other government and business organizations. The Army can benefit through a more practical, objective, and relevant SEA process, and external stakeholders in particular can become more appreciative (and, hence, supportive) of the unique environmental challenges confronting the Army Transformation.

(3) Maintain distinction between SEA "products" and "process." The SEA process is an effort at information gathering, issue appraisal, and stakeholder engagement across a broad spectrum of activities and throughout the life-cycle of Army Transformation. The products of the SEA process will be reports of findings, briefings, and white papers, as well as specific issue papers designed to raise the level of environmental intelligence (awareness) as inputs to operational Transformation planning.

5.4 The Way Ahead

The SEA process has incorporated the advice and counsel of an expanding group of environmental and operational professionals, both inside and outside government, and such collaboration will continue. The SEA process, open and collaborative, is subject to continuous process improvement, raises the level of awareness throughout the Army, and ensures that environmental stewardship remains an integral component of a successful Army Transformation. SEA can build Army support among key external stakeholders, including Congress, other elements of the Department of Defense, other government agencies, environmental regulators and interest groups, and regional and community groups.

The SEA will evolve along with the interim and objective capability phases of Army Transformation. Subsequent reports will "scrub" the observations and implications surfaced in this second report and extend the depth and scope of inquiry. These more in-depth appraisals should incorporate the perspectives of key external Army constituencies such as environmental regulators, interest groups and non-government organizations (NGOs). Army COAs will incorporate and exploit best practices and lessons learned from industry and other defense and government agencies. Future SEA efforts will also extend the strategic horizon for environmental threats and opportunities for Army Transformation.

APPENDIX A – LIST OF ACRONYMS

AAA	Army Audit Agency
AC	Active Components
ACSIM	Assistant Chief of Staff for Installation Management
ADNL	A-weighted DNL
AEC	[U.S.] Army Environmental Center
AEPI	Army Environmental Policy Institute
AMC	Army Materiel Command
AOR	Area of Responsibility
APA	Army Pre-positioned Afloat
APL	Army Pre-positioned Land
APS	Army Pre-positioned Stocks
AR	Army Regulation
ASA (ALT)	Assistant Secretary of the Army for Acquisition, Logistics and Technology
ASA (I&E)	Assistant Secretary of the Army for Installations and Environment
AST	Above-ground storage tanks
ATCP	Army Transformation Campaign Plan
AWCF	
BRAC	Base Realignment and Closure
CAA	[U.S. Army] Concepts Analysis Agency
CEQ	Council on Environmental Quality
CDMP	Community Development and Management Plan
CDNL	C-weighted DNL
CERCLA	Comprehensive Environmental Response, Compensation, and Liabilities Act
CEQ	Council on Environmental Quality
CFC	Chlorofluorocarbons
CHPPM	[U.S. Army] Center for Health Promotion and Preventive Medicine
CINC	Commander in Chief
CMTC	
CONPLAN	Contingency Plan

CONUS	Continental United States
CSA	Chief of Staff of the Army
CWA	Clean Water Act
dB	Decibel
dBP	Decibel peak
DENIX	Defense Environmental Information Exchange Network
DERP	Defense Environmental Restoration Program
DNL	Day-night level
DoD	Department of Defense
DTLOMS	Doctrine, Training, Logistics, Organizational Design, Materiel Development and Soldier Support
DU	Depleted Uranium
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELRAMP	Environmental Legislative and Regulatory Analysis and Monitoring Program
EMS	Environmental Management System
ENSI	Emerging Non-Traditional Security Issues
EO	Executive Order
ERP	Environmental Restoration Program
ESOH	Environment, Safety and Occupational Health
FGS	Final Governing Standards
FORSCOM	[U.S. Army] Forces Command
GSA	General Services Administration
HEMTT	Heavy Expanded Mobility Tactical Truck
HM	Hazardous Material [Sometimes referred to as HAZMAT]
HMMWV	High-Mobility Multipurpose Wheeled Vehicle
HQDA	Headquarters, Department of the Army
IAV	Interim Armored Vehicle
IBCT	Interim Brigade Combat Team [Also Initial Brigade Combat Team]
IPAT	Integrated Process Action Team
IRP	Installation Restoration Program
ISO	International Organization for Standardization

ITAM	Integrated Training Area Management
ITC	Installation Training Capacity
MACOM	Major Army Command
MANPRINT	MANpower and Personnel Integration
MAP	Munitions Action Plan
MCL	Minimum Containment Levels
MCLG	Maximum Containment Level Goals
MHPI	Military Housing Privatization Initiatives
MTOE	Mobilization Tables of Organization and Equipment
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPL	National Priorities List
O&O	Operations and Organization
OACSIM	Office of the Assistant Chief of Staff for Installation Management
OB	Open Burn
ODASA	Office of the Deputy Assistant Secretary of the Army
OD	Open Detonation
ODCSLOG	Office of the Deputy Chief of Staff for Logistics
ODCSOPS	Office of the Deputy Chief of Staff for Operations
OEBGD	Overseas Environmental Baseline Guidance Document
OEESCM	Operational and Environmental Executive Steering Committee
OPLAN	Operational Plan
OPORD	Operational Order
OSD	Office of the Secretary of Defense
OSHA	Occupational Standards and Health Administration
PAH	Polycyclic Aromatic Hydrocarbons
P2	Pollution Prevention
PEIS	Programmatic Environmental Impact Statement
PM	Particulate Matter
PPBS	Programming, Budget, and Execution System
RC	Reserve Components
RCI	Residential Communities Initiatives

RCRA	Resource Conservation and Recovery Act
S&T	Science and Technology
SA	Secretary of the Army
SAIC	Science Applications International Corporation
SARA	Superfund Amendments and Reauthorizations Act
SDWA	Safe Drinking Water Act
SEA	Strategic Environmental Appraisal
SELC	Senior Environmental Leadership Conference
SERDP	Strategic Environmental Research and Development Program
T&E	Threatened and Endangered [Species]
TCP	Transformation Campaign Plan
TEMG	Transformation Environmental Management Group
TRADOC	Training and Doctrine Command
USACE	U.S. Army Corps of Engineers
USAES	U.S. Army Engineer School
USAMC	U.S. Army Materiel Command
UN	United Nations
U.S.	United States
USD (AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics
USFWS	U.S. Fish and Wildlife Services
UST	Underground Storage Tanks
UXO	Unexploded Ordnance

APPENDIX B – KEY TERMS

Environmental Terms

Biodiversity – The complex relationship of all living species of a particular area, taking into account habitat diversity, genetic diversity, and species diversity.

Cumulative Effects – These are impacts that, on their own, may not be significant. However, when added to many other similar impacts (from past, present, and reasonably foreseeable actions), the cumulative effect may be very significant.

Ecosystem – The complex of a community and its environment functioning as an ecological unit in nature.

Encroachment – When used in an environmental context, the term "encroachment" describes the reduction in the utility of land resources caused by external influences – people, facilities, waste products, equipment, and, in general, the increasing urbanization of society. Encroachment affects both Army installations and civilian properties, and relationships between the two. In a military setting, a common form of encroachment occurs when residential neighborhood development moves closer to the installation perimeter, thus limiting use of the installation for training purposes and, concurrently, creating disturbances in the local community.

Environment – Environment has been defined as "The external circumstances, conditions and objects that affect the existence and development of an individual, organism, or group. These circumstances included biophysical, social, economic, historical, cultural and political aspects" (Department of Environment Affairs, 1992).

Environmental Management System – An environmental management system describes the activities for systematically managing environmental products and services, including those organized around making environmental considerations an integral component of the organizational mission. Central to the model on which an EMS is patterned is the concept of a "continuous feedback loop." To this end, EMS starts with the development of policy, moves to planning activities and policy implementation, develops tracking and corrective actions, progresses to management review, and finally feeds information back through these steps and ultimately to baseline policy development – where changes may be required based on experiences and insights gained during the preceding phases. (See also "ISO 14001.")

Hazardous Material – "Hazardous material" is the term used to describe any material, including waste, which may pose an unreasonable risk to health, safety, property, or the environment when they exist in specific quantities and forms. Hazardous material also includes chemicals determined by the Secretary of Transportation to present risks to safety, health, and property during transportation.

ISO 14001 – ISO, or International Organization for Standardization, 14001 defines the specification standard for an environmental management system (EMS), and is the standard the Army is adapting in developing its own EMS. ISO 14001 consists of five basic elements: (1) Environmental Policy, (2) Planning, (3) Implementation and Operation, (4) Checking and Corrective Action, and (5) Periodic Management Review. ISO 14001 further defines EMSs

as "…that part of the overall management system. This includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, achieving, reviewing, and maintaining environmental policy. (See also "Environmental Management System.")

National Environmental Policy Act (NEPA) – NEPA requires commanders at all levels to evaluate environmental impacts of activities before making decisions. The goals of NEPA are to provide efforts to eliminate damage to the environment and to achieve a better understanding of ecological systems and natural resources. An additional goal is to integrate public involvement in federal decision-making.

Overseas Environmental Compliance Program – DoD executive agents are appointed to identify host-nation and Status of Forces Agreement (SOFA) environmental standards. The Overseas Environmental Baseline Guidance Document (OEBGD) lays out procedures and criteria for environmental compliance at DoD installations overseas.

Strategic Environmental Appraisal – Strategic Environmental Appraisal (SEA) is a process of anticipating and addressing the potential environmental consequences of proposed initiatives at higher levels of decision-making. It aims at integrating environmental considerations into the earliest phase of policy, plan, or program development, on a par with technical, economic, and social considerations. For the Army, SEA represents the first systematic attempt to examine and evaluate the environment in terms of its influence on Army missions, with a particular emphasis on the planning and activities underway in connection with Army Transformation. SEA, as a process, is also designed to foster communication and collaboration between environmental and operational planners. (See also "Army Transformation.")

Sustainable Development – The concept of sustainability essentially means that effects on renewable resources do not exceed the regenerative capacity of the environment (Sadler, 1995). Lyle (1985) stated this principal as "no net loss of natural resources or systems." Sustainable development, however, concerns more than natural resources or systems. It has been defined as "…development that delivers basic environmental, social and economic services to all without threatening the viability of the natural, built and social systems upon which these services depend" (ICLEI, 1995).

Military Terms

Army Environmental Campaign Plan – A plan to integrate environmental stewardship with the Army's Transformation Strategy. This plan also builds on the *U.S. Army Environmental Strategy Into the 21st Century* by responding to new challenges inherent in the Army's transformation to a more responsive, deployable, agile, versatile, lethal, survivable, and sustainable instrument of national power.

[U.S.] Army Environmental Strategy into the 21st Century – The document that defines the Army's leadership commitment and philosophy for meeting present and future environmental challenges. It provides a framework to ensure that environmental considerations are integral to the Army mission and that an environmental stewardship ethic governs the all Army activities. The strategy provides a unity of direction and a cohesive framework for all Army activities associated with Army installations, facilities, training

areas, as well as acquisition, manufacturing, industrial operations and activities, and for the Army's civil works mission.

Army Transformation – The Army's transformation is conceived as one process, but with three simultaneous, interdependent axes: Trained and Ready, Transformation of the Operational Force, and Transformation of the Institutional Army. Army Transformation is the term used to describe the Army's total transformation to meet challenges posed in the post-Cold War era and dawn of a new century. It is used frequently to describe activities underway to transition the Army from a heavier, more stationary force to a more responsive, deployable, agile, versatile, lethal, survivable, and sustainable Objective Force, "dominant across the full spectrum of operations." The term, however, encompasses transformation of the full range of Army capabilities, not simply those restricted to combat operations. (See also "Army Transformation Campaign Plan" and "Objective Force.")

Army Transformation Campaign Plan (TCP) – The TCP is a mechanism for integrating and synchronizing implementation of the Army Vision within the Army. It contains a level of detail required to synchronize Army-wide transformation efforts and maximize the effectiveness and efficiency of those efforts. At the same time, it is designed to allow maximum flexibility for innovation and initiative throughout the Army, by focusing collective efforts on achieving a common goal – the Army's transformation objective. It will be updated as frequently as necessary to reflect the current situation and leadership intent.

DTLOMS – DTLOMS stands for doctrine, training, leader development, organizational design, materiel development, and soldier support. It embodies the framework for identifying, assessing, and managing the way Army members think, train, and ultimately perform across the full spectrum of operations. Environmental DTLOMS integration, on its part, describes the activities necessary to achieve a seamless integration of environmental considerations into the DTLOMS management framework.

Interim Brigade Combat Team (IBCT) – The IBCT is a divisional Brigade. It is designed to optimize its organizational effectiveness and balance the traditional domains of lethality, mobility and survivability with the capabilities required for responsiveness, deployability, sustainability and a reduced in-theater footprint. Its core qualities are high mobility (strategic, operational, and tactical) and its ability to achieve decisive action through dismounted infantry assault, supported by organic direct and indirect fire platforms, and enabled by situational understanding. The major fighting components are its motorized infantry battalions. The IBCT also has a unique Reconnaissance, Surveillance land target Acquisition (RSTA) Squadron to enhance situational understanding.

Initial Force – The Initial Force is a two-brigade force using off-the-shelf equipment. These units will evaluate and refine the Operations and Organization (O & O) combat team and develop tactics, techniques, and procedures, thereby establishing the critical conditions necessary for the Interim Force.

Interim Force – The Interim Force is designed to bridge the gap between present capabilities and the Objective Force (see below). It will entail off-the-shelf equipment based on current technology and will be full-spectrum-capable. The interim design will be extended beyond brigade echelon including interim division capabilities. At full operational capability (FOC), an interim unit will be manned, equipped, and trained to accomplish the capabilities as described in the Interim Force O & O.

Objective Force – The Objective Force is the goal of Army Transformation. Accomplishing this goal achieves the transformation objective of a force that is strategically responsive and dominant at every point on the spectrum of operations. It is a force most rigorously described by the seven force characteristics of the Army Vision: Responsive, deployable, agile, versatile, lethal, survivable, and sustainable.

MANPRINT – MANPRINT (MANpower and PeRsonnel INTegration) is a U.S. Army program designed to ensure that the needs of soldiers and their units are considered throughout the entire system acquisition process and life-cycle. It objective is to improve the effectiveness of system performance at minimum cost for personnel, maintenance, and repairs throughout the entire life-cycle of a system. This design objective is achieved by incorporating related considerations from seven key design areas: Manpower, Personnel, Training, Human Factors, Engineering, Safety, Health Hazard, and Soldier Survivability.

APPENDIX C – KEY REFERENCES

Introduction

The references that follow were used to support development of this second SEA Report. They include interviews and workshops with environmental and operational planners and decision-makers, which provided SEA preparers first-hand insight, knowledge, and experience to the appraisal process; official reports, prepared by Army and DoD agencies, which provided valuable information on the current state of environmental management in the Army; planning documents, which set forth policies, directives, and operational approaches to environmental management; and texts and white papers, which provided a range of alternative insights and experiences on the environment and proved to be beneficial in the framing of issues and opportunities discussed in this report.

Interviews and Workshops

Interviews and Workshops with Army Transformation Campaign Plan Lines of Operation Personnel and selected Major Army Command (MACOM) staff personnel at the Pentagon, and Science Application International Corporation (Alexandria Office), Inc, were conducted in August 2000 and February 2001.

Interviews and workshops with the Transformation Lines of Operations offices and primary Army MACOMs and environmental agencies provided staff and command perspectives regarding potential environmental threats and opportunities. These activities also provided environmental and operational planners a continuing update on the status of Army Transformation and its relationship to the environment, as well as help raise the level of awareness on the importance of an integrated approach to Transformation planning and implementation.

Official Reports

Installation Training Capacity, Phase I Study Report, Headquarters Department of the Army, DAMO-TR, December 1997.

This report provides an in-depth assessment of 31 FORSCOM, TRADOC, USARPAC, MDW, and AMC installations for their capability to support the live training review and analysis of the Active Component force stationed at those installations.

Preliminary Draft - Environmental Assessment, Interim Brigade Combat Team Transformation at Fort Lewis Washington, CH2M Hill, July 2000.

This Environmental Assessment (EA) analyzes the effects of transforming the 1st Brigade, 25th Infantry and the 3rd Brigade, 2nd Infantry Division into IBCTs. It describes the environmental and socioeconomic effects of these changes in the Fort Lewis and Yakima Training Center study areas.

Proceedings, DoD-Industry Round Table on Building Business Value into Environment, Safety, and Health Management: Exchanging Best Practices, Sponsored by the Deputy

Assistant Secretary of the Army (Environment, Safety, and Occupational Health) and the International Cooperative for Environmental Leadership, January 21, 1999.

> The January 1999 round table, presided over by the Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health), brought together environmental and operational executives from major defense organizations and private companies for an exchange of information on the best practices in integrating environmental, safety, and health management criteria into business operations. These proceedings represent a valuable source of information on environmental-operational integration, much of it directly applicable to Army Transformation.

SEA of the SDR, Main Report, Ministry of Defence, United Kingdom, Land Use Consultants, June 2000, admin@bristol.landuse.co.uk

> This report completes the first full iteration of the Strategic Environmental Appraisal (SEA) related to the United Kingdom's Strategic Defence Review (SDR), published by the Secretary of State for Defence in July 1998. The SEA has explored the possible environmental consequences of changes resulting from the SDR, which entails the restructuring of the UK's front line forces and support areas. The report represents a useful document for research in light of the current challenge to transform the U.S. Army, as many of the principles and practices of the UK's SEA process and objectives of the SDR are very similar to the U.S. effort.

Planning Documents

AR 200-1, *Environmental Protection and Enhancement*, Headquarters Department of The Army, February 1997

> This regulation outlines the Army's commitment to environmental stewardship in the accomplishment of its mission, and provides implementing guidance for the Army Environmental Strategy.

Army Environmental Campaign Plan and Operational Directive (Draft), Deputy Assistant Secretary of the Army for Environment Safety and Occupational Heath (DASA-ESOH), April 2000

> This plan and its implementing operational directive integrate environmental stewardship with the Army's Transformation Strategy. It delineates key issues, identifies responsible organizations, and recommends required actions. It provides a management framework for strategic environmental issues.

Army Vision, Headquarters Department of the Army, October 2000.

> The Army Vision provides the strategic direction for Army implementation of the National Military Strategy. It calls for an Army that is persuasive in peace and invincible in war through dominance across the full spectrum of conflict. Key components of the Army Vision are Transformation, People, and Training.

Draft Munitions Action Plan (MAP), Operational and Environmental Executive Steering Committee for Munitions (OEESCM), U.S. Department of Defense, July 2000

Draft 2000 Strategic Plan, U.S. Environmental Protection Agency, Office of the Chief Financial Officer, U.S. Environmental Protection Agency, August 2000

This plan presents EPA's Strategic Plan, including their mission statement and the ten long-term goals for the next five years. It establishes the framework, programs, priorities, and resources to advance environmental protection.

FM 3-100.4, *Environmental Considerations in Military Operations*, Headquarters, Department of the Army, June 2000

This field manual guides the U.S. Army and U.S. Marine Corps in applying appropriate environmental protection procedures during all types of operations. It also provides basic techniques and procedures for units at the company, battalion, and brigade/regiment levels. This manual states the purposes of "military environmental protection," a description of legal requirements, and a summary of current military programs. It also describes the growing strategic significance of environmental factors in the twenty-first century. As a unit procedures manual, it describes how to apply risk management methods to identify actions that may harm the environment and appropriate steps to prevent or mitigate damage. Appendixes provide references, formats, practical applications, checklists for self-assessment, and sources of assistance.

United States Army Transformation Campaign Plan, Headquarters Department of the Army, July 2000.

This plan provides the mechanism for integrating and synchronizing implementation of the Army's transformation. It maximizes the effectiveness and efficiency of Army Transformation by establishing common objectives and focusing on collective efforts within the Army.

U.S. Army Environmental Strategy into the 21st Century, 1992

Key features of the Army Environmental Strategy are its proactive approach to environmental challenges and responses in terms of the "four pillars" of Compliance, Restoration, Prevention, and Conservation.

Texts and White Papers

Forest L. Reinhardt, "Bringing the Environment Down to Earth," *Harvard Business Review*, July-August 1999

In this article, Reinhardt raises the point that support for the environment should not be cast in zero-sum terms, and that it is indeed possible to achieve mission success while at the same time remaining a responsible steward of the environment. He also points out how many companies have actually improved their operations as a result of responding proactively to environmental challenges.

Real Property Sustainable Development Guide, Office of Government wide Policy, Office of Real Property, U.S. General Services Administration, Undated

This guide is organized to help government real property managers to understand the principles of sustainable development and to take advantage of its benefits by making these principles and practices a part of everything they do. Because these principles cross

all sectors of business and government activity, the guide is helpful to any executive or commander interested in ensuring a more environmentally sustainable approach to mission success.

Strategic Environmental Assessment (SEA), A Primer, CSIR Report ENVR, September 1996.

This report provides a primer on the SEA process and specific applications in the Republic of South Africa. It identifies what makes SEA strategic and therefore different from traditional Environmental Impact Analysis (EIA).

Stuart L. Hart, "Beyond Greening: Strategies for a Sustainable World," *Harvard Business Review*, January-February 1997

In this article Hart demonstrates that the drive toward environmental sustainability is an absolute imperative for human survival. It also represents one of the biggest challenges – and opportunities – for individual companies in the history of commerce. Although written from a commercial perspective, the author's arguments find many applications to the environmental challenges facing the Army as it begins its transformation.

Dr. Jean Shorett, Information Paper (Draft), *Environmental Management Systems for the Army Transformation*, June 25, 2001

White Paper, Strategic Environmental Assessment for Army Transformation, Headquarters, Department of the Army, August 2000

This paper defines Strategic Environmental Appraisal (SEA), and discusses use of SEA as a process for making environmental concerns and considerations an integral component of the Army's transformation. It is written to provide information to the broader Army organization and key external stakeholders on the SEA process and its relationship to Army Transformation.